



Study on Environmental Fiscal Reform Potential in 14 EU Member States

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AARHUS UNIVERSITY



Study on Environmental Fiscal Reform Potential in 14 EU Member States: Main Report

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Final Report to DG Environment of the European Commission

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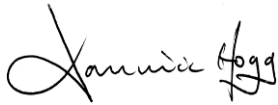
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EXECUTIVE SUMMARY

E.1.0 Introduction

The 2015 European Semester round began with the adoption of the Annual Growth Survey (AGS) in November 2014. The AGS contains priorities which should be addressed in the National Reform Programmes (NRPs) which are due by the end of April 2015. Subsequently, the Commission will propose a series of Country Specific Recommendations (CSRs) accompanied by an analysis in the form of Commission Staff Working Documents (SWDs) for each Member State.¹ The CSRs will be discussed and subsequently adopted following endorsement by the European Council in June/July. It is intended that this study may feed into the development of the CSRs for 2015.

The 2015 AGS acknowledges that *"employment and growth can be stimulated by shifting the tax burden away from labour towards other types of taxes which are less detrimental to growth, such as recurrent property, environment and consumption taxes"*.² The AGS sets out three pillars that will underpin the EU's economic and social policy for 2015:

- A coordinated response to boosting investment;
- A renewed commitment to structural reforms; and
- The pursuance of fiscal responsibility.

Environmental taxes (together with consumption and recurrent property taxes) are considered less detrimental to growth than other taxes such as on labour or corporate income and are increasingly promoted in the context of economic recovery and growth-friendly fiscal consolidation.³ The references to more growth friendly tax systems, and the expressed desire to promote more efficient use of both energy and other resources, point towards the centrality of environmental fiscal reform (EFR) as a means to set the European economy on a trajectory of growth with a strong shade of green.

E.2.0 Aims

This study, undertaken by Eunomia Research & Consulting (Eunomia) in conjunction with Professor Mikael Skou Andersen of Aarhus University and the Institute for European Environmental Policy (IEEP), has, as its central aim, to:

"... provide empirical data or secondary sources on the potential economic and social benefits of environmental fiscal reform, to support the input in the European Semester process on environmental protection and resource efficiency".

¹ The 'Programme countries' (Cyprus, Greece, Portugal) follow a slightly different procedure.

² European Commission (2014) *Annual Growth Survey 2015*, November 2014, http://ec.europa.eu/europe2020/pdf/2015/ags2015_en.pdf, p. 15

³ See for example: DG TAXUD (2013) *Tax Reforms in EU Member States 2013 - Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, Working Paper No. 38 - 2013

The specification elaborates on this as follows:

“The task includes presenting data on the potential of revenues from environmental taxation and other indirect benefits such as job creation resulting from EFR in 14 selected countries, using the methodology the EEA has developed and which was also applied to the study published on 03.03.14 for 12 Member States”.

The following 14 Member States were included in this study:

- Bulgaria
- Cyprus
- Denmark
- Finland
- Germany
- Greece
- Ireland
- Latvia
- Malta
- Netherlands
- Slovenia
- Spain
- Sweden
- United Kingdom

The approach taken in this study was to highlight the potential for revenue generation from environmental taxes using a methodology that Eunomia and Professor Mikael Skou Andersen developed as part of an earlier study published in March 2014.⁴ This study in turn built on work by the European Environment Agency between 2010 and 2013 on the potential for environmental fiscal reform in four EU Member States affected by the economic crisis.⁵ As with the last study for the European Commission, the intention of this study is to indicate where this potential may lie, and to demonstrate the order of magnitude of the revenues that could be derived from environmental taxes in each Member State if they are applied at rates proposed in this work. It should be mentioned that these rates do not constitute some ‘upper bound’ for each environmental tax, and that Member States may well seek to implement rates which exceed, or are lower than, those upon which the revenue calculations are based. The proposed timeline for implementation may also differ from that suggested here, which assumes a relatively swift application of the proposed taxes, whereas in practice, the final timeline for introduction of EFR will vary depending on various factors. Finally, whilst it is recognised that not all Member States are likely to be equally interested in all the suggested taxes, no attempt is made to understand which may be of greatest interest to a given Member States. The suggestions for reform set out in this study are meant to provide a stimulus for a general discussion on EFR and identify potential areas for exploration which could be taken forward where relevant.

E.3.0 Approach

As noted above, the approach adopted in this study was in line with that used for the review of 12 Member States undertaken in 2013/14 for the European Commission, the

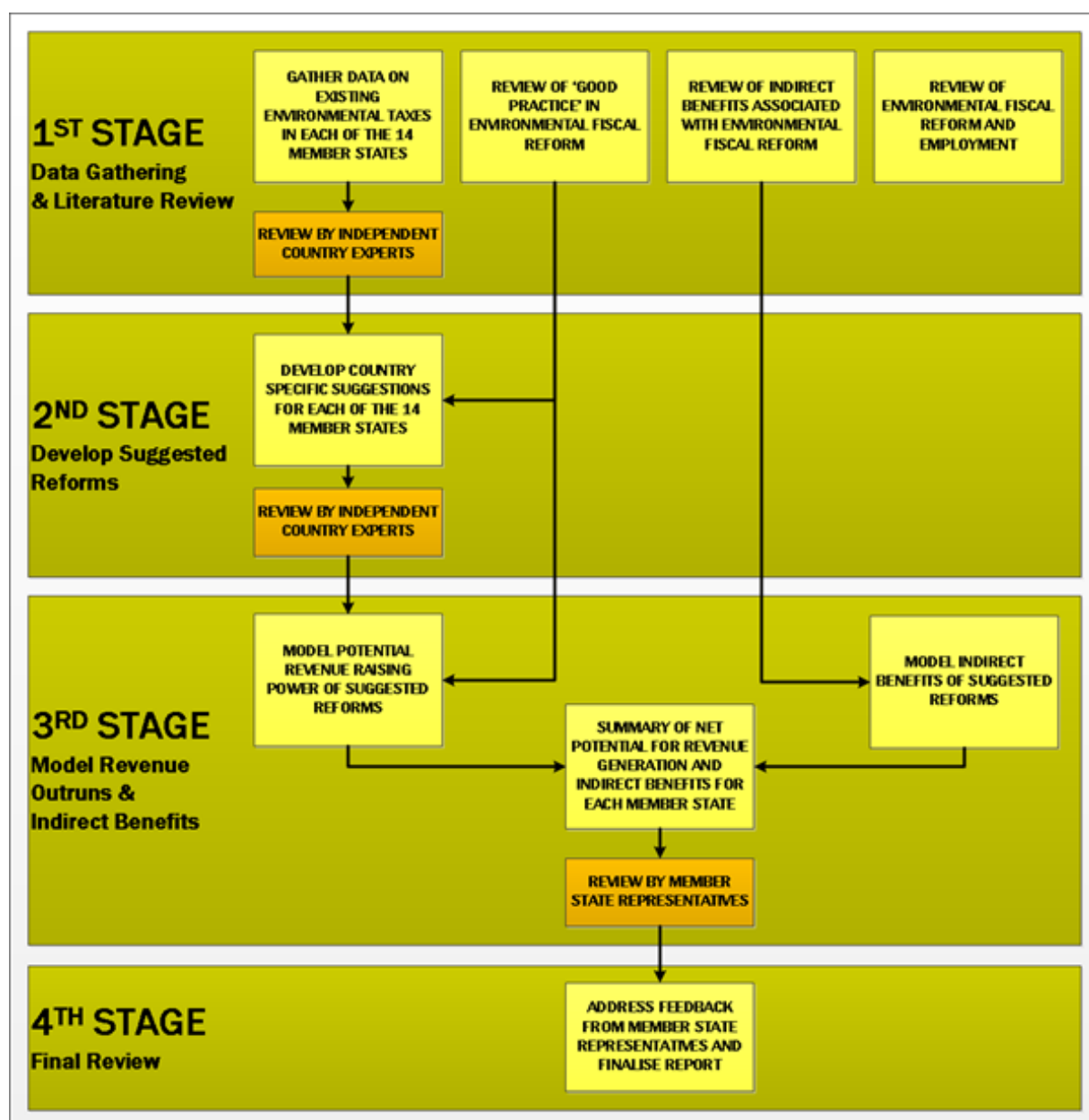
⁴ Eunomia Research & Consulting, and Aarhus University (2014) *Study on Environmental Fiscal Reform Potential in 12 EU Member States*, Report for European Commission - DG Environment, February 2014, http://ec.europa.eu/environment/integration/green_semester/pdf/EFR-Final%20Report.pdf

⁵ Reports can be downloaded from: European Environment Agency (undated) *Green Fiscal Reform Can Create Jobs and Stimulate Innovation Across the EU*, www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs

only significant difference being that environmentally harmful subsidies were not included as part of this work. The approach that has been taken is shown graphically in Figure E-1-1. From this it can be seen that the study was divided into three core stages:

- **Stage 1** – this initial stage aimed to gather all the relevant baseline information for the study and included gathering information on existing environmental taxes in each Member State (see Sections 7.0 to 20.0 of the Main Report), reviewing ‘good practice’ in Europe (Section 5.0), identifying some of the indirect benefits associated with environmental taxes (Section 6.0), and undertaking a literature review of the impacts of EFR on employment (Appendix A.4.0). Section 4.0 of the Main Report provides some commentary on the key issues that were faced in gathering this information.
- **Stage 2** – in this stage a number of suggested reforms to the tax system were developed for each Member State (Sections 7.0 to 20.0). These were based around rates suggested as a result of the review of good practice. It is worth reiterating that Member States may well choose to implement higher or lower rates, and it is recognised that some Member States will also be more inclined to increase / introduce some taxes than others. The study makes no attempt to make judgements of this nature, but rather, indicates the potential for revenue generation through such taxes;
- **Stage 3** – as part of this stage a model was developed to determine the baseline situation in each Member State, and to estimate how much additional revenue could be raised for each of the suggested changes outlined in Stage 2 relative to the baseline, as well as for the overall package of suggestions put forward for each Member State (Sections 7.0 to 20.0). The report was then sent to Member State representatives for a final review.
- **Stage 4** – this final stage involved finalising the report based on the comments of review by Member State representatives.

Figure E-1-1: Outline of the Approach Taken



E.4.0 Key Findings

All figures are given in real (2014) terms. For the group as a whole, additional revenue generated in 2017 from environmental taxes is estimated to be around €38 billion, or 0.48% of the estimated GDP for the 14 countries combined, rising to €111 billion in 2025 (in real 2014 terms), or 1.39% of the combined GDP. Additional analysis, regarding increasing cost recovery in water supply and treatment services and through HGV externality charging, indicates an additional revenue potential of over €23 billion per annum (in real 2014 terms).

Table E-1-1, Table E-1-2 and Table E-1-3 below show the split of revenue generation from different types of environmental taxes suggested for implementation in the 14 Member States. The majority of the overall increase comes from additional taxes on transport

(excl. transport fuels) (0.80% of GDP). Additional revenue generated from increasing energy excise duties amounts to 0.35% of GDP. Finally, an increase of 0.24% of GDP is estimated from increased taxes on pollution and resources.

Table E-1-1: Revenue Generated from Energy Taxes by the 14 Member States in 2025, % GDP and € billion (real 2014 terms)

Energy Tax	% GDP	€, billion
Energy Excise Duties - Transport fuels	0.24%	19.37
Energy Excise Duties - C&I / Heating	0.07%	5.66
Energy Excise Duties - Electricity	0.03%	2.62
Total Energy Taxes	0.35%	28

Table E-1-2: Revenue Generated from Transport (excl. transport fuels) Taxes by the 14 Member States in 2025, % GDP and € billion (real 2014 terms)

Transport Tax	% GDP	€, billion
Vehicle Taxes	0.57%	45.46
Passenger Aviation Tax	0.23%	18.58
Freight Aviation Tax	0.00013%	0.010
Total Transport (excl. transport fuels) Taxes	0.80%	64

Table E-1-3: Revenue Generated from Pollution and Resource Taxes by the 14 Member States in 2025, % GDP and € billion (real 2014 terms)

Pollution/Resource Tax	% GDP	€, billion
Landfill Tax - Non-haz (excl. C&D)	0.01%	0.88
Landfill Tax - Inerts (C&D)	0.0006%	0.04
Incineration /MBT Tax	0.01%	0.92
Air Pollution Tax	0.03%	2.06
Water Abstraction Tax	0.11%	8.81
Waste Water Tax	0.02%	1.34
Pesticides Tax	0.02%	1.58
Aggregates Tax	0.02%	1.53
Packaging Tax	0.02%	1.61

Pollution/Resource Tax	% GDP	€, billion
Single Use Bag Tax	0.01%	0.42
Fertiliser Tax	0.00001%	0.001
Total Pollution and Resource Taxes	0.24%	19

Potential revenue generated in the 14 Member States from increasing environmental taxes is given in Table E-1-4. The size of the economies in the different countries clearly influences the amount of revenue that is estimated to be generated.

Table E-1-4: Revenue Generation by Member State for Selected Years, € million (real 2014 terms)

Member State	2017	2020	2025
Bulgaria	528	921	946
Cyprus	212	379	425
Denmark	851	1,585	1,809
Finland	1,502	2,581	3,110
Germany	14,278	33,821	41,375
Greece	1,239	2,326	2,889
Ireland	701	1,680	2,010
Latvia	250	485	642
Malta	93	212	280
Netherlands	2,815	6,779	9,405
Slovenia	134	228	299
Spain	9,667	23,550	28,390
Sweden	1,967	5,450	6,583
United Kingdom	4,065	10,207	12,743
Total	38,301	90,204	110,908

Expressed as a proportion of GDP, the revenues are shown in Table E-1-5. In the year 2025, the estimated additional revenue generation from the environmental taxes lies between 0.62% of GDP (United Kingdom) and 3.68% GDP (Malta). The estimated increases for the other 12 countries considered all lie within the range 0.69% GDP to 2.7% GDP.

The environmental benefits associated with these changes have been estimated, though this analysis does not capture all the external benefits associated with the changes as this depends on a number of factors including the specificities of design and implementation of the taxes, revenue use, etc.

Table E-1-6 indicates that these benefits lie between 0.02% GDP (UK, NL, DK) and 0.81% GDP (Latvia) in 2025. The patterns of the benefits reflect the sources of the additional tax revenue.

Table E-1-5: Revenues Generated from Environmental Taxes by Member State, % GDP

Member State	Total Environmental Taxes in 2012, % GDP	Total Additional from Environmental Taxes in 2025, % GDP
Bulgaria	2.82%	2.19%
Cyprus	2.67%	2.64%
Denmark	3.87%	0.69%
Finland	3.07%	1.52%
Germany	2.18%	1.43%
Greece	2.85%	1.53%
Ireland	2.49%	1.15%
Latvia	2.42%	2.47%
Malta	2.98%	3.68%
Netherlands	3.56%	1.51%
Slovenia	3.82%	0.85%
Spain	1.57%	2.70%
Sweden	2.49%	1.50%
United Kingdom	2.62%	0.62%
EU-average	2.29%	
EU-Maximum	3.87%	

Table E-1-6: Estimated Indirect Benefits from Reduced Environmental Impacts, 2025, % GDP and € millions (real 2014 terms)

Member State	% GDP	€, million
Bulgaria	0.71%	392
Cyprus	0.31%	59

Member State	% GDP	€, million
Denmark	0.02%	67
Finland	0.06%	164
Germany	0.10%	3,487
Greece	0.45%	891
Ireland	0.05%	96
Latvia	0.81%	268
Malta	0.27%	26
Netherlands	0.02%	189
Slovenia	0.09%	35
Spain	0.14%	1,557
Sweden	0.04%	201
United Kingdom	0.02%	408

Table E-1-7: Revenue Generation by Member State from Cost Recovery in Water Services and HGV Externality Charging, € million (real 2014 terms)

Member State	Water Cost Recovery	HGV Externality Charge	Total
Bulgaria	496	133	629
Cyprus	5	54	59
Germany	0	1,346	1,346
Denmark	0	110	110
Greece	1,420	290	1,710
Spain	7,083	1,927	9,010
Finland	1,171	212	1,383
Ireland	1,368	87	1,455
Latvia	65	70	135
Malta	66	5	71
Netherlands	1,517	306	1,823
Sweden	1,422	137	1,559

Member State	Water Cost Recovery	HGV Externality Charge	Total
Slovenia	55	54	109
United Kingdom	3,205	844	4,049
Total	17,873	5,576	23,449

Table E-1-7 shows the revenue generation by Member State from cost recovery in water services and HGV externality charging. The figures are separated from the main results as the analysis was additional to the work carried out in the first study on 12 Member States. Thereby ensuring the high level figures between the two studies are consistent.

E.5.0 Jobs

In respect of job creation, a detailed analysis of this is beyond the scope of this study, but a review of the potential effect of EFR on employment has been undertaken (and this can be found in Appendix A.4.0). This indicates that on balance, the impacts are likely to be positive where environmental taxes effectively replace taxes such as those on employment. This is an explicit objective in many cases of EFR (where revenue from environmental taxes is matched by reductions in other taxes of the same magnitude), but it may be implicit in some circumstances where there is a need for fiscal consolidation (i.e. where the choice is between raising revenue through environmental taxes, or raising other forms of tax).

E.6.0 Administrative Costs

Some concerns have been raised in the countries covered by this study regarding the administrative costs of some existing environmental taxes. A brief review indicates that many such taxes have relatively low administrative costs (compared with other taxes). This may be related, in part, to the nature of some such taxes (for example, where they are oriented around market transactions, as with taxes on energy carriers). Not all such taxes are of this nature. It is suggested that where possible, Member States should make use of the existing administrative apparatus to collect revenues so as minimise related administrative costs. This might include making use of existing reporting or monitoring obligations. Where such obligations do not exist, the taxes can help drive the provision, and capture of, data which has some value in itself beyond that of the revenue generated by the tax.⁶

⁶ Hogg, D. (1999) *The Effectiveness of the UK Landfill Tax: Early Indications*. In Thomas Sterner (ed.) *The Market and the Environment: Environmental Implications of Market-Based Policy Instruments*, Cheltenham: Edward Elgar.

ZUSAMMENFASSUNG

E.1.0 Einführung

Das Europäische Semester 2015 begann mit der Annahme des Jahreswachstumsberichts in November 2014. Der Wachstumsbericht enthält Prioritäten, die in den bis Ende April 2015 vorzulegenden nationalen Reformprogrammen Berücksichtigung finden sollen. In einem nächsten Schritt wird die Kommission für jedes Mitgliedsland eine Reihe von landesspezifischen Empfehlungen abgeben.⁷ Begleitet werden diese durch eine Analyse in der Form von Arbeitspapieren der Kommission. Die landesspezifischen Empfehlungen können nach Erörterung und Annahme durch den Europäischen Rat im Juni/Juli 2015 zur Umsetzung kommen. Die vorliegende Studie soll in die Entwicklung der landesspezifischen Empfehlungen im Jahr 2015 einfließen.

Der Jahreswachstumsbericht 2015 stellt fest, dass Beschäftigung und Wachstum durch eine Verschiebung der Steuerlast weg von Arbeit hin zu anderen Steuerarten, die weniger wachstumsschädlich sind, gefördert werden können, wie etwa Immobilien-, Umwelt- und Konsumsteuern.⁸ Der Jahreswachstumsbericht benennt drei Säulen, auf denen die Wirtschafts- und Sozialpolitik der EU für 2015 ruht:

- Ein koordiniertes Vorgehen, um Investitionen zu fördern,
- ein erneuertes Bekenntnis zu Strukturreformen und
- die Verfolgung einer verantwortungsbewussten Haushaltspolitik.

Umweltsteuern, gemeinsam mit Steuern auf den Konsum und einer regelmäßigen Besteuerung von Immobilienvermögen, werden als weniger wachstumsschädlich angesehen, als andere Steuern wie auf Arbeit oder die Besteuerung von Unternehmen. Folglich finden Umweltsteuern im Kontext wirtschaftlicher Erholung und einer wachstumsfreundlichen Haushaltskonsolidierung ihren Anklang.⁹ Die Stoßrichtung eines wachstumsfreundlicheren Steuersystems, wie auch der ausdrückliche Wunsch nach einer effizienten Nutzung von Energie und anderen Ressourcen, verdeutlichen die zentrale Bedeutung einer umweltorientierten Fiskalreform als ein Mittel um die europäische Wirtschaft auf einen „grünen“ Wachstumspfad zu lenken.

E.2.0 Ziele

Diese Studie, durchgeführt durch Eunomia Research & Consulting (Eunomia), in Zusammenarbeit mit Professor Mikael Skou Andersen (Universität Århus) und dem Institute for European Environmental Policy (IEEP), hat als Hauptziel

„... empirische Daten oder sekundäre Quellen zu den potenziellen ökonomischen und sozialen Nutzen einer umweltorientierten Fiskalreform zusammenzutragen, die

⁷ Die „Programmländer“ (Zypern, Griechenland, Portugal) folgen einer leicht veränderten Prozedur.

⁸ European Commission (2014) Annual Growth Survey 2015, November 2014, http://ec.europa.eu/europe2020/pdf/2015/ags2015_en.pdf, p. 15

⁹ Vgl. DG TAXUD (2013) Tax Reforms in EU Member States 2013 - Tax Policy Challenges for Economic Growth and Fiscal Sustainability, Working Paper No. 38 - 2013

zu Fragen des Umweltschutzes und der Ressourceneffizienz im Rahmen des Europäischen Semesters Eingang finden.“

Die Aufgabenbeschreibung erläutert dies wie folgt:

„Die Aufgabe umfasst die Ermittlung von Daten zum potenziellen Aufkommen von Umweltsteuern und anderen indirekten Nutzen wie der Schaffung von Arbeitsplätzen durch eine umweltorientierte Fiskalreform in 14 ausgewählten Staaten, unter Nutzung der von der Europäischen Umweltagentur entwickelten Methodologie, welche auch in der am 03.03.2014 veröffentlichten Studie für 12 Mitgliedstaaten angewendet wurde.“

Für diese Studie wurden die folgenden 14 Mitgliedstaaten berücksichtigt:

- Bulgarien
- Zypern
- Dänemark
- Finnland
- Deutschland
- Griechenland
- Irland
- Lettland
- Malta
- Niederlande
- Slowenien
- Spanien
- Schweden
- Vereinigtes Königreich

Diese Studie beleuchtet das Aufkommenspotenzial von Umweltsteuern unter Nutzung einer Methodologie, die durch Eunomia und Professor Mikael Skou Andersen im Rahmen einer früheren Studie entwickelt wurde. Diese wurde im März 2014 veröffentlicht.¹⁰ Sie baute wiederum auf einer Arbeit der Europäischen Umweltagentur zwischen 2010 und 2013 zum Potenzial einer umweltorientierten Fiskalreform in vier EU Mitgliedstaaten auf, die durch die Wirtschaftskrise betroffen waren.¹¹

Wie in der letzten Studie für die Europäische Kommission, soll in dieser Studie aufgezeigt werden, wo diese Potenziale liegen könnten und in welcher Größenordnung sich das Aufkommenspotenzial in jedem Mitgliedstaat bewegen könnte, wenn Umweltsteuern im in dieser Arbeit vorgeschlagenen Steuersätzen erhoben würden. Diese Steuersätze stellen jedoch keinen oberen Wert für die jeweilige Umweltsteuer dar. Vielmehr steht es den Mitgliedstaaten frei, Steuersätze zu erheben, die die Sätze über- oder unterschreiten auf denen die Aufkommensberechnungen basieren. Auch kann der verfolgte Zeitplan für die Umsetzung von dem hier vorgeschlagenen Zeitplan abweichen, welcher eine vergleichsweise zügige Anwendung der vorgeschlagenen Steuern annimmt. In der Praxis wird der Fahrplan einer umweltorientierten Fiskalreform von verschiedenen Faktoren abhängen. Zu beachten ist auch, dass nicht alle Mitgliedstaaten in gleicher Weise an den vorgeschlagenen Steuern Interesse zeigen werden, wobei kein Versuch unternommen wird, herauszuarbeiten, welche Umweltsteuern für den jeweiligen Staat von besonderem Interesse sein könnten. Die in dieser Studie vorgeschlagenen Reformen sollen eine allgemeine Diskussion zu einer umweltorientierten Fiskalreform anregen und Bereiche identifizieren, die weiter erörtert und vertieft werden können.

¹⁰ Eunomia Research & Consulting und Aarhus University (2014) *Study on Environmental Fiscal Reform Potential in 12 EU Member States*, Report for European Commission - DG Environment, February 2014, http://ec.europa.eu/environment/integration/green_semester/pdf/EFR-Final%20Report.pdf

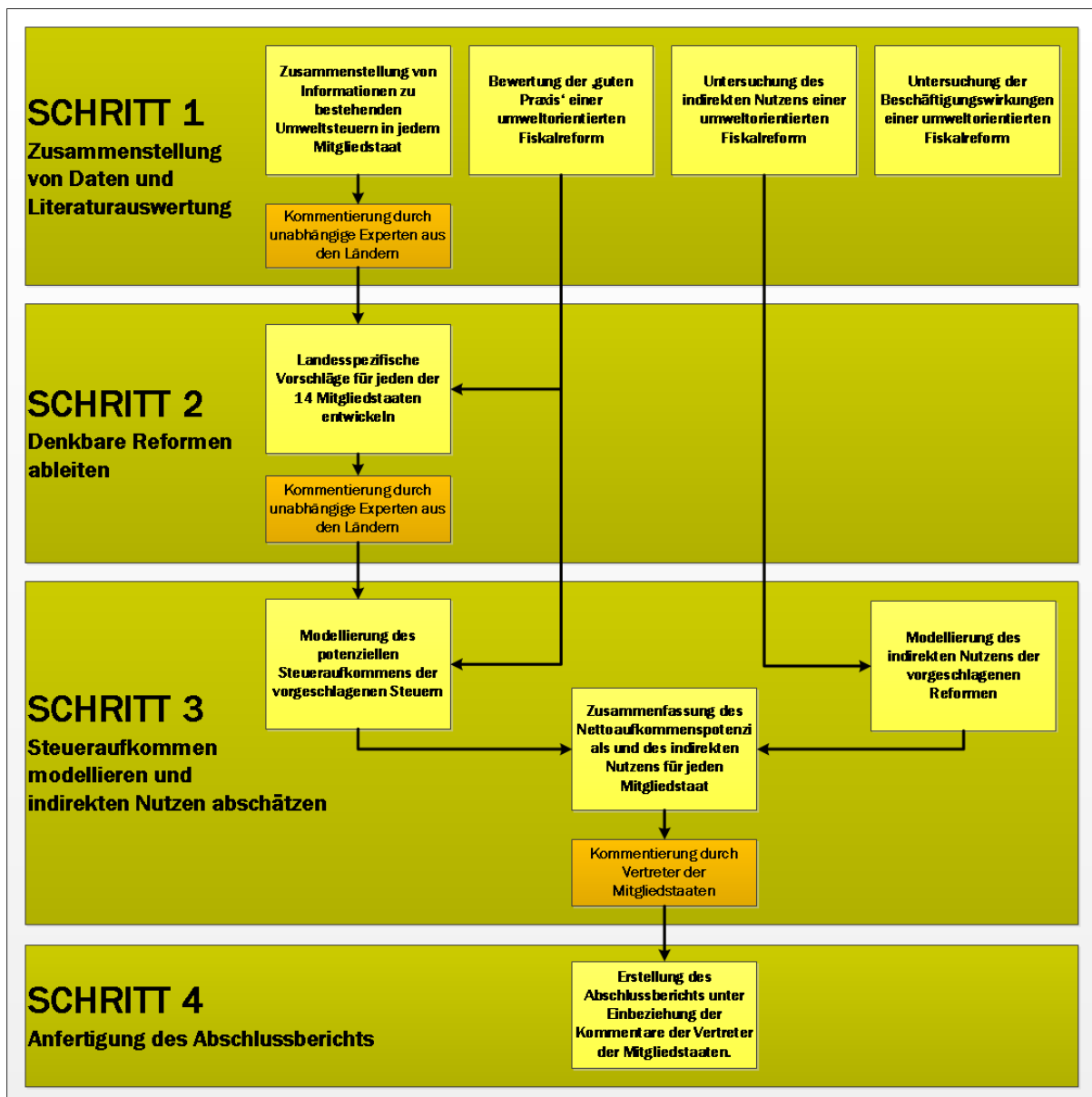
¹¹ Europäische Umweltagentur, <http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs>

E.3.0 Vorgehen

Wie oben erläutert, folgt diese Studie der Methode, wie sie bereits für die Betrachtung der 12 Mitgliedstaaten im Auftrag der EU Kommission im Jahr 2013 verwendet wurde. Ein Unterschied liegt darin, dass umweltschädliche Subventionen in dieser Arbeit nicht untersucht werden. Die Abbildung E-1-1 verdeutlicht den gewählten Ansatz. Die Studie wurde in vier Schritten durchgeführt:

- **Schritt 1** – Dieser erste Schritt zielte auf die Sammlung von relevanten Basisdaten für die Studie ab. Er beinhaltete die Zusammenstellung von Informationen zu bestehenden Umweltsteuern in jedem Mitgliedstaat (vgl. Abschnitte 7.0 bis 20.0 des Endberichts), die Bewertung der ‚guten Praxis‘ in Europa (Abschnitt 5.0), die Identifizierung einiger der mit Umweltsteuern verbundenen indirekten Nutzen (Abschnitt 6.0) und die Durchführung einer Literaturlauswertung zu den Beschäftigungswirkungen einer umweltorientierten Fiskalreform (Anhang A.4.0). Der Abschnitt 4.0 des Endberichts enthält Anmerkungen zu den wichtigsten Herausforderungen, die bei der Zusammenstellung dieser Informationen auftraten.
- **Schritt 2** – In diesem Schritt wurde eine Reihe von denkbaren Reformen des Steuersystems für jeden Mitgliedstaat entwickelt (Abschnitte 7.0 bis 20.0). Die vorgeschlagenen Steuersätze wurden in Anlehnung an die ermittelte ‚gute Praxis‘ gewählt. Es sollte nochmals festgestellt werden, dass es jedem Mitgliedstaat frei steht, höhere oder niedrigere Steuersätze einzuführen. Ebenso ist denkbar, dass einige Mitgliedstaaten geneigt sind, bestimmte Steuern gegenüber anderen zu bevorzugen. Die Studie gibt an dieser Stelle keine Bewertung ab. Vielmehr zeigt sie das Aufkommenspotenzial einer solchen Besteuerung auf.
- **Schritt 3** – Als Teil dieses Schrittes wurde ein Modell entwickelt, um die Ausgangssituation in jedem Mitgliedstaat zu ermitteln und um zu schätzen, welches zusätzliche Aufkommen für die einzelnen Steuern, wie auch für das gesamte Steueraufkommen durch die in Schritt 2 vorgeschlagenen Veränderungen in Vergleich zur Referenzentwicklung erzielt werden könnte (Abschnitte 7.0 bis 20.0). Der Bericht wurde anschließend an die Vertreter der Mitgliedstaaten für eine abschließende Bewertung übermittelt.
- **Schritt 4** – In diesem Schritt wurde der Abschlussbericht unter Einbeziehung der Kommentare der Vertreter der Mitgliedstaaten erstellt.

Abbildung E-1-1: Untersuchungsansatz und Vorgehen



E.4.0 Wesentliche Ergebnisse

Alle Zahlenangaben beziehen sich auf reale Werte für das Jahr 2014. Für die Gesamtheit der 14 betrachteten Mitgliedstaaten beläuft sich das geschätzte zusätzliche Aufkommen an Umweltsteuern auf rund €38 Mrd. Dies entspricht 0,48% des geschätzten BIP. Dieser Wert steigt auf rund €111 Mrd. im Jahr 2025 an (in realen Werten für 2014), beziehungsweise auf 1,39% des BIP der betrachteten Länder. Eine weitergehende Analyse, die einen zunehmenden Kostendeckungsgrad in der Wasserversorgung und Abwasserbeseitigung und eine Besteuerung der Externalitäten durch den Schwerlastverkehr zugrunde legt, zeigt ein zusätzliches Aufkommenspotenzial von mehr als €23 Mrd. jährlich auf (in realen Werten für 2014).

Die Tabellen E-1-1, E-1-2 und E-1-3 zeigen die Aufteilung des Einnahmeaufkommens nach verschiedenen Arten von Umweltsteuern, die zur Umsetzung in den 14

Mitgliedstaaten vorgeschlagen werden. Der Hauptteil des zusätzlichen Aufkommens entfällt auf zusätzliche Steuern im Verkehrsbereich (ohne Kraftstoffe) (0,80% des BIP). Das zusätzliche Einkommen durch höhere Energieverbrauchsteuern beträgt etwa 0,35% des BIP. Weiterhin wird eine Zunahme des BIP um 0,24% durch höhere Steuern auf Umweltverschmutzung und Ressourcenverbrauch erwartet.

Tabelle E-1-8: Einkommen durch Steuern im Energiesektor in 14 Mitgliedstaaten im Jahr 2025, in Prozent des BIP und in Mrd. (reale Werte für 2014)

Steuern im Energiesektor	% BIP	€, Mrd.
Verbrauchssteuern auf Energie - Kraftstoffe	0,24%	19,37
Verbrauchssteuern auf Energie - Gewerbe & Industrie / Wärme	0,07%	5,66
Verbrauchssteuern auf Energie - Elektrizität	0,03%	2,62
Steuern im Energiesektor gesamt	0,35%	28

Tabelle E-1-9: Einkommen durch Steuern im Verkehrssektor (ohne Kraftstoffe) in 14 Mitgliedstaaten im Jahr 2025, in Prozent des BIP und in Mrd. (reale Werte für 2014)

Steuern im Verkehrssektor	% BIP	€, Mrd.
Kraftfahrzeugsteuer	0,57%	45,46
Luftverkehrssteuer (Passagiere)	0,23%	18,58
Luftverkehrssteuer (Fracht)	0,00013%	0,010
Steuern im Verkehrssektor gesamt (ohne Kraftstoffe)	0,80%	64

Tabelle E-1-10: Einkommen durch Steuern auf Umweltverschmutzung und Ressourcenverbrauch in 14 Mitgliedstaaten im Jahr 2025, in Prozent des BIP und in Mrd. (reale Werte für 2014)

Umwelt-/Ressourcensteuer	% BIP	€, Mrd.
Deponien (keine Gefahrstoffe) - keine Inertstoffe	0,01%	0,88
Deponien - Inertstoffe	0,0006%	0,04
Abfallverbrennung / Mechanisch-biologische Abfallbehandlung	0,01%	0,92
Luftverschmutzung	0,03%	2,06
Wasserentnahme	0,11%	8,81
Abwasser	0,02%	1,34

Umwelt-/Ressourcensteuer	% BIP	€, Mrd.
Pestizide	0,02%	1,58
Zuschlagstoffe	0,02%	1,53
Verpackungen	0,02%	1,61
Einwegtüten	0,01%	0,42
Düngemittel	0,00001%	0,001
Steuern auf Umweltverschmutzung und Ressourcenverbrauch	0,24%	19

Tabelle E-1-4 stellt das potenzielle Aufkommen durch die Erhöhung bestehender Umweltsteuern dar. Dabei steht das erwartete Steueraufkommen in den einzelnen Ländern in engem Zusammenhang mit der jeweiligen Wirtschaftsleistung.

Tabelle E-1-11: Steueraufkommen nach Mitgliedstaat für ausgewählte Jahre in € Mrd. (reale Werte für 2014)

Mitgliedstaat	2017	2020	2025
Bulgarien	528	921	946
Zypern	212	379	425
Dänemark	851	1.585	1.809
Finnland	1.502	2.581	3.110
Deutschland	14.278	33.821	41.375
Griechenland	1.239	2.326	2.889
Irland	701	1.680	2.010
Lettland	250	485	642
Malta	93	212	280
Niederlande	2.815	6.779	9.405
Slowenien	134	228	299
Spanien	9.667	23.550	28.390
Schweden	1.967	5.450	6.583
Vereinigtes Königreich	4.065	10.207	12.743
Gesamt	38.301	90.204	110.908

Tabelle E-1-5 zeigt das Aufkommen in % des BIP auf. Im Jahr 2025 liegt das geschätzte zusätzliche Aufkommen durch Umweltsteuern zwischen 0,62% (Vereinigtes Königreich) und 3,68% (Malta). Für die anderen betrachteten 12 Länder liegt die geschätzte Zunahme zwischen 0,69% und 2,7% des BIP.

Der indirekte Nutzen, der mit diesen Veränderungen für die Umwelt einhergeht wurde abgeschätzt, wobei diese Analyse nicht alle externen Nutzen der Veränderungen berücksichtigt. Die Nutzen hängen von einer Reihe von Faktoren ab, wie etwa der Ausgestaltung im Detail oder der Verwendung des Aufkommens. Tabelle E-1-6 zeigt auf, dass diese Nutzen sich zwischen 0,02% des BIP (Vereinigtes Königreich) und 0,81% des BIP (Lettland) bewegen. Die Herkunft dieses Nutzens spiegelt sich in den unterschiedlichen Quellen des zusätzlichen Steueraufkommens wieder.

Tabelle E-1-12: Steueraufkommen durch Umweltsteuern in % des BIP

Mitgliedstaat	Umweltsteuern gesamt in 2012, % BIP	Zusätzliche Umweltsteuern gesamt in 2025, % BIP
Bulgarien	2,82%	2,19%
Zypern	2,67%	2,64%
Dänemark	3,87%	0,69%
Finnland	3,07%	1,52%
Deutschland	2,18%	1,43%
Griechenland	2,85%	1,53%
Irland	2,49%	1,15%
Lettland	2,42%	2,47%
Malta	2,98%	3,68%
Niederlande	3,56%	1,51%
Slowenien	3,82%	0,85%
Spanien	1,57%	2,70%
Schweden	2,49%	1,50%
Vereinigtes Königreich	2,62%	0,62%
EU-Durchschnitt	2,29%	
EU-Maximum	3,87%	

Tabelle E-1-13: Geschätzter indirekter Nutzen durch verringerte Auswirkungen auf die Umwelt, 2025, % BIP und € Mio. (reale Werte für 2014)

Mitgliedstaat	% BIP	€, Mio.
Bulgarien	0,71%	392
Zypern	0,31%	59
Dänemark	0,02%	67
Finnland	0,06%	164
Deutschland	0,10%	3.487
Griechenland	0,45%	891
Irland	0,05%	96
Lettland	0,81%	268
Malta	0,27%	26
Niederlande	0,02%	189
Slowenien	0,09%	35
Spanien	0,14%	1.557
Schweden	0,04%	201
Vereinigtes Königreich	0,02%	408

Tabelle E-1-14: Steueraufkommen nach Mitgliedstaat durch höheren Kostendeckungsgrad in der Wasserversorgung und Abwasserbeseitigung und eine Besteuerung der Externalitäten durch den Schwerlastverkehr, € Mio. (reale Werte für 2014)

Mitgliedstaat	Höherer Kostendeckungsgrad Wasser und Abwasser	Besteuerung Schwerlastverkehr	Gesamt
Bulgarien	496	133	629
Zypern	5	54	59
Deutschland	0	1.346	1.346
Dänemark	0	110	110
Griechenland	1.420	290	1.710
Spanien	7.083	1.927	9.010

Mitgliedstaat	Höherer Kostendeckungsgrad Wasser und Abwasser	Besteuerung Schwerlastverkehr	Gesamt
Finnland	1.171	212	1.383
Irland	1.368	87	1.455
Lettland	65	70	135
Malta	66	5	71
Niederlande	1.517	306	1.823
Schweden	1.422	137	1.559
Slowenien	55	54	109
Vereinigtes Königreich	3.205	844	4.049
Gesamt	17.873	5.576	23.449

Tabelle E-1-7 zeigt das Aufkommen durch eine zunehmenden Kostendeckungsgrad in der Wasserversorgung und Abwasserbeseitigung und eine Besteuerung der Externalitäten durch den Schwerlastverkehr. Die Angaben werden von den Hauptergebnissen getrennt ausgewiesen, da diese Analyse zusätzlich zur Arbeit in der ersten Studie von 12 Mitgliedstaaten durchgeführt wurde. Damit wird die Konsistenz der allgemeinen Angaben in den beiden Studien gewährleistet.

E.5.0 Beschäftigung

Mit Blick auf die Schaffung von Arbeitsplätzen wurden die potenziellen Wirkungen einer umweltorientierten Fiskalreform auf die Beschäftigung abgeschätzt, wobei eine detaillierte Betrachtung nicht Gegenstand dieser Arbeit ist. Diese zeigt auf, dass die Auswirkungen wahrscheinlich positiv sind, wenn Umweltsteuern effektiv eingesetzt werden, um Steuern auf Beschäftigung zu reduzieren. In vielen Fällen ist dies ein explizites Ziel einer umweltorientierten Fiskalreform, etwa durch die Erstattung des Aufkommens durch eine niedrigere Besteuerung von Arbeit in der gleichen Größenordnung. Diese Einschätzung ist auch von Bedeutung in Situationen in denen eine Haushaltskonsolidierung verfolgt wird und sich die Frage stellt, ob ein höheres Steueraufkommen durch Umweltsteuern oder andere Steuerquellen generiert werden sollte.

E.6.0 Administrative Kosten

In den Ländern, die in dieser Studie betrachtet werden, stellt sich zum Teil die Frage nach den administrativen Kosten einiger bereits bestehender Umweltsteuern. Eine kurze Überprüfung zeigt, dass vieler dieser Steuern in Vergleich mit anderen Steuern vergleichsweise niedrige administrative Kosten aufweisen. Teilweise hängt dies mit der Ausgestaltung dieser Steuern ab, etwa wenn diese im Zusammenhang mit Markttransaktionen erhoben werden, wie etwa durch Energienetzbetreiber. Nicht alle Umweltsteuern haben jedoch diesen Charakter. Es wird daher empfohlen, dass

Mitgliedstaaten auf bereits bestehende administrative Strukturen zurückgreifen, um Steuern zu erheben, so dass die verbundenen administrativen Kosten minimiert werden. In Frage kommt auch die Nutzung bestehender Berichts- und Monitoringverpflichtungen. Dort wo diese nicht bestehen, können Steuern die Bereitstellung und Erfassung von Daten befördern, welche auch einen Wert für sich haben, jenseits des generierten Steueraufkommens.¹²

¹² Hogg, D. (1999) The Effectiveness of the UK Landfill Tax: Early Indications. In Thomas Sterner (Hg.) The Market and the Environment: Environmental Implications of Market-Based Policy Instruments, Cheltenham: Edward Elgar.

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All appendices have been prepared as a separate document.

1.0 Introduction

Eunomia Research & Consulting (Eunomia), Aarhus University and Institute for European Environmental Policy (IEEP) are pleased to present this draft final report for the study *Environmental Fiscal Reform Potential in 14 EU Member States* to DG Environment of the European Commission. This report is a follow-on to four pilot studies on Environmental Fiscal Reform (EFR) carried out by the European Environment Agency on countries affected by the economic crisis that commenced in 2008, and a subsequent report for DG Environment on the potential for EFR in 12 Member States published on 3rd March 2014. The illustrative potential for EFR was outlined in the pilot studies, and a methodology for elaborating this in a relatively formulaic manner was developed in the subsequent work for DG Environment. The same approach is applied to the 14 Member States considered as part of this study.

1.1 Aim and Objectives

According to the Specification the purpose of this study is to:

“... provide empirical data or secondary sources on the potential economic and social benefits of environmental fiscal reform, to support the input in the European Semester process on environmental protection and resource efficiency”.

The specification elaborates on this as follows:

“The task includes presenting data on the potential of revenues from environmental taxation and other indirect benefits such as job creation resulting from EFR in 14 selected countries, using the methodology the EEA has developed and which was also applied to the study published on 03.03.14 for 12 Member States”.

This work covers the following 14 Member States:

- Bulgaria
- Cyprus
- Denmark
- Finland
- Germany
- Greece
- Ireland
- Latvia
- Malta
- Netherlands
- Slovenia
- Spain
- Sweden
- United Kingdom

In line with the Specification, the work has been carried out in close alignment with the abovementioned studies conducted by the EEA from 2010 to 2013, and the report from early 2014.¹³ The approach taken is to ensure a high level of consistency with the latter

¹³ See Mikael Skou Andersen, Stefan Speck, David Gee and Jock Martin (2010) Further Environmental Tax Reform – Illustrative Potential in Ireland Prepared for the Environmental Tax Reform Workshop Dublin October 28 and 29, 2010, hosted by Comhar Sustainable Development Council, and organised with University College Dublin Earth Sciences Institute, Smart Taxes and Feasta. *EEA Staff Position Note (October 2010) SPN10/01*; Mikael Skou Andersen, Stefan Speck and Orsola Mautone (2011) Environmental Fiscal Reform – Illustrative Potential in Italy, Prepared for the Conference ‘Environmentally-related Taxation and Fiscal Reform, Rome, December 5th 2011, hosted by Ministry of Economy and Finance, *EEA Staff Position Note (December 2011) SPN11/01*; Stefan Speck and Mikael Skou Andersen (2012) Environmental Fiscal Reform – Illustrative Potential in Spain, Prepared for the Seminar on

report so that comparable results are obtained for the Member States. The study covers all forms of environmental taxes within each Member State, but does not include environmental harmful subsidies.

The approach taken in this study has been to highlight the *potential* for revenue generation using environmental taxes, based on the application of tax rates using a consistent methodology. The intention was to indicate where this potential may lie, and to demonstrate the magnitude of the revenues that could be derived from the taxes. It is important, therefore, to note that the project uses a relatively mechanistic approach to the calculation of revenues, based on the tax rates assumed to be applied. Evidently, not all Member States are likely to be equally interested in all the taxes explored. Equally, it should be noted that the tax rates considered here do not constitute an upper bound. Member States may set higher or lower tax rates, and they may implement changes faster or slower than is envisaged in this report. The intention is, however, to give some indication of the revenues which could be raised when the rates assumed in this study are applied.

1.2 Structure of the Report

An overview of the report is provided in Figure 1-1 below. From this figure it can be seen that the main report consists of a total of 21 Sections. The first five sections provide background details which form the basis of the study and set the scene for the main body of the report which includes individual chapters for each of the 14 Member States included in this study (Sections 7.0 to 20.0). In addition to these sections, there are a number of appendices which are referenced throughout this document. These have been prepared as a separate document and should be referred to for further details.

The Appendices include sections on the following:

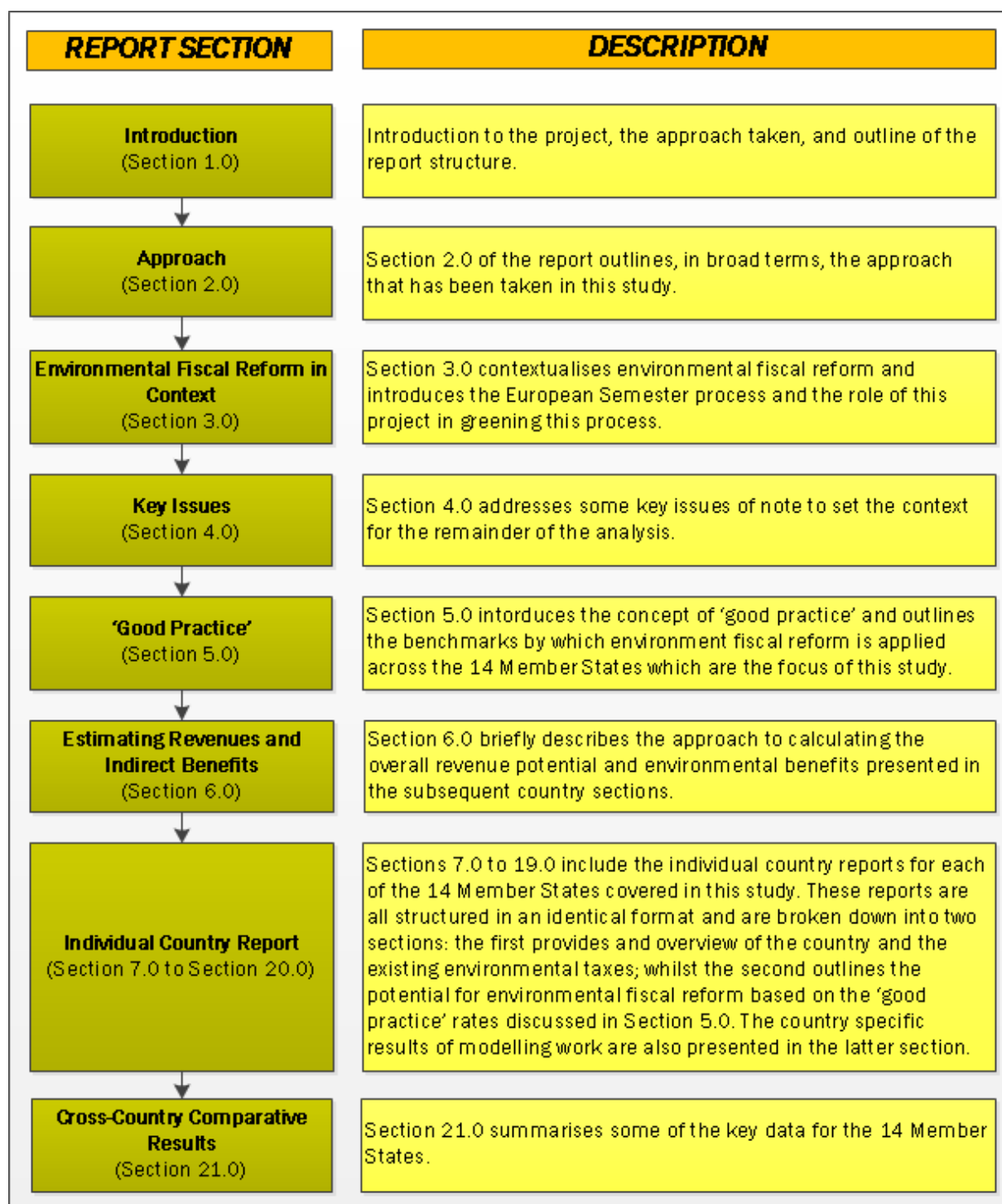
- Good practice (Appendix A.1.0);
- Calculating revenues (Appendix A.2.0);
- Calculating indirect benefits (Appendix A.3.0);
- Environmental fiscal reform and employment (Appendix A.4.0); and
- More detail on existing environmental taxes and model outputs for each Member State (Appendix A.5.0 to Appendix A.18.0).

This document is, as far as we are aware, correct as of the time of drafting, which began in summer 2014. Taxes (and charges) are changing all the time. Every attempt has been made, in the time available, to be current in the information provided. It is, however, in the nature of the subject that matters will evolve over time, rendering some of the material, in due course, out of date. For excise duties on energy (including transport fuels), data was taken from a European Commission publication showing the situation as

Environmental Fiscal Reform, Madrid, September 13th 2012, hosted by Ministerio de Agricultura, Alimentación y Medio Ambiente. *EEA Staff Position Note (September 2012) SPN12/01*; and Mikael Skou Andersen, Stefan Speck and David Gee (2013) Environmental Tax Reform – Illustrative Potential in Portugal Prepared for the Conference ‘Green Taxation: A Contribution to Sustainability, Lisbon, April 30th 2013, hosted by Ministry of Fiscal Affairs and Ministry of Environment. *EEA Staff Position Note (April 2013) SPN13/01*.

at 1st July 2014, unless more recent data was obtained through our investigations, or proposed by in-country reviewers. Tax rates are regularly being revised, often at the start of a given calendar year.

Figure 1-1: Overview of the Report Structure

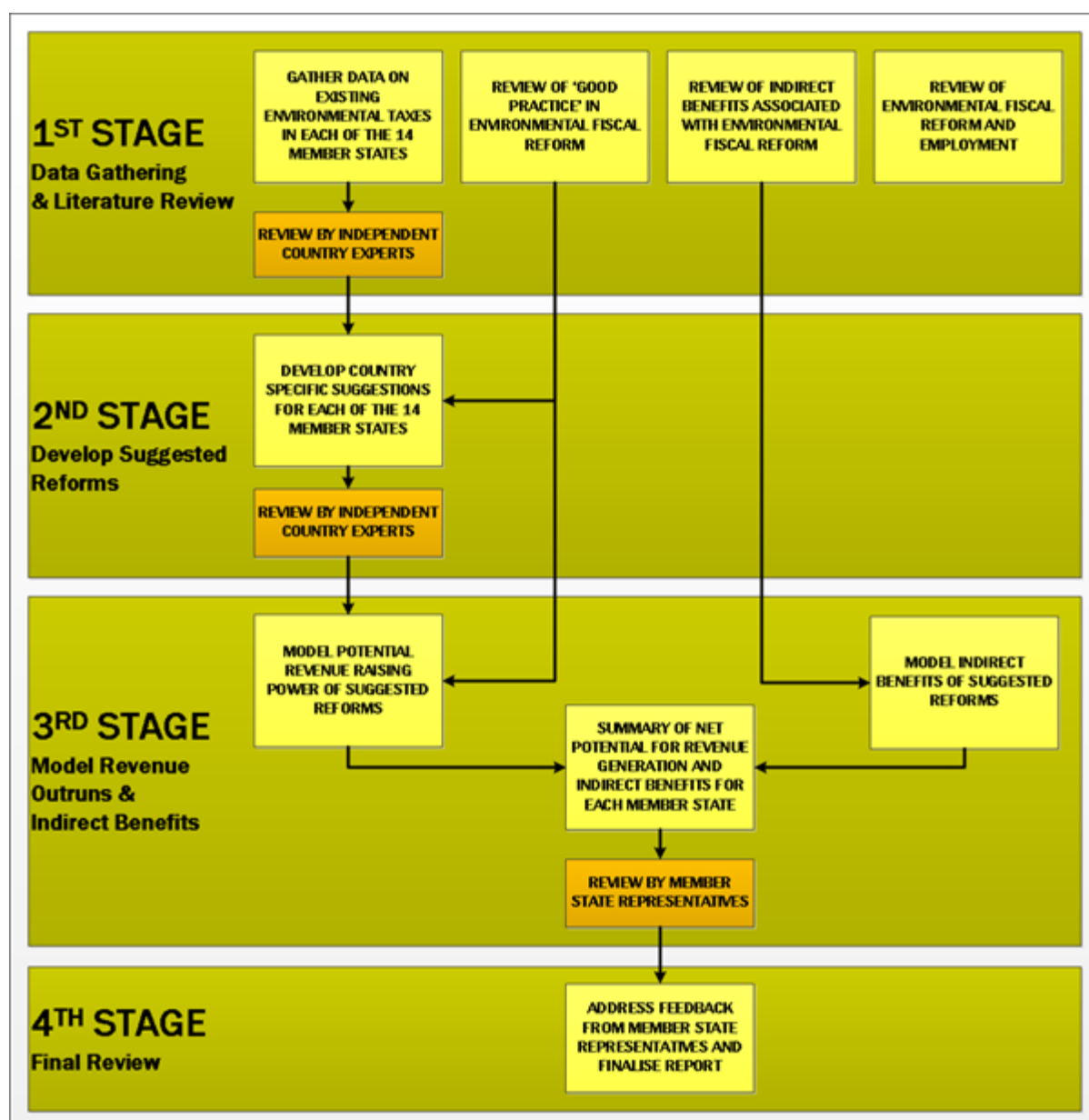


2.0 Approach

As noted above, the approach adopted in this study was in line with that used for the review of 12 Member States, the only significant difference being that environmentally harmful subsidies were not included as part of this work. The approach that has been taken is shown graphically in Figure E-1-1. From this it can be seen that the study was divided into three core stages:

- **Stage 1** – this initial stage aimed to gather all the relevant baseline information for the study and included gathering information on existing environmental taxes in each Member State (Sections 7.0 to 20.0), reviewing ‘good practice’ in Europe (Section 5.0), identifying some of the indirect benefits associated with environmental taxes (Section 6.0), and undertaking a literature review of the impacts of EFR on employment (Appendix A.4.0). Section 4.0 provides some commentary on the key issues that were faced in gathering this information. Independent reviewers commented on the Member State sections, and provided views on the context for EFR in their respective countries.
- **Stage 2** – in this stage a number of suggested reforms to the tax system were developed for each Member State (Sections 7.0 to 20.0). Independent reviewers commented on the Member State sections, and provided views on the context for EFR in their respective countries. As noted in Section 1.2 above, these rates have been applied in a relatively mechanistic manner, and they are used mainly to indicate the order of magnitude of revenues which could be generated from individual taxes, and from application of an overall package of measures. It is clear that ultimately, Member States will need to make decisions which best reflect their specific circumstances;
- **Stage 3** – as part of this stage a model was developed to determine the baseline situation in each Member State, and to estimate how much additional revenue could be raised for each of the suggested changes outlined in Stage 2 relative to the baseline, as well as for the overall package of suggestions in a given Member State (Sections 7.0 to 20.0). The report was then sent to Member State representatives for review.
- **Stage 4** involved finalising the report based on the comments of review by Member State representatives.

Figure 2-1: Outline of the Approach Taken



2.1 Stage 1: Data Gathering and Literature Review

As noted above, the study proceeded with a desk-review of the existing situation based on the use of existing databases and information. The sources used for reviewing existing taxes included, but was by no means limited to, the following:

- The European Commission's DG TAXUD database;¹⁴
- DG TAXUD Excise Duties Tables (energy products and electricity); and¹⁵

¹⁴ European Commission (2013) *Taxes in Europe Database*, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- The OECD/EEA's database on environmental taxes and charges.¹⁶

The project team produced the first summary of the existing taxes in each Member State, before passing the report via a number of independent country experts in each country. All reports were reviewed by the country experts who provided comments and helped to ensure that all relevant environmental taxes which are in scope of this study were identified. This initial research provided the baseline context for understanding the current situation within each Member State.

Recognising the desirability of a sound basis for making suggestions for EFR, a review of 'good practice' was undertaken as part of the earlier study which was led by Eunomia. The 'good practice' guidance was reviewed again as part of this project and updated to make it relevant for the 14 Member States which are the focus of this study (see Section 5.0). The 'good practice' covers the following environmental taxes:

- Energy taxes:
 - Motor fuels;
 - Heating fuels; and
 - Electricity.
- Transport taxes (excluding transport fuels):
 - Vehicle taxes; and
 - Aviation taxes.
- Waste taxes:
 - Landfill taxes; and
 - Incineration/MBT taxes.
- Packaging taxes.
- Taxes on single-use carrier bags;
- Air pollution taxes;
- Water abstraction taxes;
- Taxes on discharges to waste water;
- Pesticides taxes;
- Fertiliser taxes; and
- Taxes on the use of aggregates.

¹⁵ European Commission - Taxation and Customs Union (2014) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rares/excise_duties-part_ii_energy_products_en.pdf

¹⁶ OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, www2.oecd.org/econstat/queries/index.htm

The review of 'good practice' was undertaken with a view to identifying the types of tax rate that could be considered as applicable for estimating the potential for revenue generation through EFR in each Member State. These rates formed the basis for the development of the country specific suggestions of which environmental taxes could form part of an EFR programme. It is recognised that Member States could apply different rates to those indicated, and might not be equally interested in all the taxes under examination: the emphasis of the study has been to indicate the potential for additional revenue generation through adapting existing / introducing new environmental taxes.

In addition to a review of good practice research was also undertaken to identify how the introduction of the taxes listed above will lead to indirect environmental benefits (see Section 6.2 and Appendix A.3.0 for more details). A literature review was also undertaken to assess the relationship between EFR and employment (see Section 3.2 and Appendix A.4.0).

2.2 Stage 2: Develop Suggested Reforms

Following the above review of existing environmental taxes in each Member State a list of suggested reforms were drafted for each country. The suggestions, based on 'good practice', relate either to changes to existing taxes or for the introduction of new environmental taxes. It is important to note, that in the context of this work, the proposed rates should be considered as suggestions rather than firm recommendations. This is because the intention is to demonstrate the *potential* for revenue generation from EFR rather than to attempt to provide a detailed roadmap of how it is anticipated that EFR could be implemented in each Member State, with all that could imply in terms of understanding the political and economic realities in a given country. The suggestions, therefore, cover the broad range of taxes listed above, with the assumed rates being based on 'good practice', which generally correspond to those towards the upper end of what has been applied in the EU. It is acknowledged that these rates, and the suggested timings of implementation, are not definitive – it is understood that, should Member States choose to consider a particular tax that is suggested here, they will undertake further research and negotiations at the national/regional level to determine the appropriate level of taxation and means of implementation. The good practice rates are not intended to present 'upper bounds' for tax rates, but equally, Member States may feel that lower rates than those suggested are appropriate.

In many instances the proposed timing for the introduction of the suggested reforms is ambitious and may not be feasible in many cases. A new tax must be researched, discussed with interest groups, run through parliament, carefully designed, implementation planned, announced etc. However, in order to model the potential revenue that could be gained from implementing the taxes it is necessary to set a timeframe for when the taxes will be implemented. The implementation dates suggested in the report should, therefore, be seen as indicative and understood in the context of modelling which has been to illustrate the potential for revenue generation, this favouring an earlier, rather than a later, implementation (and it should be noted that for some countries in both this and the previous study are confronting mounting debts which might, to some degree, be aided by fiscal consolidation through deployment of environmental taxes, and the potential for a 'net stimulus' from shifting taxes towards environmental bases and away from those which might be more likely to constrain growth).

Initial country specific reforms were prepared before being sent for review by the country

experts in each country. The assistance of these country experts is gratefully acknowledged, though the project team takes ultimate responsibility for the work presented here and the final presentation of the suggested reforms. Following review by the country experts the country specific reports were then amended to reflect these comments.

2.3 Stage 3: Model Revenue Outruns and Indirect Benefits

The modelling of revenues was based on projections of the tax base (e.g. energy consumed) in the absence of any change, and changes to those projections as a result of the suggested change in tax rate. This modelling of the changes in the tax base in response to changes in tax rates / new taxes is not especially sophisticated, but designed to impose some realism into the modelling. The estimates of revenue generation were made on the basis of the changed tax bases. The changes in the tax base between the 'with' and 'without' tax projections were used to make estimations of the environmental impact of the changes.

It should be noted that the revenue projections are not based on macroeconomic modelling, and interactions between the measures are not explicitly modelled. In essence, the revenue figures assume each tax is implemented independently of the others. In reality, one would expect some interaction between, for example, taxes on abstraction and taxes on discharges to waste water, and taxes on transport fuels and taxes on vehicles (especially where these are designed to increase the fuel efficiency of the stock of vehicles in use).

3.0 Environmental Fiscal Reform in Context

Even before the financial downturn in 2008 there was significant interest in environmental tax policies which can promote sustainable economic growth and increase employment.¹⁷ The protracted economic recovery has further stimulated interest in environmental tax reform which has now become a core objective of the European Commission. The Roadmap to a Resource Efficient Europe, for example, includes the following objective:¹⁸

“By 2020 a major shift from taxation of labour towards environmental taxation, including through regular adjustments in real rates, will lead to a substantial increase in the share of environmental taxes in public revenues, in line with the best practice of Member States”.

Since the Roadmap’s publication in 2011 a number of reports have been issued by the Commission focusing on the need for environmental fiscal reform as a means of promoting sustainable growth.¹⁹

Prior to Rio+20 in June 2012, the Director of the International Monetary Fund (IMF), Christine Lagarde, called for a greening of the economy, as a key element in defining a new economic trajectory – one which was focused on job creation and sustainable economic development. She stressed how one important element in a green market economy is to ensure that prices better reflect the full environmental and social costs of goods and services:

*“Getting the prices right, means using fiscal policy to make sure, that the harm we do is reflected in the prices we pay”.*²⁰

This line of reasoning echoes statements from institutions of the European Union, including from Heads of State in the European Council. Prior to Rio+20 the European Council stated that *“promoting a more resource-efficient, greener and more competitive*

¹⁷ See for example: European Commission (2007) *Green Paper on Market-Based Instruments for Environmentally and Related Policy Purposes*, COM(2007) 140 final, http://ec.europa.eu/environment/enveco/green_paper.htm; European Environment Agency (2005) *Market-Based Instruments for Environmental Policy in Europe*, www.eea.europa.eu/publications/technical_report_2005_8

¹⁸ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm, p. 11.

¹⁹ See for example: European Commission (2013) *Tax Reforms in EU Member States 2013: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf; European Commission (2012) *Tax Reforms in EU Member States 2012: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*; and European Commission (2011) *Taxation Papers – Quality of Taxation and the Crisis: Tax Shifts from a Growth Perspective*, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_29_en.pdf

²⁰ International Monetary Fund (2012) *Back to Rio—the Road to a Sustainable Economic Future*, Speech by Christine Lagarde, 12th June 2012, Accessed 3rd February 2014, <https://www.imf.org/external/np/speeches/2012/061212.htm> .

economy is crucial”,²¹ whilst also acknowledging the link between fiscal policies and a green economy:

“Tax policy can contribute to fiscal consolidation and growth. In line with the Council conclusions of 21 February, and recognising Member States' competences in this area, the European Council invites Member States, where appropriate, to review their tax systems with the aim of making them more effective and efficient, removing unjustified exemptions, broadening the tax base, shifting taxes away from labor, improving the efficiency of tax collection and tackling tax evasion”²².

EU Member States are well aware of the needs to develop a broader and sounder tax base, so as to meet the requirements for budgets which, in the longer term, are both balanced and sustainable. It is in the context of shifts in the tax burden from labour to environmental taxes and the removal of unjustified exemptions, that the notion of ‘environmental fiscal reform’ (EFR), also known as ‘environmental tax reform’ (ETR), comes into its own. As pointed out in a recent IMF staff paper:²³

“Several factors point to continued momentum for environmental tax reform. One is pressure for new revenues to strengthen fiscal positions. Another is growing acceptance among policymakers that emissions pricing instruments are far more effective at exploiting the entire range of emissions reduction opportunities than are regulatory approaches. Swapping environmental taxes (that apply to traded goods) for labor taxes might also be means to improve competitiveness. And environmental problems are of growing concern, from rising greenhouse gas (GHG) concentrations to deteriorating urban air quality in industrializing nations to increasing congestion (a related externality) of transportation systems.

The EU’s 2020 targets aim to create new economic activity and employment opportunities. In looking for appropriate policy instruments for these purposes the Commission DG for Employment, Social Affairs and Inclusion have noted that fiscal measures related to the environment provide an important tool that deserves careful consideration:

“It should be noted that the average contribution of environmental taxes in the EU amounts to 6.3% of the overall tax bill. If all Member States were to raise this figure to 10% the result would yield an additional tax revenue equivalent to around 1.4% of EU GDP that could be used to reduce budget deficits or labour taxes. Studies show that the positive impacts in terms of job creation of the green policies would outweigh the shortcomings. For example, the increased investments in energy efficiency would stimulate job creation in the construction and manufacturing of construction materials and sectors and would have limited impact on the reduction in jobs in the fossil fuels mining sectors”²⁴.

²¹ European Council (2012) European Council – Conclusions, Brussels, 1st to 2nd MARCH 2012, http://europa.eu/rapid/press-release_DOC-12-4_en.doc, p. 7

²² *Ibid*, p 4.

²³ D Heine et al (2012) *Environmental Tax Reform: Principles from Theory and Practice to Date*, IMF Working Paper WP/12/180, www.imf.org/external/pubs/ft/wp/2012/wp12180.pdf, p. 4

²⁴ European Commission (2012) *Exploiting the Employment Potential for Green Growth*, SWD. Accompanying the Communication on ‘Towards a Job-Rich Recovery,

3.1 The European Semester Process

The previous study took place in the context of the European Semester process, which provides an opportunity to ensure that macroeconomic policies are sustainable, not only economically and socially, but also environmentally.²⁵ Furthermore, in order to secure the jobs and growth benefits of resource-efficiency in the transition to a low-carbon economy, EU and national policies need to fully exploit the growth potential of the green and low-carbon economy.

The 2015 European Semester round began with the adoption of the Annual Growth Survey (AGS) in November 2014. The AGS contains priorities which should be addressed in the National Reform Programmes (NRPs) which are due by the end of April 2015. Subsequently, the Commission will propose a series of Country Specific Recommendations (CSRs) accompanied by an analysis in the form of Commission Staff Working Documents (SWDs) for each Member State.²⁶ The CSRs will be discussed and subsequently adopted following endorsement by the European Council in June/July. It is intended that this study may feed into the development of the CSRs for 2015.

The 2015 AGS acknowledges that *"employment and growth can be stimulated by shifting the tax burden away from labour towards other types of taxes which are less detrimental to growth, such as recurrent property, environment and consumption taxes"*.²⁷ The AGS sets out three pillars that will underpin the EU's economic and social policy for 2015:

- A coordinated response to boosting investment;
- A renewed commitment to structural reforms; and
- The pursuance of fiscal responsibility.

On 26-27 June 2014, the European Council endorsed the Country Specific Recommendations on ETR or removal of environmental harmful subsidies for several Member States (BE, CZ, ES, IE, FR, HU, IT, LT, LU & LV); they were adopted by the ECFIN Council on 08.07.14. In the analytical Staff Working Documents by the Commission published on 2 June 2014, ETR or removal of Environmental Harmful subsidies was only not mentioned for 4 Member States namely: BG, CY, GR and UK.²⁸

3.2 Environmental Fiscal Reform and Employment

In 1991 Pearce suggested that environmental taxation could lead to a 'double dividend' as well structured schemes could help to curb harmful environmental activities and at the same time boost employment opportunities.²⁹ Employment can be increased either directly through private actors responding to the tax by finding innovative ways to reduce

<http://ec.europa.eu/social/main.jsp?catId=89&langId=en&newsId=1270&moreDocuments=yes&tableName=news>, p. 6

²⁵ See for more on this: http://ec.europa.eu/environment/integration/green_semester/index_en.htm

²⁶ The 'Programme countries' (Cyprus, Greece, Portugal) follow a slightly different procedure.

²⁷ European Commission (2014) *Annual Growth Survey 2015*, November 2014, http://ec.europa.eu/europe2020/pdf/2015/ags2015_en.pdf, p. 15

²⁸ See Written Question E-4485/14

²⁹ Pearce, D. (1991) The Role of Carbon Taxes in Adjusting to Global Warming, *Economic Journal*, Vol. 101, pp. 938-948.

their tax burden (and therefore pollution), or indirectly, as a result of government using Government using the revenue raised by the environmental tax to reduce taxes on labour.³⁰ Although it is widely accepted that EFR can help to stimulate employment, the degree to which this occurs is very much dependent on the specifics of the environmental tax being considered, how the revenues are to be used, and the employment/economic dynamics within a country (e.g. the size of the informal sector, extent of unemployment, and the flexibility of different elements of the labour force).

Over the last few decades a growing body of literature has emerged which has looked at the relationship between EFR and employment.³¹ Although a substantial amount of work has been done, much of this is based on theoretical modelling as opposed to the gathering of empirical evidence (perhaps unsurprisingly, given the difficulties of gathering empirical data and assigning cause and effect to a particular policy intervention in such a complex setting). Nevertheless, the findings of detailed modelling work appear to be relatively consistent and suggest that gains in employment may be achieved under certain circumstances (typically, when revenues derived from the taxes are used to offset social security taxes). It should be noted, however, that some studies have suggested that unemployment may rise as a result of environmental tax reform, but these are certainly more limited than those which suggest net positive gains in employment.³²

Employment generation appears to be most well documented in relation to energy and carbon taxes as opposed to other forms of environmental taxes such as resource taxes, or taxes on pollution. Given that the underlying principle - of shifting taxes away from employment and onto pollution and resource use - remains the same, however, there are reasons to believe that a positive outcome would result from their application in these areas also. This seems especially likely in some sectors, such as waste management, where improved management of resources tends to increase demand for labour.

³⁰ European Environment Agency (2012) *Environmental Tax Reform in Europe: Opportunities for Eco-innovation*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-opportunities

³¹ See for example: European Commission (2013) *Tax Reforms in EU Member States 2013: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf; European Environment Agency (2012) *Environmental Tax Reform in Europe: Implications for Income Distribution*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-in-europe; Anger, N., Böhringer, C., and Löschel, A. (2010) Paying the Piper and Calling the Tune?: A Meta-Regression Analysis of the Double-Dividend Hypothesis, *Special Section: Ecosystem Services Valuation in China*, Vol.69, No.7, pp.1495–1502; European Commission (2011) *Impact Assessment on the Proposal for a Council Directive Amending Directive 2003/96/EC Restructuring the Community Framework for the Taxation of Energy Products and Electricity*, http://ec.europa.eu/taxation_customs/resources/documents/taxation/sec_2011_409_impact_assessment_part1_en.pdf; Vivid Economics (2012) *Carbon Taxation and Fiscal Consolidation: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, Report for the European Climate Foundation and Green Budget Europe, May 2012; Jacobs, M., Ward, J., Smale, R., Krahé, M. and Bassi, S. (2012) *Less Pain, More Gain: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, November 2012, Report for Centre for Climate Change Economics and Policy Grantham Research Institute on Climate Change & the Environment, <http://www.lse.ac.uk/GranthamInstitute/publications/Policy/docs/PP-carbon-pricing-europe-fiscal-deficits.pdf>

³² Patuelli, R., Nijkamp, P., and Pels, E. (2005) Environmental Tax Reform and the Double Dividend: A Meta-analytical Performance Assessment, *Ecological Economics*, Vol.55, No.4, pp.564–583

For the full review please refer to Appendix A.4.0. This Appendix contains more details and separately examines, where literature is available, a number of different types of environmental taxes.

3.3 EFR and the Counterfactual

As noted above, EFR is frequently discussed as a means of bringing about a so called 'tax shift' in which a progressive increase in the revenues generated through environmental taxes provides a rationale for reducing taxes derived from other sources, such as income, profits and employment, the taxation of which is less desirable. The rationale for using an increase in revenues from environmental taxes in this manner is entirely sound where the fiscal position in the country concerned is relatively healthy.

However, where budgets are out of balance, and in particular, where deficits are leading to increasing indebtedness (leading, potentially, to increased costs of borrowing, and perceived risks of sovereign default, where no action is taken to address such deficits), the more immediate concern may be to reduce the gap between expenditure and revenue generation. Evidently, improved efficiency in public services, coupled with some retrenchment, will reduce public spending, but the exchequer may need to act to increase revenue take to completely close the gap between income and expenditure. Generating additional revenues from taxation may also limit the extent to which austerity has to bear the brunt of adjustment required to bring the fiscal position back into balance. In such situations, the question becomes one of which taxes to deploy to help reduce budgetary deficits.

To the extent that environmental taxes may have a role to play in such situations, their use as a means to reduce budget deficits is not so different to their deployment in the context of environmental tax reform: in both cases, it could be argued that the counterfactual situation (to that where additional environmental tax revenues are generated) is one where other forms of tax have to be used to generate the equivalent revenue.^{33,34} As such, even where there are no explicit offsetting reduction in other forms of taxation, fiscal consolidation through increasing environmental tax revenue might implicitly keep the level of other taxes below that which might otherwise have prevailed.

It should be noted that this study makes no specific assumptions about the way in which any revenue that might be generated from environmental taxes (or saved from the removal of environmentally harmful subsidies) should be used. For this reason (and for reasons associated with the project timeframe), no modelling of a 'tax shift' has been undertaken.

³³ Jacobs, M., Ward, J., Smale, R., Krahé, M. and Bassi, S. (2012) *Less Pain, More Gain: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, November 2012, Report for Centre for Climate Change Economics and Policy Grantham Research Institute on Climate Change & the Environment, <http://www.lse.ac.uk/GranthamInstitute/publications/Policy/docs/PP-carbon-pricing-europe-fiscal-deficits.pdf>

³⁴ Vivid Economics (2012) *Carbon Taxation and Fiscal Consolidation: the Potential of Carbon Pricing to Reduce Europe's Fiscal Deficits*, Report for the European Climate Foundation and Green Budget Europe, May 2012

4.0 Key Issues

This Section raises some key issues associated with the approach to the study. This is also intended to highlight some general features of the approach we have adopted.

4.1 Definitions Used

This study concentrates on environmental taxes, as opposed to charges. The definition that has been used is that of the European Commission of 2001, the same definition also being used in Regulation EU 691/2011 on ‘*European Environmental Economic Accounts*’. This defines environmental taxes as a tax “*whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment*”.³⁵ Such taxes include taxes on energy, transport, and pollution and resources. They do not include VAT.

It is important to clarify terminology in respect of the transport taxes. Because taxes on transport fuels are classified as energy taxes, transport taxes are often referred to as ‘transport taxes (excl. fuel)’. Although this is implicit in the definition of energy taxes, this terminology serves to ensure that readers who are not acquainted with the definitions understand that transport taxes – mainly related to either registration taxes, or circulation taxes, or vignettes – do not include taxation on transport fuels. The Eurostat publication, ‘*Taxation Trends in the European Union*’, seeks to clarify matters further by referring to a subcategory of energy taxes which relate to the transport use of fuels as ‘transport fuel taxes’.³⁶ Motor fuels are also one of the classes of energy carrier for which minimum tax rates are specified under the Energy Tax Directive (Directive 2003/96/EC, as amended).

It should be noted that where the term ‘transport taxes’ is used in this report without any qualifier, then this should be interpreted as referring to, ‘transport taxes excluding taxes on transport fuel’. The term is used without qualification for the sake of the flow of the text.

4.2 Taxes or Charges?

Taxes are generally considered to be unrequited payments to (usually) national or regional governments with no individual counterpart service received in exchange for the payment. Charges, on the other hand, are typically payments made in exchange for a service, with the charges usually levied in proportion to the quantum of service received, and so the terms ‘user charges’, or ‘cost recovery charges’ are often used in this context.

This distinction is not always so clear cut. For example, some ‘taxes’ might be considered to have a ‘cost recovery charge’ element to them (for example, some vehicle taxes have, historically, been used to fund maintenance of transport infrastructure), but in this case, those paying the tax may not, themselves, be direct beneficiaries of the payments made. The distinction is also made more opaque by the fact that some ‘taxes’ are referred to as

³⁵ European Commission (2001) *Environmental Taxes – A Statistical Guide*, 2001 Edition, Luxembourg: Office for Official Publications of the European Communities, p.9.

³⁶ European Commission (2013) *Taxation Trends in the European Union: Data for the EU Member States, Iceland and Norway*, 2013 Edition, Luxembourg: Publications Office of the European Union.

'charges' (and vice versa). This often appears to be the case where revenues from what appear to be taxes, but are usually described as charges, are destined for Environmental Funds, whose purpose is (usually) to make use of the revenues generated for environmental projects. Equally, some user charges, which are used to fund the delivery of a service, are levied on an environmental basis.

The distinction is most difficult, perhaps, in respect of:

1. Charges for waste water treatment, which typically have an environmental rationale (i.e. they vary by load of pollutant), but which might be sufficient only to recover the financial costs of the treatment being used;
2. Charges for water abstraction, which may also vary by the source of abstracted water, but may also be sufficient only to cover the maintenance and upkeep of the resource; and
3. Road user charges, which might be designed to recover the costs of maintaining transport infrastructure.

Where user charges accrue to Environmental Funds, there is an additional question to be considered regarding whether, and if so, how, any increases in the rates applied might accrue to the state budget. In principle, it might be possible to define, separately, revenues which are used to recover financial costs of relevant infrastructure and activities, and revenues which should accrue to the central (or regional) government budget. Unless it is clear that revenues would accrue elsewhere, the assumption has generally been that revenues would accrue to national finance ministries.

In addition to these cases, there are taxes in place on products and packaging which are applied only to a very limited extent since they are intended to induce (or at least, this is clearly their effect) those who place products or packaging on the market to participate in compliance schemes, or otherwise to demonstrate that they have met their obligations in respect of recycling and recovery.

Note that because we are focused on environmental taxes, we have not included discussion of the charges levied by, for example, producer responsibility organisations on their members since these are clearly mechanisms used to recover the costs of meeting their obligations under Member State law. Similarly, we have not included information on so-called 'pay-as-you-throw' systems used to fund, and incentivise, improvements in, household waste management. These are also mechanisms used to (partially) fund the provision of the waste management service, and to do so in such a way that the households have incentives to (usually) manage waste in a better way.

In making suggestions for how existing regimes may be adapted, or when suggesting new taxes, the full complexity of the existing situation is not always completely understood by us. Partly because of the difficulties in understanding this in full, the country chapters and appendices include information on some measures which are not taxes, but are, in reality, charges. The fiscal implications of increasing user charges, as opposed to levying new taxes, are likely to be dependent on the nature of the funding system prior to the user charges being implemented. If, for example, transport infrastructure costs are recovered by levies on transport, but ones not related to road use, then a shift to road use charging could, for example, be offset by a reduction in the rates of other levy rates which had, until then, generated the bulk of the required revenue.

The approach taken for specific taxes under consideration is considered in the Appendix on good practice (A.1.0).

4.3 Allowance Trading Schemes

It is worth commenting on trading schemes here. They are of interest to this study to the extent that they have fiscal implications, and to the extent that Member States have freedom to influence the potential revenue generation from such schemes. For example, schemes may exist where, instead of grandfathering all allowances, some are, or could be, auctioned, with the associated revenue accruing to regional, or national governments. Price floors may seek to ensure that where allowance prices fall below a defined level, taxes are effectively applied to ensure a given level of incentive for environmental improvement.

Evidently, the major trading scheme of relevance to this study is the EU Emissions Trading Scheme (EU-ETS), the basis for which is Directive 2003/87/EC, as amended.³⁷ In Phase III of the scheme, the default means of allocating allowances is auctioning. The power sector is included under the EU-ETS, and in Phase III of the scheme, which commenced in 2013, no free allowances will be given to the power sector. Two of the countries in this study - Bulgaria and Cyprus - have availed themselves of a derogation (under Article 10(c) of the revised EU-ETS Directive) which allows them to allocate, free of charge, a diminishing number of allowances to existing power plants for a transitional period (the number allocated free of charge has to be zero by 2020).³⁸ This is conditional upon the countries concerned making use of at least as much revenue as would have been obtained from auctioning the free allowances in the modernisation of their electricity sector. Otherwise, these countries might expect to see additional revenues flowing to them over time as a result of the progressive increase in the number of allowances being auctioned, whilst the effect on countries already auctioning all allowances to the power sector will depend on how the price of allowances changes over time (as the overall allocation is reduced).

Because of the rules governing the way in which the EU-ETS functions, we have not made major suggestions regarding how the power sector should be taxed other than in respect of air pollution (i.e., excluding greenhouse gases). In principle, it is possible for Member States to consider setting price floors (the UK, for example, has done so), but we have taken the view that in the absence of a process being led at the European level, the implied message would be that the cap within the EU-ETS was insufficiently tight. Evidently, the EU-ETS is intended to address only those greenhouse gases covered by the scheme. However, it should also be considered that a minimum rate of tax for electricity (on the output side) exists under the existing (and proposed) Energy Taxation Directive. In addition, we have considered the situation in respect of the level of taxes on air pollution. For these reasons, we have not proposed changes other than in relation to air pollution taxation.

In addition, it should be mentioned that although the EU-ETS Directive provides for 15% of EU aviation allowances to be auctioned in Phase III, auctioning has effectively been suspended pending the development of a proposal from the International Civil Aviation Organisation (ICAO). For this reason, we have included consideration of schemes for

³⁷ A number of Commission Regulations and Decisions have also shaped the form and function of the EU-ETS – for a list of relevant legislation, see http://ec.europa.eu/clima/about-us/climate-law/index_en.htm#EU_ETS

³⁸ Both Latvia and Malta were eligible for this derogation but chose not to use it.

taxing flights, recognising that the nature of the scheme anticipated is not completely clear at present. Such taxes could be removed, for example, if the nature of the market based instrument which ICAO proposes is such as to effectively replace the tax.

4.4 VAT

The changes suggested in this study (in terms of changes in tax rates) could be expected to have implications for the budget through their effect on the overall VAT take. We have not calculated these in this study.

In general, these could be expected to be positive since VAT is generally raised on the price of a good inclusive of the environmental tax. Though businesses might be able to reclaim VAT, consumers will not generally be able to do so. Furthermore, other than for items such as single-use carrier bags, the response of consumers to the taxes is not expected to be especially strong (the demand for many of the goods and services is, especially over the short-term, relatively inelastic – see Appendix A.2.0 for a review in respect of energy, for example). In principle, therefore, additional VAT revenues might be expected to accrue to the central budget. The amounts will, however, depend upon the applicable VAT rates, and the changes in demand for the goods / services being taxed.

4.5 Administrative Costs

The suggested taxes will each have, associated with them, an administrative cost. These costs will tend to vary depending upon the nature of the good or service being taxed, whilst the incremental costs of the administration (arguably, what matters most here) depend very much on the administrative apparatus already in place.

From the budgetary perspective, it is clear that taxes which require a considerable amount of administration relative to the revenue they generate are of limited value. Some authors have expressed concerns regarding these costs where some charges / taxes are concerned. Vitek et al suggest that in the Czech Republic, the charges on air pollution that were collected from medium-sized sources at a cost which exceeds the revenue generated.³⁹ The same authors cite some estimates of administrative costs of introducing environmental taxes:

“Convery, McDonnell and Ferreira (2007) demonstrate that regularly administrative costs for plastic bag levy in Ireland are approximately 3 % of revenue because of it is possible to integrate reporting and collection into existing Value Added Tax reporting systems.

OECD (2006) in its summary publication states in the chapter eight, that AC for a collection of environmental charges and evaluation of environmental projects in Poland vary between 0.8 % and 4.5 %. According to OECD (2005), administrative costs for the government related to the aviation fuel tax (Norwegian aviation fuel tax) are very limited. Sweden National Tax Board presented that CO₂ tax incorporated into the existing petroleum tax, energy tax, and environment tax on

³⁹ Vitek, Leoš, Pavel, Jan, Jílková, Jiřina (2007) *Comparison of the Administrative Costs of the Environmental Charges on Air Pollution for Large and Extra-Large Sources of Air Pollution*, Banská Bystrica 4th December 2007, in Marta Orviská ns Peter Pisár (ed.). *Európske Financie – Teória, Politika a Prax* (European finance - theory, politics and practice) [CD-ROM]. Banská Bystrica : Ekonomická fakulta Univerzity Mateja Bela, 2007, s. 15. ISBN 978-80-969535-8-5

domestic air traffic is from the perspective of AC effective (AC for collecting are approximately 3 mil. SEK)."

The first paragraph, regarding the Irish levy on plastic bags, indicates that even where the revenue generated by a tax is relatively low, the administrative costs do not need to be high. Pavel and Vitek appear to confirm this:⁴⁰

"Overviews of studies presented in Vaillancourt (1987), Evans (2003) and Klun and Blazic (2004) of personal, corporate and sales taxes, on the one hand, and existing modest evidence for environmental taxes on the other hand, indicate that the transaction costs of environmental taxes are rather low compared with those of other taxes, notably income taxes."

They add, by way of explanation:

"This is due mainly to their design, in the case of energy and mineral oil taxes based on the principles of excise duties (a small number of taxpayers, a tax base oriented around market transactions, and a relatively simple construction of the tax base). In this way both the administrative costs of governments and the compliance costs of the private sector are reduced"

Evidently, not all taxes have this character, but through relying on existing mechanisms for reporting on transactions, or on emissions, the administrative costs can be minimised.

It is not possible to consider all the existing taxes in this study, and to comment on the administrative costs of collecting the associated revenue. It is clear, however, that when considering the introduction of new taxes, due consideration should be given to how to make best use of existing administrative structures as a means to simplify administration of the tax, and reduce the costs of collecting revenue. It might also be the case that some taxes which exhibit high administrative costs relative to their revenue generation do so for the simple reason that the tax rates are too low to generate significant revenue (not least in situations where there has been no indexing of rates over an extended period of time). Finally, it may be considered that where existing reporting mechanisms do not exist, the fact that taxes can help to drive the provision, and capture of, data has some value in itself beyond that of the revenue generated by the tax.

4.6 Revenue Estimates

The revenue estimates that have been made for each tax are based on the what might be expected if the tax is implemented in isolation, and with no assumption made regarding what might happen if other taxes (such as those on employment) were changed at the same time. They are estimates based on a set of assumptions which are set out in this document.

Two things follow from this:

1. The revenues actually generated from any given tax which has been suggested should not be treated as perfectly accurate given that they are based upon

⁴⁰ J Pavel and L Vitek (2012) *Transaction costs of environmental taxation: the administrative burden*, pp 273-282 in J Milne and MS Andersen (eds) *Handbook of research on environmental taxation*, Cheltenham: Edward Elgar.

assumptions regarding tax rates, and the response to them, which might be different to what occurs in reality;

2. Because the implementation of one tax may have implications for the revenue generated from another tax (for example, vehicle taxes might effect, over time, the use of fuel, and hence, the revenues generated from transport-related fuel taxes), then if a range of taxes is introduced, it would be wise to consider the nature of these interactions.

It should also be considered that tax revenues generated would also be affected by decisions regarding whether or not to deploy changes in taxes as part of a tax shifting process (this might be expected to affect the state of the economy, and hence, the nature of the response to the tax).

5.0 ‘Good Practice’

In this section we outline the approach to making suggestions for new environmental taxes, or changes in existing ones. In Section 6.1 below, we indicate how we have estimated the revenue that may be generated by such taxes. On energy and transport, as will become clear, we have been guided by the proposed revision to the Energy Tax Directive,⁴¹ referred to as ‘the proposed ETD’, and the Commission’s proposal of 2005 regarding vehicle taxation,⁴² referred to as ‘the Commission’s 2005 proposal’. The former is still being debated, whilst the latter never became law, but they are considered to represent the Commission’s most recent publicly available view regarding these two taxes, and it was agreed with the Steering Group to base suggested changes around these. The exposition below is a summary of a more comprehensive Appendix produced in the context of the study. The reader is referred to Appendix A.1.0 for further details. This also indicates that in many cases, the presumption is that taxes are indexed to a measure of inflation to ensure that the incentive conveyed is not eroded by inflation.

5.1 Energy Taxes

The proposed ETD sets out a formula which seeks to equalize treatment of different fuels within a given grouping. It proposes adoption of a formula for the calculation of tax rates which suggests that the tax rate for all fuels in a given group (motor fuels, motor fuels used in commercial and industrial purposes,⁴³ and heating fuels) is based on:

1. A common rate of tax per unit of energy content; and
2. A common rate of tax per unit of CO₂ emissions (considered in the proposal to be set at €20 per tonne CO₂).

It suggests that whether the rates set in a Member State are at or above the proposed minimum rates, this formula should be applied to ensure equal treatment. It also has the merit of identifying a specific CO₂ component, enabling entities included in the EU-ETS to be exempted from that specific element of any tax.

5.1.1 Motor Fuels

Most countries have set rates higher than the minimum rates in the proposed ETD for at least one energy carrier within this group of fuels. Given the emphasis in this study on the potential for generating revenue, then suggested changes are based on upward harmonization of tax rates within the group of transport fuels to the rate which is, according to the formula set out in the proposed ETD, the highest in terms of the implied rate of tax per unit of energy content, assuming that the CO₂ element of the duty is €20/tonne of emissions of CO₂. Where this implied rate of tax per unit of energy is below

⁴¹ This is considered in the form in which it exists as a firm proposal: European Commission (2011) Proposal for a Council Directive amending Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity, Brussels, COM(2011) 169/3, http://ec.europa.eu/taxation_customs/resources/documents/taxation/com_2011_169_en.pdf

⁴² European Commission (2005) Proposal for a Council Directive on Passenger Car Related Taxes, Brussels, 5.7.2005, COM(2005) 261 final, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0261:FIN:en:PDF>

⁴³ As set out in Article 8(2) of the (existing and) proposed ETD.

the minimum level proposed in the ETD, the minimum level in the ETD becomes the basis for harmonization.

5.1.2 Motor Fuels used for Purposes Set Out in Article 8(2) of the ETD

The same approach is adopted as for motor fuels above. It should be noted that the proposed ETD indicates, for the calculation of minimum rates of tax, much lower rates per unit of energy content for these uses than for Motor Fuels (€0.15 per GJ as opposed to €9.6 per GJ).

5.1.3 Heating Fuels

The same approach is applied for heating fuels with one modification. Within the group of heating fuels, some fuels (notably kerosene and diesel / gas-oil) are taxed at the same rate for heating as for motor fuels. If tax rates were harmonised on this basis, it would imply enormous increases in heating tax rates given the difference in the minimum rate per unit of energy content for heating and for motor fuel in the ETD (€0.15 per GJ as opposed to €9.6 per GJ). For this reason, we have calculated the implied tax rate per unit of energy for the other heating fuels, and then harmonized fuels upwards on the basis of the highest level within this sub-set of heating fuels.

5.1.4 Electricity

For electricity, the proposed approach is to increase electricity taxes to the level proposed in the ETD (€0.15 per GJ) where they are not already at that level (in principle, this is generally the case since the proposed ETD minimum rate is little different to that in the existing ETD (Directive 2003/96/EC).

5.1.5 Indexation

In line with Article 4(4) of the proposed ETD, we have indexed rates in line with inflation to maintain the price signal imparted by the above taxes.

5.2 Transport Taxes (Excluding Transport Fuels)

5.2.1 Vehicle Taxes

The considerable variation in approaches and experience with taxation on vehicles, and with vignettes, makes it difficult to propose an unequivocal package of measures in the case of the taxation of transport (excluding transport fuels). Directive 2011/76/EU on the charging of heavy goods vehicles for the use of certain infrastructures sets common rules on distance-related tolls and time-based user charges for vehicles with a maximum permissible gross laden weight of not less than 12 tonnes.⁴⁴ For Heavy Goods Vehicles, this makes provision for MSs to charge for externalities (air pollution and noise) on top of the mechanisms to recover the costs of infrastructure provision. Revenues from currently applied infrastructure charges (tolls or vignettes) are estimated to amount to only about 10% of total road infrastructure costs on average. Road charges are often applied to

⁴⁴ Directive 2011/76/EU amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures, OJEU 14.10.2011, L 269, pp.1-16, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:269:0001:0016:EN:PDF>

heavy goods vehicles only, and on a limited part of the network. Some Member States do not have any road charges in place.

Revenue generation from transport taxes (excl. fuel) varied from 0.05% GDP to 1.49% GDP across the EU-28 in 2011.⁴⁵ When revenues from transport fuels are included, the variation is from 1.31% GDP to 3.01% GDP.⁴⁶ There is clearly considerable potential for further revenue generation from taxation of transport over and above that raised from fuels.

The countries examined have different combinations of registration and circulation taxes. The approach we have adopted is to suggest that the overall revenue take from transport, including revenue from transport fuels, is moved to levels equating to the average of upper quartile performance in the EU-28, expressed in terms of GDP, this being 2.67% of GDP. This is effectively used as a revenue target. Where Member States are below this, we have considered what revenue gap exists, and the extent to which that gap is closed by increased taxes on transport fuel (see above). Some Member States already have taxes in place that exceed this level. It is clear that there is scope to generate additional revenue over and above what is proposed here, and hence, the proposals (as for other taxes) should be seen as indicative only.

In terms of the means used to close that gap, in line with the Commission's 2005 proposal, we have suggested that circulation taxes are increased, and that these are banded in such a way as to encourage a shift to vehicles with lower emissions (not only of CO₂, but also, other pollutants such as particulate matter). Several Member States already have such taxes in place. It is suggested that the banding is adjusted periodically to reflect technological change, to maintain incentives to use vehicles with lower emissions, and maintain revenue levels.

We also suggest that Member States give consideration to their approach to taxing HGVs in line with Directive 2011/76/EU. A recent report indicates that there is wide variation in the extent to which Member States are aligned with the approach set out in the Directive.⁴⁷ In some additional analysis (relative to the previous work), we have considered the potential revenues which could be generated from what Directive 2011/76/EC refers to as external cost charges related to air pollution and noise. The estimates assume – in line with the study's focus on revenue potential – that vehicles have applied to them maximum rates of externality charge for air pollution and noise as set out in Annex IIIb of the Directive. We have, however, applied the (lower) rates applicable to interurban roads (for air pollution and noise) and the (lower) rates applicable for daytime for noise.

5.2.2 Aviation Taxes

Some Member States deploy levies on passenger flights. Aviation emissions have been included under the ETS since the start of 2012, and 15% of EU Aviation Allowances

⁴⁵ European Commission (2013) *Transport in Figures 2013, Part 2: Transport*, Directorate General for Mobility and Transport, Tables 2.1.11 and 2.1.12.

⁴⁶ European Commission (2013) *Transport in Figures 2013, Part 2: Transport*, Directorate General for Mobility and Transport, Tables 2.1.11 and 2.1.12.

⁴⁷ See Ricardo-AEA (2014) *Evaluation of the Implementation and Effects of EU Infrastructure Charging Policy since 1995*, Final Report to DG MOVE, January 2014.

(EUAAAs) were to have been auctioned. In April 2013 the EU decided to temporarily suspend enforcement of the EU ETS requirements for flights operated in 2010, 2011, and 2012 from or to non-European countries, while continuing to apply the legislation to flights within and between countries in Europe. In October 2013 the International Civil Aviation Organization (ICAO) Assembly agreed to develop, by 2016, a global market-based mechanism (MBM) addressing international aviation emissions and apply it by 2020.

We have suggested the introduction of passenger levies based on distance. For the purpose of modelling, the data available to us relates to flights within the country concerned, outside the country concerned but within the European Union, and outside the country concerned, and outside the European Union. As a proxy for a distance related tax, we have applied levels of tax of €15 per passenger, €25 per passenger and €50 per passenger, respectively, for these different types of flight. We would, however, expect Member States to set such taxes with reference to distance rather than what is, effectively, a country listing. In addition, in line with the approach adopted in France, we have also suggested a tax of €1.25 per tonne of freight carried by air. We have assumed these rates are maintained in real terms over time.

It should be noted that the interface with the mechanism to be proposed by the ICAO would need to be kept under review. That mechanism could lead to some revenue being generated through the auctioning of allowances to the aviation sector (as had been envisaged under Phase III of the EU-ETS).

5.3 Pollution and Resource Taxes

5.3.1 Waste

A recent report from the European Commission highlights both the variability in landfill taxation, but also, its importance in driving improved waste management.⁴⁸ The suggested approach is based upon moving tax rates for landfilling to a level of €50 per tonne where they are below this level. The implementation of major changes in landfill tax in short periods of time without prior announcement can be problematic in a sector which is characterised by long lead times. As such, the implementation is phased over a period of years, depending upon the rate of tax already applied in the Member State concerned.

In order to ensure landfill taxes generate movement of waste into upper tiers of the hierarchy, it is also suggested that a tax is implemented on incineration. Although Denmark has a much higher tax rate for incineration, the suggestion is that rates similar to those in France would be appropriate. The tax rate proposed is €15 per tonne, with the rate being phased in so that it is achieved in the same year as the landfill tax proposed above.

As regards inert (construction type) wastes, for countries with no tax in place at present, it is suggested the tax is set at €2.40 per tonne. In conjunction with aggregates taxes

⁴⁸ E. Watkins, D. Hogg, A. Mitsios, S. Mudgal, A. Neubauer, H. Reisinger, J. Troeltzsch, M. van Acoleyen (2012) *Use of Economic Instruments and Waste Management Performances*, Final Report to DG Environment, 10 April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

(see below), such taxes can help to encourage recycling of construction wastes for use as secondary aggregates.

These taxes are assumed to be indexed to inflation (either through index linking, or through periodic adjustments to rates).

5.3.2 Packaging

Although Member States have made major strides in respect of packaging recycling, there has been less emphasis on packaging waste prevention. Some countries included in this study make use of deposit refund schemes which may increase use of refillable beverage packaging relative to the counterfactual scenario. The recently abolished Danish tax appears to have had some success in constraining the growth in packaging.⁴⁹ The suggested approach for packaging is to introduce a tax which reflects the embodied greenhouse gas emissions of materials typically used in packaging. This is a relatively conservative approach to the extent that such a tax does not account for other impacts associated with manufacture of such materials. The suggested rates for this work are shown in Table 5-1 (see Appendix A.1.0 for more details). It should be noted that whilst there are mechanisms, in some countries, to levy charges, under producer responsibility schemes, on packaging producers in respect of the packaging they place on the market, these are essentially mechanisms used to recover the cost of meeting obligations rather than a tax. The tax was modelled as being introduced in 2016. The rates are assumed to be indexed to inflation.

Table 5-1: Weight-based Packaging Tax Rates Based on Embodied CO₂ Content (€/kg)

Material	Tonnes CO ₂ Embodied in Material	€ per Tonne of Material
Aluminium	9.84	€196.88
Plastics	3.18	€63.57
Steel	2.71	€54.16
Paper and Card	1.02	€20.35
Glass	0.89	€17.89
Wood	0.67	€13.32

5.3.3 Single-use Carrier Bags

Plastics dominate marine litter and represent a significant threat to the marine environment due to their abundance, longevity in the marine environment and their ability to travel vast distances.⁵⁰ Despite representing only 10% of all waste produced,

⁴⁹ The Nordic Council (2008) *Extension of environmental taxes*, consulted October 2008
<http://www.norden.org/webb/news/news.asp?id=6237>

⁵⁰ KIMO (2010) *Economic Impacts of Marine Litter*, Kommunernes Internationale Miljøorganisation Local Authorities International Environmental Organisation, September 2010, available at

plastics are believed to account for between 50-80% of marine litter and this is not expected to decline for the foreseeable future (particularly as plastics do not degrade quickly).⁵¹ Terrestrial litter is also increasingly recognised as problematic, and a source of considerable disamenity.⁵²

There is a growing body of evidence which highlights the dramatic reduction in use of single-use carrier bags that a simple tax can generate. The suggested approach is a tax on all single-use carrier bags (not just plastic ones) as a means of encouraging the use of reusable bags, and reducing terrestrial and marine litter. The rate, reflecting levels which appear to have achieved major reductions elsewhere, has been proposed as €0.10 per bag. This has been adjusted to reflect purchasing power in the different Member States. Where the countries concerned already have such taxes in place, they are increased to this level. Experience indicates that allowing such taxes to be hollowed out by inflation leads to an increase in consumption, so indexing of these rates is assumed to occur.

5.3.4 Air Pollution

Several Member States implement taxes on air pollution. Such taxes provide incentives for further abatement of emissions which are harmful to human health, and are especially important in countries which are experiencing exceedance of air quality thresholds. Most existing taxes (where they exist at all) are, typically, well below the levels of the externalities which are believed to be generated. The suggestion is that there is scope for introducing such taxes where other equivalent schemes (such as emissions trading) are not already in operation, and for increasing them where they already exist. We have suggested rates of €1,000 per tonne of SO₂, €1,000 per tonne of NO_x, and €2,000 per tonne of PM₁₀ (and / or €3,000 per tonne of PM_{2.5}). Such rates are still well below the level of the externalities generated, but are likely to generate some additional incentive for abatement. The suggested transition period from existing rates, or where there is no air pollution tax in place, is from 2015 to 2018, and the rates are assumed to be indexed to inflation.

5.3.5 Water Abstraction

The need for providing improved incentives for management of the water resource varies on a catchment by catchment basis. A number of countries already apply taxes on water abstraction as a means to reduce exploitation of the water resource and to address leakages. Such measures may also encourage companies to adopt measures to improve resource efficiency.

<http://www.kimointernational.org/Portals/0/Files/Marine%20Litter/Economic%20Impacts%20of%20Marine%20Litter%20Low%20Res.pdf>

⁵¹ Thompson, R.C., Swan, S.H., Moore, C.J. and vom Saal, F.S. (2009a) Our Plastic Age. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364(1526): 1969-2166; Barnes, D.K.A., Galgani, F., Thompson, R.C. and Barlaz, M. (2009) Accumulation and fragmentation of plastic debris in global environments. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364(1526): 1985-1998; Thompson, R.C., Moore, C.J., vom Saal, F.S., and Swan, S.H. (2009b) Plastics, the environment and human health: current consensus and future trends. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364(1526): 2153-2166.

⁵² Eunomia (2013) *Exploring the Indirect Costs of Litter in Scotland*, Report to Zero Waste Scotland, <http://www.zerowastescotland.org.uk/sites/files/wrap/Indirect%20Costs%20of%20Litter%20-%20Final%20Report.pdf>

The suggested approach takes, as its point of departure, the Danish scheme, considered to be good practice for households, and the Dutch scheme, as good practice for businesses, with the lowest business rate applied in the Netherlands also applied to agricultural abstractions. The Danish and Dutch rates are weighted according to indices of purchasing power parity. It was also considered desirable to reflect some indicator of water scarcity in the proposal. Although there is no perfect indicator in this regard, the indicator used was the water exploitation index. PPP-adjusted rates were multiplied by:

- 0.25 for Member States with a WEI <10%;
- 0.50 for Member States with a WEI >10%, <20%;
- 0.75 for Member States with a WEI between >20%, <30%; and
- 1.00 for Member States with a WEI >30%.

The rates applied are shown in Table 5-2 below, and are phased in over a period to 2018. After this, they are assumed to be indexed in line with inflation.

Table 5-2: Suggested Tax Rates for Water Abstraction (€ per '000 m³)

Member State	Public Supply	Manufacturing	Agriculture
Bulgaria	60	40	5
Cyprus	460	280	40
Denmark	180	110	16
Finland	160	100	14
Germany	280	170	24
Greece	230	140	19
Ireland	150	90	12
Latvia	130	80	11
Malta	300	190	26
Netherlands	290	180	25
Slovenia	110	70	9
Spain	480	300	40
Sweden	180	110	15
United Kingdom	290	180	25

5.3.6 Discharges to Waste Water

The review of good practice identified the Dutch system as being the most comprehensive and well designed. A number of countries included in this study have

systems of waste water charges in place, some of these being extremely comprehensive in their pollutant coverage.

The absence of a comprehensive dataset on emissions to waste makes it difficult to understand the existing situation in different countries, and makes modelling of revenue from any taxes rather challenging. In this case, we have modelled a tax only on BOD, which is set at the Dutch tax rate for BOD, €2.47 per kg BOD in 2013. The rate applied in each Member State is adjusted for relative purchasing power in the different countries. The rates applied are as shown in Table 5-3.

Table 5-3: Rate of Tax to be Applied for BOD, € per kg

Member State	Tax Rate
Bulgaria	1.03
Cyprus	1.93
Denmark	1.62
Finland	2.77
Germany	2.34
Greece	1.92
Ireland	2.46
Latvia	2.14
Malta	1.69
Netherlands	0.00
Slovenia	1.81
Spain	2.04
Sweden	3.01
United Kingdom	2.44

5.3.7 Additional Analysis on Charges for Water Supply and Treatment

Article 9 of the EU's Water Framework Directive (2000/60/EC) (WFD) establishes that Member States "shall take account of the principle of the recovery of costs of water services" and requires that by 2010, they have ensured "that water-pricing policies provide adequate incentives for users to use water resources efficiently and thereby contribute to the environmental objectives of this directive".

The preamble of the WFD states that "there is a need for a greater integration of qualitative and quantitative aspects of both surface waters and ground waters". Although the WFD is primarily concerned with water quality, control of quantity is an

'ancillary element' to this purpose. The WFD specifically defines the 'available groundwater resource' for potable water in view of the need to respect the "*long-term annual rate of flow required for achieving the ecological quality objectives for associated surface waters*". This definition is effectively linking water abstraction to ecological water quality, which in turn explains why the WFD mandates influencing the demand for water through the mechanism of water pricing.

We have made estimates as to the extent to which cost recovery is achieved in different countries for water supply and treatment. We have then provided estimates as to the revenue which could be generated as a result of moving to full cost recovery. We recognise that these might not be taxes per se, but they are likely to have fiscal implications, and they also help to separate the matter of below cost recovery levels of charging, and the implementation of taxes (in line with the rates suggested in preceding sections).

5.3.8 Pesticides

A number of Member States have, or have had, pesticides taxes in place. In the past, it was common to set taxes based simply on the amount of active ingredient used. Good practice is to band the tax according to the potential impact of the pesticide in the environment, with Norway and Denmark being prime examples of this approach.

Member States have developed national action plans for the management of the use of pesticides.⁵³ Several of these indicate a desire to reduce use of pesticides, and to reduce the risks associated with their use. Suitably designed pesticide taxes have a role to play in this regard. It remains possible, also, that this can improve the efficiency of agriculture by signalling to farmers the need to consider the rate of application of existing products.

It has not been possible to gain data for each country disaggregated by the nature of the active ingredient. We have, therefore, modelled revenue generation based on a tax per unit of active ingredient, though we would expect the instrument to be designed with banding of active ingredients by some indicator of potential impact. The tax rate used is based on the level of the Danish and Norwegian taxes, and the equivalent revenue per kg active ingredient. We have suggested a central rate of €10 per kg active ingredient, and adjusted this in line with differences in relative price levels of the various national agricultural sectors. The adjustment index refers to the effective CAP support schemes per hectare of utilised agricultural area in Member States, and has been derived from the CAPRI-model.⁵⁴ The resulting tax rates at the Member State level are indicated in Table 5-4 below.

⁵³ See

http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/national_action_plans_en.htm

⁵⁴ Annex III 'Intensity of spending for CAP pillar 1 and pillar 2 per hectare of UAA' in European Environment Agency (2009) *Distribution and Targeting of the CAP Budget from a Biodiversity Perspective*, EEA Technical Report 12/2009.

Table 5-4: Tax Rates Suggested for Member States for Pesticides Based on Relative Levels of CAP Support (€ per kg active ingredient)

Rate	€2.50	€5.00	€7.50	€10.00	€12.50	€17.50
Member States	LV	BG	ES	FI SE UK CY SI	IE	DK DE

The suggested transition period from existing rates, or where there is no such tax in place, from zero rates, is from 2016 to 2018. Thereafter, rates are assumed to remain constant in real terms.

5.3.9 Fertilisers

Relatively few countries have currently taxes on fertilisers. Usually, the focus has been on nitrate pollution, with phosphate being of some interest also. Although there has been some experience with nutrient surplus taxation in the Netherlands, a decision by the European Court in the MINAS case, that input taxation is required for a scheme to be compatible with the Nitrates Directive, suggests that a tax should be based on the input of nutrients, and not to surpluses over a specified level.⁵⁵ The Dutch scheme was abandoned as a result of this ruling.

We have suggested a rate of €0.2 per kg N applied, and have, as with the rates of pesticides tax above, adjusted this in line with differences in relative price levels of the various national agricultural sectors. The resulting tax rates at the Member State level are in Table 5-5 below.

Table 5-5: Tax Rates Suggested for Member States for Nitrogen Fertilisers Based on Relative Levels of CAP Support (€ per kg N)

Rate	0.05€ per kg N	0.10€ per kg N	0.15€ per kg N	0.20€ per kg N	0.25€ per kg N	0.3€ per kg N	0.35€ per kg N	0.4€ per kg N
Member States	LV	BG	ES	CY FI SE SI UK	IE	DK DE MT	NL	EL

The suggested transition period from existing rates, or where there is no such tax in place, from zero rates, is from 2016 to 2018. Thereafter, rates are assumed to remain constant in real terms.

⁵⁵ European Court, 2002, Case C-322/00, Commission v. Netherlands, Opinion of Advocate General Léger.

5.3.10 Aggregates

Few materials are subject to primary resource taxes in the EU-28. Aggregates stand out in this regard, partly because they are not so widely traded, and for the associated reason that their relatively low value but considerable bulk means that they tend to be transported only over relatively short distances (albeit with some exceptions). Impressive results from the combined effect of taxes on aggregates and on the landfilling of construction and demolition (C&D) wastes have been observed in the UK. The instrument should be considered in conjunction with the suggestion above (regarding the taxation of landfilled C&D wastes).

It is suggested that the implementation of such taxes should be such that the rates applied to aggregates in the UK (€2.40 per tonne) are applied to the types of materials covered by such taxes. There appears to be little reason to phase this tax in. It is suggested that the tax is implemented at, or raised to, this rate by 2016. It is assumed that the tax rate is indexed to inflation.

5.4 Competitiveness Issues

The above discussion has not entered into the detail of how countries might seek to ensure that domestic industries are not rendered less competitive in export markets. However, in principle, this can be overcome through the specification of the taxable event such that exports are effectively exempt from the tax (though they could be taxed in the destination country). It might be appropriate for the opposite to be the case where what is being exported is effectively a service (for example, incineration of waste). In this case, it may be more appropriate to tax exports of waste, and exempt waste imports. Other ways to overcome potential impacts are in respect of supporting research and innovation in respect of processes and products which help industries overcome the potential downsides of any environmental taxes.

5.5 Regulatory Issues

It should be noted that when any environmental tax is introduced, or changed, the nature of incentives confronting the various actors in the affected markets also changes. The altered structure of incentives will incentivise means to evade the impact of the tax, including behaving illegally.

In this context, the potential for such behaviour to arise (and give rise to environmental problems) needs to be considered and anticipated. As such, it may be sensible to consider strengthening of the relevant regulatory apparatus, including the sanctions that may be applied, in advance of, or alongside, the tax's introduction. A classic examples in this respect is in terms of responses to taxes on landfilling, in which respect, the potential for triggering illegal, or questionable activities should be considered.

6.0 Estimating Revenues and Indirect Benefits

This section summarises the approach to calculating the revenue potential resulting from the application of environmental fiscal reform in the 12 Member States. The detailed approach is described in Appendices A.2.0 and A.3.0.

6.1 Revenue Implications of Good Practice

In calculating the revenue potential resulting from environmental fiscal reform in the 14 Member States, a number of approaches were taken depending on the different types of taxes. These approaches are outlined as follows (note this approach is detailed in Appendix A.2.0 with full references to data sources):

➤ Energy Taxes:

- The overall approach to estimating revenues from energy taxation was to seek to perform the calculations at the lowest level of granularity possible. In most cases revenue data is not broken down by fuel type, and it is not possible to access Member State's detailed budgets. Therefore making exact revenue calculations is not possible. The approach was to use as detailed data as possible on the quantities of fuels consumed in the Member States, along with the latest published excise duty rates, in order to estimate the revenue potential by fuel type.
- The first step is to align the energy consumption data (from the International Energy Agency tables) with the categories of excise duties in the ETD. The categories in the IEA tables are not disaggregated to the same extent as the excise duties, and as such some simplifying assumptions were needed to apportion fuel consumption to different excise duties (gas oil as an industrial / commercial motor fuel versus as a heating fuel, for example).
- Once the consumption of fuels had been split out to the extent possible, the existing excise duty rates were applied to the fuel quantities and the resultant proportions used to 'pro-rate' the latest total revenue figures (from official sources) to the different categories of fuel. The implied tax base for each fuel category was then calculated.
- Baseline fuel consumption was assumed to remain constant in future years. To estimate a change in demand for the different fuel an own-price elasticity calculation was performed. It is recognised that there would be substitution effects in the consumption of fuels (using cross-price elasticities also would be ideal) but the aim was to show some level of realism in the revenue forecasts, not to generate complex forecasting models. The elasticities were then used to estimate a reduction in the tax base based upon the percentage change in the price of the fuel as the excise duty rates were increased – based upon the application of good practice (see Section 5.2.1). Some assumptions around fuel pricing were also needed to perform this calculation.
- The 'adjusted' tax base was then multiplied by the tax rates (assumed to stay constant in real terms i.e. adjusted upwards for inflation on an annual basis), to calculate future revenue generation by fuel type.

➤ **Transport Taxes (excluding transport fuels):**

- Vehicles – the calculation of revenue was undertaken simply by multiplying the % GDP increase in tax revenue by GDP in real terms for future years. GDP was assumed to increase at the same rate as the latest real GDP growth rate projection made by Eurostat (i.e. the rate for 2015 by Member State was used to project GDP out to 2025).
- Passenger aviation – an elasticity based approach was taken, with data on the number of passenger flights taken from Eurostat. The tax base was projected forward based upon historic trends, and revenue calculated by multiplying the rate by the adjusted tax base (and the same was done with all the taxes listed below).
- Air-freight – a simple overall reduction estimate to the tax base was made given the lack of relevant elasticities and price data. Data on the amount of freight transported was taken from Eurostat.

➤ **Pollution and Resource Taxes:**

- Waste disposal – revenues from taxes on landfilling and incineration / MBT were calculated based upon a tax base adjusted using an elasticity approach. Data was taken from the European Reference Model on Municipal Solid Waste Management.
- All other pollution and resource taxes were calculated by taking evidence from the literature on the levels of reduction in demand that might be expected following the implementation of a tax (in percentage terms) or where no evidence was available, assuming marginal decreases to take some price-response into account. The following types of data were taken for the historic tax bases for each of the relevant taxes.
 - Landfilled construction and demolition mineral wastes (Eurostat – Waste Statistics Regulation);
 - Aggregates extracted for domestic use (Eurostat – Material Flow Accounts);
 - Packaging generation (Eurostat – Packaging Directive);
 - Single-use carrier bags (CBA – DG Environment);
 - Air emissions of SO_x, NO_x and PM (EEA – Airbase);
 - Water abstracted for public water supply, manufacturing purposes and agriculture (Eurostat);
 - Discharge of water from waste water treatment plants (EEA – Urban Waste Water Treatment Directive);
 - Sales of active ingredients in pesticides (Eurostat); and
 - Use of nitrogen in fertiliser (Eurostat).

6.2 Indirect Benefits

The project specifications state that data on indirect benefits resulting from environmental fiscal reform should be presented. Our approach, therefore, has been to estimate potential environmental benefits which result from increases in rates of

taxation. This cannot be comprehensive in a study of this duration, so the aim has been to seek quantification of some of the environmental benefits rather than all of them.

The following points summarise the methodology:

- Data on the tax bases, and how they change based upon increased levels of taxation, is presented in Appendix A.3.0. This indicates the reduction in demand for the activities which are taxed (and which have an environmental impact);
- The environmental impacts from the following main activities were included:
 - Change in use of transport fuels;
 - Change in use of fuels used in stationary engines;
 - Change in use of fuels used for heating;
 - Change in the use of electricity;
 - Change in emissions to air of certain air pollutants from industrial processes and power plants ;
 - Change in the use of vehicles;
 - Change in the number of passenger flights;
 - Change in the demand for air freight;
 - Diversion of mixed municipal type wastes from landfill;
 - Diversion of mixed municipal type wastes from incineration and MBT plants;
 - Change in the amount of water abstraction;
 - Change in the amount of pesticides produced;
 - Change in the amount of aggregates extracted;
 - Change in the generation of various types of packaging wastes;
 - Change in the production of single-use carrier bags; and
 - Change in the production of nitrogen based fertilisers.
- Factors for the emission of greenhouse gases and other air pollutants were taken from the literature;
- Damage costs were applied to the air emission to estimate a 'value' of the offset environmental damages, resulting in an estimate of benefit;
- Carbon was valued using the approach applied in the proposed Energy Tax Directive (€20 per tonne CO₂ eq). Other air emission (such as NO_x, SO_x and particulates) were valued using data from the European Environment Agency;⁵⁶
- The total 'indirect' environmental benefits are then presented along with the revenue estimates.

⁵⁶ The methodology used is summarised in: European Environment Agency (2011) *Revealing the Costs of Air Pollution from Industrial Facilities in Europe*, EEA Technical Report No 15/2011, November 2011.

7.0 Bulgaria

7.1 Country Overview

7.1.1 Key Facts about the Economy and Tax System

- Bulgaria achieved significant economic growth in the between 2003 and 2008, with GDP increasing by an average of 6.3% per annum in real terms. The global recession hit hard in 2009, with GDP decreasing by 5.5% in real terms against 2008. Since then, in the period 2010 to 2013 there has been a return to growth – although typically at a rate of less than 1% per year – the exception being 2011 which saw GDP increase by 1.8% in real terms.⁵⁷
- Bulgaria's overall tax revenue (including social contributions) as a percentage of GDP is the lowest in the EU-28, at 27.7% for 2012. This has fallen from a high of 33.3% in 2007.⁵⁸
- Indirect taxes accounted for over half (55.3%) of total tax revenues in Bulgaria in 2012. Social contributions made up 25.8%, while direct taxes made up the smallest proportion of the total tax take at 18.8%. The indirect tax share has risen since 2002, when it stood at 44.1%.⁵⁹
- In 2012, environmental taxes amounted to 2.82% of Bulgaria's GDP. This percentage share is up overall compared to 10 years ago, but has fallen from a high of 3.45% in 2006.⁶⁰
- The largest proportion of revenues from environmental tax in 2012 came from energy taxes, which amounted to 2.82% of the country's GDP. Taxation of transport (excluding fuels) account for a much lower proportion at 0.26% of GDP, with taxation on pollution and resource amounting to only 0.05% of GDP.⁶¹
- Energy taxes accounted for 89% of Bulgaria's total environmental tax revenue in 2012, the highest rate over the past 10 years.⁶²

7.1.2 Relative Position within the EU

- In 2012, revenue from environmental taxes as a percentage share of the country's GDP was higher than the EU-28 average of 2.4%. The GDP percentage

⁵⁷ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

⁵⁸ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

⁵⁹ Ibid.

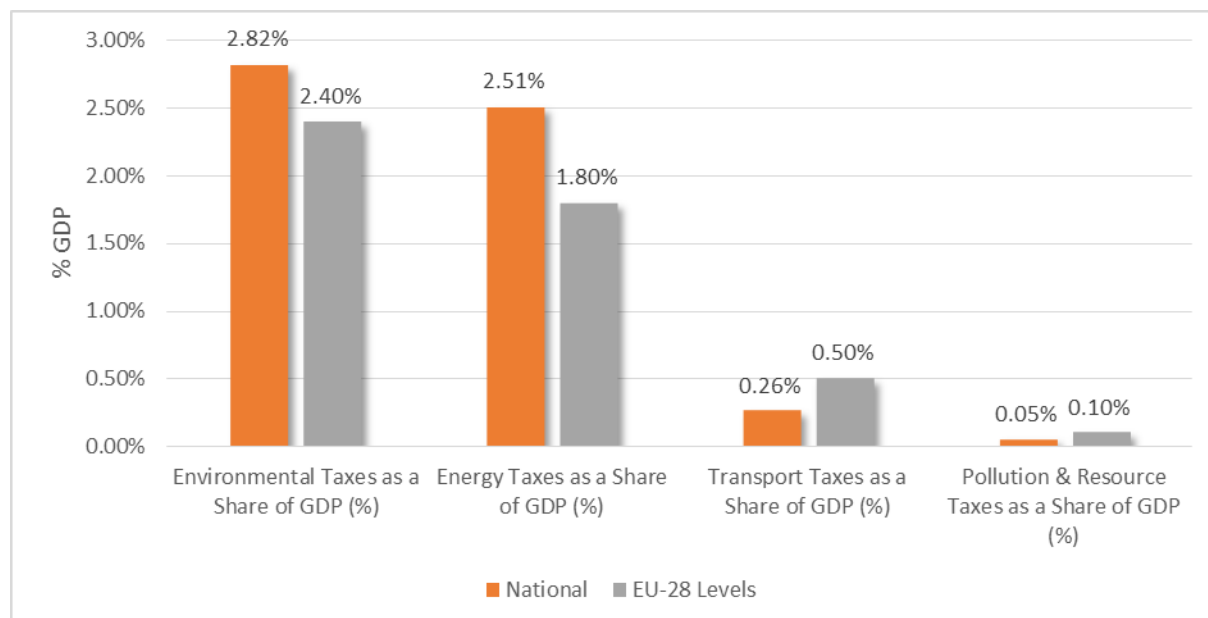
⁶⁰ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

⁶¹ Ibid.

⁶² Ibid.

share of energy taxes was higher than the EU-28 average of 1.8%, while the share for transport (excluding fuel) taxes was lower than the average of 0.5%. The share for taxation on pollution and resource was half that of the average of 0.1% (see Figure 7-1).⁶³

Figure 7-1: Environmental Taxes in Bulgaria as a % of GDP vs EU-28 Levels (2012)



- Relative to the rest of the EU-28, Bulgaria ranked 9th overall in terms of environmental tax revenue expressed as a share of GDP in 2012. In terms of energy tax revenue as a share of GDP it ranked highly, coming in second out of all Member States. The proportional contributions made by transport (excluding fuel) and pollution and resource taxation rank somewhat lower, at 19th and 17th place respectively (see Table 7-1).⁶⁴

Table 7-1: Ranking of Bulgaria's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	9
Energy Taxes as a Share of GDP (%)	2
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	19
Pollution & Resource Taxes as a Share of GDP (%)	17

Source: based on Eurostat data

⁶³ Ibid.

⁶⁴ Ibid.

7.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.5.0 (see separate document). This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat. ^{65,66}

➤ Energy Taxes:

- The Bulgarian excise duties on fuels and electricity are shown in Table 7-2, alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 7-2: Standard Rates of Excise Duties on Fuels and Electricity in Bulgaria

Excise Duty	Unit	Rate Applied in Bulgaria	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol ¹	€ per 1000 litres	BGN 830.00 (€424.38)	€421	€585	€583
Unleaded Petrol ²	€ per 1000 litres	BGN 688.00 (€351.77) - BGN 710.00 (€363.02)	€359	€519	€509
Gas Oil (Diesel) ³	€ per 1000 litres	BGN 645.00 (€329.79)	€330	€427	€405
Kerosene	€ per 1000 litres	BGN 645.00 (€329.79)	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	BGN 340.00 (€173.84)	€125	€209	€180
Natural Gas ⁴	€ per GJ	BGN 0.85 (€0.43)	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	BGN 645.00 (€329.79)	€21	€221	€163
Kerosene	€ per 1000 litres	BGN 645.00 (€329.79)	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	BGN 340.00 (€173.84)	€41	€126	€125
Natural Gas ⁴	€ per GJ	BGN 0.85 (€0.43)	€0.30	€1.76	€1.50
Heating – Business Use					

⁶⁵ Eurostat (2014) Euro/ECU Exchange Rates – Annual Data [ert_bil_eur_a], Accessed 5th August 2014, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ert_bil_eur_a&lang=en

⁶⁶ Eurostat (2014) GDP and Main Components - Current Prices [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Excise Duty	Unit	Rate Applied in Bulgaria	Existing ETD Minimum	EU-28 Average	EU-28 Median
Gas Oil (Diesel)	€ per 1000 litres	BGN 50.00 (€25.56)	€21	€221	€163
Kerosene	€ per 1000 litres	BGN 50.00 (€25.56)	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	BGN 50.00 (€25.56)	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	BGN 0.00 (€0.00)	€0.00	€82	€40
Natural Gas	€ per GJ	BGN 0.60 (€0.31)	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	BGN 0.60 (€0.31)	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	BGN 50.00 (€25.56)	€21	€179	€125
Kerosene	€ per 1000 litres	BGN 50.00 (€25.56)	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	BGN 50.00 (€25.56)	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	BGN 0.00 (€0.00)	€0.00	€111	€42
Natural Gas	€ per GJ	BGN 0.00 (€0.00)	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	BGN 0.60 (€0.31)	€0.30	€1.77	€0.32
Electricity					
Business Use	€ per MWh	BGN 2.00 (€1.02)	€0.50	€8.42	€1.03
Non-Business Use ⁵	€ per MWh	BGN 2.00 (€1.02)	€1.00	€14.53	€2.06
Notes:					
<ol style="list-style-type: none"> 1. Leaded petrol is no longer sold in Bulgaria. 2. The lower rate applies for petrol containing minimum 4% biofuels. 3. Farmers are eligible to receive a 50% discount on this rate. 4. This rate is below the EU Directive minimum and Bulgaria has applied to the European Commission to use a provision in the Directive allowing lower rates of the tax on natural gas when less than 15% of the total energy consumption is natural gas. 5. Household usage of electricity is exempt from the excise duty. 					

Sources: European Commission - Taxation and Customs Union (2014) Excise Duty Tables: Part II - Energy Products and Electricity, July 2014,
http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

Ministry of Finance (Bulgaria) (no date) Excise Duties and Tax Warehouses Act, no date,
<http://www.minfin.bg/document/12064:2>

- As shown in Table 7-2, the excise duty rates for Bulgaria are lower (in some cases significantly so) than the EU averages for almost all fuels except gas oil and liquid petroleum gas for industrial or commercial use. Natural gas rates are lower than the EU ETD minimum rates, but all other rates are

over the minimum required.

- Revenue: The total revenue of all excise duties on energy products in 2012, the latest year for which figures are available, were BGN 1.95 billion (€995 million), equivalent to 2.5% of GDP.⁶⁷

➤ **Transport Taxes (excluding transport fuels):**

- There is no registration tax on vehicles in Bulgaria.
- Circulation (Road) Tax:⁶⁸
 - All vehicles, aircraft and ships pay an annual circulation tax to the relevant local Municipality under the Local Taxes and Fees Act. The range of rates of the tax is set by the government, with each Municipality able to determine the level they wish to charge within this range.
 - For passenger cars, the rate is set according to the engine power and age of the vehicle and ranges from BGN 0.34 (€0.17) per kW to BGN 3.69 (€1.89) per kW, with vehicles with greater engine power paying a higher rate. These rates are multiplied by a specific coefficient which depends on the age of the vehicle – newer vehicles pay a higher rate than older vehicles.
 - Rates for motorcycles are based on the engine size and range from BGN 12.00 (€6.14) to BGN 300.00 (€153.39). Buses and lorries are also required to pay circulation tax. For details of rates for these vehicles, please see Appendix A.5.0. Electric vehicles are exempt and vehicles with engine power up to 74 kW can receive a reduction in the rate if they meet particular emissions classes.⁶⁹
 - Revenue in 2012 (the latest year for which figures are available) was BGN 180 million (€92 million), equivalent to 0.23% of GDP.⁷⁰
- Bulgaria implemented an aircraft noise tax in November 2012. This tax is levied on all aircraft traffic at one of five international airports in within the country.⁷¹ The tax rate is calculated as a multiple of a “base noise unit”

⁶⁷ European Commission (2014) Taxes in Europe Database, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

⁶⁸ European Commission (2014) Taxes in Europe Database, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

⁶⁹ Ministry of Finance (Bulgaria) (no date) Transport Vehicle Tax, accessed 21 September 2014, <http://www.minfin.bg/en/page/779>

⁷⁰ Eurostat (2014) Revenue Data by Individual Tax (National Tax List), accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

⁷¹ Ministry of Transport (Bulgaria) (2012) *Ordinance on the taxes for use of public airports and navigational services in Bulgaria*, 30th November 2012, http://caa.gateway.bg/upload/docs/NAREDBA_za_taksite_za_izpolzvane_na_letisata_za_obsestveno_polzvane_i_za_aeronavigacionno_obs_lujvane.pdf

(set at EUR 3.74 since 01.01.2013). The multiplier used varies according to the maximum takeoff weight of the aircraft (helicopters and aircraft under 9 tonnes MTOW are exempt) as well the time of the day of the takeoff or landing and the noise categorization of each aircraft type. Revenue for the 1-year period from July 2013 to June 2014 for Sofia airport is estimated at BGN 641 thousand (€328 thousand), equivalent to 0.0008% of GDP. The other 4 Bulgarian international airports may be expected to generate significantly less revenue from the noise tax, based on traffic volumes.⁷²

- Bulgaria also uses a road vignette system, where cars must pay an annual fee to use public roads in the national road network (outside of settlement road networks). The rate depends on the type of the vehicle (with heavy goods vehicles paying a much higher rate than passenger vehicles), the validity period of the vignette and, for some vehicles, the emissions class. From 1 January 2014, annual vignette fees range from €34 for passenger vehicles to €665 for heavy goods vehicles with emissions classes Euro 0, Euro I or Euro II.⁷³

➤ Pollution and Resource Taxes:

- Landfill tax:
 - Bulgaria is one of the most recent EU Member States to impose a tax on landfilling waste, having introduced the tax from 1 January 2011.⁷⁴
 - Rates have increased each year from 2011 through 2014. Since 2011, the rate has increased more than ten-fold. The current rate for all waste types is BGN 22 (€11.25) per tonne, with plans to increase this rate to BGN 95 (€48.57) by 2020. Rates are double for landfills that do not conform to the standards in the Landfill Directive.⁷⁵
 - Landfill tax is paid on a quarterly basis by municipalities to the Regional Inspectorates for Environment and Water. Total revenues in 2012 amounted to BGN 27.4 million (€14 million), equivalent to 0.035% of GDP.

⁷² Sofia Airport (2014) *Airport Taxes Income and Expenses*, 28th February 2014, http://www.sofia-airport.bg/UserFiles/%D0%9F%D1%80%D0%B8%D0%BB%D0%BE%D0%B6%D0%B5%D0%BD%D0%B8%D0%B5%203_%D0%A0%D0%B0%D0%B7%D1%85%D0%BE%D0%B4%D0%B8%20%D0%B8%20%D0%9F%D1%80%D0%B8%D1%85%D0%BE%D0%B4%D0%B8.pdf

⁷³ Road Infrastructure Agency (Bulgaria) (2014) *Vignette Stickers*, accessed 21 September 2014, <http://www.api.bg/index.php/en/vinetni-stikeri>

⁷⁴ European Topic Centre on Sustainable Consumption and Production (2012) *Overview of the Use of Landfill Taxes in Europe*, Report for European Environment Agency, April 2012, http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1, pp. 24-25.

⁷⁵ MOEW (2013) *Landfill Tax Ordinance 7/2013*, http://www.moew.government.bg/files/file/Waste/Legislation/Naredbi/waste/NAREDBA_7_ot_19.12.2013_g_za_reda_i_nachina_za_izchislqvane_i_opredelqne_razmera_na_obezpecheniqta_i_otchisleniqta_izis_kvani_pri_deponirane_na_otpadaci.pdf

- Single-use bag levy:
 - Bulgaria has imposed a product tax on single-use plastic bags since October 2011. The tax was first imposed at a rate of BGN 0.15 (€0.08) per bag.⁷⁶ Since then it has increased annually to the current rate (2014), which is BGN 0.55 (€0.28) per bag. All producers and importers of plastic bags are required to pay the tax, the cost of which is usually passed on to the consumer. Revenues from the plastic bag tax were BGN 18,182 in 2013.^{77 78}
- Although there are no further pollution and resources taxes in Bulgaria, there are a number of additional relevant levies. These include:
 - Environmental product fees (under a producer responsibility scheme), paid by producers of certain items within six waste streams, including packaging materials, batteries, WEEE and vehicles.⁷⁹ Most producers and importers are members of a producer responsibility scheme and thus pay a licence fee to these. Total revenues for 2013 for the product fees amount to BGN 2.1 million (€1.1 million), equivalent to 0.0027% of GDP.⁸⁰
- Water taxes: The Water Act stipulates several taxes related to the use of water, water bodies and water pollution. The total revenue from all water taxes in 2013 amounts to BGN 51.4 million (€26.3 million), equivalent to 0.066% of GDP. This is the single most important revenue source for EMEPA (Enterprise for Management of Environmental Protection activities, a fund operated by the Ministry of Environment and Water).
 - Water abstraction taxes: There is a system of tariffs which are different depending on the purpose (household water supply, hydro-power, industry, cooling, irrigation, etc.) and source (surface or groundwater) of water.⁸¹ Rates vary from BGN 0.0003 (€0.0002) to BGN 0.75 (€0.38) per m³.⁸²
 - Tax for the extraction of inert materials from water bodies. The current tax rate is BGN 1 (€0.51) per m³ of inert materials.

⁷⁶ Using the fixed exchange rate since 1999.

⁷⁷ Earth Policy Institute (2014) Plan B Updates: The Downfall of the Plastic Bag: A Global Picture, accessed 3 September 2014, http://www.earth-policy.org/plan_b_updates/2013/update123

⁷⁸ Adamowski, J. (2012) Bulgaria to Increase Plastic Bag Tax by 233%, accessed 22 September 2014, <http://www.europeanplasticsnews.com/subscriber/headlines2.html?id=1643>

⁷⁹ IEEP (2013) Steps to Greening Country Report: Bulgaria, Report for the European Commission, p.19

⁸⁰ EMEPA (2013) *Report of the Company for Management Activities 2013*, <http://pudoos.bg/%D0%BE%D1%82%D1%87%D0%B5%D1%82%D0%B8/>

⁸¹ Ministry of Environment (2012) Tariff for the taxes for water abstraction, use of water bodies and discharge of wastewater, 1st January 2012, http://www3.moew.government.bg/files/file/Water/Legislation/tarifi/Ttaksi_vodovz_polzv_zamyrs.pdf

⁸² Ministry of Environment and Water (2012) *Tariff of Fees for Water Use*, 1st January 2012

- Water pollution taxes. A tax rate of BGN 0.005 (€0.0026) per m³ for discharge to surface water bodies applies. The tax rate for discharge to groundwater bodies is dependent on a number of variables, including the level of pollution in the wastewater. The tax rate can range from a maximum of BGN 1 (€0.51) per kg of pollutant to a minimum of BGN 0.0001 (€0.000051) per kg of pollutant.⁸³

7.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Bulgaria. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

7.2.1 Current Status of EFR

As shown in Section 7.1.1, a large proportion of environmental taxation in Bulgaria (89%) consists of revenue from taxation on energy products. As Section 7.1.3 shows, however, this is not necessarily because of high tax rates, as Bulgaria's rates are below the EU average in the case of many of the energy products. Instead, this is due to a highly energy intensive economy.⁸⁴ In recent years, following a transition period after Bulgaria's accession to the EU, some excise duty rates on energy products have been increased, including small changes to the kerosene and gas oil rates; an excise duty on natural gas was also implemented in 2012. Following the introduction of the tax on natural gas, the rate on natural gas used for heating for business use was subsequently subject to a five-fold increase in January 2014.^{85 86}

A new energy tax on renewable electricity providers, set at the rate of 20% of the feed-in tariffs paid to producers of solar and wind power, was proposed in December 2013. However, this was never implemented and was deemed unconstitutional by the Bulgarian Constitutional Court in July 2014. According to the then Minister for the Economy and Energy Mr. Dragomir Stoynev, the rationale for this tax, as a "type of corporate tax", was related to the need for affordable electricity tariffs for the Bulgarian households, lifting some of the burden of previous renewable energy incentive schemes on energy consumers, and was in line with renewable energy reforms limiting such

⁸³ Ministry of Environment and Water (2012) *Tariff of Fees for Water Use*, 1st January 2012

⁸⁴ European Commission (2014) *Assessment of the 2014 National Reform Programme and Convergence Programme for Bulgaria*, June 2014, http://ec.europa.eu/europe2020/pdf/csr2014/swd2014_bulgaria_en.pdf, p. 12

⁸⁵ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

⁸⁶ Sofia News Agency (2013) *Bulgaria Asks EC to Keep Reduced Excise Rate on Natural Gas for Motor-Fuel Use*, accessed 20 September 2014, <http://www.novinite.com/articles/153735/Bulgaria+Asks+EC+to+Keep+Reduced+Excise+Rate+on+Natural+Gas+for+Motor-Fuel+Use>

schemes already in place in other EU countries.⁸⁷ The first instance and the full judgment from the Court has yet to be released, but earlier challenges to the tax were made on the basis of its anti-competitive nature, rather than environmental, grounds.⁸⁸

A key concern in Bulgaria, which will likely limit the appetite for increasing energy taxes (and possibly other environmental taxes) is the impact of high energy costs on the population. The government has, this year, started providing farmers with a total of BGN 84 million (€43 million) worth of financial support which will see the tax rate on gas oil reduced by 50% to BGN 0.31 (€0.16) per litre.⁸⁹ Furthermore, protests over the cost of electricity were re-ignited in spring 2014, following a proposal for increased prices which was laid before the national energy regulator. In 2013, Prime Minister Boiko Borisov was forced to resign over the issue of electricity prices. When in power, the Bulgarian Socialist Party (May 2013 – July 2014) lowered electricity prices twice: first by 1.5%, and then by a further 0.8%. The subsequent government – an interim government assigned by the president – increased electricity prices by 9.77% on 1st October, 2014.^{90,91}

In relation to vehicle taxation, it is worth noting that an excise duty on motor vehicles was in place from 1994 to 2009. The rate for this tax was determined by the engine power and whether the vehicle was used or new.⁹² Revenues were BGN 15.2 million (€7.8 million), equivalent to 0.02% of GDP in 2009.⁹³ Additionally, a quarrying fee, collected by municipalities, which was previously included under the Local Taxes and Fees Act,⁹⁴ was repealed in 2008; the reasons behind this decision are not known. The fee was charged on the extraction of materials such as sand, clay and limestone. The level of the fee in 2006 was BGN 0.4 (€0.20) per m³ of extracted material and revenues totalled BGN 1.2

⁸⁷ Ministry of the Economy, Energy and Tourism (2013) *Press Release from December 10, 2013*, Accessed October 17th 2014, <http://www.mi.government.bg/bg/news/ministar-stoinev-podkrepi-vavejdaneto-na-20-taksa-ot-preferencialnata-cena-pri-izkupuvane-na-energi-1469.html>

⁸⁸ The Sofia Globe (2014) *Bulgarian Constitutional Court Repeals Renewable Energy Tariff Fee*, Accessed 20 September 2014, <http://sofiaglobe.com/2014/07/31/bulgarian-constitutional-court-repeals-renewable-energy-tariff-fee/>

⁸⁹ Council of Ministers (Republic of Bulgaria) (2014) *Minister Grekov: The Distribution of Vouchers for Reduced Excise Duty on Diesel to Farmers Started*, accessed 20 September 2014, <http://www.government.bg/cgi-bin/e-cms/vis/vis.pl?s=001&p=0234&n=437&g=>

⁹⁰ State Commission for Energy and Water Regulation (2014) *Decision No. C-16*, 10th January 2014, http://www.dker.bg/files/DOWNLOAD/res_c16_2014.pdf

⁹¹ Ecologic Institute, and eclareon (2014) *Assessment of Climate Change Policies in the Context of the European Semester - Monthly Progress Update: 01 June - 30 June (Issue 15/2014)*, Report for European Commission - DG Clima, June 2014, http://ec.europa.eu/clima/policies/gas/progress/docs/progress_201406_en.pdf, p. 7

⁹² European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

⁹³ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

⁹⁴ A previous version of the Local Taxes and Fees Act (ca. anno 2007) is available in English here: <http://www.minfin.bg/document/1915:1>

million (€0.61 million) in 2008.^{95 96} No information has been found to suggest that either of these taxes and fees are likely to be re-introduced in the near future.

It thus appears that, although there has been some shift towards environmental taxation in recent years (including the introduction of the single use plastic bag tax and the landfill tax), there has also been movement in the opposite direction. Finally, it is worth noting that no country specific recommendations relating to environmental fiscal reform were made as part of the 2014 European Semester.

7.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Bulgaria. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€9.7 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€7.9 per GJ). Finally, the rates for heating fuels are equalised using the ETD minimum rate for gas oil of €0.15 per GJ.
- The existing electricity taxes are harmonised and above the ETD minimum of €0.15 per GJ so no change is suggested.
- Table 7-3 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the good practice section on energy taxes (Section 5.1). The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.
- For propellants, essentially, rates are harmonised upwards in line with existing rates for petrol. This implies a major increase in taxes on LPG, and less significant, though important ones, on diesel and kerosene. Natural gas, currently not taxes at all, comes under the tax regime.

⁹⁵ Marinov, A. (2006) *Analysis of the Organizational Changes in the Local Taxes and Fees Administration*, Trakia Journal of Science, Vol.4, No.4, pp.52–60

⁹⁶ Eurostat (2014) Revenue Data by Individual Tax (National Tax List), accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

- For industrial and commercial motors, the major change is, once again, for LPG.
- For business and non-business heating fuels, all fuels witness significant increases, reflecting the low levels currently.
- No adjustment is required for electricity.

Table 7-3: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	363	363
Light fuel oil (diesel)	€ per 1000 litre	393	330
LPG (propellant)	€ per 1000 kg	504	174
Kerosene	€ per 1000 litre	395	330
Natural gas (prop)	€ per GJ	11	0.43
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	330	330
Kerosene	€ per 1000 litre	332	330
LPG	€ per 1000 kg	422	174
Natural gas	€ per GJ	9	0
Business Heating			
Gas oil	€ per 1000 litre	57	26
Heavy fuel oil	€ per 1000 kg	68	26
Kerosene	€ per 1000 litre	56	26
LPG	€ per 1000 kg	65	0
Natural gas	€ per GJ	1.27	0.31
Coal	€ per GJ	2.04	0.31
Non-Business Heating			
Gas oil	€ per 1000 litre	57	26
Heavy fuel oil	€ per 1000 kg	68	26
Kerosene	€ per 1000 litre	56	26

Energy Tax	Units	Suggested Rates	Existing Rates
LPG	€ per 1000 kg	65	0
Natural gas	€ per GJ	1.27	0.00
Coal	€/per GJ	2.04	0.31
Electricity			
Electricity - business use	€ per MWh	1.02	1.02
Electricity - non-business use	€ per MWh	1.02	1.02

➤ **Transport Taxes:**

- **Vehicles:** It is suggested that there is no increase as vehicle taxes and transport fuel taxes combined already amount to 2.7% of GDP, which is around the level of the good practice benchmark (see Section 5.2.1). However, it should be noted that only 0.2% of GDP is derived from vehicle circulation and registration taxes, and that there is significant scope for increasing these should the Government be seeking additional sources of revenue. Furthermore, the existing national vignette appears to levy relatively low rates on HGVs as compared with, for example, the levels applied under the Eurovignette (covering Belgium, Netherlands, Denmark, Luxembourg and Sweden), even though the rates applied therein have not risen since 2001.⁹⁷
- **Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. The introduction of a tax on passenger flights and air freight is recommended in Bulgaria. The suggested rates for the air passenger tax for are €15 per passenger (flights within the country concerned), €25 per passenger (to other countries in the European Union), and €50 per passenger (to other countries outside the European Union). The suggested air transport tax rate is €1.25 per tonne of freight. The year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. As noted in the good practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax (see Section 5.2.2).

➤ **Pollution and Resource Taxes:**

- **Aggregates:** An aggregates tax can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This is

⁹⁷ See Ricardo-AEA (2014) *Evaluation of the Implementation and Effects of EU Infrastructure Charging Policy since 1995*, Final Report to DG MOVE, January 2014.

in-line with the flagship initiative 'A Resource Efficient Europe'.⁹⁸ Bulgaria currently has an aggregates tax only on the extraction of inert materials from water bodies, with a tax rate of €0.51 per m³. It is suggested that this rate should be increased to €2.40 per tonne from 2016, and that thereafter, kept constant in real terms. The tax should also be expanded to include extraction of aggregates from land, and could include the following types of materials:

- Marble
- Chalk and dolomite
- Slate
- Limestone and gypsum
- Sand and gravel

The total amount of aggregates extraction in 2013 was 11.9 million tonnes (construction materials and natural stone/rocks, not including industrial minerals). Thus, such a tax could provide a significant stream of additional revenue.

- **Waste – landfill tax:** Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Landfill taxes also provide support to the application of the waste hierarchy. In 2012, the rate of waste landfilled (directly or indirectly) in Bulgaria was 73% (excluding major mineral wastes, dredging spoils and contaminated soils),⁹⁹ considerably higher than the EU-28 average of 29%.¹⁰⁰ A landfill tax is in place in Bulgaria. Two rate structures are used to encourage the disposal of waste in landfills that conform to the EU Landfills Directive: a rate of €11.25 per tonne is specified for municipal and non-hazardous waste deposited in a landfill that conforms to Directive, while a higher rate of €35.79 per tonne is applied to waste deposited into a landfill that does not conform to the Directive. There are plans to gradually increase the rate of the former tax to €48.57 (in nominal terms) by 2020. It is suggested that, in order to further incentivise reduction in the landfilling rate, the rate for non-hazardous waste is raised to a minimum of €50 per tonne in real terms by 2019. An early announcement of this tax and its escalation over a number of years would help drive the change in the waste management sector needed to meet EU targets in

⁹⁸ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

⁹⁹ Communication from the Bulgarian's Ministry of Environment and Water to the European Commission, 2014.

¹⁰⁰ Eurostat (2014) *Landfill Rate of Waste Excluding Major Mineral Wastes*, Accessed 14th October 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=t2020_rt110&tableSelection=1

2020 and beyond. We suggest this tax should be indexed to an appropriate measure of inflation.

- **Waste – incineration / MBT tax:** In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, up to €15 per tonne in real terms over the same period as the landfill tax is increased (i.e. up to 2019). An equivalent rate is also proposed for MBT facilities. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.¹⁰¹
- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. According to the Bulgarian ExEA 89.55% of the urban population in Bulgaria is exposed to PM₁₀ concentrations exceeding the daily limit value (50 µg per m³) for over 35 days per year.¹⁰² A recent report on air quality by the EEA found that particular sites in Bulgaria and Poland registered annual mean concentrations of PM_{2.5} concentrations close to or above double the target value threshold.¹⁰³ This might be improved in part by the changes in energy taxes proposed above, which may affect the use of transport, and the choice of vehicle type.

In most Bulgarian cities, high PM emissions are mainly caused by the widespread use of wood and coal for household heating. State subsidies to poorer households serve to encourage the use of these fuel types. In Sofia, emissions from transport are also a significant source of PM. Industrial facilities are significant contributors at several specific locations, mainly in smaller cities such as Pernik, Dimitrovgrad and Galabovo.

Bulgaria does not currently have a system of air pollution taxes in place, although many industrial users currently pay fines for high emissions. It is suggested that an air pollution tax could be implemented for industry, in order to generate improvements, at the margin, in air quality. The suggested tax rates used in our modelling are as follows:

- SO_x €1,000 per tonne
- NO_x €1,000 per tonne
- PM₁₀ €2,000 per tonne

¹⁰¹ European Commission (2011) *Roadmap to a Resource Efficient Europe*, 20th September 2011, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN>

¹⁰² Bulgarian Executive Environmental Agency (2012) *National Report of the State of the Environment*, <http://eea.government.bg/bg/soer/2012>

¹⁰³ European Environment Agency (2013) *Air Quality in Europe*, p.32, http://www.eea.europa.eu/publications/air-quality-in-europe-2013/at_download/file

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2021. The rates are then held constant in real terms.

- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested that the following rates could be applied to all packaging placed on the market in Bulgaria:
 - Aluminium €197 per tonne
 - Plastic €64 per tonne
 - Steel €54 per tonne
 - Paper and card €20 per tonne
 - Glass €18 per tonne
 - Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Water abstraction:** A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that “*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*”. Water abstraction charges are currently in place in Bulgaria; however, some charges do not ensure full cost recovery and an increase in rates is suggested. Increases would be appropriate on water abstraction for drinking water, manufacturing purposes, and agriculture; recommended rates are €60 per 1,000 m³, €40 per 1,000 m³ and €5 per 1,000 m³ respectively. We have assumed that the additional revenue which such rates may generate can accrue to the central budget. A transition period from 2016 to 2021 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21st May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.¹⁰⁴ Bulgaria does charge users for wastewater treatment as part of water charges. A water pollution tax on the discharge of waste water to surface and groundwater bodies is also in place. To improve prevention of water pollution we suggest consolidation of this tax so that tax rates are directly proportionate to the level of pollution in the waste water, and to adjust tax rates in-line with

¹⁰⁴ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

good practice (see Section 5.3.6). With relative price levels in Bulgaria this would imply, for BOD, a rate of €1.03 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. Given the magnitude of the increase in rates a transition period from 2016 to 2019 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. It is suggested that rates should be held constant in real terms once they reach the 2019 levels.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Bulgaria. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €5.00 per kg active ingredient. The suggested transition period is from 2017 to 2019, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would contribute towards the aims of the Action Plan.

- **Fertilisers:** Bulgaria does not currently implement a tax on nitrogen (or other) fertilisers. It is therefore suggested that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of 0.1 € per kg N be implemented from 2017 with rates gradually increasing to the maximum level in 2019.

7.2.3 Summary of Revenue Outcomes

Table 7-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 7-4: Potential Additional Revenue from Environmental Fiscal Reform in Bulgaria, million BGN (real 2014 terms)¹⁰⁵

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	44	169	285
C&I / Heating	76	151	151
Electricity	26	26	26
<i>Sub-total Energy, million BGN</i>	146	346	463
<i>Sub-total Energy, % GDP</i>	0.17%	0.41%	0.55%
Transport Taxes			
Passenger Aviation Tax	252	552	656
Freight Aviation Tax	0.03	0.06	0.06
<i>Sub-total Transport, million BGN</i>	252	552	656
<i>Sub-total Transport, % GDP</i>	0.30%	0.65%	0.78%
Pollution and Resource Taxes			
Landfill Tax - Non-haz General	41	47	9
Incineration /MBT Tax	3	9	9
Air Pollution Tax	336	646	507
Water Abstraction Tax	7	17	17
Waste Water Tax	23	32	32
Pesticides Tax	7	14	15
Aggregates Tax	201	124	131
Packaging Tax	16	13	11
Fertiliser Tax	0.026	0.056	0.070
<i>Sub-total Pollution & Resource, million BGN</i>	634	903	732

¹⁰⁵ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
<i>Sub-total Pollution & Resources, % GDP</i>	0.75%	1.07%	0.86%
Total Environmental Taxes			
Total, million BGN	1,032	1,801	1,850
Total Increase, % GDP	1.22%	2.13%	2.19%

Table 7-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 7-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Bulgaria, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	133
Increased Cost Recovery for Water Use	496
Total	629

7.2.4 Environmental Benefits

Table 7-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.5.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, BGN 761 million of benefits are anticipated annually by 2025 in real terms.

Table 7-6: Monetised Environmental Benefits from Implementation of Suggested Taxes, million BGN (real 2014 terms)¹⁰⁶

Tax Type	2017	2020	2025
Energy Taxes	4	10	13
Transport Taxes (excluding transport fuels)	2	5	6
Pollution and Resource Taxes	204	710	748

¹⁰⁶ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax Type	2017	2020	2025
Total, million BGN	210	725	767
Total, % GDP	0.23%	0.75%	0.71%

7.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Bulgaria:¹⁰⁷

- In 2012, environmental taxes generated revenue equivalent to 2.82% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Bulgaria. These could generate BGN 1.0 billion in 2017 (EUR 0.5 billion), rising to BGN 1.8 billion in 2025 (EUR 0.9 billion) (both in real 2014 terms). This is equivalent to 1.19% and 2.16% of GDP in 2017 and 2025 respectively.
- The largest single contribution to revenue comes from the suggested Passenger Aviation Tax. This accounts for BGN 0.66 billion by 2025 (EUR 0.34 billion) (real 2014 terms), equivalent to 0.61% of GDP.
- The next largest contribution to revenue comes from an Air Pollution Tax. This accounts for BGN 0.51 billion by 2025 (EUR 0.26 billion) (real 2014 terms), equivalent to 0.47% of GDP.
- Revenue potential from a C&I / Heating Tax would raise BGN 0.15 billion by 2025 (EUR 0.08 billion) (real 2014 terms), equivalent to 0.14% of GDP.
- An Aggregates Tax is also suggested. This would contribute BGN 0.13 billion by 2025 (EUR 0.07 billion) (real 2014 terms), equivalent to 0.12% of GDP.
- In addition, a range of more minor taxes on could generate revenue of BGN 0.094 billion by 2025 (EUR 0.048 billion) (real 2014 terms), equivalent to 0.09% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around BGN 0.8 billion by 2025 (EUR 0.4 billion) (real 2014 terms), equivalent to 0.70% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €629 million per annum could be raised in addition to the above.

¹⁰⁷ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

8.0 Cyprus

8.1 Country Overview

8.1.1 Key Facts about the Economy and Tax System

- Cyprus experienced erratic economic growth between 2003 and 2008, with its year on year increase in GDP averaging out at 3.8% per annum in real terms. Following a 1.9% decrease in GDP in 2009, 2010 brought some recovery with a 1.3% in real terms increase against the previous year. From 2011 to 2013, however, the economic situation has become steadily worse, with growth falling from a 0.4% increase in real terms in 2011 to a 5.4% decrease in 2013.¹⁰⁸
- Cyprus's overall tax revenue (including social contributions) is below the EU-28 average of 39.8%, at 35.3% of GDP. This has risen overall from 30.9% in 2002, although it has dropped since peaking at 40.1% in 2007.¹⁰⁹
- In 2012, indirect taxes made up 42.7% of Cyprus's total tax revenue, with direct taxes providing 31.4% and social contributions making up the remaining 25.9%. Since 2007, the shares of direct and indirect taxes have been falling (from 34.4% and 46.8% respectively) with social contributions rising.¹¹⁰
- In 2012, environmental taxes in Cyprus amounted to 2.67% of GDP. This percentage is at a 10 year low, and has been falling year on year since reaching a high of 4.02% in 2004.¹¹¹
- Energy taxes accounted for the greatest proportion of environmental taxes in 2012, amounting to 1.89% of Cyprus' GDP in 2012. Revenues from transport (excluding fuel) taxes amounted to 0.78% of GDP. According to Eurostat, Cyprus does not generate any revenue from taxation placed on pollution and resource.¹¹²
- The contribution of energy taxes to overall environmental tax revenue for 2012 stood at 70.8%. This contribution has risen considerably over the past 10 years, from 33.4% in 2002. There has therefore been a corresponding fall in the proportion of the revenue which is raised from transport taxes.

¹⁰⁸ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

¹⁰⁹ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

¹¹⁰ Ibid.

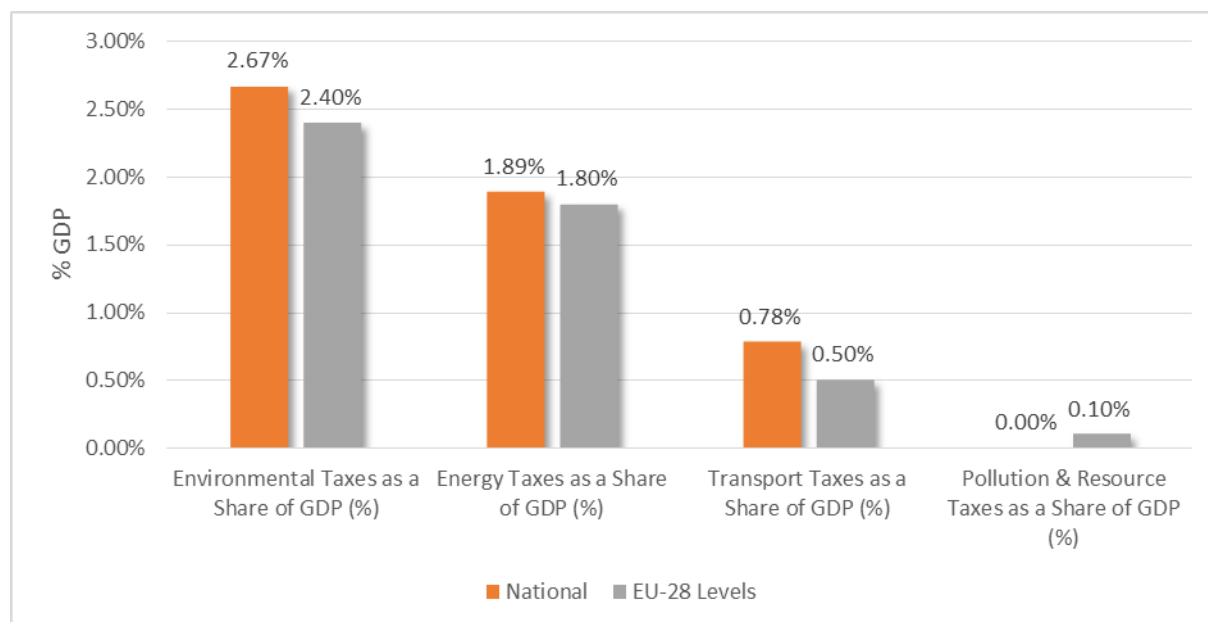
¹¹¹ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

¹¹² Ibid.

8.1.2 Relative Position within the EU

- The proportion of environmental tax revenue as a percentage share of GDP in Cyprus was higher than the EU-28 average of 2.4% in 2012. Both the GDP percentage shares of energy tax and transport (excluding fuel) tax revenue were higher than the EU-28 averages (1.89% and 0.5% respectively). As Cyprus is not recorded as deriving any revenue from taxes on pollution and resource, the corresponding percentage share is obviously below the average of 0.1% of GDP for the EU-28 (see Figure 8-1).¹¹³

Figure 8-1: Environmental Taxes in Cyprus as a % of GDP vs EU-28 Levels (2012)



- In terms of revenues derived from all environmental taxes expressed as a percentage share of GDP, Cyprus ranked 11th in the EU-28 for 2012. Looking similarly at revenue from energy taxes alone, Cyprus ranked 15th, while it ranked in a higher position of 7th place for revenue from transport (excluding fuel) taxes. Owing to the fact that Cyprus is not recorded as having any revenue from the taxation of pollution and resource, for this measure it ranked joint 27th with Greece, for which revenue from this group of tax sources is similarly absent (see Table 8-1).¹¹⁴

¹¹³ Ibid.

¹¹⁴ Ibid.

Table 8-1: Ranking of Cyprus's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	11
Energy Taxes as a Share of GDP (%)	15
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	7
Pollution & Resource Taxes as a Share of GDP (%)	27

Source: based on Eurostat data

8.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.6.0. This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon nominal GDP figures for the same year as the reported revenues.^{115,116}

➤ Energy Taxes:

- The Cypriot excise duties on fuels and electricity are shown in Table 8-2, alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 8-2: Standard Rates of Excise Duties on Fuels and Electricity in Cyprus

Excise Duty	Unit	Rate Applied in Cyprus	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	€ per 1000 litres	€421	€421	€585	€583
Unleaded Petrol	€ per 1000 litres	€479	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€450	€330	€427	€405
Kerosene	€ per 1000 litres	€450	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€125	€125	€209	€180

¹¹⁵ Eurostat (2014) *Euro/ECU Exchange Rates – Annual Data* [ert_bil_eur_a], Accessed 5th August 2014, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ert_bil_eur_a&lang=en

¹¹⁶ Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Excise Duty	Unit	Rate Applied in Cyprus	Existing ETD Minimum	EU-28 Average	EU-28 Median
Natural Gas	€ per GJ	€2.60	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€450	€21	€221	€163
Kerosene ¹	€ per 1000 litres	€450	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€125	€41	€126	€125
Natural Gas	€ per GJ	€2.60	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€124.73	€21	€221	€163
Kerosene	€ per 1000 litres	€124.73	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€15	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	-	€0.00	€82	€40
Natural Gas	€ per GJ	€2.60	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€0.31	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€124.73	€21	€179	€125
Kerosene	€ per 1000 litres	€124.73	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€15	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	-	€0.00	€111	€42
Natural Gas	€ per GJ	€2.60	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€0.31	€0.30	€1.77	€0.32
Electricity					
Business Use ²	€ per MWh	-	€0.50	€8.42	€1.03
Non-Business Use ²	€ per MWh	-	€1.00	€14.53	€2.06
Notes:					
1. When gas oil or kerosene is used as a motor fuel in a stationary motor, a reduced rate applies: €124.73 per 1,000 litres of fuel.					
2. No excise duty is levied on electricity as a separate tax on electricity exists.					

Sources: European Commission - Taxation and Customs Union (2014) Excise Duty Tables: Part II - Energy Products and Electricity, July 2014,

- Many of the excise duty rates increased significantly in 2013 as a part of fiscal consolidation measures undertaken by the government in order to eliminate its budget deficit as required by the Economic Adjustment Programme that has been implemented since April 2013. Despite these increases most excise duty rates are still at or below the EU average, though a few are above.
- Full exemptions from excise duty apply for gas oil and kerosene used in certain machineries in agricultural, horticultural and piscicultural works and in forestry. Other exemptions include fuels used by the armed forces; fuels used for the purpose of air and sea navigation (the latter within EU waters only); fuels used for the production of electricity or for agricultural, horticultural and piscicultural works and in forestry.¹¹⁷
- Revenue from all excise duties on energy products in 2012 (the latest year for which figures are available): €317 million (equivalent to 1.8% of GDP).¹¹⁸
- Electricity levy ('Tax on Energy Conservation (Funds)'):¹¹⁹
 - A levy is applied to all uses of electricity. The income from this levy is dedicated to supporting renewable electricity and energy conservation projects (through the Special Fund for Renewable Energy Sources and Energy Conservation). The levy is collected by the Electricity Authority of Cyprus at a flat rate of €5.00 per MWh¹²⁰
 - Revenue from the Electricity Levy in 2012 (the latest year for which figures are available) was €21 million (equivalent to 0.12% of GDP).¹²¹

¹¹⁷ Customs & Excise Department (Cyprus) (no date) *Excise Duties - Frequently Asked Questions*, accessed 12 September 2014, <http://www.mof.gov.cy/mof/Customs/customs.nsf/All/722042670E887148C2257BF10032FAD1?OpenDocument>

¹¹⁸ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

¹¹⁹ Partasides, G. (2013) *Feed-In Tariff Specifications, Features, Amendments, and Current and Future Challenges in Cyprus*, paper given at Third IRENA Assembly Meeting: Workshop on Renewable Energy Policies, 12 January 2013, <https://www.irena.org/DocumentDownloads/2013/January/Workshop/Country%20Case%20Study%20-%20Cyprus%20-%20George%20Partasides.pdf>

¹²⁰ European Commission - Taxation and Customs Union (2014) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

¹²¹ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

➤ **Transport Taxes (excluding transport fuels):**

- Registration Tax / Vehicle Excise Duty (Φόροι κατανάλωσης):¹²²
 - Cars imported into Cyprus are required to pay excise duty (registration tax) before being registered in Cyprus.¹²³ This is a ‘one-off’ tax. The level of taxation is based on the CO₂ emissions, engine capacity or, in the case of a few specific vehicles, the value of the vehicle.
 - Electric vehicles and hybrids are exempt from the excise duty, as are trucks, buses and vehicles with more than 9 seats. The level of the duty is reduced for used vehicles. The level of reduction takes the age, type, condition and mileage of the vehicle into account and is also applicable to motorcycles.
 - The basic rates of the excise duty are outlined in Appendix A.6.0 and range from €0 to more than €2,000 for the most polluting vehicles. Additionally, regardless of any relief of the excise duty (in respect of used vehicles) an additional €0.02 per cc of engine capacity is charged for each vehicle.
 - Revenue in 2013 (the latest year for which figures are available) was €14.8 million (equivalent to 0.09% of GDP).¹²⁴
- Road Tax (for a Circulation License):¹²⁵
 - Cars registered in Cyprus are required to pay an annual ‘road tax’ in order to receive a circulation license. All vehicles are required to pay this tax, including both public and private vehicles.
 - The tax was amended with effect from 1 January 2014. Vehicles registered in Cyprus after this date pay according to the CO₂ emissions of the vehicle, whilst vehicles registered prior to this date pay an amount based on engine size, though with an added malus payment depending on CO₂ emissions and engine size.
 - Rates and other discounts and exemptions are outlined in Appendix A.6.0. For vehicles registered since 1st January 2014, the rates range from €10 per year for the least polluting vehicles to €240 for vehicles emitting 180 g per km CO₂ plus an additional €8 per g per km CO₂ above 240 g per km CO₂. Revenue from the road tax in

¹²² Customs & Excise Department (Cyprus) (2013) *Vehicles from Member States of the European Union - On Payment of Excise Duties and VAT*, accessed 31 August 2014, <http://www.mof.gov.cy/mof/Customs/customs.nsf/All/505369EB35BEDE8B422579040055CC92?OpenDocument>

¹²³ This is in addition to customs duties, which vehicles from outside the EU must also pay.

¹²⁴ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

¹²⁵ Cyprus Advanced Driving and Road Safety Network (2014) *Road Tax - Circulation Licence*, accessed 31 August 2014, http://www.cyprusdriving.net/documents/Road_Tax_Cyprus.php

2012 (the latest year for which a total figure is available) was €91.9 million (equivalent to 0.52% of GDP).¹²⁶

- Additionally, there are a number of fees and charges relating to transport in Cyprus, all of which are considered ‘taxes’ within a variety of sources (e.g. they appear in Eurostat’s National Tax List and are discussed as taxes in academic literature). This study does not consider these as taxes, but outlines them here for completeness:
 - The registration fee for all vehicles since January 2014 is €150 per vehicle.¹²⁷ Prior to January 2014, this fee was based on the type of vehicle and its engine power and generated a more substantial amount of income.¹²⁸ Revenue in 2012 (the latest year for which figures are available): €10.4 million (equivalent to 0.06% of GDP).¹²⁹
 - Fees for driving licences and road use permits: Rates unknown. Revenue for driving licences: €1.8 million in 2012 (equivalent to 0.01% of GDP). Revenue for road use permits: €0.3 million in 2012 (equivalent to 0.002% of GDP).¹³⁰
- Additional transport ‘taxes’ included within the Eurostat National Tax List include:¹³¹
 - Ship registration fees (revenue in 2012: €1.3 million, equivalent to 0.007% of GDP); Fees for professional licenses of road transporters (revenue in 2012: €0.0 million); Ships’ wireless licence fees (revenue in 2012: €0.1 million, equivalent to 0.001% of GDP); and Tax on ship management services (revenue in 2012: €1.9 million, equivalent to 0.011% of GDP).
- There are no air transport taxes in Cyprus.

¹²⁶ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

¹²⁷ Τμήμα Οδικών Μεταφορών (Road Transport Department) (no date) *Οχήματα - Τέλος Εγγραφής (Vehicles - Registration Fee)*, accessed 3 September 2014, <http://www.mcw.gov.cy/mcw/RTD/rtd.nsf/All/FFDD4D44F29E862DC2257824002B1F92?OpenDocument>

¹²⁸ Adamou, A., and Clerides, S. (2013) Tax Reform in the Cypriot Road Transport Sector, *Cyprus Economic Policy Review*, Vol.7, No.1, pp.87 – 114

¹²⁹ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

¹³⁰ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

¹³¹ Ibid.

➤ Pollution and Resource Taxes:

- There are no pollution or resources taxes in Cyprus, apart from property and land ownership taxes which are not considered in this study.
- Although no waste taxes are in place, there are charges for municipal waste disposal, and some producer responsibility schemes in place, requiring payment of fees for packaging waste (ranging from €21.28 for aluminium to €105.89 for plastic), WEEE and batteries.¹³² These are not taxes and fall out of scope of this study.

8.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Cyprus. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

8.2.1 Current Status of EFR

There is a reasonable amount of interest in implementing environmental fiscal reform across the country, although Cyprus is not currently very far along the road in the implementation of many environmental taxes. As an example, the European Commission Representation in Cyprus jointly hosted a conference with the Cyprus University of Technology on Environmental Tax Reform in Nicosia in June 2014.¹³³ In one of the opening speeches for this conference, the Agriculture Minister, Nicos Kouyialis, discussed the necessity of moving towards a 'Green Economy' stating that the Ministry of Agriculture, Natural Resource and the Environment is currently working on an action plan with this aim. A key element of this new economy will be new forms of environmental taxation, though other economic instruments will also be used and environmentally harmful subsidies removed. No specific initiatives or taxes were introduced at the time, but it does seem that there is commitment to some degree of environmental fiscal reform.^{134,135}

Some recent changes have been made in relation to energy- and transport-related environmental taxation. This includes increasing excise duty rates for motor fuels (petrol and gas oil) in 2013 and 2014 as well as implementing an emissions-based increase in

¹³² IEEP (2013) *Steps to Greening Country Report: Cyprus*, Report for the European Commission, p.11

¹³³ European Commission Representation in Cyprus (2014) *Environmental Tax Reform in Times of Economic Crisis: What are the Prospects?*, accessed 31 August 2014, http://ec.europa.eu/cyprus/events/20140526_en.htm

¹³⁴ Kouyialis, N. (2014) *Opening Speech of Agriculture Minister Nicos Kouyialis at 'Environmental Tax Reform in Times of Economic Crisis: What are the Prospects?'*, June 2014, http://ec.europa.eu/cyprus/documents/2014/20140526_speech_minister_kouyialis_greentax.pdf

¹³⁵ Psillides, C. (2014) *'Green Tax' Plans to Boost 'Green Growth' Says Minister*, accessed 3 September 2014, <http://cyprus-mail.com/2014/06/07/green-tax-plans-to-boost-green-growth-says-minister/>

the circulation tax for vehicles in 2014.^{136,137} In 2013, the Parliamentary Committee for Environment also tabled a proposal for a biofuel exemption from excise duties.¹³⁸

Within pollution and resources taxes, less progress has been made overall. Although there are indications that various taxes have been considered in one way or another, no pollution taxes are currently in place in Cyprus. As an example, proposals for a plastic bag tax or charge were tabled by the Greens in 2008 but did not result in new legislation.¹³⁹ Furthermore, no mention of plans for a pesticides tax have been made in Cyprus' National Action Plan on pesticide usage.¹⁴⁰ However, a study was done on the 'optimum' pesticides tax rate in Cyprus in 2011 by the Economics Research Centre at the University of Cyprus, a centre which is part funded by several government ministries.¹⁴¹

Cyprus receives financial support from the European Central Bank and the International Monetary Fund through the Economic Adjustment Programme. There are terms and conditions associated with this support programme and in order not to duplicate these, no country specific recommendations have been applied to Cyprus as part of the European Semester programme.

8.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Cyprus. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

¹³⁶ European Commission - DG ECFIN (2014) *The Economic Adjustment Programme for Cyprus: Fourth Review - Spring 2014*, June 2014, http://ec.europa.eu/economy_finance/publications/occasional_paper/2014/pdf/ocp197_en.pdf, pp. 95-96.

¹³⁷ Psillides, C. (2014) *Big Cars to Pay Higher Road Tax*, accessed 31 August 2014, <http://cyprus-mail.com/2014/01/09/big-cars-to-pay-higher-road-tax/>

¹³⁸ Ecologic Institute, and eclareon (2014) *Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Cyprus*, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/cy_2014_en.pdf, p. 13.

¹³⁹ Earth Policy Institute (2014) *Plan B Updates: The Downfall of the Plastic Bag: A Global Picture*, accessed 3 September 2014, http://www.earth-policy.org/plan_b_updates/2013/update123

¹⁴⁰ Available in English on the European Commission website: http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/national_action_plans_en.htm

¹⁴¹ Kalaitzidakis, P., Tzouvelekas, V., Mamuneas, T.P., Stengos, T., and Gregoriou, P. (2011) *Optimal Tax Rates for Pesticides Usage in Cyprus Agriculture Production*, November 2011, <http://www.ucy.ac.cy/erc/documents/DOPO5-11.pdf>

➤ **Energy Taxes:**

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€13.2 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€11.3 per GJ). Finally, the rates for heating fuels are equalised using the minimum rate for kerosene of €2.1 per GJ.
- There are no existing electricity taxes, so a new tax at the ETD minimum of €0.15 per GJ is suggested.
- Table 8-3 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the good practice section on energy taxes (Section 5.1). The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not
- In the case of propellants, the revisions imply a major increase in taxes on LPG, and an alignment of taxes on diesel and kerosene with those on petrol. The tax on natural gas also increases significantly.
- In the case of fuels used in commercial and industrial motors, again, taxes on natural gas and on LPG are the ones that are increased most as a result of the alignment associated with the proposed revision to the ETD;
- On heating fuels (business and non-business), the changes imply significant uplifts in taxes on heavy fuel oil and coal (both by a factor of around 10), whilst LPG – at present, untaxed for this purpose – sees a significant tax imposed.
- Because there is currently no tax on electricity, this is also increased in line with the proposed revision of the ETD,

Table 8-3: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	479	479
Light fuel oil (diesel)	€ per 1000 litre	518	450
LPG (propellant)	€ per 1000 kg	666	125
Kerosene	€ per 1000 litre	520	450
Natural gas (prop)	€ per GJ	14	3
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	450	450

Energy Tax	Units	Suggested Rates	Existing Rates
Kerosene	€ per 1000 litre	453	450
LPG	€ per 1000 kg	579	125
Natural gas	€ per GJ	12	3
Business Heating			
Gas oil	€ per 1000 litre	125	125
Heavy fuel oil	€ per 1000 kg	145	15
Kerosene	€ per 1000 litre	125	125
LPG	€ per 1000 kg	154	0
Natural gas	€ per GJ	3.20	2.60
Coal	€ per GJ	3.97	0.31
Non-Business Heating			
Gas oil	€ per 1000 litre	125	125
Heavy fuel oil	€ per 1000 kg	145	15
Kerosene	€ per 1000 litre	125	125
LPG	€ per 1000 kg	154	0
Natural gas	€ per GJ	3.20	2.60
Coal	€per GJ	3.97	0.31
Electricity			
Electricity - business use	€ per MWh	0.54	0.00
Electricity - non-business use	€ per MWh	0.54	0.00

➤ **Transport Taxes:**

- **Vehicles:** No increase in vehicle taxes is suggested since the revenue from vehicle taxes and transport fuel taxes combined are already 2.7% of GDP, which is the good practice benchmark (see Section 5.2.1). However, only 0.9% of GDP was derived from vehicle circulation and registration taxes in 2011 (the year the benchmark relates to). It should be noted that Cyprus appears to have the most polluting HGVs of all European Member States, as assessed by the measure of the proportion of vehicle kilometres travelled by vehicles in Euro Class I and below. Addressing this through appropriately differentiated charges would appear to make sense in

Cyprus.

- **Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Cyprus does not have any aviation taxes on passenger flights, so there is scope for introducing these. The suggested rates for the air passenger tax are €25 per passenger (to other countries in the European Union), and €50 per passenger (to other countries outside the European Union). The suggested air transport tax rate is €1.25 per tonne of freight. The year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. As noted in the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax (see Section 5.2.2).

There has been some discussion about the introduction of an air passenger/freight tax in Cyprus. However, the country's reliance on tourism as a means of economic growth and as a source of revenue to help tackle the fiscal deficit means that there may be strong resistance to such a tax if it were not applied uniformly across Europe. Indeed, as noted above, this may come to pass depending on the final proposals that are put forward by ICAO. Nonetheless, we have applied the rates noted above, and the revenues are, as expected, significant (see below).

➤ **Pollution and Resource Taxes:**

- **Aggregates:** There is currently no tax on aggregates in Cyprus on a national level. An aggregates tax can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This is in-line with the flagship initiative 'A Resource Efficient Europe'.¹⁴² It is suggested that regional rates set by the levy on landscape protection and nature conservation are set at €2.40 per tonne from 2017, and that thereafter, they are kept constant in real terms. The types of materials that could be covered by the tax are:

- Marble
- Chalk and dolomite
- Slate
- Limestone and gypsum
- Sand and gravel

The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste – landfill tax:** There is currently no landfill tax in place in Cyprus. Landfill taxes provide incentives for improved waste management,

¹⁴² European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

encourage waste prevention and recycling and facilitate the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. A landfill tax would also give support to the application of the waste hierarchy. The most recent data available for Cyprus indicated that 60% of all non-hazardous waste went to landfill in 2012, which is one of the highest rates of waste landfilled (either directly or indirectly) in an EU member state.¹⁴³ This is partly because recycling was only introduced in Cyprus in the last few years (i.e. 2006 for industry and incrementally from 2007 for households), and slow progress has been made in terms of educating the general public and industries and incentivising recycling as opposed to landfill and incineration.¹⁴⁴ It is suggested that the rate of landfill tax for non-hazardous wastes is raised to a minimum of €50 per tonne in real terms by 2021. An early announcement of this tax and its escalation over a number of years would help drive the change in the waste management sector needed to meet EU targets in 2020 and beyond. It is also suggested that a landfill tax be introduced for construction wastes in 2017 at a rate of €2.40 per tonne. We suggest these taxes should be indexed to an appropriate measure of inflation.

- **Waste – incineration / MBT tax:** Although there is currently no incineration in Cyprus, in order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, up to €15 per tonne over the same period as the landfill tax is increased (i.e. up to 2017). An equivalent rate is also proposed for MBT facilities. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe. It is suggested that this is also applied to waste prepared for export for incineration.
- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. Cyprus is not one of these. It is suggested that the following rates could be applied to all packaging placed on the market in Cyprus:
 - Aluminium €197 per tonne
 - Plastic €64 per tonne
 - Steel €54 per tonne

¹⁴³ Eurostat (2014) *Landfill rate of waste excluding major mineral wastes*, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rt110&language=en

¹⁴⁴ Green Dot (Cyprus) (2014) *Green Dot Cyprus*, <http://www.greendot.com.cy/en/view-subpage-green2b/1/profile>

- Paper and card €20 per tonne
- Glass €18 per tonne
- Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2017 and be kept constant in real terms.

- **Single-use carrier bag tax:** There is currently no tax on single-use carrier bags in Cyprus. Of these bags, plastic bags in particular cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the riverine, or marine, environment. Moreover in countries such as Cyprus with high level of tourism littered plastic bags can deter visitors. A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. In 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.¹⁴⁵ Consequently, it is suggested that Cyprus implements a tax on single-use carrier bags at a rate of €0.09 per bag from 2017, and maintains the rate constant in real terms thereafter.
- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. According to Airbase (EEA) 100% of the urban population in Cyprus is exposed to PM₁₀ concentrations exceeding the daily limit value (50 µg/m³) for over 35 days per year since 2010, when data first became available.¹⁴⁶ The sectors most responsible for the particulate matter are industrial processes (45%) followed by energy use (25%) and road transport (24%).¹⁴⁷ For ozone, the percentage of the total population exposed to ozone concentrations above the target value for the 26th highest daily maximum eight-hour average was 0% in 2010, down from 50.9% in 2009.¹⁴⁸ Part of the problem is that public transportation (i.e. buses) were only introduced in Cyprus in 2010.

¹⁴⁵ DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

¹⁴⁶ Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

¹⁴⁷ European Environment Agency (2013) *Air Pollution Fact Sheet 2013 - Cyprus*, 2013, <file:///C:/Users/christina.tsiarta/Downloads/Cyprus.pdf>

¹⁴⁸ European Environment Agency (2013) *Air Pollution Fact Sheet 2013 - Cyprus*, 2013, <file:///C:/Users/christina.tsiarta/Downloads/Cyprus.pdf>

No railways or trams exist making the society a predominantly car driven one, which contributes significantly to air pollution.¹⁴⁹ Cyprus does not currently have a system of air pollution taxes in place. It is suggested that an air pollution tax could be implemented in order to generate improvements in air quality as follows:

- SO_x €1,000 per tonne
- NO_x €1,000 per tonne
- PM₁₀ €2,000 per tonne

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2021. The rates are then held constant in real terms.

- **Water abstraction:** A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that “*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*”. Cyprus is one of four member states (the others being Malta, Italy and Spain) which are considered to be water stressed, together comprising 18% of Europe’s population.¹⁵⁰ Cyprus’ water exploitation index (WEI) for fresh surface water and groundwater abstraction¹⁵¹ was 68.8% in 2011, indicating the country has severe scarcity of fresh surface and ground water (WEI>40% indicates severe stress).¹⁵²

This means that Cyprus has high abstraction rates in relation to its available resources and is therefore prone to suffering severe competition for water, which may trigger water crises. Such severe water stress could also impact freshwater ecosystems which cannot remain healthy if the waters in a river basin are abstracted as intensely as indicated by a WEI that is greater than 40%.¹⁵³ It is also worth noting that countries with the highest agricultural water use also have the highest water consumption indexes,¹⁵⁴ such as Cyprus, where agricultural water use predominates. Cyprus’ consumption index is about –25% and its exploitation index is

¹⁴⁹ Wikipedia (2014) *Transport in Cyprus*, http://en.wikipedia.org/wiki/Transport_in_Cyprus

¹⁵⁰ Marcuello, C., and Lallana, C. (2003) Indicator Fact Sheet - Water Exploitation Index (WQ01c)

¹⁵¹ The indicator presents: i) the annual total fresh water abstraction in a country as a percentage of its long term average available water (LTAA) from renewable fresh water resources; ii) the annual groundwater abstraction as a percentage of the country’s long-term annual average groundwater available for abstraction; and iii) the annual surface water abstraction as a percentage of the country’s long-term annual average surface water resources available for abstraction. The latter is calculated as the total fresh water resources (external inflow plus precipitation less evapotranspiration) less groundwater available for abstraction.

¹⁵² Eurostat (2014) *Water Exploitation Index*, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=0&language=en&pcode=tsdnr310>

¹⁵³ Marcuello, C., and Lallana, C. (2003) Indicator Fact Sheet - Water Exploitation Index (WQ01c)

¹⁵⁴ Water consumption index is the total consumption divided by the long term freshwater resources of a country. This index highlights those regions where higher consumptive uses are predominant.

about +43%, with the average water consumption index in Europe being 3%.^{155,156} As a result Cyprus has five desalination plants in place to meet its total water demand (three of which contribute 65% of total demand in drinking water to the water balance).¹⁵⁷ However, desalination plants consume vast quantities of energy and contribute to greenhouse gas emissions, marine pollution, and also generate noise pollution.

Currently, there are no taxes for abstraction in Cyprus (i.e. to address scarcity or the environmental impacts for abstraction), although charges on irrigation water exist and these are currently at the same rates that existed in the early 2000s before the Water Framework Directive was implemented, at €170 per 1,000 m³. National authorities are in the process of implementing higher irrigation water charges in order to cover the improve costs recovery for water provision (of the order of €210 per 1,000 m³). The existing charges are substantially lower than the 'optimal' rates for full cost recovery which are reported to be in the order of €450 per 1,000 m³.¹⁵⁸

It is suggested that appropriate levels of taxation would be of the order €460 per 1,000 m³ for the public water supply, €280 per 1,000 m³ for manufacturing purposes and €40 per 1,000 m³ for agriculture. We have assumed that the additional revenue which such rates may generate can accrue to the central budget. A transition period from 2016 to 2021 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.

It is also considered imperative that the new Law for the Protection and Management of Water Resources¹⁵⁹ that was passed in February 2014 is implemented as soon as possible, to ensure compliance with Article 9 of the Water Framework Directive, and to make it easier to implement water levies in such a way that they cover both resource and environmental costs, in line with the requirements of the Directive.

¹⁵⁵ Marcuello, C., and Lallana, C. (2003) Indicator Fact Sheet - Water Exploitation Index (WQ01c)

¹⁵⁶ For the purpose of this assessment it has been assumed that 80 % of total water abstracted for agriculture, 20 % for urban use, 20 % for industry and 5 % for energy production is consumed and not returned to the water bodies from where it was abstracted (+/- 5-10%) . Variation depends on the sector and other factors e.g. the actual water consumption in agriculture depends on climatic conditions, crop composition and irrigation techniques.

¹⁵⁷ Manoli, A. (2010) Desalination in Cyprus, Water Development Department, Ministry of Agriculture, Natural Resources and the Environment, March 2010, [http://www.moa.gov.cy/moa/wdd/Wdd.nsf/0/24B06DE543FBD990C22576EB002E2633/\\$file/Desalination.pdf](http://www.moa.gov.cy/moa/wdd/Wdd.nsf/0/24B06DE543FBD990C22576EB002E2633/$file/Desalination.pdf)

¹⁵⁸ Personal communication with Theodoros Zachariadis, Department of Environmental Science and Technology, Cyprus University of Technology, 15th October 2014.

¹⁵⁹ Ministry of Agriculture, Natural Resources and the Environment, Republic of Cyprus (2014) Law for the Protection and Management of Water Resources

- Waste water:** Council Directive 91/271/EEC concerning urban waste water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.¹⁶⁰ Cyprus does not currently have a waste water tax, although citizens to pay a fee for wastewater treatment which however does not account for any environmentally related concerns. To improve prevention of water pollution it is suggested to implement a waste water tax and adjust tax rates in-line with 'good practice'. With relative price levels in Cyprus this would imply, for BOD, a rate of €1.93 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. Given the magnitude of the increase in rates a transition period from 2016 to 2019 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2019 levels.
- Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

Cyprus' Action Plan for 2013-2017¹⁶¹ sets out:

“...the quantitative and other targets, measures and timetables to reduce risks and impacts of plant protection products use on human health and the environment and for the development and introduction of integrated pest management and of alternative approaches and techniques in order to reduce dependency on the use of plant protection products.”

Moving away from pesticides to other means of managing pests will be critical in minimising their use. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €10 per kg active ingredient. The suggested transition period is from 2017 to 2019, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and

¹⁶⁰ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

¹⁶¹ European Commission (2013) *The Plant Protection Products Law of 2011 - National Action Plan for Cyprus 2013-2017*, October 2013, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_cypriot_en.pdf

Denmark) would be a concrete measure that would contribute towards the aims of the Action Plan.

- **Fertilisers:** Cyprus does not currently implement a tax on nitrogen (or other) fertilisers. It is therefore suggested that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of 0.2 € per kg N be implemented from 2017 with rates gradually increasing to the maximum level in 2019.

8.2.3 Summary of Revenue Outcomes

Table 8-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated). It is worth noting that the calculated revenue from transport taxes are high – this is due to the fact that the ratio of flights to GDP in Malta is the second highest in the EU-28.

Table 8-4: Potential Additional Revenue from Environmental Fiscal Reform in Cyprus, million EUR (real 2014 terms)¹⁶²

Tax	2017	2020	2025
Energy			
Transport fuels	3	13	23
C&I / Heating	15	61	107
<i>Sub-total Energy, million EUR</i>	<i>19</i>	<i>74</i>	<i>130</i>
<i>Sub-total Energy, % GDP</i>	<i>0.12%</i>	<i>0.46%</i>	<i>0.80%</i>
Transport			
Passenger Aviation Tax	107	203	195
Freight Aviation Tax	0.01	0.02	0.01
<i>Sub-total Transport, million EUR</i>	<i>107</i>	<i>203</i>	<i>195</i>
<i>Sub-total Transport, % GDP</i>	<i>0.67%</i>	<i>1.26%</i>	<i>1.21%</i>

¹⁶² % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Pollution and Resource			
Landfill Tax - Non-haz General	15	21	21
Landfill Tax - Inerts (C&D)	0.3	0.2	0.2
Incineration /MBT Tax	0.7	1.0	1.1
Air Pollution Tax	11	22	18
Water Abstraction Tax	11	27	27
Waste Water Tax	0.9	1.2	1.2
Pesticides Tax	3	6	6
Aggregates Tax	33	21	22
Packaging Tax	1.3	1.0	0.7
Single Use Bag Tax	10	2	2
Fertiliser Tax	0.000	0.0003	0.0002
<i>Sub-total Pollution & Resource, million EUR</i>	<i>87</i>	<i>102</i>	<i>100</i>
<i>Sub-total Pollution & Resources, % GDP</i>	<i>0.54%</i>	<i>0.63%</i>	<i>0.62%</i>
Total Environmental Taxes			
Total, million EUR	212	379	425
Total Increase, % GDP	1.32%	2.35%	2.64%

Table 8-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 8-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Cyprus, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	54
Increased Cost Recovery for Water Use	5
Total	59

8.2.4 Environmental Benefits

Table 8-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.6.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €58 million of benefits are anticipated annually by 2025 in real terms.

Table 8-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in Cyprus, million EUR (real 2014 terms)¹⁶³

Tax Type	2017	2020	2025
Energy Taxes	0	2	3
Transport Taxes (excluding transport fuels)	1	2	2
Pollution and Resource Taxes	14	47	53
Total, million EUR	15	51	59
Total, % GDP	0.09%	0.29%	0.31%

8.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Cyprus:¹⁶⁴

- In 2012, environmental taxes generated revenue equivalent to 2.67% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Cyprus. These could generate EUR 0.2 billion in 2017, rising to EUR 0.4 billion in 2025 (both in real 2014 terms). This is equivalent to 1.32% and 2.64% of GDP in 2017 and 2025, respectively.
- The largest single contribution to revenue comes from the suggested Passenger Aviation Tax. This accounts for EUR 0.19 billion by 2025 (real 2014 terms), equivalent to 1.02% of GDP.

¹⁶³ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

¹⁶⁴ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- The next largest contribution to revenue comes from the proposed tax on business heating fuels. This accounts for EUR 0.11 billion by 2025 (real 2014 terms), equivalent to 0.56% of GDP.
- Revenue potential from the suggested reforms to transport fuels would raise EUR 0.023 billion by 2025 (real 2014 terms), equivalent to 0.12% of GDP.
- A tax on aggregates has also been suggested. This would contribute EUR 0.022 billion by 2025 (real 2014 terms), equivalent to 0.11% of GDP.
- In addition, a range of more minor taxes could generate revenue of EUR 0.052 billion by 2025 (real 2014 terms), equivalent to 0.27% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 0.058 billion by 2025 (real 2014 terms), equivalent to 0.30% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €59 million per annum could be raised in addition to the above.

9.0 Denmark

9.1 Country Overview

9.1.1 Key Facts about the Economy and Tax System

- Between 2003 and 2007 Denmark's GDP grew by an average rate of 2% per annum in real terms, with growth peaking in 2006 when the country's GDP grew by 3.4% in real terms. The rate of growth slowed in 2007 and the country entered into recession in 2008. Denmark's GDP contracted markedly in 2009, decreasing by 5.7% in real terms. Since then, most years have seen muted growth, except for 2012 which saw a 0.4% real terms decrease in GDP.¹⁶⁵
- In 2012, Denmark's total tax revenue (including social contributions) as a percentage of GDP was the highest in the EU-28, at 49.9%. This high level of tax as a share of GDP has remained relatively constant since 2002, although it was at its highest in 2005 when the total tax take amounted to 51.9% of GDP.¹⁶⁶
- The contribution made by direct taxes to the total tax take is the highest in the EU-28 at 62%, and social contributions are the lowest at 3.8% (2012). Indirect taxes make up the remaining 34.2%.¹⁶⁷
- In 2012, revenues from environmental taxes amounted to 3.87% of Denmark's GDP, this share being the highest in the EU-28. Denmark has consistently had the highest rates of environmental taxation as a share of GDP for the past 10 years, and reached a high of 4.86% in 2005.¹⁶⁸
- In 2012, revenues from energy taxes made up the greatest proportion of the total stream of environmental taxes, amounting to 2.2% of Denmark's GDP. Revenues from transport (excluding fuel) taxes were equivalent to 1.44% of GDP, and income from pollution and resource taxes amounted to 2.4% of the country's GDP in 2012.¹⁶⁹
- Energy taxes made up 56.8% of Denmark's total environmental tax revenue in 2012. This percentage is now higher than it was in 2002 (53.8%) after having dipped around 2006–2007 and risen again in the interim.¹⁷⁰

¹⁶⁵ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

¹⁶⁶ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

¹⁶⁷ Ibid.

¹⁶⁸ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

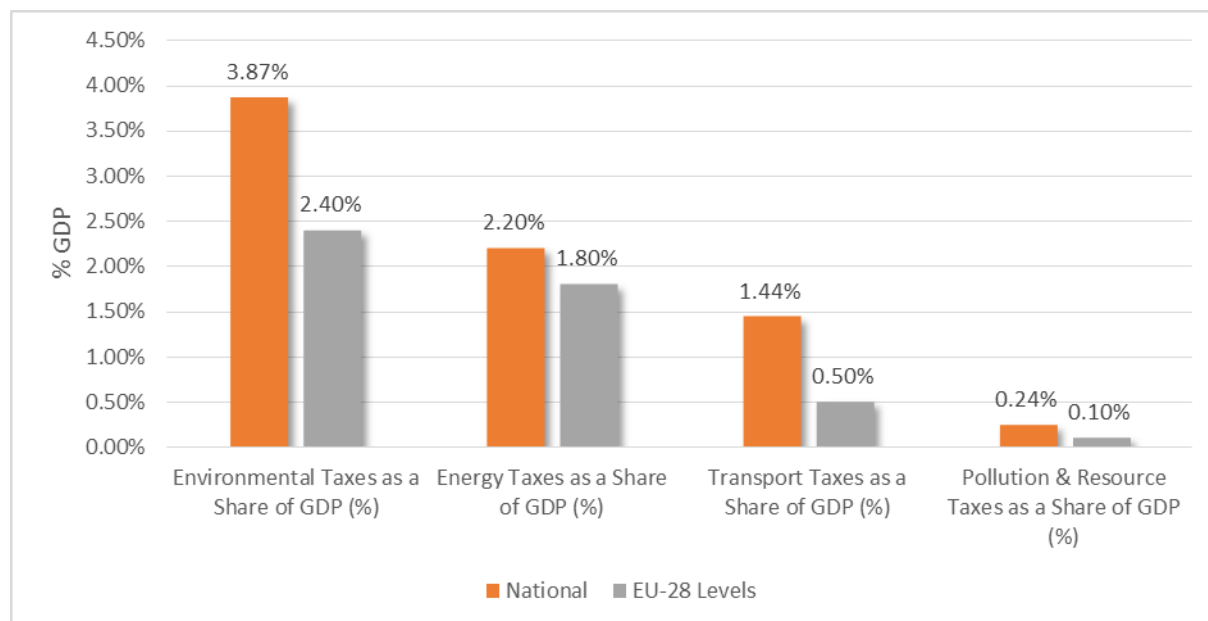
¹⁶⁹ Ibid.

¹⁷⁰ Ibid.

9.1.2 Relative Position within the EU

- Expressed as a percentage share of GDP, Denmark had the highest environmental tax revenue in 2012, well above the 2.4% average for the EU-28. Revenues from energy, transport (excluding fuel), and pollution and resource taxes amounted to 2.20%, 1.44%, and 0.24% of GDP, respectively – in all cases these are above the European average rates (see Figure 9-1).¹⁷¹

Figure 9-1: Environmental Taxes in Denmark as a % of GDP vs EU-28 Levels (2012)



- In 2012, Denmark ranked 1st out of all EU-28 Member States in terms of revenue from environmental taxation expressed as a percentage of GDP. Denmark also ranked 1st in terms of revenue from transport (excluding fuel) taxation as a share of GDP, and it ranked high in terms of the share for energy taxes, and pollution and resource taxes, at 6th place on both accounts (see Table 9-1).¹⁷²

Table 9-1: Ranking of Denmark's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	1
Energy Taxes as a Share of GDP (%)	6
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	1
Pollution & Resource Taxes as a Share of GDP (%)	6

Source: based on Eurostat data

¹⁷¹ Ibid.

¹⁷² Ibid.

9.1.3 Existing Environmental

The structure and rates for each tax, as well as full references, are given in Appendix A.7.0. This section summarises key aspects of the main environmental taxes, and for energy, describes how the rates compare with European averages and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC):

➤ Energy Taxes:

- In Denmark there are excise duties on fuels and electricity. These taxes are shown in Table 9-2, which shows how they compare to the recommended minimum rates in the existing ETD and the EU-28 average and median rates.¹⁷³

Table 9-2: Excise Duties on Fuels and Electricity in Denmark

Excise Duty	Unit	Rate Applied in Denmark (1€=7.4582DKK)	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels - Propellant					
Unleaded Petrol	€ per 1000 litres	€595.99	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€405.59	€330	€427	€405
Kerosene	€ per 1000 litres	€454.13	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€502.80	€125	€209	€180
Natural Gas	€ per GJ	€10.13	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€81.04	€21	€221	€163
Kerosene	€ per 1000 litres	€80.39	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€94.66	€41	€126	€125
Natural Gas	€ per GJ	€14.03	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€404.92	€21	€221	€163
Kerosene	€ per 1000 litres	€404.92	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€462.58	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€502.80	€0.00	€82	€40

¹⁷³ European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Excise Duty	Unit	Rate Applied in Denmark (1€=7.4582DKK)	Existing ETD Minimum	EU-28 Average	EU-28 Median
Natural Gas	€ per GJ	€10.92	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€11.76	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€404.92		€179	€125
Kerosene	€ per 1000 litres	€404.92	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€462.58	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€502.80	€0	€111	€42
Natural Gas	€ per GJ	€10.92	€0.3	€2.04	€0.94
Coal and Coke	€ per GJ	€11.76	€0.3	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€0.54	€0.5	€8.42	€1.03
Non-Business Use	€ per MWh	€111.69	€1.0	€14.53	€2.06

Sources: European Commission - Taxation and Customs Union (2014) Excise Duty Tables: Part II - Energy Products and Electricity, July 2014,
http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/ra/tes/excise_duties-part_ii_energy_products_en.pdf

- Taxes on petrol and diesel were increased gradually in the late 1990's as part of Denmark's environmental tax reform. They peaked in 2002 and, although nominal tax rate adjustments have been made in recent years, they have gradually declined, with current rates being about 10% lower in real terms (e.g. 5 to 6 cents per litre). A legally mandated indexation of all energy tax rates since 2009 has brought the decline to a standstill.
- The discrepancy between tax rates for petrol and diesel has been fairly stable at about €0.18 to €0.20 per litre over the past two decades, but being close to 30% of the petrol tax, it is significant. The discrepancy is addressed with an offsetting circulation surtax on diesel vehicles, which has recently been increased.
- Denmark's fuel taxation has had an energy tax component as well as a CO₂ tax component for more than two decades, although with extensive exemptions. The energy tax component of non-motor fuels is refunded for business purposes liable to VAT, except the share of energy taxation corresponding to EU minima rates. The CO₂ tax rate is reduced for specific energy-intensive processes listed in the CO₂ tax law.

- In 2008 the carbon-energy tax system was amended, to exempt ETS-covered installations from the CO₂ tax. Non-ETS business remains liable to the CO₂ tax.
- Following a decision in 2013 to reduce non-heating energy tax rates for business, the present rates for gas oil, kerosene, and gas listed in the TAXUD tables mainly reflect the EU minima plus Denmark's CO₂ tax. In addition, the energy tax on electricity for business has been reduced to the obligatory EU minimum. The CO₂ tax on electricity was renamed an energy savings tax, before being abolished in 2014.
- Fuels used for power production, including in CHP units, are exempt from energy and CO₂ fuel taxes for the non-heating share of their production. The tax burden on fuels used for heating, on the other hand, is scaled down – assigning heating fuels energy contents according to the 120% formula. Businesses that receive their heating from public suppliers can reclaim the share of energy taxes passed over in their heat bill, as well as 94% of the energy taxes due on their own heating fuels, but not the CO₂ tax applicable to heating.
- In addition to the energy and CO₂ taxes, there are air pollution taxes regarding SO₂ and NO_x relevant for fossil fuels (see section on Pollution and Resource Taxes below).

➤ **Transport Taxes (excluding transport fuels):**

- There is an *ad-valorem* registration tax on passenger vehicles at 105% of the list price for the first €10,600 and 180% for the remaining part. A bonus-malus adjustment complements the registration tax, pending on energy-efficiency (see Appendix A.7.0 for more details). Reduction in the registration tax to a 50% flatrate is available for passenger vehicles that are used partly for business purposes.
- The circulation tax for passenger vehicles ('grøn ejer-afgift') is also linked to the relative energy efficiency of the vehicle and varies between €32 and €4,052 annually (see Appendix A.7.0 for more details). Diesel vehicles are subject to a circulation surtax ('udligningsafgift'), which partly offsets the advantage conveyed with lower taxation of diesel relative to petrol. Finally, a €134 surtax for diesel vehicles without particle filters also applies in Denmark.
- For light-duty vehicles (<4 tonnes) there is an *ad-valorem* registration tax at 50% of the list price above €2,300. The bonus-malus adjustment for passenger vehicles applies for light-duty vehicles too. Light-duty vehicles (<3.5 tonnes) registered after 18th March 2009 are under the same energy-efficiency scale for circulation taxes as passenger vehicles and to comparable surtaxes.
- Heavy-duty vehicles (>4 tonnes) for freight transport are not subject to a registration tax. There is a road user charge for heavy-duty vehicles (>12 tonnes), which is part of the Eurovignette scheme in which Denmark participates. Duty vehicles between 3.5 and 12 tonnes are not subject to the road user charge, but to a weight-based circulation tax. It applies also to vehicles above 12 tonnes if they are not subject to the Eurovignette.

- In addition to the above, there are further transport-related taxes on large yachts, vehicle tires, vehicle license plates and insurances for pleasure boats and vehicles (see Appendix A.7.0 for more details).

➤ **Pollution and Resource Taxes:**

- The Danish pesticide tax, which previously had an *ad-valorem* tax base, has (since 2013) been changed so that the base is now a score related to toxicity of the individual products.¹⁷⁴ The toxicity score depends on aspects relating to human health, diffusion, and biodiversity. The tax rate is DKK 107 (€14.36) for each unit of the score on the toxicity index. It is payable by all manufacturers and importers of pesticides. The revised tax is expected to increase the tax burden overall for pesticides.
- Since 1987, landfilling and incineration of waste in Denmark has been subject to a tax.¹⁷⁵ All sites that receive waste are required to register. From 2010 the tax rate for incineration depends on the energy content of waste, harmonised with other energy taxes.
- SO₂ emissions from fuels used in power plants and industrial installations have been subject to a tax since 1996. The tax only applies when the sulphur content of the fuel exceed 0.05% - fuels include, fossil fuels as well as certain biofuels, such as, straw, wood pellets, and waste. The tax rate is DKK 22.60 (€3.03) per kg of sulphur or DKK 11.30 (€1.52) per kg of SO₂ emitted.
- NO_x emissions from fuels with airborne emissions are subject to a tax in Denmark (introduced in 2008). The tax applies to fossil fuels as well as to certain biofuels, including straw, wood pellets and waste. Following an increase in 2012 a tax rate of DKK 25.50 (€3.42) per kg of NO_x emissions now applies – this rate applies for motor fuels and for stationary emitters.
- Methane emissions from natural gas and biogas are subject to a tax, when used for stationary motors or for heating purposes. The methane tax is DKK 0.065 (€0.009) per Nm³. For biogas, the rate is DKK 1.1 (€0.15) per GJ.
- Discharges of waste water effluent (BOD, nitrogen and phosphorus) that are emitted directly to surface waters are (since 1995) subject to taxation.¹⁷⁶ Mainly, it is sewage outlets/sewage treatments plants and industries (e.g. food-processing) that are liable. The tax rates are DKK 16.50 per kg BOD (€2.21); 30 DKK per kg nitrogen (€4.03); and DKK 165 per kg phosphorus (€22.15).

¹⁷⁴ <http://eng.mst.dk/topics/pesticides/international-seminar-on-a-new-pesticide-tax/>

¹⁷⁵ The waste tax: an ex-post evaluation of incentives and environmental effects, Working report for the Danish Environmental Protection Agency 1997.
http://pure.au.dk/portal/files/78887428/waste_tax_87_7944_195_5.pdf

¹⁷⁶ Miljøstyrelsen (2004) *Samfundsøkonomisk analyse af spildevandsafgiften*, København.

- A tax on piped water supply applies for households and VAT-exempt entities.¹⁷⁷ The tax has a rate of DKK 5.46 (€0.73) per m³.¹⁷⁸ Water works are obliged to register and must collect the tax with the water bills. The law requires that at least 90% of the water sent into the distribution network must be accounted for, which provides an incentive to minimise leakages.
- A tax is charged on the extraction of raw materials in Denmark. The standard tax rate is DKK 5 (€0.67) per m³. About 30 different raw materials are subject to the tax, including, among others sand, stones, clay, chalk and peat. Extraction of raw materials requires a permit, whereby the relevant extracting businesses are officially registered, while importers have an obligation to register. For exported products containing raw materials a refund option is available.
- Taxes are charged on beverage packaging according to a complex system with differences in tax rates which partly reflect the environmental burdens of the various packaging materials. Higher rates have therefore been set for aluminium, other metals, and plastics; and lower rates for paper, cardboard, and wood. The tax rates are also linked to the existing deposit refund system. The same legislation prescribes taxes for disposable tableware and shopping bags. See Appendix A.7.0 for more details. A previous weight-based packaging tax on a range of non-beverage goods was abolished in 2013.¹⁷⁹
- Denmark has a tax on the phosphorous content in animal fodder, to minimise the environmental impacts on soils and freshwaters via livestock manure or other diffusion. The tax rate is DKK 4 (€0.54) per kg of mineral phosphorus. There is also a tax on nitrogen fertiliser with a rate of DKK 5 (€0.67) per kg but it applies only to smaller quantities. Farmers have obtained an exemption (see Appendix A.7.0 for more details).
- A tax is charged on CFC's and halons at a rate of 30 DKK per kg (€4.03). The tax is due for producers and importers of CFC's and halons. The tax can be refunded when these substances are embedded in products which are exported (see Appendix A.7.0 for more details).
- A tax is charged on PVC-foils and on PVC products with phthalates softeners for 10 different product groupings listed in the law. The tax rate is weight or volume based, with a specific rate for each product group (see Appendix A.7.0 for more details).

¹⁷⁷ MS Andersen et al (2014) Implications of water price reform for riverine and coastal surface water quality, EPI-WATER working paper.

¹⁷⁸ www.skat.dk/skat.aspx?old=2067490&vld=0

¹⁷⁹ MS Andersen (2012) Innovative responses to packaging taxes, powerpoint presentation at 13th Global Conference on Environmental Taxation, Vancouver. [http://pure.au.dk/portal/en/persons/mikael-skou-andersen\(d6eb07fd-3020-4801-9beb-04c0cc0f0914\)/activities.html](http://pure.au.dk/portal/en/persons/mikael-skou-andersen(d6eb07fd-3020-4801-9beb-04c0cc0f0914)/activities.html)

- Since 1996, a tax has been charged on chlorinated solvents, with the current rate being DKK 2 (€0.27) per kg. The tax is paid by producers and importers, but the tax base has been practically eliminated over the years.
- A waste management tax is charged on nickel-cadmium batteries at a rate of DKK 6 (€0.81) a piece. The tax is paid by producers and importers, but the tax base has been now been largely eliminated. A comparable tax on lead accumulators has been abolished after tax base elimination.
- A tax is charged on electric bulbs at a rate of DKK 2.42 (€0.32) per item. Eurostat labels it as a pollution tax, while Denmark regards it as a consumption tax along with coffee and cigarettes.
- A new tax on the distribution of printed commercial media to households has been approved by the Danish parliament and notified to the European Commission. The rates are DKK 2 to DKK 3 (€0.27-€0.40) per item.
- From the above list, the most significant taxes in terms of revenue raised are the tax on piped water supply, the tax on pesticides, the packaging taxes and the NO_x tax. Together, these taxes raise about 75% of Denmark's total revenues in the category of pollution and resource taxes.

9.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Denmark. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

9.2.1 Current Status of EFR

Denmark was one of the pioneers in broadening the tax base and during the 1990's introduced three successive phases of environmental fiscal reform:

- Phase one (1992-1993) targeted mainly households with income tax relief and environmental taxes;
- Phase two (1995-1996) targeted industry and resulted in a comprehensive scheme of carbon and energy taxation; and
- Phase three (1998-1999) further extended the scope of energy taxes, for example, to include natural gas, and aimed for approximating tax rates per GJ of energy within each of the categories of industry motors and heating.

Vehicle taxation is traditionally an important source of revenue in Denmark. From 1997 a new tax base was defined for the circulation tax, based on the energy efficiency of vehicles. This tax base was later extended to included light-duty vehicles.

During the decade of the 2000's Denmark experienced a 'tax stop', which resulted from a government that did not allow any tax rates to increase. Industrial installations covered by ETS were freed from the CO₂ tax. The registration tax was moderated by increasing the threshold for the highest tax rate and taxes on packaging were lowered. The resulting fiscal squeeze eventually brought a revival to tax reform, and in 2009 a 'green tax reform' was agreed. It lowered income taxes against introducing indexation of energy taxes and the foreseen revenues from auctioning of ETS-allowances.

Following the failure at COP15 and the deepening of the fiscal and economic crisis which started in 2008, Denmark dismantled some of the energy taxes on industry and business in 2013. The country has, however, kept in place for non-ETS business its national CO₂ tax on top of the minimum energy tax rates defined in the EU's ETD. A tax related to air pollution with NO_x from power plants and industry was introduced in 2012 at a rate of €3.36 per kg. There has also been an increase in the offsetting circulation surtax for diesel vehicles.

It is remarkable that environmentally-related taxes have declined by a full percentage point of GDP over the last decade. This mainly reflects the fact that registration taxes for passenger vehicles have been effectively reduced, and the 8-fold 'dieselization' of the passenger vehicle fleet, which has caused revenues from transport-related fuel taxes to decline markedly. The weakening of packaging and waste taxes has also played a role in this decline. Many of these changes have taken place in a relatively subtle manner without much attention being drawn to them.

9.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Finland. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- Energy taxes are harmonised based upon the highest energy content of all of the different fuels used for each purpose (propellants, heating etc). Transport fuels are equalised using the energy content on petrol (€12.7 per GJ). Motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€9.85 per GJ). Finally, due to the existing rates for gas oil used for heating being very close to the new minimum rates proposed for ETD, this proposal is applied to other heating fuels with the consistent approach implied (€0.15 per GJ and CO₂ at €20 per tonne).
- Table 9-3 shows the increases in tax rates (using ETD units) for the different fuels by use. Due to the unusually high non-business electricity tax in Denmark the proposed average increase for business amounts to 1/3 or €0.40 per kWh.

Table 9-3: Existing and New Rates Based upon Proposed Revisions to ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	596	596

Energy Tax	Units	Suggested Rates	Existing Rates
Light fuel oil (diesel)	€ per 1000 litre	643	406
LPG (propellant)	€ per 1000 kg	831	506
Kerosene	€ per 1000 litre	647	454
Natural gas (prop)	€ per GJ	18	10
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	81	81
Kerosene	€ per 1000 litre	80	80
LPG	€ per 1000 kg	96	95
Natural gas	€ per GJ	2	2
Business Heating			
Gas oil	€ per 1000 litre	405	405
Heavy fuel oil	€ per 1000 kg	463	463
Kerosene	€ per 1000 litre	407	405
LPG	€ per 1000 kg	519	506
Natural gas	€ per GJ	11.15	10.92
Coal	€ per GJ	11.92	11.76
Non-Business Heating			
Gas oil	€ per 1000 litre	405	405
Heavy fuel oil	€ per 1000 kg	463	463
Kerosene	€ per 1000 litre	407	405
LPG	€ per 1000 kg	519	506
Natural gas	€ per GJ	11.15	10.92
Coal	€ per GJ	11.92	11.76
Electricity			
Electricity - business use	€ per MWh	40.00	0.54
Electricity - non-business use	€ per MWh	111.69	111.69

- In the case of propellants, the revisions imply a significant increase in the tax on diesel (58%), redressing the existing imbalance between petrol and diesel rates. There are also significant increases in taxes on kerosene, LPG and natural gas (43%, 64% and 80%, respectively).
- In the case of fuels used in commercial and industrial motors, there is very little change required (1% increase in the tax on LPG).
- On heating fuels (business and non-business), the minimal changes required reflect the relatively comprehensive approach already in place in Denmark. The largest increase is for LPG, for which the tax rate increases by less than 3%.

➤ **Transport Taxes:**

- **Vehicles:** The taxes on transport and on transport related fuels together raise revenues of the order 2.50% of GDP. The suggested increase in transport taxes for Denmark to meet the good practice benchmark is 0.13% of GDP. Transport taxes in Denmark are well above the average in the EU (1.49% of GDP compared to an average of 0.54% GDP). Even so, some changes could be considered. For example, the tax base is not related to emissions, and so is not in line with the Commission's 2005 proposal on taxes on passenger vehicles.¹⁸⁰ Along with other countries under the Eurovignette scheme, for heavy-goods vehicles, some differentiation according to EURO class, and extension of the scheme to vehicles between 3.5t and 12t could be considered. These vehicles are subject only to a weight based circulation tax.¹⁸¹
- **Aviation:** Currently there is no aviation tax in Denmark. It is suggested to implement an aviation tax on air passenger flights and on air freight. The suggested rates for the air passenger tax are €15 per passenger for flights within the Denmark, €25 per passenger for flights within the European Union, and €50 per passenger for flights to destinations outside the European Union. The suggested air transport tax rate is €1.25 per tonne of freight. The suggested year of implementation is 2016.

➤ **Pollution and Resource Taxes:**

- **Aggregates:** Extraction of minerals for use as aggregates causes harm to the environment. An aggregates tax helps to reduce the environmental burden by increasing the price of raw materials, and so stimulates the market for recyclable materials. This ultimately reduces costs for businesses, but also is in-line with the flagship initiative 'A Resource Efficient Europe'.¹⁸² Denmark has an existing volume-based aggregates tax

¹⁸⁰ European Commission (2005) Proposal for a Council directive on passenger car related taxes COM(2005)261 final.

¹⁸¹ European Environment Agency (2013) Road user charges for HGV – tables with external costs of air pollution, EEA Technical Report 1/2013, Copenhagen.

¹⁸² European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

that can be estimated to an average rate of about €0.40 per tonne.¹⁸³ It is suggested that Denmark adjusts and extends its aggregates tax to a rate of €2.40 per tonne from 2016, and following this keeps the rate constant in real terms. The types of materials that could be covered by the tax are:

- Marble
- Chalk and dolomite
- Slate
- Limestone and gypsum
- Sand and gravel

Not all of these are extracted in Denmark. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste:** the existing taxes, as well as a ban on landfilling, have been supporting more recycling of waste. Waste taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Further development of the waste tax would help drive changes in the waste management sector needed to meet EU targets in 2020 and give support to the application of the waste hierarchy. The recent change of its tax base to one relating to energy content is not deemed especially useful in this context, and has been difficult to deal with for those liable to the tax. It is suggested that tax base reverts to being weight-based, whereby lost revenues of about €100 million could be restored.
- **Air pollution:** It is suggested that in order to generate further improvements in air quality, the existing tax rates on air pollution are complemented with new taxes on emissions of primary particles:
 - PM_{2.5} €3,000 per tonne

Given the new tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2020. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.

- **Waste water:** Denmark has taxes in place on direct discharges of water pollution from industry and treatment plants. To improve prevention of water pollution, improve compliance and better reflect the environmental burdens it is suggested that the existing exemptions be reviewed. It is also suggested that the tax rates be brought in-line with good practice rates (see Section 5.3.6). With relative price levels in Denmark this would imply a rate of €3.25 per kg BOD (i.e. an increase of €1 on current rates) and corresponding adjustments of tax rates for phosphorus and nitrogen.

¹⁸³ Annex 1 of the relevant legislation defines a bulk density of 0.6 tonnes per m³ for several materials – although there is obviously some variation. The most common density of 0.6 tonnes has been used here to convert to a tonnage rate.

- **Packaging:** A small number of Member States have implemented packaging taxes for packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested to apply the following good practice rates to all packaging placed on the market in Denmark:
 - Paper and card €0.07 per kg
 - Plastic €1.40 per kg
 - Wood €0.07 per kg
 - Metallic €1.69 per kg
 - Glass €0.25 per kg

- **Plastic bag tax:** There is a weight-based tax on shopping bags of both paper and plastic in Denmark. Plastic bags cause many environmental problems when littered in the environment, especially when they end up in the marine environment. In 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.¹⁸⁴ The weight-based tax in Denmark for a standard 25 g plastic bag can be estimated to about €0.07. It is suggested that Denmark adjusts its tax on single-use plastic bags to €0.22 to strengthen the incentive for reducing bag use.

- **Fertilisers:** A tax on the use of nitrogen in mineral fertilisers is suggested at a rate of €0.30 per kg N from 2016. This tax rate would reflect relative price levels for Denmark relevant to EU schemes under the CAP, and support the prevention of groundwater contamination, ammonia evaporation, emissions of greenhouse gases and surface water eutrophication.

9.2.3 Summary of Revenue Outcomes

Table 9-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

¹⁸⁴ DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

Table 9-4: Potential Additional Revenue from Environmental Fiscal Reform in Denmark, million DKK (real 2014 terms)¹⁸⁵

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	143	565	977
C&I / Heating	2	8	14
Electricity	856	856	856
<i>Sub-total Energy, million DKK</i>	1,001	1,429	1,847
<i>Sub-total Energy, % GDP</i>	0.05%	0.07%	0.09%
Transport Taxes (excluding transport fuels)			
Vehicle Taxes	523	2,092	2,618
Passenger Aviation Tax	3,300	6,835	7,531
Freight Aviation Tax	0.82	1.67	1.87
<i>Sub-total Transport, million DKK</i>	3,823	8,929	10,150
<i>Sub-total Transport, % GDP</i>	0.20%	0.46%	0.52%
Pollution and Resource Taxes			
Landfill Tax - Inerts (C&D)	2.0	1.8	1.8
Incineration /MBT Tax	145	190	197
Air Pollution Tax	11	21	15
Water Abstraction Tax	21	50	51
Waste Water Tax	118	165	165
Pesticides Tax	227	461	515
Aggregates Tax	790	399	379
Packaging Tax	181	169	166
Single Use Bag Tax	26	6	6

¹⁸⁵ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
<i>Sub-total Pollution & Resource, million DKK</i>	1,521	1,461	1,497
<i>Sub-total Pollution & Resources, % GDP</i>	0.08%	0.07%	0.08%
Total Potential for Environmental Fiscal Reform			
Total, million DKK	6,346	11,819	13,495
Total Increase, % GDP	0.33%	0.61%	0.69%

Table 9-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 9-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Denmark, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	110
Increased Cost Recovery for Water Use	0
Total	110

9.2.4 Environmental Benefits

Table 9-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.7.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, DKK 500 million of benefits are anticipated annually by 2025 in real terms.

Table 9-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in Denmark, million DKK (real 2014 terms)¹⁸⁶

Tax Type	2017	2020	2025
Energy Taxes	36	48	60
Transport Taxes (excluding transport fuels)	41	84	92

¹⁸⁶ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax Type	2017	2020	2025
Pollution and Resource Taxes	111	390	349
Total, million DKK	188	523	500
Total, % GDP	0.01%	0.02%	0.02%

9.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Denmark:¹⁸⁷

- In 2012, environmental taxes generated revenue equivalent to 3.87% of GDP. Although this is already high on European standards, the headline figures suggest that there is still considerable potential for additional revenue from environmental taxes in Denmark. These could generate DKK 6.5 billion in 2017, rising to DKK 13.6 billion in 2025 (EUR 1.8 billion) (both in real 2014 terms). This is equivalent to 0.33% and 0.70% of GDP in 2017 and 2025, respectively.
- The largest single contribution to revenue comes from the proposed passenger aviation tax. This accounts for DKK 7.5 billion by 2025 (EUR 1.0 billion) (real 2014 terms), equivalent to 0.32% of GDP.
- The next largest contribution to revenue comes from the suggested increase in vehicle taxes. This accounts for DKK 2.6 billion by 2025 (EUR 0.4 billion) (real 2014 terms), equivalent to 0.11% of GDP.
- The suggested harmonisation of taxes on transport fuels with the rates set out in the proposed ETD could raise DKK 1.0 billion by 2025 (EUR 0.1 billion) (real 2014 terms), equivalent to 0.04% of GDP.
- Revenue potential from harmonisation of taxes on electricity would raise DKK 0.9 billion by 2025 (EUR 0.1 billion) (real 2014 terms), equivalent to 0.04% of GDP.
- A tax on aggregates has also been suggested. This would contribute DKK 0.5 billion by 2025 (EUR 0.1 billion) (real 2014 terms), equivalent to 0.02% of GDP.
- In addition, a range of more minor taxes on could generate revenue of DKK 1.1 billion by 2025 (EUR 0.2 billion) (real 2014 terms), equivalent to 0.05% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around DKK 0.5 billion by 2025 (EUR 0.1 billion) (real 2014 terms), equivalent to 0.02% of GDP.

¹⁸⁷ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €101 million per annum could be raised in addition to the above.

10.0 Finland

10.1 Country Overview

10.1.1 Key Facts about the Economy and Tax System

- On average Finland's GDP increased annually by 3.7% in real terms between 2003 and 2007. Between 2007 and 2008 economic growth stalled and increased by only 0.3%. Subsequently, a significant decrease in GDP of 8.5% in real terms was experienced in 2008 when the economy was at its worst. 2010 and 2011 saw a return to growth, with GDP increasing by 3.1% in real terms averaged between the two years; however, 2012 and 2013 both saw recession, with an average decrease in GDP of 1.2% in real terms.¹⁸⁸
- Finland's overall tax revenue (including social contributions) as a percentage of GDP is high and has been rising over the past few years to reach 44.3% in 2012, almost reaching previous levels (44.8% in 2002) from which there was a slight drop during 2006–2010.¹⁸⁹
- Finland's total tax revenue is fairly evenly split between direct taxes at 36.8%, indirect taxes at 33.2%, and social contributions at 30% (2012). Since 2002, the contribution of direct taxes has dropped by 5.9 percentage points, with both indirect taxes and social contributions rising.¹⁹⁰
- In 2012, revenue from environmental taxes accounted for 3.07% of Finland's GDP, which is high for the EU-28. This share of GDP was on the rise in the early 2000s, but began to fall in 2005, picking up again in 2010. At present, it is very close to the share that was typical of 10 years ago (3.06% in 2002).¹⁹¹
- Energy taxes represent the majority of environmental tax revenues, amounting to 2.08% of Finland's GDP in 2012. Transport taxes (excluding fuel taxes) amounted to 0.93% of GDP in the same period, while pollution and resource taxes were 0.06% of GDP.¹⁹²
- In 2012, energy taxes accounted for 67.8% of Finland's total environmental tax revenues. This share is 2.8% higher than the share in 2002, and has risen after falling to around 60% between 2004 and 2007.¹⁹³

¹⁸⁸ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

¹⁸⁹ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

¹⁹⁰ Ibid.

¹⁹¹ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

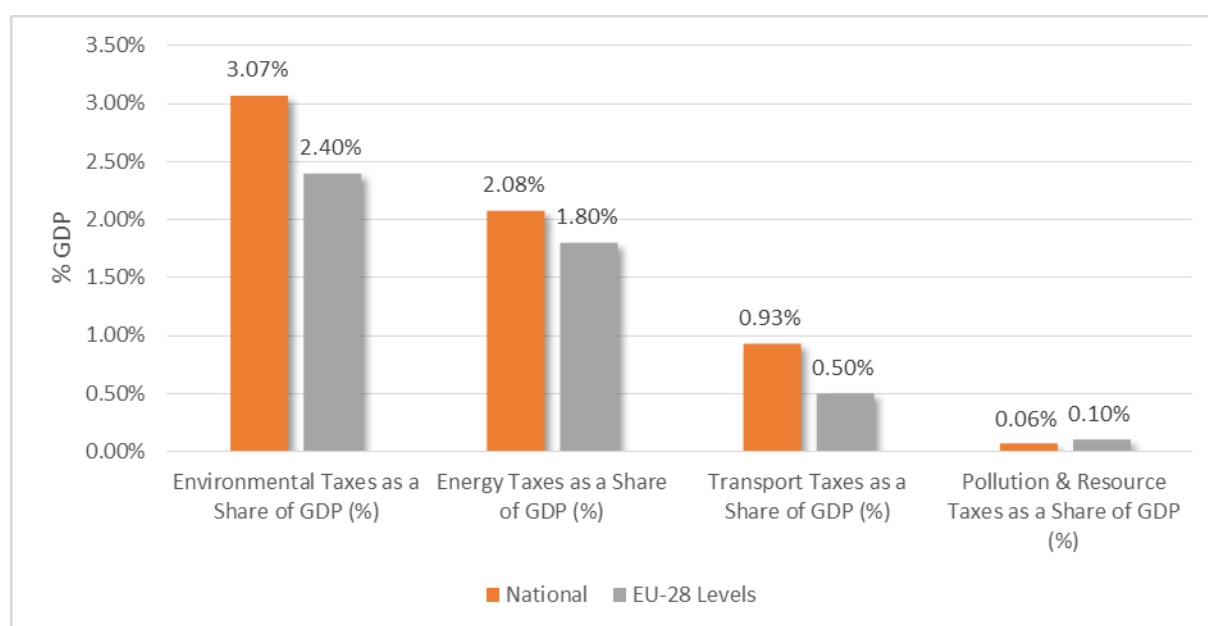
¹⁹² Ibid.

¹⁹³ Ibid.

10.1.2 Relative Position within the EU

- In 2012, expressed as a percentage of GDP, Finland's revenue from environmental taxation was above the EU-28 average of 2.4%. Finland's individual revenue streams for taxes placed on energy and transport (excluding fuel), as percentages of GDP, were also above the respective EU-28 averages of 1.8% and 0.5%. However, revenues from pollution and resource taxes were below the EU-28 average of 0.1% (see Figure 10-1).¹⁹⁴

Figure 10-1: Environmental Taxes in Finland as a % of GDP vs EU-28 Levels (2012)



- Taking revenue from all environmental taxes as a proportion of GDP, Finland ranked 5th in the EU-28 in 2012. For transport (excluding fuel) tax revenue as a share of GDP it ranked 4th, for energy 10th, and for pollution and resource tax 15th (see Table 10-1).¹⁹⁵

Table 10-1: Ranking of Finland's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	5
Energy Taxes as a Share of GDP (%)	10
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	4
Pollution & Resource Taxes as a Share of GDP (%)	15

Source: based on Eurostat data

¹⁹⁴ Ibid.

¹⁹⁵ Ibid.

10.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.8.0 (prepared as a separate document). This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon nominal GDP figures for the same year as the reported revenues.^{196,197}

Environmental taxes in Finland consist of energy taxes, transport taxes, emission taxes and waste-related taxes. As outlined in the previous section, two-thirds of environmental taxes are energy taxes on electricity and fuels, nearly one-third are various transport taxes levied on vehicles. The share of emission and resource taxes account for less than two per cent of total environmental taxes, with the main share of this from waste taxes. In 2012 environmental taxes accounted for seven per cent (€5.8 billion) of the entire tax revenue of the state.¹⁹⁸

➤ Energy Taxes:

- An excise duty is levied on transport fuels, heating fuels and electricity. The rates are shown in
- Table 10-2, alongside minimum rates in the existing ETD and the EU-28 average and median rates. This table shows that apart from LPG, which is exempt from excise duties in Finland, all rates applied in Finland are well above the existing ETD minimum rates, as well as the average and median EU rates.
- The excise duty is divided into three components: an energy content tax, a CO₂ tax and an additional surcharge, the strategic stockpile fee. For the specific rates of these components see Appendix A.8.0.
- Revenue in 2012 (including all excise duties and the stockpile fee) was €4,000 million (equivalent to 2% of GDP).¹⁹⁹

¹⁹⁶ Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1>

¹⁹⁷ Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

¹⁹⁸ Tilastokeskus (2013) *Ympäristöverot 2012*, http://tilastokeskus.fi/til/yev/2012/yev_2012_2013-11-07_fi.pdf

¹⁹⁹ DG TAXUD (2014) *Taxes in Europe Database, Finland Excise Duty – Energy Products*, Accessed 19 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=844/1395070212&taxType=Energy+products+and+electricity

Table 10-2: Standard Rates of Excise Duties on Fuels and Electricity in Finland

Excise Duty	Unit	Rate Applied in Finland	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Unleaded Petrol ¹	€ per 1000 litres	€672.9	€359	€519	€509
Gas Oil (Diesel) ¹	€ per 1000 litres	€496.6	€330	€427	€405
Kerosene	€ per 1000 litres	€731.0	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€0.0	€125	€209	€180
Natural Gas	€ per GJ	€3.18	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€163.4	€21	€221	€163
Kerosene	€ per 1000 litres	€731.0	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€0.0	€41	€126	€125
Natural Gas	€ per GJ	€3.18	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€163.4	€21	€221	€163
Kerosene	€ per 1000 litres	€731.0	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€192.1	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€0.0	€0.00	€82	€40
Natural Gas	€ per GJ	€3.18	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€5.2	€0.15	€1.27	€0.31
Lignite	€ per 1000 kg	€132.71	-	-	-
Heating – Non-Business Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€163.4	€21	€179	€125
Kerosene	€ per 1000 litres	€731.0	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€192.1	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€0.0	€0.00	€111	€42
Natural Gas	€ per GJ	€3.18	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€5.2	€0.30	€1.77	€0.32

Excise Duty	Unit	Rate Applied in Finland	Existing ETD Minimum	EU-28 Average	EU-28 Median
Lignite	€ per 1000 kg	€132.71	-	-	-
Electricity					
Business Use	€ per MWh	€7.03	€0.50	€8.42	€1.03
Non-Business Use	€ per MWh	€19.03	€1.00	€14.53	€2.06
Notes: Leaded petrol is no longer sold in Finland					

Source: DG TAUXD (2014) *Taxes in Europe Database, Finland Excise Duty – Energy Products*, Accessed 19th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=844/1395070212&taxType=Energy+products+and+electricity

➤ Transport Taxes (excluding transport fuels):

- Vehicle Tax:

- The vehicle tax constitutes two elements: 1) a base tax levied on all registered vehicles which have a maximum permitted total mass of 3,500 kg under categories N or M (cars, vans, special purpose cars and lorries); and 2) a tax levied on propelling force. This second component is levied annually on all vehicles which use fuel other than petrol, i.e. diesel oil, kerosene, LPG or electricity.²⁰⁰
- The propelling force tax is levied on passenger cars to even out differences between lower-taxed diesel vehicles and higher-taxed petrol vehicles based on total annual kilometres driven. The propelling force tax levied on HGVs aims to meet the requirements of the Eurovignette Directive.²⁰¹
- Revenue in 2012: €758 million (equivalent to 0.39% of GDP)²⁰² of which €434 million was from the base tax and €324 million from

²⁰⁰ . DG TAUXD (2014) *Taxes in Europe Database, Finland Motor vehicles tax – Vehicle Tax*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=621/1388754737&taxType=Other+indirect+tax

²⁰¹ Ministry of Transport and Communications (2014), *Fair and Intelligent Transport, Working Group Final Report*, 21 February 2014,

²⁰² DG TAUXD (2014) *Taxes in Europe Database, Finland Motor vehicles tax – Vehicle Tax*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=621/1388754737&taxType=Other+indirect+tax

the propelling force tax. Revenue in 2013: €866 million (equivalent to 0.44% of GDP).²⁰³

- Car Tax:²⁰⁴
 - A once-off car tax is levied on the first registration for road use of new cars or motorcycles purchased in Finland or second-hand cars or motorcycles imported into the country.
 - Passenger cars, delivery vans, busses weighing less than 1,875 kg and motorcycles are subject to the tax. The tax is based on CO₂ emissions and on the taxable value of the car. In case no CO₂ emission information is available, the tax rate is based on the mass and the energy source of the vehicle.²⁰⁵
 - Revenue in 2012: €1,066 million (equivalent to 0.55% of GDP).²⁰⁶ Revenue in 2013: €932 million (equivalent to 0.48% of GDP).²⁰⁷
- Railway Tax:²⁰⁸
 - The railway tax is used to cover the costs of building and maintenance of railway infrastructure.
 - Rate in 2006: goods transport for diesel-driven trains: €0.001 per gross tonne-km; goods transport for electric trains: €0.0005 per gross tonne-km; investment surtax on the Kerava-Lahti railway: €0.0050 per gross tonne-km (in addition to the basic tax); and passenger transport: €0.0001 per gross tonne-km.
 - Revenue in 2010: €18 million (equivalent to 0.01% of GDP).²⁰⁹

➤ **Pollution and Resource Taxes:**

²⁰³ Valtiokonttori (2014), *Valtion Tilinpaatos Vuodelta 2013*, 9.4.2014, Accessed 19.9.2014
[http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013\(50407](http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013(50407)

²⁰⁴ DG TAUXD (2014) *Taxes in Europe Database, Finland Motor vehicles tax – Car Tax*, Accessed 27 August,
http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=253/1388754737&taxType=Other+indirect+tax

²⁰⁵ Ibid.

²⁰⁶ Ibid.

²⁰⁷ Valtiokonttori (2014), *Valtion Tilinpaatos Vuodelta 2013*, 9.4.2014, Accessed 19.9.2014
[http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013\(50407](http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013(50407)

²⁰⁸ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Main characteristics of selected countries – Finland, Accessed 28 August 2014,
http://www2.oecd.org/eoicst/queries/QueryResult_2.aspx?Key=36808684-770f-4ed7-9a3b-5f000506834e&OryCtx=1&OryFlag=3

²⁰⁹ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Revenues raised by environmentally related taxes for selected countries – Finland, Accessed 28 August 2014,
http://www2.oecd.org/eoicst/queries/QueryResult_3.aspx?Key=1e14c362-3df6-452d-a8c7-a3706593e75e&OryCtx=2&OryFlag=3#

- Landfill Tax:²¹⁰
 - The waste tax is paid by landfill site operators on taxable waste groups (based on the Waste Tax Act (1126/2010)).
 - Rate: €50 per tonne of waste in 2013. If the weight of the waste cannot be measured a special conversion coefficient is applied.
 - Revenue in 2012: €56 million (equivalent to 0.029% of GDP). Revenue in 2013: €55.8 million (equivalent to 0.029% of GDP).²¹¹
- Excise Duty on Certain Beverage Packages:²¹²
 - This excise duty is levied on retail packages made of various materials for alcoholic beverages, soft drinks, water and certain other beverages. Rates applied in 2014 are 51 cents/litre of packaging product.
 - Revenue in 2012: €15 million (equivalent to 0.007% of GDP). Revenue in 2013: €15 million (equivalent to 0.007% of GDP).²¹³
- Water Level Regulation Charge:
 - Water abstraction charges are levied by municipal authorities.²¹⁴
 - The rate of the charge is separately set through an environmental permit procedure.²¹⁵
- Water User Charges:²¹⁶
 - The water user charge is based on the amount of water consumed. Furthermore, fixed components are paid by the users.
 - Average rate in February 2011: €1.51 per m³.

²¹⁰ DG TAUXD (2014) *Taxes in Europe Database, Finland Landfill Tax*, Accessed 27 August, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=252/1388754737&taxType=Other+indirect+tax

²¹¹ Valtiokonttori (2014), *Valtion tilinpaatos vuodelta 2013*, 9.4.2014, Accessed 19.9.2014 [http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013\(50407](http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013(50407)

²¹² DG TAUXD (2014) *Taxes in Europe Database, Finland Excise Duty – Beverage Packages*, Accessed 27 August, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=246/1388754737&taxType=Other+indirect+tax

²¹³ Valtiovarainministerio (2014), *Hallitus esittää useita muutoksia verolakeihin*, 138/2014. 15.9.2014, Accessed 19.9.2014. http://www.vm.fi/vm/fi/03_tiedotteet_ja_puheet/01_tiedotteet/20140915Hallit/name.jsp

²¹⁴ EEA (2013) *Assessment of cost recovery through water pricing*, EEA Technical Report, No 16/2013, <http://www.eea.europa.eu/publications/assessment-of-full-cost-recovery>

²¹⁵ OECD (n.d.) *Database on instruments used for environmental policy, Taxes, fees or charges – Main characteristics of selected countries – Finland*, Accessed 28 August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=36808684-770f-4ed7-9a3b-5f000506834e&OryCtx=1&OryFlag=3

²¹⁶ Ibid.

- Revenue in 2010: €385.1 million (equivalent to 0.21% of GDP),²¹⁷
- Wastewater User Charges:
 - The charge is based on water consumption or on the volume and quality of waste water. Furthermore, fixed components, such as a connection charge or a meter charge, are added to the volume based charge. The average rate in February 2011 was €2.28 per m³ in total.²¹⁸
 - Revenue in 2010: €516.1 million (equivalent to 0.28% of GDP),²¹⁹

10.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of EFR in Finland, this is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, as well as the basis for the calculation of revenue generation. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

10.2.1 Current Status of EFR

Finland has a long history with EFR, being the first country to introduce a CO₂ tax over 20 years ago. The early EFR reforms were not only used as a means to achieve environmental objectives, but also primarily as part of a wider tax shifting policy to partly off-set revenue losses from the reduction in labour taxes which was made to stimulate employment.²²⁰ In 2008, the employer's social security contribution was abolished and to compensate for these revenue losses (about €800 million) energy taxes were increased as part of the energy tax reform – in 2011 this generated over €700 million in revenue for the government. So far both of these measures can be seen as the most extensive EFR in Finland. Altogether labour taxation was reduced and environmental taxation increased about by €2 billion.²²¹

²¹⁷ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Revenues raised by environmentally related taxes for selected countries – Finland, Accessed 28 August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_3.aspx?Key=1e14c362-3df6-452d-a8c7-a3706593e75e&QryCtx=2&QryFlag=3#

²¹⁸ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Main characteristics of selected countries – Finland, Accessed 28 August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=36808684-770f-4ed7-9a3b-5f000506834e&QryCtx=1&QryFlag=3

²¹⁹ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Revenues raised by environmentally related taxes for selected countries – Finland, Accessed 28 August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_3.aspx?Key=1e14c362-3df6-452d-a8c7-a3706593e75e&QryCtx=2&QryFlag=3#

²²⁰ Sairinen, R, (2012) Regulatory reform and development of environmental taxation: the case of carbon taxation an ecological tax reform in Finland in Milne, J., and Skou Andersen, M., (Eds.) (2012) Handbook of Research on Environmental Taxation, Edward Elgar, Cheltenham/Massachusetts

²²¹ Finnish Government (2010) *Governments Proposal to Parliament on energy taxation to amend the legislation*(page 18) www.finlex.fi/fi/esitykset/he/2010/20100147.pdf

According to Sairinen (2012), Finland's approach to EFR has been influenced over the years by the use of other policy instruments (such as voluntary agreements trying to reduce energy consumption), EU policy (anticipation of an EU Energy Tax), concerns regarding violation of trade agreements (tax on imported electricity) as well as party political aims (to balance income tax and energy tax).²²² This long history has enabled Finland to mainstream EFR into its broader policy-making process. Even so, there remains a level of scepticism within the State Administration towards the concept and use of EFR, for instance, the double dividend principle is disputed. In the interim report *Sustainable Development and Ecological Tax Reform* (2004) by the Ministry of Finance, the conclusion was that environmental tax reform as a major shift in tax bases is not possible in Finland. According to the report environmental taxation should be developed only as an instrument for environmental policy. After the publication of this interim report, there has not been any report or study where environmental tax reform has been evaluated as a means of fiscal consolidation and/or part of a wider tax shifting policy.

Thus, one of the main features of Finland's approach to EFR is that it has been introduced without a comprehensive overall strategy, or schedule on tax bases and timetables for rate increases. The main argument for increasing environmental tax rates has mostly been as a way to compensate losses from the reduction in labour taxes. However, the environmental steering effect of environmental taxation has been highly improved, for example, through the CO₂ component within vehicle related taxation, and energy taxes.

In 2012, the total sum of revenues from environmental taxes was €5.8 billion, of which households paid nearly €2.7 billion. Over one half of the environmental taxes paid by households, €1.4 billion, were related to energy taxes and €1.2 billion related to transport taxes (Figure 10-2).²²³ The burden of environmental taxation on households has been discussed widely in the Parliament, particularly in relation to the 2010 energy tax reform and subsequent increases in energy taxes. The opposition blamed the Government for the regressive nature of the energy taxes and the impact on poorer households as well as for abandoning social security contributions for companies and compensating these revenue losses by increasing energy taxes for households.²²⁴

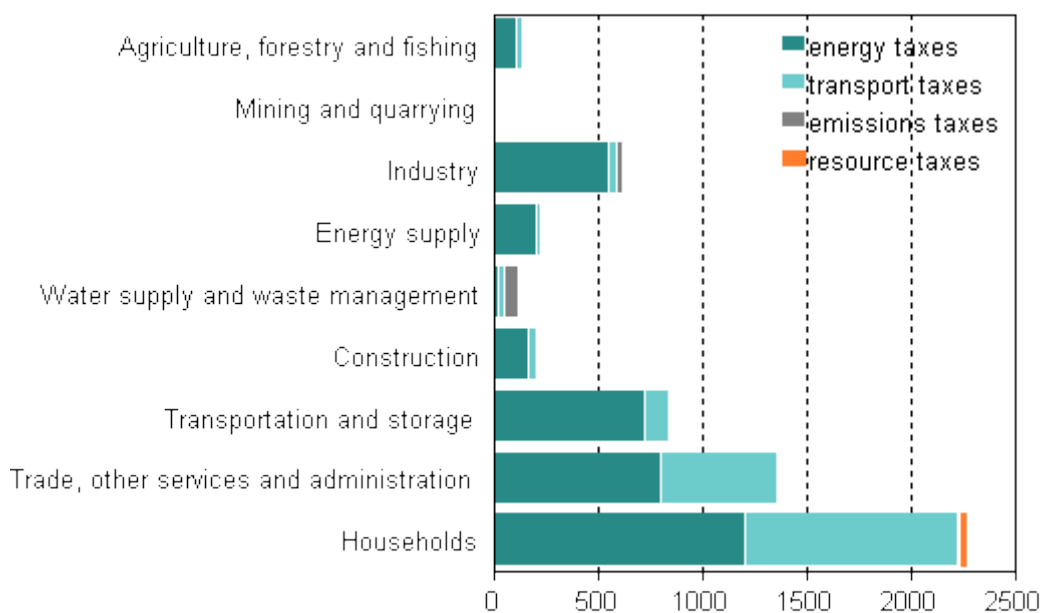
Minister of Finance (2009) *Speech of Jyrki Katainen in Big Tax Day* –conference in Helsinki 23.9.2009. http://www.vm.fi/vm/fi/03_tiedotteet_ja_puheet/02_puheet/20090923Valtio/name.jsp;

²²² Ibid.

²²³ Statistics Finland (2014), *Households pay 45 per cent of environmental taxes*, 11 September 2014, Accessed 19 September 2014, http://tilastokeskus.fi/til/yev/2012/01/yev_2012_01_2014-09-11_tie_001_en.html

²²⁴ Personal Communication with Sarianne Tikkanen

Figure 10-2: Amount and Type of Environmental Taxes Paid by Different Users in 2011 (in € million)



Source: Statistics Finland (2014), *Households pay 45 per cent of environmental taxes*, 11 September 2014, Accessed 19 September 2014, http://tilastokeskus.fi/til/yev/2012/01/yev_2012_01_2014-09-11_tie_001_en.html

Over the years, the focus of EFR in Finland has shifted more towards supporting the achievement of environmental policy goals, such as plans to introduce a kilometre tax that would better serve environmental objectives than the current tax regime. The Finland We Want in 2050 report by the Finnish Sustainable Development Strategy Group sets targets to ensure that Finland will prosper and grow in the future within the carrying capacity of nature.²²⁵ This report is mentioned in the 2013 Finnish NRP in relation to the Government’s aims on the green economy²²⁶ Proposals for further ETR have also been raised in the context of discussions on the national budget and the need to reduce public spending, including *inter alia* on environmentally harmful subsidies.²²⁷

As Sairinen (2012) stated, EFR in Finland has, over the years, been influenced by other policy instruments, one can therefore argue that the Finland We Want in 2050 commitments might have a similar influence - leading towards increased use of environmental taxes to achieve policy goals. Reflecting this, the 2013 NRP states that taxation in Finland “will move away from growth-hampering taxation of labour and entrepreneurship towards environmentally- and health-motivated taxation”.

²²⁵ The Sustainable Development Strategy Group (2014) *The Finland We Want by 2050— Society’s Commitment to Sustainable Development*, www.ymparisto.fi/download/noname/%7BB33B641F-E999-41A4-8EE8-D13635FF1110%7D/75867

²²⁶ Ministry of Finance (2013) *Finland’s National Programme*, 16c/2014, Spring 2014, http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014_finland_en.pdf

²²⁷ Finnish Association for Nature Conservation (2014) *Harmful Subsidies as Barriers to Sustainable Development - The price of subsidy policy in Finland and the developing world*

To date, CSRs focused on environmental taxes have not been adopted for Finland.

10.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Finland. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels and motor fuels used for commercial and industrial purposes are equalised using the energy content on kerosene (€19.2 per GJ). In addition, due to the existing rates for kerosene used for heating being very high relative to coal and gas the rates for heating fuels are equalised using the minimum rate for coal of €3.3 per GJ.
- In the case of propellants, the revisions imply a major increase in taxes on LPG and natural gas. More importantly, however, the petrol / diesel differential, which significantly favours diesel at present, is closed as the revisions imply a significant tax increase for diesel.
- In the case of fuels used in commercial and industrial motors, there is a major increase in the rate for gas oil to bring the tax into alignment with rates on kerosene. Taxes on LPG and natural gas are also introduced / increased as a result of the alignment associated with the proposed revision to the ETD;
- On heating fuels (business and non-business), the changes imply significant uplifts in taxes on LPG, but more importantly, perhaps, for gas.
- The existing electricity tax rates are harmonised according to the highest rate, which for Finland is non-business use.
- We note, in passing, that a planned increase in the peat tax from €4.9 per MWh to €5.9 per MWh was recently cancelled. The Finnish Government recently abolished the peat land conservation programme, choosing instead to rely on voluntary approaches.²²⁸ There may be some rationale

²²⁸ Suomen Luonnonsuojeluliitto (2014) *Kokoomuksen Ympäristöpolitiikka Fossiloituu*, 16.10.2014, Accessed 17.10.2014, <http://www.sll.fi/ajankohtaista/tiedotteet/tiedotteet-2014/kokoomuksen-ymparistopolitiikka-fossiloituu>

for considering the applicable rate of tax for peat alongside those, recognising that a tax of €4.9 per MWh of energy content is equivalent to a rate of €1.36 per GJ, or between a third and a quarter of the rates for gas and coal.

- Table 10-3 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are to be reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.

Table 10-3: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	674	673
Light fuel oil (diesel)	€ per 1000 litre	727	497
LPG (propellant)	€ per 1000 kg	940	0
Kerosene	€ per 1000 litre	731	731
Natural gas (prop)	€ per GJ	20	3
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	725	163
Kerosene	€ per 1000 litre	731	731
LPG	€ per 1000 kg	940	0
Natural gas	€ per GJ	20	3
Business Heating			
Gas oil	€ per 1000 litre	169	163
Heavy fuel oil	€ per 1000 kg	194	192
Kerosene	€ per 1000 litre	731	731
LPG	€ per 1000 kg	210	0
Natural gas	€ per GJ	4.43	3.18
Coal	€ per GJ	5.20	5.20
Non-Business Heating			
Gas oil	€ per 1000 litre	169	163
Heavy fuel oil	€ per 1000 kg	194	192

	Units	Suggested Rates	Existing Rates
Kerosene	€ per 1000 litre	731	731
LPG	€ per 1000 kg	210	0
Natural gas	€ per GJ	4.43	3.18
Coal	€/per GJ	5.20	5.20
Electricity			
Electricity - business use	€ per MWh	19.03	7.03
Electricity - non-business use	€ per MWh	19.03	19.03

➤ **Transport Taxes:**

- Vehicles:** The taxes on transport in Finland are significantly higher than average in the EU (0.93% of GDP compared to the EU-28 level of 0.50% GDP in 2012)²²⁹. In addition, taxes on transport fuels are suggested to increase as a consequence of the suggestions above. However, it is suggested that additional revenue of 0.23% of GDP could still be generated. Increasing vehicle taxation could both raise revenue, and, increasing differentiation between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future, could have significant environmental benefits. The existing Vehicle Tax and Car Tax already integrate a CO₂ based component in their calculation. This CO₂ element could be further tightened or expanded it to cover other emissions. The revision could be phased in over the period from 2016 to 2021. It should also be noted that Finland is one of few EU Member States with no widespread system of charging HGVs for road use, though the propelling force tax is intended to implement Directive 2011/76/EC. Relative to income levels, a high proportion of HGV vehicle kilometres are made by vehicles in Euro Class 1 and below in Finland.
- Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Finland currently has an Air Traffic Supervision Charge as noted in the Appendix, which applies to all passengers above 2 years old and is a general fee not considering environmental concerns. The rate of this charge was €1.2 per passenger in 2012. We suggest that a specific passenger aviation tax is introduced instead of (or as a complement to) the current Air Traffic Supervision Charge. The suggested rates for the air passenger tax are €15 per

²²⁹ Eurostat (2014) *Environmental tax revenues*, Accessed 15th October 2014, <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

passenger (flights within Finland), €25 per passenger (to other countries in the European Union), and €50 per passenger (to other countries outside the European Union). We also propose the introduction of a freight aviation tax, for which the suggested rate is €1.25 per tonne of freight. The year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. As noted in the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or the design of this tax.

➤ **Pollution and Resources Taxes:**

- **Aggregates:** There is currently no tax on aggregates in Finland. An aggregates tax can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This is in-line with the EU flagship initiative 'A Resource Efficient Europe'²³⁰ and related Roadmap. It is suggested that an aggregate tax with a rate set at €2.40 per tonne from 2017 could be introduced, and that thereafter, it is kept constant in real terms. The types of materials that could be covered by the tax are:
 - Marble
 - Chalk and dolomite
 - Slate
 - Limestone and gypsum
 - Sand and gravel
- Although marble, limestone and gypsum are not extracted in Finland, the suggested aggregates tax could be applied to domestic aggregate extraction and imports to Finland, excluding exports (a similar approach to the aggregates levy applied in the UK).²³¹ The tax could also adopt a phased approach applying to certain materials such as sand and gravel first and then expanding coverage to other materials over time. The specific range of materials suggested above reflects, in part, the nature of the data available to us in developing estimates of potential revenues.
- **Waste Tax:** The current waste tax in Finland is levied on waste deposited at public or private landfill sites and for which reuse and recycling is technically feasible and environmentally justifiable. The rate was €50 per tonne of waste in 2013 and it is planned to be increased to €55 in 2015. Finland's landfill rate is quite low (11% in 2012)²³² and since the tax on landfill is already planned to exceed €50 per tonne, we suggest no further increase other than indexation. On the other hand, whilst landfill rates are

²³⁰ European Commission (2011) Roadmap to a Resource Efficient Europe, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

²³¹ Söderholm, P (2011) Taxing Virgin Natural Resources: Lessons from Aggregates Taxation in Europe, Luleå University of Technology, Sweden. Submitted to Resources, Conservation and Recycling 2011

²³² Eurostat (2014) *Landfill rate of waste excluding major mineral waste*, Accessed on 15th October 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=t2020_rt110&tableSelection=1

low, recycling rates are not especially high. We suggest that an incineration tax is implemented at the rate of €15 per tonne, phased in over the period 2016 to 2019, and that rates are set so that other forms of residual waste treatment are taxed in an equivalent manner. This should help to give additional impetus to recycling, preparation for reuse and waste prevention

- **Packaging:** In Finland currently there is no general packaging tax, however an excise duty is levied on retail packages made of various materials for alcoholic beverages, soft drinks, water and certain other beverages (as described in the Appendix). The rate in 2014 is 51 cents/litre of packaged product. In order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials it is suggested that the current excise duty be extended/revised to a more general packaging tax. It is suggested that the following rates could be applied to all packaging placed on the market in Finland:
 - Aluminium €197 per tonne
 - Plastic €64 per tonne
 - Steel €54 per tonne
 - Paper and card €20 per tonne
 - Glass €18 per tonne
 - Wood €13 per tonne

These are suggested rates and could be revised to reflect national circumstance. These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2017 and be kept constant in real terms.

- **Single-use carrier bag tax:** There is no tax on plastic bags in Finland, though all food store chains currently apply a charge for plastic bags. The price for a plastic bag of the K-Group (around 900 food stores with 900 000 customers /day²³³) is €0.20, S-Group (over 900 food stores²³⁴) is €0.18 and Lidl (142 shops²³⁵) is €0.15. For biodegradable bags, however, the price is normally higher, such as €0.30 at the food stores of K-group. In Finland, one household uses about 100 bags each year. This amount does not include free bags and fruit bags. S-Group food stores alone sold nearly 144 million plastic bags in 2012²³⁶.

²³³ Kesko (2014), *Ruokakauppa*, 18.9.2014, Accessed 14.10.2014. <http://www.kesko.fi/fi/Kesko-yrityksena/Toimialat/Ruokakauppa/>

²³⁴ S-Ryhma (2014), *s-Ryhman rakenne*, Accessed 14.10.2014, <https://www.s-kanava.fi/web/s-ryhma/s-ryhman-rakenne>

²³⁵ Lidl (2014), *Yritys*, Accessed 14.10.2014, <http://www.lidl.fi/fi/yritys.htm>

²³⁶ YLE Uutiset (2013), *The Demise of the Finnish Plastic Bag*, 7.5.2013, Accessed 14 October 2014, http://yle.fi/uutiset/the_demise_of_the_finnish_plastic_bag/6620329

- A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. In 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.²³⁷ Consequently, it is suggested that Finland could implement a minimum national tax on single-use carrier bags at a rate of €0.12 per bag from 2016, and maintains the rate constant in real terms thereafter. The tax may have the effect of reducing the profits that food stores are currently making on selling plastic bags, instead providing an additional source of state revenue. The tax will also provide a uniform approach to the charging of single-use carrier bags (including appropriate pricing for biodegradable bags) across the country and in all shops providing such bags.
- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Finland's NO_x and SO_x emissions have declined by one and a half (NO_x) and three quarters (SO_x) since the 1990s, however the emission of particulates have remained the same and are a problem. About 60% of particle emissions originate from energy production and some 25% from transport.²³⁸

Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. Finland does not currently have a system of air pollution taxes from stationary sources in place. It is therefore suggested that an air pollution tax, especially for PM₁₀, could be implemented in order to generate improvements in air quality as follows:

- SO_x €1,000 per tonne
- NO_x €1,000 per tonne
- PM₁₀ €2,000 per tonne

Given the magnitude of the recommended tax rates, it is suggested that there is a transition period from 2016 to maximum levels by 2021. The rates are then held constant in real terms.

- **Fertilisers:** Finland does not currently have a tax on nitrogen (or other) fertilisers. Between 1976 and 1994 a fertiliser tax was in place but was abolished when Finland joined the EU. Nevertheless, when the tax was in place, the primary goal of the tax was not to deal with environmental problems but to lower production levels of cereals for export and to provide

²³⁷ DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

²³⁸ Finnish Environment Institute (2014), *State of the Environment 2013*, Edita, Helsinki 2014, www.syke.fi/publications_and_www.environment.fi/soer2013

funds to financially support export subsidies. The rate in 1994 was €0.44 per kg of N in the fertiliser.

In 2007, the Ministry of Environment assessed the potential introduction of a fertiliser tax and concluded that due to the complex regulatory system for farming, a fertiliser tax could have unwanted side effects and needs to be combined with other measures and supporting policies such as information tools and research and development. The study also highlighted that the tax would have to set at a relatively high level in order to achieve changes in farming practices (i.e. application of less fertilisers) and that revenues from the tax should be recycled back to farmers in order to help overcome political opposition to a high tax.²³⁹

We suggest that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of €0.2 per kg N be implemented from 2017 with rates gradually increasing to the maximum level in 2019. Although this rate would be lower than the fertiliser tax rate applied in Finland in 1994, it could be considered an initial starting point for further development of the instrument.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

Finland does not have a pesticide tax at the moment. As noted in the Appendix between 1988 and 2006 it used to levy a pesticide registration fee on the pesticide industry, but this fee was not used for environmental purposes. We therefore suggest that a pesticide tax dedicated to reduce the impact of pesticides on the environment and human health be introduced from 2017 with a transition period until 2019. The proposed tax could cover pesticides used for professional purposes, as well as pesticides used in households. The proposed rate is €10 per kg active ingredient. A rate structure similar to the one in Norway or Denmark, where the rate is banded according to the potential effects of different active ingredients, is considered to be the most effective.

²³⁹ Ympäristöministeriön (2007) *Verotukseen perustuva ohjaus maatalouden ravinnepäästöjen rajoittamisessa*, <http://www.ymparisto.fi/download/noname/%7B55DB01AC-D2AD-4B77-B88D-DD92E8BAF71C%7D/31962>

- **Water abstraction:** Finland is currently not under pressure from water abstraction.²⁴⁰ There are application and handling fees which are charged to the entity seeking to undertake water abstraction and these are determined locally. For example in the case of an application for 500 m³/day water abstraction in the Liperi municipality, the handling fee is €1,150 and the application fee is €2,300²⁴¹.

A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that “Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs”. Currently, although there are user charges in place in Finland (for example €1,650 per 1,000m³ for the city of Kuopio)²⁴² there are no taxes for abstraction. It is suggested that appropriate levels of taxation would be in the order of €160 per 1,000m³ for the public water supply, €100 per 1,000 m³ for manufacturing purposes and €14 per 1,000 m³ for agriculture. We have assumed that the additional revenue which such rates may generate can accrue to the central budget. Another option would be for revenues above cost recovery levels to accrue to the national budget. This would require understanding of what acceptable levels of cost recovery are (allowing for proper maintenance of the resource as appropriate), and it would also, ideally, require incentives, at the margin, to be reflected in levy structures. A transition period from 2016 to 2021 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.

- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21st May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.²⁴³ Finland has waste water user charges, but not a waste water tax. To improve prevention of water pollution it is suggested to implement a waste water tax and adjust tax rates in-line with ‘good practice’. With relative price levels in Finland this would imply, for BOD, a rate of €2.77 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. Given the magnitude of the increase in rates a transition period from 2016 to 2019 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms after 2019.

²⁴⁰ Eurostat (2014), *Water exploitation index*, 9.10.2014. Accessed 14 October 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=tsdnr310&tableSelection=1>

²⁴¹ Aluehallintovirasto (2010), *Paatos*, 37/10/2, 18.3.2010, Accessed 14 October 2014, http://www.avi.fi/documents/10191/56846/isavi_paatos_37_10_2-2010-3-18.pdf

²⁴² Kuopion Vesi (2014), *Maksut*, <http://www.kuopio.fi/web/kuopion-vesi/maksut>, Accessed 14 October 2014.

²⁴³ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

10.2.3 Summary of Revenue Outcomes

Table 10-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 10-4: Potential Additional Revenue from Environmental Fiscal Reform in Finland, million EUR (real 2014 terms)²⁴⁴

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	73	286	492
C&I / Heating	43	161	269
Electricity	559	559	559
<i>Sub-total Energy, million EUR</i>	674	1,006	1,320
<i>Sub-total Energy, % GDP</i>	0.33%	0.49%	0.65%
Transport Taxes			
Vehicle Taxes	92	370	462
Passenger Aviation Tax	235	480	518
Freight Aviation Tax	0.18	0.49	0.84
<i>Sub-total Transport, million EUR</i>	328	850	981
<i>Sub-total Transport, % GDP</i>	0.16%	0.42%	0.48%
Pollution and Resource Taxes			
Landfill Tax - Inerts (C&D)	37	34	34
Incineration /MBT Tax	10	16	16
Air Pollution Tax	59	123	107
Water Abstraction Tax	131	358	453

²⁴⁴ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Waste Water Tax	17	24	24
Pesticides Tax	12	27	33
Aggregates Tax	205	119	113
Packaging Tax	24	25	28
Single Use Bag Tax	3	1	1
Fertiliser Tax	0.014	0.025	0.024
<i>Sub-total Pollution & Resource, million EUR</i>	500	725	809
<i>Sub-total Pollution & Resources, % GDP</i>	0.24%	0.35%	0.40%
Total Environmental Taxes			
<i>Total, million EUR</i>	1,502	2,581	3,110
<i>Total Increase, % GDP</i>	0.74%	1.26%	1.52%

Table 10-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 10-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use Finland, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	212
Increased Cost Recovery for Water Use	1,171
Total	1,383

10.2.4 Environmental Benefits

Table 10-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.8.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €165 million of benefits are anticipated annually by 2025 in real terms.

Table 10-6: Monetised Environmental Benefits from Implementation of Suggested Taxes, million EUR (real 2014 terms)²⁴⁵

Tax Type	2017	2020	2025
Energy Taxes	28	36	42
Transport Taxes (excluding transport fuels)	6	12	14
Pollution and Resource Taxes	23	94	109
Total, million EUR	56	142	165
Total, % GDP	0.03%	0.06%	0.06%

10.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Finland:²⁴⁶

- In 2012, environmental taxes generated revenue equivalent to 3.07% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Finland. These could generate EUR 1.5 billion in 2017, rising to EUR 3.1 billion in 2025 (both in real 2014 terms). This is equivalent to 0.74% and 1.54% of GDP in 2017 and 2025, respectively.
- The largest single contribution to revenue comes from the proposed harmonisation of the tax on electricity. This accounts for EUR 0.6 billion by 2025 (real 2014 terms), equivalent to 0.22% of GDP.
- The next largest contribution to revenue comes from the suggested harmonisation of the taxes on transport fuels. This accounts for EUR 0.6 billion by 2025 (EUR 0.6 billion) (real 2014 terms), equivalent to 0.22% of GDP.
- The proposed passenger aviation tax would account for EUR 0.5 billion by 2025 (EUR 0.5 billion) (real 2014 terms), equivalent to 0.20% of GDP.
- Revenue potential from a water abstraction tax would also raise EUR 0.5 billion by 2025 (EUR 0.5 billion) (real 2014 terms), equivalent to 0.18% of GDP.
- The suggested increase in vehicle taxes could contribute EUR 0.4 billion by 2025 (real 2014 terms), equivalent to 0.16% of GDP.

²⁴⁵ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

²⁴⁶ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- In addition, a range of more minor taxes could generate revenue of EUR 0.6 billion by 2025 (real 2014 terms), equivalent to 0.25% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 0.2 billion by 2025 (real 2014 terms), equivalent to 0.06% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €1.4 billion per annum could be raised in addition to the above.

11.0 Germany

11.1 Country Overview

11.1.1 Key Facts about the Economy and Tax System

- Germany experienced negative growth in 2003, with GDP decreasing by 0.4% in real terms against the previous year. Between 2004 and 2008 the country's economy experienced consistent growth, with GDP increasing annually by an average of 2% in real terms. Growth began to slow in 2008 and in 2009 Germany's GDP decreased by 5.1% in real terms. There was a fairly rapid return to growth in 2010 and 2011 which saw GDP growth comparable to pre-recession rates, this growth began to stall in 2012 and 2013, with GDP increasing by less than 1% in real terms in both years.²⁴⁷
- Germany's overall tax revenue (including social security contributions) as a percentage of GDP is just above the EU-28 average of 39.8%, at 40.4% (2012), with this share rate having held relatively stable over the past ten years.²⁴⁸
- The portion of Germany's total tax revenue coming from social security contributions is high at 41.7% (2012). The remainder is split fairly closely between direct and indirect taxes, at 30% and 28.8% respectively. Social security contributions as a percentage of the whole tax take have fallen since 2002, when they stood at 45.5%.²⁴⁹
- Environmental tax revenue amounted to 2.18% of Germany's GDP in 2012, representing a 10 year low for Germany, having fallen from 2.53% in 2002.²⁵⁰
- In 2012, the greater part of Germany's environmental tax revenue came from energy taxation, which amounted to 1.76% of GDP. In the same year, revenues from the taxation of transport (excluding fuel) amounted to 0.35% of the country's GDP and taxation of pollution and resources to 0.07% of GDP.²⁵¹
- 80.7% of Germany's environmental tax revenue came from taxes on energy in 2012. This percentage share has fallen over the past 10 years, and stood at 86.2% in 2002.²⁵²

²⁴⁷ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

²⁴⁸ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

²⁴⁹ Ibid.

²⁵⁰ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

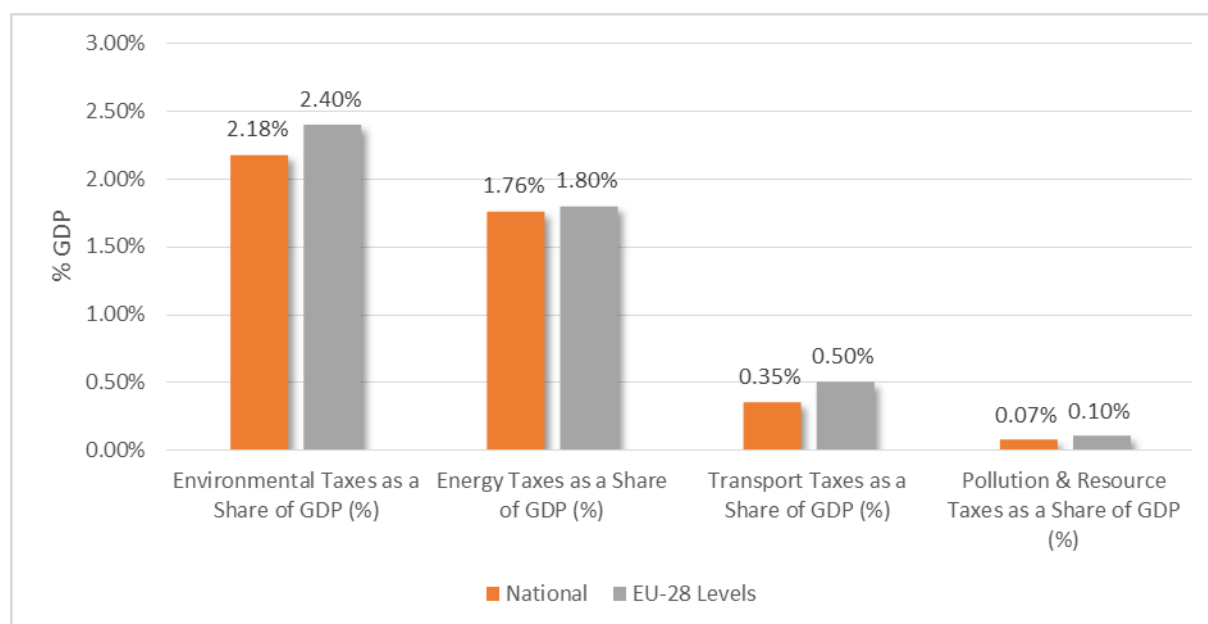
²⁵¹ Ibid.

²⁵² Ibid.

11.1.2 Relative Position within the EU

- In 2012, the total revenue from environmental taxes in Germany, as a proportion of the country's GDP, was below the EU-28 average of 2.4%. Energy taxes as a share of GDP were just below the EU-28 average of 1.8%, while the corresponding figure for transport (excluding fuel) taxes was markedly lower than the 0.5% average. The GDP percentage share of pollution and resource taxes was also lower than the EU-28 average 0.1% (see Figure 11-1).²⁵³

Figure 11-1: Environmental Taxes in Germany as a % of GDP vs EU-28 Levels (2012)



- Considering total environmental taxation revenue as a proportion of GDP, in 2012 Germany ranked 22nd in the EU-28. Its best ranking was for the percentage share of GDP contributed by pollution and resource taxes, where it was in 13th place among Member States. Against the corresponding measures for energy and transport (excluding fuel), Germany ranked 17th and 18th respectively (see Table 11-1).²⁵⁴

²⁵³ Ibid.

²⁵⁴ Ibid.

Table 11-1: Ranking of Germany's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	22
Energy Taxes as a Share of GDP (%)	17
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	18
Pollution & Resource Taxes as a Share of GDP (%)	14

Source: based on Eurostat data

11.1.3 Existing Environmental Taxes

The structure and rates for each tax, as well as full references, are given in the Appendix. This section summarises key aspects of the main environmental taxes, and for energy, describes how the rates compare with European averages and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC):

Energy Taxes:

- In Germany there are excise duties on fuels and electricity. These taxes are shown in Table 11-2, which shows how they compare to the obligatory minimum rates in the existing ETD and the EU-28 average and median rates.^{255,256} In Germany there is no provision for indexation of tax rates.

Table 11-2: Excise Duties on Fuels and Electricity in Germany – nominal rates

Excise Duty	Unit	Rate Applied in Germany	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels – propellant					
Unleaded Petrol	€ per 1000 litres	€654.50 ¹	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€470.40 ²	€330	€427	€405
Kerosene	€ per 1000 litres	€654.50	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€180.32	€125	€209	€180
Natural Gas	€ per GJ	€3.86	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use (excl. non-manufacturing business)					

²⁵⁵ European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

²⁵⁶ Bundesministerium des Justiz, 2014, *Energiesteuergesetz (EnergieStG) vom 15. Juli 2006 (BGBl. I S. 1534; 2008 I S. 660, 1007)*, das zuletzt durch Artikel 11 des Gesetzes vom 18. Juli 2014 (BGBl. I S. 1042) geändert worden ist.

Excise Duty	Unit	Rate Applied in Germany	Existing ETD Minimum	EU-28 Average	EU-28 Median
Gas Oil (Diesel)*	€ per 1000 litres	€46.01 ^{3, 4}	€21	€221	€163
Kerosene	€ per 1000 litres	€654.50	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€180.32	€41	€126	€125
Natural Gas	€ per GJ	€3.86	€0.30	€1.76	€1.50
Heating – Business Use (manufacturing industries)					
Gas Oil (Diesel)	€ per 1000 litres	€46.01 ⁴	€21	€221	€163
Kerosene	€ per 1000 litres	€654.50	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€25	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€45.45	€0.00	€82	€40
Natural Gas	€ per GJ	€1.14	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€0.3 ⁶	€0.15	€1.27	€0.31
Heating – Non-Business Use (and non-manufacturing business)					
Gas Oil (Diesel)	€ per 1000 litres	€61.35 ⁵	€21	€179	€125
Kerosene	€ per 1000 litres	€654.50	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€25	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€60.60	€0	€111	€42
Natural Gas	€ per GJ	€1.53	€0.3	€2.04	€0.94
Coal and Coke	€ per GJ	€0.3 ⁶	€0.3	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€15.37 ⁷	€0.5	€8.42	€1.03
Non-Business Use	€ per MWh	€20.50	€1.0	€14.53	€2.06
<p>Notes:</p> <ol style="list-style-type: none"> 1. This rate is for petrol with less than 10 mg sulphur per kg. Rate above this threshold is 669.80 2. This rate is for diesel with less than 10 mg sulphur per kg. Rate above this threshold is 485.70 3. €255.60 for agriculture, horticulture, pisciculture and forestry according to art 15(3); €61.35 for CHP with minimum 60% utilization rate (cf. note 5) with further reductions and exemptions available. 4. This rate is for diesel with less than 50 mg sulphur per kg. Rate above this threshold is 61.01 5. This rate is for diesel with less than 50 mg sulphur per kg. Rate above this threshold is 76.35 6. The tax rate as related to the net calorific value is €0.33/GJ. Coal is exempt where used for electricity production. 					

Excise Duty	Unit	Rate Applied in Germany	Existing ETD Minimum	EU-28 Average	EU-28 Median
7. The effective rate is reduced about 50% due to the 'peak adjustment' (spitzenausgleich), see annex.					
*. TAXUD tables provide no single tax rate for Germany.					

- Taxes on petrol and diesel were increased gradually over the years 1999 to 2003 with Germany's Ecological Tax Reform. Since 2003 the nominal tax rates for motor fuels have not been adjusted and as a result have declined significantly in real terms, although they remain well above the EU minimum. The real terms decline is 8.5 and 11.5 cents per litre for diesel and petrol, respectively. The discrepancy between tax rates for petrol and diesel has been fairly stable at about 20 cents per litre over the past two decades, but being close to 30 % of the petrol tax, it is among the highest within the EU.
- Discrepancies in tax rates for other fuel uses are notable in that use for heating purposes is generally less taxed than for commercial stationary motors (e.g. for natural gas). All tax rates for heating purposes are below the EU averages, except for kerosene that is not widely used in Germany. Heating for business purposes is taxed at even lower rates than for households. Heavy fuel oil in particular enjoys a considerable advantage and unlike other fuels its tax rates are not differentiated according to sulphur contents. Coal is taxed, but also at a relatively modest rate.
- Table 11-2 provides nominal tax rates without the more complex system of individual reductions which are available to business and including;
 - Process specific reductions in energy tax (§51 EnergieStG);
 - Peak adjustment (Spitzenausgleich) for energy tax (§55 EnergieStG);
 - Process specific reductions in electricity tax (§9b StromStG); and
 - Peak adjustment (Spitzenausgleich) for electricity tax (§10 StromStG).
- The above are explained in more detail in Appendix A.9.0.
- Coal that is used for the generation of electricity (>2 MW) is exempt from taxation, according to EnergieStG §37.²⁵⁷ Gas oil used for electricity production (>2 MW) is taxed at a reduced rate (EnergieStG §53) of €15 per hectolitre. When the same units are also producing heat, the share of energy for that purpose will be taxed. Energy use for flue gas treatment is liable too. However, when a combined heat and power unit is highly efficient with an energy utilization rate of at least 70%, it may obtain a complete exemption from the tax.

²⁵⁷ EnergiStG is Energiesteuergesetz; the energy taxation law.

➤ **Transport Taxes (excluding transport fuels):**

- The annual circulation tax for cars (Kfz-Steuer) registered after 1st July 2009 is based partly on CO₂ emissions, consisting of a base tax and a CO₂ tax. The base tax is €2 per 100 cm³ (petrol) and €9.5 per 100 cm³ (diesel). The CO₂ component is linear and set at a rate of €2 per g/km emitted above 95 g/km, whereas cars below the threshold are exempt. The OECD has observed that *“the CO₂-related component accounts for a relatively low share of the tax, which, in turn, represents a minor share of the total costs of vehicle ownership and use. This suggests that the incentive provided by the new tax component remains relatively weak”*.²⁵⁸ At the same time there are generous arrangements for company cars and commuters, and the tax expenditures on these may well be exceeding revenues from the annual circulation tax (Kfz-Steuer).
- There is no registration tax on purchase and imports of cars in Germany. Despite having the third highest rate of car ownership within the EU, the absence of registration taxes with the low circulation tax explains why, overall, Germany has a fairly low ranking with regards to the share of transport taxation in the EU-28 (see Section 11.1.2). The average CO₂ emissions of new cars has always been one of the highest within EU and remains so to this day (see also above).
- The road user charge for heavy-goods vehicles (Lkw-Maut) on motorways (and from 2012 certain federal roads) is differentiated according to vehicle exhaust classes for vehicles above 12 tonnes. According to the OECD the tax has helped to increase the uptake of low-emission freight vehicles.²⁵⁹ The road user charge does not apply to light duty vehicles. A study by the EEA suggested that, within the range of tax liability, the largest vehicles are treated too leniently, when considering more carefully the relative burdens on infrastructure and the environment.²⁶⁰ Only the Eurovignette countries and Germany do not apply their tolls to all vehicles above 3.5 tonnes (under Directive EC/2006/38, this was meant to be the case by 2012, and it is mandatory under Directive EC/2011/76).
- A tax on aviation was introduced in 2011 with tax rates differentiated in three categories according to flight distances. The tax rates were adjusted slightly downwards the following year in anticipation of the agreed inclusion of aviation in the European Emissions Trading Scheme (ETS) and have remained €7.5 for short distance, €23.43 for mid-distance, and €42.18 for long-distance flights.

➤ **Pollution and Resource Taxes:**

- The federal tax on nuclear fuels (Kernbrennstoffsteuer) has been imposed for the years 2011 to 2016 as part of a deal whereby nuclear power

²⁵⁸ OECD (2012) *Environmental performance reviews: Germany, Paris*.

²⁵⁹ OECD (2012) *Environmental performance reviews: Germany, Paris*.

²⁶⁰ Verkehrs Rundschau 21.3.2013: Wie hoch müsste die Deutsche LKW-maut sein ?

stations have had their lifetime extended. The tax base relates to the fuelrods and is weight-based with a rate of €145 per gram of plutonium or uranium. The legislative proposal justifies the tax on the grounds of the polluter-pays principle – the costs for final storage and management of nuclear waste are a federal responsibility for which a contribution is adequate for consolidation of the general budget.²⁶¹ It is classified by Eurostat as a pollution related tax and generates about €1.7 billion in annual revenues (the tax is, therefore, by far the most important pollution related tax, in terms of revenue take, on the National Tax List for Germany).

- Germany's waste water tax (Abwasserabgabe) was agreed in 1976 and phased in gradually from 1981 and onwards following legal implementation by the individual Länder by whom the tax is imposed and managed.²⁶² It is a classical emissions levy, not a user charge, and applies only for the direct discharges to surface waters from industries and sewage treatment plants, altogether about 10,000-12,000 entities. The tax base is a so called 'damage unit', which is defined as 50 kg of COD (chemical oxygen demand) or 25 kg nitrogen or 3 kg phosphorus.²⁶³ 50 kg of COD translates into about 2.5 inhabitant equivalents of organic pollution. Since 1997 the tax rate has been €35.79 per damage unit, or approximately €14 per inhabitant equivalent (not indexed with inflation). It is uniform across all German Länder. Discharges are controlled with permits, and a 50% reduction is provided to dischargers in compliance with permit requirements. The revenues from the tax are in most Länder ring-fenced for purposes related to improvements of water quality and are administrated by the Länder themselves. Despite annual revenues of €300 million it is not included on the National Tax List for Germany.²⁶⁴
- Germany's water abstraction levy (Wasserpfeennig; or Entgelt für Wasserentnahmen) is a natural resource tax that applies to water works and others abstracting from aquifers or surface waters. The legal framework is provided by legislation in each of the German Länder within the framework of the Federal Water Law (*Wasserhaushaltsgesetz*). In the same way as for the waste water tax it is managed by the Länder, since water management according to the German constitution is an area where the Länder have the competencies. It is a volumetric tax, with tax rates that are decided by the individual Länder government and which hence differ across Germany. The Länder also administrate the tax bases differently with respect to the rates for surface waters and groundwater. There are also significant differences with regard to tax liability for cooling

²⁶¹ Deutsche Bundestag, 2010. Entwurf eines Kernbrennstoffsteuergesetzes, Drucksache 17/3054.

²⁶² <http://www.economicinstruments.com/index.php/component/zine/article/166>-

²⁶³ Additionally the following parameters constitute one damage unit; 2 kg organic halogens, 20 g mercury, 100 g cadmium, 500 g chromium, 500 g nickel, 500 g lead, 1000 g zinc; see RIZA (1995) Waste water charge schemes in the European Union Part I-II, Lelystad.

²⁶⁴ Profile of the German water sector 2011; p28, Bonn
www.dvgw.de/fileadmin/dvgw/wasser/organisation/branchenbild2011_en.pdf

water and other specific uses. A level of about €0.05 per m³ seems most common, but tax rates up to €0.30 are in place (see Appendix for more details). From waterworks the tax is passed over to water consumers, where it accounts for about 5% of their water supply tariff. As levied at the point of abstraction it provides an incentive for water suppliers to reduce on leakage rates. These are, perhaps as a result, in Germany among the lowest in Europe, less than 10% and comparable to Denmark which also has an abstraction tax in place. In most Länder the revenues are ring-fenced for regional compensation schemes, whereas others do not tie it to specific statutory purposes.²⁶⁵ Abstraction for irrigation purposes is exempted in several Länder or subject to reduced rates. Two Länder, Bavaria and Rhineland-Palatinate, have not yet passed a law to implement the water abstraction tax, whereas two other have repealed theirs (i.e. Hesse and Thuringia). Saxony-Anhalt introduced one from 2012. The annual revenues for Germany as a whole have ranged from €200-400 million, but they do not feature on the National Tax List for Germany.

11.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform (EFR) in Germany. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

11.2.1 Current Status of EFR

Germany introduced an ecological tax reform programme over the years 1999 to 2003, where rates of petrol and diesel taxation were increased. At the same time electricity taxation was reintroduced. It succeeded the former Kohlepfennig for electricity that had been declared unconstitutional in 1995, while increasing the tax rates.²⁶⁶ The introduction, in 2005, of the German 'Lkw-Maut', a distance-based road-pricing scheme for heavy-goods vehicles on motorways, was agreed under the same government, but was technically not part of the tax reform. In 2006 taxes were introduced on coal with the implementation of the EU's Energy Taxation Directive.

Additional steps on market-based instruments generating fiscal revenues included the 2009 restructuring of vehicle taxation on the basis, at least in part, of CO₂ emission performance, and the introduction, in 2011, of an aviation tax and a tax on nuclear fuels.

As noted by the OECD, there is no overarching policy reform framework for environmental fiscal reform in Germany.²⁶⁷ In fact, the specialized government administration is hardly suited to pursue the linkages between fiscal policies and environment/climate concerns. The Finance Ministry tends to consider taxation mainly for its revenue raising purposes

²⁶⁵ *Water abstraction charges and compensation payments in Baden-Württemberg*, EPI-WATER report; www.feem-project.net/epiwater/docs/d32-d6-1/CS13_Buden-Wurtemberg.pdf

²⁶⁶ Annex Table A.7. (by Stefan Speck) pp. 288 in M.S. Andersen and P. Ekins, eds. (2009) *Carbon-energy taxation: lessons from Europe*, Oxford University Press.

²⁶⁷ OECD (2012) *Environmental performance reviews: Germany*, Paris.

and is not occupied with the regulatory aspects, whereas the Ministry for the Environment has a well-established tradition for command-and-control instruments, an approach which the Ministry has tended to prefer over using more market-based solutions to achieve environmental objectives.

The tax rates on motor fuels have not been adjusted since 2003 and have therefore been eroded by inflation to the level which they were at prior to the ecological tax reform. Exemptions from the energy tax for specific energy-intensive processes were introduced in 2006, when the energy tax law was introduced.

A government coalition treaty establishes that Lkw-Maut, the road-pricing scheme, should be extended to other federal roads. In addition a time, but not distance, dependent charge on passenger vehicles should be introduced from 2016. The main purpose appears to be that vehicles from other countries should be charged for their use of German roads (thereby ensuring that they contribute to the wear and tear of the country's road networks). There is a pledge to offset the burden for German passenger vehicles by providing a form of relief on other taxes (the annual circulation tax) corresponding to the envisioned revenue relating to road-pricing. The rather modest level of vehicle taxation in Germany appears to limit the level of ambition for such reform.

11.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Germany. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€18.6 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for kerosene (€17 per GJ). Finally, due to the existing rates for kerosene used for heating being very high relative to coal and gas the rates for heating fuels are equalised using the minimum rate for natural gas of €0.41/GJ.
- The existing electricity tax rates are harmonised according to the highest rate, which for Germany is non-business use.
- Table 11-3 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.
- In the case of propellants, the revisions imply a major increase in taxes on

LPG and natural gas. More importantly, however, the petrol / diesel differential, which significantly favours diesel at present, is closed as the revisions imply a 50% increase in the tax applied to diesel.

- In the case of fuels used in commercial and industrial motors, there is a major increase in the rates for gas oil, LPG to and natural gas to bring the taxes into alignment with existing rates on kerosene;
- On heating fuels (business and non-business), the changes imply significant uplifts in taxes on heavy fuel oil and gas oil, but most significantly, the tax on coal increases more than sevenfold.
- The existing electricity tax rates are harmonised according to the highest rate, which for Finland is non-business use (implying an increase for business users of around one third of current rates).

Table 11-3: Existing and New Minimum Rates Based upon Proposed Revisions to ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	655	655
Light fuel oil (diesel)	€ per 1000 litre	706	470
LPG (propellant)	€ per 1000 kg	913	180
Kerosene	€ per 1000 litre	710	655
Natural gas (prop)	€ per GJ	20	4
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	649	46
Kerosene	€ per 1000 litre	655	655
LPG	€ per 1000 kg	841	180
Natural gas	€ per GJ	18	4
Business Heating			
Gas oil	€ per 1000 litre	67	46
Heavy fuel oil	€ per 1000 kg	78	25
Kerosene	€ per 1000 litre	655	655
LPG	€ per 1000 kg	77	45
Natural gas	€ per GJ	1.53	1.14
Coal	€ per GJ	2.30	0.30

Energy Tax	Units	Suggested Rates	Existing Rates
Non-Business Heating			
Gas oil	€ per 1000 litre	67	61
Heavy fuel oil	€ per 1000 kg	78	25
Kerosene	€ per 1000 litre	655	655
LPG	€ per 1000 kg	77	61
Natural gas	€ per GJ	1.53	1.53
Coal	€per GJ	2.30	0.30
Electricity			
Electricity - business use	€ per MWh	20.50	15.37
Electricity - non-business use	€ per MWh	20.50	20.50

➤ **Transport Taxes:**

- Vehicles:** The taxes on transport in Germany are lower than average in the EU (0.36% of GDP compared to an average of 0.54% GDP), not least because Germany has no registration tax for passenger vehicles in place. GHG-emissions from road transport have been increasing slightly again since 2007.²⁶⁸ Emissions are not projected to decrease significantly in the business-as-usual scenario for climate policy, and the so called Energie-wende scenario relies on improving vehicle standards without behavioural change.²⁶⁹ Germany has, at 136 g CO₂ per km, one of the highest average emission levels for new passenger cars in the EU-28 (exceeded only by Baltic States, Bulgaria, Hungary, Poland and Cyprus) and still above the EU target of 130 g to be achieved by 2015.²⁷⁰ Hence, it is proposed that Germany should consider increasing vehicle taxes to the level of good practice (i.e. by 0.74% of GDP). More specifically, the OECD in its review has suggested that Germany should adjust the level of circulation taxes and introduce purchase taxes, while extending the system of road tolls to include light duty vehicles and passenger cars.²⁷¹ For heavy-goods vehicles the opportunities for road-pricing under the 2011 Euro-vignette Directive

²⁶⁸ <http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>

²⁶⁹ Umweltbundesamt, 2013, Politikszenerien für den Klimaschutz IV, p 249
<http://www.umweltbundesamt.de/sites/default/files/medien/461/publikationen/4412.pdf>

²⁷⁰ European Environment Agency (2012) *Monitoring CO₂ emissions from new passenger cars in the EU: summary of data for 2012*, Copenhagen.

²⁷¹ OECD (2012) *Environmental performance reviews: Germany, Paris*, page 44.

also deserves more serious consideration, in particular the opportunities for a more fine-tuned approach to reflect actual damage costs associated with the air pollution generated by specific vehicle categories.²⁷²

- **Aviation:** Germany has an aviation tax in place reflecting certain external costs of air transport including noise. It is suggested to adjust the aviation tax on air passenger flights, mainly with regard to the short distance flights, and to introduce a complementary tax on air freight. The suggested rates for the air passenger tax are €15 per passenger (flights within the country concerned), €25 per passenger (to other countries in the European Union), €50 per passenger (to other countries outside the European Union). The suggested air transport tax rate is €1.25 per tonne of freight. The suggested year of implementation is 2016.

➤ **Pollution and Resource Taxes:**

- **Aggregates:** Extraction of minerals for use as aggregates causes harm to the environment. An aggregates tax helps to reduce the environmental burden by increasing the price of raw materials, and so stimulates the market for recyclable materials. This ultimately reduces costs for businesses, but also is in-line with the flagship initiative 'A Resource Efficient Europe.'²⁷³ It is suggested that Germany implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this to keep the rate constant in real terms. The types of materials that could be covered by the tax are:
 - Marble
 - Chalk and dolomite
 - Slate
 - Limestone and gypsum
 - Sand and gravel

Not all of these are extracted in Germany. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste – landfill tax:** Germany is one of the few remaining Member States without a landfill tax. Member States bordering Germany with a landfill tax include Austria, Belgium, Czech Republic, Denmark, France, the Netherlands and Poland (Switzerland also has a landfill tax).²⁷⁴ Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive.

²⁷² European Environment Agency (2013) Road user charges for HGV – tables with external costs of air pollution, EEA Technical Report 1/2013, Copenhagen.

²⁷³ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

²⁷⁴ ETC/SCP (2013) *Overview of the use of Landfill Taxes in Europe*, April 2012, p.25, http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1

Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. However, Germany has implemented a restriction on landfilling for many years, and the introduction of a tax is unlikely to deliver much further improvement (or much additional revenue). Germany has, however, significant capacity for incineration and mechanical biological treatment. It is suggested that, in order to continue to drive waste up the hierarchy, the incineration of waste is subject to a tax of €15 per tonne, with other residual waste treatments treated in an equivalent manner. This tax is modeled as being introduced in 2019. Given that Germany is already importing waste for treatment at such facilities, it is suggested that waste prepared for treatment at recovery facilities overseas are also taxed, but imports are not.

- **Air pollution:** It is suggested that in order to generate improvements in air quality the following tax rates are introduced:
 - NO_x/VOC €1,000 per tonne
 - SO_x €1,000 per tonne
 - PM_{2.5} €2,000 per tonne

Such emissions taxes would operate much the same way as the waste water tax in Germany by providing incentives to full compliance with standards for emissions of air pollution, while minimizing on the allowable default periods. With their least-cost basis they will also provide more flexibility and cost-efficiency in abatement, than further tightening of standards. At the same time they could provide relief to the feed-in tariffs for electricity from renewables, because they will increase costs for use of fossil fuels at the margin. The above rates are appropriate for a start, while alignment to the higher rates in place in certain neighbouring countries should be analysed. Given the novelty of the tax rates it is suggested that there is a transition period from 2016 to proposed levels by 2020. The rates are then held constant in real terms. Part of the revenues could accrue to national or Länder budgets.

- **Water abstraction for public water supply:** To improve efficiency in the usage of the water supply system it is suggested to adjust tax rates in-line with 'good practice'. With relative price levels in Germany this would imply rates of €0.60 per m³ for non-business and €0.40 per m³ for business purposes. These rates could be indicated in federal law in the same way as the waste water tax rates to avoid tax competition among the Länder. Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.
- **Waste water:** Germany has a tax on water pollution, but to improve prevention of water pollution and reflect better the environmental burdens it is suggested to adjust tax rates in-line with 'good practice'. With relative price levels in Germany this would imply an increase from the present level of about €0.7 to a rate of €2.7 per kg BOD/COD. The tax rates for phosphorous, nitrogen and other emission parameters should be adjusted too, while taking into account estimates of their relative external costs. A

transition period from 2016 to 2019 is suggested, whereby the rates are increased gradually from an introductory rate to proposed levels. Existing exemptions should be reviewed and adjusted accordingly. The rates are then held constant in real terms. Part of the added revenues could accrue to national budget.

- **Pesticides:** There is currently no tax on pesticides in Germany. Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

It is suggested that Germany implements a pesticides tax at a rate of €5 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark), could go a long way to helping Germany achieve the risk indicators that are to be developed under the National Pesticide Action Plan.

- **Packaging:** A small number of Member States have implemented packaging taxes for packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested to apply the following good practice rates to all packaging placed on the market in Germany:
 - Paper and card €0.07 per kg
 - Plastic €1.40 per k
 - Wood €0.07 per kg
 - Metallic €1.69 per kg
 - Glass €0.25 per kg
- **Plastic bag tax:** There is currently no tax on single-use plastic bags in Germany. Plastic bags cause many environmental problems when littered in the environment, especially when they end up in the marine environment. Taxing single-use plastic bags significantly influences consumers purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the

EU.²⁷⁵ Therefore, it is suggested that Germany implements a tax on single-use plastic bags at a rate of €0.22 per bag (same rate as Ireland) from 2016, and following this to keep the rate constant in real terms.

- **Fertilisers:** A tax on the use of nitrogen in mineral fertilisers is suggested at a rate of €0.30 per kg N from 2016. This tax rate would reflect relative price levels for Germany relevant to EU schemes under the CAP, and support the prevention of groundwater contamination, ammonia evaporation, emissions of greenhouse gases and surface water eutrophication.

11.2.3 Summary of Revenue Outcomes

Table 11-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 11-4: Potential Additional Revenue from Environmental Fiscal Reform in Germany, million EUR (real 2014 terms)²⁷⁶

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	1,128	4,417	7,586
C&I / Heating	231	884	1,497
Electricity	1,693	1,693	1,693
<i>Sub-total Energy, million EUR</i>	3,052	6,994	10,777
<i>Sub-total Energy, % GDP</i>	0.11%	0.24%	0.37%
Transport Taxes (excluding transport fuels)			
Vehicle Taxes	4,274	17,101	21,403
Passenger Aviation Tax	2,387	4,390	3,969
Freight Aviation Tax	2.21	3.75	2.86

²⁷⁵ DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

²⁷⁶ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
<i>Sub-total Transport, million EUR</i>	6,663	21,495	25,375
<i>Sub-total Transport, % GDP</i>	0.23%	0.74%	0.88%
Pollution and Resource Taxes			
Landfill Tax - Inerts (C&D)	6	5	5
Incineration /MBT Tax	196	273	269
Air Pollution Tax	376	793	714
Water Abstraction Tax	801	1,799	1,632
Waste Water Tax	266	371	371
Pesticides Tax	253	494	516
Aggregates Tax	1,507	932	979
Packaging Tax	530	533	591
Single Use Bag Tax	627	133	147
Fertiliser Tax	0.230	0.423	0.400
<i>Sub-total Pollution & Resource, million EUR</i>	4,562	5,332	5,224
<i>Sub-total Pollution & Resources, % GDP</i>	0.16%	0.18%	0.18%
Total Potential for Environmental Fiscal Reform			
<i>Total, million EUR</i>	14,278	33,821	41,375
<i>Total Increase, % GDP</i>	0.49%	1.17%	1.43%

Table 11-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 11-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Germany, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	1,346
Increased Cost Recovery for Water Use	0
<i>Total</i>	1,346

11.2.4 Environmental Benefits

Table 11-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.9.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €3,487 million of benefits are anticipated annually by 2025 in real terms.

Table 11-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in Germany, million EUR (real 2014 terms)²⁷⁷

Tax Type	2017	2020	2025
Energy Taxes	113	309	484
Transport Taxes (excluding transport fuels)	393	784	784
Pollution and Resource Taxes	481	1,895	2,220
Total, million EUR	988	2,989	3,487
Total, % GDP	0.03%	0.09%	0.10%

11.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Germany:²⁷⁸

- In 2012, environmental taxes generated revenue equivalent to 2.18% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Germany. These could generate EUR 14.3 billion in 2017, rising to EUR 41.4 billion in 2025 (both in real 2014 terms). This is equivalent to 0.49% and 1.43% of GDP in 2017 and 2025, respectively.
- The largest single contribution to revenue comes from the suggested increase in vehicle taxes. This accounts for EUR 21.4 billion by 2025 (real 2014 terms), equivalent to 0.61% of GDP.

²⁷⁷ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

²⁷⁸ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- The next largest contribution to revenue comes from the suggested harmonisation of transport fuels with the rates set out in the proposed ETD. This accounts for EUR 7.6 billion by 2025 (real 2014 terms), equivalent to 0.21% of GDP.
- The Passenger Aviation Tax would account for EUR 4.0 billion by 2025 (EUR 4.0 billion) (real 2014 terms), equivalent to 0.11% of GDP.
- Revenue potential from the suggested changes to electricity taxes would raise EUR 1.7 billion by 2025 (real 2014 terms), equivalent to 0.05% of GDP.
- A water abstraction tax has also been suggested. This would contribute EUR 1.6 billion by 2025 (real 2014 terms), equivalent to 0.05% of GDP.
- In addition, a range of more minor taxes on could generate revenue of EUR 5.1 billion by 2025 (real 2014 terms), equivalent to 0.14% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 3.5 billion by 2025 (real 2014 terms), equivalent to 0.10% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €1.3 billion per annum could be raised in addition to the above.

12.0 Greece

12.1 Country Overview

12.1.1 Key Facts about the Economy and Tax System

- Greece experienced strong economic growth prior to the financial downturn. Between 2003 and 2007 the country's GDP increased by an average of 4.3% per annum in real terms. However, Greece was badly affected by the economic downturn which started in 2008 and from which the country has still not recovered. Greece experiencing negative growth in every year since 2008. On average, for the period 2008 to 2013 Greece's GDP has decreased by 4.4% per annum in real terms.²⁷⁹
- Greece's overall tax revenue (including social contributions) as a percentage of GDP is below the EU-28 average of 39.8%, at 36.6% (2012). This has recently risen, however, since dropping from 35.7% in 2002 to a low of 32.8% in 2009.²⁸⁰
- In 2012, total tax revenue in Greece was made up of 27.9% direct taxes, 34.7% indirect taxes, and 37.4% social contributions. Since 2002, the contribution made by direct taxes has risen, and that made by indirect taxes and social contributions has fallen in both cases.²⁸¹
- In 2012, environmental taxes amounted to 2.85% of Greece's GDP, the highest proportion in 10 years. In 2002 environmental taxes amounted to 2.3% of GDP, and hit its lowest level in 2008 when revenues from these taxes were equivalent to 1.95% of GDP.²⁸²
- The highest proportion of revenues from environmental taxes in 2012 came from energy taxes, which, at the time, amounted to 2.17% of Greece's GDP. The remainder came from taxation on transport (excluding fuel), which was equivalent to 0.68% of GDP. According to Eurostat, Greece does not generate any revenue from taxes placed on pollution and resources.²⁸³
- The taxation of energy provided 76.1% of Greece's total environmental tax revenue for 2012. This percentage has risen over the past 10 years from 60% in 2002.²⁸⁴

²⁷⁹ Eurostat (2014) Real GDP Growth Rate - Volume, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

²⁸⁰ Eurostat (2013) Main National Accounts Tax Aggregates [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

²⁸¹ Ibid.

²⁸² Eurostat (2014) Environmental tax Revenues [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

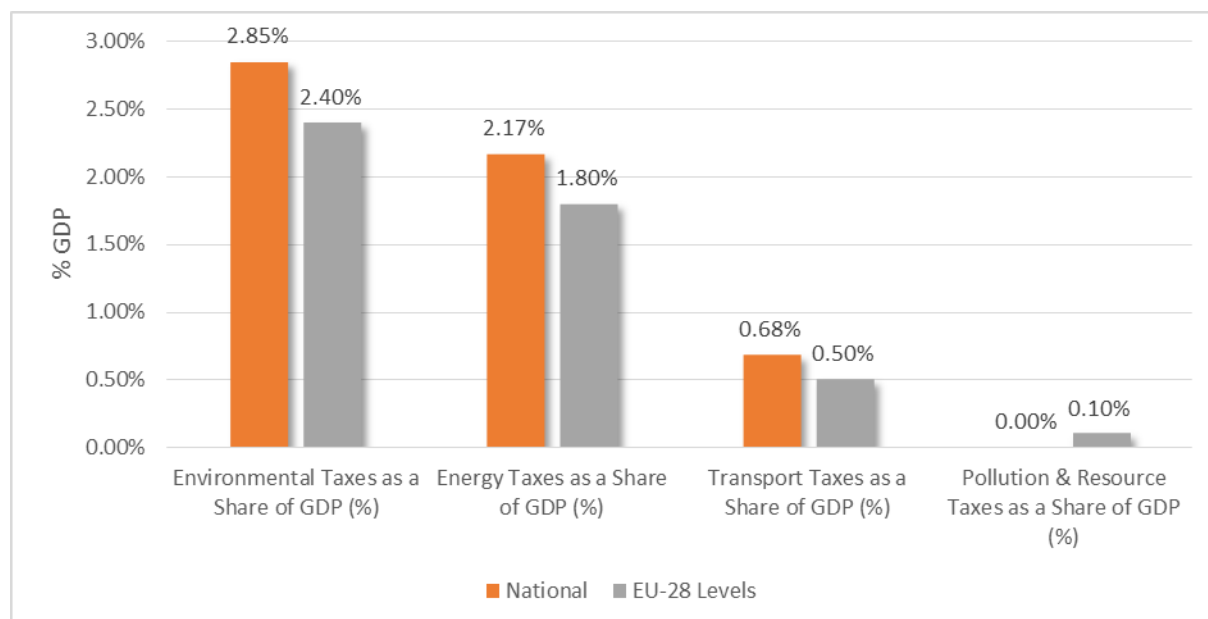
²⁸³ Ibid.

²⁸⁴ Ibid.

12.1.2 Relative Position within the EU

- In 2012, revenue from environmental taxes as a proportion of GDP was notably higher for Greece than the EU-28 average of 2.4%. The share of revenue from the taxation of energy was higher than the average of 1.8% of GDP, and the share of revenue from the taxation of transport (excluding fuel) was higher than the average of 0.5% GDP. However, Greece is not recorded as receiving any revenue from taxes on pollution or resource, and so is below the corresponding EU-28 average of 0.1% GDP by this measure (see Figure 12-1).²⁸⁵

Figure 12-1: Environmental Taxes in Greece as a % of GDP vs EU-28 Levels (2012)



- In 2012, taking revenue from environmental taxation as a share of GDP, Greece ranked 8th in the EU-28. It also ranked 8th in relation to energy taxes, and ranked 10th for the amount of revenue generated from transport taxes (excluding fuel) as a proportion of GDP. Lacking any revenue from pollution and resource taxes, Greece ranked joint 27th with Cyprus (see Table 12-1).²⁸⁶

²⁸⁵ Ibid.

²⁸⁶ Ibid.

Table 12-1: Ranking of Greece's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	8
Energy Taxes as a Share of GDP (%)	8
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	10
Pollution & Resource Taxes as a Share of GDP (%)	=27

Source: based on Eurostat data

12.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.10.0 (see separate document). This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon nominal GDP figures for the same year as the reported revenues.^{287,288}

➤ Energy Taxes:

- The Greek excise duties on fuels and electricity are shown in Table 12-2 alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 12-2: Standard Rates of Excise Duties on Fuels and Electricity in Greece

Excise Duty	Unit	Rate Applied in Greece	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	€ per 1000 litres	€681	€421	€585	€583
Unleaded Petrol	€ per 1000 litres	€670	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€330	€330	€427	€405
Kerosene	€ per 1000 litres	€330	€330	€440	€405

²⁸⁷ Eurostat (2014) Euro/ECU Exchange Rates – Annual Data [ert_bil_eur_a], Accessed 5th August 2014, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ert_bil_eur_a&lang=en

²⁸⁸ Eurostat (2014) GDP and Main Components - Current Prices [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Excise Duty	Unit	Rate Applied in Greece	Existing ETD Minimum	EU-28 Average	EU-28 Median
Liquid Petroleum Gas	€ per 1000 kg	€330	€125	€209	€180
Natural Gas	€ per GJ	-	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€330	€21	€221	€163
Kerosene	€ per 1000 litres	€330	€21	€283	€330
Liquid Petroleum Gas ⁴	€ per 1000 kg	€120	€41	€126	€125
Natural Gas	€ per GJ	€1.50	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel) ²	€ per 1000 litres	€330	€21	€221	€163
Kerosene	€ per 1000 litres	€330	€0	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€38	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€60	€0	€82	€40
Natural Gas	€ per GJ	€1.50	€0.15	€1.36	€0.46
Coal and Coke ⁵	€ per GJ	€0.30	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel) ²	€ per 1000 litres	€330	€21	€179	€125
Kerosene	€ per 1000 litres	€330	€0	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€38	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€60	€0	€111	€42
Natural Gas	€ per GJ	€1.50	€0.30	€2.04	€0.94
Coal and Coke ⁵	€ per GJ	€0.30	€0.30	€1.77	€0.32
Electricity					
Business Use ⁶	€ per MWh	€2.50 - €5.00	€0.50	€8.42	€1.03
Non-Business Use ⁶	€ per MWh	€2.20 - €5.00	€1.00	€14.53	€2.06
Notes:					
<ol style="list-style-type: none"> Industrial use of gas oil in production activities is eligible for a refund of €125 per 1,000 litres, and a refund of €264 per 1,000 litres is applied for gas oil used for agricultural purposes. Following equalisation of the excise on gas oil for heating, with that used as propellant to €330 per 1,000 litres of fuel, a system of tax refunds which vary in accordance with income and 					

Excise Duty	Unit	Rate Applied in Greece	Existing ETD Minimum	EU-28 Average	EU-28 Median
<p><i>geographical region was introduced for households and a standard refund for farmers.</i></p> <p>3. <i>Bio-diesel is taxed at the same rate as gas oil.</i></p> <p>4. <i>A special rate of €0.29 is applied for LPG used in agriculture.</i></p> <p>5. <i>When used for electricity production, mineralogical and metallurgical processes and for chemical reductions, an exemption on the excise duty on coal and coke is applied.</i></p> <p>6. <i>The lower rates for electricity apply to high voltage, the higher rates to other voltages. Electricity of solar, wind, wave, tidal or geothermal origin is not subject to excise duties. Furthermore, electricity used in agriculture is also exempt.</i></p>					

Sources: European Commission - Taxation and Customs Union (2014) Excise Duty Tables: Part II - Energy Products and Electricity, July 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rares/excise_duties-part_ii_energy_products_en.pdf; and European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- All of Greece's excise duty rates are above the EU ETD minimum. Additionally, many rates are above the EU average, notably gas oil and kerosene rates, though not when used as a propellant, and petrol rates. Some rates are also below the EU average, particularly most natural gas rates and rates for electricity.
- Additional rates, outlined in Appendix A.10.0 apply to other energy products, including aircraft petrol, aromatic hydrocarbons and other light oils.
- Several uses of energy products are exempt from excise duties. These include energy products used by aircraft (except private leisure flights), sea transport vessels or vessels fishing within EU waters and diesel oil, kerosene, white spirit and other light oils used as raw material for production purposes.²⁸⁹
- Revenue from all excise duties on mineral oil products in 2012 (the latest year for which figures are available): €3.97 billion (equivalent to 2.06% of GDP).²⁹⁰
- Special Levy for the Reduction of GHGs ('Ειδικό Τέλος Μείωσης Εκπομπών Αερίων Ρύπων' (ETMEAP)):
 - This is a source of financing for the renewable energy special account which supports the installation of renewable energy

²⁸⁹ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

²⁹⁰ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

systems.²⁹¹ It is a levy charged on actual usage of electricity and is added to customer bills each month.

- In December 2013, the Greek government decided to increase the levy by 97% on average, however this decision was revised in spring 2014 and the imposed increase on 1 April 2014 was restricted to an average of 32%.²⁹² ²⁹³ The levy varies depending on the type of customer – after the increase on 1 April 2014, the average rate is of the levy is €19.73 / MWh, with domestic customers paying €26.30 / MWh.²⁹⁴
- Revenue: in 2012 (the latest year for which figures are available): €178 million (equivalent to 0.09% of GDP).²⁹⁵
- Special Duty 0.5%: ²⁹⁶
 - As with the previous levy, this is collected on all electricity bills. The rate for all types of electricity users is 0.5%. The basis of the calculation is the cost of the actual electricity usage plus the value of the excise duty (but excluding the value of the Special Levy for the Reduction of GHGs). Revenue: unknown.

➤ **Transport Taxes (excluding transport fuels):**

- There are three types of transport taxes in Greece, excluding excise duties on transport fuels. These are a registration duty, a circulation duty and an additional annual ‘luxury tax’ imposed on large vehicles.
- Motor vehicle registration duty (Τέλος ταξινόμησης οχημάτων):
 - This is a one-off registration duty paid as a set percentage of the total wholesale price of the vehicle plus any insurance and transport costs. The percentage is determined by the engine size and the emissions standard of the vehicle and ranges from 5% to

²⁹¹ Ecologic Institute, and eclareon (2014) Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Greece, Report for European Commission - DG Clima, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/gr_2014_en.pdf

²⁹² Ecologic Institute, and eclareon (2014) Assessment of Climate Change Policies in the Context of the European Semester - Monthly Progress Update: 01 February - 30 February (Issue 11/2014), Report for European Commission - DG Clima, March 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/progress_201402_en.pdf

²⁹³ Ecologic Institute, and eclareon (2014) Assessment of Climate Change Policies in the Context of the European Semester - Monthly Progress Update: 01 April - 30 April (Issue 13/2014), Report for European Commission - DG Clima, May 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/progress_201404_en.pdf

²⁹⁴ Ibid.

²⁹⁵ Eurostat (2014) Revenue Data by Individual Tax (National Tax List), accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

²⁹⁶ Public Power Corporation S.A.-Hellas (no date) Special Duty 5% (L. 2093/92), accessed 8 September 2014, <https://www.dei.gr/en/eidiko-telos-5-eidtel-5-n-209392>

350% of the aforementioned price for passenger cars, with smaller vehicles and better emissions classes paying a lower rate. For second-hand vehicles, the rates are reduced by a set percentage, determined by the type, age and mileage of the vehicle.²⁹⁷

- All electric vehicles and hybrid vehicles which comply with the European directives on emissions standards are exempt from the duty. Additionally, vehicles used as ambulances, by people with disabilities and by certain faith-based organisations are also exempt.
- Details of certain rates are included within Appendix A.10.0. Full details of all rates are available on the TAX-UD database.²⁹⁸
- Revenue in 2012 (the latest year for which figures are available): €100 million (equivalent to 0.05% of GDP).
- Circulation duty on motor vehicles (Τέλη κυκλοφορίας):²⁹⁹
 - This is an annual duty paid on vehicles (including buses and lorries) and motorcycles. The bases for the level of tax are the following:
 - Engine size for private cars registered up to 31 October 2010;
 - CO₂ emissions for private cars registered after 1 November 2010;
 - Engine size for motorcycles;
 - Gross weight for lorries; and
 - Number of passenger seats for buses.
 - For private cars registered up to 31 October 2010, rates range from €22 per year to €1,320 per year and for cars registered after 1 November 2010, rates range from €0.90 per g/km CO₂ for emissions greater than 100 g/km CO₂ to €3.40 per g/km CO₂ for the most polluting vehicles.
 - All rates for private and public use vehicles are presented in Appendix A.10.0.
 - Exemptions related to emissions levels include hybrid vehicles with engine sizes up to 1,929 cc, electric vehicles registered up through

²⁹⁷ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

²⁹⁸ European Commission (2014) Taxes in Europe Database – Motor Vehicles Tax: Car Registration Tax, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=216/1388754775&taxType=Other+indirect+tax

²⁹⁹ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

31 October 2010 and private vehicles registered after 31 October 2010 with CO₂ emissions below 100 g/km.

- The duty in its present form has been in place since 2011. Prior to this, the duty was based on the vehicle's engine capacity alone.³⁰⁰
- Revenue in 2012 (the latest year for which figures are available): €1.21 billion (equivalent to 0.63% of GDP).³⁰¹
- Tax on Luxurious Living (Φόρο Πολυτελούς Διαβίωσης):
 - The 'luxury tax' is imposed annually on owners of swimming pools, aircraft and vehicles with engines larger than 1,929 cc.³⁰² The tax was initially imposed for one year in 2011 before being implemented as an annual tax in 2013.³⁰³ The rate is flat-rate, based on the engine size and the age of the vehicle and ranges from just under €300 to over €5,000 per year. Details of rates are included in Appendix A.10.0.³⁰⁴
 - Vehicles with engines smaller than 1,929 cc as well as vehicles more than 10 years old are exempt from the tax.³⁰⁵
 - The revenue generated by this tax is unknown but in 2013, the tax was expected to generate between €100 million and €130 million (0.05% to 0.07% of GDP).³⁰⁶
- Air passenger tax ('spatosimo'):³⁰⁷
 - This tax has been in place since 1992 and is charged on all passengers flying into or out of a Greek airport. Revenues are used to modernise Greek airports. There are two rates depending on the origin of the flight: €12 per passenger to and from another EU airport; €24 per passenger to and from a non-EU airport.

³⁰⁰ Ministry of Environment, Energy and Climate Change (Hellenic Republic) (2010) Fifth National Communication to the United Nations Framework Convention on Climate Change, January 2010, http://unfccc.int/resource/docs/natc/grc_nc5.pdf, p. 127

³⁰¹ Eurostat (2014) Revenue Data by Individual Tax (National Tax List), accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁰² Greek Reporter (2014) Rich Greeks Face Luxury Tax, accessed 28 August 2014, <http://greece.greekreporter.com/2013/09/13/rich-greeks-face-luxury-tax/>

³⁰³ Ibid.

³⁰⁴ TO BHMA (Tovima) (2013) Έρχονται τα σημειώματα του φόρου πολυτελείας για ΙΧ άνω των 1.929 κ.εκ., accessed 28 August 2014, <http://www.tovima.gr/finance/article/?aid=542754>

³⁰⁵ Ibid.

³⁰⁶ TO BHMA (Tovima) (2013) Έρχονται τα σημειώματα του φόρου πολυτελείας για ΙΧ άνω των 1.929 κ.εκ., accessed 28 August 2014, <http://www.tovima.gr/finance/article/?aid=542754>

³⁰⁷ GTP Headlines (2014) Greece's 'Spatosimo' Air Passenger Tax to be Revised, accessed 31 August 2014, <http://news.gtp.gr/2014/04/29/greeces-spatosimo-air-passenger-tax-revised/>

- Proposals have been tabled to reduce the tax from October 2014. The revenue from the tax is unknown.
- In addition, although not taxes, there are road tolls in place in many parts of Greece. These are levied for motorways and some tunnels and bridges. Per stretch of road or bridge, they range from €2 to €3 for several stretches of motorways to €13.20 for the Rio-Antirio Bridge.^{308,309}

➤ Pollution and Resources:

- Pollution and resource taxes in Greece are extremely limited in scope. The only tax that has been identified through this research is the recently imposed landfill tax:
- Landfill Tax:
 - A landfill tax was included within the new framework Law 4042/2012 on waste management which transposes the Waste Framework Directive 2008/98/EC and the Directive 2008/99/EC and was due to be implemented as of 1 January 2014.
 - The landfill tax rate for 2014 is €35 per tonne, with planned increases of €5 per tonne per year to €60 per tonne by 2019.
 - The tax is paid by organisations or companies disposing municipal and construction and demolition waste, though the tax rate is not dependent on the type of waste.
 - The revenue is unknown as the tax has only been in force since January 2014.

12.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Greece. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

12.2.1 Current Status of EFR

As outlined in Section 12.1.1, the Greek economy has been under severe strain since August 2009, with a large budget deficit which was estimated at €30.9 billion (13.4% of GDP) at the end of 2009.³¹⁰ In the spring of 2010, the Government sought aid from the EU and the International Monetary Fund, who covered the financial deficits of the budget

³⁰⁸ Rhino Car Hire (2013) Greek Toll Roads - A Guide to Toll Roads in Greece, accessed 8 September 2014, <http://www.rhinocarhire.com/Car-Hire-Blog/November-2013/Greek-Toll-Roads.aspx>

³⁰⁹ The AA (no date) European Tolls: Search Results for Greece, accessed 8 September 2014, http://www.theaa.com/allaboutcars/overseas/european_tolls_results.jsp?country=Greece

³¹⁰ Ministry of Finance (Hellenic Republic) (2010) State Budget Execution Bulletin: December 2010, December 2010, http://www.minfin.gr/content-api/f/binaryChannel/minfin/datastore/6d/39/63/6d3963ba1158e373e4aaefb30e34379e91473b45/application/pdf/BULLETIN_7_2014.pdf

on the basis of agreements, providing for extensive restructuring of public finances and other structural reforms.

As a result, public finances recovered and the most recent figures (for the months of January to July 2014) show a budget deficit of only €1.7 billion, equivalent to only 0.9% of estimated GDP.³¹¹ However, the 5 year long recession has had a severe socio-economic impact on the people of Greece. Most recent figures indicate that €68 billion is owed to the state,³¹² and that almost 2.5 million people are currently unable to repay their debts to the state.³¹³ Furthermore, it is noted that, although Greece has comparatively high rates of taxation in relation to other EU member states, the revenue is not correspondingly high owing to an inefficient collection system and a culture of tax evasion.³¹⁴ Indeed, the recent improvement in the budget deficit reported above is largely the outcome of a re-organisation of the tax collection services.

The Greek government considers that the need to restrain public spending puts serious limitations on introducing new environmental regulations and measures, for example, in the realm of improving waste management in Greece.³¹⁵

Many changes have been made to the taxation system in recent years, both in order to shift taxes away from labour and onto consumption, including using environmental taxation to a greater degree, and to increase revenue outcomes by improving and streamlining tax collection systems. Additionally, new taxes have been introduced, including a solidarity tax on income, a new luxury tax on private owners of large cars, yachts, aircraft and swimming pools, and, most recently, a new property tax ('ΕΝΦΙΑ') which will be applied from 1 July 2014 to 31 December 2014 on all private landlords and landowners. This is based on the type and size of the property and land owned. With the introduction of this tax, it will be the first time that farmers will have to pay property tax.³¹⁶

When looking at the status of (and potential for) environmental fiscal reform in Greece, there are thus many factors that must be considered. First of all, many changes have already been implemented in the last few years: these include many increases in excise duties on energy products, with excise duties on electricity and natural gas introduced in 2011 and the equalisation of heating oil and diesel tax rates. The resulting increase in

³¹¹ Ministry of Finance (Hellenic Republic) (2014) State Budget Execution Monthly Bulletin: July 2014, August 2014, http://www.minfin.gr/content-api/f/binaryChannel/minfin/datastore/6d/39/63/6d3963ba1158e373e4aaefb30e34379e91473b45/application/pdf/BULLETTIN_7_2014.pdf

³¹² Η ΚΑΘΗΜΕΡΙΝΗ (Kathimerini) (2014) Στα 7,2 δισ. ευρώ τα νέα ληξιπρόθεσμα χρέη προς την εφορία στο 7μηνο, accessed 8 September 2014, <http://www.kathimerini.gr/781208/article/oikonomia/ellhnikh-oikonomia/sta-72-dis-eyrw-ta-nea-lh3ipro8esma-xreh-pros-thn-eforia-sto-7mhno>

³¹³ Η Αυγή Online (Avgi Online) (2014) Φοροαπόγνωση για 2.428.233 πολίτες, accessed 8 September 2014, <http://www.avgi.gr/article/3802711/foroapognosi-gia-2-428-233-polites>

³¹⁴ The Times of Change (Greece) Greece Ranks 8th in Taxes Among EU 28 Countries, accessed 31 August 2014, <http://www.thetoc.gr/eng/economy/article/greece-ranks-8th-in-taxes-among-eu-28-countries>

³¹⁵ Ministry of Environment, Energy and Climate Change (Greece) (2013) Comments of the Ministry of Environment, Energy and Climate Change on the Waste Management Roadmap for Greece proposed by DG ENV, March 2013, http://ec.europa.eu/environment/waste/framework/pdf/GR_Comments_Roadmap.pdf

³¹⁶ See <http://www.enfia.gr/calc.aspx>

heating oil tax (450%) has led both to a sharp decline in demand for heating oil, and a switch to other fuels (such as waste wood, pellets, etc) to heat homes, contributing to increases in air pollution.³¹⁷ However, in the realm of energy taxation, some measures are also in place to reduce the tax burden on some consumers, with tax refunds being allocated to low-income households and to farmers for fuel for agricultural machinery. Refunds to farmers alone totalled €53 million in May 2014. A second instalment is expected in October 2014.³¹⁸

Regarding vehicle taxes, proposals have been made to change the circulation tax in order to reduce the tax burden from 2015 onwards. This could include removing the luxury tax on large vehicles. There is also interest in changing the tax base of the circulation tax from the vehicle's cubic capacity to the distance travelled, the so-called 'Dutch model'. Finally, vehicles with emissions-ratings lower than 100 g CO₂/km currently pay no circulation tax; new proposals for the circulation tax are considering lowering this limit to 80 or 90 g CO₂/km.³¹⁹ It is estimated that 250,000 vehicles have been taken off the road in recent years due to high circulation taxes and insurance costs; a revised circulation tax could result in the Greek government receiving €15 million in additional tax revenue in 2015 from those cars being put back on the road.³²⁰

Finally, it is worth noting some recent changes or proposals relating to a number of smaller environmental taxes. For example, reports suggest that the air passenger tax may be reduced from October 2014, in order to boost tourism in Greece.³²¹ Secondly, a landfill tax was introduced for the first time in Greece from January 2014. Finally, in relation to single use plastic bags, a pilot was run in Athens in 2008 to try and reduce their impact on the environment. It is not known whether this pilot included a charge for plastic bags, but with proposed amendments to the Packaging Waste Directive requiring a 80% reduction in the number of plastic bags consumed by 2019, a single use plastic bag tax may be easier and less controversial to implement than other new environmental taxes.³²²

As mentioned above, Greece receives financial support from the European Central Bank and the International Monetary Fund through the Economic Adjustment Programme. There are terms and conditions associated with this support programme and so as not to

³¹⁷ Ecologic Institute, and eclareon (2014) Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Greece, Report for European Commission - DG Clima, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/gr_2014_en.pdf, p.10

³¹⁸ Agrotyposgr (2014) Από Οκτώβριο η 2η δόση για την επιστροφή φόρου πετρελαίου στους αγρότες, accessed 8 September 2014, <http://www.agrotypos.gr/index.asp?mod=articles&id=87417>

³¹⁹ Newsbomb (2014) Τέλη κυκλοφορίας με το... χιλιόμετρο, accessed 8 September 2014, <http://www.newsbomb.gr/chrhma/story/399876/teli-kykloforias-me-to-hiliometro>

³²⁰ Ημερησία (Imerisia) (2014) ΙΧ: Προς κατάργηση ο Φόρος Πολυτελείας, accessed 8 September 2014, <http://www.imerisia.gr/article.asp?catid=27199&subid=2&pubid=113258012>

³²¹ GTP Headlines (2014) Greece's 'Spatosimo' Air Passenger Tax to be Revised, accessed 31 August 2014, <http://news.gtp.gr/2014/04/29/greeces-spatosimo-air-passenger-tax-revised/>

³²² Η ΚΑΘΗΜΕΡΙΝΗ (Kathimerini) (2014) Φρένο στη χρήση πλαστικών σακουλών από τον Σεπτέμβριο, του Γιάννη Παλαιολόγου | Kathimerini, accessed 1 September 2014, <http://www.kathimerini.gr/777722/article/epikairothta/perivallon/freno-sth-xrhsh-plastikwn-sakoylwn-apo-ton-septemvrio>

duplicate these, no country specific recommendations are thus applied to Greece as part of the European Semester programme.

12.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Greece. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€19.1 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€7.9 per GJ). Finally, due to the existing rates for gas oil and kerosene used for heating being very high relative to coal and gas the rates for heating fuels are equalised using the minimum rate for natural gas of €0.38 per GJ.
- Table 12-3 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the 'good practice' on energy taxes (Section 5.1). The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.
- In the case of propellants, the revisions imply a major increase in taxes on LPG and natural gas. More importantly, however, the petrol / diesel differential, which significantly favours diesel at present, is closed as the revisions imply that the tax applied to diesel is more than doubled, redressing the enormous imbalance in taxes between diesel and petrol, and a similar change for kerosene.
- In the case of fuels used in commercial and industrial motors, there is a major increase in the rates for LPG and natural gas to bring the taxes into alignment with existing rates on gas oil.
- On heating fuels (business and non-business), the changes imply significant uplifts in taxes on heavy fuel oil and LPG, and significantly, the tax on coal increases more than sevenfold.
- The existing electricity tax rates are harmonised according to the highest rate, which for Greece is business use, but the change is relatively small.

Table 12-3: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	670	670
Light fuel oil (diesel)	€ per 1000 litre	723	330
LPG (propellant)	€ per 1000 kg	934	330
Kerosene	€ per 1000 litre	727	330
Natural gas (prop)	€ per GJ	20	0
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	330	330
Kerosene	€ per 1000 litre	332	330
LPG	€ per 1000 kg	422	120
Natural gas	€ per GJ	9	2
Business Heating			
Gas oil	€ per 1000 litre	330	330
Heavy fuel oil	€ per 1000 kg	77	38
Kerosene	€ per 1000 litre	330	330
LPG	€ per 1000 kg	75	60
Natural gas	€ per GJ	1.50	1.50
Coal	€ per GJ	2.27	0.30
Non-Business Heating			
Gas oil	€ per 1000 litre	330	330
Heavy fuel oil	€ per 1000 kg	77	38
Kerosene	€ per 1000 litre	330	330
LPG	€ per 1000 kg	75	60
Natural gas	€ per GJ	1.50	1.50
Coal	€per GJ	2.27	0.30
Electricity			

Energy Tax	Units	Suggested Rates	Existing Rates
Electricity - business use	€ per MWh	3.75	3.75
Electricity - non-business use	€ per MWh	3.75	3.60

➤ **Transport Taxes (excluding fuel):**

- Vehicles:** The taxes on transport in Greece are slightly higher than average in the EU (0.68% of GDP compared to the EU-28 level of 0.50% GDP). However, it is suggested taxes on transport should be increased further by 0.04% of GDP to bring the country in line with the ‘good practice’ rates outlined in Section 5.2.1 above. Increasing vehicle taxation could further increase revenue raised, and also, increase differentiation between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future. If one was seeking to align with the proposals from the Commission of 2005, it could be suggested that the main increase could relate to the circulation tax (Τέλη κυκλοφορίας). This is already differentiated according to CO₂ emissions for newer vehicles, and could be further amended to reflect the emissions performance of vehicles. However, given ongoing concerns (mentioned above) regarding the level of circulation taxes, an alternative might be to consider application of taxes on HGVs. Although some tolls appear to be in place, these appear to be relatively low,³²³ and there is scope for their expansion, as well as for the application of externality based taxes in line with Directive 2011/76/EC. As noted above, some of these types of tax appear to be already under discussion within Greece. The increase is phased in over the period from 2016 to 2021.
- Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. An air passenger tax was implemented in Greece in 1992.³²⁴ Current tax rates are €12 per passenger for flights between 100 km and 750 km, and €24 per passenger for flights above 750 km. It is recommended to increase these rates to €15 per passenger (flights within Greece), €25 per passenger (to other countries in the European Union), and €50 per passenger (to other countries outside the European Union). The suggested air transport tax rate is €1.25 per tonne of freight. The year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. As noted the Good Practice section, the way in which the picture unfolds concerning the

³²³ See Ricardo-AEA (2014) *Evaluation of the Implementation and Effects of EU Infrastructure Charging Policy since 1995*, Final Report to DG MOVE, January 2014 (Figure 2.3).

³²⁴ Personal communication with Yannis Palaiokrassas

proposals from ICAO might influence future levels and / or design of this tax.

➤ **Pollution and Resource Taxes:**

- **Aggregates:** There is currently no tax on aggregates in Greece on a national level. An aggregates tax can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This is in-line with the flagship initiative 'A Resource Efficient Europe'.³²⁵ It is suggested that regional rates set by the levy on landscape protection and nature conservation are set at €2.40 per tonne from 2017, and that thereafter, they are kept constant in real terms. The types of materials that could be covered by the tax are:
 - Marble;
 - Chalk and dolomite;
 - Slate;
 - Limestone and gypsum; and
 - Sand and gravel.

The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste:** The recent introduction of a landfill tax in Greece should support the development of waste management. Assuming this does rise to €60 per tonne by 2019 as planned, we would suggest that this should stimulate significant change in waste management within the country. In order to ensure that the main incentive is to move waste management towards the upper tiers of the hierarchy, we would suggest that – notwithstanding the limited availability of such treatment in Greece at present – a tax on incineration is also introduced. We suggest that a rate of €15 per tonne is appropriate, and that equivalent taxes should apply to other means of treating residual waste. This should be phased in to the level of €15 per tonne over the same period as the landfill tax increases are planned. We suggest these taxes should be indexed to an appropriate measure of inflation.
- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. Greece is not one of these. It is suggested that the following rates could be applied to all packaging placed on the market in Greece:
 - Aluminium €197 per tonne
 - Plastic €64 per tonne

³²⁵ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

- Steel €54 per tonne
- Paper and card €20 per tonne
- Glass €18 per tonne
- Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2017 and be kept constant in real terms.

- **Single-use carrier bag tax:** There is currently no tax on single-use carrier bags in Greece. Of these bags, plastic bags in particular cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the riverine, or marine, environment. Moreover in countries with high level of tourism such as Greece, littered plastic bags can deter visitors. A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. In 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.³²⁶ Consequently, it is suggested that Greece implements a tax on single-use carrier bags at a rate of €0.09 per bag from 2017, and maintains the rate constant in real terms thereafter.
- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. Data is not currently available on the exposure of the urban population in Greece to selected air pollutants such as PM₁₀, ozone or nitrogen oxide on Airbase (EEA).³²⁷ According to Greece's air pollution factsheet (2013), however, an average of 20.9% of the population was exposed to PM₁₀ concentrations exceeding the daily limit value (50 µg per m³) for over 35 days per year in 2010.³²⁸ For ozone, the percentage of the total population exposed to ozone concentrations above the "target value for the 26th highest daily maximum eight-hour average" was 37.9% in 2010 down from 59.4% in

³²⁶ DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

³²⁷ Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_m200&language=en

³²⁸ European Environment Agency (2013) *Air pollution fact sheet 2013 - Greece*, October 2013, <file:///C:/Users/christina.tsiarta/Downloads/Greece.pdf>

2009.³²⁹ Historically, Greece's major cities such as Athens and Thessaloniki have always had traffic congestion and air pollution issues, leading the government to impose restrictions on car circulation through an odd/even system corresponding to cars' license plates, with exceptions for electric, hybrid and other 'green' cars.³³⁰ Greece does not currently have a system of air pollution taxes in place. It is suggested that an air pollution tax could be implemented in order to generate improvements in air quality as follows:

- SO_x €1,000 per tonne
- NO_x €1,000 per tonne
- PM₁₀ €2,000 per tonne

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2021. The rates are then held constant in real terms.

- **Water abstraction:** A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that "*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*". No data was available for Greece on its water exploitation index (WEI) for fresh surface water and groundwater abstraction.³³¹ According to the water exploitation index report of the European Environment Agency (2010),³³² however, Greece's water exploitation index for 2010 was about 13%. This indicates a balanced rate of abstraction of both fresh surface water and groundwater compared to the resources available in Greece, and a low water stress (about 32% of Europe's population experience low water stress).

The warning threshold which distinguishes a non-stressed water region from a stressed one is a WEI of 20%, with a WEI of over 40% indicating severe water stress that can lead to water crises. It is also worth noting that countries with the highest agricultural water use also have the highest water consumption indexes, such as Greece, where agricultural water use predominates.³³³ Greece's consumption index is about -8% and its exploitation index is about +12%, with the average water consumption index in Europe being 3%.^{334,335}

³²⁹ European Environment Agency (2013) *Air pollution fact sheet 2013 - Greece*, October 2013, www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets/greece-air-pollutant-emissions-country-factsheet

³³⁰ Living in Greece (2010) *Athens Ring*, <http://livingingreece.gr/2010/09/06/athens-ring/>

³³¹ Eurostat (2014) *Water Exploitation Index*, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=0&language=en&pcode=tsdnr310>

³³² Marcuello, C., and Lallana, C. (2003) Indicator Fact Sheet - Water Exploitation Index (WQ01c)

³³³ Water consumption index is the total consumption divided by the long term freshwater resources of a country. This index highlights those regions where higher consumptive uses are predominant.

³³⁴ Marcuello, C., and Lallana, C. (2003) Indicator Fact Sheet - Water Exploitation Index (WQ01c)

Currently there are no taxes for water abstraction in Greece. It is suggested that the levels of taxation that could be applied could be of the order €230 per 1,000m³ for the public water supply, €140 per 1,000 m³ for manufacturing purposes and €19 per 1,000 m³ for agriculture. We have assumed that the additional revenue which such rates may generate can accrue to the central budget. A transition period from 2016 to 2021 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.

- **Waste water:** Council Directive 91/271/EEC concerning urban waste water treatment was adopted on 21st May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.³³⁶ Greece does not have a waste water tax but municipalities include in their rates the full cost of water supply and waste water services. Furthermore, industry, tourist establishments, and other entities are obliged by law to build and operate their own treatment systems, and are charged heavy fines if they do not comply. To further improve prevention of water pollution it is suggested that a waste water tax is implemented in-line with 'good practice' rates (see Section 5.3.6). With relative price levels in Greece this would imply, for BOD, a rate of €1.92 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. Given the magnitude of the increase in rates a transition period from 2016 to 2019 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2019 levels.
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

Greece's Action Plan aims to provide training on the sustainable use of pesticides in order to minimise use and in order to shift to alternative

³³⁵ For the purpose of this assessment it has been assumed that 80 % of total water abstracted for agriculture, 20 % for urban use, 20 % for industry and 5 % for energy production is consumed and not returned to the water bodies from where it was abstracted (+/- 5-10%). Variation depends on the sector and other factors e.g. the actual water consumption in agriculture depends on climatic conditions, crop composition and irrigation techniques.

³³⁶ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

pesticide management methods.³³⁷ Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €20 per kg active ingredient. The suggested transition period is from 2017 to 2019, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark), would be a concrete measure that would contribute towards the aims of the Action Plan.

- **Fertilisers:** Greece does not currently implement a tax on nitrogen (or other) fertilisers. It is therefore suggested that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of 0.4 € per kg N be implemented from 2017 with rates gradually increasing to the maximum level in 2019.

12.2.3 Summary of Revenue Outcomes

Table 12-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 12-4: Potential Additional Revenue from Environmental Fiscal Reform in Greece million EUR (real 2014 terms)³³⁸

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	138	541	928
C&I / Heating	16	65	113
Electricity	2	2	2
<i>Sub-total Energy, million EUR</i>	<i>157</i>	<i>608</i>	<i>1,044</i>
<i>Sub-total Energy, % GDP</i>	<i>0.08%</i>	<i>0.32%</i>	<i>0.55%</i>

³³⁷ Ministry of Rural Development and Food, Hellenic Republic (2013) *Greece National Action Plan on Sustainable Use of Pesticides (Plant Protection Products)*, July 2013, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_greece_en.pdf

³³⁸ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Transport Taxes			
Vehicle Taxes	17	66	83
Passenger Aviation Tax	215	429	442
Freight Aviation Tax	0.03	0.06	0.04
<i>Sub-total Transport, million EUR</i>	231	495	525
<i>Sub-total Transport, % GDP</i>	0.12%	0.26%	0.28%
Pollution and Resource Taxes			
Landfill Tax - Inerts (C&D)	2	2	2
Incineration /MBT Tax	12	17	18
Air Pollution Tax	146	291	243
Water Abstraction Tax	206	550	695
Waste Water Tax	28	39	39
Pesticides Tax	111	210	210
Aggregates Tax	38	19	13
Packaging Tax	38	37	37
Single Use Bag Tax	269	57	63
Fertiliser Tax	0.026	0.043	0.034
<i>Sub-total Pollution & Resource, million EUR</i>	851	1,222	1,320
<i>Sub-total Pollution & Resources, % GDP</i>	0.45%	0.65%	0.70%
Total Environmental Taxes			
Total, million EUR	1,239	2,326	2,889
Total Increase, % GDP	0.66%	1.23%	1.53%

Table 12-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 12-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Greece, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
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Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	290
Increased Cost Recovery for Water Use	1,420
Total	1,710

12.2.4 Environmental Benefits

Table 12-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.10.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €891 million of benefits are anticipated annually by 2025 in real terms.

Table 12-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in Greece, million EUR (real 2014 terms)³³⁹

Tax Type	2017	2020	2025
Energy Taxes	7	26	42
Transport Taxes (excluding transport fuels)	5	9	10
Pollution and Resource Taxes	203	756	839
Total, million EUR	214	791	891
Total, % GDP	0.11%	0.41%	0.45%

12.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Greece:³⁴⁰

- In 2012, environmental taxes generated revenue equivalent to 2.85% of GDP. The headline figures suggest that there is considerable potential for additional

³³⁹ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

³⁴⁰ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

revenue from environmental taxes in Greece. These could generate EUR 1.2 billion in 2017, rising to EUR 2.9 billion in 2025 (both in real 2014 terms). This is equivalent to 0.66% and 1.53% of GDP in 2017 and 2025 respectively.

- The largest single contribution to revenue comes from the suggested changes to transport fuels (i.e. their harmonisation with the proposed ETD rates). These changes could generate EUR 0.9 billion of revenue by 2025 (real 2014 terms), equivalent to 0.47% of GDP.
- The next largest contribution to revenue comes from the proposed water abstraction tax. This accounts for EUR 0.7 billion by 2025 (real 2014 terms), equivalent to 0.35% of GDP.
- The passenger aviation tax would account for EUR 0.4 billion by 2025 (real 2014 terms), equivalent to 0.22% of GDP.
- Revenue potential from the suggested air pollution tax would raise a further EUR 0.2 billion by 2025 (real 2014 terms), equivalent to 0.12% of GDP.
- A pesticides tax is also suggested. This would contribute EUR 0.2 billion by 2025 (real 2014 terms), equivalent to 0.11% of GDP.
- In addition, a range of more minor taxes could generate revenue of EUR 0.4 billion by 2025 (real 2014 terms), equivalent to 0.19% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 0.9 billion by 2025 (real 2014 terms), equivalent to 0.45% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €1.7 billion per annum could be raised in addition to the above.

13.0 Ireland

13.1 Country Overview

13.1.1 Key Facts about the Economy and Tax System

- Ireland experienced considerable economic growth between 2003 and 2007, with real terms GDP increasing by an average of 4.9% per annum over the period. Ireland was hard hit by the recession, with the country's GDP falling by 6.4% in real terms in 2009. 2011 and 2012 saw a tentative return to growth, although the economy again fell into recession in 2013, when GDP fell back by 0.3% in real terms on the previous year.³⁴¹
- Ireland's overall tax revenue (including social contributions) as a percentage of GDP is significantly below the EU-28 average of 39.8%, at 30.2% (2012). It has risen over the past 10 years from 29.7% in 2002, but has dropped from a high of 33.4% in 2006.³⁴²
- 43.3% of Ireland's total tax income comes from direct taxation and 37.2% from indirect taxation, with social contributions making up the smallest share of 19.5% (2012). The contribution of direct taxation has been rising since 2002, while that of indirect taxation has been falling. The percentage share of social contributions rose in the period to 2009 but then began to fall, and is now close to the 2002 level.³⁴³
- In 2012, revenues from environmental taxes amounted to 2.49% of GDP. This percentage share is higher than it was 10 years ago (the level was 2.36% of GDP in 2002), but is currently lower than in most years within this period. Expressed in these terms, environmental tax revenues peaked in 2010, when revenues were equivalent to 2.58% of GDP.³⁴⁴
- In 2012, the majority of revenues from environmental taxes came from energy taxes, which amounted to 1.32% of GDP. Revenues from transport taxes (excluding fuel) amounted to 0.9% of GDP, with pollution and resources taxes raising revenues equivalent to 0.27% of GDP in 2012.³⁴⁵
- Energy taxes accounted for just over half (53%) of Ireland's total environmental tax revenues in 2012, down slightly from 2002 when these taxes contributed

³⁴¹ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

³⁴² Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

³⁴³ Ibid.

³⁴⁴ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

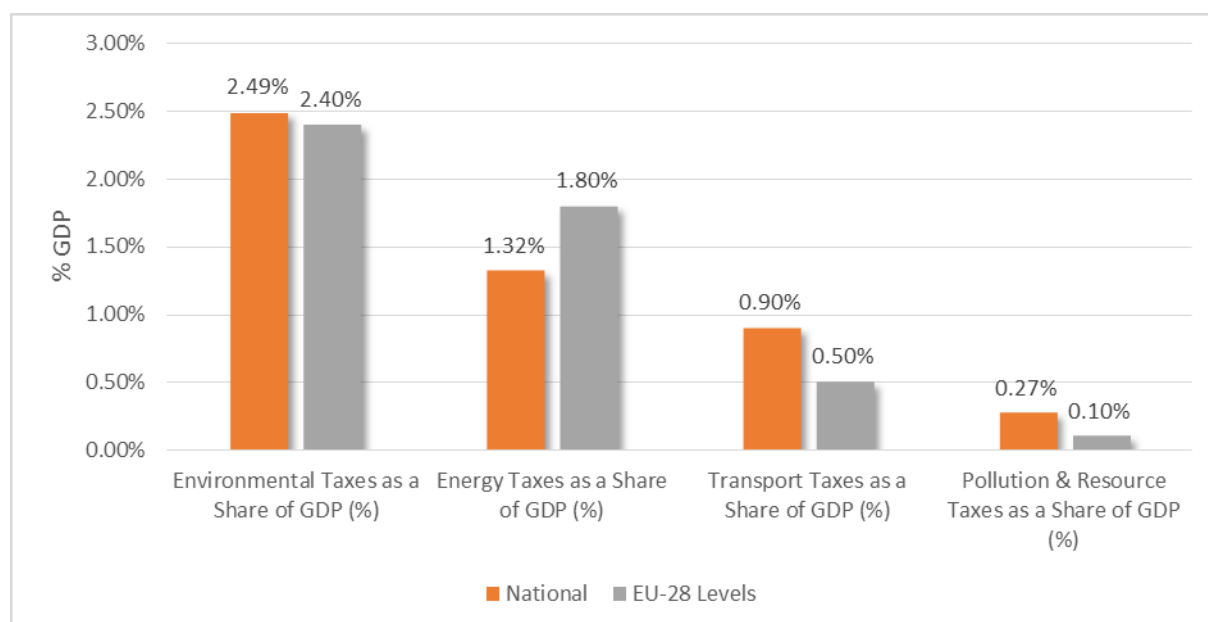
³⁴⁵ Ibid.

54.2%. This percentage has fluctuated over the past 10 years – it was at its lowest level in 2007 (46.9%) and at its highest level in 2009 (59.1%).³⁴⁶

13.1.2 Relative Position within the EU

- The revenue derived from environmental taxes in Ireland, expressed as a percentage share of the country’s GDP, was just above the EU-28 average of 2.4% in 2012. Revenues from energy taxes, as a proportion of GDP, were below the EU-28 average of 1.8%, but the percentage share derived from transport (excluding fuel) taxes was above the European average of 0.5% GDP. The share from pollution and resource taxes was almost three times the EU-28 average of 0.1% of GDP (see Figure 13-1).³⁴⁷

Figure 13-1: Environmental Taxes in Ireland as a % of GDP vs EU-28 Levels (2012)



- In terms of the percentage share of GDP coming from environmental taxation, Ireland sits around middle ranking among the Member States, ranking 15th in the EU-28 in 2012. The revenue derived from energy taxes in Ireland, expressed as a proportion of GDP, was among the lowest in the EU-28 in 2012, with Ireland ranking 26th in this regard. Ireland ranked higher in terms of transport (excluding fuel) taxes and pollution and resource taxes, placed in 5th and 4th place, respectively (see Table 13-1).³⁴⁸

³⁴⁶ Ibid.

³⁴⁷ Ibid.

³⁴⁸ Ibid.

Table 13-1: Ranking of Ireland's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	15
Energy Taxes as a Share of GDP (%)	26
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	5
Pollution & Resource Taxes as a Share of GDP (%)	4

Source: based on Eurostat data

13.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.11.0. This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.^{349,350}

➤ Energy Taxes:

- Ireland has excise duties on fuels and electricity. These taxes are shown in Table 13-2, which shows how they compare to the recommended minimum rates in the existing ETD and the EU-28 average and median rates.³⁵¹

Table 13-2: Excise Duties on Fuels and Electricity in Ireland

Excise Duty	Unit	Rate Applied in Ireland	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels - propellant					
Unleaded Petrol	€ per 1000 litres	€587.71 ¹	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€479.02	€330	€427	€405

³⁴⁹ Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1>

³⁵⁰ Eurostat (2013) *GDP and Main Components - Current Prices [nama_gdp_c]*, Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

³⁵¹ European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Excise Duty	Unit	Rate Applied in Ireland	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene	€ per 1000 litres	€479.02	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€176.33	€125	€209	€180
Natural Gas	€ per GJ	€0 ²	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€102.28	€21	€221	€163
Kerosene	€ per 1000 litres	€50.73	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€60.07	€41	€126	€125
Natural Gas	€ per GJ	€1.03	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€102.28	€21	€221	€163
Kerosene	€ per 1000 litres	€50.73	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€77.68	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€60.07	€0.00	€82	€40
Natural Gas	€ per GJ	€1.03	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€1.89	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€102.28	€21	€179	€125
Kerosene	€ per 1000 litres	€50.73	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€77.68	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€60.07	€0	€111	€42
Natural Gas	€ per GJ	€1.03	€0.3	€2.04	€0.94
Coal and Coke	€ per GJ	€1.89	€0.3	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€0.5	€0.5	€8.42	€1.03
Non-Business Use	€ per MWh	€1.0	€1.0	€14.53	€2.06
Notes:					
1. Including CO2 charge of 4.5 cents/liter (€20 per ton CO2) for non-ETS emitters.					
2. Gas not in use as propellant in Ireland.					

○

- Taxes on petrol and diesel were increased in the years after 2002 when oil prices declined. The petrol tax was further increased in response to the outbreak of the financial crisis in October 2008 and the diesel tax was also increased soon afterwards. As a result, both tax rates are presently higher than existing ETD minima, and higher than the increases proposed for the revision of the ETD. Nevertheless, the differential between petrol and diesel taxes persists and is about 10 cents per litre, only slightly less than the difference that existed in the 1990's. While the petrol tax is close to the rate in the United Kingdom, the lower diesel tax in Ireland is believed to cause tank tourism from Northern Ireland. It is not clear whether the associated revenue stream is sufficient to offset the loss in revenue from the long-term decline in the number of petrol vehicles.
- Since 2008, taxes have been introduced for various heating fuels that were previously exempt, and for electricity. Tax rates are admirably consistent for the various heating fuels. For electricity Ireland adheres closely to present ETD minimum rates and the differentiation between business and non-business use (prior to 2008 there was no taxation of electricity).
- A CO₂ tax was introduced in 2009 at a rate of €15 per tonne CO₂, which, in 2012, was increased to €20 per tonne CO₂.³⁵² Besides motor fuels, it also applies to natural gas, LPG, and kerosene used in non-ETS installations. A reduced rate for solid fuels was phased out by May 2014. Whilst electricity is not affected, CHP units meeting high energy efficiency standards can obtain partial relief.³⁵³

➤ **Transport Taxes (excluding transport fuels):**

- There is a vehicle registration tax (VRT) on the purchase and importation of private cars. Since 2008, the registration taxes have been based on CO₂ emissions, with an ad-valorem rate from 14% to 36% of market price.³⁵⁴ Their introduction has been associated with a marked drop in average CO₂ emissions for new cars, from 164 g CO₂ per km in 2007 to 125 g CO₂ per km in 2012. Revenues have declined from €1,400 million in 2007 to €384 million in 2012, largely as a result of the economic downturn which saw new vehicle registrations fall by 60%. For commercial vehicles there is a flat-rate VRT, unrelated to emissions, which is currently set at €200 per vehicle.³⁵⁵ Exempted categories of vehicles include those used in transport of road construction machinery.
- Ireland's circulation tax (Cáin Mhóitair; or Motor Tax) for private vehicles has an element that is based on the CO₂ emissions of the vehicle. Vehicles

³⁵² www.greenheat.ie/index.php?contentid=carbon-tax&sid=information

³⁵³ <http://frontlineenergy.ie/carbon-tax-increase-on-solid-fuels/>

³⁵⁴ www.economicinstruments.com/index.php/climate-change/article/34-

³⁵⁵ <http://vrt.ie/vrtDetail.php?page=20>

registered before the emission-based Motor Tax was introduced in 2008 are still taxed according to engine capacity. Imported vehicles registered prior to 2008 are also taxed under the old scheme. For heavy duty vehicles, the Motor Tax is weight-based and rates have not been increased since the 2008 reform.³⁵⁶ Annual Motor Tax revenues have been stable at about €1 billion since 2008, but declining in real terms.

- According to Eurostat's national tax list, the air travel tax in place in Ireland from 2009 generated annual revenues of about €100 million. The tax rate was €2.5 per passenger and €10 for journeys longer than 300 km. The tax was abolished in April 2014 following a large decline in passenger numbers (from 30 to 23 million annually), though this was thought mainly due to the economic crisis.

➤ **Pollution and resources:**

- Landfilling of waste in Ireland has been subject to a landfill tax since 2002. A tax rate of €75 per tonne applies to waste disposed of at all landfill facilities (authorised and unauthorised). A number of exemptions apply, including for non-hazardous construction and demolition waste, excavation spoil, stabilised waste arising from the composting of the biodegradable fraction of municipal waste, and waste from street cleaning. Revenue from the landfill tax in 2012 was €50.8 million.³⁵⁷
- A plastic bag levy was introduced in Ireland in March 2002.³⁵⁸ A charge of €0.22 per plastic bag applies. Exemptions apply to plastic bags containing certain food products, and to plastic bags designed for re-use. The tax raised €14.2 million in revenue in 2012.³⁵⁹

13.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Ireland. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue

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www.environ.ie/en/LocalGovernment/MotorTax/MotorTaxRates/MotorTaxRatesbasedonCO2Emissions/

³⁵⁷ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=857/1388754801&taxType=Other+indirect+tax

³⁵⁸ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=861/1388754801&taxType=Other+indirect+tax

³⁵⁹ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=814/1388754940&taxType=Other+indirect+tax

potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

13.2.1 Current Status of EFR

The role of environmentally related fiscal measures in government budgets has been strengthened over the last five years. In line with the National Climate Change Strategy 2007-12, the rates for calculating the VRT and the motor tax were increased and revised in 2008 to reflect CO₂ emissions, and have since been linked to a new mandatory labelling system.

A Government-appointed *Commission on Taxation* reviewed, in 2009, the structure and efficiency of the Irish taxation system, including fiscal measures to protect the environment. The Commission recommended that a tax on the CO₂ content of energy products for non-ETS sectors be introduced (excluding agriculture) and that efforts be made to strengthen local government financing through property taxes and waste and water charges. The report stated that these environmental fiscal measures were important tools for pursuing Ireland's green economy goals. The CO₂ tax was subsequently introduced and has gradually been extended, whilst property taxes are also slowly being phased in.

In October 2010, the administration's *National Recovery Plan 2010-2014* addressed water charging as a means to secure revenues for local authorities and to target water shortages. As part of the subsequent EC-ECB-IMF Programme of Assistance to Ireland, agreed in November 2010, the government committed itself to the introduction of water charges. Ireland was, at the time, the only OECD country without water charging. Introduction of water charging has recently been agreed and legislation came into effect on October 1st 2014, with the first water bills to be issued in 2015.³⁶⁰ The expected revenues for the first two years are expected to amount to about €2 billion.³⁶¹

13.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Ireland. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- Energy taxes are harmonised based upon the highest energy content of all of the different fuels used for each purpose (propellants, heating etc).

³⁶⁰ www.irishtimes.com/news/consumer/q-a-explaining-the-details-of-the-water-charges-1.1884200?page=1

³⁶¹ www.irishtimes.com/news/consumer/family-with-two-children-faces-278-annual-water-bill-1.1883784

Transport fuels are equalised using the energy content on petrol (€12.7 per GJ). Motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€9.85 per GJ). Finally, due to the existing rates for gas oil used for heating being very close to the new minimum rates proposed for ETD, this proposal is applied to other heating fuels with the consistent approach implied (€0.15 per GJ and CO₂ at €20 per ton). No changes are proposed for electricity.

- Table 13-3 shows the minimum tax rates proposed for the amendment of ETD (using ETD units) for the different fuels by use; figures are in bold where it is suggested that revisions follow for Ireland. The main implications are higher tax rates for stationary motors in business and for the use of natural gas in all sectors.
- In the case of propellants, the revisions imply a major increase in taxes on light fuel oil (diesel), LPG, kerosene, and natural gas. More importantly, however, the petrol / diesel differential, which significantly favours diesel at present, is closed as the revisions imply that the tax applied to diesel is substantially increased, redressing the imbalance in taxes between diesel and petrol, and a similar change for kerosene and LPG.
- In the case of fuels used in commercial and industrial motors, there is a major increase in the rates for kerosene and LPG to bring the taxes into alignment with existing rates on gas oil.
- On heating fuels (business and non-business), the changes imply significant uplifts in taxes on heavy fuel oil, kerosene, LPG, natural gas and coal.
- The existing electricity tax rates are harmonised according to the highest rate, which for Ireland is non-business use, but the change is relatively small.

Table 13-3: Existing and New Rates Based upon Proposed Revisions to ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	588	588
Light fuel oil (diesel)	€ per 1000 litre	634	479
LPG (propellant)	€ per 1000 kg	819	176
Kerosene	€ per 1000 litre	638	479
Natural gas (prop)	€ per GJ	18	0
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	102	102
Kerosene	€ per 1000 litre	102	51

Energy Tax	Units	Suggested Rates	Existing Rates
LPG	€ per 1000 kg	124	60
Natural gas	€ per GJ	3	1
Business Heating			
Gas oil	€ per 1000 litre	102	102
Heavy fuel oil	€ per 1000 kg	119	78
Kerosene	€ per 1000 litre	102	51
LPG	€ per 1000 kg	124	60
Natural gas	€ per GJ	2.55	1.03
Coal	€ per GJ	3.32	1.89
Non-Business Heating			
Gas oil	€ per 1000 litre	102	102
Heavy fuel oil	€ per 1000 kg	119	78
Kerosene	€ per 1000 litre	102	51
LPG	€ per 1000 kg	124	60
Natural gas	€ per GJ	2.55	1.03
Coal	€ per GJ	3.32	1.89
Electricity			
Electricity - business use	€ per MWh	1.00	0.50
Electricity - non-business use	€ per MWh	1.00	1.00

➤ **Transport Taxes (excluding transport fuels):**

- **Vehicles:** The taxes on transport in Ireland are higher than average in the EU (0.91% of GDP compared to an average of 0.54% GDP). However, an increase of 0.35% of GDP would still be required to meet the good practice benchmark. Emissions from the transport sector have increased considerably since 2000, due to a 40% increase in the number of private vehicles and a doubling of goods traffic on the roads since the turn of the century. The number of vehicles on the road is projected to increase as the country's economy continues to recover. Ireland has, with its change to a

CO₂ emissions-related tax base, achieved an impressive reduction in average emission levels for new passenger cars (with its level comparable to France).³⁶² However, the rebate for CO₂ efficient vehicles is too generous and should be aligned as a minimum with the CO₂ tax rate for motor fuels. OECD, in its environmental performance review,³⁶³ proposed that Ireland should consider expanding the emissions-related tax base to include commercial vehicles, which would be in line with the Commission's 2005 proposal on passenger related taxes.³⁶⁴ For heavy-goods vehicles the opportunities for road-pricing under the 2011 Euro-vignette Directive deserve serious consideration.³⁶⁵ There is no uniform approach to taxing HGVs, and the extent to which HGVs are taxed in relation to emissions appears to be limited.

The discrepancy in motor fuel tax rates for petrol and diesel have changed the composition of the vehicle fleet, and eroded revenues from the higher taxed petrol. An annual surtax on diesel vehicles - as in Denmark - could offset the advantage to some extent and help to close the revenue gap, though if the energy taxes are changed in line with what has been suggested, this would not – over the longer-term – be necessary (as the vehicle stock would be expected to change accordingly).

- **Aviation:** It is suggested that an aviation tax on air passenger flights and on air freight to reflect external costs other than carbon. The suggested rates for the air passenger tax for are €15 per passenger for flights within the country concerned, €25 per passenger for flights within the European Union, and €50 per passenger for flights to destinations outside the European Union. The suggested air transport tax rate is €1.25 per tonne of freight. The suggested year of implementation is 2015.

➤ **Pollution and Resource Taxes:**

- **Aggregates:** Extraction of minerals for use as aggregates causes harm to the environment. An aggregates tax helps to reduce the environmental burden by increasing the price of raw materials, and so stimulates the market for recyclable materials. This ultimately reduces costs for businesses, but also is in-line with the flagship initiative 'A Resource Efficient Europe'.³⁶⁶ It is suggested that Ireland implements an aggregates tax at a rate of €2.40 per tonne from 2016, and following this to keep the

³⁶² European Environment Agency (2012) *Monitoring CO₂ emissions from new passenger cars in the EU: summary of data for 2012*, Copenhagen.

³⁶³ OECD (2010) *Environmental Performance Reviews: Ireland 2010*, May 2010, <http://www.oecd.org/env/country-reviews/environmentalperformancereviewsireland2010.htm>, p. 54

³⁶⁴ European Commission (2005) Proposal for a Council directive on passenger car related taxes COM(2005)261 final.

³⁶⁵ European Environment Agency (2013) Road user charges for HGV – tables with external costs of air pollution, EEA Technical Report 1/2013, Copenhagen.

³⁶⁶ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

rate constant in real terms. The types of materials that could be covered by the tax are:

- Marble
- Chalk and dolomite
- Slate
- Limestone and gypsum
- Sand and gravel

Not all of these are extracted in Ireland. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Air pollution:** It is suggested that in order to generate improvements in air quality the following tax rates are introduced:
 - NO_x/VOC €1,000 per tonne
 - SO_x €1,000 per tonne
 - PM_{2.5} €2,000 per tonne

Given the magnitude of the change in tax rates it is suggested that there is a transition period from 2015 to maximum levels by 2020. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.

- **Water abstraction for public water supply:** To improve efficiency in the usage of the water supply system, in particular the high leakage rates, it is suggested to introduce a water abstraction tax in-line with the good practice rates (see Section 5.3.5). With relative price levels in Ireland this would imply rates of €0.60 per m³ for non-business and €0.40 per m³ for business purposes. Given the magnitude of the increase in rates a transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.
- **Waste water:** Ireland has no levy on direct discharges of water pollution from industry and treatment plants. To help reduce water pollution, improve compliance and reflect better the environmental burdens, it is suggested to introduce tax rates in-line with 'good practice'. With relative price levels in Ireland this would imply a rate of €3.02 per kg BOD. For fresh-water discharges also phosphorus should be charged, while for coastal discharges a charge on nitrogen could be relevant. A transition period from 2016 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms. Part of the revenues could accrue to national budget.
- **Pesticides:** There is currently no tax on pesticides in Ireland. Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

Ireland's *National Action Plan for the Sustainable Use of Pesticides* does not set clear objectives for reducing the amount of pesticides used within the country (objectives are more heavily focused on storage, packaging, traceability and safe application).³⁶⁷ Given that the OECD has noted an increase in the use of pesticides in Ireland, it is suggested that a pesticides tax at a rate of €5 per kg active ingredient be introduced.³⁶⁸ The suggested transition period is from 2016 to 2018, and following this the rate is kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark), could be linked to the risk indicators to be developed under the National Pesticide Action Plan.

- **Packaging:** A small number of Member States have implemented packaging taxes for packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested to apply the following good practice rates to all packaging placed on the market in Ireland:
 - Paper and card €0.07 per kg
 - Plastic €1.40 per kg
 - Wood €0.07 per kg
 - Metallic €1.69 per kg
 - Glass €0.25 per kg
- **Fertilisers:** A tax on the use of nitrogen in mineral fertilisers is suggested at a rate of 0.25 €/kg N from 2016. This tax rate would reflect relative price levels for Ireland relevant to EU schemes under the CAP, and support the prevention of groundwater contamination, ammonia evaporation, emissions of greenhouse gases and surface water eutrophication.

13.2.3 Summary of Revenue Outcomes

Table 13-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

³⁶⁷ Irish Department of Agriculture, Food and the Marine (2013) *National Action Plan for the Sustainable Use of Pesticides*,
http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/national_action_plans_en.htm

³⁶⁸ OECD (2010) *Environmental Performance Reviews: Ireland 2010*, May 2010,
<http://www.oecd.org/env/country-reviews/environmentalperformancereviewsireland2010.htm>

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 13-4: Potential Additional Revenue from Environmental Fiscal Reform in Ireland, million EUR (real 2014 terms)³⁶⁹

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	48	190	330
C&I / Heating	20	77	134
Electricity	6	6	6
<i>Sub-total Energy, million EUR</i>	73	273	470
<i>Sub-total Energy, % GDP</i>	0.04%	0.16%	0.27%
Transport Taxes			
Vehicle Taxes	123	494	618
Passenger Aviation Tax	335	654	659
Freight Aviation Tax	0.08	0.16	0.18
<i>Sub-total Transport, million EUR</i>	459	1,147	1,277
<i>Sub-total Transport, % GDP</i>	0.26%	0.66%	0.73%
Pollution and Resource Taxes			
Landfill Tax - Inerts (C&D)	0.02	0.02	0.02
Incineration /MBT Tax	15	27	29
Air Pollution Tax	11	18	12
Water Abstraction Tax	38	88	85
Waste Water Tax	15	21	21
Pesticides Tax	28	60	73
Aggregates Tax	30	15	11

³⁶⁹ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Packaging Tax	31	30	31
Fertiliser Tax	0.036	0.064	0.058
<i>Sub-total Pollution & Resource, million EUR</i>	168	260	264
<i>Sub-total Pollution & Resources, % GDP</i>	0.10%	0.15%	0.15%
Total Environmental Taxes			
Total, million EUR	701	1,680	2,010
Total Increase, % GDP	0.40%	0.96%	1.15%

Table 13-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 13-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Ireland, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	87
Increased Cost Recovery for Water Use	1,368
Total	1,455

13.2.4 Environmental Benefits

Table 13-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.11.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €96 million of benefits are anticipated annually by 2025 in real terms.

Table 13-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in Ireland, million EUR (real 2014 terms)³⁷⁰

Tax Type	2017	2020	2025
Energy Taxes	3	10	17
Transport Taxes (excluding transport fuels)	12	24	25
Pollution and Resource Taxes	16	58	54
Total, million EUR	31	92	96
Total, % GDP	0.02%	0.05%	0.05%

13.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Ireland:³⁷¹

- In 2012, environmental taxes generated revenue equivalent to 2.49% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Ireland. These could generate EUR 0.7 billion in 2017, rising to EUR 2.0 billion in 2025 (both in real 2014 terms). This is equivalent to 0.40% and 1.15% of GDP in 2017 and 2025 respectively.
- The largest single contribution to revenue comes from the suggest reintroduction of the passenger aviation tax. This accounts for EUR 0.7 billion by 2025 (real 2014 terms), equivalent to 0.33% of GDP.
- The next largest contribution to revenue comes from a the suggested increase in vehicle taxes. This accounts for EUR 0.6 billion by 2025 (real 2014 terms), equivalent to 0.31% of GDP.
- The suggested harmonisation of the excise duties on transport fuels with those in the proposed ETD would help to generate EUR 0.3 billion in additional revenue by 2025 (real 2014 terms), equivalent to 0.17% of GDP.
- Revenue potential from the suggested increase in taxes on business heating fuels would raise EUR 0.1 billion by 2025 (real 2014 terms), equivalent to 0.07% of GDP.

³⁷⁰ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

³⁷¹ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- A water abstraction tax has also been suggested. This tax would contribute EUR 0.1 billion by 2025 (real 2014 terms), equivalent to 0.04% of GDP.
- In addition, a range of more minor taxes on could generate revenue of EUR 0.2 billion by 2025 (real 2014 terms), equivalent to 0.09% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 0.1 billion by 2025 (real 2014 terms), equivalent to 0.05% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €1.5 billion per annum could be raised in addition to the above.

14.0 Latvia

14.1 Country Overview

14.1.1 Key Facts about the Economy and Tax System

- For the period 2003 to 2007, when Europe as a whole enjoyed year on year economic growth, Latvia achieved the single highest yearly growth rate in the EU-28 when in 2006 GDP increased by 11% in real terms on the previous year. For the whole period 2003 to 2007, Latvia's GDP increased very rapidly by an average of 9.5% per annum in real terms. However, Latvia was not immune to the effects of recession, and experienced negative growth from 2008 to 2010, suffering the greatest decrease in GDP out of any EU-28 nation during the trough year of 2009, when GDP decreased by 17.7% in real terms on the previous year. Latvia's post-recession recovery, however, has been among the strongest in the EU-28, with Latvia averaging a 4.9% increase in GDP per annum in real terms for the years 2011 to 2013.³⁷²
- Latvia's overall tax revenue (including social contributions) as a percentage of GDP is low for the EU-28, at 28.1% (2012). This share rate had previously peaked in 2006 at 30.8%, from which it fell to a low of 27% in 2009.³⁷³
- Indirect taxation makes the greatest contribution to Latvia's total tax revenue, at 41.9% (2012). Social contributions account for 30.7%, and direct taxes for 27.4%. All tax revenue streams have fluctuated over the last 10 years, with the final effect that the share of indirect taxation has risen by 1.4%, whilst the share of social contributions has fallen by 2.5%, and the share of direct taxation has remained unchanged.³⁷⁴
- In 2012, revenue from environmental taxes amounted to 2.42% of Latvia's GDP, which is very close to the EU-28 average of 2.4%. Overall environmental tax revenues as a share of GDP have risen over the past 10 years, from 2.32% of GDP in 2002 to a high of 2.68% in 2005.³⁷⁵
- In 2012, the greatest proportion of revenue from environmental taxation came from taxation of energy, amounting to 1.91% of Latvia's GDP in this year. The next largest contribution—though significantly smaller—came from transport (excluding

³⁷² Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

³⁷³ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

³⁷⁴ Ibid.

³⁷⁵ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

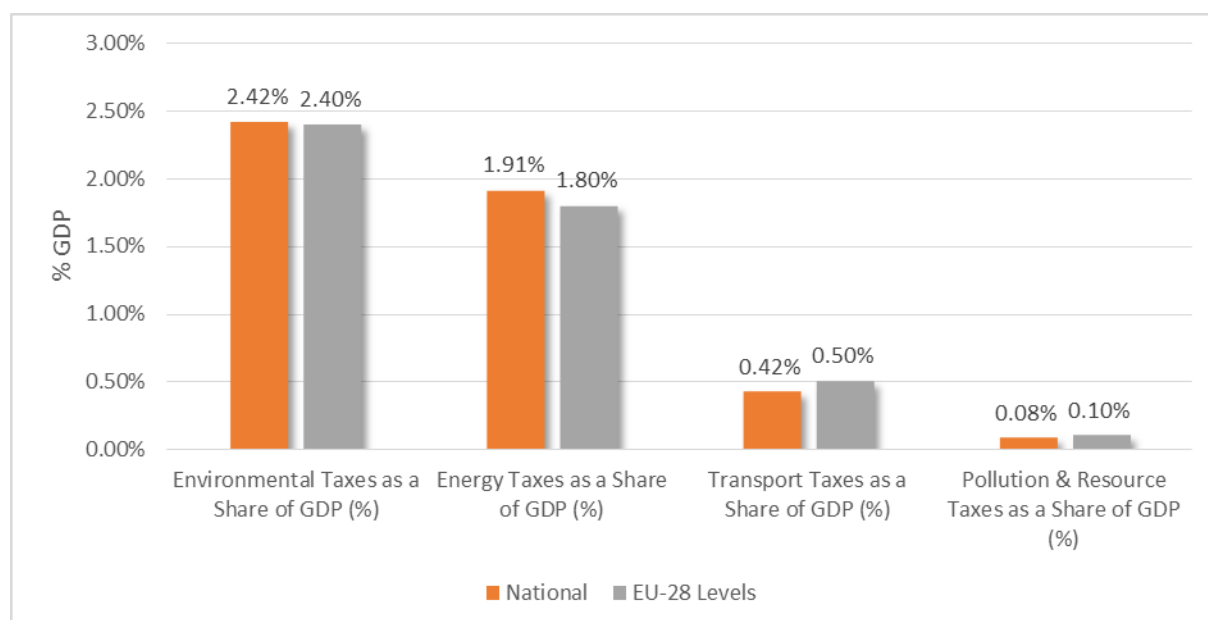
fuel) taxation which amounted to 0.42% of GDP, whilst the smallest contribution came from taxation of pollution and resource at 0.08% of the country's GDP.³⁷⁶

- Taxes placed on energy made up 78.9% of the revenue derived from environmental taxes in 2012. Although this percentage is higher than it was 10 years ago, it was above 80% for the period between 2004 and 2010, and was at its highest in 2009 at 88%.³⁷⁷

14.1.2 Relative Position within the EU

- In 2012, expressed as a percentage share of Latvia's GDP, revenue from environmental taxes was marginally above the EU-28 average of 2.4%. The contribution of energy taxes, as a share of GDP, was above the average of 1.8%, whereas that of transport (excluding fuel) taxes was below the average of 0.5%. The GDP percentage share contribution of taxes on pollution and resource was also below the EU-28 average of 0.1% (see Figure 14-1).³⁷⁸

Figure 14-1: Environmental Taxes in Latvia as a % of GDP vs EU-28 Levels (2012)



- In 2012, Latvia ranked 18th in the EU-28 for environmental tax revenue expressed as a percentage of its overall GDP. Taking individual tax streams as GDP shares, it ranked 13th for both energy taxes and pollution and resource taxes, and 15th for transport (excluding fuel) taxes (see Table 14-1).³⁷⁹

³⁷⁶ Ibid.

³⁷⁷ Ibid.

³⁷⁸ Ibid.

³⁷⁹ Ibid.

Table 14-1: Ranking of Latvia's Position in EU-28, 2012

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	18
Energy Taxes as a Share of GDP (%)	13
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	15
Pollution & Resource Taxes as a Share of GDP (%)	13

Source: based on Eurostat data

14.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.12.0 (see separate document). This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon nominal GDP figures for the same year as the reported revenues.^{380,381}

➤ Energy Taxes:

- The Latvian excise duties on fuels and electricity are shown in Table 14-2, alongside minimum rates in the existing ETD and the EU-28 average and median rates.
- All Latvia excise duty rates are above the minimum set out in the Energy Taxation Directive; however, almost all of them are also below the EU-28 average, putting Latvia towards the lower end of Member States in terms of energy taxation. In fact, only LPG used for industrial and commercial purposes is taxed at a higher rate in Latvia than the EU-28 average.
- Several exemptions also apply: fuels that are 100% biofuels are exempt from excise duties as is gas oil used for certain agricultural purposes.³⁸²
- Additionally, any fuel used for the following purposes is exempt from excise duties: aircraft, except those used for private recreation and entertainment; ships, except those used for private recreation and entertainment; generation of energy or in CHP plants; and chemical treatment processes.

³⁸⁰ Eurostat (2014) *Euro/ECU Exchange Rates – Annual Data* [ert_bil_eur_a], Accessed 5th August 2014, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ert_bil_eur_a&lang=en

³⁸¹ Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

³⁸² European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- The revenue in 2012 (the latest year for which figures are available) was LVL 281 million (€403 million, equivalent to 1.81% of GDP).³⁸³

Table 14-2: Standard Rates of Excise Duties on Fuels and Electricity in Latvia

Excise Duty	Unit	Rate Applied in Latvia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol ¹	€ per 1000 litres	€455.32	€421	€585	€583
Unleaded Petrol ²	€ per 1000 litres	€123.36 - €411.21	€359	€519	€509
Gas Oil (Diesel) ³	€ per 1000 litres	€233.35 - €332.95	€330	€427	€405
Kerosene	€ per 1000 litres	€332.95	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€161	€125	€209	€180
Natural Gas	€ per GJ	€2.67	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel) ⁴	€ per 1000 litres	€21.34 - €56.91	€21	€221	€163
Kerosene ⁴	€ per 1000 litres	€21.34 - €56.91	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€161	€41	€126	€125
Natural Gas	€ per GJ	€0.46	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel) ⁴	€ per 1000 litres	€21.34 - €56.91	€21	€221	€163
Kerosene ⁴	€ per 1000 litres	€21.34 - €56.91	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€15.65	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	-	€0.00	€82	€40
Natural Gas	€ per GJ	€0.46	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€0.30	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel) ⁴	€ per 1000 litres	€21.34 - €56.91	€21	€179	€125

³⁸³ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

Excise Duty	Unit	Rate Applied in Latvia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene ⁴	€ per 1000 litres	€21.34 - €56.91	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€15.65	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	-	€0.00	€111	€42
Natural Gas	€ per GJ	€0.46	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€0.30	€0.30	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€1.01	€0.50	€8.42	€1.03
Non-Business Use	€ per MWh	€1.01	€1.00	€14.53	€2.06
Notes:					
<ol style="list-style-type: none"> 1. Leaded petrol is no longer sold in Latvia. 2. The lower rate is for petrol with 70% - 85% biofuel content. 3. The lower rate is for gas oil with at least 30% biofuel of rape seed origin. 4. The lower rate is for gas oil and kerosene with at least 5% biofuel of rape seed origin. 					

Sources: European Commission - Taxation and Customs Union (2014) Excise Duty Tables: Part II - Energy Products and Electricity, July 2014,
http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- A further energy tax is the Subsidised Electricity Tax:^{384,385}
 - This tax is charged on the income obtained by electricity companies from subsidised electricity generation (from renewable energy or through combined heat and power [CHP] units). Income from this tax is due to be used for a new Electricity Customer Support Fund, which is intended to mitigate rising electricity costs caused by the renewable energy 'Compulsory Procurement Component' which has been added to electricity bills since 2013.
 - Rates are charged based on the fuel used in the production of electricity: Fossil fuels used in CHP units: 15% of income; Renewable energy sources: 10% of income; and Fossil fuelled Combined Heat and Power with capacity (up to 4MW) and

³⁸⁴ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014,
http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³⁸⁵ Ecologic Institute, and eclareon (2014) *Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Latvia*, Report for European Commission - DG Clima, January 2014,
http://ec.europa.eu/clima/policies/g-gas/progress/docs/lv_2014_en.pdf, pp. 13-14

renewable energy fuelled Combined Heat and Power (all scales), where heat is delivered to district heating networks: 5% of income.

- This tax is time-limited and applies to income earned in 2014-2017. The revenue is unknown as the tax has only been collected since 1 January 2014.

➤ **Transport Taxes (excluding transport fuels):**

- **Car Registration Tax ('Car and Motorcycle Tax'):**³⁸⁶
 - Latvia imposes a registration tax on vehicles, known until 2004 as an excise duty on vehicles, which is paid prior to them being registered in Latvia.
 - Exemptions apply to several types of vehicle, including vehicles more than 25 years old, electric vehicles and vehicles for certain uses, such as ambulances, caravans and hearse.
 - As of 1st January 2010, for vehicles first registered in Latvia or abroad prior to 1st January 2009, rates are determined based on the age and/or the engine size of the vehicle, with rates ranging from €107 to €854. Vehicles registered after 1st January 2009 are charged according to their CO₂ emissions, between €0.43 and €7.11 per g/km CO₂.
 - Motorcycles registered prior to 1st January 2009 pay 25% of the rate for passenger cars. Motorcycles registered after 1st January 2009 are charged according to their engine size (€0.14 per cc).
 - The revenue in 2012 (the latest year for which figures are available) was LVL 6.26 million (€8.98 million, equivalent to 0.04% of GDP).
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- **Motor Vehicles Tax ('Vehicle Use/Operating Tax'):**³⁸⁸
 - This is a circulation tax (paid annually) on all vehicles, except tractors, trailers or semi-trailers with a gross vehicle weight of less than 3.5 tonnes, trams, trolleybuses, off-road vehicles, snowmobiles and mopeds.
 - Exemptions apply for emergency vehicles, diplomatic or consular vehicles, and vehicles used by people with disabilities. Deductions also apply for farmers and people with three or more children (80% deduction on one vehicle).

³⁸⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³⁸⁷ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁸⁸ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Motorcycles, motorised tricycles and quad bikes registered after 1st January 2005 are charged according to their engine capacity, with rates ranging from €17 to €68 per annum.³⁸⁹ Motorcycles, motorised tricycles and quad bikes registered prior to 1st January 2005 are charged a flat-rate of €36 per annum.³⁹⁰
- All passenger cars are taxed according to their gross vehicle weight. Additionally, those registered after 1st January 2005 are also taxed according to engine capacity and engine power, with larger vehicles charged a higher rate. Buses and lorries are taxed on their weight only. These rates are outlined in Appendix A.12.0 and for passenger cars range from around €30 per annum to upwards of €650 per annum.
- Revenue in 2012 (the latest year for which figures are available): LVL 47.7 million (€68.4 million, equivalent to 0.31% of GDP).³⁹¹
- Company Car Tax:³⁹²
 - This is a circulation tax (paid monthly), which is charged on vehicles which are used both as company and personal vehicles and which have 9 seats or fewer. The tax has been collected since 1st January 2011 and is based on the engine size and the car registration date.
 - Vehicles registered before 1st January 2005 pay €43 per month.
 - Vehicles registered after 1st January 2005 pay between €27 and €57 per month, depending on their engine capacity.
 - Exemptions include emergency vehicles, taxis and certain other vehicles.
 - Revenue in 2012 was (the latest year for which figures are available): LVL 11.7 million (€16.9 million, equivalent to 0.08% of GDP).³⁹³
- As part of the Natural Resources Tax, there is also a flat-rate charge of €40 per vehicle at the time of registration in Latvia.³⁹⁴ See Appendix A.12.0 for more details of the Natural Resources Tax.

³⁸⁹ *Vehicle Operating Tax*, accessed 5 September 2014, http://www.fm.gov.lv/en/s/taxes/vehicle_operating_tax/43722-vehicle-operating-tax

³⁹⁰ Ibid.

³⁹¹ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁹² European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³⁹³ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁹⁴ Valsts Ieņēmumu Dienests (State Revenue Service) (2014) *Natural Resources Tax*, accessed 5 September 2014, <https://www.vid.gov.lv/default.aspx?tabid=8&id=6681&hl=2>

- There is currently no air passenger or freight tax, but a ‘passenger departure duty’ was in place until the end of the 2004.³⁹⁵ The rate of the duty is unknown and revenue in 2004 (the latest year the tax was in existence) was LVL 3.59 million (€5.40 million, equivalent to 0.024% of GDP).³⁹⁶
- In addition to the taxes above, a road toll system (Euro Vignette) has been in place in Latvia on many stretches of main state roads since 1st July 2014. Rates depend on the type and size of the vehicle used and the vehicle’s emissions rating (Euro class). Daily rates range from €8 to €11 per vehicle, while annual rates range between €400 and €925 per vehicle.³⁹⁷

➤ **Pollution and Resource Taxes:**

- In Latvia, one all-encompassing Natural Resources Tax includes taxation on most of the types of activities covered by individual taxes in many other Member States. This includes an aggregates tax, water abstraction tax, landfill tax, water pollution tax, tax on various goods that are harmful to the environment, tax on materials used for packaging, tax on radioactive materials, air pollution tax (including CO₂), tax on the use of coal, coke and lignite and, finally, a tax on the pumping of natural gas or greenhouse gases into geological structures.^{398,399} For the sake of comparison with other EU member states in this report, the Natural Resources Tax is here described under headings related to the environmental aspects that the tax aims to target.
- In 2012, the total Revenue for Natural Resources Tax was €17.5 million, equivalent to 0.078% of GDP. Revenue figures for each sub-category of the Natural Resources tax are provided in Table 14-3.

Table 14-3: Revenue from Natural Resources Tax (2012)

Natural Resources Tax type	Tax revenue, thousand EUR
Pollution and Resource tax	13,607
Environmentally harmful products	145

³⁹⁵ Valsts Valodas Centrs (State Language Centre) (2010) *Transport Development Guidelines 2007-2013 (Informative Part) (English Translation)*, March 2010, http://www.vvc.gov.lv/export/sites/default/docs/LRTA/Citi/Transport_Development_Guidelines_x2007-2013x.doc#, p.11

³⁹⁶ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁹⁷ Rates and information about the Vignette are available in English: <https://www.lvvignette.eu/#middle:lng=en>

³⁹⁸ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³⁹⁹ Valsts Ieņēmumu Dienests (State Revenue Service) (2014) *Natural Resources Tax*, accessed 5 September 2014, <https://www.vid.gov.lv/default.aspx?tabid=8&id=6681&hl=2>

Natural Resources Tax type	Tax revenue, thousand EUR
Packaging	1,148
Use of radioactive substances	0.26
Incineration of Hazardous waste and extraction of natural minerals	320
Single use disposable tableware and accessories	55.9
Registration of vehicles upon registration in LV for the first time	1,302
Penalty payments for breach of legal limit values	211
Coal, coke and lignite	677
Total	17,464

- Waste Disposal Tax (Landfill Tax):
 - A tax on waste disposal (landfill tax) has been imposed in Latvia since 1991 and has been amended twice, both in 1996 and 2006, though rates have been increased multiple times since its introduction, most recently in January 2014.^{400,401} The rate depends on the type of waste disposed and is charged on a per tonne basis.
 - Municipal waste: €12.00 per tonne (increased in several increments from €1.07 per tonne in 2007); construction & demolition (C&D) waste: €21.34 per tonne; asbestos: €35.57 per tonne; hazardous waste: €35.57 per tonne; and industrial waste: €21.34 per tonne
- Water Abstraction Tax:
 - Extraction of water is taxed depending on the type and quality of water extracted. Consumers who use more than 10 m³ of water in any 24-hour period must pay the tax. Rates are set according to the 'polluter pays' principles and the principle that water management costs and any damage caused must be covered.⁴⁰²
 - Additionally, anyone wishing to abstract water must have a permit. The fee for issuing a water permit was €79 in 2011. If no permit is issued, the water abstraction tax rates are ten times the rates shown below.⁴⁰³
 - The rate for surface water abstraction was increased between 2007 and 2010; rates for other types and uses of water have

⁴⁰⁰ European Topic Centre on Sustainable Consumption and Production (2012) *Overview of the Use of Landfill Taxes in Europe*, Report for European Environment Agency, April 2012, http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1, p. 55

⁴⁰¹ European Commission (2014) *Commission Staff Working Document: Assessment of the 2014 National Reform Programme and Stability Programme for Latvia*, June 2014, http://ec.europa.eu/europe2020/pdf/csr2014/swd2014_latvia_en.pdf, p. 26

⁴⁰² IEEP (2013) *Steps to Greening Country Report: Latvia*, Report for the European Commission, p. 12

⁴⁰³ Ibid, pp. 12-13

remained steady since 2007. As an example, the rate for surface water is €0.009 per m³ while high-value ground water which is sold on is charged at €1.42 per m³.

- Aggregates Tax:
 - The extraction of natural materials is taxed on a per weight or volume basis. Rates are different for each material. For example, soil is charged at €0.43 per m³, sand is charged at €0.21 per m³, while freshwater limestone is charged at €0.14 per m³. Further details on these rates can be found in Appendix A.12.0.
- Air Pollution Tax:
 - Any emission of air pollutants (including CO₂) which is outside of transferred allowances is taxed. A number of these rates are due to be further increased in 2015, having increased steadily since 2007. Some example rates are provided below, with full details available in Appendix A.12.0.⁴⁰⁴
 - CO₂ from stationary technological installations (except those covered by exemptions outlined in the Law on Pollution⁴⁰⁵): 2014 rate: €2.85 per tonne; 2015 rate: €3.50 per tonne; PM₁₀ (not containing heavy metals): 2014 rate: €51.22 per tonne; 2015 rate: €75.00 per tonne; carbon monoxide: rate (not changing in 2015): €7.83 per tonne; sulphur dioxide, nitrogen oxides, VOCs and other hydrocarbons: rate (not changing in 2015): €85.37 per tonne; and heavy metals and compounds thereof: rate (not changing in 2015): €1,138.30 per tonne
- Water Pollution Tax:
 - A tax is levied on pollution discharged into water ways. The level of the tax is set according to how hazardous the material is and is paid per tonne of material released. Example rates are:
 - Non-hazardous substances: €5.50 per tonne;
 - suspended (non-hazardous) substances: €14 per tonne;
 - moderately-hazardous substances: €43 per tonne;
 - hazardous substances: €11,383 per tonne;
 - especially hazardous substances: €71,144 per tonne; and
 - phosphorus (total content): €270 per tonne
 - Packaging Tax (and tax on disposable tableware and accessories):

⁴⁰⁴ IEEP (2013) *Steps to Greening Country Report: Latvia*, Report for the European Commission, p. 30

⁴⁰⁵ This includes energy generation from renewable energy and peat. [Source: IEEP (2013) *Steps to Greening Country Report: Latvia*, Report for the European Commission, p.10]

- The sale of materials used for packaging as well as the use of disposal tableware is taxed on a per kg basis. This also includes plastic bags. Example rates are provided below, with full details available in Appendix A.12.0.
 - Glass-source materials: €0.44 per kg;
 - plastic-source materials, except 'bioplastic' and oxy-degradable plastic source materials: €1.22 per kg;
 - metal-source materials: €1.10 per kg;
 - Wood-, paper-, cardboard- and other natural fibre- and bioplastic-source materials: €0.24 per kg;
 - plastic bag (weight per bag is less than 0.003 kg): €3.70 per kg; and
 - plastic bag (weight per bag is more than 0.003 kg): €1.14 per kg.
- It should be noted, however, that the packaging tax is not widely paid, and generates a very small amount of revenue. This is because those who would otherwise pay the tax are exempt if they are part of an authorised compliance scheme. As such, the tax acts to push producers into the compliance schemes. Note that the same applies in respect of WEEE and good harmful to the environment (see below);
- Tax on goods harmful to the environment:
 - The sale of goods harmful to the environment is taxed, either according to the weight of material or per item. Example rates are provided below, with full details available in Appendix A.12.0.
 - Lubricating oils: €0.17 per kg; electric batteries and galvanic sources of electricity: €0.74 to €17.03 per kg, depending on the type of battery; ozone depleting substances: €2.22 per kg of ozone depletion potential; and tyres: €0.33 per kg.
 - The use of radioactive substances (resulting in radioactive waste) is also taxed. The rate ranges from €711 per m³ of waste for the first radionuclide group from a closed radiation source to €14,229 per m³ of waste for the seventh radionuclide group from an ionising radiation source.
 - Vehicles are also taxed under the Natural Resources Tax, in addition to being subject to registration taxes. This is paid by the person who imports or sells the vehicles in Latvia. The rate is €40 per vehicle.
- Additional tax on the sale of coal, coke and lignite. The rates are:
 - Coal, coke and lignite with known thermal input: €0.30 per GJ; and
 - Coal, coke and lignite without known thermal input: €8.54 per tonne.
- Tax on the pumping of natural gas and greenhouse gases into geological

structures:

- The tax depends on the particular gas pumped: natural gas: €0.0143 per m³; methane: €0.0143 per m³; carbon dioxide: €0.07 per m³; other greenhouse gases: €0.14 per m³.
- It has been reported that advertisement paper was due to be taxed under the Natural Resources Tax from August 2013 at a rate of €1.28 per kg, but this does not appear to be the case and has not yet come into force.⁴⁰⁶
- In addition to the Natural Resources Tax, Latvia was recently considered a mandatory deposit refund system for beverage containers, to be enforced from 1st January 2015.⁴⁰⁷ The legal framework needed to implement this has not been adopted and the idea has now been put on hold.⁴⁰⁸

14.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Latvia. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

14.2.1 Current Status of EFR

Latvia has a wide suite of environmental taxes in place. This includes a Natural Resources Tax which covers a number of environmental aspects – the first incarnation of the tax was introduced in 1992 and it is regularly revised to remain up-to-date. For example, landfill tax rates (covered by the Natural Resources Tax) increased sharply between 2010 and 2013, particularly for construction and demolition waste.⁴⁰⁹ Certain other taxes have also increased recently, including a progressive increase in the taxation rate on PM₁₀ released into the air. However, taxation on other air pollutants, such as NO₂ have not increased in recent years.⁴¹⁰

Following recommendations from the 2013 European Semester programme, excise duty rates on natural gas and other gaseous hydrocarbons were increased and a new road toll system was implemented from 1st July 2014. This shows a degree of interest and willingness to shift taxation towards environmental taxes, though rates of many taxes, including excise duties on energy products and the landfill tax are far below those of many other EU Member States and commentary suggests that the taxes, despite their

⁴⁰⁶ Ecologic Institute, and eclareon (2014) *Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Latvia*, Report for European Commission - DG Clima, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/lv_2014_en.pdf, p.12

⁴⁰⁷ Ecologic Institute, and eclareon (2014) *Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Latvia*, Report for European Commission - DG Clima, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/lv_2014_en.pdf, p.15

⁴⁰⁸ Personal communication with Silviya Aile of DG Environment at the European Commission, 3rd October 2013.

⁴⁰⁹ IEEP (2013) *Steps to Greening Country Report: Latvia*, Report for the European Commission, p.4

⁴¹⁰ IEEP (2013) *Steps to Greening Country Report: Latvia*, Report for the European Commission, p.5

increased rates, are still insufficient to drive widespread behaviour change and that “environmental indicators continue to pose significant challenges”.⁴¹¹

Latvia, however, appears to consider that such rate increases amount to meeting the recommendation to reduce taxation of low-income earners by shifting taxation to areas such as excise duties and/or environmental taxes.⁴¹² It thus appears that the Latvian government currently considers itself as having done what is required in respect of environmental fiscal reform.

As in 2013, one of the country specific recommendations made as part of the 2014 European Semester encourages Latvia to continue its efforts to shift taxation towards environmental aspects:

Recommendation 1: [...] Pursue efforts to further reduce the tax burden on low-income earners in the context of a shift towards more growth-friendly property and environmental taxes and by improving tax compliance and collection.⁴¹³

The reforms described below are aimed at identifying a number of areas where environmental taxes could be used to raise additional revenues and offset taxes on low income earners. Such taxes would also help to achieve environmental goals by providing clear price signals to ensure that environmental objectives are achieved and maintained over time.

14.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Latvia. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the ‘good practice’ rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol

⁴¹¹ See pp. 12-13 and footnote 14 in European Commission (2014) *Commission Staff Working Document: Assessment of the 2014 National Reform Programme and Stability Programme for Latvia*, June 2014, http://ec.europa.eu/europe2020/pdf/csr2014/swd2014_latvia_en.pdf

⁴¹² Government of Latvia (2014) *National Reform Programme of Latvia for the Implementation of the ‘Europe 2020’ Strategy: Progress Report*, April 2014, http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014_latvia_en.pdf, p. 9

⁴¹³ Council of the European Union (2014) *Council Recommendation on the National Reform Programme 2014 of Latvia and Delivering a Council Opinion on the Stability Programme of Latvia*, 2014, July 2014, ec.europa.eu/europe2020/pdf/csr2014/csr2014_council_latvia_en.pdf

(€11.2 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for LPG (€2.2 per GJ). Finally, the rates for heating fuels are equalised using the minimum rate for kerosene of €0.17 per GJ.

- The existing electricity taxes are harmonised and above the ETD minimum of €0.15 per GJ so no change is suggested.
- Table 14-4 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.
- In the case of propellants, the revisions imply a major increase in taxes on LPG and natural gas. More importantly, however, the petrol / diesel differential, which significantly favours diesel at present, is closed as the revisions imply that the tax applied to diesel is increased by roughly a third of its current level, redressing the enormous imbalance in taxes between diesel and petrol. A similar change is implied for kerosene.
- In the case of fuels used in commercial and industrial motors, there is a major increase in the rates for gas oil, kerosene and natural gas to bring the taxes into alignment with existing rates on LPG;
- On heating fuels (business and non-business), the changes imply significant uplifts in taxes on heavy fuel oil and LPG, and significantly, the taxes on coal and natural gas increase by 180% and almost 600%, respectively.
- The existing electricity tax rates are unchanged.

Table 14-4: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	411	411
Light fuel oil (diesel)	€ per 1000 litre	445	333
LPG (propellant)	€ per 1000 kg	571	161
Kerosene	€ per 1000 litre	447	333
Natural gas (prop)	€ per GJ	12	3
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	131	57
Kerosene	€ per 1000 litre	130	57
LPG	€ per 1000 kg	161	161

Energy Tax	Units	Suggested Rates	Existing Rates
Natural gas	€ per GJ	3	0
Business Heating			
Gas oil	€ per 1000 litre	58	57
Heavy fuel oil	€ per 1000 kg	68	16
Kerosene	€ per 1000 litre	57	57
LPG	€ per 1000 kg	66	0
Natural gas	€ per GJ	1.29	0.46
Coal	€ per GJ	2.06	0.30
Non-Business Heating			
Gas oil	€ per 1000 litre	58	57
Heavy fuel oil	€ per 1000 kg	68	16
Kerosene	€ per 1000 litre	57	57
LPG	€ per 1000 kg	66	0
Natural gas	€ per GJ	1.29	0.46
Coal	€ per GJ	2.06	0.30
Electricity			
Electricity - business use	€ per MWh	1.01	1.01
Electricity - non-business use	€ per MWh	1.01	1.01

➤ **Transport Taxes:**

- **Vehicles:** The taxes on transport in Latvia are slightly lower than average in the EU (0.42% of GDP compared to the EU-28 level of 0.50% GDP). There is, however, scope to increase vehicle taxation and it is suggested here that vehicle taxes be raised by an amount equivalent to 0.07% of GDP. This would both raise revenue, and also, increasing differentiation between vehicles based upon environmental performance, thereby influencing the stock of vehicles in use in future. In line with the proposals from the Commission of 2005, we suggest that the main increase could

relate to the circulation tax.⁴¹⁴ The increase is phased in over the period from 2016 to 2021. There is also scope to introduce a more widespread system of charging for road use by HGVs.

- **Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. The introduction of a tax on passenger flights and air freight is recommended in Latvia. The suggested rates for the air passenger tax for are €15 per passenger (flights within the country concerned), €25 per passenger (to other countries in the European Union), and €50 per passenger (to other countries outside the European Union). The suggested air transport tax rate is €1.25 per tonne of freight. The year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. As noted the Good Practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax.

➤ **Pollution and Resource Taxes:**

- **Aggregates:** An aggregates tax can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This is in-line with the flagship initiative 'A Resource Efficient Europe'.⁴¹⁵ The extraction of aggregates is currently taxed on a per weight or volume basis in Latvia. Examples of current tax rates are €0.43 per m³ for sand, and 0.28 per m³ for limestone. It is recommended that tax rates are increased to €2.40 per tonne of material extracted from 2017, and that thereafter, they are kept constant in real terms. While the current tax covers most major extractable materials, further analysis will be required to assess whether any additional materials should be covered by the aggregates tax.
- **Waste – landfill tax:** Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Landfill taxes also provide support to the application of the waste hierarchy. In 2012, the rate of waste landfilled (directly or indirectly) in Latvia was 40%, excluding major mineral wastes, dredging spoils and contaminated soils.⁴¹⁶ This rate is much lower than in 2010 (when it was 72%), yet there is significant potential to lower it further. While a landfill tax is in place in Latvia, the rate is relatively low: €12 per tonne for the disposal of municipal waste. A study on landfill tax was conducted for the

⁴¹⁴ European Commission (2005) *Proposal for a Council Directive on Passenger Car Related Taxes*, 5th July 2005, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0261:FIN:en:PDF>

⁴¹⁵ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

⁴¹⁶ Eurostat (2014) *Landfill Rate of Waste Excluding Major Mineral Wastes*, Accessed 14th October 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=t2020_rt110&tableSelection=1

Latvian Ministry of the Environment last year.⁴¹⁷ The study proposed an increase in the tax by €3 per tonne per year starting in 2015, reaching €30 per tonne for municipal waste and €40 per tonne for construction waste in 2020. It also proposed to increase the tax on hazardous waste by 3% annually, reaching €42.47 per tonne in 2020. We suggest that the rate for non-hazardous landfill is raised to a minimum of €50 per tonne by 2020. An early announcement of this tax and its escalation over a number of years would help drive the change in the waste management sector needed to meet EU targets in 2020 and beyond. We suggest this tax should be indexed to an appropriate measure of inflation.

- **Waste – incineration / MBT tax:** In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, up to €15 per tonne over the same period as the landfill tax is increased (i.e. up to 2020). An equivalent rate is also proposed for MBT facilities. We would recommend that the tax is applied on materials being prepared for export for incineration also so as to avoid a simple movement of waste to incinerators in countries without such a tax in place (or which may exempt imported wastes from the tax). These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.⁴¹⁸
- **Single-use carrier bag tax:** Plastic bags cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the riverine, or marine, environment. Moreover in countries with high level of tourism littered plastic bags can deter visitors. A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. In 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.⁴¹⁹ Latvia currently has a tax on plastic bags; however, the tax rate is specified by weight, rather than on a per bag basis. In most circumstances, the effective tax rate is less than €0.01 per bag. It is recommended that Latvia switches to a specific tax rate per bag and extends the tax to cover all single-use carrier bags. Furthermore, the tax rate could be increased to €0.10 per bag from 2016, and kept constant in real terms thereafter.
- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are

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http://www.varam.gov.lv/in_site/tools/download.php?file=files/text/publikacijas/petijumi/vide/Atkritumi/poligonu_likmes_novertejums_Final.pdf

418 European Commission (2011) *Roadmap to a Resource Efficient Europe*, 20th September 2011, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN>

419 DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. Latvia already has a system of air pollution taxes in place, covering CO₂, PM₁₀, CO, SO_x, NO_x, VOCs, ammonia and heavy metals. It is suggested that a number of increases in specific tax rates should be implemented in order to generate improvements in air quality as follows:

- SO_x €1,000 per tonne
- NO_x €1,000 per tonne
- PM₁₀ €2,000 per tonne

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2021. The rates are then held constant in real terms.

- **Water abstraction:** A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that “*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*”. Water abstraction charges are currently in place in Latvia, and the current pricing structure is based on the type and quality of water. It is suggested that the tax rate calculation should also depend on the usage type (e.g. agriculture, drinking water etc.). An increase in tax rates is also recommended: appropriate levels of taxation would be of the order €130 per 1,000m³ for the public water supply, €80 per 1,000 m³ for manufacturing purposes and €11 per 1,000 m³ for agriculture. We have assumed that the additional revenue which such rates may generate can accrue to the central budget. A transition period from 2016 to 2021 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21st May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.⁴²⁰ Latvia already has a tax on water pollution, with higher tax rates for more hazardous substance. To improve prevention of water pollution it is suggested to adjust tax rates in-line with ‘good practice’. With relative price levels in Latvia this would imply, for BOD, a rate of €2.14 per kg of the pollutant. Given the magnitude of the increase in rates a transition period from 2016 to 2019 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. It is suggested that rates should be held constant in real terms once they reach the 2019 levels.

⁴²⁰ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

While Latvia currently uses smaller volumes of pesticides than more developed Member States the use of these substances still poses risks to human and environmental health.⁴²¹ The current pesticide management plan for Latvia does not specifically mention taxes on pesticides; however, the introduction of such taxes may help to achieve the wider objectives of the plan which explicitly encourage alternatives to be used prior to resorting to the use of pesticides.⁴²²

There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in Latvia, with special provisions being made to meet specific national circumstances (e.g. the control of particular invasive species). Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €2.50 per kg active ingredient. The suggested transition period is from 2017 to 2019, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would contribute towards the aims of the Action Plan.

- **Fertilisers:** The use of fertilisers is steadily growing in Latvia. From 2000 to 2013, fertilizer use increased from 37 thousand tonnes to 122 thousand tonnes.⁴²³ Despite the rapid increase, fertilise use remains at a very low level relative to other Member States, with approximately 0.036 tonnes of nitrogen being applied per hectore of active agricultural land. On December 23rd 2014 the Cabinet of Ministers Regulations No.834 was published, providing *Regulations on the Protection of Water and Soil against Pollution Caused by Nitrates from Agricultural Sources*. These regulations set out

⁴²¹ FAOSTAT (2013) *Pesticides Use in Selected Country*, Accessed 20th October 2014, <http://faostat3.fao.org/browse/R/RP/E>

⁴²² Latvijas Republikas Oficiālais Izdevums (2013) *Par Rīcības Plānu Augu Aizsardzības Līdzekļu Ilgtspējīgai Izmantošanai 2013–2015.gadam*, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_latvia_lv.pdf

⁴²³ Central Statistical Bureau of Latvia (2013) *Public Database, General Agricultural Indicators*, Accessed 20th October 2014, http://data.csb.gov.lv/pxweb/en/lauks/lauks_ikgad_01Lauks_visp/?rxid=a79839fe-11ba-4ecd-8cc3-4035692c5fc8

the requirements for protecting water and soil against pollution caused by nitrates from agricultural activity, with more stringent requirements being laid down for nitrate vulnerable zones. The Cabinet of Minister Regulations No. 278, published on 3rd June 2014, also require that fertilisers be applied in accordance with a crop fertilisation plan. There are thus regulatory controls covering the application of fertilisers in Latvia. The introduction of a tax on nitrogen (or other) fertilisers could contribute towards the broader objectives of these regulations by driving efficiencies in the use of these products. It is therefore suggested that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of 0.05 € per kg N be implemented from 2017 with rates gradually increasing to the maximum level in 2019.

14.2.3 Summary of Revenue Outcomes

Table 14-5 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 14-5: Potential Additional Revenue from Environmental Fiscal Reform in Latvia, million EUR (real 2014 terms)⁴²⁴

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	13	52	89
C&I / Heating	17	66	116
Electricity	0	0	0
<i>Sub-total Energy, million EUR</i>	<i>30</i>	<i>118</i>	<i>205</i>
<i>Sub-total Energy, % GDP</i>	<i>0.12%</i>	<i>0.46%</i>	<i>0.79%</i>
Transport Taxes			
Vehicle Taxes	4	15	19
Passenger Aviation Tax	102	227	277

⁴²⁴ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Freight Aviation Tax	0.02	0.05	0.06
<i>Sub-total Transport, million EUR</i>	<i>106</i>	<i>242</i>	<i>296</i>
<i>Sub-total Transport, % GDP</i>	<i>0.41%</i>	<i>0.93%</i>	<i>1.14%</i>
Pollution and Resource Taxes			
Landfill Tax - Non-haz General	6	12	14
Incineration /MBT Tax	1	2	2
Air Pollution Tax	12	32	42
Water Abstraction Tax	11	25	24
Waste Water Tax	8	11	11
Pesticides Tax	3	6	9
Aggregates Tax	42	25	26
Packaging Tax	6	6	6
Single Use Bag Tax	26	5	6
Fertiliser Tax	0.002	0.005	0.007
<i>Sub-total Pollution & Resource, million EUR</i>	<i>114</i>	<i>125</i>	<i>141</i>
<i>Sub-total Pollution & Resources, % GDP</i>	<i>0.44%</i>	<i>0.48%</i>	<i>0.54%</i>
Total Environmental Taxes			
Total, million EUR	250	485	642
Total Increase, % GDP	0.96%	1.87%	2.47%

Table 14-6 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 14-6: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Latvia, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	70
Increased Cost Recovery for Water Use	65
Total	135

14.2.4 Environmental Benefits

Table 14-7 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.12.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €268 million of benefits are anticipated annually by 2025 in real terms.

Table 14-7: Monetised Environmental Benefits from Implementation of Suggested Taxes in Latvia, million EUR (real 2014 terms)⁴²⁵

Tax Type	2017	2020	2025
Energy Taxes	1.2	4.8	8.2
Transport Taxes (excluding transport fuels)	1.6	3.4	4.0
Pollution and Resource Taxes	28	139	256
Total, million EUR	31	147	268
Total, % GDP	0.11%	0.50%	0.81%

14.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Latvia:⁴²⁶

- In 2012, environmental taxes generated revenue equivalent to 2.42% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Latvia. These could generate EUR 0.2 billion in 2017, rising to EUR 0.6 billion in 2025 (EUR 0.6 billion) (both in real 2014 terms). This is equivalent to 0.96% and 2.47% of GDP in 2017 and 2025, respectively.
- The largest single contribution to revenue comes from the proposed passenger aviation tax. This accounts for EUR 0.3 billion by 2025 (real 2014 terms), equivalent to 0.84% of GDP.

⁴²⁵ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

⁴²⁶ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- The next largest contribution to revenue comes from the suggested reforms to the taxes on fuels for business heating. The taxes account for EUR 0.1 billion by 2025 (real 2014 terms), equivalent to 0.35% of GDP.
- The suggested harmonisation of the taxes on transport fuels would account for EUR 0.1 billion by 2025 (real 2014 terms), equivalent to 0.27% of GDP.
- Revenue potential from the proposed air pollution tax would would raise EUR 0.042 billion by 2025 (real 2014 terms), equivalent to 0.13% of GDP.
- A tax on aggregates has also been suggested. This would contribute EUR 0.026 billion by 2025 (real 2014 terms), equivalent to 0.08% of GDP.
- In addition, a range of more minor taxes on could generate revenue of EUR 0.09 billion by 2025 (real 2014 terms), equivalent to 0.28% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 0.3 billion by 2025 (real 2014 terms), equivalent to 0.81% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €135 million per annum could be raised in addition to the above.

15.0 Malta

15.1 Country Overview

15.1.1 Key Facts about the Economy and Tax System

- Over the period 2003–2013, Malta experienced its largest drop in GDP in 2009, which saw a 2.8% reduction in GDP in real terms from the previous year. This was also the most difficult year of the recession for the EU-28 as a whole. Immediately after 2009, however, Malta enjoyed its largest increase in GDP over the whole period, with GDP increasing by 4.3% in real terms in 2010. On average, Malta's annual rates of increase in GDP for the pre-recession years 2003–2007 (2.1% in real terms) and post-recession years 2010–2013 (2.4% in real terms) were not dissimilar.⁴²⁷
- Malta's overall tax revenue (including social contributions) as a percentage of GDP was 34.8% in 2012. This share declined from a high of 35.3% in 2007, but has risen overall in the past 10 years from 31.4% in 2002.⁴²⁸
- Direct taxation and indirect taxation make similar contributions to Malta's total tax income, at 40.1% and 38.7% respectively (2012). Social contributions account for a smaller share at 21.3%, with this amount having decreased steadily over the past 10 years.⁴²⁹
- In 2012, revenues from environmental taxes accounted for 2.98% of GDP. This percentage share is somewhat low for Malta compared to previous levels, and represents only the second time in the past 10 years that it has fallen below 3%.⁴³⁰
- In 2012, energy taxes represented the largest share of environmental taxes in Malta accounting for 1.58% of GDP. This was followed by transport taxes (excluding fuel) which accounted for 1.27% of GDP, while pollution and resource taxes accounted for a smaller contribution of 0.13% of GDP.⁴³¹

⁴²⁷ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

⁴²⁸ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

⁴²⁹ Figures based on feedback from EU Secretariat, Ministry for Sustainable Development, the Environment and Climate Change, 18th December 2014

⁴³⁰ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

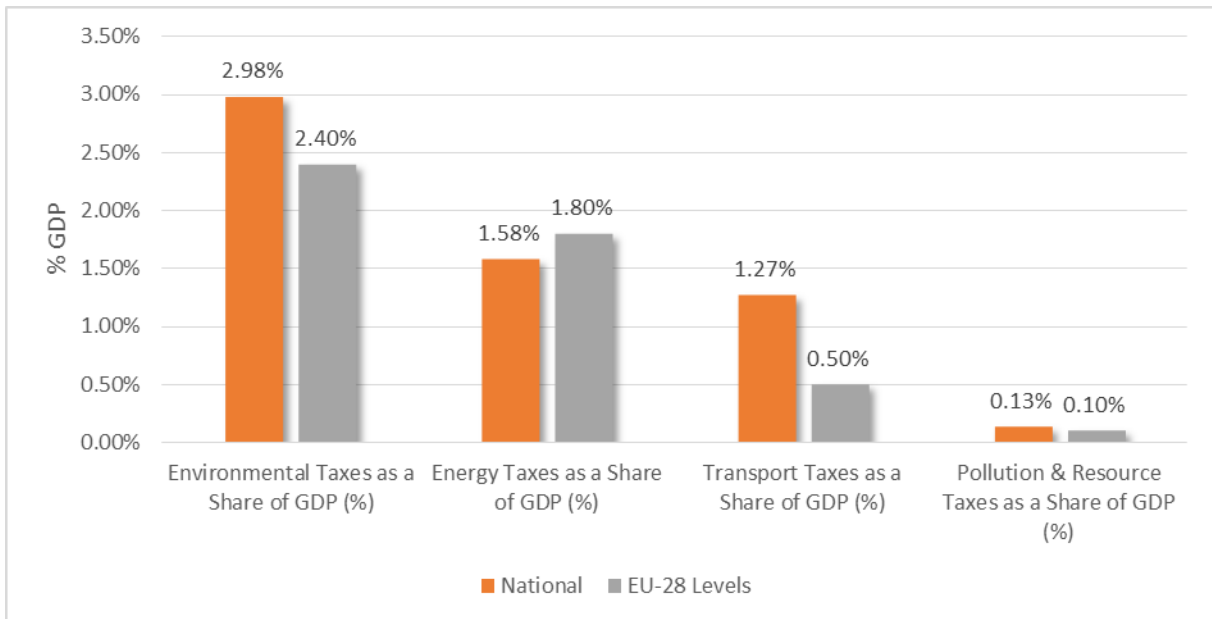
⁴³¹ Ibid.

- Energy taxes contributed 53% of Malta’s overall revenue from environmental taxation in 2012. This percentage has risen significantly over the past 10 years from 39.8% in 2002.⁴³²

15.1.2 Relative Position within the EU

- In 2012, the share of environmental taxes as a percentage of Malta’s GDP was above the EU-28 average of 2.4%. While energy taxes as a percentage of GDP were lower than the EU-28 average of 1.8%, transport taxes (excluding fuel) as a percentage of GDP were significantly higher than the EU-28 average of 0.5%. Pollution and resource taxes as a share of GDP were also slightly higher than the EU-28 average of 0.1% (see Figure 15-1).⁴³³

Figure 15-1: Environmental Taxes in Malta as a % of GDP vs EU-28 Levels (2012)



Expressed as a proportion of GDP, Malta ranked 7th among the EU-28 in 2012 in terms of revenue derived from environmental taxes. Malta ranked low, in 22nd place, for the percentage share of GDP from energy taxes, but was in 2nd place in terms of percentage share of GDP from transport taxes (excluding fuel) (see Table 15-1).⁴³⁴

⁴³² Ibid.

⁴³³ Ibid.

⁴³⁴ Ibid.

Table 15-1: Ranking of Malta's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	7
Energy Taxes as a Share of GDP (%)	22
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	2
Pollution & Resource Taxes as a Share of GDP (%)	10

Source: based on Eurostat data

15.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.13.0 (see separate document). This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon nominal GDP figures for the same year as the reported revenues.^{435,436}

➤ Energy Taxes:

- Maltese excise duties on fuels and electricity are shown in Table 15-2, alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 15-2: Standard Rates of Excise Duties on Fuels and Electricity in Malta

Excise Duty	Unit	Rate Applied in Malta	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol ¹	€ per 1000 litres	€628.18	€421	€585	€583
Unleaded Petrol	€ per 1000 litres	€509.38	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€422.40	€330	€427	€405

⁴³⁵ Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1>

⁴³⁶ Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Excise Duty	Unit	Rate Applied in Malta	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene	€ per 1000 litres	€422.40	€330	€440	€405
Liquid Petroleum Gas ²	€ per 1000 kg	Not used at present	€125	€209	€180
Natural Gas	€ per GJ	Not used at present	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€422.40	€21	€221	€163
Kerosene	€ per 1000 litres	€422.40	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€125.00	€41	€126	€125
Natural Gas	€ per GJ	€2.60	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€422.40	€21	€221	€163
Kerosene	€ per 1000 litres	€422.40	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€34.00	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€38.94	€0.00	€82	€40
Natural Gas	€ per GJ	€0.84	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€0.30	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€182.09	€21	€179	€125
Kerosene	€ per 1000 litres	€382.40	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€34.00	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€38.94	€0.00	€111	€42
Natural Gas	€ per GJ	€0.84	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€0.30	€0.30	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€1,50	€0.50	€8.42	€1.03
Non-Business Use	€ per MWh	€1,50	€1.00	€14.53	€2.06

Excise Duty	Unit	Rate Applied in Malta	Existing ETD Minimum	EU-28 Average	EU-28 Median
Notes:					
<ol style="list-style-type: none"> 1. Leaded petrol has not been sold in Malta since 1 January 2003. LRP (Lead Replacement Petrol) was available between January 2003 and December 2010. 2. Although indicated as not currently used as propellant in the DG TAXUD table, in January 2014 the government put in place a programme to promote the up-take of LPG-fuelled cars. 					

Sources: DG TAXUD (2014) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2014,

http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf; and The Malta Independent (2010), LRP Fuel being phased out, Accessed 14th August 2014, <http://www.independent.com.mt/articles/2010-10-07/news/lrp-fuel-being-phased-out-281258/>

- With the exception of LPG and natural gas all of the excise duties on transport fuels are above the minimum set by the existing ETD. However, excise duties applied on all transport fuels in Malta are below the EU-28 average (with the exception of leaded petrol).
- Excise duties on motor fuels (for industry/commercial use) are in line or above the EU-28 median. LPG used for heating purposes by industry is also taxed below both the EU-28 average and EU-28 median while excise duties applied on heavy fuel oil is below the EU-28 average. Natural gas and coal/coke used for business heating is taxed above the threshold set by the ETD but below the EU-28 average.
- Fuels used for heating purposes by households, mainly natural gas and coal/coke products, are taxed at rates close to the EU-28 median. However, with the exception of kerosene, rates remain below the EU-28 average.
- Electricity used by households and businesses is taxed above the minimum rates set by the ETD and are close to the EU-28 median; however, rates are well below the EU-28 average.
- As described under *The Bunkering (Fuel) Tax Act* (Chapter 381 of the Laws of Malta), the government applies different tax rates for bunkering of ships outside territorial waters.⁴³⁷ Further details can be found in Appendix A.13.0.
- Exemptions from excise duties are applied to fuels used for: electricity generation; international aircrafts travelling outside the EU; inshore fishing; fuelling and provision of fishing, industrial, commercial and rescue vessels; and private and pleasure sea craft with direct voyages outside the EU.

⁴³⁷ Government of Malta (2014), Bunkering (Fuels) Tax Act (Chapter 381), Accessed 11th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8848>

- A reduced rate is applied on gas oil/diesel and LPG used for heating purposes. A reduced rate is also applied on gas oil/diesel used for bunkering operations, dredging operations, harbour cruises, inland navigation, sea farming activities, and navigation for commercial purposes.
- Consumption tariffs for electricity are also applied (see Appendix A.13.0 for more details).
- A reduced VAT rate (5%) is applied on the supply of electricity.
- In 2012, the annual total tax revenues from energy taxes in Malta amounted to €108 million. These taxes accounted for 1.58% of Maltese GDP and were equivalent to 4.70% of total tax revenues.⁴³⁸

➤ **Transport Taxes (excluding transport fuels):**

- Motor Vehicle Registration Tax: (Taxxa tar-Registrazzjoni fuq il-Vetturi):⁴³⁹
 - The tax was introduced with the approval of the *Motor Vehicle Registration and Licensing Act* (Chapter 368) and came into force in January 1994.
 - The value of the tax is calculated according to engine power, EURO emission standards, particulate matter (for diesel engines only) and CO₂ emissions. As such, it seeks to target key aspects of air pollution from vehicles.^{440,441}
 - Since 2011, registration taxes for commercial vehicles with emission standards lower than EURO 3 were increased to encourage the purchase of newer and less polluting vehicles. In January 2012, this was extended to non-commercial vehicles.⁴⁴² Thus a higher tax is applied on vehicles with EURO 1-3 emission standards compared to those with higher EURO standards. This measure was enacted to rejuvenate the aging vehicle fleet in the

⁴³⁸ European Commission (2014), Taxes in Europe Database, Accessed 11th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=870/1391413804&taxType=Energy+products+and+electricity

⁴³⁹ European Commission (2014), Taxes in Europe Database, Accessed 4th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=16/1357119635&taxType=Other+indirect+tax

⁴⁴⁰ Transport Malta (November 2013). POL 02 - REGISTERING & LICENSING OF NEW & USED MOTOR VEHICLES, Accessed 4th August 2014, [http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2002%20-%20Registration%20and%20Licensing%20of%20Vehicles%20\(Versions%2026%20-%2025th%20November%202013\).pdf_20131108070800.pdf](http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2002%20-%20Registration%20and%20Licensing%20of%20Vehicles%20(Versions%2026%20-%2025th%20November%202013).pdf_20131108070800.pdf)

⁴⁴¹ Government of Malta (2014), *Act No. XII of 2014 (An Act to implement measures for the financial year 2014 and other administrative measures)*, Accessed 7th August 2014, <http://justiceservices.gov.mt/DownloadDocument.aspx?app=lp&itemid=26033&l=1>

⁴⁴² IEEP et al. (2013), Steps towards greening in the EU: Monitoring Member States' achievements in selected environmental policy areas; EU summary report, Final Report - July 2013, http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/Greening.pdf

country, a measure reinforced by the introduction of a scrappage scheme.⁴⁴³

- Electric cars and hybrid goods carrying vehicles (with a maximum mass up to 12 tonnes) are exempt from the registration tax. A car which emits less CO₂ and with a lower engine size pays a lower tax rate. For further information see Appendix A.13.0.
- In 2013, revenues from this tax amounted to €35.55 million, representing 0.52% of Maltese GDP and 1.54% of total tax revenue.^{444,445}
- Circulation Licence Fee: (Licenzja ta' Cirkolazzjoni)⁴⁴⁶
 - Since 1950, all vehicles registered with the Authority for Transport in Malta are subject to an annual circulation licence fee.
 - The fee varies according to the age of the car, cubic capacity of the engine, fuel type and CO₂ emissions.⁴⁴⁷ It is paid by owners of passenger cars, quad bikes and motorcycles.
 - For private petrol vehicles, the fee ranges between €100 for a new petrol-powered vehicle with CO₂ emissions of 0-100g per km to €1,110 for a vehicle aged 14 years old or more and emitting over 250g/km CO₂. For private diesel vehicles, the fee ranges between €100 for a new car with CO₂ emissions of 0-100g per km and with particulate matter up to 0.005g/km, to €1,210 for an old vehicle older than 14 years which emits more than 250g CO₂ per km and with particulate matter exceeding 0.035g/km.⁴⁴⁸

⁴⁴³ Ministry for Finance - Government Grant on the Purchase of Environment-friendly vehicles, <http://live.transport.gov.mt/admin/uploads/media-library/files/Scrappage%20scheme.pdf>

⁴⁴⁴ European Commission (2014) Taxes in Europe Database, Accessed 4th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=1901/1388754867&taxType=Other+indirect+tax

⁴⁴⁵ Data provided by the Ministry of Treasury differs slightly from the figures given by the Eurostat. According to the latest Financial report released, the 'Motor Vehicle Registration Tax' yielded €37.025.558 in 2012 and €32.003.369 in 2013. Please refer to Government of Malta (2014), Financial Report 2013, Floriana: The Treasury, p. 6.

⁴⁴⁶ European Commission (2014) Taxes in Europe Database, Accessed 12th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=425/1388754867&taxType=Other+indirect+tax

⁴⁴⁷ Transport Malta (1st January 2014), POL 33 – Annual circulation licence fees, <http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2033.pdf>, Accessed 7th August 2014

⁴⁴⁸ Government of Malta (2014), Motor Vehicle Registration Act (Chapter 368), Accessed 5th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8837>

- Vehicles for disabled persons, vehicles owned by the Maltese State or vehicles which belong to diplomatic staff are exempt from the fee.⁴⁴⁹
- The fee applies to electric and hybrid electric motor vehicles.⁴⁵⁰
- In 2012, revenues from the fee amounted to €48.59 million, representing 0.71% of Maltese GDP and 2.11 % of total tax revenue.^{451,452}
- Vessel registration and annual fee for small ships:
 - According to the *Small Ship Regulations (Subsidiary Legislation 499.52)*,⁴⁵³ vessels under twenty-four metres of length are required to pay a once-off registration fee and an annual fee.⁴⁵⁴
 - The fee varies accordingly to the total engine horse power (HP) installed on the boat – see Appendix A.13.0 for further details. Small ships with engines are also subject to a registration tax of €50. Small ships with no engine are not subject to the registration tax and are also exempt from the annual renewal fee. Fishing boats registered with the Department responsible for Fisheries are exempt from the tax.
 - Information on revenues from this tax could not be found.
- **Pollution and Resource Taxes:**
 - **Aggregates:**
 - Malta has an annual operating license fee of €699 for the quarrying and sale of soft stone or hard stone derivatives (this is a one off fee paid annually by registered facilities). The fee is regulated through subsidiary legislation 128.01 of the *Police*

⁴⁴⁹ European Commission (2014) Taxes in Europe Database, Accessed 4th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=425/1388754867&taxType=Other+indirect+tax

⁴⁵⁰ Transport Malta (1st January 2014), POL 33 – Annual circulation licence fees, Accessed 7th August 2014 <http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2033.pdf>

⁴⁵¹ European Commission (2014) Taxes in Europe Database, Accessed 4th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

⁴⁵² In this case data provided by Eurostat is in line with the figures the figures given by the Ministry of Treasury. According to the latest Financial report released, the ‘Annual Circulation Licence Fee’ yielded €48.588.334 in 2012 and €49.866.874 in 2013. Please refer to Government of Malta (2014), Financial Report 2013, Floriana:The Treasury, p. 6.

⁴⁵³ Government of Malta (2014), Small Ships Regulations (Subsidiary Legislation 499.52), Accessed 13rd August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=11374&l=1>

⁴⁵⁴ OECD/EEA (2013) OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management, Accessed 13th August 2014, www2.oecd.org/ecoinst/queries/index.htm

Licenses Regulations.⁴⁵⁵ There is, however, no environmental tax in place regarding aggregates.

- MSW and C&D gate fees:
 - There is currently no landfill tax in Malta; however, fees charged for landfilling, biological treatment, and for recycling / recovery of dry recyclables at public facilities are effectively prescribed in legislation. These are not taxes, and they appear to be below rates that would prevail with full cost recovery
 - The cost of collection and management of dry recyclables is covered through the Eco-contribution scheme (see below).
- Cement tax:
 - Following approval of Act N. IV of 2011, Malta introduced an excise tax on Portland cement, excluding white cement (grey Portland cement).⁴⁵⁶ Initially set at €9 per 1000kg, the tax increased over the years and in March 2014 it was €27.00 per 1000kg (grey Portland cement remains exempt).⁴⁵⁷
 - In 2012, revenues from the tax amounted to €3.20 million and to €4.11 million in 2013 (respectively, 0.045% and 0.057% of Maltese GDP).⁴⁵⁸
- ECO-contribution scheme (Att dwar l-Eko-Kontribuzzjoni):
 - The Eco-contribution scheme is paid on a quarterly basis by producers of selected products (listed in the First Schedule of the ECO Contribution Act - Chapter 473 of the Laws of Malta) based on the number of products present on the market. Different rates are applied to different products – detailed in Appendix A.13.0.
 - Under the eco-contribution scheme, a charge of €0.14 is applied on plastic bags with some exceptions as elaborated in Appendix A.13.0. The measure was introduced as a way to discourage the use of plastic bags⁴⁵⁹ and reportedly contributed to a decrease of 5 million plastic bags in the first five months of 2005 as well as

⁴⁵⁵ Government of Malta (2013), Police Licences Regulations – Subsidiary Legislation 128.01, Accessed 13th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=9422>

⁴⁵⁶ Government of Malta (2011), *Act No. IV of 2011 entitled the Budget Measures Implementation Act, 2011*, Accessed 9th August 2014, <http://www.doi-archived.gov.mt/en/parliamentacts/2011/Act%20IV%20of%202011.pdf>

⁴⁵⁷ Government of Malta (2014), *An act to implement Budget measures for the financial year 2014 and other administrative measures*, Accessed 8th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lp&itemid=25742&l=1>

⁴⁵⁸ Government of Malta (2014), *Financial Report 2013*, Floriana:The Treasury, p. 6.

⁴⁵⁹ The Times of Malta (2009), *Eco tax on plastic bags from March*, Accessed 13rd October 2014, <http://www.timesofmalta.com/articles/view/20090129/local/eco-tax-on-plastic-bags-from-march-1.242668>

improved traceability and monitoring of the production of plastic bags in the country.⁴⁶⁰

- Producers who “take-back” waste products on which they have already paid an eco-contribution could have their future eco-contribution payments reduced totally or partially, according to the value of the eco-contribution paid on recovered waste products.⁴⁶¹
- Annual revenues from the scheme in 2012 were equivalent to €6.9 million, which represented 0.10% of Maltese GDP and was equivalent to 0.29% of total tax revenue.⁴⁶²
- Groundwater abstraction:
 - Regulations on the registration and use of groundwater resources have been in place since 1948.⁴⁶³ Today, groundwater abstraction is broadly metered.
 - Water used for agricultural purposes is exempt from water abstraction fees⁴⁶⁴ and the cost of water is limited to the private on-farm costs.⁴⁶⁵ Moreover a “flat” volumetric tariff of €0.093 per m³ is in place for the supply of non-potable water to both agricultural and industrial consumers.
 - Further information on abstraction fees could not be found.
- Water tariffs:
 - Differentiated annual water tariffs are applied for residential or domestic consumers and for industrial and commercial users.
 - Charges for households increased between 2008 and 2010; however, in 2014 (following approval of LN 109 of 2014) water fees for households decreased from €1.47 to €1.40 (for annual consumption between 0 and 33 m³) and from €5.41 to €5.14 (for annual consumption above 33 m³). These charges are based on a

⁴⁶⁰ Lyons, L., (2013) Dynamix policy mix evaluation – Reducing plastic bag use in the UK and Ireland, http://dynamix-project.eu/sites/default/files/Plastic%20bags_Ireland%20and%20UK.pdf

⁴⁶¹ Government of Malta (2014) Eco-Contribution Act (Chap. 473), Accessed 8th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8939&l=1>

⁴⁶² Data provided by the Ministry of Treasury differs slightly from the figures given by the Eurostat. According to the latest financial report released, the ‘Eco-contribution’ yielded €6,908,470 in 2012 and €6,457,162 in 2013. Please refer to Government of Malta (2014) Financial Report 2013, Floriana: The Treasury, p. 7.

⁴⁶³ Government of Malta (2014) Subsidiary Legislation 423.03 – Water Supply Regulations, Accessed 11th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Water-Supply-Regulations.pdf>

⁴⁶⁴ European Commission (2012) The role of water pricing and water allocation in agriculture in delivering sustainable water use in Europe – FINAL REPORT, February 2012, http://ec.europa.eu/environment/water/quantity/pdf/agriculture_report.pdf

⁴⁶⁵ European Commission (2012) The role of water pricing and water allocation in agriculture in delivering sustainable water use in Europe – FINAL REPORT, February 2012, http://ec.europa.eu/environment/water/quantity/pdf/agriculture_report.pdf

methodology to reflect cost recovery, but after taking into account government subventions, and other factors.

- Wastewater management costs are also covered by water tariffs.⁴⁶⁶

15.2 Illustrative Potential of EFR

In this section we first give a brief synopsis of the current status of Environmental Fiscal Reform in Malta. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

The proposed changes to taxation are part of the cross-country common approach (within this study) of applying “good practice” with environmental taxation (taken as a “best in the class type approach”) to each country. This allows comparable results. Some countries may wish to go further than the tax rates noted here – as today’s “best in the class” can become “tomorrow’s middle of the class” – and some countries may have other mechanisms for dealing with the environmental challenges and raising revenues and/or face insurmountable obstacles for fiscal reform for various reasons. The proposals for reform should be seen in that light – countries could go further or less far in the coming years depending on country circumstance. Nevertheless, it is useful to illustrate the potential for using taxation for addressing challenges and raising revenue to help map out the potential for fiscal reform.

15.2.1 Current Status of EFR

The government has sought to encourage the development of greener energy sources in recent years. This has been driven by concerns of Malta’s reliance on fossil fuels for electricity production. Malta is fully dependent on imported fossil fuels for electricity generation with almost all of the country’s gross electricity consumption derived from two conventional thermal power plants in Delimara and in Marsa which currently run on heavy fuel oil and gas oil.⁴⁶⁷ In 2012, only 2.7% of electricity was from renewable energy sources (hydro, wind, solar, geothermal and biomass).⁴⁶⁸ The government is seeking to encourage further development of renewables, for example a system of feed-in tariffs for solar photovoltaic systems was introduced in 2010 for residential and non-residential sectors (*Feed-In Tariffs Regulations*, LN 422/2010).⁴⁶⁹

⁴⁶⁶ Malta Resource Authority (2014) Decision on Proposed Water Tariffs March 2014 – Summary of Review Process and Conclusions, Accessed 18th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Minister-MECW-Approval-of-new-tariffs-for-supply-of-water-27.03.14.pdf>

⁴⁶⁷ Malta Resource Authority (2014) *Malta’s Biennial Report on Policies and Measures and Projected Greenhouse Gas Emissions 2013*, Report prepared by the Climate Change and Policy Unit, Report 3/2013, <http://mra.org.mt/wp-content/uploads/2013/07/Malta-PAMs-Report-2013-V1.5.pdf>

⁴⁶⁸ Eurostat (2014), *Share of Energy from Renewable Sources (% of gross electricity consumption)* [[nrg_ind_335a], Accessed 09/01/2015, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_ind_335a&lang=en

⁴⁶⁹ Malta Resource Authority (2014), *Malta’s Biennial Report on Policies and Measures and Projected Greenhouse Gas Emissions 2013*, Report prepared by the Climate Change and Policy Unit, Report 3/2013, <http://mra.org.mt/wp-content/uploads/2013/07/Malta-PAMs-Report-2013-V1.5.pdf>

In relation to transport, the government has adopted some positive changes to environmental taxes to encourage behaviour change. For example, since 2011 a higher registration tax has been applied on commercial vehicles with EURO 1-3 emission standards compared to those with higher EURO standards to encourage the purchase of newer, less polluting vehicles and rejuvenate the ageing vehicle fleet in the country, particularly in the context of a scrappage scheme.⁴⁷⁰

In the pre-budget document for 2014 released in August 2013, the government stressed the importance of fiscal consolidation and focused on ensuring macro-economic stability. In relation to environmental taxation, the government pledged to improve the competitiveness of the economy by lowering electricity and water tariffs for households and businesses.⁴⁷¹ Both tariffs were subsequently lowered in 2014 (see Appendix A.13.0), with part of the rationale for the reduction in water tariffs being the anticipated reduction in electricity tariffs.⁴⁷² The latter will be extended to businesses in 2015.

The Government has also stressed its intent to further improve fiscal transparency and re-adjust public finances in the latest pre-budget document.⁴⁷³ Once again, importance was given to energy and to the shift from fossil fuels toward renewable energy production (such as PV and Wind).⁴⁷⁴

In 2011, the Government introduced a tax on cement, to address the environmental externalities of the construction sector. The tax, which initially was set at €9 per tonne of cement was increased to reach €27 per tonne in March 2014.^{475,476} Moreover, the *Waste Management Plan for the Maltese Islands for 2014 to 2020*, proposed the introduction of lower tax rates for first time buyers purchasing old properties, a new

⁴⁷⁰ European Commission (2014), *Taxation Trends in the European Union: Malta*, Accessed 21st August 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/country_tables/mt.pdf

⁴⁷¹ Government of Malta (2014), *Pre-budget Document 2014*, Accessed 21st August 2014, https://mfin.gov.mt/en/The-Budget/Documents/The_Budget_2014/Pre_Budget_2014.pdf

⁴⁷² Malta Resource Authority (2014), *Regulated Tariffs – Electricity 2014*, Accessed 10th September 2014, <http://mra.org.mt/news/regulated-tariff-electricity-2014/>

⁴⁷³ Times of Malta (2014), *Priorities in 2015 pre-Budget overview*, Accessed 9th September 2014, http://www.timesofmalta.com/articles/view/20140909/editorial/Priorities-in-2015-pre-Budget-overview.534968?utm_source=rss&utm_medium=rss&utm_campaign=priorities-in-2015-pre-budget-overview

⁴⁷⁴ Government of Malta (2014), *Pre-budget Document 2015*, Accessed 9th September 2014, http://mfin.gov.mt/en/Library/Documents/PRE%20BUDGET%202015/PRE_BUDGET_2015_FIN.pdf

⁴⁷⁵ European Commission (2014), *Taxation Trends in the European Union: Malta*, Accessed 21st August 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/country_tables/mt.pdf

⁴⁷⁶ Government of Malta (2014), *An act to implement Budget measures for the financial year 2014 and other administrative measures*, Accessed 8th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lp&itemid=25742&l=1>

system of charges for waste management services and revisions to the Eco-contribution scheme.⁴⁷⁷

At a more general level, in 2005-2007 the Malta Environment and Planning Authority (MEPA) and the Ministry of Finance undertook a project on 'Building capacity to introduce the Polluter Pays principle through economic instruments to implement the EU Environmental Acquis'. The project concluded that the legislative framework for the use of economic instruments was largely in place and that there were a number of environmentally relevant instruments in place in Malta; however these operated to varying degrees of success, generally lacking in enforcement and a coherent strategic approach. The project recommended the introduction of new instruments to respond to Malta's key priority needs (in relation to stone, land, waste, water, energy and transport) and also resulted in the development of training programmes and a checklist for the design of new instruments.⁴⁷⁸ In particular, the project proposed to introduce a tradable permit scheme for stone extraction, an increase in development permit fees, effluent discharge fees and waste disposal fees, higher landfill charges and higher water prices, including effluent charges, the introduction of higher environmental permit fees and fish farm licence fees. The introduction of better incentives for energy was also discussed. Regarding transportation, the project proposed to tax higher emission vehicles, increase annual motor vehicle licence tax, increase annual marine vessel fees and congestion charges.

More recently, Malta's National Environmental Policy (NEP) programme adopted in 2012 refers to the use economic instruments and underlined the need to formulate an action plan for the development of market-based instruments in the environmental field by 2013.^{479,480} The programme also mentioned the need to align economic instruments with national environmental policies as part of an overall strategy; to formulate economic instruments on the basis of detailed studies with particular attention to impacts on vulnerable groups; to include positive incentives and rewards and for sunset mechanisms to be put in place. The envisaged Action Plan for environmental economic instruments is to be integrated into the annual budget process, complemented by consultation and communication and a staged approach to environmental taxation adopted. Key policy areas mentioned include air quality, climate change, stone, land and built heritage, and waste. Thus, more efforts in relation to EFR could be taken forward in the coming years under this envisaged Action Plan.

⁴⁷⁷ Maltese ministry for Sustainable Development, the Environment and Climate Change (2014), *WASTE MANAGEMENT PLAN FOR THE MALTESE ISLANDS: A Resource Management approach 2014 - 2020*, Final document, January 2014, p. 104, <http://msdec.gov.mt/en/Document%20Repository/Waste%20Management%20Plan%202014%20-%202020%20-%20Final%20Document.pdf>

⁴⁷⁸ Ernst & Young, Cordina and IEEP (2007) *Environmental Economic Instruments - A Current State Assessment*, Malta Environment and Planning Authority, 2007

⁴⁷⁹ Minister of Tourism and Sustainable Development Unit (2012), *National Environmental policy*, Final report, February 2011, <https://secure2.gov.mt/tsdu/file.aspx?f=7342>

⁴⁸⁰ Minister of Tourism and Sustainable Development Unit (2011), *National Environmental Policy (Scenarios Paper)*, Final report, September 2011, <https://secure2.gov.mt/tsdu/file.aspx?f=5886>

The European Commission made the following country specific recommendation (CSR) as part of the 2014 European Semester:⁴⁸¹

Recommendation 4: “[...] *Diversify the energy mix in the economy, including by increasing the share of energy produced from renewable sources.*”

The CSR also highlights transport and energy as sectors with growing potential, notes the untapped potential for locally-produced renewable sources and the importance of investments in energy infrastructure.

The shift towards environmental taxes described below can support implementation of these recommendations as well assist with achieving broader environmental objectives.

15.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustment of existing taxes and/or the introduction of new environmental taxes in Malta. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the ‘good practice’ rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€14.2 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€10.6 per GJ). Finally, due to the existing rates for gas oil and kerosene used for heating being very high relative to other fuels, proposed rates are equalised using the minimum ETD rate of €0.15 per GJ. However, non-business rates for gas oil and kerosene used as a heating fuel are harmonised with business rates.
- The existing electricity taxes are harmonised and above the ETD minimum of €0.15 per GJ so no change is suggested.
- Table 15-3 shows the differentials in tax rates (using ETD units) for the various fuels by use.⁴⁸² For a description of how the proposed rates are

⁴⁸¹ Council of the European Union (2014) *COUNCIL RECOMMENDATION on the National Reform Programme 2014 of Malta and delivering a Council opinion on the Stability Programme of Malta, 2014*, 16 June 2014, <http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2010797%202014%20INIT>

⁴⁸² It should be noted that subsequent to the modelling being undertaken for this project the Maltese government announced that some energy taxes would be increased. For more details see Maltase Ministry of Finance (2014) *Budget Document 2015*, November 2014, https://mfin.gov.mt/en/The-Budget/Documents/The_Budget_2015/Budget_Doc_2015.pdf. The updated rates are presented as a footnote in Table 15-3.

derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below 0.15 EUR per GJ or not.

- In the case of propellants, the revisions imply a major increase in taxes on LPG and natural gas. More importantly, however, the petrol / diesel differential, which favours diesel at present, is closed as the revisions imply that the tax applied to diesel is increased by 30% of its current level, redressing the imbalance in tax rates between diesel and petrol. A similar change is implied for kerosene.
- In the case of fuels used in commercial and industrial motors, there is a major increase in the rates for natural gas and LPG;
- On heating fuels, the current rates for business use are higher than those for non-business use. As a result, the rates for non-business use are harmonised upwards to reflect the business use rates.
- For business heating fuels, the changes imply more or less a doubling in the tax rates for heavy fuel oil and LPG. Rates for gas and coal are increased by 51% and 580%, respectively.
- For non-business heating fuels, the changes are the same for all fuels other than gas oil and kerosene, for which the rates of tax for non-business use are currently lower than for business use. These rates are increased by 230% and 10%, respectively.
- The existing electricity tax rates are unchanged.

Table 15-3: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	509	509
Light fuel oil (diesel)	€ per 1000 litre	550	422
LPG (propellant)	€ per 1000 kg	709	0
Kerosene	€ per 1000 litre	553	422
Natural gas (prop)	€ per GJ	15	0
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	422	422
Kerosene	€ per 1000 litre	425	422
LPG	€ per 1000 kg	543	125
Natural gas	€ per GJ	12	3
Business Heating			

Energy Tax	Units	Suggested Rates	Existing Rates
Gas oil	€ per 1000 litre	422	422
Heavy fuel oil	€ per 1000 kg	68	34
Kerosene	€ per 1000 litre	422	422
LPG	€ per 1000 kg	65	39
Natural gas	€ per GJ	1.27	0.84
Coal	€ per GJ	2.04	0.30
Non-Business Heating			
Gas oil	€ per 1000 litre	422	128
Heavy fuel oil	€ per 1000 kg	68	34
Kerosene	€ per 1000 litre	422	382
LPG	€ per 1000 kg	65	39
Natural gas	€ per GJ	1.27	0.84
Coal	€per GJ	2.04	0.30
Electricity			
Electricity - business use	€ per MWh	1.50	1.50
Electricity - non-business use	€ per MWh	1.50	1.50
<p><i>Note: it should be noted that subsequent to the modelling being undertaken for this work the Maltese government announced that some energy taxes would be increased (see Maltase Ministry of Finance (2014) Budget Document 2015, November 2014, https://mfin.gov.mt/en/The-Budget/Documents/The_Budget_2015/Budget_Doc_2015.pdf). The following changes were announced in the budget:</i></p> <ul style="list-style-type: none"> • <i>Unleaded fuel – from €509 to €519 € per 1000 litres</i> • <i>Diesel/gas oil – from €422 to €442 € per 1000 litres</i> • <i>Kerosene – from €422 to €442 € per 1000 litres</i> • <i>Heavy fuel oil – from €34 to €36 € per 1000 litres</i> • <i>The tax on gas oil used for non-business heating was increased from €128 to €182 per 1000 litres</i> • <i>The tax on kerosene used for non-business heating was increased from €382 to €422 per 1000 litres</i> 			

- The current scenario of energy production in Malta is characterized by uncertainty (mainly due to the expected decommissioning of power plants in the country) and the government has pledged to decrease current energy tariffs. However, the need to develop renewable energy sources and meet climate change objectives will likely put pressure on the low energy tariffs which are currently in place in the country. Higher tariffs

could be implemented along with a progressive tax system which targets high energy consumers in an effort to induce them to invest more in energy saving measures.

- Malta has experienced several black-outs in recent years (2010 and 2014); thus, revised energy taxes could receive more support if put into the broader context of energy savings and actions to reduce supply disruptions and invest in new power generating technologies.^{483,484} The implementation of energy efficiency measures, increased consumer information, and the installation of smart meters could be part of a wider package of measures introduced to facilitate the transition towards a more efficient and sustainable energy system in Malta.
- Malta is currently struggling to meet EU air quality standards in certain areas and the country has one of the highest per capita ownership rates of cars in the EU (with 709 motor vehicles per 1,000 inhabitants in 2012).⁴⁸⁵ This is despite the small size of the country and the short distance of most journeys. Higher taxes on transport fuels would provide an incentive to reduce traffic congestion (and related loss of productive time) and improve air quality (thereby helping the country to meet related EU air quality targets), whilst reducing the differential favouring diesel over petrol might also improve air quality over time.

➤ **Transport Taxes:**

- **Vehicles:** Vehicle taxes and transport fuel taxes combined are already 3.0% of GDP, which is at the higher end for the EU-28. Furthermore, registration taxes and circulation fees are already in place in Malta and reflect environmental criteria including CO₂ emissions. We have not, therefore, suggested an increase in vehicle taxation in this study. Such revisions could help address the externalities associated with excessive air pollution, traffic and congestion – which as noted above is a major problem in the country.
- **Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Malta had a passenger aviation tax in place between 1997 and 2008, but it was discontinued following public

⁴⁸³ Times of Malta (2010), *Malta-wide blackout as aging plant trips again. Blackout causes traffic congestion*, Accessed 20th October 2014, <http://www.timesofmalta.com/articles/view/20100323/local/malta-wide-blackout-as-aging-plant-trips-again.299461>

⁴⁸⁴ Times of Malta (2014), *Update 4: Power restored but few localities still without electricity, flight diverted. Police investigations, internal inquiries underway*, Accessed 20th October 2014, <http://www.timesofmalta.com/articles/view/20140812/local/update-4-power-restored-but-few-localities-still-without-electricity-flights-diverted.531616>

⁴⁸⁵ World Bank (2014), *Data – Motor Vehicles per 1000 people*, Accessed 20th October 2014, <http://data.worldbank.org/indicator/IS.VEH.NVEH.P3>

pressure.⁴⁸⁶ There is scope for re-introducing this tax with suggested rates of €25 per passenger for flights to countries in the European Union and €50 per passenger for flights to countries outside the European Union. In addition, an air transport tax of €1.25 per tonne of freight could be introduced. For the purposes of this study, the year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. As noted in the 'good practice' section on aviation, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax (see Section 5.2.2). Given its peripheral location (which makes Malta very dependent on air travel for tourism and trade) and current problems facing the national carrier Air Malta,⁴⁸⁷ the introduction of such a tax is likely to be contentious. Malta has been a staunch opponent of the inclusion of aviation in the ETS scheme and has argued for a global measure rather than one which only covers the EU.⁴⁸⁸

➤ **Pollution and Resource Taxes:**

- **Aggregates:** There is currently no tax on aggregates in Malta on a national level; however, a system of differentiated development planning fees is applied at the national level. The introduction of an aggregates tax can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This option would also be in-line with the EU flagship initiative 'A Resource Efficient Europe'⁴⁸⁹ and related Roadmap. In addition, Maltese stone has been reported as a key priority area in the National Environment Policy and in a project on implementing the polluter pays principle in Malta, given the rapid depletion of stone resources and environmental damage caused by their extraction, transportation, and disposal.⁴⁹⁰

It is suggested that Malta could introduce a tax on aggregate extraction set at €2.40 per tonne from 2017, and that the rate be kept constant in real terms thereafter. The types of materials that could be covered by the tax (as part of the common approach within the study) are:

- Marble

⁴⁸⁶ OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management*, Accessed 4th August 2014, www2.oecd.org/econinst/queries/index.htm

⁴⁸⁷ Times of Malta (2014), *What's the best route for Air Malta?*, Accessed 20th October 2014, <http://www.timesofmalta.com/articles/view/20140922/editorial/What-s-the-best-route-for-Air-Malta-536694>

⁴⁸⁸ Times of Malta (2011) *New Emission rules should have 'limited impact' on Air Malta*, Accessed 20th October 2014, <http://www.timesofmalta.com/articles/view/20110406/local/new-eu-emission-rules-should-have-limited-impact-on-air-malta.358466>

⁴⁸⁹ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

⁴⁹⁰ European Union (2004), *Building Capacity to introduce the Polluter Pays Principle through Economic Instruments to Implement the EU Environmental Acquis*, Accessed 20th October 2014, <http://ec.europa.eu/enlargement/pdf/fiche-projet/malta/mt-fm/2004/2004-016.762.06.02-building-capacity-to-introduce-the-polluter-pays-principle.pdf>

- Chalk and dolomite
 - Slate
 - Limestone and gypsum
 - Sand and gravel
- Some of these materials are both domestically extracted and imported, while others are only imported (and could be taxed on import). The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues. Aggregate that could be particularly useful to target using economic incentives is soft-stone. Soft-stone is currently traded at a low price in Malta (reflecting high competition from many open sites) and this price does not adequately reflect the related environmental externalities or the resource limitations of the rock itself. A material extraction tax could have impacts on the amount of discarded materials, encourage reuse, and reduce waste and also affect the number of quarries in operation.
 - **Waste – landfill tax:** Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Landfill taxes also provide support to the application of the waste hierarchy. In 2012, the rate of waste landfilled (directly or indirectly) in Malta was 93%, considerably higher than the EU-28 average of 29%.⁴⁹¹ There is currently no landfill tax in Malta and the current charges promulgated by government legislation seem unlikely to be sufficient to even to cover operational costs at modern sites. It is suggested that, in order to incentivise reduction in the landfilling rate, the rate for non-hazardous landfill is raised to €50 per tonne by 2021. An early announcement of this tax and its escalation over a number of years would help drive the change in the waste management sector needed to meet EU targets in 2020 and beyond. We suggest this tax should be indexed to an appropriate measure of inflation.
 - **Waste – incineration / MBT tax:** Malta currently has one incinerator operating in Marsa and the government has been exploring whether it should construct a new incinerator close to the Delimara power plant.⁴⁹² Malta does not have an incineration tax in place.⁴⁹³ In order to prevent a

⁴⁹¹ Eurostat (2014) *Landfill rate of waste excluding major mineral wastes* [t2020_rt110], Accessed 13rd October 2014, http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=0&language=en&pcode=t2020_rt110&tableSelection=1

⁴⁹² Malta Today (2014) *Studies underway for new incinerator*, Accessed 14th October 2014, <http://www.maltatoday.com.mt/news/national/24972/studies-underway-for-new-incinerator-20130224#.VDzjgU0cR9A>

⁴⁹³ CEWEP (2014) *Landfill taxes & bans – February 2014*, Accessed 14th October 2014, http://www.cewep.eu/media/www.cewep.eu/org/med_557/1200_2014-02-06_cewep_-_landfill_inctaxesbans.pdf

shift from landfilling to incineration (as has happened in other Member States) it is suggested that an incineration tax of €15 per tonne be introduced over the same period as the landfill tax is introduced. An equivalent rate is also proposed for MBT facilities. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.⁴⁹⁴

- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested that the following rates could be applied to all packaging placed on the market in Malta:
 - Aluminium €197 per tonne
 - Plastic €64 per tonne
 - Steel €54 per tonne
 - Paper and card €20 per tonne
 - Glass €18 per tonne
 - Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. According to provisional data, Malta exceeded the NO_x emissions ceiling in 2010 and 2012 set by the National Emission Ceilings Directive (NEC Directive).⁴⁹⁵ Moreover in 2010, more than 49% of the total population in the country was exposed to PM₁₀ concentrations exceeding the daily limit value (50 µg per m³) for over 35 days per year.⁴⁹⁶ Malta does not currently have a system of air pollution taxes in place. It is suggested that an air pollution

⁴⁹⁴ European Commission (2011) *Roadmap to a Resource Efficient Europe*, 20th September 2011, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN>

⁴⁹⁵ European Environmental Agency (2014), *NEC Directive status report 2013 Reporting by Member States under Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants*, Accessed 15th October 2014, http://www.eea.europa.eu/publications/nec-directive-status-report-2013/at_download/file

⁴⁹⁶ European Environmental Agency (2014), *Air pollution fact sheet 2013 – Malta*, Accessed 14th October 2014, <http://www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets/malta-air-pollutant-emissions-country-factsheet/view>

tax might be implemented in order to generate improvements in air quality as follows:

- NO_x €1,000 per tonne
- PM₁₀ €2,000 per tonne
- SO_x €1,000 per tonne

It is understood that the main problems in Malta are NO_x, PM, methane and NMVOCs, while SO_x emissions are less of a problem (according to EEA data).

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2021. The rates are then held constant in real terms.

The tax could be focused directly on major polluting activities, such as, energy and construction sectors, and industries regulated under the IPPC.

- **Water abstraction:** Water is a critical issue in Malta given its scarcity, environmental status, and the country's reliance on costly (and energy intensive) reverse osmosis for generating potable water. A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that "*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*". Surface and ground water supplies in Malta are currently under heavy stress, with an extraction rate in 2011 which was higher than 48%.⁴⁹⁷ Although there are Groundwater Abstraction Metering Regulations which require annual fees related to the installation and maintenance of meters for groundwater abstraction, the need to introduce and enforce tariffs for abstraction is an area that has received particular attention. Domestic users are charged a subsidised rate, with subsidies varying inversely with the size of the household. Agricultural water use is also exempted from abstraction taxes (the costs of water abstraction are limited to the private on-farm costs and no water price is charged beyond this).

It is therefore suggested that a water abstraction tax be introduced of the order of €300 per 1,000m³ for household consumption, €190 per 1,000 m³ for manufacturing purposes, and €26 per 1,000 m³ for agriculture. A transition period from 2016 to 2021 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms. There may be some challenges associated with implementing such a system in Malta given the difficulty in quantifying the extent of private groundwater abstraction as well as issues related to impacts on agriculture (including impacts on food prices.⁴⁹⁸ Thus, such a tax will need to be accompanied by effective enforcement

⁴⁹⁸ MEPA (2008), *THE ENVIRONMENT REPORT 2008 - Sub-Report 5 (Fresh Waters)*, Final report, Accessed 14th October 2014, <http://www.mepa.org.mt/file.aspx?f=4475>.

mechanisms as well as necessary infrastructure and support for waste water treatment facilities and provision for agricultural irrigation.

- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.⁴⁹⁹ Malta does not have a waste water tax currently in place and wastewater management costs are covered by existing water tariffs.⁵⁰⁰ The only charge in place is a one-time permit application fee for the discharge of trade effluents which is not sufficient to cover the regulation, monitoring and compliance costs associated with the disposal of these trade effluents. To strengthen the prevention of water pollution it is suggested that a waste water tax be introduced with tax rates adjusted in-line with ‘good practice’. With relative price levels in Malta this would imply, for BOD, a rate of €1.69 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. Given the magnitude of the increase in rates a transition period from 2016 to 2019 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. It is suggested that rates should be held constant in real terms from 2019. The revenues from such a tax could be used to cover the costs associated with the treatment and disposal of waste water discharges as well as for investment in facilities for wastewater treatment and provision for agricultural irrigation (polished water).⁵⁰¹
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

Malta does not have a tax on pesticides. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable for Malta. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €15 per kg of active ingredient. The

⁴⁹⁹ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

⁵⁰⁰ Malta Resource Authority (2014), Decision on Proposed Water Tariffs March 2014 – Summary of Review Process and Conclusions, Accessed 18th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Minister-MECW-Approval-of-new-tariffs-for-supply-of-water-27.03.14.pdf>

⁵⁰¹ Malta Water Association (2012), *Towards Integrated Water Management in Malta – Recommendation to Political Parties*, Final report, July 2012, <http://www.maltastar.com/userfiles/file/mwa.pdf>

suggested transition period is from 2017 to 2019, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure to adequately address the environmental externalities posed by pesticides on the environment.

- Fertilisers:** Malta does not currently have a tax on nitrogen (or other) fertilisers. However, Malta's groundwater reserves have been already severely contaminated by nitrates. The quality of the aquifers has worsened over the recent years (a survey carried out in 2009 demonstrated that 90% of the groundwater reserves in Malta are unfit for potable water) mainly due to over-fertilization.⁵⁰² It is therefore suggested that a tax on the use of nitrogen in mineral fertilisers could be considered as a means of driving efficiencies in the application of fertilisers to land. It is suggested that a tax at a rate of €0.3 per kg N be implemented from 2017 with rates gradually increasing to the maximum level in 2019.

15.2.3 Summary of Revenue Outcomes

Table 15-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 15-4: Potential Additional Revenue from Environmental Fiscal Reform in Malta, million EUR (real 2014 terms)⁵⁰³

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	3	10	18
C&I / Heating	11	42	73
<i>Sub-total Energy, million EUR</i>	<i>13</i>	<i>52</i>	<i>91</i>
<i>Sub-total Energy, % GDP</i>	<i>0.17%</i>	<i>0.69%</i>	<i>1.20%</i>

⁵⁰² Malta Water Association (2012), Towards Integrated Water Management in Malta – Recommendation to Political Parties, Final report, July 2012, <http://www.maltastar.com/userfiles/file/mwa.pdf>

⁵⁰³ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Transport Taxes			
Passenger Aviation Tax	59	128	158
Freight Aviation Tax	0.01	0.02	0.02
<i>Sub-total Transport, million EUR</i>	59	129	158
<i>Sub-total Transport, % GDP</i>	0.77%	1.69%	2.08%
Pollution and Resource Taxes			
Landfill Tax - Non-haz General	4	8	8
Landfill Tax - Inerts (C&D)	0.8	1.0	1.0
Incineration /MBT Tax	0.2	0.5	0.5
Air Pollution Tax	3	7	5
Water Abstraction Tax	3	8	7
Waste Water Tax	1.0	1.4	1.4
Pesticides Tax	2	4	4
Aggregates Tax	0.14	0.09	0.09
Packaging Tax	2	2	2
Single Use Bag Tax	4	1	1
Fertiliser Tax	0.000	0.000	0.000
<i>Sub-total Pollution & Resource, million EUR</i>	21	32	30
<i>Sub-total Pollution & Resources, % GDP</i>	0.28%	0.42%	0.40%
Total Environmental Taxes			
Total, million EUR	93	212	280
Total Increase, % GDP	1.23%	2.80%	3.68%

Table 15-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 15-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Malta, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
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Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	5
Increased Cost Recovery for Water Use	65
Total	71

15.2.4 Environmental Benefits

Table 15-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.13.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €25 million of benefits are anticipated annually by 2025 in real terms.

Table 15-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in Malta, million EUR (real 2014 terms)⁵⁰⁴

Tax Type	2017	2020	2025
Energy Taxes	0.5	1.8	3.2
Transport Taxes (excluding transport fuels)	0.4	1.0	1.3
Pollution and Resource Taxes	6	20	22
Total, million EUR	7	23	26
Total, % GDP	0.09%	0.26%	0.27%

15.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Malta:⁵⁰⁵

- In 2012, environmental taxes generated revenue equivalent to 2.98% of GDP. The headline figures suggest that there is considerable potential for additional

⁵⁰⁴ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

⁵⁰⁵ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

revenue from environmental taxes in Malta. These could generate EUR 0.1 billion in 2017, rising to EUR 0.3 billion in 2025 (both in real 2014 terms). This is equivalent to 1.23% and 3.68% of GDP in 2017 and 2025, respectively.

- The largest single contribution to revenue comes from the suggested passenger aviation tax. This accounts for EUR 0.16 billion by 2025 (real 2014 terms), equivalent to 1.61% of GDP.
- The next largest contribution to revenue comes from the proposed reforms to the taxes rates on fuels used for business heating. This accounts for EUR 0.073 billion by 2025 (real 2014 terms), equivalent to 0.75% of GDP.
- Revenue potential from the proposed landfill tax would raise EUR 0.008 billion by 2025 (real 2014 terms), equivalent to 0.08% of GDP.
- A water abstraction tax has also been suggested. This would contribute EUR 0.007 billion by 2025 (real 2014 terms), equivalent to 0.07% of GDP.
- In addition, a range of more minor taxes on could generate revenue of EUR 0.015 billion by 2025 (real 2014 terms), equivalent to 0.16% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 0.025 billion by 2025 (real 2014 terms), equivalent to 0.25% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €71 million per annum could be raised in addition to the above.

16.0 Netherlands

16.1 Country Overview

16.1.1 Key Facts about the Economy and Tax System

- The Netherlands experienced a period of economic growth from 2003–2008, with GDP increasing on average by 2.3% in real terms per annum during those years. In 2009 GDP fell by 3.7% in real terms against 2008. 2010 and 2011 saw growth, although below pre-recession levels at an average of 1.2% per annum in real terms. 2012 and 2013, however, were years of negative growth, with GDP falling by 1% per annum in real terms on average over this two year period.⁵⁰⁶
- The Netherlands' overall tax revenue (including social contributions) as a percentage of GDP is slightly below the EU-28 average of 39.8%, at 39.6% (2012). This percentage has risen over the past 10 years from 38.7% in 2002, and has held fairly constant since 2006.⁵⁰⁷
- Social contributions provided the largest part of the Netherlands' total tax income, at 41.9% in 2012. The remainder is close to evenly split between direct and indirect taxation, which accounted for 28.2% and 29.9% respectively. The share of social contributions has risen over the past 10 years while the shares of direct and indirect taxation have both fallen.⁵⁰⁸
- In 2012, environmental tax revenue as a percentage of GDP was 3.56% –the third highest percentage share in the EU28. Although this share is slightly higher than the 3.51% found 10 years ago in 2002, it is lower than it has been for any year since. It was at its highest in 2006 at 3.9%.⁵⁰⁹
- Energy taxes represented the largest share of environmental taxation in 2012 accounting for 1.94% of GDP. Transport (excluding fuel) taxes accounted for 1.11% of GDP, and pollution and resource taxes accounted for 0.51%.⁵¹⁰
- In 2012, 54.5% of the total environmental tax revenue in the Netherlands was from taxes on energy. This percentage has been rising steadily over the past 10 years from 51% in 2002, excepting a dip to 49.2% in 2007.⁵¹¹

⁵⁰⁶ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

⁵⁰⁷ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

⁵⁰⁸ Ibid.

⁵⁰⁹ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

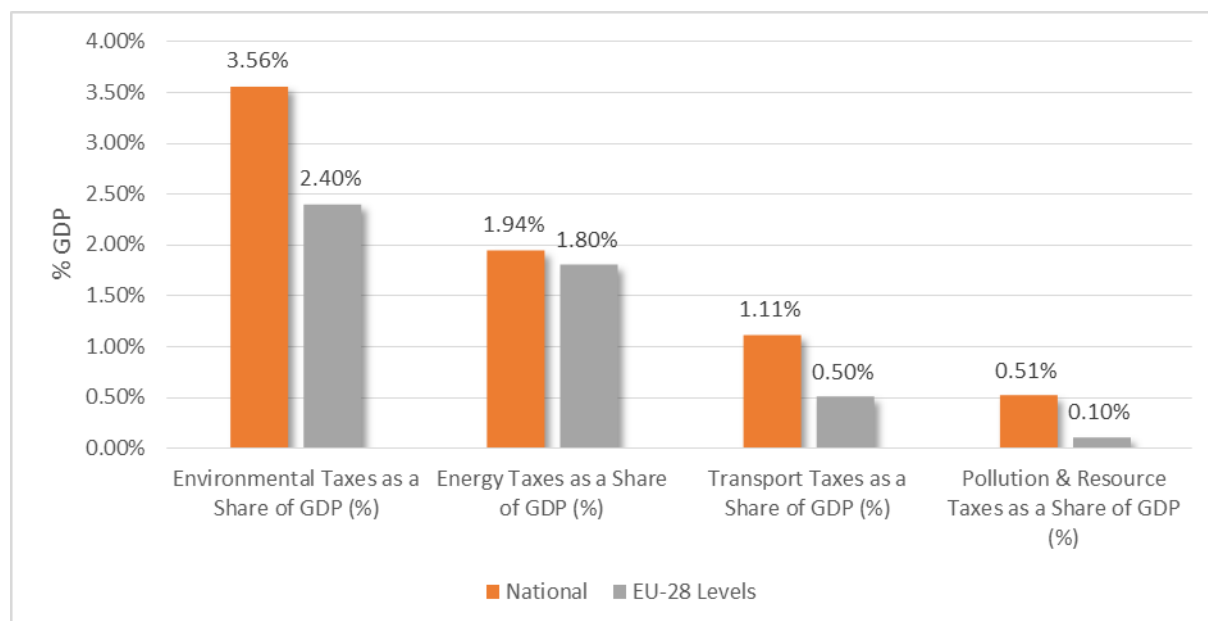
⁵¹⁰ Ibid.

⁵¹¹ Ibid.

16.1.2 Relative Position within the EU

- Expressed as a proportion of GDP, in 2012 the revenue derived by the Netherlands from environmental taxation was significantly higher than the EU-28 average of 2.4%. Similarly expressed, the individual revenue streams for energy taxation, transport (excluding fuel), and pollution and resource taxation were all higher than the respective EU-28 averages of 1.8%, 0.5%, and 0.1%. In particular, the revenues from transport and pollution and resource taxes were considerably higher (see Figure 16-1).⁵¹²

Figure 16-1: Environmental Taxes in the Netherlands as a % of GDP vs EU-28 Levels (2012)



- In 2012, the Netherlands ranked 3rd highest among the EU-28 Member States for revenue from environmental taxes considered as a percentage share of GDP. It ranked 2nd in the EU-28 for pollution and resource tax revenue as a share of GDP, and 3rd for transport (excluding fuel) tax revenue as a share of GDP. The Netherlands ranked in 12th place in terms of energy tax revenue as a share of GDP (see Table 16-1).⁵¹³

⁵¹² Ibid.

⁵¹³ Ibid.

Table 16-1: Ranking of the Netherlands' Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	3
Energy Taxes as a Share of GDP (%)	12
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	3
Pollution & Resource Taxes as a Share of GDP (%)	2

Source: based on Eurostat data

16.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.14.0 (please see separate document). This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon nominal GDP figures for the same year as the reported revenues.^{514,515}

➤ Energy Taxes:

- The Dutch excise duties on fuels and electricity are shown in Table 16-2, alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 16-2: Standard Rates of Excise Duties on Fuels and Electricity in the Netherlands

Excise Duty	Unit	Rate Applied in the Netherlands	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol ¹	€ per 1000 litres	€845.51	€421	€585	€583
Unleaded Petrol	€ per 1000 litres	€759.24	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€477.76	€330	€427	€405

⁵¹⁴ Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1>

⁵¹⁵ Eurostat (2013) *GDP and Main Components - Current Prices [nama_gdp_c]*, Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Excise Duty	Unit	Rate Applied in the Netherlands	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene	€ per 1000 litres	€477.76	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€322.17	€125	€209	€180
Natural Gas ^{2, 3}	€ per GJ	€5.39 (0 - 170,000m ³) €1.27 (170,000 - 1 million m ³) €0.46 (1 million - 10 million m ³) €0.33 (>10 million m ³)	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€477.76	€21	€221	€163
Kerosene	€ per 1000 litres	€477.76	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€322.17	€41	€126	€125
Natural Gas	€ per GJ	€5.39 (0 - 170,000m ³) €1.27 (170,000 - 1 million m ³) €0.46 (1 million - 10 million m ³) €0.33 (>10 million m ³)	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€477.76	€21	€221	€163
Kerosene	€ per 1000 litres	€477.76	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€35.83	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€322.17	€0.00	€82	€40
Natural Gas	€ per GJ	€5.39 (0 - 170,000m ³) €1.27 (170,000 - 1 million m ³) €0.46 (1 million - 10 million m ³) €0.33 (>10 million m ³)	€0.15	€1.36	€0.46

Excise Duty	Unit	Rate Applied in the Netherlands	Existing ETD Minimum	EU-28 Average	EU-28 Median
Coal and Coke ⁴	€ per GJ	€0.53	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€477.76	€21	€179	€125
Kerosene	€ per 1000 litres	€477.76	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€35.83	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€322.17	€0.00	€111	€42
Natural Gas ⁵	€ per GJ	€5.39 (0 - 170,000m ³) €1.27 (170,000 - 1 million m ³) €0.46 (1 million - 10 million m ³) €0.33 (>10 million m ³)	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€0.53	€0.30	€1.77	€0.32
Electricity⁶					
Business Use	€ per MWh	€118.5 (0 - 10,000 kWh) €43.1 (10,000-50,000 kWh) €11.5 (50,000-10,000,000 kWh) €0.50 (>10,000,000 kWh)	€0.50	€8.42	€1.03
Non-Business Use	€ per MWh	€118.5 (0-10,000 kWh) ⁷ €43.1 (10,000-50,000 kWh) €11.5 (50,000-10,000,000 kWh) €1.00 (>10,000,000 kWh)	€1.00	€14.53	€2.06
Notes:					
<p>1. Leaded petrol is not sold any longer.</p> <p>2. These rates are approximate because the national tax rate is based on m³. Tariffs per m³ are: € 0.1894 (0 – 170,000 m³); €0.0446 (170,000 – 1 million m³); € 0.0163 (1 million – 10 million m³); 0.0117 (over 10 million m³). For propellant use, natural gas used in installations for the production of CNG (compressed natural gas) is taxed at a generic rate of € 0.128 per</p>					

Excise Duty	Unit	Rate Applied in the Netherlands	Existing ETD Minimum	EU-28 Average	EU-28 Median
<p><i>m</i>³ (€ 3.64 per GJ).</p> <p>3. There is a surcharge on this tax in order to finance the subsidy scheme on renewable energy since 1st January 2013. Tariffs are € 4.60, €1.70, €0.50 and €0.40, respectively for the four brackets. This also holds for the other uses of natural gas. No distinction is made between business and non-business use.</p> <p>4. The coal tax is calculated based on weight: €14.27 per 1,000 kg.</p> <p>5. As noted above, a surplus is applied for financing the development of renewable energy sources. Tariffs applied are as follows: € 4.60, €1.70, €0.50, and €0.40, respectively for the four brackets, no distinction is made between business/non-business use.</p> <p>6. The rates in the table are given per MWh, whereas national rates are given per kWh. Since 1st January 2013 a surcharge on this energy tax is in place in order to finance the subsidy scheme on renewable energy. The rate of this surcharge is expected to increase. No distinction is made between business and non-business use.</p> <p>7. As of 1st January 2014 a tax reduction of 7.7 cent per kWh applies for locally produced sustainable electricity in the first tax bracket (0-10.000 kWh).</p>					

Source: DG TAXUD (2014) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2014, http://ec.europa.eu/taxation_customs/index_en.htm#

- Excise duty on mineral oils (“Accijns van minerale oliën”):⁵¹⁶
 - Exemptions or refunds apply for kerosene used for the propelling of airplanes (other than pleasure craft).
 - A tax reduction might apply for LPG in vehicles used in public functions, like buses.
 - Rates are generally considerably higher than the ETD minimum and the EU-28 average. Only the rates for heavy fuel oil are considerably lower than the EU-28 average, but still higher than the ETD minimum.
- Energy tax (“Energiebelasting”):⁵¹⁷
 - The energy tax is levied on delivery of electricity and natural gas.
 - Exemptions apply for natural gas and electricity used as fuel to generate electricity and for electricity used for chemical reduction and in electrolytic and metallurgical processes.
 - Tax refunds apply for use of electricity above 10 million kWh per year per connection by an energy-intensive business (if they have

⁵¹⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=873/1395149523&taxType=Energy+products+and+electricity

⁵¹⁷ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=873/1395149523&taxType=Energy+products+and+electricity

entered long-term energy efficiency agreements with the government and as long as they pay on average more than the European minimum rate) or for natural gas or electricity used by non-profit institutions (50% refund).

- A tax credit/reduction applies to each electricity connection with a capacity of more than 1x6 Ampere and for the use of natural gas in the horticulture sector (greenhouse heating).
- The rates applied for electricity for deliveries up to 50.000 kWh are much higher than the EU-28 average. The rates for deliveries between 50.000 and 10 million kWh are closer to the EU-28 average for both business and non-business use, but still considerably higher than the ETD minimum. The rate for deliveries above 10 million kWh is equal to the ETD minimums.
- The rates for natural gas respect the ETD minimum for all uses except for transport fuel. In the latter case the rates applied for deliveries of more than 170,000 m³ are below the ETD minimum and below the EU-28 average. The rates for deliveries of less than 170,000 m³ are significantly higher than the EU-28 averages.
- Tax on coal (“Kolenbelasting”):⁵¹⁸
 - The tax is levied on coal or coal products imported or when released from the coal establishment.
 - Exemptions apply for coal not used as a fuel and for coal used for dual purposes.
 - Tax refunds are granted when the coal tax has been levied when an exemption was applicable and for coal exports.
 - The rate (€0.53 per GJ) is higher than the ETD minimum; both for business and non-business use (heating), but lower than the EU-28 average.
 - The tax on coal will be abolished by 2016 with the closing down of five older power plants. This was agreed in the 2013 Energy Agreement.⁵¹⁹
- Revenue in 2012 from the mineral oil excise duties, energy tax and the tax on coal together amounted to €11,480 million (equivalent to 1.92% of GDP and to 4.91% of total tax revenue). It should be noted that the excise duty on leaded petrol does not generate any revenue, as leaded petrol is not sold in the Netherlands.

⁵¹⁸ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=873/1395149523&taxType=Energy+products+and+electricity

⁵¹⁹ Ministerie van Economische Zaken (2013) Kamerbrief over Energieakkoord voor Duurzame Groei, Accessed 22 September 2014, <http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2013/09/06/kamerbrief-over-energieakkoord-voor-duurzame-groei.html>

➤ **Transport Taxes (excluding transport fuels):**

- Tax on passenger cars and motorcycles (“Belasting van personenauto’s en motorrijwielen – BPM”):⁵²⁰
 - The tax on passenger cars is based on the fuel type and CO₂ emissions; the tax on motorcycles or vans is levied on the net catalogue price (see Appendix A.14.0 for more details).
 - For used passenger cars, motorcycles and vans: this one-off registration tax is reduced in line with the reduction in value of the vehicle.
 - Exemptions apply among others for vans of entrepreneurs, ambulances, police vehicles, military vehicles and fire engines, electric cars, taxis and used vehicles over 25 years old.
 - Revenue in 2012: €1,500 million (equivalent to 0.25% of GDP and to 0.64% of total tax revenue).
- Tax on heavy motor vehicles (“Belasting zware motorrijtuigen” or “Eurovignette”):⁵²¹
 - Tax on the use of a motorway by heavy goods vehicle in the Netherlands.
 - The rate is dependent on total number of axles and Euro-classification of the vehicle.
 - For a week or for a month, reduced rates apply. The rate for one day is € 8.00, regardless of the type of vehicle.
 - Exemptions apply among others for vehicles used by certain public services, vehicles used in road-making, vehicles in business-stock and vehicles commonly used for short distances on motorways.
 - Revenue in 2012: €134 million (equivalent to 0.02% of GDP and to 0.06% of total tax revenue).
- Motor vehicles tax (“Motorrijtuigenbelasting” (MRB)):⁵²²
 - The tax rate for passenger cars depends on weight, fuel type and CO₂-emissions and province of residence of the owner. For instance for a 1,000kg car using petrol the tax rate ranges from €396 (Zeeland) to €424 (Zuid-Holland) per year.

⁵²⁰ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=443/1388754879&taxType=Other+indirect+tax

⁵²¹ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=682/1388754879&taxType=Other+direct+tax

⁵²² Rijksoverheid (2014) *Belastingen op auto en motor*, Accessed 4 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-op-auto-en-motor>

- The tax rate for vans and busses depends on weight: e.g. an entrepreneur pays €340 per year for a 1,400 kg van.
- The tax rate for lorries depends on weight, number of axles, suspension and EURO-classification.
- A fixed fee applies for motorcycles.
- Exemptions apply e.g. for motor vehicles used in agriculture and forestry, taxis, ambulances, police vehicles, fire brigade vehicles and old vehicles (older than 40 years).⁵²³
- Tax reductions apply e.g. for old vehicles between 26 and 40 years old, electric motor vehicles, vehicles which run on hydrogen, caravans, circus wagons and campers.⁵²⁴
- A partial tax refund can be requested for commercial vehicle fleets which have more trucks than trailers.
- Revenue in 2012: €5,138 million (equivalent to 0.86% of GDP and to 2.20% of total tax revenue).
- Aviation noise tax:⁵²⁵
 - The tax applies to airports where soundproofing projects around the airport have not been completed. The tax is to be paid by owners or holders of an aircraft as part of the airport charge.
 - The following rates apply in 2014: Schiphol airport, €180.50 per noise-production unit; airports of national significance, €37 per noise-production unit; and the rates at airports of regional significance are to be arranged by Provinces.
 - Revenue in 2012: €46 million.
- **Pollution and Resource Taxes:**
 - Waste tax (“Afvalstoffenbelasting”) or landfill tax:^{526,527}

⁵²³ Rijksoverheid, Belastingen op auto en motor, Accessed 4 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-op-auto-en-motor/vraag-en-antwoord/wat-is-de-overheid-van-plan-met-de-motorrijtuigenbelasting-mrb-voor-oldtimers.html>

⁵²⁴ Rijksoverheid, Belastingen op auto en motor, Accessed 4 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-op-auto-en-motor/vraag-en-antwoord/wat-is-de-overheid-van-plan-met-de-motorrijtuigenbelasting-mrb-voor-oldtimers.html>

⁵²⁵ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/econst/queries/AllInformation_Result.aspx?Key=f08e343c-a619-4c83-9286-226b1dc20acc&Keys=1773c438-e42c-476c-aede-a7cdada3f820&Ctry=19

⁵²⁶ European Commission (2014) Taxes in Europe Database, Accessed 2 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=874/1388754878&taxType=Other+indirect+tax

⁵²⁷ Belastingdienst (2014) Afvalstoffenbelasting, Accessed 3 September 2014, http://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/afvalstoffenbelasting/

- The tax was abolished on 1st January 2012 and reinstated on 1st April 2014.
- The disposal of dredging is exempted from the tax.
- Tax rate: €17 per 1,000 kilograms (as of 1st April 2014).
- Revenue in 2011: €17 million (equivalent to 0.00% of GDP and to 0.01% of total tax revenue).
- The 2015 Fiscal Plan foresees an extension in the scope of the tax to waste incinerated by waste incineration plants. The rate for both landfilled and incinerated waste is expected to be €13 per 1,000 kg from 2015.⁵²⁸
- Packaging waste :
 - The Netherlands used to have a packaging tax (“Verpakkingenbelasting”) in place, but since 1st January 2013, this has been replaced by the packaging waste management charge (“Afvalbeheersbijdrage Verpakkingen”). This is a scheme which allocates the funds collected to the packaging waste fund (“Afvalfonds Verpakkingen”) for the collection and recycling of packaging waste.
 - The charge rate per kilogram distinguishes between eight materials (see table in annex). This is not a tax and the rates applied are considerably lower than those which were applied under the packaging tax.
- Tap water tax (“Belasting op leidingwater”):⁵²⁹
 - The tax is charged on tap water delivered to a consumer by a fixed connection to the water mains.
 - Tap water is taxed to a maximum quantity of 300 cubic metres per connection per year.
 - The 2014 tax rate is €0.330 per cubic metre (increased from €0.165 per cubic metre in 2013).⁵³⁰
 - Exemptions may apply for tap water delivered for emergency provisions such as fireplugs and sprinkler installations.
 - Revenue in 2010 was €126 million.
- Water system charge (“watersysteemheffing”):⁵³¹

⁵²⁸ Rijksoverheid (2014) Belastingplan 2015, Accessed 23 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingplan-2015>

⁵²⁹ OECD (2014) Database on instruments used for environmental policy, Accessed on 3 September 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

⁵³⁰ Belastingdienst (2014) Tabellen tarieven milieubelastingen, Accessed 3 September 2014, http://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/tarieven_milieubelastingen/tabellen_tarieven_milieubelastingen

- This charge is levied to finance measures and programmes to prevent flooding, surplus water (after heavy rainfall) and water shortage.
- The cost recovery rate is 100%.⁵³²
- There are two parts of the charge: The solidarity part is paid by each inhabitant of the concerned river basin; the profit part is paid by land owners and owners of buildings.
- The rate for the solidarity part is a fixed amount per household.
- The rate for the profit part is based on the value of the property or the land.
- The cost recovery rate is deemed to be 100%.⁵³³
- Wastewater treatment charge (“Zuiveringsheffing”):^{534,535}
 - The charge is levied on the amount and the qualification of (indirect) discharges into the sewerage system or into wastewater treatment plants.
 - The charge is meant to cover the costs of transport and treatment of wastewater.
 - The rate is based on the pollution load of substances discharged in one calendar year.
 - A lump charge is levied on households on the basis of a fixed number of pollution units (up to 3).
 - Revenue in 2010: €1,128 million.
 - The cost recovery rate is deemed to be 100%.⁵³⁶
- Water pollution charge (“Zuiveringsheffing”):

⁵³¹ Kenniscentrum InfoMil (2014) Handboek water, Accessed 5 September 2014, <http://www.infomil.nl/onderwerpen/klimaat-lucht/handboek-water/wetgeving/waterschapswet-0/inhoud/watersysteemheffing/>

⁵³² European Commission (2012) Commission Staff Working Document. Member State: the Netherlands. Accompanying the document: Report from the Commission on the implementation of the Water Framework Directive (2000/60) River Basin Management Plans, Brussels, 14.11.2012, SWD (2012)379.

⁵³³ European Commission (2012) Commission Staff Working Document. Member State: the Netherlands. Accompanying the document: Report from the Commission on the implementation of the Water Framework Directive (2000/60) River Basin Management Plans, Brussels, 14.11.2012, SWD (2012)379.

⁵³⁴ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

⁵³⁵ Kenniscentrum InfoMil (2014) Handboek water, Accessed 5 September 2014, <http://www.infomil.nl/onderwerpen/klimaat-lucht/handboek-water/wetgeving/waterschapswet-0/inhoud/zuiveringsheffing/>

⁵³⁶ European Commission (2012) Commission Staff Working Document. Member State: the Netherlands. Accompanying the document: Report from the Commission on the implementation of the Water Framework Directive (2000/60) River Basin Management Plans, Brussels, 14.11.2012, SWD (2012)379.

- The charge is levied on the amount and the qualification of direct discharges, i.e. discharges into surface water systems.
- The calculation of the charge is identical to that of the waste water treatment charge.
- Municipal sewerage charge:⁵³⁷
 - Local authorities charge households for the costs of the local sewerage system.
 - Charges are waived for households with less than minimum income.
 - Rates are determined by local authorities per household, differentiated according to the number of members.
 - Revenue in 2008 (the latest year for which figures are available): €1143 million.
 - The cost recovery rate is 95%.⁵³⁸
- A tax on groundwater extraction was abolished in 2011 and has not been levied since 1st January 2012.

16.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in the Netherlands. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

16.2.1 Current Status of EFR

The Netherlands has a relatively high level of (revenues from) environmentally related taxes⁵³⁹ (see Section 16.1.1) and can be considered one of the frontrunners in this area. In recent years, however, some environmentally related taxes have been removed such as the taxes on packaging, waste and groundwater extraction. These measures were taken within the renewed fiscal philosophy presented in the 2012 Fiscal Plan which aims for a simpler, more robust and fraud resistant fiscal system. This has led to the introduction and subsequent termination of a number of environmental taxes in recent years.

From 1st January 2013 the packaging tax was replaced by a waste management charge. Companies that use more than 50,000kg of packaging for their products are required to

⁵³⁷ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

⁵³⁸ European Commission (2012) Commission Staff Working Document. Member State: the Netherlands. Accompanying the document: Report from the Commission on the implementation of the Water Framework Directive (2000/60) River Basin Management Plans, Brussels, 14.11.2012, SWD(2012)379

⁵³⁹ Eurostat (2014) Environmental tax statistics, Accessed 24 September 2014, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Environmental_tax_statistics

pay a charge depending on the type and amount of packaging generated. Revenues are allocated to a fund which has set up a waste management system and aims to ensure waste monitoring and prevent packaging litter.⁵⁴⁰ The waste tax or landfill tax, abolished on 1st January 2012, was reinstated on 1 April 2014.

Over the past decade water prices have decreased in real terms. The removal of the groundwater extraction tax further decreases water prices in the Netherlands. This trend may give an unwanted signal to water users and fail to incentivise more efficient water use.⁵⁴¹ In addition, the government recently rejected the introduction of a road pricing scheme.⁵⁴²

Some efforts have also been taken to further green taxation. For example, the exemption from the coal tax for coal used in the production of electricity has been abolished. The reduced tax rate for red diesel (diesel used in mobile agricultural machinery) has been abolished as of 1 January 2013 and the excise duty for LPG and diesel was increased in 2013 and 2014. In addition, excise rates on all energy products are indexed to inflation.⁵⁴³ These measures were also driven by the government's aim to put public finances in order.^{544 545}

In addition the government repealed an earlier decision to decrease rates of the motor vehicles tax in its 2014 tax plan.⁵⁴⁶ From 2015 onwards, the CO₂ emission brackets within the tax on passenger cars and motorcycles will be further sharpened.⁵⁴⁷ However, the recently adopted 2015 Fiscal Plan does not mention this measure thus it is unclear when this measure will be put in place.⁵⁴⁸

⁵⁴⁰ Afvalfonds verpakking (2014) Afvalfonds verpakking, Accessed 3 September 2014, www.afvalfondsverpakkingen.nl

⁵⁴¹ Ecologic, Eclareon (2014) Assessment of climate change policies in the context of the European Semester. Country Report: The Netherlands, Study under DG Climate Action Service Contract: 071201/2012/635684/SER/CLIMA.A.3, Berlin, 2014.

⁵⁴² Ecologic, IEEP, IVM, BIO (2013) Steps towards greening in the EU - Monitoring Member States achievements in selected environmental policy areas, Country Report on the Netherlands, Study under DG Environment's Framework contract for economic analysis ENV.F.1/FRA/2010/004, Brussels, 2013.

⁵⁴³ The Netherlands is one of few Member States to index excise duty levels to inflation, thereby helping to maintain the real value of taxes over time and thus revenue, and as a result to maintain the impact of the tax on relative prices and thus on agents' behavior (European Commission (2013) Tax reforms in EU Member States 2013 Tax policy challenges for economic growth and fiscal sustainability. EUROPEAN ECONOMY 5|2013.)

⁵⁴⁴ European Commission (2014) Taxes in Europe Database, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/measureDetail.html?id=2282

⁵⁴⁵ Rijksoverheid (2014) Accijns op brandstoffen, Accessed 5 September 2014, <http://www.rijksoverheid.nl/onderwerpen/accijns/accijns-op-brandstoffen>

⁵⁴⁶ Rijksoverheid (2013) Belastingplan 2014, Accessed 5 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingplan-2014>

⁵⁴⁷ Rijksoverheid (2013) Belastingplan 2014, Accessed 5 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingplan-2014>

⁵⁴⁸ Rijksoverheid (2014) Belastingplan 2015, Accessed 14 October 2014, <http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2014/09/16/belastingplan-2015.html>

The rate of the tap water tax was increased from 1 January 2014 to €0.330 per cubic metre.⁵⁴⁹ Tap water is taxed to a maximum quantity of 300 cubic metres per connection per year. The 2014 budget foresaw the repeal of this tax ceiling as of 1 July 2014. The government has however decided not to implement this measure.⁵⁵⁰ The government has also set up a project to modernise the wastewater treatment charge (“zuiveringsheffing”) for large companies to contribute to an efficient and sustainable treatment of wastewater.⁵⁵¹

In a letter on green growth sent to the Dutch Parliament in 2013, the Dutch government envisages a further greening of taxation.⁵⁵² The letter however recognised that smart policies are needed that prevent pricing (such as taxes) having negative impacts on competitiveness, which requires a European and sometimes a global approach. What exactly is meant by this is not specified in the letter. Thus, further action on EFR can be expected in the future, however cross-border issues have led to competitiveness concerns and undermined political and public support for action in this area. This was the case with the introduction of an air passenger duty in 2008 in the Netherlands which was abolished after one year due to concerns about passengers diverting to airports in neighbouring Germany and Belgium. Similarly, recent fuel tax increases have led to cases of fuel tourism, particularly in border areas, and have sparked much political and media attention⁵⁵³.

There have also been wider discussions on environmental tax reform. For example, in a 2014 policy brief on fiscal greening of energy taxes, the Netherlands Environmental Assessment Agency sets out some initial short-term policy options.⁵⁵⁴ Based on an in-depth analysis of the existing energy taxes,⁵⁵⁵ a series of ideas for policy options are presented such as reconsidering exemptions for biomass and green gas (because of their negative impacts on air quality), for waste incineration, shipping and aviation. The policy brief argues that energy taxes should not just take into account the CO₂ content of fuels, but also the impacts on air quality; while tariffs should be brought in line with the

⁵⁴⁹ Rijksoverheid (2014) Belasting op leidingwater, Accessed 5 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-voor-ondernemers/milieubelastingen/belasting-op-leidingwater>

⁵⁵⁰ Rijksoverheid (2014) Belasting op leidingwater, Accessed 5 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-voor-ondernemers/milieubelastingen/belasting-op-leidingwater>

⁵⁵¹ Ministerie van Infrastructuur en Milieu (2014) Brief van de minister aan de Tweede Kamer betreffende waterkwaliteit. Den Haag, 2 juni 2014.

⁵⁵² Dutch Ministry for the Economy (2013b) Kamerbrief Groene Groei: voor een sterke, duurzame economie. Online available: <http://www.rijksoverheid.nl/onderwerpen/duurzame-economie/documenten-en-publicaties/kamerstukken/2013/03/28/kamerbrief-groene-groei-voor-een-sterke-duurzame-economie.html>.

⁵⁵³ Withana, S., ten Brink, P., Illes, A., Nanni, S., Watkins, E., (2014) *Environmental tax reform in Europe: Opportunities for the future*, A report by the Institute for European Environmental Policy (IEEP) for the Netherlands Ministry of Infrastructure and the Environment. Final Report. Brussels. 2014.

⁵⁵⁴ Vollebergh, H. (2014) Fiscale vergroening: uitdagingen voor de belastingen op energie PBL, Planbureau voor de Leefomgeving, Den Haag.

⁵⁵⁵ Vollebergh, H., Drissen, E., Eerens, H. and Geilenkirchen, G. (2014) Milieubelastingen en Groene Groei Deel II, Evaluatie van belastingen op energie in Nederland vanuit milieuperspectief, PBL Planbureau voor de Leefomgeving, Den Haag.

relative environmental damage *inter alia* by shifting the energy tax from small to big consumers and by shifting the taxes on transport fuels from petrol to diesel.

A new tax reform is expected soon, since the previous one dates back to 2001. It is generally expected that the tax burden on labour will be decreased in the new reform. It has been noted that green taxes may be considered to the extent that they generate sizeable revenues, are simple in implementation, and have a useful additional function in the total policy package.⁵⁵⁶ In June 2013 a tax reform committee published a report advocating *inter alia* such a reduction, but at the same time also suggesting to minimise the instrumental aspect of the tax system. It was generally expected that the 2015 Fiscal Plan (published on 16th September 2014) would contain concrete reform measures based on this report.⁵⁵⁷ The Plan however only announces the ambition to come up with a concrete package of measures in the 2016 Fiscal Plan. How ambitious this package will be in terms of greening the Dutch tax system will depend on the green credentials of the governing coalition. Any new proposals will need to be researched, discussed with interest groups, run through parliament, designed, implemented, and a suitable announcement period considered.

No CSRs related to environmental fiscal reform were issued for the Netherlands in 2013.

16.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in the Netherlands. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€21.8 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€12.1 per GJ). Finally, due to the existing rates for kerosene used for heating being very high relative to coal and gas the rates for heating fuels are equalised using the minimum rate for LPG of €5.74 per GJ.
- The existing electricity tax rates are harmonised according to the highest rate, which for the Netherlands is non-business use.

⁵⁵⁶ Personal communication with Hans Vos, October 2014

⁵⁵⁷ Rijksoverheid (2014) Belastingplan 2015, Accessed 23 September 2014, www.rijksoverheid.nl/onderwerpen/belastingplan-2015

- Table 16-3 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.
- There is currently a high differential in the tax rates applied to diesel and petrol. Aligning the two as per the proposed revision to the ETD suggests a much higher rate for diesel, the tax rate increasing by over 70%. The uplift in the rate for kerosene is similar. The largest percentage increases are for LPG and for natural gas, however.
- For commercial and industrial motors, there are significant increases in rates for LPG and natural gas;
- There are major increases in the taxes applied to some of the heating fuels: rates for heavy fuel oil, gas and coal are increased by 711%, 269% and 1,140%, respectively.
- There is a marginal increase in the tax on electricity for business use.

Table 16-3: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	759	759
Light fuel oil (diesel)	€ per 1000 litre	819	478
LPG (propellant)	€ per 1000 kg	1060	322
Kerosene	€ per 1000 litre	824	478
Natural gas (prop)	€ per GJ	23	2
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	478	478
Kerosene	€ per 1000 litre	481	478
LPG	€ per 1000 kg	616	322
Natural gas	€ per GJ	13	2
Business Heating			
Gas oil	€ per 1000 litre	478	478
Heavy fuel oil	€ per 1000 kg	292	36
Kerosene	€ per 1000 litre	478	478
LPG	€ per 1000 kg	322	322

Energy Tax	Units	Suggested Rates	Existing Rates
Natural gas	€ per GJ	6.86	1.86
Coal	€ per GJ	7.63	0.53
Non-Business Heating			
Gas oil	€ per 1000 litre	478	478
Heavy fuel oil	€ per 1000 kg	292	36
Kerosene	€ per 1000 litre	478	478
LPG	€ per 1000 kg	322	322
Natural gas	€ per GJ	6.86	1.86
Coal	€per GJ	7.63	0.53
Electricity			
Electricity - business use	€ per MWh	43.53	43.40
Electricity - non-business use	€ per MWh	43.53	43.53

➤ **Transport Taxes:**

- **Vehicles:** The Netherlands taxes on vehicles are some of the higher ones in the EU. Combined with the taxes on vehicle fuels, the tax burden on transport is above the level where further increases are proposed, notably once the transport fuel taxes are revised in line with above proposals (the good practice benchmark relates to vehicles taxes and transport fuel taxes combined). That having been said, there is potential for the Netherlands, which is one of the countries included in the Eurovignette scheme, to review the approach to taxing HGVs, notably in respect of providing for greater differentiation across vehicles in different Euro classes, and to extending its scope to cover vehicles between 3.5t and 12t weight (the system currently applies to vehicles over 12t weight only).⁵⁵⁸
- **Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. The Netherlands already had an air passenger duty in 2008 but this duty, as noted above, was abolished after one year due to competitiveness concerns and a reduction in demand for air tickets.

⁵⁵⁸ See Ricardo-AEA (2014) *Evaluation of the Implementation and Effects of EU Infrastructure Charging Policy since 1995*, Final Report to DG MOVE, January 2014.

There is thus scope for introducing a passenger aviation tax and a tax on air freight in the Netherlands, which will need to be designed in such a way as to address concerns with the previous duty. However, as Schiphol is fighting to maintain its position as a key European hub and with current problems faced by many airlines, opposition to such a tax is expected to be very strong. Suggested rates for an air passenger tax could be €15 per passenger (flights within the Netherlands), €25 per passenger (to other countries in the European Union), and €50 per passenger (to other countries outside the European Union). The suggested air freight transport tax rate is €1.25 per tonne of freight. For the purposes of the modelling undertaken as part of this work the year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. A longer implementation period could also be considered, particularly given likely opposition to such a measure, e.g. phased implementation between 2018 and 2020. The way in which the picture unfolds concerning the proposals from ICAO might also influence future levels and/or design of this tax.

➤ **Pollution and Resource Taxes:**

- **Aggregates:** There is currently no tax on aggregates in the Netherlands. An aggregates tax (in relation to land and marine aggregates) can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This is in line with the EU flagship initiative 'A Resource Efficient Europe'.⁵⁵⁹ It is suggested that a tax on aggregates is introduced and that the rate is set at €2.40 per tonne from 2017, and that thereafter, the rate is kept constant in real terms. A longer implementation period could also be considered. If this rate would prove to be insufficient in the future to have a positive effect on the use of secondary material, the introduction of a higher tariff might be considered. Ideally, EU or bilateral action should also be encouraged to prevent the tax having a negative impact on the competitiveness of the construction sector and to help minimise impacts in border areas. The types of materials that could be covered by the aggregates tax are:
 - Marble
 - Chalk and dolomite
 - Slate
 - Limestone and gypsum
 - Sand and gravel

Although some of these materials are not extracted in the Netherlands, the suggested aggregates tax could be applied to domestic aggregate extraction and imports to the Netherlands, excluding exports (a similar

⁵⁵⁹ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

approach to the aggregates levy applied in the UK⁵⁶⁰). It is important that the tax apply to both land and marine aggregates to avoid displacing the burden of aggregates extraction from the land to the North Sea. The tax could also adopt a phased approach applying to certain materials such as sand and gravel first and then expanding coverage to other materials over time. The specific range of materials suggested above reflects, in part, the nature of the data available to us in developing estimates of potential revenues. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues.

- **Waste – incineration / MBT tax:** There are currently twelve waste incineration plants operating in the Netherlands and there is currently no incineration tax in place. However, the 2015 Fiscal Plan foresees the implementation of an incineration tax. The rate for both landfilled and incinerated waste is expected to be €13 per 1,000 kg from 2015 onwards.⁵⁶¹ Moreover there are several mechanical biological treatment (MBT) plants used to prepare waste for subsequent energy recovery, and for stabilising waste before landfilling. In order to ensure that recycling rates do not stagnate, and to generate some additional revenue, it is suggested that the waste tax could be increased, to at least €15 per tonne, in 2020, and that rates are set so that other forms of residual waste treatment are taxed in an equivalent manner.
- **Packaging:** The packaging tax in the Netherlands was abolished and replaced by packaging waste management charge from 1st January 2013. The charge is paid by companies which annually place 50,000kg or more of packaging waste on the Dutch market (revenues are allocated to the packaging waste fund). Thus, in addition to the currently applied packaging charges (which seek to cover the costs of the collection and recycling of packaging waste from producers), a packaging tax could be (re)introduced to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested that the following rates could be applied on all packaging placed on the market in the Netherlands:

○ Aluminium	€197 per tonne
○ Plastic	€64 per tonne
○ Steel	€54 per tonne
○ Paper and card	€20 per tonne
○ Glass	€18 per tonne
○ Wood	€13 per tonne

⁵⁶⁰ Söderholm, P (2011) Taxing Virgin Natural Resources: Lessons from Aggregates Taxation in Europe, Luleå University of Technology, Sweden. Submitted to Resources, Conservation and Recycling 2011

⁵⁶¹ Rijksoverheid (2014) Belastingplan 2015, Accessed 23 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingplan-2015>

These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage firms to take measures to prevent the generation of packaging in the first place (as opposed to increase recycling). It is suggested that these rates be applied from 2017 and be kept constant in real terms. Higher rates could also be considered in order to further stimulate behaviour change; however this would have to be weighed against potential political acceptability and is something for consideration over time. A longer implementation period could also be considered, e.g. phased implementation from 2018/2019.

- **Single-use carrier bag tax:** There is currently no tax on single-use plastic carrier bags in the Netherlands. Of these bags, plastic bags in particular cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the riverine, or marine, environment. Moreover in countries with high level of tourism littered plastic bags can deter visitors and can lead to costly clean-up operations. For example it has been estimated that municipalities in the Netherlands spend approximately €10.4 million each year removing beach litter.⁵⁶² A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. In 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.⁵⁶³ Consequently, it is suggested that the Netherlands implements a tax on single-use carrier bags at a minimum rate of €0.11 per bag from 2017 and maintains the rate constant in real terms thereafter.
- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. According to Airbase (EEA) 100% of the urban population in the Netherlands is exposed to PM₁₀ concentrations exceeding the daily limit value (50 µg per m³) for between 8 and 35 days per year.⁵⁶⁴ The Netherlands does not currently have a system of air pollution taxes in place. However, it used to have a

⁵⁶² Mouat, J., R.L. Lozano and H. Bateson (2010), 'Economic impacts of marine litter', Report of Kimo international, available at <http://www.kimointernational.org/Home.aspx>

⁵⁶³ DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

⁵⁶⁴ Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 9 October 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

NO_x emission trading scheme up until 31st December 2013.⁵⁶⁵ As EU air quality standards such as for NO_x and PM₁₀ are not met, it is suggested that an air pollution tax could be implemented in order to generate improvements in air quality. Minimum tax rates could be applied as follows:

- SO_x €1,000 per tonne
- NO_x €1,000 per tonne
- PM₁₀ €2,000 per tonne

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2020. Thereafter the rates could be held constant in real terms.

- **Water abstraction:** A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that “*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*”. The European Commission estimates that water charges cover 95% or 100% of annual costs to water management boards for providing water services.⁵⁶⁶ Currently, although there are user charges in place, there are no taxes for water abstraction in the Netherlands – the groundwater extraction tax was abolished in 2011. Thus, water abstraction taxes could be introduced at the following levels of taxation: €290 per 1,000 m³ for households, €180 per 1,000 m³ for manufacturing purposes and €25 per 1,000 m³ for agriculture. In order to avoid double taxation, the design and application of this tax would have to take into account the existing tap water tax system and could be collected at the source of extraction (i.e. from water abstraction companies). Groundwater abstraction by households and other private operators may occur; however, this would be hard to monitor. A transition period from 2016 to 2020 is suggested, whereby the rates are increased over the specified period to the suggested levels. Thereafter the rates could be held constant in real terms.
- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21st May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.⁵⁶⁷ The Netherlands has waste water user charges in place, i.e. a waste water treatment charge for indirect discharges and a water pollution charge for direct discharges into

⁵⁶⁵ Rijksoverheid (2012) *Besluit intrekking handel in NO_x-emissierechten*, Accessed 9 October 2014, www.rijksoverheid.nl/documenten-en-publicaties/besluiten/2012/10/05/besluit-intrekking-handel-in-nox-emissierechten.html

⁵⁶⁶ European Commission (2012) Commission Staff Working Document. Member State: the Netherlands. Accompanying the document: Report from the Commission on the implementation of the Water Framework Directive (2000/60) River Basin Management Plans, Brussels, 14.11.2012, SWD (2012)379.

⁵⁶⁷ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

surface water systems. Although these charges have been introduced to cover costs, they have also provided incentives for behavioural change. These charges vary in level and structure on a regional basis (at the level of water management bodies). However, to further strengthen the prevention of water pollution it is suggested that the user charge rates applied by the various water management boards are at least at the same level and in line with good practice rates (see Section 5.3.6). This would imply, for BOD, a minimum rate of €2.47 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. The minimum rates could be phased in over a transition period from 2016 to 2019 and thereafter held constant in real terms.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

The Netherlands does not have a pesticides tax and its Action Plan does not expressly mention the introduction of such a tax.⁵⁶⁸ There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable in the Netherlands. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €10 per kg active ingredient. The suggested transition period is from 2017 to 2019, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would contribute towards the aims of the Action Plan. The tax could be applied on imports and ideally at the EU level to avoid competitiveness concerns.

- **Fertilisers:** The Netherlands does not currently implement a tax on nitrogen (or other) fertilisers. In the past, the Netherlands had a Mineral Accounting System (MINAS) for nutrient surpluses; however this was ruled to be not in accordance with the EU Nitrates Directive and was discontinued from 2006.⁵⁶⁹ Since 2013 a new policy on fertilisers has been in place. In 2014, stricter standards for bringing manure onto the land have been set,

⁵⁶⁸ Rijksoverheid (2012) Actieplan duurzame gewasbescherming, www.rijksoverheid.nl/onderwerpen/bestrijdingsmiddelen/documenten-en-publicaties/rapporten/2012/10/04/actieplan-duurzame-gewasbescherming.html

⁵⁶⁹ EEA (2005) Market-based instruments for environmental policy in Europe

thereby forcing farmers to deliver more manure to recycling firms. These standards thus have a similar effect to a fertiliser tax in terms of reducing the surplus of nutrients onto the land. A fertiliser tax could also be introduced to complement the current standards-based approach. It is suggested that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of €0.20 per kg N be implemented from 2017 with rates gradually increasing to the maximum level in 2019.

16.2.3 Summary of Revenue Outcomes

Table 16-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 16-4: Potential Additional Revenue from Environmental Fiscal Reform in the Netherlands, million EUR (real 2014 terms)⁵⁷⁰

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	391	1,537	2,649
C&I / Heating	403	1,536	2,574
Electricity	6	6	6
<i>Sub-total Energy, million EUR</i>	<i>800</i>	<i>3,079</i>	<i>5,229</i>
<i>Sub-total Energy, % GDP</i>	<i>0.13%</i>	<i>0.50%</i>	<i>0.84%</i>
Transport Taxes			
Passenger Aviation Tax	1,200	2,592	3,057
Freight Aviation Tax	0.99	1.97	2.05
<i>Sub-total Transport, million EUR</i>	<i>1,201</i>	<i>2,594</i>	<i>3,059</i>
<i>Sub-total Transport, % GDP</i>	<i>0.19%</i>	<i>0.42%</i>	<i>0.49%</i>

⁵⁷⁰ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Pollution and Resource Taxes			
Incineration /MBT Tax	58	80	85
Air Pollution Tax	36	66	47
Water Abstraction Tax	240	575	584
Pesticides Tax	94	185	197
Aggregates Tax	166	103	108
Packaging Tax	73	66	61
Single Use Bag Tax	149	32	35
Fertiliser Tax	0.029	0.049	0.039
<i>Sub-total Pollution & Resource, million EUR</i>	<i>814</i>	<i>1,106</i>	<i>1,117</i>
<i>Sub-total Pollution & Resources, % GDP</i>	<i>0.13%</i>	<i>0.18%</i>	<i>0.18%</i>
Total Environmental Taxes			
Total, million EUR	2,815	6,779	9,405
Total Increase, % GDP	0.45%	1.09%	1.51%

Table 16-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 16-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in the Netherlands, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	306
Increased Cost Recovery for Water Use	1,517
Total	1,823

16.2.4 Environmental Benefits

Table 16-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.14.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €185

million of benefits are anticipated annually by 2025 in real terms.

Table 16-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in the Netherlands, million EUR (real 2014 terms)⁵⁷¹

Tax Type	2017	2020	2025
Energy Taxes	16	59	96
Transport Taxes (excluding transport fuels)	18	37	43
Pollution and Resource Taxes	11	50	51
Total, million EUR	45	147	189
Total, % GDP	0.01%	0.02%	0.02%

16.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in the Netherlands:⁵⁷²

- In 2012, environmental taxes generated revenue equivalent to 3.56% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Netherlands. These could generate EUR 2.8 billion in 2017, rising to EUR 9.4 billion in 2025 (both in real 2014 terms). This is equivalent to 0.45% and 1.51% of GDP in 2017 and 2025, respectively.
- The largest single contribution to revenue comes from the proposed passenger aviation tax. This accounts for EUR 3.1 billion by 2025 (real 2014 terms), equivalent to 0.36% of GDP.
- The next largest contribution to revenue comes from the suggested harmonisation of the taxes on transport fuels with those in the proposed ETD. This accounts for EUR 2.6 billion by 2025 (real 2014 terms), equivalent to 0.32% of GDP.
- The proposed amendments to the taxes on fuels used for business heating would account for EUR 2.6 billion by 2025 (real 2014 terms), equivalent to 0.31% of GDP.
- Revenue potential from a water abstraction tax would raise EUR 0.6 billion by 2025 (real 2014 terms), equivalent to 0.07% of GDP.

⁵⁷¹ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

⁵⁷² % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- A pesticides tax has also been suggested. This would contribute EUR 0.2 billion by 2025 (real 2014 terms), equivalent to 0.02% of GDP.
- In addition, a range of more minor taxes on could generate revenue of EUR 0.3 billion by 2025 (real 2014 terms), equivalent to 0.04% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 0.2 billion by 2025 (real 2014 terms), equivalent to 0.02% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €1.8 billion per annum could be raised in addition to the above.

17.0 Slovenia

17.1 Country Overview

17.1.1 Key Facts about the Economy and Tax System

- From 2003 to 2008 Slovenia enjoyed a period of strong economic growth with an average annual increase in GDP of 4.6% in real terms. Although growth slowed in 2008, as with the rest of the EU-28, recession fully hit in 2009, when Slovenia's GDP fell by 7.9% in real terms. There was muted growth between 2010 and 2011, but negative growth returned for the years 2012 and 2013, during which GDP fell by an average of 1.8% in real terms.⁵⁷³
- Slovenia's overall tax revenue (including social contributions) as a percentage of GDP is below the EU-28 average of 39.8%, at 37.9% (2012). This share rate has fallen from a high of 39% in 2005.⁵⁷⁴
- The total tax income of Slovenia in 2012 was made up 40.9% by social contributions, 38.5% by indirect taxes, and 20.6% by direct taxes. All three revenue streams have fluctuated over past 10 years in terms of their percentage shares of the total tax take.⁵⁷⁵
- In 2012, environmental tax revenue amounted to 3.82% of Slovenia's GDP. This percentage share was the second highest in the EU-28 for the year, and represented a 10 year high for Slovenia, having risen from 3.25% of GDP in 2002.⁵⁷⁶
- The majority of Slovenia's environmental tax revenue for 2012 came from taxation of energy, which amounted to 3.1% of GDP. Making smaller contributions, transport (excluding fuel) taxes amounted to 0.41% of GDP and pollution and resource taxes amounted to 0.31% of the country's GDP in 2012.⁵⁷⁷
- Energy taxes accounted 81.2% of Slovenia's total environmental tax revenue in 2012. Overall, this percentage has risen over the past 10 years, from 78.8% in 2002.⁵⁷⁸

⁵⁷³ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

⁵⁷⁴ Eurostat (2013) *Main National Accounts Tax Aggregates [gov_a_tax_ag]*, Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

⁵⁷⁵ Ibid.

⁵⁷⁶ Ibid.

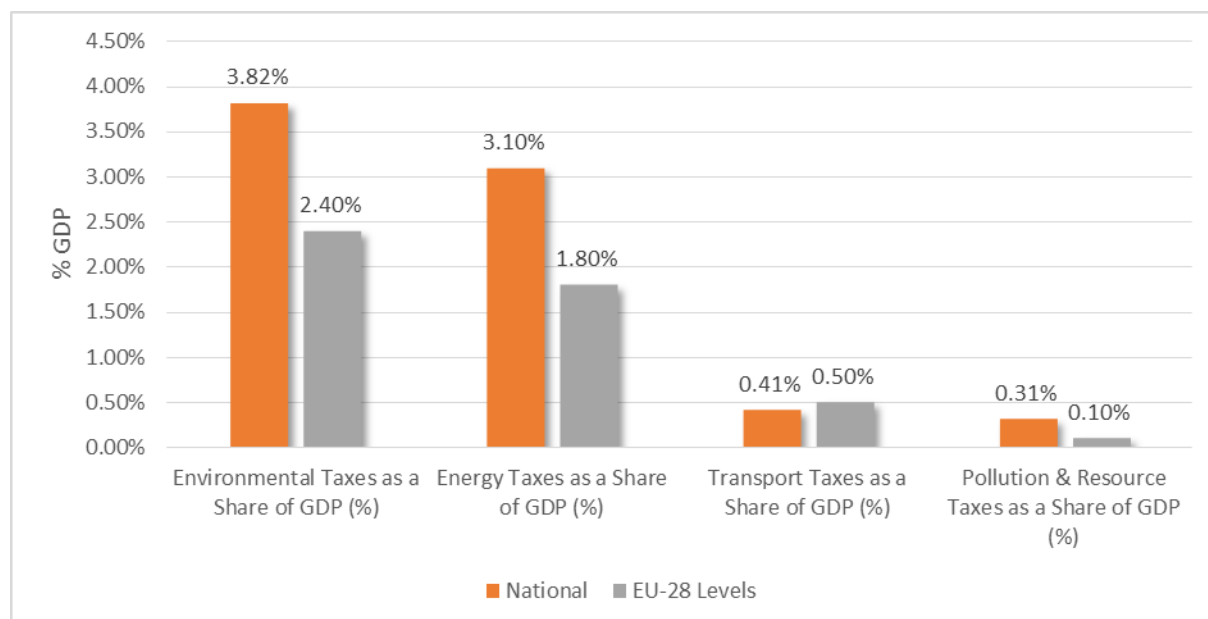
⁵⁷⁷ Eurostat (2014) *Environmental tax Revenues [env_ac_tax]*, Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

⁵⁷⁸ Ibid.

17.1.2 Relative Position within the EU

- In 2012, Slovenia's revenue from environmental taxes expressed as a proportion of GDP was well above the EU average of 2.4%. This is largely due to the contribution from energy taxes which, expressed as a proportion of GDP, were significantly higher than the EU-28 average of 1.8%. The contribution from taxes on pollution and resources was more than three times the EU-28 average. The corresponding percentage for transport (excluding fuel) taxes, however, was below the average of 0.5% (see Figure 17-1).⁵⁷⁹

Figure 17-1: Environmental Taxes in Slovenia as a % of GDP vs EU-28 Levels (2012)



- Considering revenue derived from environmental taxation as a percentage share of GDP, Slovenia ranked 2nd in the EU-28 for 2012 against this measure. For the proportion of GDP coming from taxes placed on energy, Slovenia was in 1st place of all Member States and also ranked highly for the proportion of GDP from pollution and resource taxes, in 3rd place. For transport (excluding fuel) tax revenue as GDP share Slovenia ranked somewhat lower, at 17th place (see Table 17-1).⁵⁸⁰

⁵⁷⁹ Ibid.

⁵⁸⁰ Ibid.

Table 17-1: Ranking of Slovenia's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	2
Energy Taxes as a Share of GDP (%)	1
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	17
Pollution & Resource Taxes as a Share of GDP (%)	3

Source: based on Eurostat data

17.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given Appendix A.15.0. This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). Revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat.⁵⁸¹

➤ Energy Taxes:

- The Slovenia excise duties on fuels and electricity are shown in Table 17-2 alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 17-2: Standard Rates of Excise Duties on Fuels and Electricity in Slovenia

Excise Duty	Unit	Rate Applied in Slovenia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol ¹	€ per 1000 litres	€421.61	€421	€585	€583
Unleaded Petrol	€ per 1000 litres	€549.51 ²	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€450.36 ³	€330	€427	€405
Kerosene	€ per 1000 litres	€330	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€127.50	€125	€209	€180
Natural Gas	€ per GJ	€3.51 ⁷	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					

⁵⁸¹ Eurostat (2013) GDP and Main Components - Current Prices [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Excise Duty	Unit	Rate Applied in Slovenia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Gas Oil (Diesel)	€ per 1000 litres	€43.90 ³	€21	€221	€163
Kerosene	€ per 1000 litres	€165	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€63.75	€41	€126	€125
Natural Gas	€ per GJ	€3.51 ⁷	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€133.09 ³	€21	€221	€163
Kerosene	€ per 1000 litres	€55.56 ⁴	€0	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€61.10 ⁵	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€41.76 ⁶	€0	€82	€40
Natural Gas	€ per GJ	€1.35 ⁷	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€1.47 ⁸	€0.15	€1.27	€0.31
		€1.60 ⁹			
		€1.83 ¹⁰			
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€133.09 ³	€ 21	€179	€125
Kerosene	€ per 1000 litres	€55.56 ⁴	€ 0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€61.10 ⁵	€ 15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€41.76 ⁶	€ 0.00	€111	€42
Natural Gas	€ per GJ	€1.35 ⁷	€ 0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€1.47 ⁸	€ 0.30	€1.77	€0.32
		€1.60 ⁹			
		€1.83 ¹⁰			
Electricity					
Business Use	€ per MWh	€3.05	€ 0.50	€8.42	€1.03
Non-Business Use	€ per MWh	€3.05	€ 1.00	€14.53	€2.06

Excise Duty	Unit	Rate Applied in Slovenia	Existing ETD Minimum	EU-28 Average	EU-28 Median
Notes:					
1. Leaded petrol is forbidden for sale in Slovenia.					
2. Includes CO ₂ -tax in the amount of €34.56 per 1000 litres.					
3. Includes CO ₂ -tax in the amount of €37.44 per 1000 litres.					
4. Includes CO ₂ -tax in the amount of €34.56 per 1000 litres.					
5. Includes CO ₂ -tax in the amount of €46.08 per 1000 kg.					
6. Excise duty for LPG used for heating (business and non-business use) is €0, this figure shows only the CO ₂ -tax.					
7. Includes CO ₂ -tax in the amount of €0.8047 per GJ.					
8. [CN 2701]; Includes CO ₂ -tax in the amount of €1.1829 per GJ, energy value used: 1000 kg = 28 GJ.					
9. [CN 2702]; Includes CO ₂ -tax in the amount of €1.3091 per GJ, energy value used: 1000 kg = 16.5 GJ.					
10. [CN 2704]. Includes CO ₂ -tax in the amount of €1.5393 per GJ, energy value used: 1000 kg = 29 GJ.					

Source: DG TAXUD (2014) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2014, http://ec.europa.eu/taxation_customs/index_en.htm#

- The excise duties outlined in Table 17-2 are all at or above the existing rates in the ETD. Taxes on transport fuels are, other than for kerosene and LPG, above the EU-28 average and median rates. In contrast, motor fuels used by industry/commercial sector, and fuels used for business and non-business heating are typically well below average and median European rates. Taxes on electricity are €3.05 per MWh, which is above the EU-28 average, but well below the median rates.
- A number of special rates and reductions apply, for example, for gas oil used for agriculture and railways.
- In 2012, revenues from energy excise duties amounted to €1.07 billion, equivalent to 3.02% of GDP.⁵⁸²
- A tax on CO₂ came into force in 1997 into Slovenia.⁵⁸³ This was the first instance of a CO₂ tax being implemented by a Central and Eastern Europe country. The tax is levied on all CO₂ emissions from the combustion of fuel and from the incineration of combustible organic substances.

⁵⁸² European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=534/1389189783&taxType=Energy+products+and+electricity

⁵⁸³ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=714/1388754940&taxType=Other+indirect+tax

- A tax rate of €14.4 per tonne of CO₂ is charged on all fuels, with specific tax rates calculated according to the carbon content of each fuel. These are listed in Table 17-2.
- A number of exemptions exist, including on biomass for heating, fuel extracted from biomass and biogas, fuel used in chemical reactions, electrolytic and metallurgical processes; fuel exported to the EU area; kerosene used in aviation; and fuel used by companies that participate in the EU ETS.⁵⁸⁴
- Tax revenues in 2012 totalled €55 million, equivalent to 0.16% of GDP.
- Since 2010, energy suppliers are required to collect an energy efficiency tax from final customers. Tax rates vary from €0.002 to €0.05 per litre for petroleum fuels. District heating and electricity are taxed at €0.0005 per kWh. The revenues from this tax are fully earmarked for energy efficiency programmes.⁵⁸⁵

➤ **Transport Taxes (excluding transport fuels):**

- Registration tax:
 - A motor vehicles tax (“davek na motorna vozila”) is payable at the time of purchase or first time registration of a passenger motor vehicle in Slovenia (or at the time of registration of a vehicle imported into Slovenia). Tax rates are determined by the CO₂ emissions, fuel type, and power of the vehicle, and range from 0.5% to 31% of the pre-VAT selling price of the vehicle. An additional premium is charged for motor vehicles with large engine capacities. Exemptions include: exported vehicles, vehicles used by families with three or more children, vehicles for carrying disabled people. Revenue from the motor vehicles tax in 2012 was €34.8 million, equivalent to 0.10% of GDP.⁵⁸⁶
- Circulation tax:
 - Owners of registered motor vehicles and trailers are required to pay an annual fee on the use of motor vehicles “letna dajatev za uporabo vozil v cestnem prometu”. The tax rate is calculated by a different method for each vehicle type on the basis of one or more of the following measures: engine capacity, number of passengers and maximum permissible weight. The tax rate also varies by a

⁵⁸⁴ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁵⁸⁵ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁵⁸⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=537/1388754941&taxType=Other+indirect+tax

fixed percentage depending on vehicle emissions (measured by EURO standards). Tax rates vary from €62 to €565 for personal cars. Alternative rates apply to motorbikes, buses, trucks, and trailers. The main exemptions to this tax include: electric vehicles, tractors and tractor trailers, motorcycles, three-wheeled small capacity cycles, light four wheeled cycles, light trailers, public service vehicles, and vehicles for disabled persons. Revenue from the annual fee on the use of motor vehicles in 2012 was €109 million, equivalent to 0.31% of GDP.⁵⁸⁷

- Other vehicle taxes:
 - An end-of-life vehicles tax is payable on all new vehicles in Slovenia, with a tax rate of €0.0063 per kg of vehicle. The tax generated €0.5 million of revenue in 2012, equivalent to 0.001% of GDP.⁵⁸⁸
 - Slovenia has a road toll system in place for most motorways and expressways, implemented on the 1 July 2008. This is split into two systems: vignettes are required for all motorcycles, private cars and vans whose maximum permitted weight does not exceed 3.5 tonnes; open and closed tolling systems are in place for vehicles weighing over 3.5 tonnes. The amount payable is determined by the class of vehicle, EURO emissions standard, the type of toll road, and the distance covered, and can be linked to an electronic tag in the vehicle.⁵⁸⁹ In Slovenia, tolls follow a concession funding model with the state-owned motorway company, DARS d.d, being awarded the concession. Slovenia changed from a vignette to a system of manual tolls from trucks in 2010 and plans to introduce free-flowing toll collection in 2015, consistent with the interoperability Directive (2004/52).⁵⁹⁰

➤ **Pollution and Resource Taxes:**

- Landfilling of waste in Slovenia has been subject to a landfill tax since 2001. The tax basis is the number of units of waste, multiplied by a set number of “soil load units” for each category of inert, non-hazardous and hazardous waste (units of 1, 5 and 10, respectively). The tax rate is calculated by multiplying the number of “soil load units” by €0.022. Thus tax rates of €5.5 per tonne for inert waste, €11 per tonne for non-hazardous waste, and €22 per tonne for hazardous waste apply. Revenue

⁵⁸⁷ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=812/1388754940&taxType=Other+direct+tax

⁵⁸⁸ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&OryCtx=1&OryFlag=3

⁵⁸⁹ DARS (2014) *Tolling System and Roads*, Accessed 14th August 2014, http://www.dars.si/Dokumenti/Toll/Tolling_system_and_roads_298.aspx

⁵⁹⁰ See Ricardo-AEA (2014) *Evaluation of the Implementation and Effects of EU Infrastructure Charging Policy since 1995*, Final Report to DG MOVE, January 2014.

from the landfill tax in 2012 was €4.6 million, equivalent to 0.013% of GDP).^{591 592}

- Electronic and electrical equipment (EEE), pneumatic tyres, and packaging waste placed on the market are taxed in Slovenia. The tax basis is the mass of EEE, pneumatic tyres, or packaging waste, multiplied by a “unit of environmental load”. The unit of environmental load measure aims to account for the environmental impacts of disposal of WEEE, end-of-life tyres, and packaging waste. A different unit of environmental load applies to each type of EEE. Tax rates per unit of environmental load are: €0.0083 for WEEE, €0.0054 for end-of-life tyres, and €0.0017 for packaging waste. The tax generated revenue of €1.5 million in 2012, equivalent to 0.004% of GDP.⁵⁹³
- Slovenia has a tax on the extraction of mineral resources. The tax rate is dependent on the type of material extracted and the quantity of that material extracted in previous years.^{594,595}
- A tax on the area of land used for mining applies to all mineral extraction operations. The tax rate is dependent on the type of material extracted and the area of land use for mining.^{596,597}
- Slovenia has a tax on lubricating oils and fluids. A tax rate of €0.1586 per kg applies. The full tax rate is applied to lubricating oils used in vehicles, while industrial lubricating oils are subject to a 50% tax rate. Revenue from the tax was €2.5 million in 2012, equivalent to 0.007% of GDP.⁵⁹⁸

⁵⁹¹ OECD (2012), OECD Environmental Performance Review: Slovenia 2012, <http://dx.doi.org/10.1787/9789264169265-en>

⁵⁹² Source: European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=814/1388754940&taxType=Other+indirect+tax

⁵⁹³ Source: European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=814/1388754940&taxType=Other+indirect+tax

⁵⁹⁴ Personal communication with Andrej Udovč, Professor of Environmental Economics, University of Ljubljana

⁵⁹⁵ Unable to obtain revenue figures as part of this study

⁵⁹⁶ Personal communication with Andrej Udovč, Professor of Environmental Economics, University of Ljubljana

⁵⁹⁷ Unable to obtain revenue figures as part of this study

⁵⁹⁸ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

- Volatile organic compounds are subject to a tax in Slovenia. A tax rate of €0.001 per unit load applies. The tax generated revenue of €0.1 million in 2012, equivalent to 0.0003% of GDP.⁵⁹⁹
- Slovenia has a tax on fluorinated greenhouse gases.⁶⁰⁰
- Slovenia has a “payment for water rights” charge which applies to a number of activities requiring access to (or use of) water, including hydroelectric power production, fishing, mineral water extraction and usage of thermal underground waters. Specific rates are levied for the commodity used in each activity e.g. a rate of €0.0248 per 1000 kJ of heat is charged for the use of thermal underground waters.⁶⁰¹
- A water abstraction tax is levied in Slovenia.⁶⁰² Rates vary according to the use to which the abstracted water is applied, and are generally specified on a per m³ of water basis. Water abstraction charges raised €26 million of revenue in 2012, equivalent to 0.074% of GDP.⁶⁰³
- A wastewater pollution tax applies to the disposal of waste water in Slovenia. The tax is payable by all legal entities using water in their industrial processes, and the owner or manager of a building where municipal waste water arises. The tax basis is the number of waste water pollution load units in the taxation period, and a tax rate of €26.40 per unit of waste water load applies. The tax raised €29.8 million in revenue in 2012, equivalent to 0.084% of GDP.^{604,605}

⁵⁹⁹ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁶⁰⁰ Statistical Office of the Republic of Slovenia (2013) *Improvement and Upgrading of the Existing Environmental Accounts (Environmentally Related Taxes)*, January 2013, <http://www.cbd.int/financial/fiscalenviron/slovenia-environcount.pdf>

⁶⁰¹ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁶⁰² OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁶⁰³ Eurostat (2014) *National Tax Lists*, 28th May 2014, http://epp.eurostat.ec.europa.eu/statistics_explained/images/c/c4/National_tax_lists_20140528.xls

⁶⁰⁴ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=814/1388754940&taxType=Other+indirect+tax

⁶⁰⁵ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

- Wastewater collection and treatment is subject to a charge in Slovenia.⁶⁰⁶ Both variable and fixed rates charges are in place, these vary across municipalities depending on a number of factors (e.g. the level of service provided, service costs, population distribution and density, etc.). Rates vary from €0.089 to €2.405 per m³ for households, and from €0.129 to €2.436 per m³ for industry. The charges generated revenue of €30 million in 2012, equivalent to 0.085% of GDP.⁶⁰⁷

17.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Slovenia. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

17.2.1 Current Status of EFR

Environmental awareness developed relatively early in Slovenia. Pressure to develop effective environmental legislation increased in the 1980s, as it was scientifically established that, in some places, pollution had reached considerable proportions and posed a serious threat to human health and the environment.

The Environmental Protection Act (EPA), passed in 1993, provides the main legislative basis of financing environmental protection in Slovenia. The EPA established the polluter pays principle, and enabled the government to introduce environmental taxes and charges to stimulate reduction of pollution. A new EPA was adopted in 2004 in order to fully harmonise the country's environmental laws with EU environmental directives.

Significant steps towards environmental tax reform have been taken in recent years. Slovenia was the first country in Central and Eastern Europe to introduce a CO₂ tax. This tax, implemented in 2007, has modest tax rates, suggesting that its primary function is to generate revenue rather than internalise the cost of pollution. Further legislation was passed in 2010 to extend the CO₂ tax to motor fuels. Another major step was taken in March 2010, when a reform of the motor vehicle tax linked the tax rate to vehicles CO₂ emissions rather than to their sale price, as had been the case between 2000 and 2009.

However, a number of taxes and exemptions still exist that are difficult to justify on environmental grounds. Generous refunds of excise duty, introduced in 2009 in response to the economic downturn, guarantee minimum EU tax rates for commercial diesel. Slovenia also has a significant tax differential between petrol and diesel.

In 2012, environmental taxes in Slovenia represented 3.8% of GDP, the third highest in the EU. This share rose by 0.8 percentage points from a 3.0% value in 2006–2008, mainly due to increasing revenues from excise duties on mineral oil and gas. In fact, energy taxes now account for a greater share of GDP in Slovenia than in any other

⁶⁰⁶ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁶⁰⁷ Eurostat (2014) *National Tax Lists*, 28th May 2014, http://epp.eurostat.ec.europa.eu/statistics_explained/images/c/c4/National_tax_lists_20140528.xls

Member State. It is important to note, however, that this is not due to high tax rates (which are no higher than in most other European countries), but to the high level of final energy consumption in Slovenia relative to GDP.⁶⁰⁸

A working group was established in 2012 to develop proposals on green tax reform. The group has made a number of further proposals to expand the scope of some environmental taxes, as well as the possibility of introducing new taxes on pollution or the use of certain materials. However, little public attention is paid to the working group and these proposal are not published.

In 2013, the group released a report on environmentally harmful subsidies in Slovenia, the abolition of which would help to address the budget deficit, strengthen incentives for environmental protection, and enhance economic efficiency. Partly on the basis of this report, a joint government committee has agreed to review environmentally harmful subsidies in Slovenia.⁶⁰⁹ A proposal for the gradual reduction of EHS over the next five year period was due to be published by the end of 2013.

17.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Slovenia. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€15.4 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for kerosene (€3.2 per GJ). Finally, the rates for heating fuels are equalised using the minimum rate for gas oil of €2.3 per GJ.
- The existing electricity taxes are harmonised and above the ETD minimum of €0.15 per GJ so no change is suggested.
- The changes indicate that the rates for LPG, used as a propellant, would increase significantly, reflecting the current, low, level of taxation. The

⁶⁰⁸ Eurostat (2012) *Taxation Trends in the European Union, 2012*, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-DU-12-001/EN/KS-DU-12-001-EN.PDF

⁶⁰⁹ Document of the National Assembly of RS, no. 411-01 / 13-30 / 4 dated 20 September 2013

same applies to natural gas. In addition, diesel and kerosene rates are increased, bringing both into line with the tax on petrol.

- Rates applied to LPG and natural gas, used in industrial motors, are also increased in line with gas oil.
- As regards heating fuels, rates for LPG and coal are increased quite significantly.
- Table 17-3 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the good practice section on energy taxes (Section 5.1). The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.
- There is currently a significant differential in the tax rates applied to diesel and petrol. Aligning the two as per the proposed revision to the ETD leads to the tax rate for diesel increasing by over 30%. The uplift in the rate for kerosene is over 80%. The largest increases are for LPG and for natural gas, however, these moving to 6 and 4 times their current levels, respectively.
- For commercial and industrial motors, there are significant increases in rates for gas oil and LPG;
- There are major increases in the taxes applied to some of the heating fuels: rates for heavy fuel oil, natural gas and coal are all increased by around 150%, with the LPG tax rate increasing by 290%.
- There is no change to the taxes on electricity.

Table 17-3: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	550	550
Light fuel oil (diesel)	€ per 1000 litre	593	450
LPG (propellant)	€ per 1000 kg	765	128
Kerosene	€ per 1000 litre	597	330
Natural gas (prop)	€ per GJ	16	4
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	165	44
Kerosene	€ per 1000 litre	165	165
LPG	€ per 1000 kg	206	64
Natural gas	€ per GJ	4	4

Energy Tax	Units	Suggested Rates	Existing Rates
Business Heating			
Gas oil	€ per 1000 litre	133	133
Heavy fuel oil	€ per 1000 kg	154	61
Kerosene	€ per 1000 litre	133	56
LPG	€ per 1000 kg	164	42
Natural gas	€ per GJ	3.42	1.35
Coal	€ per GJ	4.19	1.63
Non-Business Heating			
Gas oil	€ per 1000 litre	133	133
Heavy fuel oil	€ per 1000 kg	154	61
Kerosene	€ per 1000 litre	133	56
LPG	€ per 1000 kg	164	42
Natural gas	€ per GJ	3.42	1.35
Coal	€per GJ	4.19	1.63
Electricity			
Electricity - business use	€ per MWh	3.05	3.05
Electricity - non-business use	€ per MWh	3.05	3.05

➤ **Transport Taxes:**

- **Vehicles:** The revenues from taxes on vehicles and from taxes on transport related fuels, when combined, are already 3.0% of GDP, which is above the benchmark figure of 2.7% of GDP suggested as a target figure (see Section 5.2.1). We do not model any changes in these. We note, however, that the differentiation in charges for HGVs for road use could be stronger in favour of cleaner vehicles, It should be noted that a recent study indicated that Slovenia's road charges for HGVs are the highest in the EU-28 relative to the quality of its roads (measured in terms of the rates charged per km).⁶¹⁰

⁶¹⁰ See Ricardo-AEA (2014) *Evaluation of the Implementation and Effects of EU Infrastructure Charging Policy since 1995*, Final Report to DG MOVE, January 2014.

- **Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. The introduction of a tax on passenger flights and air freight is recommended in Slovenia. The suggested rates for the air passenger tax are €25 per passenger (to other countries in the European Union), and €50 per passenger (to other countries outside the European Union). The suggested air freight tax rate is €1.25 per tonne of freight. The year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. As noted in the good practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax (see Section 5.2.2).

➤ **Pollution and Resource Taxes:**

- **Aggregates:** An aggregates tax can help stimulate the market for use of aggregates from secondary sources (such as construction waste). This is in-line with the flagship initiative 'A Resource Efficient Europe'.⁶¹¹ Slovenia taxes the extraction of aggregates under a broader system of mineral extraction taxes. It is recommended to increase tax rates for aggregates to €2.40 per tonne from 2017, and that thereafter, they are kept constant in real terms. The types of materials that could be covered by the tax are:
 - Marble
 - Chalk and dolomite
 - Slate
 - Limestone and gypsum
 - Sand and gravel

Not all of these are extracted in Slovenia. The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues;

- **Waste – landfill tax:** A landfill tax is currently in place in Slovenia. Landfill taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Landfill taxes also provide support to the application of the waste hierarchy. The current landfill tax system applies a rate for non-hazardous equivalent to €11 per tonne of waste going to landfill. The disposal of inert and hazardous waste is also taxed at rates of €5.5 per tonne and €22 per tonne respectively. It is suggested that the rate for non-hazardous landfill is raised to a minimum of €50 per tonne by 2019 . An early announcement of this tax and its escalation over a number of years would help drive further change in the waste management sector needed to meet EU targets in 2020 and

⁶¹¹ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

beyond. We suggest this tax should be indexed to an appropriate measure of inflation.

- **Waste – incineration / MBT tax:** In order to ensure that wastes are not simply shifted from landfill to incineration, it is suggested that an incineration tax is introduced, up to €15 per tonne over the same period as the landfill tax is increased (i.e. up to 2019). We would recommend that the tax is applied on materials being prepared for export for incineration also so as to avoid a simple movement of waste to incinerators in countries without such a tax in place (or which may exempt imported wastes from the tax). An equivalent rate is also proposed for MBT facilities. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.⁶¹²
- **Packaging:** A small number of Member States have implemented packaging taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. Slovenia has a low level tax in place (as well as the more common producer responsibility fees), but these seem designed to ensure data capture rather than generating a specific incentive. It is suggested that the following rates could be applied to all packaging placed on the market in Slovenia:
 - Aluminium €197 per tonne
 - Plastic €64 per tonne
 - Steel €54 per tonne
 - Paper and card €20 per tonne
 - Glass €18 per tonne
 - Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2017 and be kept constant in real terms.

- **Single-use carrier bag tax:** There is currently no tax on single-use carrier bags in Slovenia. Of these bags, plastic bags in particular cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the riverine, or marine, environment. Moreover in countries with high level of tourism littered plastic bags can deter visitors. A wide body of experience suggests that taxing single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. In 2013, the Commission

⁶¹² European Commission (2011) *Roadmap to a Resource Efficient Europe*, 20th September 2011, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN>

adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.⁶¹³ Consequently, it is suggested that Slovenia implements a tax on single-use carrier bags at a rate of €0.08 per bag from 2016, and maintains the rate constant in real terms thereafter.

- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. According to Airbase (EEA) all of the urban population in Slovenia is exposed to PM₁₀ concentrations exceeding the daily limit value (50 µg/m³) for over 35 days per year.⁶¹⁴ Analysis of PM₁₀ sources indicates that the cause of this pollution is largely road transport, particularly in urban centres with heavy traffic.⁶¹⁵ However, some gains could be made from implementing a tax on stationary sources of such pollution, whilst also raising revenue. Slovenia does not currently have a system of air pollution taxes in place. It is suggested that an air pollution tax could be implemented in order to generate improvements in air quality as follows:
 - SO_x €1,000 per tonne
 - NO_x €1,000 per tonne
 - PM₁₀ €2,000 per tonne

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2021. The rates are then held constant in real terms.

- **Water abstraction:** A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that “*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*”. Water abstraction charges are currently in place in Slovenia. However, simplification of the tax structure and an increase in tax rates is recommended. It is suggested that appropriate levels of taxation would be of the order €110 per 1,000m³ for the public water supply, €70 per 1,000 m³ for manufacturing purposes and €9 per 1,000 m³ for agriculture. We have assumed that the additional revenue which such rates may generate can accrue to the central budget. A transition period from 2016 to 2021 is suggested, whereby the rates are

⁶¹³ DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

⁶¹⁴ Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_m200&language=en

⁶¹⁵ Ministry of the Environment and Spatial Planning (2013) *Air Pollution*, Accessed 13th October 2014, http://www.arso.gov.si/en/soer/air_pollution.html

increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.

- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21 May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.⁶¹⁶ Slovenia has waste water user charges, but not a waste water tax. Charges vary across municipalities depending on a number of factors, with both fixed and combined fixed/variable pricing structures in place, and are levied on a per m³ basis, rather than being charged according to the level of pollutants in waste water. To improve prevention of water pollution it is suggested to implement a waste water tax and adjust tax rates in-line with good practice (see Section 5.3.6). With relative price levels in Slovenia this would imply, for BOD, a rate of €1.81 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. Given the magnitude of the increase in rates a transition period from 2016 to 2019 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2019 levels.
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

The Slovenia Plan notes, amongst other things, that:⁶¹⁷

“...the maximum residue levels of PPP found in food, feed and the environment have still been exceeded in some cases, which requires a more thorough systemic approach to the integrated pest management (hereinafter referred to as: IPM) and the shift of farm holdings from the existing conventional production to sustainable farming practices (e.g. organic or integrated)”.

Amongst its objectives are the following:

“...to minimise the hazard and risk to human and animal health and the environment from the use of PPP, including through the

⁶¹⁶ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

⁶¹⁷ Government of the Republic of Slovenia (undated) *National Action Programme: to Achieve Sustainable Use of Plant Protection Products for the Period 2012-2022*, http://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/docs/nap_slovenia_en.pdf

substitution of the most dangerous substances with safer (including non-chemical) alternatives;

to reduce the levels of harmful active substances in food and drinking water, including through the substitution of the most dangerous ones with safer (including non-chemical) alternatives”.

One part of the Programme considers ‘Reduction of PPP use or risk resulting from their use or prohibition of their use in specific areas’. There is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest such an approach is suitable for application in Slovenia to support the objectives of the Programme. Our calculations assume that the country implements a pesticides tax, and in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €10 per kg active ingredient. The suggested transition period is from 2017 to 2019, and following this the rate should be kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark) would be a concrete measure that would contribute towards the aims of the Action Plan.

- **Fertilisers:** Slovenia does not currently implement a tax on nitrogen (or other) fertilisers. It is therefore suggested that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of €0.2 per kg N be implemented from 2017 with rates gradually increasing to the maximum level in 2019.

17.2.3 Summary of Revenue Outcomes

Table 17-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 17-4: Potential Additional Revenue from Environmental Fiscal Reform in Slovenia, million EUR (real 2014 terms)⁶¹⁸

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	26	103	179

⁶¹⁸ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
C&I / Heating	2	8	14
<i>Sub-total Energy, million EUR</i>	28	111	193
<i>Sub-total Energy, % GDP</i>	0.08%	0.32%	0.55%
Transport Taxes			
Passenger Aviation Tax	17	29	23
Freight Aviation Tax	0.01	0.02	0.02
<i>Sub-total Transport, million EUR</i>	17	29	23
<i>Sub-total Transport, % GDP</i>	0.05%	0.08%	0.07%
Pollution and Resource Taxes			
Landfill Tax - Non-haz General	9	14	14
Incineration /MBT Tax	1	3	3
Air Pollution Tax	6	11	8
Water Abstraction Tax	7	17	15
Waste Water Tax	6	8	8
Pesticides Tax	6	11	10
Aggregates Tax	22	10	7
Packaging Tax	9	10	12
Single Use Bag Tax	22	5	5
Fertiliser Tax	0.003	0.005	0.005
<i>Sub-total Pollution & Resource, million EUR</i>	89	88	83
<i>Sub-total Pollution & Resources, % GDP</i>	0.25%	0.25%	0.24%
Total Environmental Taxes			
Total, million EUR	134	228	299
Total Increase, % GDP	0.38%	0.65%	0.85%

Table 17-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 17-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Slovenia, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	54
Increased Cost Recovery for Water Use	55
Total	109

17.2.4 Environmental Benefits

Table 17-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.15.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €15 million of benefits are anticipated annually by 2025 in real terms.

Table 17-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in Slovenia, million EUR (real 2014 terms)⁶¹⁹

Tax Type	2017	2020	2025
Energy Taxes	1.3	4.9	8.4
Transport Taxes (excluding transport fuels)	0	0	0
Pollution and Resource Taxes	7.8	27	27
Total, million EUR	9.3	32	35
Total, % GDP	0.026%	0.086%	0.091%

17.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Slovenia:⁶²⁰

⁶¹⁹ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

⁶²⁰ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- In 2012, environmental taxes generated revenue equivalent to 3.82% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Slovenia. These could generate EUR 0.1 billion in 2017, rising to EUR 0.3 billion in 2025 (both in real 2014 terms). This is equivalent to 0.38% and 0.85% of GDP in 2017 and 2025, respectively.
- The largest single contribution to revenue comes from the proposed harmonisation of taxes on transport fuels in line with those in the proposed ETD. This accounts for EUR 0.2 billion by 2025 (real 2014 terms), equivalent to 0.46% of GDP.
- The next largest contribution to revenue comes from the suggested passenger aviation tax. This accounts for EUR 0.023 billion by 2025 (real 2014 terms), equivalent to 0.06% of GDP.
- The water abstraction tax would account for EUR 0.015 billion by 2025 (real 2014 terms), equivalent to 0.04% of GDP.
- Revenue potential from the suggested landfill tax would raise an estimated EUR 0.014 billion by 2025 (real 2014 terms), equivalent to 0.04% of GDP.
- It has also been suggested that taxes on fuels used for business heating be harmonised with the proposed rates in the ETD. This would contribute EUR 0.014 billion by 2025 (real 2014 terms), equivalent to 0.04% of GDP.
- In addition, a range of more minor taxes on could generate revenue of EUR 0.054 billion by 2025 (real 2014 terms), equivalent to 0.14% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 0.015 billion by 2025 (real 2014 terms), equivalent to 0.04% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €109 million per annum could be raised in addition to the above.

18.0 Spain

18.1 Country Overview

18.1.1 Key Facts about the Economy and Tax System

- Spain saw sustained economic growth from 2003 to 2007, enjoying an average increase in GDP of 3.5% per annum in real terms over this period. Growth slowed in 2008, with the country's GDP increasing by only 0.9% in real terms on the previous year. Since then, between 2009 and 2013, GDP has fallen at an average rate of 1.3% per annum in real terms, though GDP did increase by 0.1% between 2010 and 2011.⁶²¹
- Spain's overall tax revenue (including social contributions), expressed as a percentage of GDP, was 34.3% in 2012 which was below the EU-28 average of 39.8%. This percentage share has declined over the past 10 years decreasing dramatically from a high of 38.4% in 2007.⁶²²
- Social contributions account for the greatest share of Spain's total tax income, at 37.9% in 2012, while direct taxes accounted for 30.9% and indirect taxes for 31.2%. There have been fluctuations in all three revenue streams over the past 10 years, although the overall percentage shares have ultimately remained similar to 2002 levels.⁶²³
- Revenue from environmental taxes amounted to 1.57% of Spain's GDP in 2012, the lowest percentage share in the EU-28 for that year. This share represents a 10 year low for Spain, and has fallen from 2.08% of GDP in 2002.⁶²⁴
- Energy taxes represented the largest share of environmental tax revenues, amounting to 1.27% of GDP in 2012. Transport (excluding fuel) taxes amounted to 0.26% of GDP, and pollution and resource taxes were 0.03% of GDP in 2012.⁶²⁵
- In 2012, taxation of energy provided 80.9% of Spain's total environmental taxation revenue. This is an increase of just one percentage point from 10 years ago (79.8% in 2002). In the interim, it fell to 76.5% in 2006 before rising again.⁶²⁶

⁶²¹ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

⁶²² Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

⁶²³ Ibid.

⁶²⁴ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

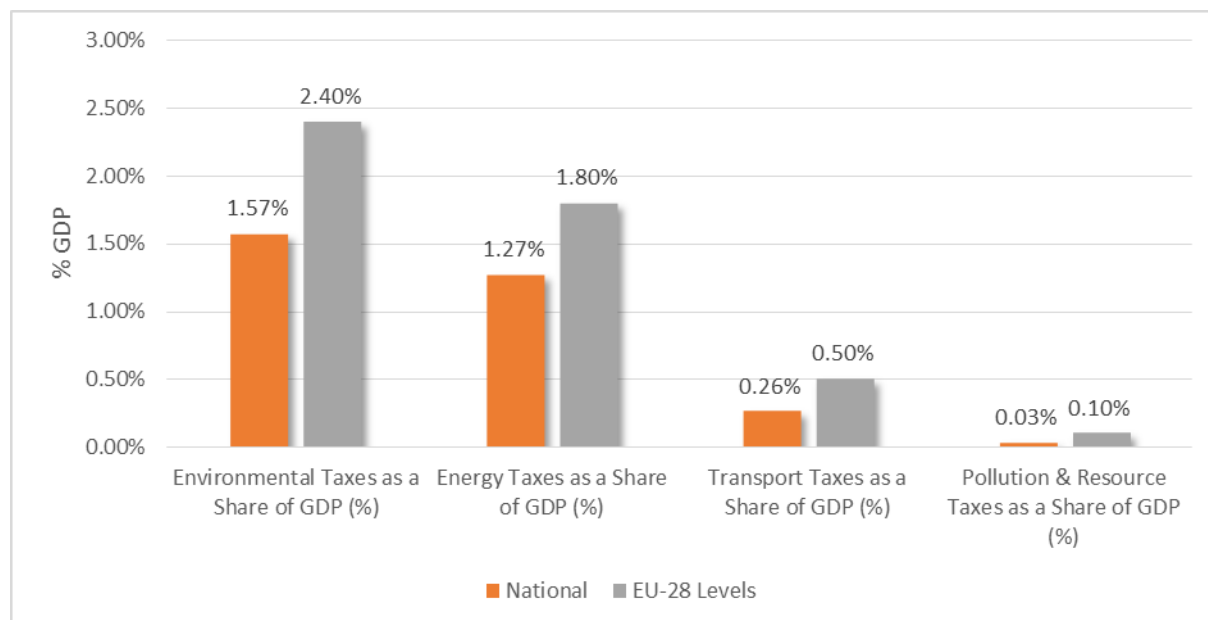
⁶²⁵ Ibid.

⁶²⁶ Ibid.

18.1.2 Relative Position within the EU

- Revenue from environmental taxes as a percentage share of GDP were markedly lower than the EU-28 average of 2.4% in 2012. Energy tax revenue as a share of GDP was below the EU-28 average, as were the comparable figures for revenues from transport (excluding fuel) taxes and pollution and resource taxes (see Figure 18-1).⁶²⁷

Figure 18-1: Environmental Taxes in Spain as a % of GDP vs EU-28 Levels (2012)



- In 2012, Spain ranked the lowest out of all EU-28 Member States for revenue from environmental taxation as a share of GDP. It also ranked the lowest for energy tax revenues. For transport (excluding fuel) taxes, and for pollution and resource taxes, it ranked somewhat higher, being positioned at 19th place for both measures (see Table 18-1).⁶²⁸

Table 18-1: Ranking of Spain's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	28
Energy Taxes as a Share of GDP (%)	28
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	19
Pollution & Resource Taxes as a Share of GDP (%)	19

Source: based on Eurostat data

⁶²⁷ Ibid.

⁶²⁸ Ibid.

18.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.16.0. This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon nominal GDP figures for the same year as the reported revenues.^{629,630}

➤ Energy Taxes:

- The Spanish excise duties on fuels and electricity are shown in Table 18-2: Standard Rates of Excise Duties on Fuels and Electricity in Spain alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 18-2: Standard Rates of Excise Duties on Fuels and Electricity in Spain

Excise Duty	Unit	Rate Applied in Spain	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	€ per 1000 litres	€457.79	€421	€585	€583
Unleaded Petrol ¹	€ per 1000 litres	€424.69	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€331.00	€330	€427	€405
Kerosene	€ per 1000 litres	€330.00	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€57.47	€125	€209	€180
Natural Gas	€ per GJ	€1.66	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel) ²	€ per 1000 litres	€84.71	€21	€221	€163
Kerosene	€ per 1000 litres	€330.00	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€57.47	€41	€126	€125

⁶²⁹ Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1>

⁶³⁰ Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Excise Duty	Unit	Rate Applied in Spain	Existing ETD Minimum	EU-28 Average	EU-28 Median
Natural Gas	€ per GJ	€1.15 – €0.65 ³	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€84.71	€21	€221	€163
Kerosene	€ per 1000 litres	€78.71	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€12.00 – €15.00 ⁴	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€15.00	€0.00	€82	€40
Natural Gas	€ per GJ	€0.65 – €0.15 ⁵	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€0.65 ⁶	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€84.71	€21	€179	€125
Kerosene	€ per 1000 litres	€78.71	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€15.00	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€15.00	€0.00	€111	€42
Natural Gas	€ per GJ	€0.65	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€0.65	€0.30	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€0.50 ⁷	€0.50	€8.42	€1.03
Non-Business Use	€ per MWh	€1 ⁷	€1.00	€14.53	€2.06
<p>Notes:</p> <ol style="list-style-type: none"> The rate shown is for <98 octane I.O. Diesel intended for electric power production and/or cogeneration of electricity and heat costs €29.15. €0.64 excise rate is applied on natural gas used for stationary motors. €12 excise rate is applied on heavy fuel oil used for electric power production and/or cogeneration of electricity and heat costs (See Council Directive 2003/96/EC). The rate for natural gas and biogas applicable for industrial users is €0.15. The rate for coal used for “professional uses” is €0.15 (following approval of Real Decreto-Ley 9/2013) The rates applied for electricity used for business and non-business use are minimum tax rates. The actual electricity rates applied are higher, for example in the case of electricity used for non-business purposes, tax rates around €9 per MWh are common. 					

Source: DG TAXUD (2014) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1st July 2014,

http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- Motor fuels:
 - The excise duty applied on unleaded petrol (€424) is below both the EU-28 average and median rates, but above the ETD threshold. Leaded petrol is no longer sold in Spain and a substitute for leaded petrol was introduced in August 2001 (*Real Decreto 785/01*). Gas oil/diesel used for transportation is taxed at a lower rate than petrol, both on a per litre and CO₂ content basis.⁶³¹
 - Excise duties on gas oil/diesel (€331) and kerosene (€330) used as transport fuels are in line with the minimum rates set under the ETD but below the EU-28 average and median rates. Liquefied Petroleum Gas (€57) and natural gas (€1.66) used as motor-fuels are both below the existing ETD minimum. The VAT rate for gas oil/diesel used as propellant increased from 18% to 21% in September 2012.
 - A reduced rate of €78.71 per 1,000 litres is applied on gas oil/diesel used as motor fuel for agricultural purposes. A reimbursement is provided for gas oil used for agricultural purposes. Gas oil/diesel used in railways is also exempt from excise duties. Additional excise duty exemptions are in place for fuels used for aviation and navigation purposes.
 - The general excise duties on hydrocarbons (*Impuesto sobre Hidrocarburos*) are made of three different types of rates (the *tipo general*, *tipo especial* and *tipo autonómico*). The *tipo general* are generally set at the national level through the *Ley 38/1992, de 28 de diciembre, de Impuestos Especiales*, while the *tipo especial* is a special excise duty applied on the retail sale of petrol, gas oil/diesel, fuel oil and kerosene. The TAXUD database reports *tipo general* and *tipo especial* as a single taxes. In addition, autonomous regions can choose to apply a regional excise rate (*tipo autonómico*) for fuel locally consumed in addition to those applied at the national level. The rates applied in the autonomous regions can be found in Appendix A.16.0. The *Impuesto sobre Hidrocarburos* yielded €9,933 million (equivalent to 0.96% of GDP) in 2013.⁶³²
- Electricity:
 - A fee on the use of continental waters for the production of electricity (*Canon por utilización de las aguas continentales para la*

⁶³¹ OECD (2013), *Taxing Energy Use: A graphical Analysis*, OECD Publishing, p. 201.

⁶³² Agencia Tributaria (2014), Informe Anual de Recaudacion Tributaria: AÑO 2013, Accessed 24th September 2014, www.agenciatributaria.es/static_files/AEAT/Estudios/Estadisticas/Informes_Estadisticos/Informes_Anual_es_de_Recaudacion_Tributaria/Ejercicio_2013/IART_13.pdf

producción de energía eléctrica) is applied on the value of electricity generated by hydroelectric plants.

- Moreover, Spain has a Special Tax on Electricity (*Impuesto especial sobre la electricidad*). The Tax was introduced following the approval of Ley 66/1997 and is regulated through the Ley 38/1992. Exemptions are granted for electricity delivered in the framework of diplomatic relations or international organisations; for consumption in third countries in the framework of international agreements, international aviation and navigation.
- In 2012, the Special Tax on Electricity generated revenues of €1.6 billion (equivalent to 0.15% of Spanish GDP), while the fee on the use of continental waters for the production of electricity was expected to generate revenues of €298 million in 2013 (equivalent to 0.02% of GDP).⁶³³
- Since 2013, Spain has implemented taxes on the production of electric energy (*Impuesto sobre el valor de la producción de la energía eléctrica*), production of radioactive fuel and storage of radioactive waste. These taxes are regulated under Ley 15/2012 (Law 15/2012)⁶³⁴ and rates can be found in the Appendix. These three taxes generated €1,570 million of revenues in 2013, equivalent to 0.15% of Spanish GDP.⁶³⁵
- A Special Excise Duty on Coal (*Impuesto especial sobre el Carbon*) has been in place in Spain since 2005, following the introduction of the Ley 22/2005 (Law 22/2005). Coal and Coke used for power generation and cogeneration of electricity and heat, for electrolytic and metallurgical processes, mineralogical processes and as a fuel for domestic consumption and any other use that does not involve combustion are exempt from the duty. According to data provided by the *Agencia Tributaria*, the tax generated €148 million of revenues in 2013, equivalent to 0.014% of Spanish GDP.⁶³⁶

⁶³³ Economics for Energy (2013), *Impuestos energético-ambientales en España [Informe 2013]*, Accessed 23rd September 2014, URL:

http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

⁶³⁴ Government of Spain (2012), *Ley 15/2012, de 27 de diciembre, de medidas fiscales para la sostenibilidad energética* (Law 15/2012), Accessed 3rd September 2014,

http://www.boe.es/diario_boe/txt.php?id=BOE-A-2012-15649

⁶³⁵ Agencia Tributaria (2014), *Informe Anual de Recaudacion Tributaria: AÑO 2013*, Accessed 24th September 2014,

http://www.agenciatributaria.es/static_files/AEAT/Estudios/Estadisticas/Informes_Estadisticos/Informes_Anuales_de_Recaudacion_Tributaria/Ejercicio_2013/IART_13.pdf

⁶³⁶ Agencia Tributaria (2014), *Informe Anual de Recaudacion Tributaria: AÑO 2013*, Accessed 24 September 2014,

http://www.agenciatributaria.es/static_files/AEAT/Estudios/Estadisticas/Informes_Estadisticos/Informes_Anuales_de_Recaudacion_Tributaria/Ejercicio_2013/IART_13.pdf

➤ **Transport Taxes (excluding transport fuels):**

- Vehicle Registration Tax (Impuesto Especial sobre Determinados Medios de Transporte):⁶³⁷
 - A tax on specific means of transport has been in place since January 1993. It covers the registration of small vessels and boats for pleasure and / or water sports, mechanically powered aircrafts and self-propelled vehicles powered by an engine.⁶³⁸
 - The rates applied vary according to the market value of the vehicle and CO₂ emissions. For motorcycles and quads, the tax also takes into account the overall engine power and different rates are applied.⁶³⁹ A general ‘default’ tax rate is applied at national level on different categories of vehicles. Autonomous communities can set local rates up to 15% higher than those applied at the national level.
 - The city of Ceuta y Melilla is exempted from the tax.⁶⁴⁰ A detailed description of the different rates applied in the autonomous communities can be found in Appendix A.16.0.
 - In 2012, total revenues from this tax amounted to €428 million, accounting for 0.04% of GDP and 0.13% of total tax revenues.⁶⁴¹
- Vehicle Circulation Tax (Impuesto sobre los Vehículos de Tracción Mecánica):⁶⁴²
 - A tax on “mechanically powered vehicles” has been in place since November 1988, under the Municipal Road Tax (*Impuesto municipal sobre circulación de vehículos*) and now under Royal Legislative Decree No 2 of 5th March 2004.⁶⁴³

⁶³⁷ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁶³⁸ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁶³⁹ Agencia Tributaria (2014), *Impuesto especial sobre determinados medios de transporte*, Accessed 2nd September 2014, http://www.agenciatributaria.es/AEAT/Contenidos_Comunes/La_Agencia_Tributaria/Modelos_y_formularios/Declaraciones/Modelos_500_al_599/576/Instrucciones/instr_mod576.pdf

⁶⁴⁰ Agencia Tributaria (2014), *Impuesto especial sobre determinados medios de transporte*, Accessed 2nd September 2014, http://www.agenciatributaria.es/AEAT/Contenidos_Comunes/La_Agencia_Tributaria/Modelos_y_formularios/Declaraciones/Modelos_500_al_599/576/Instrucciones/instr_mod576.pdf

⁶⁴¹ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁶⁴² OECD and EEA (2014), *Database on instruments used for environmental policy*, Accessed 3rd September 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

⁶⁴³ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

- The tax applies to the whole Spanish territory and is an annual tax applied on vehicle owners. The tax is municipal but is regulated at national level. All classes and categories of mechanically powered vehicles which are suitable for use on public highways or roads are subject to the tax.
 - The tax rate is calculated according to the engine rating, type of vehicle and weight (for certain vehicles). National rates are set through Art. 95 of the *Real Decreto Legislativo 2/2004* (and are shown in the table below), autonomous communities may increase the tax by applying a coefficient of between 1 and 2 to these taxes.⁶⁴⁴
 - In 2012, total revenue from this tax amounted to €2.243 million, accounting for 0.22% of GDP and 0.67% of total tax revenue.⁶⁴⁵
- **Pollution and Resource Taxes:**
- Landfill and incineration taxes:
 - There is currently no national landfill or incineration tax applied in Spain; however, Article 16 of the Spanish Waste Act (*Ley 22/2011, de 28 de julio, de residuos y suelos contaminados*) provides a possibility for waste authorities to introduce economic and fiscal measures, including landfill and incineration taxes, on municipal waste, and also allows autonomous communities to impose regional waste taxes at their own discretion.⁶⁴⁶
 - Nine autonomous communities have introduced local waste taxes to date:
 - A tax on the management of municipal waste in Catalonia was introduced in 2004 generating revenues of €24.4 million in 2011.⁶⁴⁷ The tax applies to incineration (€7.40 per tonne for incinerated municipal waste and €18.60 per tonne for incinerated municipal waste from local authorities that do not collect organic waste separately (*Article 15 of Ley 8/2008, de 10 de julio, de financiación de las infraestructuras de gestión de los residuos y de los cánones*

⁶⁴⁴ Government of Spain (2014), *Real Decreto Legislativo 2/2004, de 5 de marzo, por el que se aprueba el texto refundido de la Ley Reguladora de las Haciendas Locales (Vigente hasta el 15 de Julio de 2015)*, Accessed 22nd September, 2014, http://noticias.juridicas.com/base_datos/Admin/rdleg2-2004.t2.html#c2s3ss4

⁶⁴⁵ European Commission (2014), Taxes in Europe Database, Accessed 22nd August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁶⁴⁶ Ignasi Puig Ventosa, I. (2011) *Landfill and Waste incinerated taxes – the Spanish case*, [http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20\(2\).pdf](http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20(2).pdf)

⁶⁴⁷ OECD and EEA (2014) *Database on instruments used for environmental policy*, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

sobre la disposición del desperdicio de los residuos⁶⁴⁸ since 2014) and landfill (€15.80 per tonne for controlled municipal waste and €25.40 per tonne of controlled municipal waste from local authorities that do not collect organic waste separately according to the development project approved by the Waste Agency of Catalonia since 2014).

- *Valencia* introduced a general tax on waste management excluding municipal waste in 2013 (with rates from €0.5 to €10 per tonne) and a landfill tax on construction waste.
 - Waste taxes have been in place in Madrid since 2003 (with rates applied ranging from €5 to €8 per tonne and €1 per m³ of construction and demolition waste) and in Murcia since 2006 (with rates applied ranging from €3 to €15 per tonne).
 - La Rioja applies a tax for waste management except for municipal waste (with rates applied ranging from €4 to €21 per tonne), landfilling of construction waste is not taxed in this region.
 - Cantabria has a landfill tax on industrial non-hazardous waste of €7 per tonne in place since 2010.
 - In Andalusia, landfill of hazardous waste and radioactive waste is taxed at rates ranging from €15-€35 per tonne.
 - Castile and Leon and Extremadura apply a tax on the landfill of any type of waste (municipal, industrial, hazardous and construction waste) with rates ranging from €3-€35 per tonne in Castile and Leon, to €3 to €15 per tonne in Extremadura.
- In 2010, revenues from all waste related taxes in Spain amounted to about €315 million⁶⁴⁹, representing 0.03% of GDP.
- Air pollution taxes:
 - There is currently no air pollution tax applied at the national level in Spain; however, there are several taxes in place in the autonomous communities. Air pollution taxes have been in place in Galicia since 1996, Valencia since 2003, Andalusia since 2004, Murcia and Aragon since 2006, and Catalonia since 2014. Varying rates are applied in each region, for example, for SO₂ emissions, tax rates range from €33 to €94 per tonne, whilst for NO₂, rates range from

⁶⁴⁸ Ignasi Puig Ventosa, I. (2011) *Landfill and Waste incinerated taxes – the Spanish case*, [http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20\(2\).pdf](http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20(2).pdf)

⁶⁴⁹ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, September 2012, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

€50 to €140 per tonne emitted. The rates are low compared to those in Nordic countries such as Denmark and Sweden. Moreover, revenues from these taxes dropped from €28 million in 2005 to €7 million in 2010.

- Fluorinated greenhouse gases:
 - After the approval of *Ley 16/2013*,⁶⁵⁰ a tax on fluorinated greenhouse gases (i.e. perfluorocarbons, hydro-fluorocarbons and sulphur hexafluoride) was introduced.
 - The tax is being gradually phased in from 2014 and will not be fully operational until 2016.⁶⁵¹
 - The tax base is structured according to the weight (in kg), and environmental impact (in terms of global-warming potential) of each type of gas emitted.
 - No data is available on revenues from this tax as it was only recently introduced. Spanish authorities estimate that the tax could potentially generate up to €400 million in 2014 (equivalent to 0.039% of Spanish GDP).⁶⁵² It has been estimated that proposed amendments⁶⁵³ to the final bill could make this value drop to just €113 million⁶⁵⁴; however, the Congress of Deputies recently rejected the proposed amendments⁶⁵⁵, thus initial revenue estimates still hold.
- Other pollution taxes:
 - Other environmental taxes have been introduced in the autonomous communities. For example, in Aragon a soil pollution tax, and a tax on the environmental damage caused by the installation of cable transport (e.g. ski facilities), have been introduced. The tax on soil pollution applies to the construction of

⁶⁵⁰ Government of Spain (2013), *Ley 16/2013, de 29 de octubre, por la que se establecen determinadas medidas en materia de fiscalidad medioambiental y se adoptan otras medidas tributarias y financieras*, Accessed 5th September 2014, www.boe.es/boe/dias/2013/10/30/pdfs/BOE-A-2013-11331.pdf

⁶⁵¹ Government of Spain (2013), *Ley 16/2013, de 29 de octubre, por la que se establecen determinadas medidas en materia de fiscalidad medioambiental y se adoptan otras medidas tributarias y financieras*, Accessed 5th September 2014, www.boe.es/boe/dias/2013/10/30/pdfs/BOE-A-2013-11331.pdf

⁶⁵² European Commission (2014), Assessment of the 2014 national reform programme and stability programme for SPAIN Accompanying the document Recommendation for a COUNCIL RECOMMENDATION on Spain's 2014 national reform programme and delivering a Council opinion on Spain's 2014 stability programme, June 2014, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0410&from=fr>

⁶⁵³ www.congreso.es/public_oficiales/L10/CONG/BOCG/A/BOCG-10-A-109-2.PDF

⁶⁵⁴ Economics for Energy (2013) *Impuestos energetico-ambientales en España*, Accessed 24th September 2014, http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

⁶⁵⁵ www.congreso.es/portal/page/portal/Congreso/Congreso/SalaPrensa/NotPre?piref73_7706063_73_1337373_1337373.next_page=/wc/detalleNotaSalaPrensa&idNotaSalaPrensa=14047&anyo=2014&mes=9&pagina=1&mostrarvolver=S&movil=null

large department stores since 2006. The €7.2 million collected in 2012 were used for preventive, corrective and restoration activities caused by construction and installation.

- In Andalusia a tax on disposable plastic bags is in place. This tax generated €0.7 million of revenues in 2011, which were not earmarked for any particular use.
- Additional environmental taxes include, for example, those in Asturias, La Rioja, and the Canary Islands (taxes on activities causing environmental harm such as communication networks, electricity supply networks, underground or submarine electricity supply networks), Valencian Community (tax on activities causing environmental harm such as the production of electricity by hydroelectric power plants, thermonuclear plants and all other sources of energy), Castile and Leon (tax on environmental damage caused by some uses of water from reservoirs and by high voltage transportation of electricity), Castile and la Mancha (tax on certain activities that cause environmental harm, including a tax on production of electricity from nuclear plants and radioactive waste disposal), Extremadura (tax on production and distribution of electricity), and in Galicia (tax on environmental damage caused by some uses of water from reservoirs).
- Wastewater discharges and water pollution taxes:
 - At the national level, a fee on wastewater discharges has been applied to tackle water pollution since 1986 (Ley 29/1985, de 2 de agosto, de Aguas, modified by Ley 46/1999, de 13 de diciembre). In 2001, these fees generated €32.6 million of revenues (latest date for which OECD estimates are available).⁶⁵⁶ This fee is composed of a fixed rate of €0.0120 per m³ for municipal wastewater discharges and a fixed rate of €0.03 per m³ for industrial wastewater discharges. These rates increase progressively depending on the level of pollution.
 - Regional taxes on wastewater and discharges have been introduced in several autonomous communities and are sometimes combined with water abstraction taxes, as in Aragon, Cantabria, Catalonia and Galicia ⁶⁵⁷ These taxes are composed of a variable tax rate depending, in most cases, on the level of pollution, and a fixed tax rate, ranging from €1 per month per taxpayer in Andalusia to €1,280 per month per taxpayer in Asturias. The fixed element of the tax is not applied in Catalonia, the Canary Islands, Castile-La Mancha, La Rioja, Navarre and the Basque Country.

⁶⁵⁶ OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 5th September 2014, <http://www2.oecd.org/ecoinst/queries/>

⁶⁵⁷ Vales-Gimenez, J., Zarate-Marco, A. (2013) Environmental taxation and industrial water use in Spain, in *Investigaciones Regionales*, No. 25, pp.133-62.

- Water abstraction charges:
 - There are no water abstraction charges applied at the national level:⁶⁵⁸ however, many autonomous communities have introduced regional taxes for water abstraction (which in some cases are combined with water pollution charges as noted above). Overall, these regional taxes and charges are considered inefficient, as noted by the EEA,⁶⁵⁹ since Spanish water tariffs are amongst the lowest in OECD/EU countries⁶⁶⁰. Large differences in design and tariff rates between regions suggest significant revenue raising potential from the introduction of a general tax for all utilities abstracting water, as well as gains from further efforts to tackle losses in non-domestic uses of water. ⁶⁶¹
 - Water abstraction charges applied in the other autonomous communities are set out in Table 18-3 below.

Table 18-3: Water Abstraction Charges Applied in the Autonomous Communities

Autonomous Community	Introduction Date	Tax Rate (in €)
Andalusia	2011	Fixed rate: 1 per household per month Variable rate: 0.1-0.6 per m ³
Asturias	2000	Fixed rate: 3 per month Variable rate: 0.0001-1280 per m ³
Aragon (the same tax applies to water pollution)	2002	Fixed rate: 5.02 per household per month Variable rate: 0.6050 per m ³ or 18.8790 per month per activity
Balearic Islands	1992	Fixed rate: 3.8861 per month Variable rate: 0.2779-1.6662 per m ³
Cantabria (the same tax applies to water pollution)	2006	Fixed rate: 25.88 per annum Variable rate: 0.4874-0.6332 per m ³
Castile-La Mancha	2003	Variable rate: 0.2805-0.4883 per m ³
Catalonia (the same tax	2000	Variable rate: 0.0927-4.1176 per m ³

⁶⁵⁸ IEEP (2013), Steps to Greening Country Report: Spain, Final report for the European Commission, p. 7.

⁶⁵⁹ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, Accessed 2nd September 2014, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

⁶⁶⁰ See EC study, http://ec.europa.eu/europe2020/pdf/nd/swd2012_spain_en.pdf

⁶⁶¹ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, Accessed 2nd September 2014, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

Autonomous Community	Introduction Date	Tax Rate (in €)
applies to water pollution)		
Extremadura	2012	Fixed rate: 2 per household and 4 per user per month Variable rate: 0.10-0.60 per m ³
Galicia (the same tax applies to water pollution)	2011	Fixed rate: 1.5-2.5 per person and per month, depending on the type of consumption Variable rate: 0.2800-0.4210 per m ³
La Rioja	2001	Variable rate: 0.4800 per m ³ and per pollution unit (formula determined through the Law 5/2000)
Murcia	2001	Fixed rate: 30 per household or user per year Variable rate: 0.2500-0.3400 per m ³
Navarra	2001	Variable rate: 0.6500 per m ³ if connected to public drainage system, and 0.0800 per m ³ otherwise
Valencia	1993	Fixed rate: 28.6300 - 39.5600 per year per household or activity according to the size of the municipality, 102.73 – 3593.55 per year per activity depending on the calibre of the water meter Variable rate: 0.2840-0.5030 per m ³

Sources: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, www2.oecd.org/ecoinst/queries/All_Information.aspx; and Government of Spain (2000), Article 40 of Ley 5/2000, de saneamiento y depuración de aguas residuales de La Rioja of 25 October, Accessed 23rd September 2014, http://noticias.juridicas.com/base_datos/CCAA/lr-l5-2000.html

18.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Spain. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

18.2.1 Current Status of EFR

The economic downturn has led to a need for fiscal consolidation in several EU Member States. In Spain, this has *inter alia* led to a decline in funding for environmental agencies, reinforcing a downward trend since 2000.⁶⁶² Furthermore, revenues from environmental taxes have declined by 1.3% (as a percentage of total tax revenues) between 2000 and

⁶⁶² IEEP et al. (2013), *Steps towards greening in the EU: Monitoring Member States' achievements in selected environmental policy areas; EU summary report*, Final Report - July 2013, http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/Greening.pdf

2010.⁶⁶³ Environmentally-related taxes account for just 1.6% of Spanish GDP, ranking the country last among the EU-28.⁶⁶⁴ One possible explanation for this weak performance could be that the Government perceives environmental taxes as having negative impacts on employment and competitiveness.⁶⁶⁵ This view may, however, be changing slowly as seen in recent developments and the Government's need for additional sources of revenue (see Appendix A.4.0 for a detailed discussion about the impacts of EFR on employment).

In 2013, a package of measures aimed at reinforcing fiscal consolidation was approved by the Spanish Government.⁶⁶⁶ This included the *Ley 16/2013* (Law 16/2013) which included important elements on environmental taxation, such as, an increase on excise rates for certain types of oil and gas, and the introduction of a tax on fluorinated greenhouse gases. The package also covered electricity and partially amended and clarified *Ley 15/2012* (Law 15/2012) regarding the tax on nuclear waste, although these changes were considered by some to be relatively minor.⁶⁶⁷

Water remains a core environmental issue in the country. Two-thirds of Spain have problems of water scarcity and is subject to droughts.⁶⁶⁸ Moreover, the country is struggling to comply with the provisions of the Drinking Water Directive, the Urban Wastewater Treatment Directive and the Water Framework Directive.⁶⁶⁹ In some autonomous communities, water tariffs are amongst the lowest in the EU-28 (sometimes as low as €0.01 per m³) while the agriculture sector has few economic incentives to increase efficiency and reduce water consumption for irrigation (irrigation accounted for 68% of total water demand in 2013).⁶⁷⁰ There are also problems with water pollution

⁶⁶³ IEEP (2013), *Steps to Greening Country Report: Spain*, Final report for the European Commission, p. 3.

⁶⁶⁴ DG Taxation and Custom union (2014), *Country Chapters: Spain*, Accessed 4th September 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/country_tables/es.pdf

⁶⁶⁵ OECD (2008), *Taxation, Innovation and the Environment – The Spanish Case*, Accessed 4th September 2014, <http://search.oecd.org/officialdocuments/displaydocumentpdf/?doclanguage=en&cote=com/env/epoc/ctpa/cfa%282008%2938/final>

⁶⁶⁶ European Commission (2014), Assessment of the 2014 national reform programme and stability programme for SPAIN Accompanying the document Recommendation for a COUNCIL RECOMMENDATION on Spain's 2014 national reform programme and delivering a Council opinion on Spain's 2014 stability programme, June 2014, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0410&from=fr>

⁶⁶⁷ Government of Spain (2014), *Ley 16/2013, de 29 de octubre, por la que se establecen determinadas medidas en materia de fiscalidad medioambiental y se adoptan otras medidas tributarias y financieras*, Accessed 5th September 2014, <http://www.boe.es/boe/dias/2013/10/30/pdfs/BOE-A-2013-11331.pdf>

⁶⁶⁸ IEEP (2013), *Steps to Greening Country Report: Spain*, Final report for the European Commission, p. 7.

⁶⁶⁹ European Commission (2011), Commission asks Spain to improve drinking water in Alicante (16 June 2011), Accessed 5th September 2014, http://europa.eu/rapid/press-release_IP-11-728_en.htm

⁶⁷⁰ European Commission (2012), Assessment of the 2012 national reform programme and stability programme for SPAIN Accompanying the document Recommendation for a COUNCIL RECOMMENDATION on Spain's 2012 national reform programme and delivering a Council opinion on Spain's updated stability programme, 2012-2015, May 2015, http://ec.europa.eu/europe2020/pdf/nd/swd2012_spain_en.pdf

including a variety of emissions (of nitrogen, phosphorus, chemical oxygen demand, etc.) and urban waste water treatment.⁶⁷¹

Spain also faces a number of challenges related to air pollution. Seasonal air pollution still persists in major cities (mainly due to traffic congestion and large use of private transportation) and Spain is expected to miss its 2020 target for reducing greenhouse gas emissions.⁶⁷² In November 2010, Spain was taken to court by the European Commission for its inability to comply with air quality limits under Directive 2008/50/EC on ambient air quality.⁶⁷³ While there are currently no air pollution taxes applied at the national level, some autonomous communities apply taxes on air pollutants such as SO₂ and NO₂. In those regions where air pollution taxes are applied (and not all regions apply such taxes), tax rates are amongst the lowest (sometimes lower than €50 a tonne) applied in Europe (together with France and Italy).⁶⁷⁴ However, some recent efforts have been undertaken in this area; for example, the government approved measures to tackle air pollution including the *Real Decreto 102/2011* (Royal Decree 102/2011) which set out a number of objectives, targets, limits and authorisation procedures for SO_x and NO_x emissions and the introduction of a new tax on fluorinated greenhouse gases in October 2013.⁶⁷⁵

Waste is another challenging sector. Spain landfilled more than 50% of its municipal waste in 2011.⁶⁷⁶ Although some progress has been made over the last years, in particular after implementation of the two *National Municipal Solid Waste Management Plans* (of 2000-2006 and 2008-2012), more action is needed to increase recycling and reduce landfilling in the country.⁶⁷⁷ Interesting initiatives are underway in some

⁶⁷¹ European Environment Agency (2012), Environmental Fiscal Reform – Illustrative Potential in Spain, EEA Staff Position Note, September 2012, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

⁶⁷² European Commission (2014), Assessment of the 2014 national reform programme and stability programme for SPAIN Accompanying the document Recommendation for a COUNCIL RECOMMENDATION on Spain's 2014 national reform programme and delivering a Council opinion on Spain's 2014 stability programme, June 2014, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SCO410&from=fr>

⁶⁷³ IEEP (2013), *Steps to Greening Country Report: Spain*, Final report for the European Commission, p. 4.

⁶⁷⁴ IEEP (2014), *Environmental Tax Reform in Europe: Opportunities for the future*, Final report for the Netherlands Ministry of Infrastructure and the Environment, May 2014, http://www.ieep.eu/assets/1397/ETR_in_Europe_-_Final_report_of_IEEP_study_-_30_May_2014.pdf

⁶⁷⁵ KPMG (2013), *New tax measures introduced by Law 16/2013 of 29 October 2013 establishing certain environmental tax measures and adopting other tax and financial measures*, November 2013, <http://www.kpmg.com/ES/es/servicios/Abogados/Fiscal/Documents/Novedades2013-Ley16-29-oct-EN.pdf>

⁶⁷⁶ Eurostat (2013), *Eurostat News Release: In 2011, 40% of treated municipal waste was recycled or composted, up from 27% in 2001*, Accessed 5th September 2013, http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/8-04032013-BP/EN/8-04032013-BP-EN.PDF

⁶⁷⁷ ETC/SCP (2013), *Municipal waste management in Spain*, Accessed 5th September 2014, <http://www.google.fr/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CCYQFjAA&url=http%3A%2F%2Fwww.eea.europa.eu%2Fpublications%2Fmanaging-municipal-solid-waste%2Fspain-municipal-waste-management&ei=tH8JVPycPMOROLPgYAF&usg=AFQjCNF-on7RuyOGSBVnKZ3ZmAde8NMVfw&bvm=bv.74649129.d.ZWU>

autonomous communities – such as, the landfill and incineration tax in Catalonia⁶⁷⁸ - and effectiveness of these initiatives can offer valuable insights to other parts of the country.

In 2013, the Spanish Government commissioned a group of experts to elaborate a proposal on a comprehensive and integral reform of the Spanish taxation system.⁶⁷⁹ This report, known as the Lagares report, was presented in March 2014 and included a chapter (Chapter VI) almost entirely devoted to environmental taxation which includes proposals in a number of areas such as (see pages 86 to 93):

- The alignment of tax rates on diesel and petrol;
- Replace the tax base of electricity tax from sales to consumption;
- Reform the vehicle circulation tax to consider emissions of the vehicles; and
- The introduction of congestion charging.

The report also suggested the need to remove fiscal benefits provided by Corporate Income Taxation (*Impuesto Sobre Sociedades*) including tax breaks on activities linked to environmental purposes and R&D with additional revenues invested in other measures.

After the presentation of the Lagares report, the Government submitted three proposed bills amending different taxes to the Spanish Parliament.^{680,681,682} None of these proposed bills related to the proposals on environmental taxation in the *Lagares* report. However, the report's proposal to suppress the tax deduction on environmental investments provided in the Corporate Income Tax (proposal 45) has been included in the proposed bill to reform the system of Corporate Income Tax (*Proyecto de Ley del Impuesto sobre Sociedades*). Although there have been some concerns of the impact

⁶⁷⁸ Puig Ventosa, I., Gonzales, A.C., Jofra Sora, M., (2012) Landfill and waste incineration taxes in Catalonia, Spain, in Kreiser, L., Yabar, A., Herrera, P., Milne, J.E., Aishabor, H. (Eds) *Green Taxation and Environmental Sustainability. Critical Issues in Environmental Taxation*, Vol. XII, p. 244-257

⁶⁷⁹ Comisión de Expertos (2014), *Informe de la comisión de expertos para la reforma del sistema tributario español (Lagares Report)*, Final Report, March 2014, URL: http://www.economiadigital.es/es/downloads2/reforma_fiscal_informe_lagares.pdf

⁶⁸⁰ Congreso de los Diputados (2014), *Proyecto de Ley por la que se modifican la Ley 37/1992, de 28 de diciembre, del Impuesto sobre el Valor Añadido, la Ley 20/1991, de 7 de junio, de modificación de los aspectos fiscales del Régimen Económico Fiscal de Canarias, la Ley 38/1992, de 28 de diciembre, de Impuestos Especiales, y la Ley 16/2013, de 29 de octubre, por la que se establecen determinadas medidas en materia de fiscalidad medioambiental y se adoptan otras medidas tributarias y financieras*, Accessed 18th September 2014, URL: [http://www.congreso.es/portal/page/portal/Congreso/PopUpCGI?CMD=VERLST&BASE=pu10&DOCS=1-1&DOCORDER=LIFO&QUERY=%28BOCG-10-A-108-1.CODI.%29#\(Página1\)](http://www.congreso.es/portal/page/portal/Congreso/PopUpCGI?CMD=VERLST&BASE=pu10&DOCS=1-1&DOCORDER=LIFO&QUERY=%28BOCG-10-A-108-1.CODI.%29#(Página1))

⁶⁸¹ Congreso de los Diputados (2014), *Proyecto de Ley del Impuesto sobre Sociedades*, Accessed 18th September 2014, URL: [http://www.congreso.es/portal/page/portal/Congreso/PopUpCGI?CMD=VERLST&BASE=pu10&DOCS=1-1&DOCORDER=LIFO&QUERY=%28BOCG-10-A-109-1.CODI.%29#\(Página1\)](http://www.congreso.es/portal/page/portal/Congreso/PopUpCGI?CMD=VERLST&BASE=pu10&DOCS=1-1&DOCORDER=LIFO&QUERY=%28BOCG-10-A-109-1.CODI.%29#(Página1))

⁶⁸² Congreso de los Diputados (2014), *Proyecto de Ley por la que se modifican la Ley 35/2006, de 28 de noviembre, del Impuesto sobre la Renta de las Personas Físicas, el texto refundido de la Ley del Impuesto sobre la Renta de No Residentes, aprobado por el Real Decreto Legislativo 5/2004, de 5 de marzo, y otras normas tributarias*, 18th September 2014, URL: [http://www.congreso.es/portal/page/portal/Congreso/PopUpCGI?CMD=VERLST&BASE=pu10&DOCS=1-1&DOCORDER=LIFO&QUERY=%28BOCG-10-A-107-1.CODI.%29#\(Página1\)](http://www.congreso.es/portal/page/portal/Congreso/PopUpCGI?CMD=VERLST&BASE=pu10&DOCS=1-1&DOCORDER=LIFO&QUERY=%28BOCG-10-A-107-1.CODI.%29#(Página1))

and effectiveness of these tax breaks, this could be considered one of the few measures in the Spanish tax system at the national level specifically conceived with an environmental purpose.

There have also been discussions on EFR among civil society groups which have been relatively active in proposing specific environmental taxes. In 2009, a draft bill was registered in the Spanish Parliament by a number of large environmental NGOs, the trade union, and a left wing party, but the bill did not pass and thus no legislation was forthcoming.⁶⁸³ In 2012, this draft bill was revised and updated before being registered again in the Parliament – it was again met with defeat.⁶⁸⁴ In March 2014 a number of NGOs – that is, Green Budget Europe, Plataforma por un Nuevo Modelo Energético, and Xarxa per la Sobirania Energética – signed a manifesto calling for a deep reform of the Spanish tax system and the inclusion of environmental objectives in the current fiscal reform that the country is undergoing.⁶⁸⁵ More recently Green Budget Europe and Fundacio ENT also proposed several concrete proposals on environmental taxation, focusing on energy and transportation.⁶⁸⁶ Specific proposals put forward by civil society groups in the context of the CEPRIE project (Carbon and Energy Pricing Reform in Europe)⁶⁸⁷ include the following (see pg. 9 to 10):⁶⁸⁸

- To reform current taxes on hydrocarbons and coal, while reducing the tax benefits/exemptions currently in place;
- To shift energy taxation to reflect the energy content and CO₂ emissions of energy products;
- To move towards a convergence between the tax rates on petrol and diesel fuels (currently petrol taxes are 33% higher than diesel);
- To amend the current tax base for electricity to increase efficiency; and
- To increase the scope of circulation charges on certain means of transportation (*impuesto de matriculación*) to reflect CO₂ emissions and consider a reform of the *impuesto de circulación* to fully address the environmental impact of certain motor vehicles.

⁶⁸³ http://www.congreso.es/public_oficiales/L9/CONG/BOCG/B/B_190-01.PDF

⁶⁸⁴ http://www.congreso.es/public_oficiales/L10/CONG/BOCG/A/BOCG-10-A-25-2.PDF (p35 and ss)

⁶⁸⁵ Green Budget Europe et al. (2014), *La importancia de incluir aspectos ambientales en la reforma fiscal*, Final Report, March 2014, http://ent.cat/blog/wp-content/uploads/140313-Manifiesto_final.pdf

⁶⁸⁶ Green Budget Europe & Fundacio ENT (2014), *Propuestas de enmiendas con finalidad ambiental a diferentes Proyectos de Ley y respuesta de los Grupos Parlamentarios*, Final Report, September 2014, <http://fundacioent.cat/images/stories/ENT/pdf/enmiendas%20a%20los%20proyectos%20de%20ley%20sobre%20fiscalidad.pdf>

⁶⁸⁷ Green Budget Europe (2014), *CEPRIE - Carbon and Energy Pricing Reform in Europe*, Accessed 21st October 2014, <http://www.foes.de/internationales/green-budget-europe/gbe-projekte/ceprie/?lang=en>

⁶⁸⁸ Jofra Sora, M., Meyer, E., Puig Ventosa, I. and Calaf Forn, M. (2014), *Los impuestos energéticos en España: situación y propuestas*, Final Report, June 2014, http://www.foes.de/pdf/20140702_jornada_resumen_propuestas_fiscalidad.pdf

Two country-specific recommendations relating to EFR were made as part of the 2014 European Semester:⁶⁸⁹

Recommendation 1: [...] *Shift revenues towards less distortive taxes, such as consumption, environmental (e.g. on motor fuels) and recurrent property taxes.*

Recommendation 7: [...] *ensure the effective elimination of deficit in the electricity system as of 2014, including by taking further structural measures if needed. Address the problem of insolvent toll motorways so as to minimise costs for the State.*

More detailed recommendations are made in the accompanying Commission Staff Working Document⁶⁹⁰ which states that it would be beneficial to tax CO₂ and the energy content of products separately to ensure the neutrality of the tax system among different energy sources. Moreover, the document suggests bringing the taxation of diesel to the same level as petrol. Finally, the document proposes to eliminate certain regional environmental taxes that hamper the functioning of the market or do not achieve their purpose and replace them with taxes at the national level. However, some experts argue that certain regional taxes work well and are tailored to reflect specific regional characteristics, thus they should not all be systematically harmonised as this could risk jeopardising progress made in some autonomous communities. Rather, a certain (but not necessarily complete) degree of harmonisation could be considered where appropriate⁶⁹¹ - for example, setting minimum tax rates at the national level above which individual autonomous communities could choose to set higher rates. The 2014 Spanish National Reform Programme⁶⁹² does not propose any specific EFR related measures, but it does put forward general measures on energy efficiency and flood prevention.

18.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Spain. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for

⁶⁸⁹ Council of the European Union (2014), COUNCIL RECOMMENDATION of on the National Reform Programme 2014 of Spain and delivering a Council opinion on the Stability Programme of Spain, 2014, 16th June 2014, <http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2010786%202014%20INIT>

⁶⁹⁰ European Commission (2014), COMMISSION STAFF WORKING DOCUMENT "Assessment of the 2014 national reform programme and stability programme for SPAIN Accompanying the document Recommendation for a COUNCIL RECOMMENDATION on Spain's 2014 national reform programme and delivering a Council opinion on Spain's 2014 stability programme, June 2014, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0410&from=fr>

⁶⁹¹ Jofra Sora, M., Meyer, E., Puig Ventosa, I., Calaf Forn, M., (2014) Los impuestos energéticos en España: situación y propuestas, June 2014, http://fundacioent.cat/images/stories/ENT/pdf/jornada_resumen_propuestas_fiscalidad.pdf and <http://fundacioent.cat/images/stories/ENT/pdf/revisin%20impuestos%20energeticos%20espa.pdf>

⁶⁹² Government of Spain (2014), PROGRAMA NACIONAL DE REFORMAS: REINO DE ESPAÑA (2014), Accessed 9th September 2014, http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014_spain_es.pdf

revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ **Energy Taxes:**

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€11.6 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for kerosene (€7.9 per GJ). Finally, the rates for heating fuels are equalised using the minimum rate for gas oil of €0.9/GJ. The suggested tax changes reflect some of the proposals put forward by civil society groups (see above).
- The existing electricity tax rates are harmonised according to the highest rate, which for Spain is non-business use. In addition to rate increases, it may also be relevant to consider a change in the tax base, for example, changing the tax base in the *Impuesto sobre la electricidad* from the current base on the sale price of electricity to one focused on the amount of final electricity consumed.⁶⁹³ This was, for instance, one of the suggestions of the Lagares report and has also been included in the proposals put forward by civil society.
- Table 18-4 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the good practice on energy taxes (see Section 5.1). The proposed rates are reached (in real terms) by 2018 or 2023, depending on whether all of the existing rates are below €0.15 per GJ or not.
- There is currently a significant differential in the tax rates applied to diesel and petrol. Aligning the two as per the proposed revision to the ETD leads to the tax rate for diesel increasing by almost 40%. The uplift in the rate for kerosene is more or less the same. The largest increases are for LPG and for natural gas, however, these moving to 10 times and 13 times their current levels, respectively.
- For commercial and industrial motors, there are significant increases in rates for gas oil, and even more so, for natural gas and LPG.
- There are major increases in the taxes applied to some of the heating fuels: rates for heavy fuel oil and LPG both increase by more than 500%, Rates for natural gas and coal are increased by 215% and 334%, respectively.

⁶⁹³ Jofra Sora, M., Meyer, E., Puig Ventosa, I. and Calaf Forn, M. (2014), Los impuestos energéticos en España: situación y propuestas, Final Report, June 2014, http://www.foes.de/pdf/20140702_jornada_resumen_propuestas_fiscalidad.pdf

Table 18-4: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	425	425
Light fuel oil (diesel)	€ per 1000 litre	459	331
LPG (propellant)	€ per 1000 kg	590	57
Kerosene	€ per 1000 litre	461	330
Natural gas (prop)	€ per GJ	13	1
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	328	85
Kerosene	€ per 1000 litre	330	330
LPG	€ per 1000 kg	420	57
Natural gas	€ per GJ	9	1
Business Heating			
Gas oil	€ per 1000 litre	85	85
Heavy fuel oil	€ per 1000 kg	99	15
Kerosene	€ per 1000 litre	84	79
LPG	€ per 1000 kg	101	15
Natural gas	€ per GJ	2.05	0.65
Coal	€ per GJ	2.82	0.65
Non-Business Heating			
Gas oil	€ per 1000 litre	85	85
Heavy fuel oil	€ per 1000 kg	99	15
Kerosene	€ per 1000 litre	84	79
LPG	€ per 1000 kg	101	15
Natural gas	€ per GJ	2.05	0.65
Coal	€per GJ	2.82	0.65
Electricity			

Energy Tax	Units	Suggested Rates	Existing Rates
Electricity - business use	€ per MWh	1.00	0.50
Electricity - non-business use	€ per MWh	1.00	1.00

➤ **Transport Taxes:**

- Vehicles:** It is suggested that additional revenues of 1.17% GDP could be generated from increased transport fuel taxes (described above) and revisions to vehicle taxes. Possible changes to vehicle taxation could, for example, include: an increase in the rate of the vehicle registration tax; current CO₂ limits applied for different categories of vehicles could be tightened; criteria expanded to include consideration of EURO emission standards of vehicles; and certain exemptions eliminated or phased out (see Appendix A.16.0 for more details on existing exceptions etc.). In addition, the annual vehicle circulation tax could be reformed with rates modified to reflect CO₂ emissions (as with the vehicle registration tax) and potentially take into account additional environmental impacts.⁶⁹⁴ The latter proposals on the circulation tax are also among the suggestions of the Lagares report and proposals put forward by civil society. Spain has not yet implemented the provisions of the Eurovignette Directive. It operates a concession based scheme for charging HGVs for road use. The current approach lacks any differentiation on the basis of EURO class, and the rates applied (in terms of the amount paid per km) are relatively low, with only Greece applying lower rates of the countries operating concession based approaches.
- Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. Spain does not currently have an aviation tax in place, although Catalonia recently introduced a tax on the emissions of NO_x released during take-off and landing operations of commercial flights (see Appendix A.16.0 for more details).⁶⁹⁵ There is thus scope for introducing a passenger flight tax and a tax on air freight. The suggested rates for the air passenger tax are €15 per passenger for flights within

⁶⁹⁴ Jofra Sora, M., Meyer, E., Puig Ventosa, I. and Calaf Forn, M. (2014) *Los impuestos energéticos en España: situación y propuestas*, Final Report, June 2014, www.foes.de/pdf/20140702_jornada_resumen_propuestas_fiscalidad.pdf

⁶⁹⁵ Parlament de Catalunya (2014), *LLEI 12/2014, del 10 d'octubre, de l'impost sobre l'emissió d'òxids de nitrogen a l'atmosfera produïda per l'aviació comercial, de l'impost sobre l'emissió de gasos i partícules a l'atmosfera produïda per la indústria i de l'impost sobre la producció d'energia elèctrica d'origen nuclear*, Accessed 21st October 2014, <http://legislacion.derecho.com/llei-012-2014-de-l-impost-sobre-l-emissio-d-oxids-de-nitrogen-a-l-atmosfera-produida-per-l-aviacio-comercial-de-l-impost-sobre-l-emissio-de-gasos-i-particules-a-l-atmosfera-produida-per-la-industria-i-de-l-impost-sobre-la-produccio-d-energia-electrica-d-origen-nuclear>

Spain, €25 per passenger for flights within the the European Union), and €50 per passenger for flights outside the European Union. The suggested air freight tax rate is €1.25 per tonne of freight. For the purposes of this study, the year of implementation is taken to be 2016 with rates gradually increasing to the maximum level in 2018. As noted in the good practice section on aviation, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax (see Section 5.2.2). There may also be scope to consider taxation of kerosene fuel used in domestic flights where some form of EU or international cooperation would be required.

➤ **Pollution and Resource Taxes:**

- **Aggregates:** No national or regional tax is levied on the 175 million tonnes of aggregates extracted in Spain (UEPG 2011 approximates⁶⁹⁶). An average rate of €2.40 per tonne of materials extracted could be applied to aggregates extracted in all Spanish regions. This could be a proposed minimum tax rate, with certain regions potentially choosing higher rates to reflect regional circumstances. Such a tax would help stimulate the use of secondary materials (such as construction waste) and recycled materials. Recycled aggregates currently represent less than 1% of the total aggregates produced.⁶⁹⁷ The types of materials that could be covered by the tax are:
 - Marble
 - Chalk and dolomite
 - Slate
 - Limestone and gypsum
 - Sand and gravel

Although some of these materials are not extracted in Spain (where the large majority of materials extracted are crushed rocks, sand and gravel), the suggested aggregates tax could be applied to domestic aggregate extraction and imports to Spain, excluding exports (a similar approach to the aggregates levy applied in the UK).⁶⁹⁸ The specific range of materials suggested reflects, in part, the nature of the data available to us in developing estimates of potential revenues. The tax would be introduced in 2017, and would remain constant in real terms thereafter.

- **Waste – landfill tax:** There is currently no national landfill tax applied in Spain; however, regional taxes on waste are applied in a number of autonomous regions. Landfill taxes provide incentives for improved waste

⁶⁹⁶ European Aggregates Association (2013) *Annual Review 2012-2013*, Accessed 21st October 2014, http://www.uepg.eu/uploads/Modules/Publications/uepg-ar2012-2013_en_inter_v14_pbp_small.pdf

⁶⁹⁷ Ibid.

⁶⁹⁸ Söderholm, P (2011) *Taxing Virgin Natural Resources: Lessons from Aggregates Taxation in Europe*, Luleå University of Technology, Sweden. Submitted to *Resources, Conservation and Recycling* 2011

management, and the meeting of targets under Article 11 of the Waste Framework Directive. Article 28(4) proposes that the use of economic instruments is evaluated in the development of waste management plans. Landfill taxes also provide support to the application of the waste hierarchy. It is suggested that a minimum rate for non-hazardous waste sent to landfill is set at €50 per tonne by 2021 for the whole of Spain. An early announcement of this tax and its escalation over a number of years would help drive further change in the waste management sector needed to meet EU targets in 2020 and beyond. We suggest this tax should be indexed to an appropriate measure of inflation.

- **Waste –Incineration / MBT Tax:** There is currently no national incineration tax applied in Spain. Although Spanish legislation has made provision for the setting of incineration taxes by the autonomous regions, only Catalonia has introduced such a tax. There were around ten incinerators in use in Spain in 2009, treating 2.2 million tonnes a year of residual waste. Four of these facilities are in Catalonia⁶⁹⁹ which has what is considered an effective landfill and incineration tax in place⁷⁰⁰. It is suggested that a minimum national incineration tax be introduced at a rate of €15 per tonne. This would be a proposed minimum tax rate to be applied across all regions. It is suggested that the tax is applied on materials being prepared for export for incineration also, so as to avoid a simple movement of waste to incinerators in countries without such a tax in place (or which may exempt imported wastes from the tax). These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.⁷⁰¹ An equivalent rate is also proposed for MBT facilities.
- **Packaging:** There are no material-specific packaging taxes currently levied in Spain. In 2011, in more than 150 kg of packaging waste per capita was produced and on average 100 kg of packaging waste was recycled.⁷⁰² According to Article 5(c) of Law 11/1997, the total quantity of packaging waste arising is to be reduced by at least 10% by weight (a target date is not specified in the law). These targets have, however, not been very effective as the actual generation of packaging has increased. Law 10/1998 also stipulates that Packaging Prevention Plans have to be drawn up by those responsible for placing more than a given limit of

⁶⁹⁹ BIO Intelligence Service et al. (2012) *Use of Economic Instruments and Waste Management Performances*, Final Report, Accessed 09th October 2014, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

⁷⁰⁰ Puig Ventosa, I., Gonzales, A.C., Jofra Sora, M., (2012) Landfill and waste incineration taxes in Catalonia, Spain, in Kreiser, L., Yabar, A., Herrera, P., Milne, J.E., Aishabor, H. (Eds) *Green Taxation and Environmental Sustainability. Critical Issues in Environmental Taxation*, Vol. XII, p. 244-257

⁷⁰¹ European Commission (2011) *Roadmap to a Resource Efficient Europe*, 20th September 2011, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN>

⁷⁰² Eurostat (2013) *Packaging Waste Statistics*, Accessed 9th October 2014, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Packaging_waste_statistics

packaging on the Spanish market. These plans are required to help minimise the production of packaging waste at source and to reduce adverse effects on the environment. Reuse incentives are therefore part of companies' obligation to draw up Packaging Prevention Plans.⁷⁰³ In some Member States, packaging taxes have been applied to all packaging placed on the market in order to stimulate waste prevention and to reduce demand for raw materials. Based on these experiences, the following rates could be applied in Spain to packaging placed on the market:

- Aluminium €197 per tonne
- Plastic €64 per tonne
- Steel €54 per tonne
- Paper and card €20 per tonne
- Glass €18 per tonne
- Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Single-use carrier bag tax:** Approximately 150 plastic bags per capita are used every year in Spain, with most of them being single-use plastic carrier bags, for which supermarkets are the biggest provider.⁷⁰⁴ A plastic bag tax is not in place at the national level. Andalusia is the only region in Spain where a tax is levied on the consumption of single-use carrier bags. The tax was introduced in 2011 at a rate of €0.05 per bag. It was increased in 2014 to €0.10 per plastic bag. In Catalonia, a voluntary agreement between the regional Waste Agency, regional and national business groups, plastic bag manufacturers, food distributors, and supermarkets has contributed to a reported 40% drop in consumption of single-use plastic bags in the period from 2007 to 2011.⁷⁰⁵ The European Commission has issued a proposal for regulation to reduce the consumption of lightweight plastic carrier bags.⁷⁰⁶ At the national level

⁷⁰³ Ecologic and IEEP (2009) *A Report on the Implementation of the Packaging and Packaging Waste Directive 94/62/EC*, Accessed 9th October 2014, <http://ec.europa.eu/environment/waste/reporting/pdf/Packaging%20Directive%20Report.pdf>

⁷⁰⁴ Eunomia (2012) *Assistance to the Commission to Complement an Assessment of the Socio-economic Costs and Benefits of Options to Reduce the Use of Single-use Plastic Carrier Bags in the EU*, Final Report for the European Commission DG Environment under Framework Contract No ENV.C.2/FRA/2011/0020, Accessed 10th October 2014, http://ec.europa.eu/environment/waste/packaging/pdf/study_options.pdf

⁷⁰⁵ Earth Policy Institute (2014) *The Downfall of the Plastic Bag: A Global Picture*, Plan B Updates, Accessed 10th October 2014, http://www.earth-policy.org/plan_b_updates/2013/update123

⁷⁰⁶ European Commission (2013) *Proposal for a Directive of the European Parliament and of the Council amending Directive 94/62/EC on packaging and packaging waste to reduce the consumption of lightweight plastic carrier bags*, COM/2013/0761 final – 2013/0371 (COD), Accessed 10th October 2014, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013PC0761>

Spain plans to completely stop the use of plastic bags by 2018 (*Ley 22/2011, de 28 de Julio, de residuos y suelos contaminados*); thus, it could consider introducing a plastic bag tax at the national level in order to help achieve the desired reductions. It is suggested to apply such a tax at a rate of €0.09 per bag from 2017, and maintaining the tax at a constant level in real terms thereafter. We note that Andalusia already applies a marginally higher tax rate, so a clear precedent exists for such a tax.

- **Air pollution:** The urban population in Spain is exposed to air pollutant concentrations up to 38% above the EU reference values (50 µg per m³ per day of PM₁₀, 120 µg per m³ per 8-hours' periods of O₃ and 40 µg per m³ per year for NO₂).⁷⁰⁷ In 2010, around 33% of the total population was exposed to PM₁₀ concentrations above limit values for 35 days.⁷⁰⁸ The equalisation of tax rates of diesel and petrol may, over the medium-term, and in conjunction with changes in vehicle taxes described above, contribute to improvements in this regard through influencing the vehicle stock. In addition, to these measures, taxes on air pollution from large and medium sources should provide incentives for measures to reduce pollution (e.g. abatement technologies), and therefore improve air quality (and thereby, the health of the population). No national tax on air pollution is currently in place; however, several regions (Andalusia, Murcia, Aragon, Galicia, Catalonia, and Valencia) have introduced taxes ranging from €33 to €94 per tonne for SO₂ emissions, and between €50 to €140 per tonne of NO₂ emitted (see Appendix A.16.0 for more details).⁷⁰⁹ These rates are considerably lower than those applied in Nordic countries such as Denmark and Sweden. 2010 data indicates that Spain exceeded its respective NO_x ceilings for that year set by the NEC Directive and has not been able to meet its ceilings for NH₃ emissions for 2012.^{710,711} In order to improve air quality, the following tax rates are therefore suggested:
 - SO_x €1,000 per tonne
 - NO_x €1,000 per tonne
 - PM₁₀ €2,000 per tonne

⁷⁰⁷ European Environment Agency (2013) *Air pollution fact sheets 2013*, Spain, Accessed 10th October 2014

⁷⁰⁸ European Environmental Agency (2013), *Air pollution fact sheet 2013 – Spain*, Accessed 16th October 2014, http://www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets/spain-air-pollutant-emissions-country-factsheet/at_download/file

⁷⁰⁹ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, Accessed 4th September 2014, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

⁷¹⁰ European Environmental Agency (2013), *NEC Directive status report 2013 Reporting by Member States under Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants*, Accessed 16th October 2014, http://www.eea.europa.eu/publications/nec-directive-status-report-2013/at_download/file

⁷¹¹ European Environmental Agency (2013), *Air pollution fact sheet 2013 – Spain*, Accessed 16th October 2014, http://www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets/spain-air-pollutant-emissions-country-factsheet/at_download/file

These taxes represent a significant increase over current practices in some regions; therefore, a progressive increase from 2016 to a maximum level by 2021 is suggested, and then held constant in real terms.

- **Water abstraction:** Water scarcity is a major concern in Spain which is expected to be exacerbated in the future with climate change. In 2002, Spain had a 35% abstraction rate of long-term freshwater resources, categorising Spain as a water-stressed country.⁷¹² The EU Water Framework Directive (Directive 2000/60/EC) stresses that cost recovery for water services should include environmental and resource costs. Although there is no national water abstraction tax in Spain, many autonomous communities have introduced regional taxes (which in some cases also combine water pollution charges) and these are used for the financing of river basin management. The EEA notes, however, that these taxes are rather inefficient, as they are amongst the lowest in OECD and EU countries and that there are large differences in design and rates between regions.^{713,714} Moreover, agriculture is exempted from environmental related water charges in Aragon, Asturias, Balearic Islands, Cantabria, Catalonia, Galicia and La Rioja.⁷¹⁵ Thus, it is suggested that minimum tax rates of €480 per 1,000m³ for households, €300 per 1,000m³ for manufacturing, and €40 per 1,000 m³ for agriculture could be introduced at the national level. These would be proposed minimum rates to be applied across all regions. As noted above, certain regions may choose to set higher tax rates than the minimum rate (e.g. as already applied in some autonomous communities). Given the significant difference in the structure and rates, a progressive increase in tax rates is recommended from 2016 to 2021, and rates maintained in real terms thereafter.
- **Waste water:** The Council Directive 91/271/EEC concerning urban wastewater treatment specifically targets waste water discharges and discharges from certain industrial sectors.⁷¹⁶ Spain has faced several accusations of breaching EU waste water legislation. This included allegations of improper treatment of waste water from agglomerations with more than 10,000 inhabitants due to failures in treatment systems, which

⁷¹² EEA (2014) *Water scarcity*, Accessed 10th October 2014, <http://www.eea.europa.eu/themes/water/featured-articles/water-scarcity>

⁷¹³ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, Accessed 2nd September 2014, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

⁷¹⁴ See EC study, http://ec.europa.eu/europe2020/pdf/nd/swd2012_spain_en.pdf

⁷¹⁵ OECD (2010) *Taxation, Innovation and the Environment*, Accessed 10th October 2014, <http://www.oecd.org/env/tools-evaluation/taxationinnovationandtheenvironment.htm>

⁷¹⁶ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014, http://ec.europa.eu/environment/water/water-urbanwaste/index_en.html

pose risks to human health, inland waters, and the marine environment.⁷¹⁷ As noted above, a national *fee on wastewater discharges* is applied, with regional taxes on wastewater and discharges having been introduced in several autonomous communities which are sometimes combined with water abstraction taxes, and are typically composed of a fixed rate element, and a variable tax rate depending on the type and level of pollution.⁷¹⁸ In order to improve prevention of water pollution, waste water taxes could be introduced across all of the autonomous communities, at a level of at least €2.04 per kg of pollutant for all BOD. This would be a proposed minimum tax rate to be applied across all regions. Certain regions may choose to have a tax higher than the minimum rate (e.g. as already applied in some autonomous communities). A transition period between 2016 and 2019 would be needed in order to equalise the various rates, and exemptions reviewed. It is proposed to keep the rate constant in real terms from 2019 onwards.

- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

Spain does not have a national tax or regional pesticides taxes in place and its consumption of pesticides is currently one of the highest in the EU. Since specific data on the types of active ingredient used for the preparation of the pesticides sold in the country is missing, a general tax rate of €7.5 per kg of active ingredient could be implemented. The tax could be introduced from 2017 with a transition period to 2019. A rate structure similar to the one in Norway or Denmark, where the rate is banded according to the potential effects of different active ingredients, is considered to be the most effective.

- **Fertilizers:** Since September 2012 a low rate of VAT (at 10%) has been applied to all fertilizers sold in Spain.⁷¹⁹ This has encouraged further consumption and it has been reported that, in 2012, fertilizer consumption

⁷¹⁷ European Commission (2011) *Environment: Commission takes Spain to Court over urban waste water and river basin plans*, European Commission IP/11/729 of 16/06/2011, Accessed 10th October 2014, http://europa.eu/rapid/press-release_IP-11-729_en.htm

⁷¹⁸ Vales-Gimenez, J., Zarate-Marco, A. (2013) Environmental taxation and industrial water use in Spain, in *Investigaciones Regionales*, No. 25, pp.133-62.

⁷¹⁹ OECD (2012) *Agricultural policies and support*, Accessed 13rd October 2014, <http://www.oecd.org/tad/agricultural-policies/support-policies-fertilisers-biofuels.htm>

in Spain equalled 124.3 kg per hectare of arable land, which was slightly less than the EU average of 149.4 kg per hectare per year.⁷²⁰ This consumption measures the quantity of plant nutrients that are used per unit of arable land and covers nitrogenous (with the worst environmental performance), potash, and phosphate fertilizers (including ground rock phosphate). As there is not fertiliser tax in place in Spain it is suggested that, in order to further improve efficiency in the application of fertilisers to land, a tax of €0.15 per kg of nitrogen fertiliser be introduced. As part of this work we have assumed that the tax would be implemented from 2017, and would increase up to the maximum level in 2019. Moreover, a broader environmental tax reform could also consider reclassifying VAT rates applied on fertilisers, increasing this to the standard rate of 21%.

18.2.3 Summary of Revenue Outcomes

Table 18-5 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 18-5: Potential Additional Revenue from Environmental Fiscal Reform in Spain, million EUR (real 2014 terms)⁷²¹

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	379	1,502	2,972
C&I / Heating	166	513	602
Electricity	66	66	66
<i>Sub-total Energy, million EUR</i>	610	2,080	3,639
<i>Sub-total Energy, % GDP</i>	0.06%	0.20%	0.35%
Transport Taxes			
Vehicle Taxes	2458	9,836	12,308

⁷²⁰ World Bank (2014) *Fertilizer consumption database*, Accessed 13rd October 2014, <http://data.worldbank.org/indicator/AG.CON.FERT.ZS/countries/1W-EU?display=graph>

⁷²¹ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Passenger Aviation Tax	2,692	5,823	6,812
Freight Aviation Tax	0.36	0.72	0.77
<i>Sub-total Transport, million EUR</i>	<i>5,151</i>	<i>15,659</i>	<i>19,121</i>
<i>Sub-total Transport, % GDP</i>	<i>0.49%</i>	<i>1.49%</i>	<i>1.82%</i>
Pollution and Resource Taxes			
Landfill Tax - Non-haz General	565	794	813
Landfill Tax - Inerts (C&D)	4	2	2
Incineration /MBT Tax	83	126	132
Air Pollution Tax	212	372	255
Water Abstraction Tax	1,427	3,345	3,283
Waste Water Tax	237	330	330
Pesticides Tax	139	268	273
Aggregates Tax	402	194	135
Packaging Tax	262	257	272
Single Use Bag Tax	576	122	135
Fertiliser Tax	0.050	0.085	0.072
<i>Sub-total Pollution & Resource, million EUR</i>	<i>3,906</i>	<i>5,810</i>	<i>5,630</i>
<i>Sub-total Pollution & Resources, % GDP</i>	<i>0.37%</i>	<i>0.55%</i>	<i>0.54%</i>
Total Environmental Taxes			
Total, million EUR	9,667	23,550	28,390
Total Increase, % GDP	0.92%	2.24%	2.70%

Table 18-6 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 18-6: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Spain, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	1,927

Revenue Type	Revenue Per Annum, million EUR
Increased Cost Recovery for Water Use	7,083
Total	9,010

18.2.4 Environmental Benefits

Table 18-7 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.16.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, €1.6 billion of benefits are anticipated annually by 2025 in real terms.

Table 18-7: Monetised Environmental Benefits from Implementation of Suggested Taxes in Spain, million EUR (real 2014 terms)⁷²²

Tax Type	2017	2020	2025
Energy Taxes	26	87	143
Transport Taxes (excluding transport fuels)	244	493	502
Pollution and Resource Taxes	341	949	912
Total, million EUR	612	1,529	1,557
Total, % GDP	0.06%	0.14%	0.14%

18.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Spain:⁷²³

- In 2012, environmental taxes generated revenue equivalent to 1.57% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Spain. These could generate EUR 9.7 billion

⁷²² % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

⁷²³ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

in 2017, rising to EUR 28.4 billion in 2025 (both in real 2014 terms). This is equivalent to 0.92% and 2.70% of GDP in 2017 and 2025, respectively.

- The largest single contribution to revenue comes from the suggested increase in vehicle taxes. This accounts for EUR 12.3 billion by 2025 (real 2014 terms), equivalent to 1.08% of GDP.
- The next largest contribution to revenue comes from the proposed passenger aviation tax. This accounts for EUR 6.8 billion by 2025 (real 2014 terms), equivalent to 0.60% of GDP.
- The water abstraction tax would account for EUR 3.3 billion by 2025 (real 2014 terms), equivalent to 0.29% of GDP.
- Revenue potential from the suggested harmonisation of the taxes on transport fuels with the rates in the proposed ETD would raise EUR 3.0 billion by 2025 (real 2014 terms), equivalent to 0.26% of GDP.
- A national minimum landfill tax also been suggested. This would contribute EUR 0.8 billion by 2025 (real 2014 terms), equivalent to 0.07% of GDP.
- In addition, a range of more minor taxes on could generate revenue of EUR 2.2 billion by 2025 (real 2014 terms), equivalent to 0.19% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around EUR 1.6 billion by 2025 (real 2014 terms), equivalent to 0.14% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €9 billion per annum could be raised in addition to the above.

19.0 Sweden

19.1 Country Overview

19.1.1 Key Facts about the Economy and Tax System

- Sweden's GDP increased by an average 3.46% per annum in real terms between 2003 and 2007. Sweden was among those Member States already feeling the effects of global recession more strongly in 2008, with GDP falling by 0.6% in real terms on the previous year. The economy contracted significantly in 2009 with GDP dropping a further 5% in real terms. The economy bounced back in 2010, when GDP increased by 6.6% in real terms. The economy has continued to grow since then, although at a more modest rate.⁷²⁴
- Sweden's overall tax revenue (including social contributions) as a percentage of GDP is high compared to the majority of Member States, standing at 45% of GDP in 2013. However, it has fallen since 2002 (47.9% of GDP) and was at its highest in 2005 (49.3% of GDP).⁷²⁵
- Sweden's total tax take is split more-or-less evenly between direct and indirect taxes, which accounted for 41% and 42.3% of total revenue in 2013, respectively. The input made by social contributions, at 16.6%, is low compared to the majority of other Member States, and has fallen by 7.8% since 2002. Direct taxation's contribution has remained fairly stable, while the share of revenue raised via indirect taxes has risen by 7.6% over the same period.⁷²⁶
- Environmental tax revenue amounted to 2.49% of Sweden's GDP in 2012. This percentage share stood at 2.88% in 2002, and has fluctuated over the years, until beginning to fall in 2011.⁷²⁷
- In 2012, Sweden received the majority of its environmental tax revenue from energy, these amounting to 2.02% of GDP. Transport (excluding fuel) taxes amounted to 0.44% of GDP, and taxes placed on pollution and resources were of the order 0.03% of the country's GDP in 2012.⁷²⁸

⁷²⁴ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

⁷²⁵ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

⁷²⁶Ibid.

⁷²⁷ Eurostat (2014) *Environmental Tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

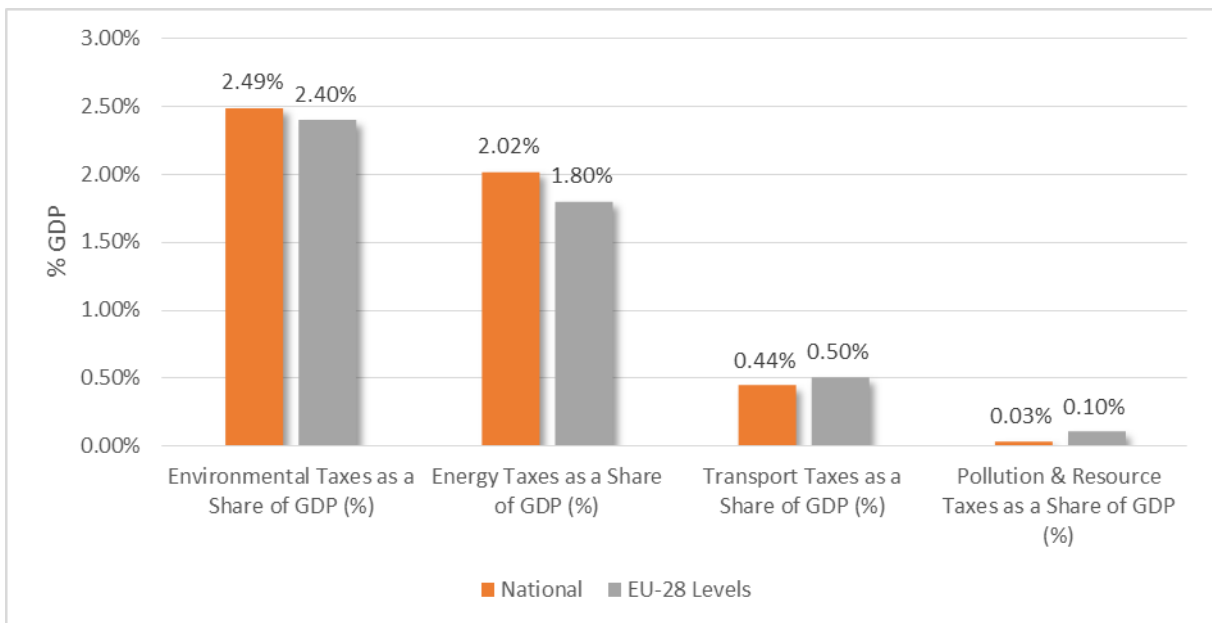
⁷²⁸ Ibid.

- Energy taxes accounted for 81.1% of revenues from environmental taxes in 2012. This figure has fallen over the past 10 years from a percentage share of 84.7% in 2002.⁷²⁹

19.1.2 Relative Position within the EU

- Expressed in terms of percentage share of GDP, Sweden's environmental tax revenue for 2012 was just above the EU-28 average of 2.4%. The revenues from energy taxes were above the EU-28 average of 1.8% of GDP; however, transport (excluding fuel) taxes and pollution and resource taxes were below the respective EU-28 averages of 0.5% GDP and 0.1% GDP (see Figure 19-1).⁷³⁰

Figure 19-1: Environmental Taxes in Sweden as a % of GDP vs EU-28 Levels (2012)



- Sweden has a middle ranking among Member States regarding environmental tax revenue as a share of GDP, ranking 15th in 2012. Regarding energy tax revenues as a proportion of GDP, it ranked 11th, for revenues from transport taxes (excluding fuel), it ranked 14th, and for pollution and resource tax revenues, it was in 19th place (see Table 19-1).⁷³¹

⁷²⁹ Ibid.

⁷³⁰ Ibid.

⁷³¹ Ibid.

Table 19-1: Ranking of Sweden's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	15
Energy Taxes as a Share of GDP (%)	11
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	14
Pollution & Resource Taxes as a Share of GDP (%)	19

Source: based on Eurostat data

19.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.17.0. This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Taxation Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon GDP in current prices from Eurostat:^{732,733}

➤ Energy Taxes:

- Sweden's excise duties on fuels and electricity are shown in Table 19-2 alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 19-2: Standard Rates of Excise Duties on Fuels and Electricity in Sweden (Rates applicable from 1 January 2015)

Excise Duty	Unit	Rate Applied in Sweden ^{734 735} (1€=9.0914SEK ⁷³⁶)	Existing ETD Minimum	EU-28 Average	EU-28 Median
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⁷³² Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1>

⁷³³ Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

⁷³⁴ These tax rates exclude the sulphur tax and the nitrogen charge; see separate sections for these.

⁷³⁵ Significant rate increases will take effect from 2015 for propellants LPG and gas; and for all industry/business heating fuels in sectors outside the EU ETS

⁷³⁶ Note as the rates for 2015 are used they are converted to EUR using the estimated exchange rate published by Eurostat for 2015.

Excise Duty	Unit	Rate Applied in Sweden ^{734 735} (1€=9.0914SEK ⁷³⁶)	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels – propellant					
Unleaded Petrol	€ per 1000 litres	SEK 5,850 (€643) ¹	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	SEK 5,051 (€556) ²	€330	€427	€405
Kerosene	€ per 1000 litres	SEK 5,051 (€556)	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	SEK 3,385 (€372)	€125	€209	€180
Natural Gas	€ per GJ	SEK 60 (€6.6)	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use (Stationary engines)					
Gas Oil (Diesel)	€ per 1000 litres	SEK 2,186 (€240) ³ SEK 255 (€28.05) ³	€21	€221	€163
Kerosene	€ per 1000 litres	SEK 2,186 (€240) ³ SEK 255 (€28.05) ³	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	SEK 2,359 (€259) ³ SEK 328 (€36.08) ³	€41	€126	€125
Natural Gas	€ per GJ	SEK 43 (€4.7)	€0.30	€1.76	€1.50
Heating – Business Use (Manufacturing, agriculture, forestry and aquaculture)					
Gas Oil	€ per 1000 litres	SEK 2,186 (€240) ³ SEK 255 (€28.05) ³	€21	€221	€163
Kerosene	€ per 1000 litres	SEK 2,186 (€240) ³ SEK 255 (€26.93) ³	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	SEK 2,301 (€253) ³ SEK 268 (€29.5) ³	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	SEK 2,359 (€259) ³ SEK 328 (€36.08) ³	€0.00	€82	€40
Natural Gas	€ per GJ	SEK 43 (€4.7) ³ SEK 7 (€0.77) ³	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	SEK 66 (€7.3) ³ SEK 6.8 (€0.75) ³	€0.15	€1.27	€0.31
Heating⁴ – Non-Business Use (incl. other business use not specified above)					
Gas Oil (Diesel)	€ per 1000 litres	SEK 4,068 (€447)	€21	€179	€125

Excise Duty	Unit	Rate Applied in Sweden ^{734 735} (1€=9.0914SEK ⁷³⁶)	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene	€ per 1000 litres	SEK 4,068 (€447)	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	SEK 4,282 (€471)	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	SEK 4,477 (€492)	€0	€111	€42
Natural Gas	€ per GJ	SEK 84 (€9.2)	€0.3	€2.04	€0.94
Coal and Coke	€ per GJ	SEK 121 (€13)	€0.3	€1.77	€0.32
Electricity					
Business Use - Manufacturing, agriculture, forestry and aquaculture	€ per MWh	SEK 5 (€0.55)	€0.5	€8.42	€1.03
Non-Business Use – and other businesses not specified above ⁵	€ per MWh	SEK 294 (€32)	€1.0	€14.53	€2.06

Notes:

1. This rate is for Class 1 petrol.
2. This rate is for Class 1 diesel. Class 2 has a rate of SEK 5,331 (€586) and Class 3 a rate of SEK 5,477 (€602). Reduced rate for agricultural motor fuel is SEK 4,151 (€457).
3. Different rates for non-ETS and ETS installations (the latter are exempt from the CO₂-tax).
4. CHP plants within ETS are exempt from the CO₂-tax; other heating plants within the ETS has a reduction of 20 per cent.
5. SEK 194 (€21.34) per MWh applies for use in the northern parts of Sweden.

Source: For fuels: SFS 2009:1497, http://www.lagboken.se/dokument/andrings-sfs/603966/sfs-2009_1497-lag-om-andring-i-lagen-1994_1776-om-skatt-pa-energi?id=44890 ; for electricity Förordning om fastställande av omräknade belopp för energiskatt på elektrisk kraft för år 2015 (will be printed in the SFS series before the end of November 2014).

- The petrol tax has been relatively stable, due to a legal requirement for indexation of energy taxes (although the figures fluctuate when expressed in euros because the Swedish currency is floating). In real euro-denominated terms, the tax is now slightly lower than at its peak in 1996, when it was 4 cents higher per litre. The differential to the diesel tax has been narrowed over recent years and is now about 10 cents per litre, whereas it was twice as high in the mid-1990's.
- Heating for non-business uses and electricity are taxed at some of the highest rates found in the EU. These rates apply for non-manufacturing

business too, e.g. services. On the other hand, when it comes to heating use in the manufacturing business, then energy and electricity are in fact taxed at rates below EU averages.⁷³⁷

- From 2011 the industrial installations covered by the EU-ETS have been exempted from the CO₂ tax, while becoming subject to an energy tax. From 2013 the same rules apply for CHP installations covered by the EU-ETS. While previously their CO₂ tax had been restricted under an ad-hoc mechanism, their effective tax rates are now close to the obligatory EU minimum.⁷³⁸ Other heating plants within the EU-ETS has obtained a reduced rate at 20% for the CO₂ tax, while still paying the full, general energy tax rate.
- The Swedish relief scheme for ETS-covered energy-intensive industries and CHP and other plants within the ETS has been notified as state aid to the European Commission and was deemed acceptable (state aid case N22/2008, compare GBER notification SA.32493). Also the lower energy and CO₂ tax rates for heating fuels used outside the EU ETS has been notified as state aid and has been deemed acceptable (GBER notification SA.32494).
- According to a report from the National Audit Office in Sweden the climate taxation reform provided a net tax relief of €650 million to the ETS sectors.⁷³⁹ The National Audit Office finds that *“in relation to the climate-related taxes, the government has not presented (to the parliament) a comprehensive, clear picture of costs between trade and industry and households or within trade and industry”*.⁷⁴⁰ In this context the Commission’s state aid approval makes reference to a stipulated relief at about €50 million annually to ETS/energy-intensive industries – while the actually implemented tax relief is higher.⁷⁴¹
- The industries covered by ETS, altogether about 600 installations, account for 33% of carbon emissions in Sweden and include the metal industry (8%), mineral industries (6%), refineries (4%) and paper & pulp (3%).^{742,743}

⁷³⁷ Prior to 1992 the business electricity tax was 10 times higher than presently and closer to that of households; Annex Table A.15. (by Stefan Speck) pp. 288 in M.S. Andersen and P. Ekins, eds. (2009) *Carbon-energy taxation: lessons from Europe*, Oxford University Press.

⁷³⁸ A cap of 0.8 per cent of their annual product sales value.

⁷³⁹ Swedish National Audit Office (2012) Climate taxes: Who pays ?, Stockholm p 71
http://www.riksrevisionen.se/PageFiles/16431/RiR_2012_01_Rapport_ENG_anpassad_NY.pdf.

⁷⁴⁰ The relief for ETS installations has been partly compensated by increasing carbon-energy taxes for non-ETS sectors with €485 million.

⁷⁴¹ European Commission, 2008, State aid case N22/2008 – Sweden: CO₂-tax reduction for fuel used in installations covered by ETS, C(2008)1917.

⁷⁴² Åsa Löfgren et. al. (2013) The effect of EU-ETS on Swedish industry’s investment in carbon mitigating technologies, Working papers in economics no. 565, University of Gothenburg: Department of Economics. https://gupea.ub.gu.se/bitstream/2077/32649/1/gupea_2077_32649_1.pdf

⁷⁴³ International Energy Agency (2013) Energy policies of IEA countries: Sweden, Paris.

In comparison about 50 companies made use of the initial exemption mechanism under the CO₂ tax.⁷⁴⁴

- The reform of energy and carbon taxation has scheduled a phasing out of certain exemptions towards 2015. It provides for a doubling of the CO₂ tax for non-ETS business sectors from 2015.⁷⁴⁵ The Commission's state aid approval furthermore implies that the relief scheme for ETS-sectors is time-limited with expiry due by the end of 2017, though an extension to this is likely to be approved.

➤ **Transport Taxes:**

- There is a circulation tax on passenger vehicles in Sweden for new cars registered from 2006. The tax is differentiated according to CO₂ emissions. The annual base tax in 2014 is SEK 360 (€42) per vehicle with an additional penalty of SEK 250 (€29) for diesel cars registered from 1st January 2008 and SEK 500 (€58) for older diesel cars. The CO₂ component is linear and set, for 2014, at SEK 20 (€2.3) per g CO₂ per km emitted above 117 g CO₂ per km, whereas cars below the threshold are exempt. For diesel cars a multiplier of 2.33 applies.
- Since 2010, low-emission cars (including Euroclass 5 and 6) have been given a 5-year exemption from the circulation tax.
- Sweden introduced a sales (registration) tax on motor vehicles in 1955, which was gradually abolished over the period 1996 to 2000, with the purpose of trying to renew the car fleet and thereby improving the environmental performance of the cars on the road. It generated about €230 million in annual revenues. A comparable revenue stream today flows from a levy on traffic insurances.
- In 1998, Sweden joined the Eurovignette club, whereby an annual road user charge is levied on heavy duty vehicles. In Sweden it applies to vehicles of more than 12 tonnes. Foreign vehicles are liable when driving on motorways and certain highways. Charging depends on weight only and may go up to €1,500; annual revenues are less than €100 million. The scheme is not distance-based. Heavy and light-duty vehicles are subject to a weight-based circulation tax.
- Stockholm implemented an urban congestion tax during a trial period between 2005 and 2006, and a permanent tax followed from 1st August 2007. Revenues are included on Eurostat's national tax list. A comparable tax was introduced in Gothenburg in 2013. Annual revenues amount to about SEK 810 (€93) million in 2012, SEK 1 490 (€172) million in 2013..

➤ **Pollution and Resource Taxes:**

⁷⁴⁴ Nordic Council of Ministers (2002) The use of economic instruments in Nordic environmental policy 1999-2001, p.100, Copenhagen; Naturvårdsverket (1997) Miljöskatter i Sverige, Stockholm, p. 50.

⁷⁴⁵ A detailed overview is available in Swedish National Audit Office (2012) Climate taxes: Who pays ?, Stockholm p 71

http://www.riksrevisionen.se/PageFiles/16431/RiR_2012_01_Rapport_ENG_anpassad_NY.pdf.

- A tax on pesticides (“Skatt på bekämpningsmedel”) applies in Sweden. The tax is payable by all manufacturers and importers of pesticides. A tax rate of SEK 30 (€3.48) per kilogram of active ingredient of the pesticide applies. Revenue from the tax was about SEK 60 million (€7 million) in 2012.⁷⁴⁶
- Landfilling of waste in Sweden is subject to a landfill tax. A tax rate of SEK 435 (€50.40) per metric tonne of waste applies. The tax raised SEK 198 million (€22.9 million) in 2012.⁷⁴⁷ From 2006 to 2010 an incineration tax was in place based on the fossil fuel equivalents of waste, with an energy tax rate of SEK 150 (€17.34) per tonne carbon content.⁷⁴⁸
- A tax is charged on the extraction of gravel in Sweden. A tax rate of SEK 13 (€1.50) per metric ton of gravel applies, this is payable by all natural or legal persons who exploit a gravel pit. Revenue from the tax was SEK 167 million (€19.34 million) in 2012.⁷⁴⁹
- A tax on sulphur came into force in 1995. The tax applies to a wide range of solid and liquid fuels: peat, petrol, diesel oil, liquefied petroleum gas, methane, natural gas, coal, petroleum coke, mineral oil, and any other products used as fuel or for heating. A tax rate of SEK 30 (€3.48) per kg of sulphur in the fuel applies to solid and gaseous fuels. For liquid fuels, a rate of SEK 27 (€3.13) per m³ of oil for each tenth of a percent by weight of the sulphur content applies. The tax raised in 2012 was SEK 29 million (€3.4 million).⁷⁵⁰
- NO_x emissions are subject to a refunded levy in Sweden. A rate of SEK 50 (€5.79) per kg of NO_x emissions applies; this is payable by all operators of energy-producing plants.⁷⁵¹ The levy is refunded to those paying the levy so there is no revenue from the levy.
- In Sweden, all oil spills are subject to a water pollution fee. The tax basis is the number of ‘basic amounts’. These are calculated according to the size

⁷⁴⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=528/1388754970&taxType=Other+indirect+tax

⁷⁴⁷ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=530/1388754969&taxType=Other+indirect+tax

⁷⁴⁸ Lag om ändring i lagen om skatt på energi, SFS 2006:592
<http://www.notisum.se/rnp/sls/sfs/20060592.pdf>

⁷⁴⁹ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=513/1388754968&taxType=Other+indirect+tax

⁷⁵⁰ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=512/1388754968&taxType=Other+indirect+tax

⁷⁵¹ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicinst/queries/QueryResult_2.aspx?Key=0e026cc8-9f1e-487f-9f9f-c3430eb94f37&QryCtx=1&QryFlag=3

of the oil spill and the size of the ship. The tax rate is adjusted each year, in 2000 the tax rate per basic amount was SEK 36,600 (€4,240).⁷⁵²

- A waste management fee is charged on batteries. Rates vary from SEK 30 (€3.48) to SEK 500 (€57.92) depending on the type of battery.⁷⁵³ It is unclear that this should be considered a tax since it is used to fund collection and management of used batteries.
- A charge is levied on the excavation of peat in Sweden. A yearly fee is charged, this varies from SEK 1,750 (€203) to SEK 17,500 (€2,027) according to the amount of material permitted for abstraction.⁷⁵⁴
- All aeroplane landings are subject to a noise related charge. The charge is set individually for each type of aeroplane and also varies between airports. Aeroplanes weighing less than 9 tonnes are exempt from this charge.⁷⁵⁵
- Waste water user charges are in place in Sweden. The charge usually consists of one fixed part and one part that varies according to water consumption. The rate varies by municipality.⁷⁵⁶

19.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in Sweden. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

19.2.1 Current Status of EFR

Sweden was in 1990 the first country to introduce a tax shift whereby environmentally-related taxes substituted taxes on labour. In 2001 a renewed reform programme was introduced to reallocate taxes from labour to environmentally harmful activities. The main change was that the carbon tax was increased, but other taxes were adjusted too,

⁷⁵² OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_4.aspx?Key=df41df7-994f-45f6-962a-6f94dc99f060&QryCtx=3&QryFlag=3

⁷⁵³ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_4.aspx?Key=df41df7-994f-45f6-962a-6f94dc99f060&QryCtx=3&QryFlag=3

⁷⁵⁴ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_4.aspx?Key=df41df7-994f-45f6-962a-6f94dc99f060&QryCtx=3&QryFlag=3

⁷⁵⁵ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=0e026cc8-9f1e-487f-9f9f-c3430eb94f37&QryCtx=1&QryFlag=3

⁷⁵⁶ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=0e026cc8-9f1e-487f-9f9f-c3430eb94f37&QryCtx=1&QryFlag=3

including those for vehicles, waste and pesticides. Of the €3.2 billion revenue shift announced in 2001 about €2.2 billion had been accomplished before the following government introduced a stand-still.

Despite the ambitious reform programme revenues from environmentally-related taxes could not keep pace with increases in GDP. Hence, since 2001, in Sweden, environment-related taxes as a share of GDP have not increased. Partly this was due to the behavioral impacts of taxes, and the fuel shifting within the domestic heating sector away from fossil fuels. Also the relative advantages for diesel vehicles eroded revenues from the higher-taxed petrol vehicles as the vehicle stock changed. Finally the economic recession plays a role too.

There has been a focus on removing, or limiting, exemptions, and reductions in tax rates for carbon and energy. A package agreed in 2009 aims at limiting these, stepwise, up to 2015, with the biggest reductions to materialize in the final year.

Biofuels have become an important element in Swedish energy supply, but despite being so, they are generally not taxed for energy content. As a result, about half of the carbon-related emissions in Sweden are facing a zero-rate tax. Peat in particular is of some concern, as it plays key role in substituting for fossil fuels in ETS-sectors. The removal of the incineration tax also means that even the fossil element of the energy in waste remains untaxed.

Sweden's green tax shifting seems to have lost some momentum. The shares of taxes related to transport remain fairly modest and so are the taxes related to pollution and resources.

19.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in Sweden. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€17.6 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for gas oil (€4.7 per GJ). Finally, the rates for heating fuels are equalised using the minimum rate for non-business use of coal at €10.92 per GJ.
- Electricity is equalised at the household rate of around €8.95 per GJ.
- Table 19-3 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are

derived see the Good Practice section above. The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.

Table 19-3: Existing and New Rates Based upon Proposed Revisions to ETD

Energy Tax	Units	Suggested Rates	Proposed Rates in 2015
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	622	622
Light fuel oil (diesel)	€ per 1000 litre	672	533
LPG (propellant)	€ per 1000 kg	868	357
Kerosene	€ per 1000 litre	675	533
Natural gas (prop)	€ per GJ	19	6
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	217	217
Kerosene	€ per 1000 litre	218	217
LPG	€ per 1000 kg	274	177
Natural gas	€ per GJ	5.80	3
Business Heating			
Gas oil	€ per 1000 litre	436	217
Heavy fuel oil	€ per 1000 kg	499	136
Kerosene	€ per 1000 litre	438	217
LPG	€ per 1000 kg	560	177
Natural gas	€ per GJ	12.04	3.3
Coal	€ per GJ	12.81	3.8
Non-Business Heating			
Gas oil	€ per 1000 litre	436	429
Heavy fuel oil	€ per 1000 kg	499	452
Kerosene	€ per 1000 litre	438	429
LPG	€ per 1000 kg	560	473
Natural gas	€ per GJ	12.04	8.84

Energy Tax	Units	Suggested Rates	Proposed Rates in 2015
Coal	€/per GJ	12.81	12.81
Electricity			
Electricity - business use	€ per MWh	32.23	0.55
Electricity - non-business use	€ per MWh	32.23	32.23

➤ **Transport Taxes:**

- Vehicles:** Sweden has, at 133.3g CO₂ per km, a relatively high average emission level for new passenger cars and it is still above the EU target of 130g to be achieved by 2015.⁷⁵⁷ The transport sector accounts for 45% of total GHG-emissions within the country,^{758,759} but the taxes on transport in Sweden are lower than average in the EU-28 (0.45% of GDP compared to an average of 0.54% GDP), partly because Sweden no longer has a registration tax for vehicles. There is scope to increase vehicle taxes to the tune of 1.08% of GDP. It is suggested that Sweden should either increase its circulation tax in line with the Commission's 2005 proposal on passenger related taxes.⁷⁶⁰ It could also consider seeking to incorporate other elements than CO₂ in the tax base, and reducing the level (117 g CO₂ per km) at which the CO₂ element falls to zero.

For heavy-goods vehicles the opportunities for distance-based road-pricing that factor in the issues of air pollution and noise, in line with the 2011 Euro-vignette Directive, could be implemented, as also recommended by IEA.⁷⁶¹

- Aviation:** an aviation tax was agreed in 2006, but suspended before implementation. It is suggested that an aviation tax on air passenger flights and on air freight reflecting external costs other than carbon (noise, air pollution) could be implemented. The suggested rates for the air passenger tax are €15 per passenger for flights within the country concerned, €25 per passenger for flights to other countries in the European Union, and €50 per passenger for flights to countries outside the European Union. The suggested air transport tax rate is €1.25 per tonne of

⁷⁵⁷ European Environment Agency (2012) *Monitoring CO₂ emissions from new passenger cars in the EU: summary of data for 2012*, Copenhagen.

⁷⁵⁸ IEA (2013) *Energy policies in IEA countries: Sweden*, Paris.

⁷⁵⁹ About 33% for domestic transport and 12% for non-domestic maritime and aviation.

⁷⁶⁰ European Commission (2005) *Proposal for a Council directive on passenger car related taxes COM(2005)261 final*.

⁷⁶¹ European Environment Agency (2013) *Road user charges for HGV – tables with external costs of air pollution*, EEA Technical Report 1/2013, Copenhagen; International Energy Agency (2013) *Energy policies of IEA countries: Sweden*, p13.

freight. For the purposes of this study the suggested year of implementation is 2016.

➤ **Pollution and Resource Taxes:**

- **Waste:** the tax has been supporting more recycling of waste. Waste taxes provide incentives for improved waste management, and the meeting of targets under Article 11 of the Waste Framework Directive. Further development of the Swedish waste tax would help drive changes in the waste management sector needed to meet EU targets in 2020 and give support to the application of the waste hierarchy. It is suggested that tax base is expanded to include incineration at a rate of at least €15 per tonne by 2017.
- **Air pollution:** It is suggested that in order to generate improvements in air quality the tax rates on air pollution are complemented with new taxes on emissions of primary particles and VOC's:
 - VOC €1,000 per tonne
 - PM_{2.5} €2,000 per tonne

Given the novelty of the tax rates it is suggested that there is a transition period from 2016 to maximum levels by 2020. The rates are then held constant in real terms. Part of the revenues could accrue to the national budget.

- **Water abstraction for public water supply:** To improve efficiency in the usage of the water supply system, in particular the high leakage rates, it is suggested to adjust tax rates in-line with the good practice rates set out in Section 5.3.5. With relative price levels in Sweden this would imply rates of €0.65 per m³ for non-business and €0.50 per m³ for business purposes. Given the magnitude of the increase in rates a transition period from 2016 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms. Part of the revenues could accrue to the national budget.
- **Waste water:** Sweden has no levy on direct discharges of water pollution from industry and treatment plants. To improve prevention of water pollution, improve compliance and to better reflect environmental burdens it is suggested that such a tax be introduced with rates in-line with good practice (see Section 5.3.6). With relative price levels in Sweden this would imply a rate of €3.25 per kg BOD. For fresh-water discharges phosphorus should also be charged, while for coastal discharges a charge on nitrogen may well be relevant. A transition period from 2016 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms. Part of the revenues could accrue to the national budget.
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes

an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

As noted above, Sweden already has a tax on pesticides (“Skatt på bekämpningsmedel”), which is set at a rate of SEK 30 (€3.48) per kilogram of active ingredient. It is suggested that the tax rate be extended to a rate of €5 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this, the rate is kept constant in real terms. Such a tax, especially if banded according to the potential effects of different active ingredients (as in Norway and Denmark), could be linked to the risk indicators to be developed under the National Pesticide Action Plan.

- **Packaging:** A small number of Member States have implemented packaging taxes for packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested to apply the following good practice rates to all packaging placed on the market in Sweden:
 - Paper and card €0.07 per kg
 - Plastic €1.40 per kg
 - Wood €0.07 per kg
 - Metallic €1.69 per kg
 - Glass €0.25 per kg
- **Plastic bag tax:** There is currently no tax on single-use plastic bags in Sweden. Plastic bags cause many environmental problems when littered in the environment, especially when they end up in the marine environment. Taxing single-use plastic bags significantly influences consumers purchasing of these bags, by stimulating a switch to reusable bags. Moreover, in 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.⁷⁶² Therefore, it is suggested that Sweden implements a tax on single-use plastic bags at a rate of €0.13 per bag from 2016, and following this to keep the rate constant in real terms.
- **Fertilisers:** Reintroducing a tax on the use of nitrogen in mineral fertilisers is suggested at a rate of €0.20 per kg N from 2016. This tax rate would reflect relative price levels for Sweden relevant to EU schemes under the CAP, and support the prevention of groundwater contamination, ammonia evaporation, emissions of greenhouse gases and surface water eutrophication.

⁷⁶² DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

19.2.3 Summary of Revenue Outcomes

Table 19-4 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 19-4: Potential Additional Revenue from Environmental Fiscal Reform in Sweden, million SEK (real 2014 terms)⁷⁶³

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	69	274	477
C&I / Heating	44	170	289
Electricity	1,553	1,553	1,553
<i>Sub-total Energy, million SEK</i>	<i>1,666</i>	<i>1,997</i>	<i>2,318</i>
<i>Sub-total Energy, % GDP</i>	<i>0.04%</i>	<i>0.05%</i>	<i>0.06%</i>
Transport Taxes			
Vehicle Taxes	8601	34,421	43,125
Passenger Aviation Tax	4,219	8,900	10,207
Freight Aviation Tax	0.67	1.20	1.03
<i>Sub-total Transport, million SEK</i>	<i>12,821</i>	<i>43,322</i>	<i>53,333</i>
<i>Sub-total Transport, % GDP</i>	<i>0.32%</i>	<i>1.09%</i>	<i>1.34%</i>
Pollution and Resource Taxes			
Landfill Tax - Inerts (C&D)	3	2	2
Incineration /MBT Tax	99	117	124
Air Pollution Tax	191	399	354

⁷⁶³ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
Water Abstraction Tax	1,099	2,580	2,548
Waste Water Tax	322	450	450
Pesticides Tax	43	76	73
Packaging Tax	335	323	336
Single Use Bag Tax	1309	278	307
Fertiliser Tax	0.133	0.244	0.229
<i>Sub-total Pollution & Resource, million SEK</i>	<i>3,400</i>	<i>4,228</i>	<i>4,194</i>
<i>Sub-total Pollution & Resources, % GDP</i>	<i>0.09%</i>	<i>0.11%</i>	<i>0.11%</i>
Total Environmental Taxes			
Total, million SEK	17,886	49,547	59,845
Total Increase, % GDP	0.45%	1.24%	1.50%

Table 19-5 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 19-5: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in Sweden, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	137
Increased Cost Recovery for Water Use	1,422
Total	1,559

19.2.4 Environmental Benefits

Table 19-6 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.17.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, SEK 1.8 billion of benefits are anticipated annually by 2025 in real terms.

Table 19-6: Monetised Environmental Benefits from Implementation of Suggested Taxes in Sweden, million SEK (real 2014 terms)⁷⁶⁴

Tax Type	2017	2020	2025
Energy Taxes	148	155	161
Transport Taxes (excluding transport fuels)	69	143	158
Pollution and Resource Taxes	321	1,267	1,507
Total, million SEK	539	1,565	1,826
Total, % GDP	0.01%	0.04%	0.04%

19.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in Sweden:⁷⁶⁵

- In 2012, environmental taxes generated revenue equivalent to 2.49% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in Sweden. These could generate SEK 17.9 billion in 2017 (EUR 2.0 billion), rising to SEK 59.9 billion in 2025 (EUR 6.6 billion) (both in real 2014 terms). This is equivalent to 0.45% and 1.50% of GDP in 2017 and 2025, respectively.
- The largest single contribution to revenue comes from the suggested increase in vehicle taxes. This accounts for SEK 43.2 billion by 2025 (EUR 4.8 billion) (real 2014 terms), equivalent to 0.93% of GDP.
- The next largest contribution to revenue comes from the proposed passenger aviation tax. This accounts for SEK 10.2 billion by 2025 (EUR 1.1 billion) (real 2014 terms), equivalent to 0.22% of GDP.
- The water abstraction tax would account for SEK 2.5 billion by 2025 (EUR 0.3 billion) (real 2014 terms), equivalent to 0.05% of GDP.
- Revenue potential from the suggested harmonisation of electricity taxes would raise SEK 1.5 billion by 2025 (EUR 0.2 billion) (real 2014 terms), equivalent to 0.03% of GDP.

⁷⁶⁴ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

⁷⁶⁵ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

- A waste water tax has also been suggested. This would contribute SEK 0.5 billion by 2025 (EUR 0.0 billion) (real 2014 terms), equivalent to 0.01% of GDP.
- In addition, a range of more minor taxes on could generate revenue of SEK 1.9 billion by 2025 (EUR 0.2 billion) (real 2014 terms), equivalent to 0.04% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around SEK 1.8 billion by 2025 (EUR 0.2 billion) (real 2014 terms), equivalent to 0.04% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €1.6 billion per annum could be raised in addition to the above.

20.0 United Kingdom

20.1 Country Overview

20.1.1 Key Facts about the Economy and Tax System

- The United Kingdom experienced strong economic growth throughout the period from 2003 to 2007, with GDP increasing by an average of 3.3% per annum in real terms. With the onset of the financial downturn, 2008 and 2009 were both years of negative growth, with 2009 proving the trough of the recession with a 5.2% real terms decrease in GDP on the previous year. There has been muted growth in all years since 2010, with GDP increasing annually by an average of 1.2% in real terms between 2010 and 2013.⁷⁶⁶
- The United Kingdom's overall tax revenue (including social contributions) as a percentage of GDP is just below the EU-28 average of 39.8%, at 37.3% (2012). Overall, this percentage share has increased over the past 10 years—it was 36.3% in 2002—but was at its highest in 2008 at 38.7%.⁷⁶⁷
- Total tax revenue in the United Kingdom is composed of 40.7% direct taxation, 36.8% indirect taxation, and 22.5% social contributions (2012). Over the past 10 years, all three tax revenue streams have fluctuated, with direct taxation experiencing the greatest change, rising from 43% in 2002 to 47% of the total tax take in 2008 before declining to its present share.⁷⁶⁸
- In 2012, environmental taxes amounted to 2.62% of the United Kingdom's GDP. Overall, this percentage share has fallen overall the past 10 years from 2.7% in 2002, but has risen again since 2006 when revenues dipped to a low of 2.38% of GDP.⁷⁶⁹
- In 2012, the United Kingdom derived the majority of its revenue from environmental taxes from the taxation of energy, with these revenues amounting to 1.9% of GDP. In the same year, taxes placed on transport (excluding fuel) amounted to 0.63% of GDP, and taxes placed on pollution and resource 0.09% of GDP.⁷⁷⁰

⁷⁶⁶ Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 2nd September 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

⁷⁶⁷ Eurostat (2013) *Main National Accounts Tax Aggregates* [gov_a_tax_ag], Accessed 2nd September 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG

⁷⁶⁸ Ibid.

⁷⁶⁹ Eurostat (2014) *Environmental tax Revenues* [env_ac_tax], Accessed 2nd September 2014 http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=ENV_AC_TAX

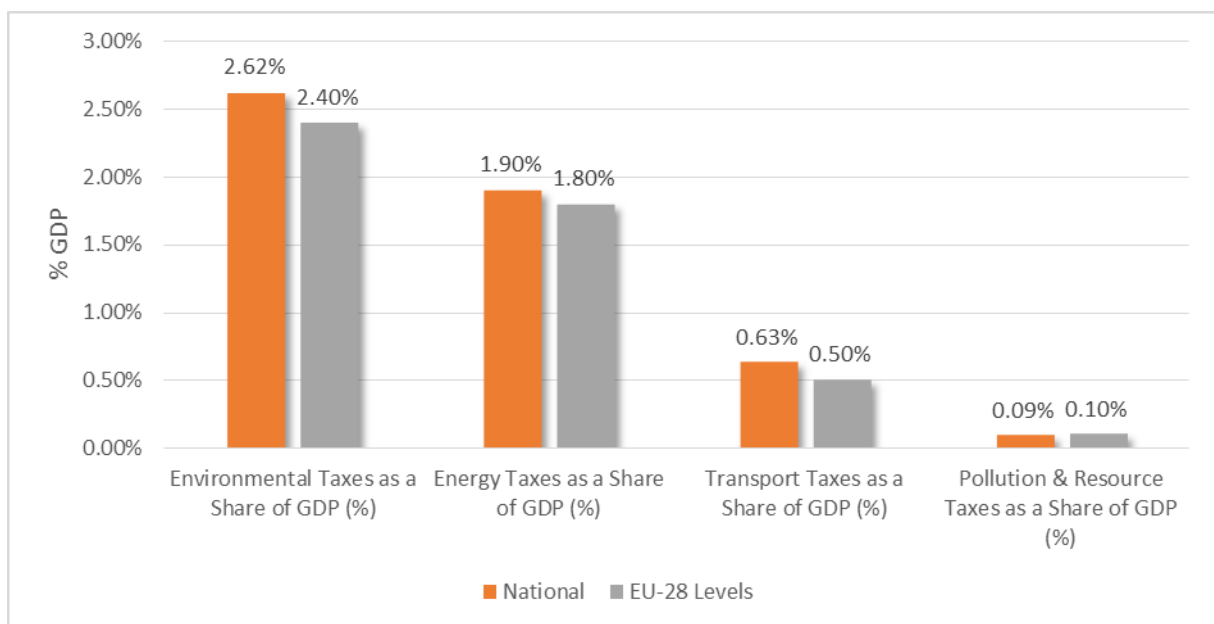
⁷⁷⁰ Ibid.

- Taxes placed on energy made up 72.5% of the United Kingdom's total environmental tax revenue in 2012. Over the past 10 years, this percentage has been steadily falling from 79.3% in 2002.⁷⁷¹

20.1.2 Relative Position within the EU

- Expressed as a proportion of GDP, in 2012 the revenue derived from environmental taxes by the United Kingdom was above the EU-28 average of 2.4%. For both energy and transport (excluding transport) taxation as a share of GDP revenue was above the EU-28 respective averages of 1.8% and 0.5%. The GDP percentage share for revenue from taxation of pollution and resource was slightly below the EU-28 average of 0.1% (see Figure 20-1).⁷⁷²

Figure 20-1: Environmental Taxes in the United Kingdom as a % of GDP vs EU-28 Levels (2012)



- Comparing the revenue generated by environmental taxation as a percentage share of GDP against the same measure for other Member States, the United Kingdom ranked 12th in the EU-28 for 2012. It also ranked 12th for the GDP share individual tax stream contributions from transport (excluding fuel) taxes and pollution and resource taxes. It ranked slightly lower for the proportion of GDP coming from energy taxes, at 14th place (see Table 20-1).⁷⁷³

⁷⁷¹ Ibid.

⁷⁷² Ibid.

⁷⁷³ Ibid.

Table 20-1: Ranking of the United Kingdom's Position in EU-28 (2012)

Measure	Ranking
Environmental Taxes as a Share of GDP (%)	12
Energy Taxes as a Share of GDP (%)	14
Transport Taxes (excl. transport fuels) as a Share of GDP (%)	12
Pollution & Resource Taxes as a Share of GDP (%)	12

Source: based on Eurostat data

20.1.3 Existing Environmental Taxes

The full structure and rates for each tax, as well as full references, are given in Appendix A.18.0 (see separate document). This section summarises key aspects of the main environmental taxes, and describes, in the case of energy, how the rates compare with European averages, and the minimum rates set out in the existing Energy Tax Directive (ETD) (2003/96/EEC). All exchange rates are annual averages taken from Eurostat, revenue figures are given in nominal terms and % of GDP figures are based upon nominal GDP figures for the same year as the reported revenues.^{774,775}

➤ Energy Taxes:

- The United Kingdom's excise duties on fuels ("Hydrocarbon Oil Duties") are shown in Table 20-2, alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 20-2: Standard Rates of Excise Duties on Fuels in the United Kingdom

Excise Duty	Unit	Rate Applied in the United Kingdom	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol ¹	per 1000 litres	GBP 676.70 (€796.81)	€421	€585	€583
Unleaded Petrol ¹	per 1000 litres	GBP 579.50 (€682.35)	€359	€519	€509

⁷⁷⁴ Eurostat (2013) *ECU/ECR Exchange Rates versus National Currencies*, Accessed 7th January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tec00033&plugin=1>

⁷⁷⁵ Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Excise Duty	Unit	Rate Applied in the United Kingdom	Existing ETD Minimum	EU-28 Average	EU-28 Median
Aviation Gasoline	per 1000 litres	GBP 377.00 (€443.91)	-	-	-
Gas Oil (Diesel) ¹	per 1000 litres	GBP 579.50 (€682.36)	€330	€427	€405
Kerosene	per 1000 litres	GBP 579.50 (€682.36)	€330	€440	€405
Liquid Petroleum Gas	per 1000 kg	GBP 316.10 (€372.21)	€125	€209	€180
Natural Gas	per GJ	GBP 5.67 (€6.68)	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel) ¹	per 1000 litres	GBP 111.40 (€137.07)	€21	€221	€163
Kerosene	per 1000 litres	GBP 111.40 (€137.07)	€21	€283	€330
Liquid Petroleum Gas	per 1000 kg	N/A	€41	€126	€125
Natural Gas	per GJ	N/A	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel) ¹	per 1000 litres	GBP 111.40 (€137.07)	€21	€221	€163
Kerosene	per 1000 litres	N/A	€0.00	€270	€330
Heavy Fuel Oil	per 1000 kg	GBP 107.00 (€125.99)	€15	€70	€25
Liquid Petroleum Gas	per 1000 kg	N/A	€0.00	€82	€40
Natural Gas	per GJ	N/A	€0.15	€1.36	€0.46
Coal and Coke	per GJ	N/A	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel) ¹	per 1000 litres	GBP 111.40 (€137.07)	€21	€179	€125
Kerosene	per 1000 litres	N/A	€0.00	€279	€330
Heavy Fuel Oil	per 1000 kg	GBP 107.00 (€125.99)	€15	€85	€26
Liquid Petroleum Gas	per 1000 kg	N/A	€0.00	€111	€42

Excise Duty	Unit	Rate Applied in the United Kingdom	Existing ETD Minimum	EU-28 Average	EU-28 Median
Natural Gas	per GJ	N/A	€0.30	€2.04	€0.94
Coal and Coke	per GJ	N/A	€0.30	€1.77	€0.32
Electricity					
Business Use	per MWh	N/A	€0.50	€8.42	€1.03
Non-Business Use	per MWh	N/A	€1.00	€14.53	€2.06

Source: DG TAXUD (2014) *Excise Duty Tables (Part II – Energy products and Electricity)*, Situation as at 1 July 2014,

http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- All of the rates of excise duty shown in Table 20-2 are above the ETD minimum. For transport fuels all of the UK rates exceed the EU-28 average and median, whereas rates on the use of motor fuels are significantly lower. Duties on heating (both business and non-business use) are lower than the average and median for the use of gas oil, but higher for heavy fuel oil.
- The main exemptions to the duty include: oil used in marine craft (except private pleasure craft), oil used as refinery fuel, oil used in blast furnaces, heavy oil used for horticultural purposes and heavy oil used in electricity generation.
- Revenue in 2013 from the Hydrocarbon Oil Duty was £26.7 (€31.4) billion, equivalent to 1.65% of GDP.⁷⁷⁶
- Coal, coke, electricity and non-propellant uses of LPG and natural gas all fall outside of the remit of the Hydrocarbon Oils Duty. Business use of these products is charged under the Climate Change Levy (CCL), which is made up of two rates, the main rates and the Carbon Price Support (CPS) rates, the latter being introduced in April 2013 as part of the scheme to introduce a Carbon Price Floor (CPF) related to the price of carbon used in power generation.⁷⁷⁷
- Fuels liable to the main rates of CCL are: electricity, natural gas, LPG and solid fuels. Businesses can receive a reduction on the main rates of CCL if they are an energy intensive business and have entered into a Climate Change Agreement (CCA) with the relevant regulatory agency. Exemptions

⁷⁷⁶ Table 2 in HMRC (2014) *Hydrocarbon Oils Bulletin June 2014*, 22 July 2014, Accessed 19th August 2014, <https://www.uktradeinfo.com/Statistics/Pages/TaxAndDutyBulletins.aspx>

⁷⁷⁷ United Kingdom Government (2014) *Green Taxes, Reliefs and Schemes for Businesses*, Accessed 19th August 2014, <https://www.gov.uk/green-taxes-and-reliefs/climate-change-levy>

can be claimed if these fuels are: not being used in the United Kingdom, the electricity is generated from renewable sources or they are used in particular types of transport.

- The CPS rates are applied to businesses and organisations using fossil fuels to generate electricity, to encourage the use of low carbon technology. This is known as the Carbon Price Floor. Fuels liable to these rates are: natural gas, LPG, gas oil, fuel oil, coal and other taxable solid fuels.
- Revenue in 2013 from CCL (including CPF) was £1.06 billion (€1.25 billion), equivalent to 0.07% of GDP.⁷⁷⁸ Prior to the introduction of CPF in April 2013, electricity was by far the largest component of total CCL declared, accounting for around 70% to 75% of total declared. Solid and other fuels CCL and CPF declarations now make up the highest proportion of CCL and CPF declared, at around 45% because the CPF is charged on fuel use, not on electricity use. At present it is not possible to provide a breakdown of CCL and CPF individually as the amounts are recorded on the same box of the CCL form.
- The CRC Energy Efficiency scheme is a mandatory carbon reporting and pricing scheme operating in the United Kingdom. The scheme, currently in Phase 2 which runs from 2014 to 2019, requires all organisations consuming over 6,000 MWh of qualifying electricity during a qualification year to comply.⁷⁷⁹ Participants must buy and surrender allowances for each tonne of CO₂ emitted. These can be bought either at the beginning of the reporting year (forecast sale), or after reporting (buy to comply).
- The cost of CRC allowances for 2014/15 are as follows:
 - Forecast sale: £15.60 (€18.37) per tCO₂
 - Buy to comply sale: £16.40 (€19.31) per tCO₂

➤ **Transport Taxes (excluding transport fuels):**

- Registration tax:
 - Vehicles registered for the first time on the Driver and Vehicle Licensing Agency (DVLA) records are required to pay a fee of £55 (€64.76). The fee is designed to cover the administrative costs associated with the registration of the vehicle throughout its life and thus, strictly speaking, is not an environmental tax. Exemptions include: those first registered and licensed in the disabled exempt

⁷⁷⁸ Table 2 in HMRC (2014) *Climate Change Levy and Carbon Price Floor Bulletin April 2014*, 28th May 2014, Accessed 19 August 2014, <https://www.uktradeinfo.com/Statistics/Pages/TaxAndDutyBulletins.aspx>

⁷⁷⁹ United Kingdom Government (2014) *CRC Energy Efficiency Scheme*, 29 July 2014, <https://www.gov.uk/government/policies/reducing-demand-for-energy-from-industry-businesses-and-the-public-sector-2/supporting-pages/crc-energy-efficiency-scheme>

taxation class, vehicles registered for off-road use only and vehicles previously registered in Northern Ireland.⁷⁸⁰

- Circulation taxes:
 - Vehicle Excise Duty (VED), also referred to as vehicle tax, is levied on most vehicle types used on public roads in the United Kingdom. For cars registered on or after 1st April 2010, a different rate is applied for the vehicle's first year. This ranges from £0 to £1,090 (€1,283.47), depending on fuel type and CO₂ emissions.⁷⁸¹ Thereafter, the rate of vehicle tax for cars registered on or after 1st March 2001 ranges from £0 to £500 (€588.75). For cars registered before 1st March 2001, the rate is based on engine size (cc) and ranges from £145 (€170.74) to £230 (€270.82). Other VED rates apply to other types of vehicles, including: light goods vehicles, motorcycles, tricycles, heavy goods vehicles, busses, recovery vehicles and haulage vehicles. Exemptions from the duty include: vehicles used by disabled persons, electric vehicles, steam vehicles and vehicles used only for agriculture, horticulture and forestry. Revenue from the VED in 2012 was £5.87 (€6.91) billion, equivalent to 0.36% of GDP.⁷⁸²
 - A road user levy for HGVs weighing 12 tonnes or more was introduced on 1st April 2014. Paid alongside VED, levy amounts range from £85 (€100.09) to £1,000 (€1,177.50) per year according to the vehicle's weight, axle configuration and levy duration.⁷⁸³ The HGV Road User Levy is in part a response to the view that domestic hauliers pay of the upkeep of UK roads whilst foreign hauliers do not. UK based hauliers are paying the levy progressively from 1st April 2014 as they pay VED, and foreign hauliers will pay from 1st April 2015. UK HGVs will see VED reduced accordingly so that broadly speaking, they are no worse off. As such, the revenue contribution is expected to come only from foreign hauliers, who are not obliged to pay VED.
- Other vehicle taxes:
 - The United Kingdom imposes user charges in some parts of the country in the form of road pricing. In London, Transport for London has imposed a charge per weekday on most vehicles being used in

⁷⁸⁰ United Kingdom Government Website: *Vehicle Registration*, Accessed 15th August, <https://www.gov.uk/vehicle-registration/new-registrations-fee>

⁷⁸¹ United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

⁷⁸² European Commission (2013) *Taxes in Europe Database*, Accessed 19th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=576/1388754985&taxType=Other+indirect+tax

⁷⁸³ United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

Central London. The charge for entering the zone is £11.50 (€13.54) per vehicle per day, and the charge generated revenue of £235 (€276.71) million in 2013/14, equivalent to 0.01% of GDP.⁷⁸⁴ ⁷⁸⁵ In Durham, a similar scheme has been put in place by the Council. The charge for entering the designated zone is £2.00 (€2.35) per vehicle.⁷⁸⁶ Thirdly, the M6 motorway toll road in the West Midlands region charges motorists for its use, with tolls depending on the class of vehicle and time of day.⁷⁸⁷

- It is also notable that the Mayor of London has proposed an Ultra Low Emissions Zone (ULEZ) in the capital, on top of the existing scheme, to tackle the problem of air pollution. Under the scheme, which has been proposed to come into force by 2020, almost all the vehicles running during the operating hours would be either zero or low emission. A public consultation on the ULEZ is due to take place in autumn 2014.⁷⁸⁸

- **Aviation taxes:**

- Air Passenger Duty (APD) is due on aircraft that depart from airports in the United Kingdom and carry passengers. The amount is related to the number of chargeable passengers, the classes of travel on offer and the destination. Rates range from £13 (€15.31) to £388 (€456.87) per flight in 2014, though the 4-band scheme which exists at present will be reduced to a 2-band scheme in 2015.⁷⁸⁹ Exemptions include: emergency or public service flights, short pleasure flights and NATO flights. In 2013, this tax generated revenue of £2.96 (€3.49) billion, equivalent to 0.18% of GDP.⁷⁹⁰

- **Pollution and Resource Taxes:**

- In the United Kingdom, a landfill tax applies to all waste disposed of by way of landfill at a licensed site. The tax is charged by weight, and there are two rates: a standard rate of £80 (€94.20) per tonne and a lower rate of £2.50 (€2.94) per tonne which is levied on 'inert' waste falling under the

⁷⁸⁴ TfL (2014) *Congestion Charge*, Accessed 20th August 2014,

<https://www.tfl.gov.uk/modes/driving/congestion-charge>

⁷⁸⁵ TfL (2014) *Annual Report and Statement of Accounts*, Accessed 20th August 2014,

<http://www.tfl.gov.uk/cdn/static/cms/documents/annual-report-2013-14.pdf>

⁷⁸⁶ Durham County Council (2014) *Durham Road User Charge Zone*, Accessed 20th August 2014,

<http://www.durham.gov.uk/pages/Service.aspx?ServiceId=6370>

⁷⁸⁷ M6toll Website (2014) *Pricing Guide*, Accessed 21st August 2014,

<http://www.m6toll.co.uk/pricing/pricing-guide/>

⁷⁸⁸ TfL (2014) *Ultra Low Emissions Zone*, Accessed 24th September 2014,

<https://www.tfl.gov.uk/modes/driving/low-emission-zone/ultra-low-emission-zone>

⁷⁸⁹ HMRC (2014) *Air Passenger Duty*, Accessed 20th August 2014,

<http://www.hmrc.gov.uk/rates/apd.htm>

⁷⁹⁰ From Table 2 in HMRC (2014) *Air Passenger Duty Bulletin June 2014*, Accessed 20th August 2014,

<https://www.uktradeinfo.com/Statistics/Pages/TaxAndDutyBulletins.aspx>

Landfill Tax (Qualifying Materials) Order 2011.^{791, 792} Exemptions exist for: dredging, mining and quarrying waste, pet cemeteries and waste from visiting forces. In 2013, this tax generated revenue of £1.20 (€1.40) billion, equivalent to 0.07% of GDP.⁷⁹³

- An aggregates levy is levied on the on the commercial exploitation of rock, sand and gravel, due from any business that quarries, dredges or imports these products in the United Kingdom. The rate is £2 (€2.35) per tonne of aggregate.⁷⁹⁴ Material that remains exempt from the levy includes soil and other organic matter. The levy is under examination by the European Courts at present because some of the exemptions applied have been identified as, potentially, a form of State Aid (so these exemptions have been suspended for the time being – most notably, in Northern Ireland, the Aggregates Levy Credit Scheme (ALCS), which allowed for an 80% relief from the full rate of the levy for aggregate extracted from 1st April 2004 to 30th November 2010, has been suspended until further notice). The tax generated revenue of £287 (€338) million in 2013, equivalent to 0.02% of GDP.⁷⁹⁵
- A single use plastic bag charge currently applies in Wales and Northern Ireland at a rate of £0.05 (€0.06) per bag. Small and medium-sized enterprises will be exempt from this charge. A similar charge is soon to be introduced in Scotland (October 2014) and England (October 2015) at the same rate.⁷⁹⁶
- In the United Kingdom, water abstraction charges vary by nation, with the Environment Agency (EA), Natural Resources Wales (NRW), the Scottish Environment Protection Agency (SEPA), and Northern Ireland Environment Agency (NIEA) each setting out different rates and exemptions. Strictly speaking, these are not taxes, but charges designed to cover the costs to the regulator of regulating access to the water resource. Further details on the different schemes can be found in Appendix A.18.0.
- Water discharge activities require a specific permit, dependant on the nature of the activity. These permits and the rates vary by nation and are controlled by each of the enforcement bodies mentioned above.

⁷⁹¹ HMRC (2014) *Landfill Tax*, Accessed 20th August 2014, <http://www.hmrc.gov.uk/rates/landfill-tax.htm>

⁷⁹² The Landfill Tax (Qualifying Material) Order 2011, Accessed 24th September 2014, http://www.legislation.gov.uk/ukxi/2011/1017/pdfs/ukxi_20111017_en.pdf

⁷⁹³ Table 2 in HMRC (2014) *Landfill Tax Bulletin April 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/statistics/pages/taxanddutybulletins.aspx>

⁷⁹⁴ Table 6 in HMRC (2014) *Aggregates Levy Bulletin April 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/statistics/pages/taxanddutybulletins.aspx>

⁷⁹⁵ Table 2 in HMRC (2014) *Aggregates Levy Bulletin April 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/statistics/pages/taxanddutybulletins.aspx>

⁷⁹⁶ United Kingdom Government (2014) *Reducing and managing Waste: Charging for single use plastic carrier bags*, Accessed 20 August 2014, <https://www.gov.uk/government/policies/reducing-and-managing-waste/supporting-pages/charging-for-single-use-plastic-carrier-bags>

20.2 Illustrative Potential of EFR

In this section we first give a synopsis of the current status of Environmental Fiscal Reform in the United Kingdom. This is followed by a summary of suggested changes to existing tax rates and/or suggested applications of new taxes, used as the basis for the calculation of revenue potential. Out-turns from the model regarding revenue projections are then presented, followed by a summary of the monetised environmental benefits.

20.2.1 Current Status of EFR

A 'statement of intent' was made by the previous Labour government shortly after coming to power in 1997 to "explore the scope for using the tax system to deliver environmental objectives" and to "shift the burden of tax from 'goods' to 'bads'". Despite this statement, the share of receipts from environmental taxes fell under Labour from 9.5% in 1997 to 7.9% in 2009. This is despite the fact that a number of taxes were introduced during this period, including the Climate Change Levy and the aggregates tax, and despite significant increases in fuel duties and in the landfill tax.

The Coalition Government's record on environmental taxation has been somewhat mixed. In opposition, the Government had been keen to ensure that the ETS would be more effective, and had considered the case for a carbon price floor. This was duly introduced, and the CPS rates now generate significant revenue for the Treasury as part of the CCL (see above). Furthermore, another instrument which had been widely consulted upon before the Coalition came to power, and which was intended to complement the ETS by targeting emissions which did not fall under the EU-ETS, was the CRC Energy Efficiency Scheme. Not long after coming into office, in 2011, the Government announced that it would no longer be refunding revenue generated from the sale of allowances back to industry, but that it would be using the revenue to support the public finances. In essence, therefore, both measures have enabled some degree of fiscal consolidation in respect of environmental taxes.

On the other hand, where fuel duty has been concerned, the Coalition has been much less willing to raise duty rates further, and to raise additional revenues. The issue of fuel duty has led to significant protests in the past and perhaps mindful of these, but also with the view that higher fuel prices might impact upon growth and competitiveness, the Coalition Government has postponed and cancelled most of the fuel duty escalators which the previous Government had proposed out to 2016. This is clearly illustrated in Table 20-3.

In April 2013, the Treasury noted:⁷⁹⁷

"...the fuel duty increase that was planned for 1 September 2013 was cancelled to support motorists and businesses – fuel duty will have been frozen for nearly 3 and a half years, with pump prices 13p per litre lower from April 2013 than under previously announced plans."

That differential has widened further with the postponement, and then cancellation, of increases that had initially been planned for April 2014.

⁷⁹⁷ HM Treasury (2013) *Policy: Creating a Simpler, Fairer Tax System*, 24 April 2013, <https://www.gov.uk/government/policies/creating-a-simpler-fairer-tax-system>.

Table 20-3: Deferrals and Cancellations of Increases in Fuel Duties

Dates uprating due before Budget 2011	Budget 2011	As 2011	June 2012	As 2012	Budget 2013	As 2013
April 2011	Jan 2012	Aug 2012	Jan 2013	Cancelled	Cancelled	Cancelled
April 2012	Aug 2012	Cancelled	Cancelled	Cancelled	Cancelled	Cancelled
April 2013	April 2013	April 2013	April 2013	Sept 2013	Cancelled	Cancelled
April 2014	April 2014	April 2014	April 2014	Sept 2014	Sept 2014	Cancelled
April 2015	April 2015	April 2015	April 2015	Sept 2015	Sept 2015	Sept 2015
April 2016	April 2016	April 2016	April 2016	April 2016	April 2016	April 2016

Source: James Browne, *Autumn Statement Policy Measures: IFS Autumn Statement Briefing, December 2013*

The simplest summary of current policy on tax is found in the 2013 statement around creating a simpler, fairer tax system:

“The government’s principles for the tax system are:

- *Taxes should be efficient and support growth*
- *Taxes should be certain and predictable*
- *Taxes should be simple to understand and easy to comply with*
- *The tax system should be fair, reward work, support aspiration and ask the most from those who can most afford it”.*

The extent to which a place remains for further shifts in taxation from ‘goods’ to ‘bads’ remains to be seen. The Coalition Government has already reduced a range of taxes, notably corporation tax, to low levels, whilst significant numbers of people have been taken out of income tax altogether as a result of changes in the tax free allowances available to those on high incomes.

In the most recent budget, in April 2014, considerable emphasis was placed upon making sure that energy supplies would be secure and affordable for businesses, reflecting employers’ concerns regarding rising input prices. As a result, a ceiling was placed on the carbon price support (CPS) rates from 2016/17 to 2019/20 so as to limit the potential impact on competitiveness. A further review of CPS rates beyond this period is planned once more is known about the nature of the reforms to the EU-ETS. In addition, the Government announced a number of measures to help *“tackle the energy costs faced by the most energy intensive industries to ensure they are as competitive as possible”*, including compensation for the energy intensive industries for the costs of the CPF and ETS to 2019-20. The Budget report noted:⁷⁹⁸

⁷⁹⁸ HM Treasury (2014) *Budget 2014*, 19 March 2014.

“...this package means that EIs will be compensated for all government policy designed to support low carbon and renewable investment up until 2019-20, saving the average EI up to £19 million by 2018-19”.

A new CPF exemption was also introduced for fuel use in CHP plants used to supply electricity to manufacturing firms. Alongside this, the Government reaffirmed its commitment to low carbon energy.

As announced at Budget 2013, from 1 April 2014 the government will reduce and re-structure VED rates for HGVs within the HGV Road User Levy scheme, as set out in ‘Overview of Tax Legislation and Rates 2014’. Information on United Kingdom bound HGVs will be drawn from the Freight Targeting System to support enforcement of the Levy scheme (Finance Bill 2014).

The coalition agreement contained a pledge to ‘increase the proportion of tax revenue accounted for by environmental taxes’. Having set this target, the Treasury announced, in a July 2012 Press Release, that it was adopting its own definition of environmental taxes, against which it expected its pledge to be measured:⁷⁹⁹

“Environmental taxes are defined as those which meet all of the following three principles:

- 1. the tax is explicitly linked to the government’s environmental objectives*
- 2. the primary objective of the tax is to encourage environmentally positive behaviour change*
- 3. the tax is structured in relation to environmental objectives, for example: the more polluting the behaviour, the greater the tax levied*

Applying these principles, the Treasury has identified the following taxes as environmental, and these will comprise the baseline against which the government’s commitment to increase the proportion of environmental tax revenue will be measured.

The independent Office of Budget Responsibility currently forecasts the proportion of revenue from these taxes doubling by 2015-16.

- *Climate Change Levy*
- *Aggregates Levy*
- *Landfill Tax*
- *EU Emissions Trading System (EU ETS)*
- *Carbon Reduction Commitment Energy Efficiency Scheme*
- *Carbon Price Support*

Announcing the definition, Economic Secretary to the Treasury Chloe Smith said:

Today’s announcement is an important step in meeting the government’s commitments on environmental tax, and our broader determination to be the greenest government ever. By setting out a clear, usable definition of what a green tax actually is, people will be able to judge us against the Coalition Agreement pledge. Indeed, through ambitious policies such as the Carbon

⁷⁹⁹ www.gov.uk/government/news/definition-of-environmental-tax-published (from 16 July 2012)

Price Floor, this Government is already on track to double the proportion of environmental tax revenue by the end of the Parliament.

We want a clear approach that delivers a positive environmental impact without adding burdens onto business or households.

The government will also continue to explore opportunities to further green the tax system through the course of the Parliament in a way that is consistent with the aims of tax simplification and deficit reduction”.

In the ‘Notes for Editors’ attached to this definition, the Treasury noted:⁸⁰⁰

- 1. “The government recognises that other taxes can deliver environmental benefits, but their aim is not environmental but revenue raising. These are specifically excluded from the Treasury definition and include taxes such as Vehicle Excise Duty, Fuel Duty and Air Passenger Duty.*
- 2. The Coalition Agreement pledged to increase the proportion of revenue raised from environmental taxation by the end of this Parliament. This definition will provide a baseline against which to measure delivery”.*

Some have been critical of this approach since it effectively includes, within the measure, taxes which were not in place when the Coalition came to power, and excludes taxes, such as Fuel Duty, which were already in place, but which the Government has allowed to be eroded by inflation through postponing, and then cancelling, increases that had been announced by the previous Government. The Institute for Fiscal Studies showed that if more widely accepted measures of environmental taxes were used (including fuel duty), then the Government would probably be falling short of its own commitment.⁸⁰¹

One possible view of Coalition policy in respect of environmental fiscal reform is that decisions made in the early years were made for reasons of fiscal consolidation. The decision not to refund the CRC Energy Efficiency Scheme revenues to business, for example, was criticised by industry, yet Government is now seeking to minimise the burden of energy taxes on heavy energy users. There appears to have been a shift, over time, from a pragmatic application of instruments already in development / in discussion to help plug a hole in the public finances to one where the emphasis is on stimulating growth, with a key element of this being to keep energy and fuel prices down. More generally, the Government that set out to be ‘the greenest government ever’ has attracted a variety of criticism on the basis of the patchiness of its green credentials.

The above considerations reflect the country specific recommendation made as part of the 2012 European Semester:

Recommendation 3: *[...] Reduce the effective tax and social security burden on labour for low-income earners in a budget-neutral way by relying more on other sources of taxation less detrimental to growth, such as recurrent property taxes.*

⁸⁰⁰ www.gov.uk/government/news/definition-of-environmental-tax-published (from 16 July 2012)

⁸⁰¹ IFS (Institute for Fiscal Studies) (2012) ‘A defining issue? The government’s pledge to raise the share of revenue from green taxes’, <http://www.ifs.org.uk/publications/6491>

The shift towards environmental taxes is part of the reforms described below.

20.2.2 Suggested Reforms to the Tax System

On the basis of the information presented in the sections above, the following suggestions are made in relation to the adjustments of existing taxes and/or the introduction of new environmental taxes in the United Kingdom. The suggested changes to taxation are part of the cross-country common approach which has been adopted in this study and are based on application of the 'good practice' rates outlined in Section 5.0. This approach allows for comparable results across the Member States to be generated. It is important to reiterate that the principle aim of this study was to review the *potential* for revenue generation through EFR in each country, and that each Member State will have its own views as to the desirability of the taxes suggested, and the levels at which they should be applied (which could be higher, or lower, than suggested here):

➤ Energy Taxes:

- It is suggested that energy taxes are harmonised based upon the highest level of tax per unit of energy content for each of the different groups of fuels, assuming that the existing duties are based on a €20 per tonne CO₂ price. Transport fuels are equalised using the energy content on petrol (€19.4 per GJ), whereas motor fuels used for commercial and industrial purposes are equalised based upon the existing rate for kerosene (€2.3 per GJ). Finally, the rates for heating fuels are equalised using the minimum rate for gas oil of €2.2 per GJ.

- Table 20-4 shows the differentials in tax rates (using ETD units) for the various fuels by use. For a description of how the proposed rates are derived see the good practice section on energy taxes (Section 5.1). The proposed rates are reached (in real terms) by 2018 or 2023 depending on whether all of the existing rates are below €0.15 per GJ or not.
- The UK has the narrowest differential in tax rates between diesel and petrol with the rates being the same, on a per litre basis, at present. Harmonisation in line with the proposed ETD still, however, implies an increase in rates for diesel, though of only 8%. The uplift in the rate for kerosene is more or less the same. The largest increases are for LPG and for natural gas, these being 156% and 200%, respectively.
- For commercial and industrial motors, there are significant increases in rates for natural gas and LPG, neither of which are taxed at present.
- There are major increases in the taxes applied to some of the heating fuels, principally because the UK does not currently tax a number of key heating fuels. New taxes would need to be introduced for kerosene, LPG, natural gas and coal. Evidently, such changes could have political and distributional ramifications in the absence of measures designed to target lower income households.

Table 20-4: Existing and Suggested Rates Based upon Proposed Revisions to the ETD

Energy Tax	Units	Suggested Rates	Existing Rates
Transport Fuels			
Motor spirit (petrol)	€ per 1000 litre	713	713
Light fuel oil (diesel)	€ per 1000 litre	769	713
LPG (propellant)	€ per 1000 kg	995	389
Kerosene	€ per 1000 litre	774	713
Natural gas (prop)	€ per GJ	21	7
Industry and Commercial Motors			
Gas oil	€ per 1000 litre	137	137
Kerosene	€ per 1000 litre	137	137
LPG	€ per 1000 kg	170	0
Natural gas	€ per GJ	4	0
Business Heating			
Gas oil	€ per 1000 litre	137	137
Heavy fuel oil	€ per 1000 kg	158	132
Kerosene	€ per 1000 litre	137	0
LPG	€ per 1000 kg	169	0
Natural gas	€ per GJ	3.53	0.00
Coal	€ per GJ	4.30	0.00
Non-Business Heating			
Gas oil	€ per 1000 litre	137	137
Heavy fuel oil	€ per 1000 kg	158	132
Kerosene	€ per 1000 litre	137	0
LPG	€ per 1000 kg	169	0
Natural gas	€ per GJ	3.53	0.00
Coal	€per GJ	4.30	0.00
Electricity			

Energy Tax	Units	Suggested Rates	Existing Rates
Electricity - business use	€ per MWh	0.54	0.00
Electricity - non-business use	€ per MWh	0.54	0.00

➤ **Transport Taxes:**

- **Vehicles:** The taxes on transport in the UK are higher than average in the EU-28 (0.63% of GDP compared to of 0.50% of GDP). In addition, taxes on transport fuels are increased as a consequence of the suggestions above. However, it is suggested that additional revenue of 0.27% GDP could still be generated. There is increasing concern, in urban areas of the UK, that levels of air pollution are excessive, and that this is due to the increasing tendency to purchase diesel vehicles, partly as a result of the tax differentials favouring vehicles with lower CO₂ emissions per kilometre (which tend to favour diesel powered vehicles). In addition, the UK HGV Road User Levy does not differentiate charges by emissions intensity (according to EURO class), and applies only to vehicles weighing above 12 tonnes. This could be extended further, and externality charges implemented in line with Directive 2011/76/EU. The increase in revenue is phased in over the period from 2015 to 2020.
- **Aviation:** Although aviation was included in Phase III of the ETS, trade in EUAAs was suspended in 2012 pending the development by the ICAO of a market based instrument in the aviation sector. This might not, however, be implemented until 2020. The UK already has its APD, which essentially forms the basis for recommendations for other countries. NO further change is recommended for this, therefore.⁸⁰² It is suggested, however, that a tax on air freight is introduced. The suggested air transport tax rate is €1.25 per tonne of freight. The year of implementation is taken to be 2015 with rates gradually increasing to the maximum level in 2017. As noted in the good practice section, the way in which the picture unfolds concerning the proposals from ICAO might influence future levels and / or design of this tax (see Section 5.2.2).

➤ **Pollution and Resource Taxes:**

- **Waste – incineration / MBT tax:** There are more than 40 incinerators operating in the UK, and there is no tax on incineration. Studies funded by Government have shown in the past that the externalities from landfill and incineration are similar, yet the tax differentials are enormous (approx. €100 per tonne for landfill, and €0 per tonne for incineration). Moreover, there are several MBT plants used to prepare wastes for subsequent energy recovery and / or for stabilising wastes before landfilling. There

⁸⁰² Deloitte (2014) Air Passenger Duty, Accessed 24th September 2014, www.ukbudget.com/2014-measures/air-passenger-duty.aspx

remains considerable scope for further recycling of both local authority collected wastes and commercial wastes. In order to ensure that wastes are not simply shifted from landfill to other forms of residual waste management (such as incineration and MBT), it is suggested that an incineration tax of €15 per tonne is introduced, with an equivalent rate implemented for MBT facilities. These rates are below the highest levels in the EU (in Denmark), and the intention is to ensure management of waste is focused on the upper tiers of the waste hierarchy, in line with the Roadmap to A Resource Efficient Europe.²⁹⁷

- **Packaging:** A small number of Member States have implemented taxes for all packaging placed on the market in order to stimulate waste prevention initiatives in the packaging industry, and reduce the demand for raw materials. It is suggested that the following rates could be applied to all packaging placed on the market in the UK:
 - Aluminium €197 per tonne
 - Plastic €64 per tonne
 - Steel €54 per tonne
 - Paper and card €20 per tonne
 - Glass €18 per tonne
 - Wood €13 per tonne

These rates are conservative in that they cover only the embodied CO₂ savings associated with materials use. The rationale is to encourage prevention of packaging (as opposed to recycling). It is suggested that these rates be applied from 2016 and be kept constant in real terms.

- **Single-use carrier bag tax:** There is currently a minimum charge on single-use plastic carrier bags in Wales, Northern Ireland and Scotland of £0.05 (€0.06). A similar charge is due to be introduced in England in October 2015 at the same rate.⁸⁰³ Of these bags, plastic bags in particular cause many environmental problems when littered in the environment, especially when they are transported to, or littered in the riverine, or marine, environment. Moreover, in countries with high level of tourism, littered plastic bags can deter visitors. A wide body of experience suggests that the taxation of single-use plastic bags significantly influences consumers' purchasing of these bags, by stimulating a switch to reusable bags. In 2013, the Commission adopted a proposal for a Directive to reduce the consumption of lightweight plastic bags in the EU.⁸⁰⁴ Consequently, it is suggested that the UK increases the tax rate on single-use carrier bags to

⁸⁰³ UK Government (2014) *Reducing and managing Waste: Charging for single use plastic carrier bags*, Accessed 20 August 2014, <https://www.gov.uk/government/policies/reducing-and-managing-waste/supporting-pages/charging-for-single-use-plastic-carrier-bags>

⁸⁰⁴ DG Environment (2013) *Proposal to Reduce Plastic Bag Consumption*, Accessed 22nd January 2014, http://ec.europa.eu/environment/waste/packaging/legis.htm#plastic_bags

a rate of €0.11 per bag from 2016, and maintains the rate constant in real terms thereafter.

- **Air pollution:** The Directive on Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) sets a number of air quality targets which Member States are obliged to achieve (emission target values are presented in Annexes XI and XIV of the Directive). Air pollution taxes stimulate emitters to install abatement technologies and therefore improve local air quality and the health of the population. Although air quality in the UK has improved over recent years, it is still a significant issue, especially in urban areas.⁸⁰⁵ According to Airbase (EEA), 73.1% of the urban population in the UK was exposed to PM₁₀ concentrations exceeding the daily limit value (50 µg per m³) for 8 to 35 days of the year in 2011.⁸⁰⁶ Vehicles that run off diesel fuel are a major cause of this (see above), and recent calls to increase the duty on diesel, and reduce the extent to which VED encourages purchase of diesel vehicles, are touched upon in the discussion around energy taxes above. The UK does not currently have a system of air pollution taxes in place, though there has been some interest in the use of damage costs to establish Best Available Techniques in the context of the IPPC Directive, now superseded by the Industrial Emissions Directive. It is suggested that an air pollution tax could be implemented in order to generate improvements in air quality as follows:

- SO_x €1,000 per tonne
- NO_x €1,000 per tonne
- PM₁₀ €2,000 per tonne

Given the magnitude of the recommended tax rates it is suggested that there is a transition period from 2015 to maximum levels by 2020. The rates are then held constant in real terms.

- **Water abstraction:** A key element of the Water Framework Directive (Directive 2000/60/EC) is the concept of cost recovery for water services. Article 9(1) of the Directive states that “*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*”. Currently, although there are abstraction charges and user charges in place in the UK, the former are in place to recover costs of the management of the resource, and the latter are used to cover the costs of water supply: there are no taxes on abstraction in the UK. Consideration has been, and continues to be, given

⁸⁰⁵ EEA (2013) *Air pollution fact sheet 2013 UK*. Accessed 14th October 2014, <http://www.eea.europa.eu/themes/air/air-pollution-country-fact-sheets/united-kingdom-air-pollutant-emissions/view>

⁸⁰⁶ Eurostat (2014) *Resource Efficiency Scoreboard: EU Urban Population Exposed to PM10 Concentrations Exceeding the Daily Limit Value %*, Accessed 21st January 2014, http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=0&pcode=t2020_rn200&language=en

to the use of trading schemes to allocate water efficiently across consumers. It is suggested that appropriate levels of taxation would be of the order €290 per 1,000 m³ for the public water supply, €180 per 1,000 m³ for manufacturing purposes and €25 per 1,000 m³ for agriculture. We have assumed that the additional revenue which such rates may generate will accrue to the central budget. A transition period from 2015 to 2020 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. The rates are then held constant in real terms.

- **Waste water:** Council Directive 91/271/EEC concerning urban waste-water treatment was adopted on 21st May 1991. Its objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors.⁸⁰⁷ The UK has a system of charges in place to cover the costs of discharges into surface waters, but there is no tax on the discharge of waste water tax. To improve the scope for prevention of water pollution it is suggested that a waste water tax is implemented in line with good practice (see Section 5.3.6). With relative price levels in the UK this would imply, for BOD, a rate of €2.44 per kg of the pollutant. For fresh-water discharges, it would be preferable to also tax phosphorus discharges. Given the magnitude of the increase in rates a transition period from 2015 to 2018 is suggested, whereby the rates are increased gradually from an introductory rate to maximum levels. Existing exemptions should be reviewed and adjusted accordingly. It is suggested that rates should be held constant in real terms once they reach the 2018 levels.
- **Pesticides:** Article 4 of the Directive on Establishing a Framework for Community Action to Achieve the Sustainable Use of Pesticides (Directive 2009/128/EC) speaks of the requirement for National Action Plans on pesticides. In particular the Article includes the following:

“...timetables and targets for the reduction of [pesticide] use shall also be established, in particular if the reduction of use constitutes an appropriate means to achieve risk reduction with regard to priority items identified under Article 15(2)(c). These targets may be intermediate or final. Member States shall use all necessary means designed to achieve these targets”.

The UK’s Action Plan outlines a series of statutory and voluntary measures to achieve the sustainable use of pesticides (for example, training inspections of equipment and the monitoring of water bodies), without any mention of taxation.⁸⁰⁸

The UK gave consideration to the introduction of a pesticides tax in the late 1990s / early 2000s, and discussions around the tax gave rise to a

⁸⁰⁷ DG Environment (2014) *Urban Waste Water Directive Overview*, Accessed 29th January 2014

⁸⁰⁸ Defra (2013) *UK National Action Plan for the Sustainable Use of Pesticides*, February 2013, Accessed 15th October 2014, www.gov.uk/government/uploads/system/uploads/attachment_data/file/221034/pb13894-nap-pesticides-20130226.pdf

voluntary agreement with the crop protection industry. Elsewhere there is a trend towards banding taxes to reflect the level of hazard associated with them, and we would suggest that such an approach, which was considered at the time the tax was under discussion, is suitable in the UK. Our calculations assume that the country implements a pesticides tax and, in the absence of data regarding the types of active ingredient used, we model revenues as though the tax is applied at a rate of €10 per kg active ingredient. The suggested transition period is from 2016 to 2018, and following this the rate should be kept constant in real terms.

- **Fertilisers:** The UK does not currently implement a tax on nitrogen (or other) fertilisers. It is therefore suggested that a tax on the use of nitrogen in mineral fertilisers is implemented as a means of driving efficiencies in the application of fertilisers to land. It is suggested that at a rate of €0.2 per kg N be implemented from 2016 with rates gradually increasing to the maximum level in 2018.

20.2.3 Summary of Revenue Outcomes

Table 20-5 below shows the estimated additional revenue that could be achieved by introducing the changes suggested above. When calculating revenue potentials, an estimate of the change in the level of demand for the material / product / service is made reflecting the nature of the suggested changes. It is worth noting that the negative revenues calculated under the single-use bag tax is the result of the fact that it has been suggested above that the tax be increased to £0.11 – that is, above the existing baseline rate of £0.05. This will cause a further reduction in the number of single-use plastic bags being purchased, and thus an erosion of the tax base over time.

Revenue figures are calculated by using the projected rates and data relating to the tax bases for each of the different taxes (see Section 6.1 for more details of how these figures were calculated).

Table 20-5: Potential Additional Revenue from Environmental Fiscal Reform in the United Kingdom, million GBP (real 2014 terms)⁸⁰⁹

Tax	2017	2020	2025
Energy Taxes			
Transport fuels	439	1,748	3,047
C&I / Heating	4	17	30
Electricity	0	0	0
<i>Sub-total Energy, million GBP</i>	<i>443</i>	<i>1,765</i>	<i>3,077</i>

⁸⁰⁹ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GD_P_C

Tax	2017	2020	2025
<i>Sub-total Energy, % GDP</i>	0.03%	0.11%	0.19%
Transport Taxes			
Vehicle Taxes	877	3,510	4,395
Freight Aviation Tax	1.22	2.41	2.49
<i>Sub-total Transport, million GBP</i>	878	3,513	4,397
<i>Sub-total Transport, % GDP</i>	0.05%	0.21%	0.27%
Pollution and Resource Taxes			
Incineration /MBT Tax	157	255	258
Air Pollution Tax	190	347	249
Water Abstraction Tax	651	1,479	1,372
Waste Water Tax	256	358	358
Pesticides Tax	78	143	134
Packaging Tax	344	353	403
Single Use Bag Tax	270	-7	-8
Fertiliser Tax	0.073	0.133	0.125
<i>Sub-total Pollution & Resource, million GBP</i>	1,946	2,926	2,766
<i>Sub-total Pollution & Resources, % GDP</i>	0.12%	0.18%	0.17%
Total Environmental Taxes			
Total, million GBP	3,268	8,204	10,240
Total Increase, % GDP	0.20%	0.50%	0.62%

Table 20-6 shows the additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services.

Table 20-6: Potential Additional Revenue from HGV Externality Charges and Increased Cost Recovery for Water Use in the United Kingdom, million EUR (real 2014 terms)

Revenue Type	Revenue Per Annum, million EUR
HGV Externality Charge	844
Increased Cost Recovery for Water Use	3,205

Revenue Type	Revenue Per Annum, million EUR
Total	4,049

20.2.4 Environmental Benefits

Table 20-7 shows the monetised environmental benefits from reduced tax bases due to increases in the tax rates. The methodology for the calculation of these numbers is summarised in Section 6.2 (projections of how the tax bases change over time as a result of the proposed changes can be found in Appendix A.18.0). It is important to note that the coverage of environmental benefits is not fully comprehensive. Even so, GBP 328 million of benefits are anticipated annually by 2025 in real terms.

Table 20-7: Monetised Environmental Benefits from Implementation of Suggested Taxes in the United Kingdom, million GBP (real 2014 terms)⁸¹⁰

Tax Type	2017	2020	2025
Energy Taxes	4	18	30
Transport Taxes (excluding transport fuels)	30	61	61
Pollution and Resource Taxes	69	250	236
Total, million GBP	104	328	328
Total, % GDP	0.01%	0.02%	0.02%

20.2.5 Summary

Based upon the analysis presented in this report the following outcomes might be achieved in the United Kingdom:⁸¹¹

- In 2012, environmental taxes generated revenue equivalent to 2.62% of GDP. The headline figures suggest that there is considerable potential for additional revenue from environmental taxes in United Kingdom. These could generate GBP 3.3 billion in 2017 (EUR 4.1 billion), rising to GBP 10.2 billion in 2025 (EUR 12.7

⁸¹⁰ % GDP calculated using the following source: Eurostat (2014) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 5th August 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C

⁸¹¹ % GDP calculated using data from Eurostat (2013) *GDP and Main Components - Current Prices* [nama_gdp_c], Accessed 29th November 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=NAM_GDP_C and projecting GDP forwards based upon the last real GDP growth rate available in the following source: Eurostat (2014) *Real GDP Growth Rate - Volume*, Accessed 21st January 2014, <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00115>

billion) (both in real 2014 terms). This is equivalent to 0.20% and 0.62% of GDP in 2017 and 2025, respectively.

- The largest single contribution to revenue comes from the suggested increase in vehicle taxes. This accounts for GBP 4.4 billion by 2025 (EUR 5.5 billion) (real 2014 terms), equivalent to 0.23% of GDP.
- The next largest contribution to revenue comes from a the proposed harmonisation of taxes on transport fuels with the rates set out in the proposed ETD. This accounts for GBP 3.0 billion by 2025 (EUR 3.8 billion) (real 2014 terms), equivalent to 0.16% of GDP.
- The suggested water abstraction tax would account for GBP 1.4 billion by 2025 (EUR 1.7 billion) (real 2014 terms), equivalent to 0.07% of GDP.
- Revenue potential from the proposed packaging tax would raise GBP 0.40 billion by 2025 (EUR 0.50 billion) (real 2014 terms), equivalent to 0.02% of GDP.
- A waste water tax has also been suggested. This would contribute GBP 0.36 billion by 2025 (EUR 0.44 billion) (real 2014 terms), equivalent to 0.02% of GDP.
- In addition, a range of more minor taxes on could generate revenue of GBP 0.67 billion by 2025 (EUR 0.84 billion) (real 2014 terms), equivalent to 0.03% of GDP.
- It has not been possible to identify all the likely environmental benefits from the suggested taxes. However, those that have been identified amount to around GBP 0.33 billion by 2025 (EUR 0.41 billion) (real 2014 terms), equivalent to 0.02% of GDP.
- Additional revenue potential from two discreet analyses carried out for the study, on externality charging for HGVs and increasing the level of cost recovery under the provision of water services, have shown that an additional €4 billion per annum could be raised in addition to the above.

21.0 Cross-Country Comparative Results

All figures are given in real (2014) terms. For the group as a whole, additional revenue generated in 2017 is estimated to be around €38 billion, or 0.48% of the estimated GDP for the 14 countries combined, rising to €111 billion in 2025 (in real 2014 terms), or 1.39% of the combined GDP.

Table E-1-1, Table E-1-2 and Table E-1-3 below show the split of revenue generation by the different types of environmental taxes which are suggested to be implemented in the 14 Member States. The majority of the overall increase comes from additional taxes on transport (excl. transport fuels) (0.80% of GDP). Additional revenue generated from increasing energy excise duties amounts to 0.35% of GDP. Finally, an increase of 0.24% of GDP is estimated from increased taxes on pollution and resources.

Table E-21-1: Revenue Generated from Energy Taxes by the 14 Member States in 2025, % GDP and € billion (real 2014 terms)

Energy Tax	% GDP	€, billion
Energy Excise Duties - Transport fuels	0.24%	19.37
Energy Excise Duties - C&I / Heating	0.07%	5.66
Energy Excise Duties - Electricity	0.03%	2.62
Total Energy Taxes	0.35%	28

Table E-21-2: Revenue Generated from Transport (excl. transport fuels) Taxes by the 14 Member States in 2025, % GDP and € billion (real 2014 terms)

Transport Tax	% GDP	€, billion
Vehicle Taxes	0.57%	45.46
Passenger Aviation Tax	0.23%	18.58
Freight Aviation Tax	0.00013%	0.010
Total Transport (excl. transport fuels) Taxes	0.80%	64

Table E-21-3: Revenue Generated from Pollution and Resource Taxes by the 14 Member States in 2025, % GDP and € billion (real 2014 terms)

Pollution/Resource Tax	% GDP	€, billion
Landfill Tax - Non-haz (excl. C&D)	0.01%	0.88
Landfill Tax - Inerts (C&D)	0.0006%	0.04
Incineration /MBT Tax	0.01%	0.92

Pollution/Resource Tax	% GDP	€, billion
Air Pollution Tax	0.03%	2.06
Water Abstraction Tax	0.11%	8.81
Waste Water Tax	0.02%	1.34
Pesticides Tax	0.02%	1.58
Aggregates Tax	0.02%	1.53
Packaging Tax	0.02%	1.61
Single Use Bag Tax	0.01%	0.42
Fertiliser Tax	0.00001%	0.001
Total Pollution and Resource Taxes	0.24%	19

Revenue generated by the 14 Member States from increasing environmental taxes is given in Table E-1-4. The size of the economies in the different countries clearly influences the amount of revenue that is estimated to be generated.

Table E-21-4: Revenue Generation by Member State for Selected Years, € billion (real 2014 terms)

Member State	2017	2020	2025
Bulgaria	528	921	946
Cyprus	212	379	425
Denmark	851	1,585	1,809
Finland	1,502	2,581	3,110
Germany	14,278	33,821	41,375
Greece	1,239	2,326	2,889
Ireland	701	1,680	2,010
Latvia	250	485	642
Malta	93	212	280
Netherlands	2,815	6,779	9,405
Slovenia	134	228	299
Spain	9,667	23,550	28,390
Sweden	1,967	5,450	6,583

Member State	2017	2020	2025
United Kingdom	4,065	10,207	12,743
Total	38,301	90,204	110,908

Expressed as a proportion of GDP, the revenues are shown in Table E-1-5. In the year 2025, the estimated additional revenue generation from the environmental taxes lies between 0.62% of GDP (United Kingdom) and 3.68% GDP (Malta). The estimated increases for the other 12 countries considered all lie within the range 0.69% GDP to 2.7% GDP.

The environmental benefits associated with these changes have been estimated, though this analysis does not capture all the external benefits associated with the changes.

Table E-1-6 indicates that these benefits lie between 0.02% GDP (UK, NL, DK) and 0.81% GDP (Latvia) in 2025. The patterns of the benefits reflect the sources of the additional tax revenue.

Table E-21-5: Revenues Generated from Environmental Taxes by Member State, % GDP

Member State	Total Environmental Taxes in 2012, % GDP	Total Additional from Environmental Taxes in 2025, % GDP
Bulgaria	2.82%	2.19%
Cyprus	2.67%	2.64%
Denmark	3.87%	0.69%
Finland	3.07%	1.52%
Germany	2.18%	1.43%
Greece	2.85%	1.53%
Ireland	2.49%	1.15%
Latvia	2.42%	2.47%
Malta	2.98%	3.68%
Netherlands	3.56%	1.51%
Slovenia	3.82%	0.85%
Spain	1.57%	2.70%
Sweden	2.49%	1.50%
United Kingdom	2.62%	0.62%
EU-average	2.29%	

Member State	Total Environmental Taxes in 2012, % GDP	Total Additional from Environmental Taxes in 2025, % GDP
EU-Maximum	3.87%	

Table E-21-6: Estimated Indirect Benefits from Reduced Environmental Impacts, 2025, % GDP and € millions (real 2014 terms)

Member State	% GDP	€, million
Bulgaria	0.71%	392
Cyprus	0.31%	59
Denmark	0.02%	67
Finland	0.06%	164
Germany	0.10%	3,487
Greece	0.45%	891
Ireland	0.05%	96
Latvia	0.81%	268
Malta	0.27%	26
Netherlands	0.02%	189
Slovenia	0.09%	35
Spain	0.14%	1,557
Sweden	0.04%	201
United Kingdom	0.02%	408

List of Appendices

All appendices have been prepared as a separate document

- A.1.0 Good Practice
- A.2.0 Revenue Calculations
- A.3.0 Indirect Benefits
- A.4.0 Environmental Fiscal Reform and Employment
- A.5.0 Bulgaria
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- A.15.0 Slovenia
- A.16.0 Spain
- A.17.0 Sweden
- A.18.0 United Kingdom



AARHUS UNIVERSITY



Study on Environmental Fiscal Reform Potential in 14 EU Member States: Appendices

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Final Report to DG Environment of the European Commission

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1.0 Good Practice

1.1 Introduction

This Appendix sets out the approach taken in making suggestions to the Member States regarding specific types of environmental tax. It is worth setting out some general principles which we have sought to follow:

1. The approach reflects the study's intention to highlight potential for revenue generation using environmental taxes. The intention is to indicate where this potential may lie, and to demonstrate the magnitude of the revenues that could be derived from the taxes;
2. The environmental impact of measures is considered important, and all the suggestions are expected to have an influence, relative to the counterfactual, on behaviour. To the extent, however, that the environmental effect is considered secondary to the issue of revenue generation, the focus is on taxes rather than, for example, refunded levies (an example of which would be the Swedish charge on NO_x). At the same time, we consider the issue of instrument design with a view to engendering a positive environment response;
3. In most cases, we have sought to develop an approach to each type of tax which could be applied to each country. We recognise, however, that each country's starting point is quite different in that some countries have certain taxes in place already, and at varying levels, whilst others may not have introduced such taxes at the time of writing. Furthermore, countries are confronting different environmental problems, and they have different levels of income. Therefore, in making suggestions for each country, we have sought to take into account the current situation when making country specific suggestions. The way we have done this is also explained in the relevant section for each tax.

It will be appreciated that in a cross country study such as this, proposing a fully designed instrument of a given type would not be feasible. We have, however, given some hints as to the types of design which might be suitable to engender a more pro-environmental response from the taxes suggested.

The way in which the revenues generated by changes in suggests tax rates does not always reflect the way we would expect the tax to be implemented in the country concerned. For example, where pesticides are concerned, it is suggested that any taxes which are introduced are banded such that they take into account the potential for environmental harm associated with each active ingredient. In practice, the data available for us to do that has not been available. As such, we have modelled the potential revenue take on a simplified basis. We would, of course, encourage Member States to introduce the suggested taxes with due consideration given to their design features so as to ensure that the tax structure (e.g. the way it is banded) reflects, as closely as possible, the source of the environmental damages.

This document is, as far as we are aware, correct as of the time of drafting, this having begun in mid-2014. Taxes and charges are changing all the time. Every attempt has been made to be current, but it is in the nature of the subject that matters will evolve over time, rendering some of the material, in due course, out of date.

1.2 Energy Taxes (Including Transport Fuel Taxes)

1.2.1 Good Practice

Revenues from energy taxation generally account for the largest share of revenue from all environmental taxes. Energy taxes cover taxes on fuels used in transport, industry and the generation of power and heat. In practice, however, it makes sense to consider energy taxes insofar as they affect the generation of power separately from the taxes applied to vehicle fuels and fuels used for heating. This is because power generation is included within the scope of the EU Emissions Trading Scheme, whereas emissions from transport and from heating are not.¹ The power sector is no longer (in Phase III of the ETS) in receipt of free allowances for GHG emissions, with all allowances for the power sector now auctioned.² Some countries do make use of taxes on inputs to electricity generation, or production capacity for electricity. However, these are not harmonised taxes. The situation in respect of power generation in the ETS is considered in Section 1.15, whilst it should also be noted that air pollution taxes, which may affect power generating installations (as well as their emitters) are considered in Section 1.4.

Revenues from environmentally-related taxes in EU Member States had, by 2012, declined to 6.05% of taxes and social contribution (TSC), and 2.4% of GDP, from their peak in 1999 of 6.9% of TSC and 2.8% of GDP. There have been very few reductions in the nominal tax rates, so besides TSC/GDP growth being more significant than revenue growth, a key contributing factor for the decline in significance of environmental taxes has been insufficient adjustment to keep pace with inflationary trends, though no doubt, environmental improvements also have contributed by eroding the tax base for specific taxes related to pollution. Environmental tax legislation often details tax rates in absolute units of a currency rather than in ad valorem terms so that the lack of indexation tends to lead to an erosion of the significance of the taxes.

Recognising this, several Member States (including Sweden, Denmark, Netherlands) have introduced a system whereby one or more energy tax rates are indexed automatically to an index of inflation. Indexing energy taxes to a measure of inflation might be considered as one element of 'best practice' relevant to budgetary consolidation, and exploring the extent of revenue erosion in the absence of this mechanism (not to mention, erosion of any environmental incentive). Indeed, the proposal from the Commission for an Energy Tax Directive suggested, at Article 4(4), states:

4. The minimum levels of general energy consumption taxation laid down in this Directive shall be adapted every three years starting from 1 July 2016 in order to take account of the changes in the harmonised index of consumer prices

¹ It should be noted that several other activities included under the ETS are also not subject to the harmonisation proposals of the existing ETD (as set out in Article 2(4) of the existing ETD, Directive 2003/96/EC). Some activities covered by the ETS are effectively covered by the existing ETD, so both pay the harmonised taxes, and are subject to the requirements of the ETS in terms of their requirement to hold sufficient allowances to cover GHG emissions. The proposed ETD, through identifying a CO₂ component explicitly, allows for installations covered by the ETS to be exempted from this part of the tax.

² Some newer Member States have availed themselves of a derogation from the requirement to auction all allowances and will be able to issue a diminishing number of free allowances for the power sector with the number falling to zero in 2020.

excluding energy and unprocessed food as published by Eurostat. The Commission shall publish the resulting minimum levels of taxation in the Official Journal of the European Union.

The minimum levels shall be adapted automatically, by increasing or decreasing the base amount in euro by the percentage change in that index over the three preceding calendar years. If the percentage change since the last adaptation is less than 0.5%, no adaptation shall take place."

That having been said, it is also clear that energy prices are politically sensitive in many countries, and it may not always be straightforward to index taxes to inflation if the underlying pre-tax prices for energy carriers are increasing at a rate that exceeds the background rate of inflation. We have not proposed *retrospective* increases in rates so as to maintain the real terms value of energy taxes where these have remained constant in nominal terms (or where they have been increased in nominal terms, but at a rate below that of inflation). However, we have proposed that indexation occurs going forward.

The European Union's Energy Taxation Directive (ETD) has, in the past, established minimum levels for energy taxation relating to certain motor fuels, heating fuels and electricity. We refer to these rates as the rates in the existing ETD. A new proposal, referred to henceforth as the proposed ETD, is currently being debated.³ This proposes new minimum rates of tax for motor fuels, heating fuels, and for electricity. It suggested that these should follow a specific formula linking the tax rate to the energy content of the fuel and the associated greenhouse gas emissions (see below). The proposal, made in 2011, had envisaged the new rates being implemented by January 2013 (with some phasing allowed for some transport fuels).

Most Member States have defined tax rates for one or more fuels that exceed the minimum levels in the proposed ETD, but there is rarely consistency in national tax rates across energy carriers according to their basic properties causing some energy products to be treated, relatively, more favorably than others. In the light of this, the proposed revision of the ETD establishes the principle that energy carriers should be taxed in a more consistent manner according to their physical properties, as follows:

- For the transport fuels, the proposed ETD suggests that different fuels be taxed according to energy content (€9.6 per GJ) and GHG emissions (€20 per tonne CO₂ equ.).
- Where motor fuels are used for commercial and industrial purposes specified in Article 8 (2) of the ETD, the minimum tax rates in the proposed ETD are based on energy content (€0.15 per GJ) and GHG emissions (€20 per tonne CO₂ equ.).
- For heating fuels, the tax rates proposed are determined as for the motor fuels used for commercial and industrial purposes; and
- For electricity, the rate in the proposed ETD is €0.15 per GJ (a small upward revision from the rate in the existing ETD).

³ The consolidated version of the existing Directive (Council Directive 2003/96/EC) can be found here http://ec.europa.eu/taxation_customs/resources/documents/taxation/com_2011_169_cod_en.pdf

For the transport fuels, and for the energy content only, then for countries with taxes below the stated minimum rates set out in the proposed ETD, it was envisaged (as per Table A of Annex I) that any necessary increases could be phased in over a period from 2013 to 2018.

The proposed ETD also made clear that where Member States have tax rates in excess of the minimum levels proposed, the approach to setting tax rates for all fuels in the relevant groups (e.g. heating fuels) should respect the principles by which the ETD rates are set, i.e. a consistent application of rates based on the energy content and related CO₂ emissions.

It is recognized that the proposal has not been agreed and continues to be debated in the European Council. However, it was agreed that it should be used as a basis for suggested changes in this work since, although the proposal continues to be debated, it represents the Commission's most recent published thinking in respect of energy taxation. The document used as the basis for the approach taken is:

European Commission (2011) Proposal for a Council Directive amending Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity, Brussels, COM(2011) 169/3, 2011/xxxx (CNS)

This is referred to, henceforth, as 'the proposed ETD'.

1.2.2 Suggested Implementation

Most countries have set rates higher than the minimum rates in the proposed ETD for at least one energy carrier within each of the groupings (transport fuels, commercial and industrial motors and heating fuels). In considering how Member States might respond to the proposed ETD, then in principle, one could have considered harmonization of rates within the given groupings either to the highest level of any energy carrier in the group, or to lowest rate of any energy carrier within the group, or many other possibilities. Given the emphasis in this study on the potential for generating revenue, then the approach is generally based on upward harmonization of tax rates within any grouping to the rate which is, according to the formula set out in the proposed ETD, the highest in terms of the implied rate of tax per unit of energy content, assuming that the CO₂ element of the duty is €20 per tonne of emissions of CO₂.

This approach does not necessarily lead to harmonization of tax rates across Member States. It follows from the formula in the proposed ETD that harmonization could only occur if all Member States harmonized taxes at the same implied rates of taxation in terms of € per GJ of energy content, and € per tonne of CO₂ emitted.

1.2.2.1 Motor Fuels

The countries concerned have taxes in place on motor fuels whose rates, and relative rates (across the motor fuels), vary. Most countries have, however, rates which are either similar to, or already well above, minimum rates in the proposed ETD. The approach we have proposed is as follows:

- 1) Where the rates are below the minimum rates in the proposed ETD, they are increased accordingly;
- 2) Where the rate for any fuel is above the minimum rate in the proposed ETD, we assume that the CO₂ based element of the tax is equivalent to €20 per tonne CO₂, as per the proposed ETD. We then calculate the implied tax rate per GJ for each of the

fuels. We then propose tax rates for all fuels which are based on equal tax rates for the energy component of the fuel.

If 1) applies, then the tax rate changes are assumed to occur over a period to 2018 as per the proposed ETD. If 2) applies, then alignment of all taxes to that of the fuel with the highest implied tax per unit of energy is assumed to occur over a period to 2023, as per the proposed ETD.

It should be noted that for many countries, the suggested approach implies an upward harmonisation of duties on diesel to reflect the implied energy-related tax on petrol. Differentials regarding rates of duty for transport fuels already give rise to concerns, in some Member States, over so-called 'tank tourism'. Depending upon how different Member States choose to respond to the suggestions made (some of the Member States under consideration share borders), it is recognised that concerns regarding tank tourism might be more or less prominent. The changes suggested are intended to indicate potential for additional revenue, and could not anticipate how each Member State would respond, still less, how other countries (both within and outside the EU-28) might choose to adjust taxes on transport fuels in future. The objective of this work is not to establish a tax harmonising proposal across all member States (indeed, since it covers only 14 Member States, it would be impossible to do so). It should also be noted that in Denmark, in order partly to address the potential for tank tourism, circulation taxes on diesel vehicles are higher than those on petrol-driven vehicles to compensate for the fact that tax rates on diesel are lower than they would otherwise be (indicating, as per the transport section below, some interdependence of circulation taxes and fuel taxes). Respecting the formula in the proposed ETD makes it difficult for Member States to take such compensating measures since the applicable tax rates have to be harmonised with respect to energy and CO₂ content, but this remains a possibility for the time being given that the proposal has not become law.

1.2.2.2 Heating Fuels

There is considerable variation in tax rates applied across Member States for heating fuels (see Table 1-1 and Table 1-2 below). A general pattern that can be discerned is that, when expressed in terms of the tax rate per GJ, mineral oils tend to be taxed at considerably higher rates than natural gas and coal. The propensity for relatively high tax rates on mineral oils also for heating purposes may historically be related to a desire to promote other energy carriers than oil, and to the concern in some Member States that setting different rates of tax for different uses of the same fuel might encourage fraudulent use of the fuel. Electricity is also frequently taxed at a more significant level than natural gas and coal, being taxed at a higher rate than oil, in terms of energy content, in seven Member States.⁴ Finally it remains the exception that fiscal administrations consider the energy contents of heating fuels.

The existing ETD has established minimum rates for a range of heating fuels used for non-business and business purposes, notably coal, mineral oils and natural gas. There are also minimum rates for electricity, which in several Member States is used for heating purposes.

⁴ This might be expected, to a degree, given the fact that non-renewable forms of electricity typically convert fossil energy carriers into electricity at an efficiency well below 100%. Hence, the energy content of electricity reflects a conversion of input fuels with a much higher energy content.

Identification of best practice for taxation of heating fuels is complicated by the various energy mixes employed by Member States across Europe for heating purposes. Low tax rates for certain energy carriers may be used to favor and promote national interests in their wider uptake.

Table 1-1 below provides the effective tax rates in EU Member States for the most important heating fuels in non-business sector, whilst Table 1-2 does the same for the business sector. A weighted average has been computed for each Member State, taking into account its specific energy mix.⁵ To allow for an illustrative comparison (exemptions were not accounted for in the weighted rate), all tax rates have been converted into the same metric (i.e. energy content). The final column of the table indicates the effective tax rate implied by adoption of the ETD amendments. While the minimum rate proposed is €0.15 per GJ, the proposed CO₂ element has been converted into an implicit tax rate per GJ too to allow comparison. This is important for heating fuels as the CO₂ element accounts for between 88% and 93% of the proposed minimum rates under the ETD, depending on the fuel.

Table 1-1: Implicit Energy Tax Rates for Non-business Heating Based on Energy Contents

€ per GJ	COAL	OIL	GAS	ELECT	Weighted for Member State	ETDwCO ₂ (weighted)*
AT	1.70	2.78	1.66	4.17	2.85	1.50
BE	0.40	0.49	0.27	0.53	0.42	1.46
DK	11.55	11.24	10.71	30.53	19.23	1.45
FI	5.20	4.64	2.91	4.73	4.71	1.63
FR ₂₀₁₄	0.64	1.67	0.39	6.94	2.81	1.39
DE	0.30	1.74	1.53	5.69	2.58	1.42
EL	0.30	9.38	1.50	0.61	6.68	1.63
IE	0.95	2.91	1.03	0.28	1.52	1.60
IT	0.32	11.46	4.73	6.31	6.40	1.36
LU	0	0	0.30	0.28	0.16	1.46
NL	0.52	12.51	5.29	32.36	11.41	1.27
PT	0	9.38	0.30	0.28	3.46	1.57
ES	0.65	2.41	0.65	0.28	1.05	1.46
SE	13.76	13.11	9.50	9.61	10.07	1.59
UK	0	3.68	0	0	0.25	1.32
CY	0.31	3.54	2.60	1.39	2.27	1.63
CZ	0.34	12.41	0.34	0.31	0.47	1.39
EE	0.30	3.15	0.70	1.24	1.05	1.42
HU	0.31	11.32	0.31	0.28	0.65	1.31
LV	0.30	1.63	0.46	0.28	0.50	1.50
LT	0.30	0.60	0	0.28	0.25	1.47

⁵ Estimates for the heating energy mix are available from the EU funded ECOHEATCOOL project (see S. Werner et. al., 2007, ECOHEATCOOL, The European Heat Market, Final Report, Bruxelles: Euroheat and Power).

€ per GJ	COAL	OIL	GAS	ELECT	Weighted for Member State	ETDwCO ₂ (weighted)*
MT	0.30	4.61	0.84	0.42	1.72	1.63
PL	0.31	1.61	0	1.35	0.62	1.65
SK	0	10.98	0.37	0	0.26	1.31
SI	1.47	3.58	1.33	0.85	2.31	1.57
BG	0.31	0.73	0.05	0.28	0.29	2.01
HR	0.31	1.31	1.09	0.28	0.82	1.41
RO	0.30	9.39	0.32	0.28	1.25	1.32
Average					3.07	1.49
NMember State -average					0.96	1.51
EU15-average					4.91	1.47
NMember State -best practice (SI, MT, CY)					2.10	
EU15-best practice (DK, EL, NL, SE)					11.78	
EU best quartile (DK, EL, FI, NL, IT, PT, SE)					8.85	
Note: *Excluding electricity for which CO ₂ price is determined by ETS						

Source: Member state reporting to European Commission, DG TAXUD excise tables, July 2013. Please refer to these tables for all details on exemptions, reduced and banded rates etc.

Table 1-2: Implicit Energy Tax Rates for Business Heating Based on Energy Content

€ per GJ	COAL	GAS OIL	GAS	ELECTR	Weighted for Member State	ETDwCO ₂ (weighted)*
AT	1.70	2.78	1.66	4.17	2.75	1.56
BE	0.40	0.49	0.13	0.83	0.46	1.52
DK	11.55	11.24	10.71	15.12	12.46	1.49
FI	5.20	4.64	2.91	1.95	2.92	1.65
FR ₂₀₁₄	0.64	1.67	0.39	4.73	2.20	1.51
DE	0.30	1.31	1.14	4.27	2.33	1.51
EL	0.30	9.38	1.50	0.69	4.61	1.68
IE	0.95	2.91	1.03	0.14	1.54	1.53
IT	0.16	11.46	0.34	3.47	3.21	1.45
LU	0	0	0.15	0.14	0.12	1.42
NL	0.52	12.51	5.29	32.36	14.64	1.40
PT	0.16	9.38	0.30	0.28	3.80	1.53
ES	0.65	2.41	0.15	0.14	0.63	1.44
SE	4.13	3.93	2.85	0.16	1.46	1.71
UK	0	3.68	0	0	0.70	1.45
CY	0.31	3.54	2.60	1.39	3.10	1.67
CZ	0.34	12.41	0.34	0.31	2.01	1.61

€ per GJ	COAL	GAS OIL	GAS	ELECTR	Weighted for Member State	ETDwCO ₂ (weighted)*
EE	0.30	3.15	0.70	1.24	1.32	1.49
HU	0.31	11.32	0.31	0.29	1.28	1.45
LV	0.30	1.63	0.46	0.28	0.57	1.37
LT	0.15	0.60	0	0.14	0.13	1.47
MT	0.30	11.43	0.84	0.42	0.42	n.a.
PL	0.31	1.61	0	1.35	0.73	1.76
SK	0.31	10.98	0.37	0.37	1.31	1.61
SI	1.47	3.58	1.33	0.85	1.46	1.43
BG	0.31	0.73	0.05	0.28	0.35	1.64
HR	0.31	1.31	0.55	0.14	0.68	1.50
RO	0.15	9.39	0.17	0.14	1.03	1.41
EU28 average					2.44	1.33
NMember State-average					1.10	1.28
EU15-average					3.59	1.37
best3-NMember State (SI, CZ, CY)					2.19	
best4-EU15 (DK, NL, EL, PT)					8.88	
best-quartile (DK, NL, FI, , CY, IT, PT, EL)					6.16	
Note: *Excluding electricity for which CO ₂ price is determined by ETS						

Source: Member state reporting to European Commission, DG TAXUD excise tables, July 2013. Please refer to these tables for all details on exemptions, reduced and banded rates etc.

It appears that tax rates within individual Member States are rarely consistent, if ever, in terms of the way they treat different energy carriers and fuels. Furthermore some Member States appear to have no tax rates in place even where minima have been defined within the existing ETD. It has not been the purpose here to clarify the legal status of these apparent derogations.

There are fairly considerable discrepancies between old and new Member States, with the latter practicing modest tax rates.

Identifying an overall EU best practice for non-business heating based on the highest quartile comes to an average of €8.85 per GJ⁶. This is based on Greece, Portugal, Italy, Netherlands, Finland, Denmark and Sweden. While the highest tax burdens are found where heating is respectively most and least needed, findings from the ECOHEATCOOL project demonstrate that per capita energy consumption for domestic heating purposes in Belgium and France are in fact higher or at the same level as in somewhat colder

⁶ The CO₂-component (at €20/tCO₂) of this best practice figure is about €1.30/GJ for non-electricity with current mix of heat energy carriers in EU. The CO₂-component will range from €1.12/GJ in Netherlands to €1.50/GJ in Poland.

Denmark. There are further indications that there is untapped potential in improving energy efficiency across wide parts of Europe and for which purpose a more consistent approach to taxation of heat energy carriers according to energy content would be useful. For business heating the best practice quartile Member States are Cyprus, Italy, Portugal, Greece, Netherlands, Denmark and Germany.

The proposed approach is based on moving towards the rates proposed for the ETD-amendment in much the same way as with motor fuels. In other words:

- 1) Where the rates are below the minimum rates in the proposed ETD, they are increased accordingly;
- 2) Where the rate for any energy carrier is above the minimum rates in the proposed ETD, we assume that the CO₂ based element of the tax is equivalent to €20 per tonne CO₂, as per the proposed ETD. We then calculate the implied tax rate per GJ for each of the energy carriers. We then suggest tax rates for all fuels which are based on equal tax rates for the energy component of the fuel.

If 1) applies, then the tax rate changes are assumed to occur over a period to 2018 as per the proposed ETD. If 2) applies, then alignment of all taxes to that of the fuel with the highest implied tax per unit of energy is assumed to occur over a period to 2023, as per the proposed ETD. Note that the proposed ETD does not appear to provide for this additional period in the case of heating fuels, but the variation in levels suggests that such a period for adaptation would be necessary given the magnitude of the proposed changes.

One difficulty presents itself with using this approach: several countries use the same tax rate for fuels which are used in different applications (e.g. diesel or kerosene used as fuel for vehicles, industrial motors and heating). Because of the considerable differential between the energy-related taxes in the different applications in the proposed ETD (the tax rate per GJ differs by a factor of 64), the strict application of this approach would lead to suggested hikes in tax rates for e.g. gas used as heating fuel that are extremely large. This can be readily appreciated by reviewing Table 1-1 and Table 1-2 above. Wherever there are large differences between the rates for oils, and the rates for other fuels, harmonisation in line with the highest taxed energy carriers clearly leads to considerable hikes in rates (see the cases of CZ, HU, SK and RO, for example, all of which are included within the first study on 12 Member States).⁷ One of the reasons for this is concern regarding fraud, and the potential for using fuels purchased at rates applicable for heating in applications such as use in vehicles. Maintaining a single rate makes such fraudulent / black market transactions unlikely.⁸

As a result of this, we have assumed the rates are harmonized upwards to the rates equivalent to the highest tax rate per GJ applied to the heating fuels other than gas oil and kerosene.

⁷ Eunomia Research & Consulting, and Aarhus University (2014) *Study on Environmental Fiscal Reform Potential in 12 EU Member States*, Report for European Commission - DG Environment, February 2014, http://ec.europa.eu/environment/integration/green_semester/pdf/EFR-Final%20Report.pdf

⁸ Some countries setting similar rates offer rebates on tax where the user provides documentary evidence of the use of the fuel for the purpose of heating. This is then, in turn, sometimes, identified as an environmentally harmful subsidy, even though it seems clear that the combined mechanism is intended to prevent fraud,

It is quite clear from the above that, as with motor fuels, the possibility to go further than this in terms of revenue generation may exist.

1.2.2.3 Electricity

For electricity, the proposed approach is to increase electricity taxes to the level proposed in the ETD (€0.15 per GJ). This is a very limited change to the rate in the existing ETD (of €0.50 per MWh, the proposal being equivalent to €0.54 per MWh). The rate is assumed to be applied in 2016. No further changes are considered here reflecting the position of the power sector in the EU-ETS and the fact that all allowances for the power sector will be auctioned (other than for some newer Member States, where a declining quantity of allowances can be issued free of charge, falling to zero in 2020).

1.3 Transport Taxes (Excluding Fuel)

1.3.1 Vehicle Taxes

The approach taken by Member States in respect of vehicle taxation varies considerably from one country to the next. Quite apart from the variation in VAT rates (EMEA suggests these vary from a low of 15% to a high of 27% across the EU), the countries of the EU make use of different taxes on the purchase / registration and the use of vehicles. In essence, a key distinguishing feature of these taxes is whether or not they are paid once (on purchase / initial registration) or annually (in the form of a license fee). A 2012 Communication from the Commission distinguishes between 'registration' taxes and 'circulation' taxes as follows:⁹

The term 'registration tax' used in this Communication includes all kinds of taxes currently linked to the registration of a vehicle, regardless of their name (tax, excise duty, environmental bonus-malus scheme, etc.) but does not cover fees covering the administrative cost for registration of a vehicle or the cost of technical inspections.

The term 'circulation tax' used in this Communication includes all kinds of taxes linked to the circulation of a car in the territory of a Member State, regardless of the name of the tax, excluding tolls, vignettes and excise duties on fuels.

Regarding the former, it notes:

At present, 18 Member States levy a registration tax on vehicles. The tax base and level of taxation differ considerably between Member States. Most common differentiators are the purchase price or value of the car, the fuel used (e.g. petrol or diesel), engine size or power and the CO₂-emissions of a car. Over the last years, many Member States have restructured the tax base of registration and circulation taxes to be totally or partially CO₂ based. National registration taxes are typically levied once in the lifetime of a car, except in Belgium, where they are levied each time the (private) ownership of a car changes.

Regarding the latter, the circulation taxes, it notes:

⁹ Communication from the Commission to the European Parliament, The Council And The European Economic And Social Committee (2012) Strengthening the Single Market by removing cross-border tax obstacles for passenger cars, COM(2012) 756 final, 14/12/2012.

Typically, circulation taxes are levied annually by the Member State in which a passenger car is registered and are differentiated according to engine size or engine power, the fuel used and/or the environmental performance of the car.

The tax bases for the circulation taxes are generally similar – weight, CO₂ emissions, engine capacity, engine power, etc. – to those for the registration taxes, with those countries that have both in place sometimes using the same base for the calculation of the tax rate.

The Staff Working Document accompanying the Communication indicated that of the (then) 27 Member States, only four had no circulation tax. Of these four, two – Lithuania and Estonia – were listed as having neither a registration tax nor a circulation tax in place.¹⁰

Countries with high levels of revenue generation from registration taxes include:

1. Malta, where the tax is based on a quite sophisticated system depending on the vehicle. For example, for passenger cars, the percentage of the retail value to be paid is based both on the length of the vehicle and the emissions performance of the vehicle. For petrol-driven cars, the emissions performance is based only on CO₂ emissions, but for diesel powered vehicles, the rate is based also on the emissions of particulate matter. For freight vehicles, the tax rate is based on weight, the cubic capacity of the engine and the emissions standard of the vehicle. The tax generated revenues equivalent to 0.6% GDP in 2011, down from a level of the 0.94% in 2008, and 1.2% in 2000;¹¹
2. Denmark, where the tax is applied as a percentage of the purchase price (including VAT), this percentage being higher on the value above a specified level. The rate payable is moderated by the fuel efficiency of the car, measured in terms of the km per litre for which the vehicle can run. There is a much higher ‘bonus’ for improved efficiency above the benchmark level (16 km per l for petrol driven cars and 17 km per l for diesel driven cars) than the malus for reduced fuel efficiency. In 2011, the tax raised revenues equivalent to 0.76% GDP (though the level in the mid-2000s was of the order 1.4% GDP);
3. Finland has a vehicle tax which is paid on the retail value of the vehicle. It applies to cars and vans weighing less than 1,875 kg and motorcycles, and for cars, is related to the CO₂ emissions associated with the vehicle. Depending on these, the tax is between 5% and 50% of the taxation value, which is effectively the retail value inclusive of VAT. For motorcycles, the rate is dependent on engine capacity. In 2011, the tax generated revenue equivalent to 0.55% GDP;
4. The Netherlands. Here, the tax on passenger cars is levied in four bands related to CO₂ emissions, but with different bands for petrol and diesel driven cars. For both types, the tax is calculated using a fixed rate and a variable rate, both of which escalate as one moves into higher emissions bands. The tax on

¹⁰ Commission Staff Working Document (2012) Principles of taxation of motor vehicles according to EU law as interpreted by the Court of Justice, SWD(2012) 429 final, Brussels, 14.12.2012, http://ec.europa.eu/taxation_customs/resources/documents/taxation/other_taxes/passenger_car/swd_2012_429_en.pdf

¹¹ These are the most recent figures from the DG TAXUD database.

motorcycles and vans, on the other hand, is based on the net catalogue price. In 2011, the tax generated revenue equivalent to 0.33% GDP (down from 0.6% in early 2000s).

These taxes vary in the extent to which they exempt (completely) the lower emission vehicles. They indicate that revenue generation can still be significant even with relatively high differentials across the different bands used to differentiate on environmental performance.

Countries with high levels of revenue generation from circulation taxes include:

1. Denmark, where the tax is charged on the basis of the fuel efficiency (measured in terms of km per litre of fuel). The rates are quite different for diesel driven cars and petrol driven cars, and since 2009, an additional amount is due on diesel vehicles without an approved filter for removal of particulate matter. In 2011, the tax raised the equivalent of 0.53% GDP;
2. Ireland, where motor tax used to be raised on the basis of the engine size (cc), but since 2008, the tax base has been the emissions of CO₂ per km. There is no zero rate, and there are twelve bands to the tax. The lowest rate of tax payable is €120 and the highest is €2,350 (see Table 1-3 below). The tax raised revenues equivalent to 0.6% GDP in 2011 and 0.62% GDP in 2012.

Table 1-3: Irish Motor Tax for New Private Cars

Band	CO ₂ emissions-grams per km	Annual €	Half-year € ¹	Quarterly € ²	Arrears Monthly € ³
A0	0	120	66	33	12.00
A1	1-80g	170	94	48	17.00
A2	More than 80g per km up to and including 100g per km	180	99	50	18.00
A3	More than 100g per km up to and including 110g per km	190	105	53	19.00
A4	More than 110g per km up to and including 120g per km	200	111	56	20.00
B1	More than 120g per km up to and including 130g per km	270	149	76	27.00
B2	More than 130g per km up to and including 140g per km	280	155	79	28.00
C	More than 140g per km up to and including 155g per km	390	216	110	39.00
D	More than 155g per km up to and including 170g per km	570	316	161	57.00
E	More than 170g per km up to and including 190g per km	750	416	211	75.00

Band	CO ₂ emissions-grams per km	Annual €	Half-year € ¹	Quarterly € ²	Arrears Monthly € ³
F	More than 190g per km up to and including 225g per km	1,200	666	339	120.00
G	More than 225g per km	2,350	1,304	663	235.00

Notes:

1. 55.5% of the annual rate (disregard cent).
2. 28.25% of the annual rate (disregard cent).
3. 1/10 of the annual rate (disregard cent after multiplication).

UK, where the vehicle excise duty has some of the characteristics of a registration tax in that, for vehicles first registered after April 2010, there is a 'first year' rate payable. Both the 'first year' rate, and the rate payable annually thereafter, are banded according to CO₂ emissions per kilometre. The first year rate is zero-rated to a higher level of CO₂ emissions per kilometre, and the escalation is more rapid as one steps through subsequent bands. Hence, for the first year rate, the differentiation between vehicles with higher and lower emissions (between £0 and £1,065) is greater than is the case for rates payable in subsequent years (between £0 and £490), giving a stronger signal to purchasers of vehicles at the point of purchase. The tax raised revenue equivalent to 0.36% of GDP in 2011 (see Table 1-4 and

3. Table 1-5).

Table 1-4: UK Vehicle Excise Duty Rates, Petrol and Diesel Cars, 2013/14

Band	CO ₂ Emission (g per km)	12 Months Rate	6 Months Rate
A	Up to 100	£0.00	Not available
B	101-110	£20.00	Not available
C	111-120	£30.00	Not available
D	121-130	£105.00	£57.75
E	131-140	£125.00	£68.75
F	141-150	£140.00	£77.00
G	151-165	£175.00	£96.25
H	166-175	£200.00	£110.00
I	176-185	£220.00	£121.00
J	186-200	£260.00	£143.00
K ¹	201-225	£280.00	£154.00

Band	CO ₂ Emission (g per km)	12 Months Rate	6 Months Rate
L	226-255	£475.00	£261.25
M	Over 255	£490.00	£269.50
<i>Note:</i>			
1. Includes cars with a CO ₂ figure over 225g per km but were registered before 23 March 2006.			

Table 1-5: UK Vehicle Excise Duty, First Year Rates for Petrol and Diesel Cars 2013/14

Band	CO ₂ Emission (g per km)	12 Months Rate	6 Months Rate
A	Up to 100	£0.00	Not available
B	101-110	£0.00	Not available
C	111-120	£0.00	Not available
D	121-130	£0.00	Not available
E	131-140	£125.00	£68.75
F	141-150	£140.00	£77.00
G	151-165	£175.00	£96.25
H	166-175	£285.00	Not available
I	176-185	£335.00	Not available
J	186-200	£475.00	Not available
K	201-225	£620.00	Not available
L	226-255	£840.00	Not available
M	Over 255	£1,065.00	Not available
<i>Note: These rates are for a vehicle's first tax disc when it is first registered.</i>			

4. Netherlands, where the tax payable is calculated using type and weight of the vehicle, type of fuel and province of residence of the owner. For example:

1. Passenger car, 1,400 kg, petrol: from € 748.00 (province of Zeeland) to € 812.00 (province of Zuid-Holland) per year;
2. Passenger car, 1,000 kg, petrol: from € 392.00 (province of Zeeland) to € 420.00 (province of Zuid-Holland) per year;
3. Passenger car, 1,000 kg, diesel: from € 896.00 (province of Zeeland) to € 928.00 (province of Zuid-Holland) per year;
4. Passenger car, 1,000 kg, LPG 3 and natural gas: from € 504.00 (province of Zeeland) to € 536.00 (province of Zuid-Holland) per year;

- Van, used by an entrepreneur, 1,400 kg: € 336.00 per year;
- Lorry, up to 25,000 kilogram, no towing-hook, no air-suspension and three axles: € 440.00 per year; and
- For a lorry with Euro 0, 1 or 2 the rates are 90%, 75% resp. 60% higher

In 2011, the tax raised revenue equivalent to 0.86% GDP.

1.3.1.1 Heavy Goods Vehicles

In addition to taxes on passenger vehicles, to the extent that public authorities may bear responsibility for the upkeep of the majority of the road network (other than those to which tolls are applied directly), then it may make sense for an element of ‘cost recovery charging’ to be incorporated into the design of ‘taxes’. For this reason, the taxation of heavier vehicles linked to (for example) axle numbers and weight, might be considered sensible as these are contributing factors to the impact of vehicles on roads. Noise and other factors, such as the emissions (reflected in the Euro standard of the vehicles concerned) may also be reflected in the design of such taxes.

Directive 2011/76/EU on the charging of heavy goods vehicles for the use of certain infrastructures sets common rules on distance-related tolls and time-based user charges for vehicles with a maximum permissible gross laden weight of not less than 12 tonnes.¹² This regulatory framework aims at improving the functioning of the internal market for road transport by reducing the differences in the levels and systems of tolls and vignettes applicable in Member States and taking better account of the principles of fair and efficient pricing by providing for greater differentiation of tolls and vignettes in line with costs associated with the road use. For example, the Directive gives guidance on how road tolls should be set, and on the approaches for setting external cost charges where these are implemented, and maximum rates thereof. An example of an approach to taxation for HGV vehicles is the HGV-Eurovignette, which applies to Belgium, Denmark, Grand Duchy of Luxembourg, the Netherlands and Sweden (Germany has not been part of the system since September 1st 2003). The Eurovignette is levied on motor vehicles and combinations of vehicles which are destined for the transport of goods by road and whose maximum gross vehicle weight is in excess of 12 tonnes. In each of the countries concerned, the system generally applies in two ways depending on whether the vehicle is registered in the country to whom the tax should be paid, or elsewhere. In Belgium, for example, this is applied as follows:

1. for vehicles which are or must be registered in Belgium: as from the very moment they use a public highway. The Eurovignette is payable for successive periods of 12 months. However, the three-monthly payment of the Eurovignette can be authorized, on reasoned written request, at monthly rate.
2. for other vehicles subjected to the tax: as soon as they are travelling on the road system specified by the King (of Belgium). According to the period during which the vehicle is driven on roads where the Eurovignette applies, the taxpayer can pay a Eurovignette for one day, one week, one month or one year.

¹² Directive 2011/76/EU amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures, OJEU 14.10.2011, L 269, pp.1-16, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:269:0001:0016:EN:PDF>

The applicable rates (in euro) are shown below. They indicate variation according to the number of axles and the emissions from the vehicle (EURO standards indicate progressively lower emissions of pollutants such as NOx).

Table 1-6: Tax Rates Applied under the Eurovignette (€ per vehicle)

Country of registration	Annually		Quarterly (*)		Monthly		Weekly		Daily
	Number of axles:								
	≤ 3	≥ 4	≤ 3	≥ 4	≤ 3	≥ 4	≤ 3	≥ 4	
Belgium									
emission norm non-EURO	960	1,550	288	465	-	-	-	-	-
emission norm EURO I	850	1,400	255	420	-	-	-	-	-
emission norm EURO II and cleaner	750	1,250	225	375	-	-	-	-	-
All other countries									
Vehicles covered by a Belgian trader's number plate or a temporary number plate									
emission norm non-EURO	960	1,550	-	-	96	155	26	41	8
emission norm EURO I	850	1,400	-	-	85	140	23	37	8
emission norm EURO II and cleaner	750	1,250	-	-	75	125	20	33	8

In 2011, in Belgium, the tax revenues amounted to 0.04% of GDP. The same tax (with the same rates) in the Netherlands (for use of vehicles on Dutch roads) raised revenue equivalent to 0.02% GDP in 2011. The tax revenues raised in Denmark, using the same tax structure, were also 0.02% GDP.

1.3.2 Good Practice

The European Commission made, in 2005, a proposal for a Directive on passenger car related taxes. The proposal document noted, regarding consultation on the matter:

The gradual phasing out of registration tax, with a refund system to apply during a five to ten year long transitional period and the introduction of a new tax structure linked to CO₂ emissions received broad support.

As well as dealing with some of the perceived single market distortions flowing from the wide range of registration taxes in different Member States, it foresaw some advantages of this approach:

the abolition of RT [registration taxes] can take place in a revenue neutral framework as the revenue loss can be off-set by a gradual and parallel transfer of revenue from RT to ACT [annual circulation taxes] and, if necessary, from other

fiscal measures in compliance with Council Directive 2003/96/EC and even to innovative road use charging provisions. These represent a more stable source of revenue for national budgets, as they produce revenue during the entire lifetime of a passenger car, unlike RT which produces revenue only upon purchase of that car. Those Member States applying a high RT will be able to adjust the shift to ACT according to their needs until 2016 at the latest. These countries will have, on the one hand, to face transition costs to adapt and administer their car tax system particularly during the first years of the transitional period, but on the other hand they will benefit from lower administrative costs for managing the car tax system after the end of the transitional period.

Regarding the desirability of incentivising a reduction in CO₂ emissions through the tax system, the proposal noted:

Recent studies provided examples on how Member States can apply the CO₂ based element. In this case the total revenue from the CO₂ based element of the tax should be gradually increased over the period up to 2010 and at the same time the revenue from the old structure of the tax should be gradually reduced if the revenue neutrality is to be respected. Certainly it will belong to each Member State to fix the level of tax in terms of Euros per g CO₂ per km.

It also cited work by COWI regarding the potential for different instruments to move different Member States towards the EU target of 120 g CO₂ per km. It foresaw some convergence in the proportion of revenues which should be related to the CO₂- based incentives:

To avoid further internal market fragmentation based on potential diversified application by Member States of the carbon dioxide element, the Commission proposes that by 1 December 2008 (the start of the Kyoto period) at least 25% of the total tax revenue from registration and annual circulation taxes respectively should originate in the CO₂ based element of each of these taxes. By 31 December 2010, at least 50% of the total tax revenue from both the annual circulation tax and the Registration tax (pending its abolition) should originate in the CO₂ based element of each of these taxes.

Notwithstanding the Commission's proposal, no Directive was ever passed into law, so in principle, Member States retain freedom to establish their own taxation arrangements, subject to other legally binding treaties. Even so, the Commission proposal does point towards the desirability of ensuring the tax system favours the use of vehicles which emit fewer greenhouse gases per kilometre travelled, whilst also proposing the phasing out of registration taxes. As noted above, this phasing out has not (at the time of writing) occurred. Whilst some countries, such as the UK, have in place circulation taxes, but no registration tax, others, such as France, have in place a registration tax, but no circulation tax.

An ACEA summary of revenues raised from different transport taxes (and those related to taxes on energy used in transport) in 15 Member States indicated that, excluding VAT, and road tolls, then of the revenues raised from transport taxes, the one-off registration taxes accounted for a share ranging 0% to 61% of the combined revenues from annual

ownership taxes and sales and registration taxes (see Table 1-7).¹³ This suggests that there is no clear pattern across the countries.

Table 1-7: Revenues from Transport Taxes

	AT € bn 2010	BE € bn 2010	DK DKK bn 2010	DE € bn 2010	ES € bn 2010	FR € bn 2009	GR € bn 2010	IE € bn 2011	IT € bn 2010	NL € bn 2010	PT € bn 2011	FI € bn 2010	SE SEK bn 2010	UK £ bn 2010
Purchase or transfer														
1.VAT on vehicle sales servicing/repair, parts, tyres	2.150	4.349	N.A.	25.750	4.242	13.604	0.342	0.382	18.100	1.304	1.719	1.339	18.500	12.500
2. Fuels & Lubricants	5.102	6.270	17.218	39.990	18.383	32.261	4.293	2.521	31.315	7.663	2.498	3.362	50.500	27.010
3. Sales & registration taxes	0.450	0.378	13.431		0.653	1.919	0.249	0.384	1.142	2.005	0.627	0.958		
Annual ownership taxes	1.596	1.455	10.077	8.500	2.813	1.270	1.590	0.990	6.610	3.608	0.396	0.670	13.500	5.840
Driving license fees		0.007		0.010	0.080	-				0.239				
Insurance taxes	0.324	0.734	1.855	3.500	0.692	3.934			4.051			0.284	3.100	
Tolls	1.409		0.356			9.350			1.422					
Customs duties		0.093		0.525		-					0.030			
Other taxes	0.570	0.652		0.820	0.372	1.201	0.055		5.186	1.315	0.370		6.500	1.500
TOTAL	11.601	13.938	42.937	79.095	27.235	63.539	6.529	4.277	67.826	16.134	5.64	6.613	92.100	46.850
EURO	11.6	13.9	5.8	79.1	27.2	63.5	6.5	4.3	67.8	16.1	5.6	6.6	10.5	56.6
GRAND TOTAL = € 375 BN														

Source: ACEA Tax Guide 12, Brussels: ACEA, p.5

At first glance, it may seem odd to implement taxes which are calculated using the same tax base on both registration and circulation. The (typically) one-off nature of registration taxes can be considered as a means to seek to influence the nature of purchases.

Because of their one-off nature, registration taxes may be higher than the annual circulation taxes (and not least, for the more polluting vehicles). Clear differentiation of rates according to emissions can act to bring the issue of fuel economy to the consumers' attention. One issue raised regarding registration taxes has been that they have been too high, and have acted as a barrier to vehicle purchase (and the effect of this may have been to slow down the change in the existing vehicle stock to those which emit fewer GHGs in cases where there is an absence of differentiation in line with such emissions). However, in principle, a suitably differentiated registration tax might influence consumption decisions in a positive manner, whilst having little or no effect on rates at which vehicles with lower emissions are purchased if these attract relatively low registration taxes. The differences in rates across Member States do, however, give rise to Single Market concerns.

Annual circulation taxes may also influence purchasing decisions. In principle, they might be considered as taxes which – when suitably differentiated – seek to reflect the annual impact of the vehicles in use, however imperfectly (since ownership does not determine the level of use). Once the vehicle has been purchased, circulation taxes are payable irrespective (generally) of mileage or actual fuel consumed. As such, the purchase of the

¹³ ACEA Tax Guide 12, Brussels: ACEA, p.5.

vehicle leads to annual payments which cannot be avoided, and the level of which will generally be lower (and with lower differentials) than for the one-off registration tax. It could be argued that the annual circulation taxes – to the extent that they seek to change behaviour – are likely to be less influential than taxes on fuel, which more directly influence fuel consumption, and hence, vehicle usage and associated emissions. In the UK, for example, the difference in the tax between different CO₂ bands for vehicle excise duty are of the order £10 per annum, whereas the costs of the fuel used annually by cars in different bands might vary by £80 or so per annum.

If tax authorities seek to raise more revenue from such taxes, they will generally need to strike a balance between the one-off registration style taxes, and the annual circulation taxes.

The rapidity of the change in the average CO₂ intensity of passenger vehicles in France using the bonus-malus system appears to provide some support for the view that the price at the point of purchase is likely to be a key determinant of the pace of transition to low-carbon vehicles, though from the fiscal point of view, the system, combined with scrapping incentives, has led to net expenditure rather than an influx of revenue. The Austrian Normverbrauchsabgabe (NOVA) appears to be a more moderated form of this approach, with smaller ‘bonus’ offered in the context of a system of registration taxes.

From the fiscal perspective, if the main flow of revenue is derived from initial purchase of vehicles, this might lead to tax revenues which are less stable since they vary with the number of new registrations made each year (a point made by the Commission in its proposal for a Directive – see above). One advantage of placing a greater burden of taxation on the annual circulation taxes is to ensure greater stability of revenue (and given that such ‘taxes’ have sometimes had a ‘cost recovery’ element to them – to fund the maintenance of roads, for example – then revenue stability has much to recommend it). If more revenue is derived from annual taxes, it may also be more straightforward to make periodic adjustments to the tax system since the whole stock of vehicles is affected rather than merely those that are yet to be purchased. Indeed, in some countries, the majority of car purchases in any given year are not purchases of new vehicles, but purchases of second-hand ones (in the UK, this figure has been estimated at 75%).

Additionally, in the case of circulation taxes, there is less scope for strategic purchasing in the wake of announcements regarding future tax rates (if the tax revenues are based more on revenues related to vehicle purchases, then the potential for strategic tax avoidance exists in the period between the announcement of any change and the time at which the change takes effect). Indeed, for the circulation taxes, it may make sense to announce rates some time in advance to indicate a direction of travel and allow consumers to see the likely impact of their purchasing decisions on the taxes they will pay: the opposite may be true of registration taxes, where any early announcement is likely to lead to strategic behaviour. Finally, high registration taxes based on environmental arguments may be counterproductive if consumers can simply import vehicles from other countries to escape high tax burdens. More generally, the variety of different registration tax systems can give rise to problems in the Single Market context.

In principle, therefore, one might suggest a mix of the following:

1. Where registration taxes do not currently do so, to have them reflect the emissions of CO₂, particulates etc.;
2. In line with Commission proposals, to shift more towards circulation taxes, and to

ensure that these are increasingly linked to CO₂ emissions, particulates etc., to the extent that the one-off registration payments seem too high;

3. Taxation on heavier vehicles to reflect the impact on road use (weight, axle numbers) and emissions (Euro standards and CO₂ emissions). Note that road tolls can, in principle, be used to reflect some of these impacts, and would be preferable insofar as they could capture all use of such vehicles; and
4. Reflecting the externalities associated with marginal road-use in conurbations, congestion charges where feasible.

It is difficult to be too specific about the best combination of instruments in this area. Each Member State starts from a different point, and the potential for overlap between policies is clear. For example, it seems entirely possible to design a system of circulation taxes which also incorporates the intent of the HGV-Eurovignette (which can take the form of a circulation tax). Equally, to the extent that Member States need to generate revenue to maintain the road system (and wish to reflect the impact of vehicles on road use), then it might be argued that the tax system ought to reflect the non-zero nature of externalities generated even by low emission vehicles (even though this might be better achieved through some form of road pricing).

Many countries have a number of bands for their vehicle taxes, generally according to the CO₂ emitted. The coarseness of the structure varies across countries. In principle, it seems wise to reward innovation through setting relatively narrow bands of, say, 10-15 g CO₂ per km (so that it is easier to envisage adapting and innovating to move a vehicle from one band to another), as applied in countries such as the UK. Member States may wish to ensure that the incremental costs between bands at least reflect the external costs of the emissions from the vehicle although it can be shown that this leads to relatively small differentials if the focus is CO₂ only.

As noted above, the Commission's proposal for a Directive in 2005 recommended that by the end of 2010, at least 50% of the total tax revenue from both the annual circulation tax and the Registration tax should originate in the CO₂ based element of each of these taxes. More generally, it seems clear that the tax system should have embedded within it incentives designed to promote vehicles with a lower environmental impact (and the above proposals reflect this). Arguably, what is more important is to generate a given quantum of revenue through a tax system which promotes a move towards the purchase of vehicles which, other things being equal, emit lower quantities of GHGs and other pollutants than others. This might suggest an overall structure of taxation which (until such time as road-pricing becomes widespread) ensures a baseline of revenue generation, but with incentives for the purchase of vehicles which emit fewer pollutants (including GHGs). To the extent that fuel duties are intended to reflect many of the externalities of fuel generation, some consideration might also be given as to whether incentives for using low-emission vehicles should allow for an implicit tax rate of zero for such vehicles when they clearly contribute to other externalities of transport.

For HGVs, the specification is more straightforward given the Framework set out in Directive 2011/76/EU. This sets a clear framework for HGV taxation, albeit that some elements of the proposed scheme are more complicated than others to apply in all circumstances.

1.3.3 Suggested Implementation

Reflecting the above, and recognising that:

1. the issue of the ‘correct design’ of transport taxes ought, properly, to consider the whole suite of possible interventions (including, for example, the extent to which road pricing / congestion charging is applied – these may not always be reported as ‘taxes’ as they more closely resemble user charges, even though vehicle ‘taxation’ may also have, associated with it, some form of cost recovery element). This includes duties on transport fuels, which (whatever the initial intention of their design) internalise externalities associated with fuel use, and, therefore, tend to overlap in their effect with circulation taxes that are banded according to emissions, but also, registration taxes;
2. different Member States have quite different starting points in respect of their approach to vehicle taxation; and
3. Member States have freedom to determine their own approach to vehicle taxation (though the Commission’s expressed wish is that registration taxes are phased out),

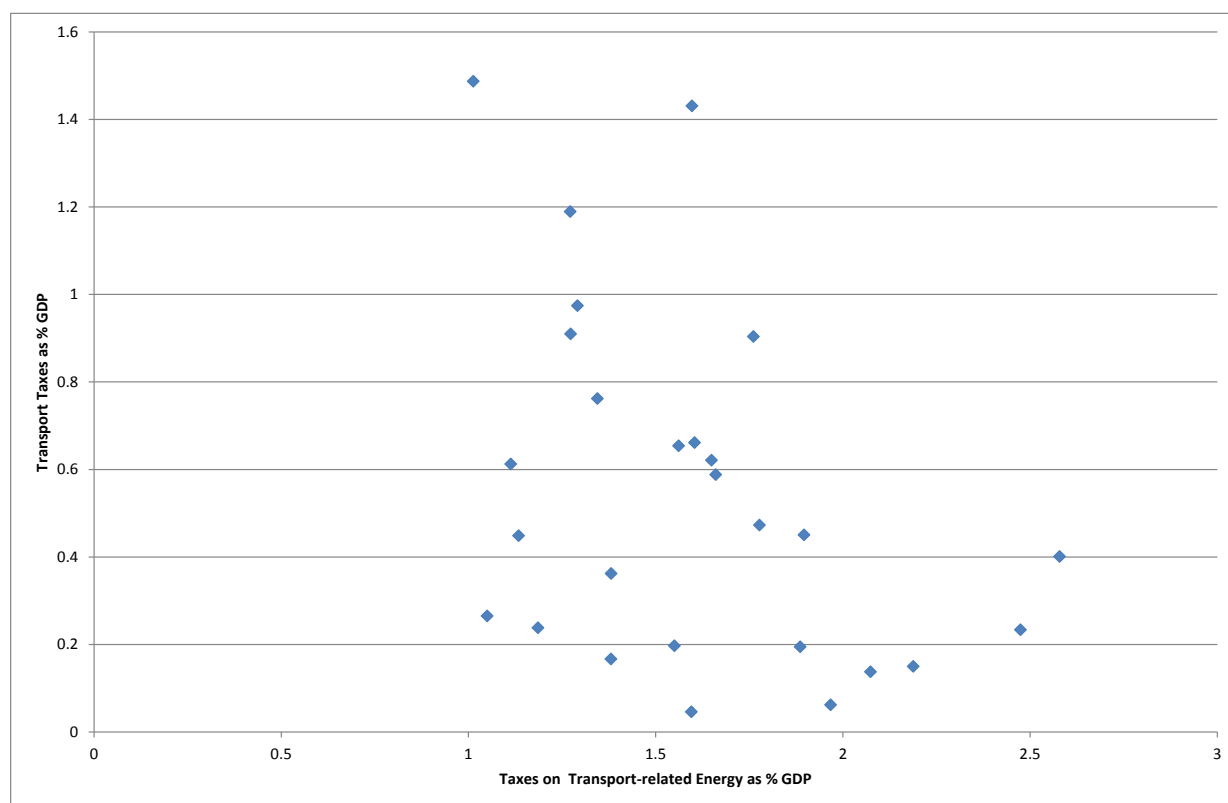
then we have taken a rather pragmatic approach to the application of good practice in this area.

In essence, we have reviewed the current level of tax associated with vehicles and transport fuels in the different countries and have proposed a change to this level in line with the difference in potential revenue take across countries relative to ‘good practice’.

In terms of how these revenues are generated, the revenue coming from taxes on transport-fuels (covered under the Energy Tax Directive) is plotted against the revenue coming from transport taxes (excl. transport fuels) in Figure 1-1. This figure suggests two things:

1. First, a line of best fit shows a weak, but discernible, inverse relationship between the two (potentially bearing out the above point regarding the need to look at all transport taxes, including those on transport fuels, in the round: Member States with high taxes on transport fuels tend not to tax vehicles quite as heavily); and
2. Second, and possibly reflecting the influence of the existing Directive on taxation of energy products and electricity (2003/96/EC, as amended), no country raises less than 1% of GDP from taxes on transport fuels, irrespective of the rate at which it applies taxes on transport (excl. transport fuels). Consequently, whilst taxes on transport (excl. transport fuels) range from below 0.1% GDP to around 1.5% GDP, the taxes on transport fuels generate from around 1% to 2.5% GDP. The ‘interval’ between the lowest and highest levels (as % GDP) is similar for each (around 1.4% GDP), but the proportionate variation (expressed in terms of revenue as % GDP) is much greater where taxes on transport (excl. transport fuels) are concerned.

Figure 1-1: Transport-related Energy Taxes (as % GDP) v Transport Taxes (as % GDP) (EU27, 2011)

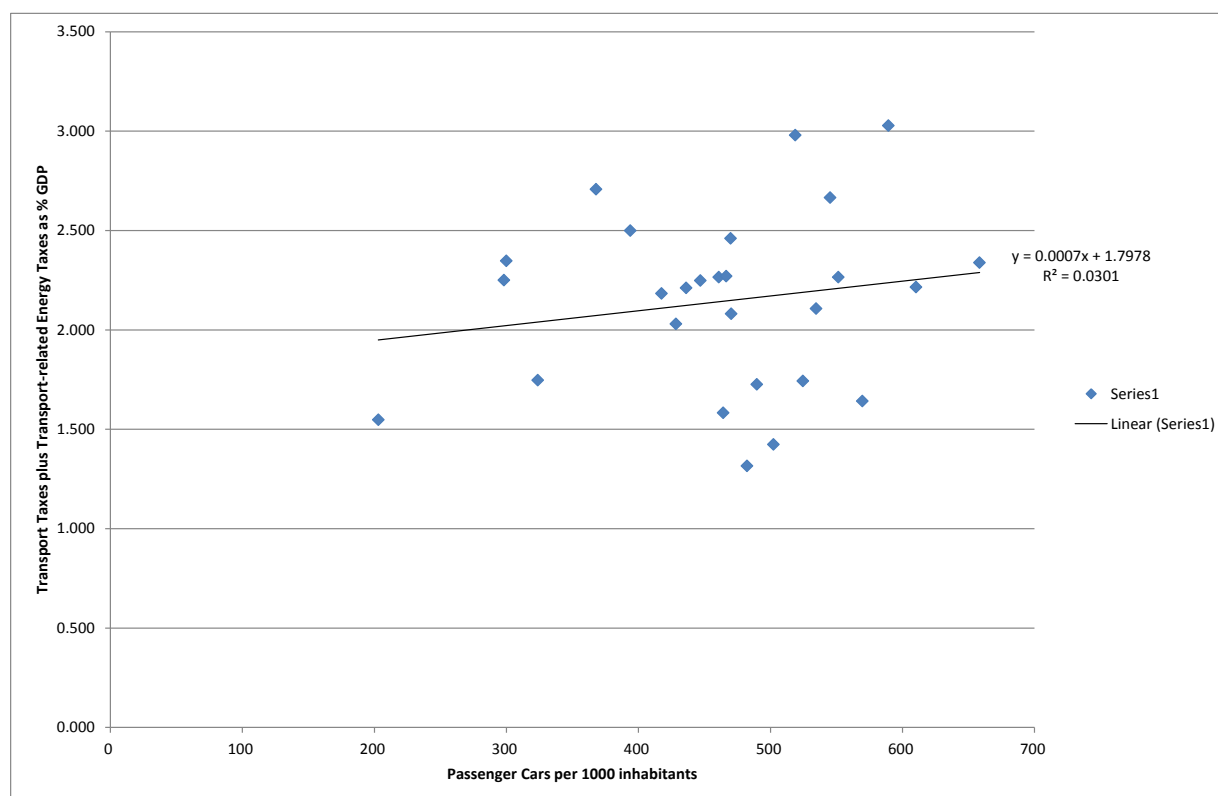


Sources: Transport Taxes as % GDP from Eurostat and Taxes on transport related energy as %GDP from Commission Services in European Commission (2013) Transport in Figures 2013, Part 2: Transport p.30, Directorate General for Mobility and Transport

In determining an appropriate level of potential revenue generation which could be generated from transport taxes (excl. transport fuels), we first of all considered the overall revenue generation in the EU Member States from transport fuels and transport taxes (excl. transport fuels) together. The highest level of taxation from the sources combines was to be found, in 2011, in Malta (3.03% GDP), followed by Slovenia (2.98% GDP) and Bulgaria (2.71% GDP). Of the EU-15 countries, the highest level of revenue generation relative to GDP for these combined taxes was in Denmark (2.50% GDP). We took the average figure in the upper quartile of performance (2.67% GDP), and used this figure effectively as a revenue target to inform the extent to which a Member State could increase taxes on transport (excl. transport fuels) and transport fuels.

We considered that in moving towards this rate, where transport taxes are concerned, the potential for revenue generation might be limited by the level of passenger car use. We have plotted in Figure 1-2 the relation between passenger cars per 1,000 inhabitants and the total revenue from transport taxes and transport-related energy taxes (as % GDP). This appears to show only a weak influence of the one upon the other. Similarly weak correspondences are shown when considering only the transport taxes on the y axis, and when considering the total number of vehicles registered on the x-axis. We considered that the evidence was, therefore, too weak to consider this as a controlling variable.

Figure 1-2: Relationship between Transport Taxes plus Transport-related Energy Taxes (as % GDP) and Passenger Cars per 1000 Inhabitants (EU27, 2011)



Sources: Transport Taxes plus Transport related energy taxes as % GDP from Eurostat and Commission Services in European Commission (2013) Transport in Figures 2013, Part 2: Transport p.30, Directorate General for Mobility and Transport / Passenger Cars per 1000 inhabitants from Eurostat in European Commission (2013) Transport in Figures 2013, Part 2: Transport p.83, Directorate General for Mobility and Transport

By subtracting the current revenue take from the target level, a proposal for the level of change in taxes on transport (including transport taxes) is derived. The net result for the countries in this study is shown in Table 1-8. The change in the far column is a suggested minimum level of increase to transport taxes (including transport fuels).

In order to arrive at the suggested level of change in transport taxes (excl. transport fuels), the revenue take from transport fuels under our revised proposals (see above) has to be estimated first. Within our modelling, therefore, there is a sequential logic applied, whereby the change in transport taxes (excl. transport fuels) is derived by subtracting from the figure in the rightmost column of Table 1-8 the implied increase in the revenue take from transport fuels implied by the changes discussed in Section 1.2.2.

Table 1-8: Suggested Minimum Increase in Transport Taxes plus Transport-related Energy Taxes

	Transport Taxes (incl. transport fuels) (% GDP, 2011)	Revenue Target (as % GDP)	Proposed Increase in Transport Taxes (incl. transport fuels) (as % GDP)
BE	1.73%	2.67%	0.94%
BG	2.71%	2.67%	-0.04%
CZ	2.21%	2.67%	0.46%
DK	2.50%	2.67%	0.17%

	Transport Taxes (incl. transport fuels) (% GDP, 2011)	Revenue Target (as % GDP)	Proposed Increase in Transport Taxes (incl. transport fuels) (as % GDP)
DE	1.74%	2.67%	0.93%
EE	2.03%	2.67%	0.64%
IE	2.18%	2.67%	0.49%
EL	2.27%	2.67%	0.40%
ES	1.32%	2.67%	1.35%
FR	1.42%	2.67%	1.25%
IT	2.22%	2.67%	0.45%
CY	2.67%	2.67%	0.00%
LV	2.35%	2.67%	0.32%
LT	1.64%	2.67%	1.03%
LU	2.34%	2.67%	0.33%
HU	2.25%	2.67%	0.42%
MT	3.03%	2.67%	-0.36%
NL	2.46%	2.67%	0.21%
AT	2.11%	2.67%	0.56%
PL	2.08%	2.67%	0.59%
PT	2.25%	2.67%	0.42%
RO	1.55%	2.67%	1.12%
SI	2.98%	2.67%	-0.31%
SK	1.75%	2.67%	0.92%
FI	2.27%	2.67%	0.40%
SE	1.58%	2.67%	1.09%
UK	2.27%	2.67%	0.40%

Source: European Commission (2013) *Transport in Figures 2013, Part 2: Transport, Directorate General for Mobility and Transport, Tables 2.1.11 and 2.1.12*

In terms of the types of taxes to be applied, the proposal for a Directive discussed above was considered, by the Steering Group, to be the latest publicly available view as to the European Commission's thinking on the matter of passenger vehicle taxation. The proposal expressed the Commission's preference for a shift away from registration taxes. As a result, we have tended to focus that the focus for the generation of additional revenue should be through circulation taxes. In this respect, and as noted above, we note that good practice is to band such taxes according to CO₂ emissions from the vehicle, though we note also that the approach in Malta (under its registration tax) to differentiating diesel vehicle tax rates according to particulate emissions is of some interest, with Denmark doing something similar with its circulation tax.

Finally, in terms of the timing of the introduction of any changes, we have typically suggested a phasing in of the changes over a period which relates to the magnitude of the change being proposed in the country concerned. The taxes are assumed to be phased in between 2016 and 2020, and increase in line with GDP thereafter. This would imply an increase over and above inflation to the extent that GDP is forecast to rise in real terms. It should be noted, in this regard, that some countries are already, in anticipation of a shift in the vehicle stock, and increased innovation in terms of fuel efficiency, reducing the level of CO₂ emissions from vehicles at which a zero rate of tax might apply (for example, in Germany, cars emitting less than 120g CO₂ per km are exempted from the CO₂-related part of the circulation tax: this tax free margin was

decreased to 110g CO₂ per km in 2012 and will be further reduced to 90g CO₂ per km in 2014).¹⁴

1.4 Air Transport

1.4.1 Good Practice

Where air transport is concerned, some Member States deploy levies on passenger flights. Aviation emissions have been included under the ETS since the start of 2012, although in April 2013 the EU decided to temporarily suspend enforcement of the EU ETS requirements for flights operated in 2010, 2011, and 2012 from or to non-European countries, while continuing to apply the legislation to flights within and between countries in Europe. In October 2013 the International Civil Aviation Organization (ICAO) Assembly agreed to develop, by 2016, a global market-based mechanism (MBM) addressing international aviation emissions and apply it by 2020. Until then, countries or groups of countries, such as the EU, can implement interim measures.

Countries which are applying, or have applied duties include:

1. Germany, where the aviation tax has three distance bands, which, in 2013, the tax rate was € 7.50 for short journeys, € 23.43 for medium distances and € 42.18 for long distances. The revenues raised amounted to 0.04% GDP in 2011, though the tax rates have been reduced since 2011;
2. France which applies two different rates for passengers, and one to freight: € 4.24 per passenger for a flight to a destination in France or in another Member State of the European Union or in another state in the European Economic Space agreement or in Switzerland; € 7.62 per passenger embarking for any other destination; and € 1.27 per tonne of freight or mail loaded onto an aircraft. The revenues raised amounted to 0.02% GDP;
3. UK, where the tax is levied at twelve different rates depending on the distance and class of travel. All countries are divided into four distance bands based on the distance between London and the capital city of that respective country/territory:
 - Band A: GBP 13 – for flights beginning in the UK and ending in the UK or any other country/territory for which the capital city is within 2000 miles of London.
 - Band B: GBP 67 – for flights beginning in the UK and ending in any country/territory for which the capital city is between 2,001 and 4,000 miles from London.
 - Band C: GBP 83 – for flights beginning in the UK and ending in any country/territory for which the capital city is between 4,001 and 6,000 miles from London.
 - Band D: GBP 94 – for flights beginning in the UK and ending in any other destination in the world.

¹⁴ See Eclareon and Ecologic (2013) Horizontal Fiche: Environmental Taxation: Reporting of Task 2 and Task 3 as part of the Project 'Assessment of climate change policies in the European Semester, 21 April 2013.

For each distance band, there are three rates of air passenger duty (APD); reduced, standard and higher, depending upon the class of travel (see Table 1-9). The reduced rates apply where the passengers are carried in the lowest class of travel on any flight unless the seat pitch exceeds 1.016 metres (40 inches), in which case, whether there is one or more than one class of travel the standard rates apply. The standard rates apply where passengers are carried in any class of travel other than the lowest or where the seat pitch exceeds 1.016 metres (40 inches), unless the conditions for the higher rate below are met. The higher rate applies if passengers are carried on aircraft with an authorised take-off weight of 20 tonnes or more and equipped to carry fewer than 19 passengers. Note that a different structure applies for Northern Ireland flights. In 2011, the duty raised revenues amounting to 0.17% GDP.

Table 1-9: UK Air Passenger Duty Rates, 2012 and 2013

Destination Bands and distance from London (miles)	Reduced rate from: (for travel in the lowest class of travel available on the aircraft)		Standard rate from: (for travel in any other class of travel)		Higher rate from: (for travel in aircraft of 20 tonnes or more equipped to carry fewer than 19 passengers)	
	1 April 2012	1 April 2013	1 April 2012	1 April 2013	1 April 2012	1 April 2013
Band A (0-2000)	£13	£13	£26	£26	N/A	£52
Band B (2001-4000)	£65	£67	£130	£134	N/A	£268
Band C (4001-6000)	£81	£83	£162	£166	N/A	£332
Band D (over 6000)	£92	£94	£184	£188	N/A	£376

Note: if a class of travel provides for seating in excess of 1.016 metres (40 inches) then the standard or higher (rather than the reduced) rate of APD applies.

4. Austria, which introduced a passenger flight charge in 2011, with rates being reduced in 2012. The tax has three bands, and rates applicable are:
 - Short haul flight: €7.00 per passenger;
 - Medium-haul flight: €15.00 per passenger;
 - Long-haul flight: €35.00 per passenger; and
 - The revenue take in 2012 was €107 million.
5. Malta, which abolished its flat rate tax (€23.29 per passenger) in 2008. The tax raised revenues amounting to 0.1-0.21% GDP in the years prior to its abolition.
6. Denmark, which abolished its duty of DKK 37.50 per passenger in 2007 (it had been half this level in 2005. The tax raised revenues of around 0.03-0.04% of GDP in the years just prior to abolition.

It should also be noted that some countries – the Netherlands and Italy for example – also levy charges related to aviation noise. In Italy, what was previously a national tax was made a regional one in 2011, with uneven implementation giving rise to some concerns. This is, clearly, a particular problem for households living adjacent to airports, or below major flight-paths.

It would appear that revenues of the order 0.15-0.2% of GDP may be raised where there is a higher propensity for air transport (as in Malta and UK, being island states). The revenue raising potential may be slightly lower in countries where the potential for road and rail transport to and from other countries is greater.

It should be noted that a feature of the French system is that freight is also subject to taxation. This is, in principle, a sensible approach, especially to the extent that road, and other forms of freight are also subject to taxation. In principle, so as not to distort modal choice in a random manner, some objective basis for aligning taxes across the modes used should be deployed (for example, the implied costs of GHG damages should be aligned across modes, to the extent that this can be agreed).

1.4.2 Suggested Implementation

Although aviation is included in the EU-ETS, and EU Aviation Allowances (EUAs) were introduced in January 2012, the European Commission announced, in 12 November 2012, a deferral of the enforcement of the requirements under the EU Emissions Trading System for aircraft operators to monitor and report emissions, as well as surrender allowances, in April 2013 for emissions from flights into and out of Europe during 2012. It had been envisaged that 15% of aviation allowances would be auctioned. Evidently, pending the introduction of a new instrument by the ICAO (which is due by 2020), there is scope for some additional revenue to be generated (this is over and above the revenue that might be achieved from intra-EU flights, for which the aviation ETS is still applied). Indeed, it is possible that the market based instrument introduced by the ICAO could provide a source of revenue to Member States (as would have been the case had the auctioning of EUAs proceeded as planned). As such, it does not seem unreasonable to propose measures on flights which could be applied either as interim measures, or with more permanent effect.

Most countries with taxes in place are applying fairly coarse banding systems to simplify administration. A three tiered approach seems reasonable in the circumstances, though in principle, a means to link the tax more closely to emissions could be made through, for example, taxes on journeys made by the aircraft.

Our approach has been to assume that such taxes are introduced, commencing in 2016 and phased in over a period to 2018 reaching tax rates broadly reflecting the UK tax rates. As noted above, the ICAO is due to come forward with a proposed instrument for implementation by 2020. It may be that the instrument is such that it can effectively replace the duties indicated here. However, we assume continuation of these levies post 2020. If a mechanism such as a trading scheme was introduced globally, then depending on the nature of the allocation mechanism for allowances, some revenue would be generated through the auctioning of these. As such, the revenues from allowances might simply replace (to a greater or lesser degree) the suggested tax in future.

The data available to us splits out flights in accordance with whether they are:

- 1) Within the country concerned;

- 2) To other countries in the European Union; and
- 3) To other countries outside the European Union.

We have used this as a proxy for distance, though clearly, for most countries, a distance related levy would not be split as neatly as this breakdown suggests.

In addition, although the UK levy is applied in 3 bands, in practice, the main bands are the lower two, relating, broadly speaking, to lower and upper classes of travel. We have not obtained such a breakdown for each country so we have applied rates close to the lower rates. The rates applied are €15 per passenger, €25 per passenger and €50 per passenger for the different types of flight are used to generate indicative revenues only. For countries with land borders with non-EU countries, it could be expected that flights to non-EU countries might be proportionately higher than for those more remote from non-EU countries. In addition, in line with the approach adopted in France, we have also suggested a tax of €1.25 per tonne of freight carried by air.

1.5 Waste

1.5.1 Good Practice

A number of countries have introduced landfill taxes.¹⁵ The rates vary significantly across countries. The highest rate, for non-hazardous wastes, is in the Netherlands at over €107 per tonne (this tax was abolished, but then reinstated late in 2013). The rate of tax in the UK is also high, at around €90 per tonne in 2013, and due to increase to approximately €100 per tonne in April 2014). Some countries within the EU have also implemented landfill bans, which amount, effectively, to an infinite tax on landfilling of those wastes falling under the scope of the ban. Countries with landfill bans in place have tended (with the exception of Germany) to set high landfill taxes to ensure that those subject to the ban have no financial incentive to seek exemptions from the ban for local reasons (for example, the absence of appropriate treatment facilities).

Much of the literature on the externalities of waste management indicates that there is relatively little to choose between the quantifiable externalities arising from landfill and those arising from incineration.¹⁶ Indeed, several studies have indicated externalities from incineration which exceed those from landfill. It is somewhat surprising, therefore, that taxes on incineration remain relatively rare.

They do exist in Denmark, Flanders in Belgium, Austria, France, Catalonia in Spain, and Portugal. Given the extent to which bans have given rise to over-capacity in treatment in most of the countries which have introduced them (Netherlands, Germany, Sweden, Denmark, Austria, Belgium), then a sensible approach – to encourage a shift away from

¹⁵ For a recent review, see ETC/SCP (2012) *Overview of the Use of Landfill Taxes in Europe*, ETC/SCP Working Paper 1/2012, April 2012.

¹⁶ HM Customs & Excise (2004) *Combining the Government's Two Heath and Environment Studies to Calculate Estimates for the External Costs of Landfill and Incineration*, December 2004; E. Dijkgraaf and H. Vollebergh (2005) Literature review of social costs and benefits of waste disposal and recycling, in EAI (2005) *Rethinking the Waste Hierachy*, EAI: Copenhagen, pp. 80-98; E. Dijkgraaf and H. Vollebergh (2004) Burn or bury? A social cost comparison of final waste disposal methods, *Ecological Economics*, 50, pp.233-247; COWI (2000) *A Study on the Economic Valuation of Environmental Externalities from Landfill Disposal and Incineration of Waste*. Final Report to DG Environment, the European Commission, August 2000.

landfill, but without encouraging a simple shift from landfill to incineration – would be to increase taxes on landfill, whilst also introducing taxes on other ways of treating residual waste so as to act as an incentive for waste prevention and further recycling, rather than encouraging a switch from disposal to landfill to combustion of residual waste. Indeed, this would be consistent with the Roadmap to a Resource Efficient Europe and the recently agreed 7th Environmental Action Programme.¹⁷ The economic case for a landfill ban in the general case seems difficult to justify.

The way in which taxes are applied to non-municipal waste is also of some interest in the design of landfill taxes. A number of countries have considerable ‘structure’ in the design of their taxes, with some countries applying more than 10 different rates depending on the waste stream.

It is interesting that Member States with taxes in place treat construction and demolition wastes very differently. The UK includes a standard rate (currently at €90 per tonne) for most wastes, and a much lower rate (currently at €3 per tonne) for specified materials which are usually of a ‘biologically inert’ character. On the other hand, Latvia applies a much higher rate of tax for inert construction wastes than it does to municipal type wastes. Several countries levy the same rates of tax for both types of waste.

Another interesting aspect of landfill taxes is the way in which hazardous wastes are dealt with. In many countries, there is no special rate for hazardous wastes, whilst in some (France), the taxes are lower for hazardous waste than for municipal waste, whilst in others, they are much higher. In this latter regard, the case of the Czech Republic is interesting given the imposition of both a tax and a risk charge, revenue from the latter being given over to the State Environmental Fund.

1.5.2 Suggested Implementation

A recent report for DG Environment highlighted the role of landfill taxes in incentivising improved waste management performance:¹⁸

The analysis suggests that there is a relationship between higher landfill taxes (and higher total landfill charges) and lower percentages of municipal waste being sent to landfill. Three broad groups of Member States emerge:

- 1. Member States with high total charges for landfill and low percentages of municipal waste landfilled (AT, BE, DE, DK, LU, NL, SE);*
- 2. Member States with mid- to high-range total charges and mid-range percentages landfilled (FI, FR, IE, IT, SI, UK); and*
- 3. Member States with low total charges and high percentages landfilled (BG, CZ, GR, HU, LT, LV, PL, PT, RO, SK, CY, EE, ES). All except the last three of these Member States have total landfill charges of less than €40 and are landfilling more than 60% of their municipal waste.*

¹⁷ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

¹⁸ E. Watkins, D. Hogg, A. Mitsios, S. Mudgal, A. Neubauer, H. Reisinger, J. Troeltzsch, M. van Acoleyen (2012) *Use of Economic Instruments and Waste Management Performances*, Final Report to DG Environment, 10 April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf, p.4.

The Member States in group 1 all have some form of landfill restriction in place for unsorted or untreated municipal waste; several of the Member States in group 2 also have landfill restrictions in place for unsorted or untreated municipal waste; and only EE, SK and LT in group 3 currently have or are planning to introduce such restrictions. It is reasonable to believe that in addition to the taxes and total charges, these restrictions also have an influence on forcing landfill rates down to low levels.

It went on to note:¹⁹

A fairly clear and linear correlation was observed between the total landfill charge and the percentage of municipal waste recycled and composted in the Member States. The Member States that charge more for landfilling show a higher percentage of waste recycled and composted. Evidently, other policies (including those to promote recycling, to encourage prevention, extended producer responsibility schemes and PAYT schemes) also influence recycling and composting rates, but it appears reasonable to state that in addition to simply reducing the amount of waste sent to landfill, higher landfill charges tend to push waste towards recycling and composting, therefore moving waste treatment up the waste hierarchy. It appears that Member States are much more likely to meet a 50% recycling target once landfill charges (or the cost of the cheapest disposal option) approach €100 per tonne.

In reality, the rate of tax to be set depends partly on the objectives for the tax. To the extent that waste is to be moved up the hierarchy, then it should be considered that the gap between the costs for recycling and the costs of landfilling are likely to be influenced by a range of factors, not least, the labour costs in the country concerned.

The above study indicates, however, that broadly speaking, a tax of less than €40 per tonne might not be sufficient to stimulate significant change in performance. Equally, for a number of countries, the rate of €100 per tonne suggested as necessary to achieve 50% recycling would impose significant costs to many of the countries in this study that don't already have low levels of landfilling.

It should also be noted that many Member States have made use of funds from the European Union to fund treatment facilities dealing mainly with residual waste. Some concerns have arisen regarding the fact that this might lead to a stitch of material from landfill to incineration with limited movement of waste management into the upper tiers of the waste hierarchy.

The suggested approach is based upon moving tax rates for landfilling to a level of €50 per tonne, and indexing rates once they are at this level. The implementation of major changes in landfill tax in short periods of time without prior announcement can be problematic in a sector which is characterised by long lead times. As such, the implementation is phased, with the €50 rate being met in a number of years, depending on the current level of tax in the country concerned.

¹⁹ E. Watkins, D. Hogg, A. Mitsios, S. Mudgal, A. Neubauer, H. Reisinger, J. Troeltzsch, M. van Acoleyen (2012) *Use of Economic Instruments and Waste Management Performances*, Final Report to DG Environment, 10 April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf, p.4.

In order to ensure landfill taxes generate movement of waste into upper tiers of the hierarchy, it is also suggested that a tax is implemented on incineration. Although Denmark has a much higher tax rate for incineration (and this is now related to CO₂ emissions), the suggestion is that rates similar to those in France would be appropriate. The tax rate proposed is €15 per tonne, with the rate being phased in so that it is achieved in the same year as the landfill tax proposed above.

For Austria and Belgium, no amendment in landfill tax is proposed given the ban on landfilling in Austria and the Flemish and Walloon regions of Belgium.

As regards inert (construction type) wastes, for countries with no such tax in place at present, it is suggested the tax is set at €2.40 per tonne. In conjunction with aggregates taxes, such taxes can help to encourage recycling of construction wastes for use as secondary aggregates, but experience indicates the tax does not have to be especially high (and where it is, it may give rise to problems of poor management of such wastes).

These approaches give some time for response by industry (which is already changing in most of these countries). The taxes on both landfill and incineration / MBT are designed to encourage approaches more focused on the upper tiers of the waste hierarchy. In some countries, there is, as yet, no incineration, but a tax, even at a low rate, can serve to indicate the desired direction of travel in future, and present over-investment in incineration capacity (which is particularly easy to do in some of the smaller Member States). Hence, the early announcement of such a tax is designed to forestall excessive investment in such infrastructure in future years. It is assumed that the taxes are indexed to inflation (they stay constant in real terms) for the purposes of the revenue calculation. In practice, this may happen through annual indexing or through periodic adjustments.

1.6 Packaging

1.6.1 Good Practice

Where packaging taxes are concerned, databases frequently record taxes which are either a) not taxes, or b) only applied in limited circumstances. This is due, mainly, to the existence of producer responsibility organisation which have been established as part of countries' response to the packaging and packaging waste Directive, and which themselves (typically) require producers to pay a fee to ensure their packaging obligations are discharged. Some taxes may relate to these schemes, whilst some are used, in essence, as inducements to join such schemes since they are paid only by organisations that choose not to discharge their obligations through such schemes. Several countries apply such taxes in the latter form, including (within the group of countries we are interested in), for example, Lithuania. The DG-TAXUD database records the tax on packaging as part of Lithuania's scheme of environmental taxes. The applicable rates are shown in Table 1-10.

Table 1-10: Packaging Tax Rates in Lithuania

Types of Packaging	Rates (LTL per kilogram of the weight of the packaging)
1. Glass packaging	0.20
2. Plastic packaging	1.80

Types of Packaging	Rates (LTL per kilogram of the weight of the packaging)
3. Composite packaging	2
4. Metal packaging	2.60
5. Paper and carton packaging	0.10
6. Other packaging	0.20
7. PET packaging	2

The description in the DG-TAXUD database states

Manufacturers and importers are exempted from the pollution tax for polluting the environment with goods and/or packaging waste proportionally the recovered and/or recycled amount of goods and/or packaging waste.

If manufacturers and importers fulfil the tasks set for recovery or recycling of goods and packaging waste they are fully exempted from this tax paying.

In our experience, few organisations will choose to ‘self-comply’ so that revenues from such taxes will be extremely limited as the implied rates are effectively punitive. For this reason, we concentrate on those taxes which are not linked to (non-)compliance with recycling obligations.

Another tax which has links to other packaging instruments is the tax in Finland. This is applied to warehouse keepers, and other persons who import packaged beverages from outside the Union or receive them in the course of their business activities from another Member State. However, there are exemptions for packaging which belongs to a deposit refund system and are recoverable within such a scheme or as raw material. The relevant deposit system has to be approved by the environmental authorities. Also exempt are liquids in board packaging (presumably, since Finland does not include such packaging in the scope of its own deposit refund scheme, operated by Palpa). Beverages produced in legally and economically independent small manufacturers are also exempt, when the amount of beverages released for consumption does not exceed 50,000 litres. The applicable rate is 51 cents per litre of packaged product. The tax raised €15 million in 2011, equivalent to 0.01% GDP.

Denmark has had a packaging tax in operation since 1978, and despite generally favourable reviews, it has recently been abolished. Significant changes to the tax were made over the last fifteen years or so.²⁰ Between 1999 and 2001, Denmark introduced a more sophisticated version of the tax which removed fiscal equality between different packaging materials. The revised taxes are now determined through reference to life cycle-based assessment of the environmental damages associated with the different materials. In Denmark, the tax was implemented for a variety of objectives including:

- Waste prevention;

²⁰ ECOTEC in association with CESAM, C. U. (2001) *Study on Environmental Taxes and Charges in the European Union and its Member States*, Final report for the European Commission, April 2001.

- Higher rates of recycling; and
- Reduced environmental / climate change impacts.

Not all packaging was covered within the scheme. The levy does not cover other items such as general foodstuffs and household goods and only applies to retail containers up to 20 litre capacity (see Table 1-11). One report suggests that only 7% of packaging was covered by the tax.²¹ The tax was weight based for a wide range of products. The rate varied depending on the material used, and there are 13 different tax levels, corresponding to the different types of materials. For drinks containers, the tax was levied per unit. This was partly in acknowledgement of the fact that reusable packaging, used in the Danish deposit refund system, is heavier, and to base the tax on weight would have penalized the use of reusable containers. In any event, a report states that:²²

If there is no obligatory deposit on the beverage, the tax rate depends on the material used and the volume of the beverage. If the material is made of cardboard or of laminate there is a single rate and if it is made from other materials such as glass, metals, plastic etc. there is a higher rate per unit (Danish Ministry of Taxation, 2011).

If there is an obligatory deposit on the beverage, the tax rate is not influenced by the material used, and the rate is lower than for beverage packaging not subject to a deposit.

Table 1-11 demonstrates the tax rates on packaging material that were applied in Denmark.

²¹ ETC / SCP (2012) Effectiveness of Economic Instruments for Packaging, ETC / SCP Working Paper No.4 / 2012, December 2012, http://scp.eionet.europa.eu/publications/wp2012_4/wp/wp2012_4 p.26.

²² Ibid, p.27.

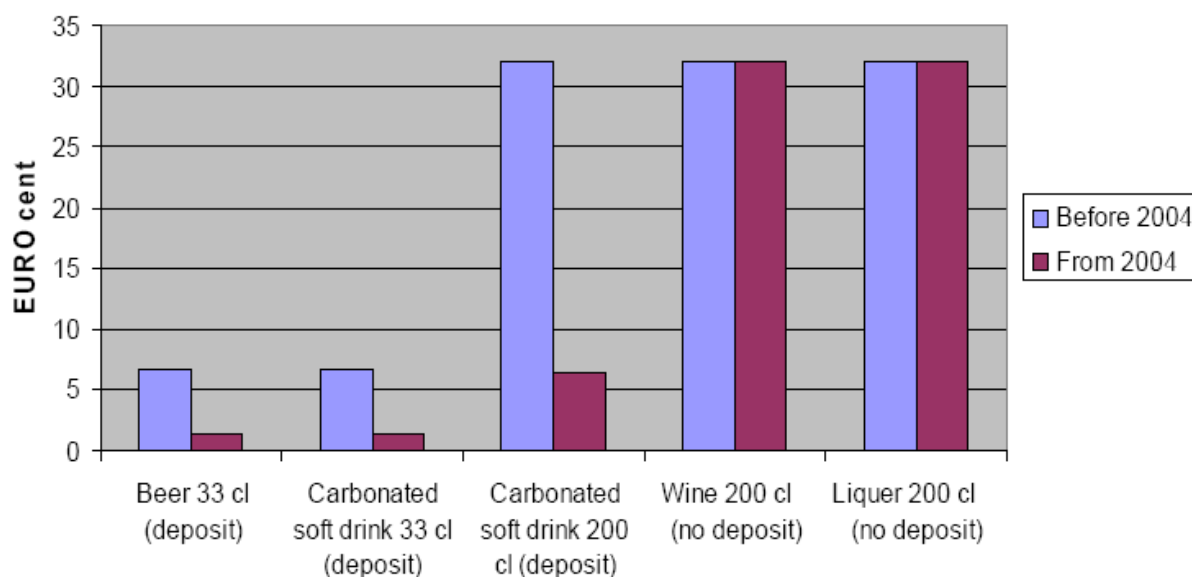
Table 1-11: Primary Packaging Tax Rates in Denmark, 2008 (weight-based)

Volume-Based Tax	Packaging Material	Rate (DKK per item)
A. Packaging and multi-packaging with a cubic content of not more than 20 litres for:		
Spirits, wine and fruit-wine;	- Cardboard or laminates of various materials: per item	
	containers with a capacity of less than 10 cl	DKK 0.08
	containers with a capacity of not less than 10 cl and not more than 40 cl	DKK 0.15
	containers with a capacity of not less than 40 cl and not more than 60 cl	DKK 0.25
	containers with a capacity of not less than 60 cl and not more than 110 cl	DKK 0.50
	containers with a capacity of not less than 110 cl and not more than 160 cl	DKK 0.75
	containers with a capacity of above 160 cl	DKK 1.00
	- Other materials: per item	
	containers with a capacity of less than 10 cl	DKK 0.13
	containers with a capacity of not less than 10 cl and not more than 40 cl	DKK 0.25
	containers with a capacity of not less than 40 cl and not more than 60 cl	DKK 0.40
	containers with a capacity of not less than 60 cl and not more than 110 cl	DKK 0.80
	containers with a capacity of not less than 110 cl and not more than 160 cl	DKK 1.20
	containers with a capacity of above 160 cl	DKK 1.60
Beer, mineral water, lemonade and similar beverages containing carbonic acid, falling under customs tariff items 22.01 and 22.02, blends of non-alcoholic drinks with spirits with an alcohol content of no more than 10% vol.;		
	containers with a capacity of less than 10 cl	DKK 0.05
	containers with a capacity of not less than 10 cl and not more than 40 cl	DKK 0.10
	containers with a capacity of not less than 40 cl and not more than 60 cl	DKK 0.16
	containers with a capacity of not less than 60 cl and not more than 110 cl	DKK 0.32
	containers with a capacity of not less than 110 cl and not more than 160 cl	DKK 0.48
	containers with a capacity of above 160 cl	DKK 0.64
<i>Weight-based tax</i>		
B. Packaging and multi-packaging of any other material and volume used for:		
Mineral water, lemonade and similar beverages not containing carbonic acid, falling under customs tariff items 22.01 and 22.02, juice and must and concentrates used for the production of such drinks;	cardboard and paper primary material and textiles	DKK 0.95
Water;		
Vinegar and edible oil;		
Denatured spirits;		
Soap, detergents, cleansing agents and cleaning preparation, polish and similar goods falling under customs tariff items		

Volume-Based Tax	Packaging Material	Rate (DKK per item)
34.01, 34.02 and 34.05;	cardboard and paper secondary material	DKK 0.55
Lubricant and similar goods falling under customs tariff item 27.10, 38.19 and 34.03 and goods liable to tax according to law of energy tax on mineral oil, etc;	plastic (except eps and pvc), primary material	DKK 12.95
Pesticides liable to tax according to law of tax on pesticides;	plastic (except eps and pvc), secondary material	DKK 7.75
Paint, lacquer, dye, stopper and similar goods falling under customs tariff items 32.08-32.10 and 32.14;	plastic (except eps and pvc), UN-approved	DKK 10.35
Perfume, cosmetics and similar goods falling under custom tariff items 33.03-33.07;	plastic (except eps and pvc) where more than 50% of the packing materials are different from plastic	DKK 7.75
Coolant for engines and windscreen wash;	eps and pvc	DKK 20.35
Certain chemical substances and products falling under statutory order No 329 of 16 May 2002 from the Ministry of the Environment and Energy;	Aluminium	DKK 33.30
Milk and dairy products falling under customs tariff items 04.01-04.03 and 04.05 except for liquid whole milk, light milk, skimmed milk and buttermilk and the vegetable replacement of these products;	tinplate and other packings of steel	DKK 9.25
Margarine and similar goods falling under customs tariff item 15.17 and other lubricate products consisting of a mixture of milk fat and vegetable fat falling under customs tariff item 21.06;	tinplate and other packings of steel, UN-approved	DKK 7.40
Dog food and cat food falling under customs tariff item 23.09.10;	glass and ceramics	DKK 1.85
Sauce, mustard and similar goods falling under customs tariff item 21.03 and tomato purée and tomato juice falling under customs tariff item 20.02.	Wood	DKK 0.55
C. Plastic or paper bags with a cubic content of not less than five litres.	Paper bags	DKK 10 per kg
D. Disposable tableware.	Plastic bags	DKK 22 per kg
E. Film wrapping product of soft polyvinyl chloride (pvc) used for wrapping foodstuff.		DKK 19.20 per kg
		DKK 20.35 per kg

The rates for beverage packaging in Denmark implied by the above levies are shown in Figure 1-3.

Figure 1-3: Tax on Beverage Packaging in Denmark



Source: Christian Fischer (2008) *Producer Responsibility Schemes versus Deposits and Taxes- Danish Experiences*, PRO Europe Congress, 15 May 2008

Due to the nature of the levy and its connection with consumption, the primary environmental outcome of the levy was anticipated to be waste prevention. According to the Nordic Council, the tax on packaging in Denmark led to an annual reduction of packaging of 400,000 tonnes.²³ It was designed to complement other existing market-based instruments, in particular, the deposit refund scheme for drinks containers.

The Danish scheme is considered by many to be successful. Success factors for the system are:

- Good coverage of materials covered by the tax;
- A switch from weight based taxation to LCA tax; and
- Tax levels set high enough to have an impact.

In 2011, the tax raised DKK 1.3 billion, or 0.07% GDP. This appears to include the revenue from taxes on plastic bags, disposable tableware, and PVC film used to wrap foodstuffs. A recent study suggests the following revenues from the packaging tax itself.²⁴

²³ The Nordic Council (2008) *Extension of environmental taxes*, consulted October 2008 <http://www.norden.org/webb/news/news.asp?id=6237>

²⁴ ETC / SCP (2012) *Effectiveness of Economic Instruments for Packaging*, ETC / SCP Working Paper No.4 / 2012, December 2012, http://scp.eionet.europa.eu/publications/wp2012_4/wp/wp2012_4 p.29.

Table 1-12: Revenues from Danish Packaging Tax

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Revenue mill.	DKK	437	436	447	423	448	474	460	394 ¹	413 ¹
% of 2002	100	100	102	97	103	108	105	90 ¹	95 ¹	
GDP index	100	100	103	105	109	111	110	104	-	
Final consumption index	100	101	105	108	111	114	114	-	-	
<p>Note:</p> <p>1) On 1 December 2008, packaging for mineral water was transferred to the volume based packaging tax due to their inclusion in a deposit refund system. Source: Danish Ministry of Taxation, Eurostat (as cited in the original, B. Kjær et al (2012) Effectiveness of Economic Instruments for Packaging, December 2012, ETC/SCP Working Paper, No 4/2012).</p>										

1.6.2 Suggested Implementation

In countries without deposit-refund systems, the distinction which is made in the Danish system makes rather less sense. The Danish weight-based rates could, in principle, be applied to all packaging, but as noted above, the tax has never covered more than a relatively small fraction of all packaging placed on the market. Applying the Danish weight-based rates to all packaging across the EU would imply a significant revenue take.

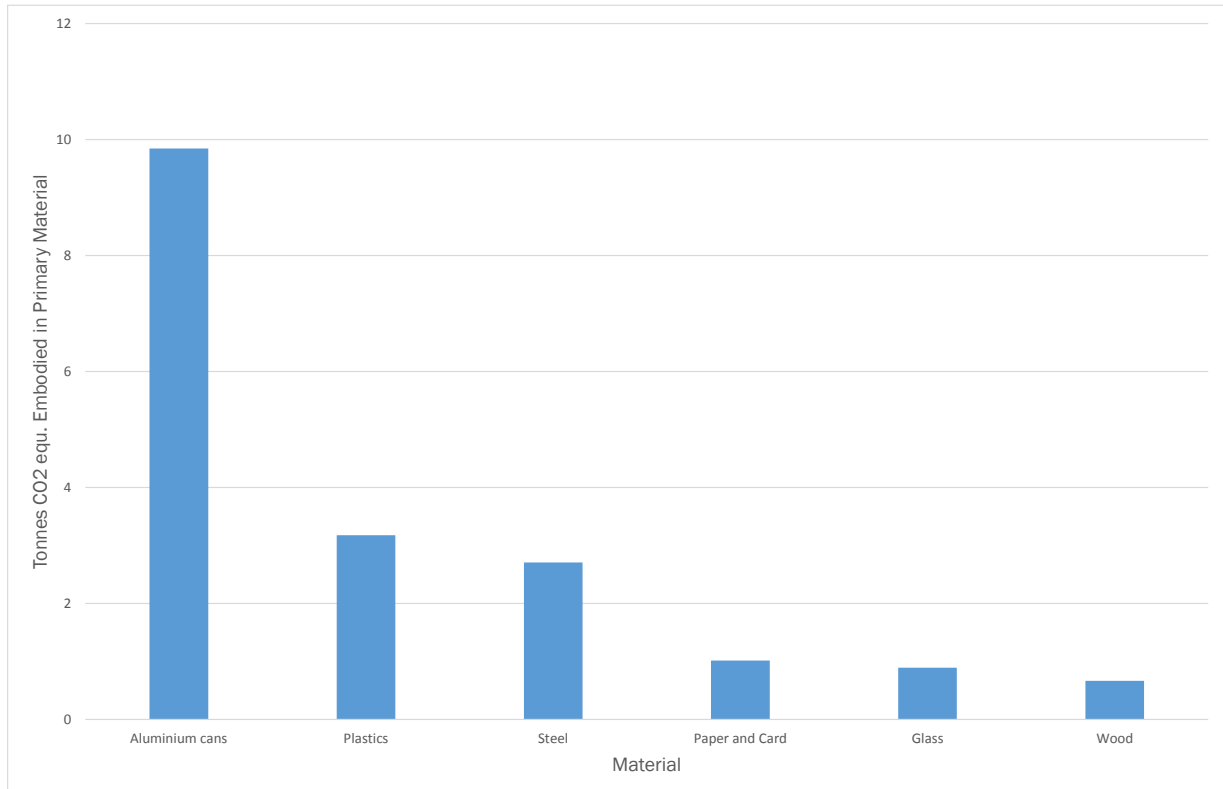
Table 1-13: Weight-based Packaging Tax Rates in Denmark (€ per kg)

Material	Tax (€ per kg)
Paper and Cardboard (primary)	€0.13
Paper and Cardboard (secondary)	€0.07
Plastic (except EPS and PVC) (primary)	€1.74
plastic (except EPS and PVC) (secondary)	€1.04
plastic (except EPS and PVC), UN-approved	€1.39
plastic (except EPS and PVC) where >50% of materials not plastic	€1.04
EPS and PVC	€2.73
Aluminium	€4.46
Tinplate and other steel packaging	€1.24
Tinplate and other steel packaging, UN approved	€0.99
Glass and ceramics	€0.25

Material	Tax (€ per kg)
Wood	€0.07
<i>Note: converted at exchange rate of €1 = DKK 7.46</i>	

The fact that these figures are relatively high can readily be appreciated from the magnitude of the greenhouse gas savings from avoiding the use of primary materials of the different types commonly used in packaging. They are shown in Figure 1-4 below.

Figure 1-4: Embodied Greenhouse Gas Emissions in Specific Materials (tonnes CO₂ equ. per tonne of primary material)



Source: based on Zero Waste Scotland carbon metric

If one assumes (as per the proposed ETD) a value of €20 per tonne CO₂, these figures can be translated into a tax rate for each material as shown in Table 1-14.

Table 1-14: Weight-based Packaging Tax Rates Based on Embodied CO₂ Content

Material	Tonnes CO ₂ Embodied in Material	€ per Tonne of Material
Aluminium	9.84	€196.88
Plastics	3.18	€63.57
Steel	2.71	€54.16
Paper and Card	1.02	€20.35
Glass	0.89	€17.89

Material	Tonnes CO ₂ Embodied in Material	€ per Tonne of Material
Wood	0.67	€13.32

These are the rates we have suggested are applied in those countries without similar measures already in place. The tax was modelled as being introduced in 2017. It is expected that a reasonable period of time would be required for discussions around such taxes prior to their being implemented.

1.7 Single-use Carrier Bags

1.7.1 Good Practice

At one level, the taxing of single-use carrier bags looks ‘trivial’ from the point of view of both revenues and environmental impact. By weight and by volume, they account for a very small proportion of the waste stream. However, the environmental impact of such bags, particularly plastic bags, is disproportionately large.

Plastics dominate marine litter and represent a significant threat to the marine environment due to their abundance, longevity in the marine environment and their ability to travel vast distances.²⁵ Despite representing only 10% of all waste produced, plastics account for between 50-80% of marine litter and this is not expected to decline for the foreseeable future (particularly as plastics do not degrade quickly).²⁶ As they are lightweight and long-lasting, and able to travel great distances, plastics are reported to present a long term threat to marine ecosystems, as they can:

- Directly harm wildlife; ²⁷
- Damage benthic environments; ²⁸
- Transport non-native and invasive species; and ²⁹

²⁵ KIMO (2010) Economic Impacts of Marine Litter, Kommunernes Internationale Miljøorganisation Local Authorities International Environmental Organisation, September 2010, available at <http://www.kimointernational.org/Portals/0/Files/Marine%20Litter/Economic%20Impacts%20of%20Mari ne%20Litter%20Low%20Res.pdf>

²⁶ Thompson, R.C., Swan, S.H., Moore, C.J. and vom Saal, F.S. (2009a) Our Plastic Age. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364(1526): 1969-2166; Barnes, D.K.A., Galgani, F., Thompson, R.C. and Barlaz, M. (2009) Accumulation and fragmentation of plastic debris in global environments. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364(1526): 1985-1998; Thompson, R.C., Moore, C.J., vom Saal, F.S., and Swan, S.H. (2009b) Plastics, the environment and human health: current consensus and future trends. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364(1526): 2153-2166.

²⁷ Sheavly, S.B. (2005) Marine Debris – an Overview of a Critical Issue for Our Oceans. Presentation at Sixth Meeting of the UN Open-ended Informal Consultative Process on Oceans and the Law of the Sea. Available at <http://www.un.org/Depts/los/index.htm>

²⁸ Moore, C.J. (2008) Synthetic polymers in the marine environment: a rapidly increasing, long-term threat. *Environmental Research* 108: 131-139.

²⁹ Cheshire, A.C., Adler, E., Barbière, J., Cohen, Y., Evans, S., Jarayabhand, S., Jędrzejewski, L., Jung, R.T., Kinsey, S., Kusui, E.T., Lavine, I., Manyara, P., Oosterbaan, L., Pereira, M.A., Sheavly, S., Tkalin, A., Varadarajan, S.,

- Concentrate toxic chemicals from seawater. ³⁰

Of all plastics, it is, arguably, single use plastic carrier bags that have the greatest impact. Data taken from the International Bottom Trawl Survey and the Clean Seas Environmental Monitoring Programme indicate that plastic bags make up 40% of all marine litter in the waters of the North East Atlantic. The French research institute IFREMER has also found that in the Bay of Biscay most of the waste items found on the seabed were plastic (92%) and of those 94% were plastic bags.³¹ An increasing area of concern is the potential impact of microplastic particles, although the environmental significance of this form of pollution is not yet fully understood. ³²

The need for action on single-use plastic carrier bags was further emphasised in 2013 when the European Commission published three studies looking into the composition and sources of marine litter in European seas. In a chapter integrating the results it noted that:³³

Plastics are the most abundant debris found in the marine environment and comprise more than half of marine litter in European Regional Seas. More than half of the plastic fraction is composed of plastic packaging waste with plastic bottles and bags being predominant types of plastic packaging.

Therefore, measures within a strategy to close the largest loopholes in the plastic packaging cycle should target plastic bottles and plastic bags.

Accordingly, a more considered perspective leads one to the view that the application of such taxes – which have proved successful in radically reducing single-use carrier bag use – should be one of the key policies by which Europe addresses the problem of marine litter. It is worth noting that this issue is a growing concern and has led to various initiatives within the European Commission³⁴ as well as initiatives in coastal areas of the EU.³⁵

However, while there is clearly merit in addressing *plastic* bags, there is a more compelling logic to placing a tax on *all kinds* of single-use carrier bags, whatever their material. Such an approach would avoid the inevitable arguments about the relative

Wenneker, B. and Westphalen, G. (2009) UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter. UNEP Regional Seas Reports and Studies, No. 186; IOC Technical Series No. 83.

³⁰ Committee on the Effectiveness of International and National Measures to Prevent and Reduce Marine Debris and Its Impacts, National Research Council, Ocean Studies Board and Division on Earth and Life Sciences (2008) Tackling Marine Debris in the 21st Century. Washington D.C.: The National Academies Press.

³¹ Seas at Risk (2011) Commission Consults on Binning Plastic Bags, available at http://www.seas-at-risk.org/news_n2.php?page=408

³² T Thompson, R.C., Olsen, Y., Mitchell, R.P., Davis, A., Rowland, S.J., John, A.W.G., McGonigle, D. and Russell, A.E. (2004) Lost at Sea: Where is all the Plastic? Science 304: 838.

³³ See

<http://ec.europa.eu/environment/marine/pdf/Integration%20of%20results%20from%20three%20Marine%20Litter%20Studies.pdf>

³⁴ See http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/index_en.htm

³⁵ The Conference of Parties of the Barcelona Convention for the Protection of the Mediterranean adopted a regional plan to manage marine litter in December 2013 (http://europa.eu/rapid/press-release_MEMO-13-1110_en.htm).

impacts of paper versus plastic (including biodegradable plastic) bags - arguments which, we note, are often conducted through the relatively restricted lens of life cycle assessment, typically excluding from consideration the 'downstream' impacts of such items when they become littered (which, as noted above, might be decisive in terms of any decision in respect of relative impacts).

Moreover, applying a tax to *all* single-use carrier bags would more fully respect the waste hierarchy, and lead to a greater waste prevention impact. Furthermore, in terms of communication, applying a tax in such a way enables the delivery of a clearer and more intellectually coherent message to citizens. This is exemplified by the Welsh Government's implementation of the Carrier Bag Charge, which also demonstrates best practice by having the charge at the point of sale, rather than absorbed by the retailer.

Several countries apply carrier bag taxes.

In France, a tax under the TGAP is levied on plastic bags delivered in supermarkets. The rate of the tax is € 10 per kilogramme. In Denmark, there is a weight-based carrier bags charge (for bags made of paper and plastic, and having a handle). The tax is charged to manufacturers and suppliers (importers) on a per kg basis on plastic and paper bags with a greater than 5-litre capacity and which can be replaced by alternatives. Charging by weight encourages greater resource efficiency and less waste. These charges in most cases are passed on by retailers to their customers, in charging for plastic bags or selling a range of re-usable bags. The tax is charged at the equivalent of 2.95 EUR per kg of plastic bags and 1.34 EUR per kg for paper bags. The initial effect was dramatic, with a 60% fall in shopping bag use experienced. Bag use in Denmark is considerably below the EU average, with 80 bags used per person per year compared to the EU average of 500. Tax revenues from the shopping bag tax were estimated in 2007 at 26.6 million EUR and these have increased each year as bag use has crept up. Revenues are understood to go to general public budgets.³⁶

However, it is worth noting that charging manufacturers and suppliers by weight may encourage a shift from paper to plastic, and indeed incentivise the production of thinner plastic bags. Whilst, from a resource efficiency perspective, such 'light weighting' may be desirable, this does not lessen the impacts if such bags become littered (indeed in some cases it may actually increase the impact, e.g. in respect of ingestion by marine fauna). Additionally, the Danish charge was not passed on to customers in all cases, thus reducing the effectiveness of the measure.

The Welsh Government introduced a £0.05 (€0.06)³⁷ compulsory charge for all single-use carrier bags at the point of sale in October 2011. Unlike Ireland this mechanism is not a levy, but a minimum charge that retailers are guided to pass on to local and environmental causes (although this is not mandatory).³⁸ Additionally it also applies to all single-use bags including those composed of paper and other plant based material, not just plastic.

³⁶ Ecorys, CambridgeEconometrics, COWI (2011); The role of market-based instruments in achieving resource efficiency; http://ec.europa.eu/environment/enveco/taxation/pdf/role_marketbased.pdf

³⁷Based on a £:€ exchange rate of 1:1.27650, ft.com currency converter, 26th July 2012.

³⁸ Welsh Government (2012), Carrier Bag Charge Wales, Accessed 19th July 2012. <http://www.carrierbagchargewales.gov.uk/?lang=en>

Nine months after the introduction of the charge, reductions are cited by Welsh Government as between 70% and 96%, depending upon the sector.³⁹ Retailers in the following sectors reported a range of reductions:

- Food retail – between 96% and 70% reductions;
- Fashion – between 75% and 68% reductions;
- Home improvement – 95% reduction;
- Food service – up to 45% reduction; and
- Telecommunications – 85% reduction.

Data released by WRAP in 2011 shows a reduction of 22% in usage across supermarkets in Wales from 2010 to 2011.⁴⁰ This would appear to be consistent with the reductions noted by the Welsh Government, bearing in mind that the charge was only in place for the final three months of 2011.

A study produced for The Welsh Government by Cardiff University conducted surveys both before and after the introduction of the charge regarding attitudes and behaviours towards it in England and Wales.⁴¹ Results show that the charge has helped to increase greatly own bag use in Wales with a 21% increase in consumers taking a reusable bag to the supermarket (increased from 61% to 82% of the sample). This also illustrates the scale of reusable bag use prior to the charge which was also confirmed at a similar level of approximately 60.5% in England. The study however, does not consider the effect of the previous UK voluntary agreement in the baseline figures, which would be expected to have influenced use of reusable bags. The magnitude of the change associated with the implementation of a charge might be expected to be greater in nations with no such agreement already in place, but with a similar ‘end point’ in terms of uptake.

The Welsh Regulatory Impact Assessment⁴² assumed that a 199% increase in demand for reusable bags would occur based on a levy charge of £0.07 (€0.09)⁴³, cited from a study commissioned for the Welsh Assembly Government by AEA Technology plc on single-use bags.⁴⁴ No supporting rationale for this figure can be gained from reviewing the AEA report and it seems to be slightly at odds with the *Cardiff University* study highlighted above which noted a relatively high level of pre-existing use of reusable

³⁹ *Welsh Government (2012), Reduction in Single-use Carrier Bags, Accessed 7th August 2012.*

http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/substance/carrierbags/reduction/

⁴⁰ WRAP (2012), UK Supermarket Retailers Voluntary Carrier Bag Agreement: 2011 Carrier Bag Use, Presentation for the WRAP website, WRAP July 2012

⁴¹ Poortinga et al (2012), Evaluation of the Introduction of the Single-Use Carrier Bag Charge in Wales: Attitude and Behavioural Spillover, Report for the Welsh Government, Cardiff University 2012.

⁴² Welsh Assembly Government (2010), Proposals for a Charge on Single Use Carrier Bags: Regulatory Impact assessment, Welsh Assembly Government May 2010.

⁴³ Based on a £:€ exchange rate of 1:1.27650, ft.com currency converter, 26th July 2012.

⁴⁴ AEA Technology plc (2009), Welsh Assembly Government, Single Use Bag Study: Final, Report for the Welsh Assembly Government August 2009.

bags.⁴⁵ Indeed, such a change would, most likely, not have been possible given the pre-existing level of use.

Table 1-15 summarises the impacts of single-use bag levies introduced in Belgium, Italy, Ireland and South Africa. From this Table it is evident that levy's on single-use bags have had a marked, if not always long-lasting, effect on demand. It might be supposed that households may have 'a stock' of single-use bags which they use for various purposes (bin liners etc.). It may be that consumption of single-use bags increases as this stock is drawn down.

Table 1-15: Examples of Taxes on Plastic Carrier Bags and Their Impact on Consumption

Rate of Tax	Consumption Trends	Impacts on Litter
Belgium, April 2007 ^{1,2}		
€3.00 per kg of plastic bags (1 to 10 cents per bag, depending on weight)	Reduction in sales of 80% between 2003 and 2009	n/a
Ireland, March 2002 ³		
Initially €0.15, but raised to €0.22 per plastic bag in July 2007	Consumption decreased by over 90%, from 328 bags per capita prior to the levy, to 21 the year after (this increased to 30 units per capita prior to the price increase in 2007)	Plastic bag litter reduced from 5% of total litter (estimated figure) in 2001 to 0.25% in 2010
Italy, 2002 ⁴		
Initially €0.13, but raised to €0.20 per plastic bag in 2007	Use of plastic bags decreased from 1.3 billion prior to the tax to 20 million units the year after (consumption then began to increase to 140 million units per annum)	n/a
South Africa: May 2003 ⁵		
Initially ZAR 0.46 (€0.04) for standard 24L bags, but subsequently decreased as retailers have absorbed the costs (retailers are liable for the tax)	For high-income earners consumption of plastic bags per ZAR 1,000 worth of shopping (€92 on 22 September 2011) has decreased by approximately 57% and for low-income earners the reduction has been approximately 50%. There was an initial sharp drop in demand, but this was soon reversed	According to the cited paper, no pre or post levy data exists on litter levels in South Africa
Notes:		
1. <i>Pre-Waste (2011) Good Practice in Waste Prevention, International Pre-Waste Workshop, March 2011, http://www.bruxellesenvironnement.be/uploadedFiles/Contenu_du_site/Professionnels/Formations_et_s%C3%A9minaires/Conf%C3%A9rence_Pre-waste_2011_%28actes%29/p2-posters-good-practices.pdf</i>		
2. <i>Bruxelles Environment (2010) Mapping Report on Waste Prevention Practices in Territories within EU27 - Pre-Waste: Improve the Effectiveness of Waste Prevention Policies in EU Territories, October 2010, http://www.bruxellesenvironnement.be/uploadedFiles/Contenu_du_site/Professionnels/Formations_et_s%C3%A9minaires/Conf%C3%A9rence_Pre-waste_2011_(actes)/p3-%20prewaste-mapping-report.pdf</i>		
3. <i>The full impacts of this levy are covered in the case study described in the preceding section</i>		
4. <i>Friends of the Irish Environment (2010) Call for Ireland to Extend Levy to all Single-use Bags, Date</i>		

⁴⁵ This may be due to the voluntary agreement on carrier bags between UK Governments and a number of supermarkets.

Rate of Tax	Consumption Trends	Impacts on Litter
<p>Published: 30 December 2010, Date Accessed: 19 September 2011, www.friendsoftheireishenvironment.net/index.php?do=friendswork&action=view&id=878 5. Dikgang, J. Leiman, A. and Visser, M. (2010) Analysis of the Plastic-Bag Levy in South Africa, Policy Paper No. 18, Environmental Policy Research Unit, School of Economics, University of Cape Town, July 2010, www.econrsa.org/papers/p_papers/pp18.pdf</p>		

1.7.2 Suggested Implementation

We have proposed an introduction of a single-use carrier bag tax at a rate of €0.10 per bag, though adjusted for purchasing power parities (see Table 1-16 for country-specific rates). In countries where such taxes have been implemented, the taxes have been implemented at their full rates with no phased increases. We have assumed such taxes could be implemented by 2016. It is assumed that the taxes, once applied, are kept constant in real terms through either annual, or periodic increases in line with inflation. Experience in Ireland suggests that without such indexation, the use of single use bags can steadily increase as inflation erodes the incentive to use reusable carrier bags.

Table 1-16: Good Practice Tax Rates for Single-use Bags (€ per bag)

Member State	BG	CY	DK	FI	DE	EL	IE	LV	MT	NL	SI	ES	SE	UK
Tax Rate	0.05	0.09	0.14	0.12	0.10	0.09	0.11	0.10	0.08	0.11	0.08	0.09	0.13	0.11

1.8 Taxes on Air Pollution from Stationary Sources

1.8.1 Good Practice

There are a number of Member States which have used measures to tax air pollutants, usually from industrial plant, and typically, from large combustion plants.

Several Member States differentiate their fuel taxes according to the sulphur contents. In this way they exercise an implicit tax on sulphur. The country to do this first was Norway, in 1971 (the tax rate in Norway was NOK 0.078 per litre on sulphur, around €0.009 per litre of sulphur).⁴⁶ Presently the following Member States differentiate one or more of their fuel tax rates according to sulphur content; Austria, Belgium, Germany, Netherlands, Slovakia.

Denmark introduced an SO₂ tax in 1996, based on:

- 1) The sulphur (S) content in the following energy products if the sulphur content is above 0.05 %: gas oil and diesel oil, fuel oil, fuel tar, kerosene, coal, petroleum coke, lignite, petrol (leaded and unleaded), auto gas (LPG), gas (LPG), gas from refineries (mineral oils), natural gas.

⁴⁶ Royal Ministry of Finance (2013) Main Features of the Tax Programme for 2013, http://www.statsbudsjettet.no/Upload/Statsbudsjett_2013/dokumenter/pdf/skatt_eng.pdf

- 2) The sulphur (S) content in: wood, straw, waste etc. used for energy purposes in plants with a capacity of 1,000 kW and more.
- 3) Instead of paying tax on the sulphur content in the above mentioned energy products, businesses can choose to pay excise duty of the sulphur dioxide (SO₂) emissions into the air.

Current rates for the tax are DKK11.1 per kilo of SO₂ emitted or DKK 22.2 per kg of sulphur in the fuel.⁴⁷ Denmark has the lowest level of SO₂ emissions per capita of all OECD countries. In 2011, the tax generated DKK 48 million.

Norway implements a tax on NO_x emissions. The rate in 2013 was NOK 17.01 per kg (approx. €2.04 per kg).⁴⁸

In Estonia, an air pollution charge exists covering a range of air pollutants (see Table 1-17). The pollution charge rates, applied to all installations requiring a permit, are increased by a factor of:

- 1.2 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of local governments bordering on the Narva River, if the height of release of pollutants is more than 100 metres above ground level;
- 1.5 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Jõhvi, Kiviõli, Kohtla-Järve, Narva, Sillamäe or Tartu;
- 2 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Tallinn;
- 2.5 if the pollutants are released into the ambient air from stationary sources of pollution located within the boundaries of the administrative territory of Haapsalu, Kuressaare, Narva-Jõesuu or Pärnu.

Table 1-17: Tax Rates for Air Pollutants in Estonia

Pollutant	EUR per 1 ton of pollutant
sulphur dioxide (SO ₂) or other inorganic sulphur compounds	86.08
carbon monoxide (CO)	6.35
particulates, except heavy metals and compounds of heavy metal	86.47
nitrogen oxides, calculated as nitrogen dioxide, and other inorganic nitrogen	101.1

⁴⁷ Danish Energy Authority. *Green Taxes in Trade and Industry – Danish experiences*. Copenhagen (no year provided). http://www.ens.dk/da-DK/ForbrugOgBespareselser/IndsatsVirksomheder/TilskudtilCO2afgift/Documents/Green_taxen%20danish%20experiences.pdf

⁴⁸ Royal Ministry of Finance (2013) Main Features of the Tax Programme for 2013, http://www.statsbudsjettet.no/Upload/Statsbudsjett_2013/dokumenter/pdf/skatt_eng.pdf

Pollutant	EUR per 1 ton of pollutant
compounds	
volatile organic compounds, except mercaptans and methane (CH ₄)	101.1
mercaptans	28,830
heavy metals and compounds of heavy metal	1,240

In Lithuania, taxes are set for emissions from stationary sources into the environment. For emissions to the atmosphere, the tax rates for various pollutants are shown in Table 1-18.

Table 1-18: Taxes on Pollutants Discharged into the Atmosphere

Pollutants	Tax rates, LTL per tonne
SO ₂	360
NO _x	680
Vanadium pentoxide	13,311
Solid particles (organic and inorganic)	213
Groups of pollutants	
I	1,402
II	661
III	86
IV	15

A feature of the Lithuanian system is that where environmental measures, intended for use of bio-fuel, or aimed at reducing the emission of pollutants into the atmosphere from stationary sources of pollution by at least 5 per cent, are planned, these are exempted from taxes except in those cases when funds from the state budget are used to fund the measure. The tax exemption is valid for a time period not exceeding 3 years from the beginning of the implementation of the measure.

In France, the TGAP covers a range of environmental taxes, including Atmospheric emissions of polluting substances: in most cases, from € 43.24 to € 259.86 per tonne.

In Italy, a tax is levied on the sulphur dioxide and nitrogen oxide discharged by large combustion plants. The tax rates are:

- 1) € 106 per tonne/year of sulphur dioxide; and
- 2) € 209 per tonne/year of nitrogen oxides.

In Czech Republic, the Clean Air Act introduces a new system of charges for air pollution imposed on VOC, NO_x, SO₂ and PM pollutants. The charge is not collected if it is less than approximately EUR 2,000 (CZK 50,000) because any amount below that threshold would not cover the administrative costs.

Table 1-19: Taxes on Air Pollution in Czech Republic (CZK per tonne)

	2013-16	2017	2018	2019	2020	2021 onward
TSP	4,200	6,300	8,400	10,500	12,600	14,700
SO ₂	1,350	2,100	2,800	3,500	4,200	4,900
NO _x	1,100	1,700	2,200	2,800	3,300	3,900
VOC	2,700	4,200	5,600	7,000	8,400	9,800

Latvia also implements taxes for air pollutants. The applicable rates are shown in Table 1-20 below.

Table 1-20: Latvia - Tax Rates for Air Pollution and the Volume of Greenhouse Gases Emitted by Stationary Technological Installations which is not Included in the Number of Transferred Allowances

Classification of emission	2013	2014	2015
	from January 1st till December 31 (LVL per tonne)	from January 1st till December 31 (LVL per tonne)	from January 1st (LVL per tonne)
Solid particles (dust not containing heavy metals)	24	36	40
Carbon monoxide (CO)	5.5	5.5	5.5
Ammonia (NH ₃) and other non-organic compounds	13	13	13
sulphur dioxide (SO ₂), nitrogen oxide (NO _x - nitrogen oxide sum, recalculated to NO ₂)	60	60	60
Volatile organic compounds and other hydrocarbons (C _n H _m)	60	60	60
Heavy metals (Cd, Ni, Sn, Hg, Pb, Zn, Cr, As, Se, Cu) and compounds thereof, recalculated for the relevant metal, and vanadium pentoxide recalculated to vanadium	800	800	800
PM ₁₀ air emissions for bulk handling at open terminals or other open areas	480	720	800

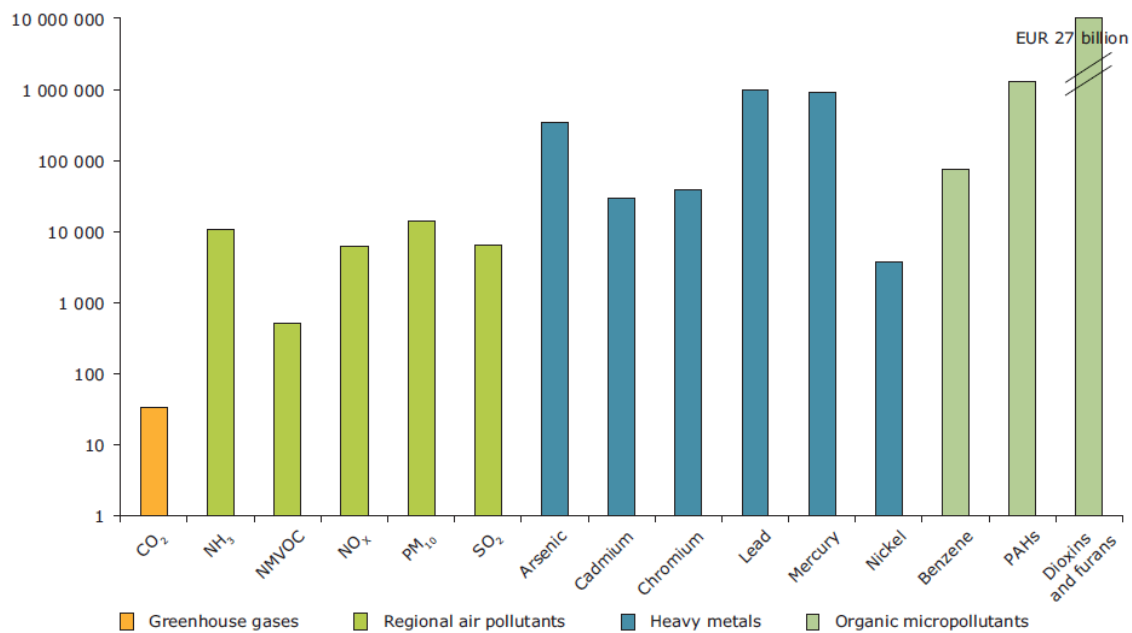
Sweden has a refunded emissions charge for NO_x. This has been successful in reducing NO_x emissions, but it does not contribute to the budget as the levy revenue is refunded in full to those subject to the tax.

In many of the countries concerned, the levy appears to be well below the level of the externalities, and does not seem to exert a significant environmental effect. The Danish

tax appears to be one of the few bona fide taxes that are high enough to have such an effect, with the Norwegian tax on NOx also at relatively high levels. The Swedish system has much higher charge rates for NOx, but this is made possible, in part, by the fact that all revenues are refunded to the affected parties in line with thermal output (so the charge actually works to drive the efficiency of thermal power generation with respect to the emissions of NOx). As such, it does not represent a conventional tax, but a refunded levy.

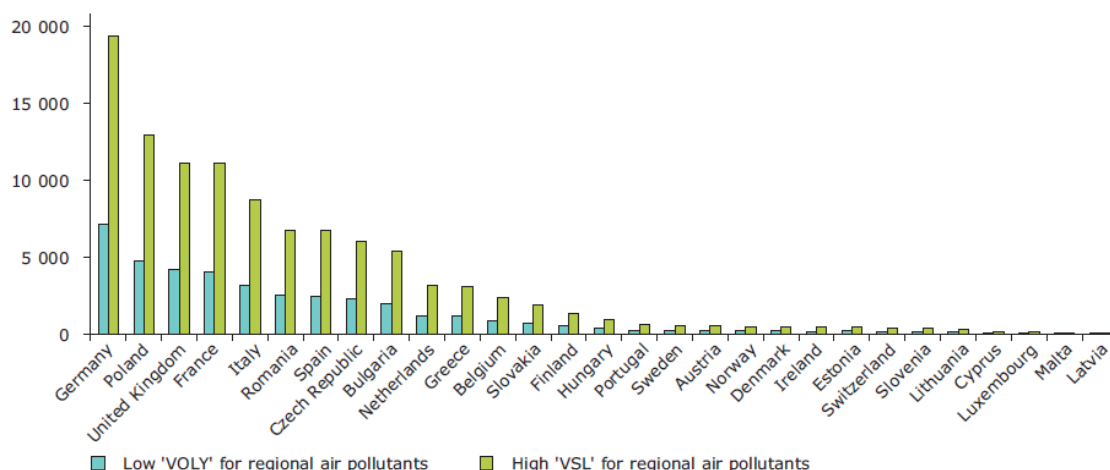
Of some interest is the fact that some of the newer Member States have tax systems which affect a range of pollutants and installations. This is encouraging and suggests the potential for wider application of such taxes across a range of pollutants. The level at which they are levied, on the other hand, seems rather low. Externalities from the emission of such pollutants are typically at least a factor of 10, and sometimes a factor of 100 or more, higher than the tax rates levied (see Figure 1-5). Another effect of this is that revenues tend to be very small. The Italian tax raised €13 million in 2011, which is a notional proportion of GDP. It compares with figures for the externalities from industrial facilities which appear to be well over 100 times that value, irrespective of the assumed approach to mortality valuation (which influences unit damage costs - see Figure 1-6).

Figure 1-5: Estimates of the European Average Damage Cost (€ per tonne) Emitted for Selected Air Pollutants (note the logarithmic scale on the Y-axis)



Source: EEA (2011) *Revealing the Costs of Air Pollution from Industrial Facilities in Europe*, EEA Technical report, No.15/2011, p.23

Figure 1-6: Aggregated Damage Costs by Country, excluding CO₂ (€ million)



Note: The low-high range shows the differing results derived from the alternative approaches to mortality valuation for the regional pollutants.

SouSource: EEA (2011) *Revealing the Costs of Air Pollution from Industrial Facilities in Europe*, EEA Technical report, No.15/2011, p.33

1.8.2 Suggested Implementation

The suggestion is that there is scope for introducing such taxes where other equivalent schemes (such as emissions trading) are not already in operation, and for increasing them where they already exist. We suggest rates moving towards €1,000 per tonne of SO₂, €1,000 per tonne of NO_x, and €2,000 per tonne of PM₁₀ (and / or €3,000 per tonne of PM_{2.5}). Such rates are still below the level of the externalities generated (see Figure 1-5), but are more likely to generate some additional incentive for abatement. In fact where abatement costs are lower than the externalities these would determine the rate.⁴⁹

The suggested transition period from existing rates, or where there is no air pollution tax in place, is from 2016 to 2021. It is assumed that the taxes are indexed to inflation (they stay constant in real terms) for the purposes of the revenue calculation. In practice, this may happen through annual indexing or through periodic adjustments.

1.9 Water Abstraction

1.9.1 Good Practice

The majority of Member States appear to have some kind of tax or charging scheme for water abstraction and/or supply. Although only two Member States have reported their water tax to the Commission's 'Taxes in Europe database', the TAXUD list of 'minor taxes' features further Member States with water abstraction taxes or charges in places. Member States have also reported such taxes to the OECD/EEA database on economic instruments. Apparently revenues from some of these schemes are ring-fenced for water management purposes and so do not feature in Eurostat's revenue statistics (they may

⁴⁹

http://www.unece.org/fileadmin/DAM/env/documents/2009/EB/wg5/wgsr45/Informal%20docs/NMR_Gothenburg_Protocol_finalversion.pdf

have more the character of charges than taxes, with revenues used to manage, or support the management of, the water resource).

Altogether 20 of 28 Member States are reported in one of these sources to have such environment-related tax or charge, which is not a simple user charge or water tariff for the supply of water, Member States that have NOT reported any such instrument include Ireland, Cyprus, Malta, Slovakia, Luxembourg, Sweden, Finland and Austria.

Numerous exemptions and special arrangements apply where these instruments are concerned, making it difficult to assess their tax bases accurately. For the same reason revenue flows appear to be rather small in most Member States, although water across Europe is a scarce resource in many regions. As water is abstracted at relatively well-defined points, the administrative requirements for a fiscal instrument are not very demanding. Even in regions where water is relatively abundant, the 'tragedy of the commons' has caused shortfalls in water availability in the absence of pricing. Hence, it is appropriate with a fiscal instrument to ensure that water is abstracted for purposes of genuine economic value and is not wasted. Article 9 of the EU's Water Framework Directive aimed for 'adequate' full-cost water pricing by 2010, which is understood to include pricing of the resource. Article 9(1) states that "*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs*".

In Netherlands a national tax is due on tap water. The tax is due on water supplied in piped water supply. The tax applies to households, as well as to water used for business purposes. The rates are banded, so that a basic consumption of up to 300m³ is taxed at a rate of €0.33 per m³, and above that level at a rate of €0.40/m³. Above 50,000 m³ the rate is €0.36 per m³ and then lowered successively down to €0.05 per m³ for consumption above 250,000 m³ annually, which is relevant for business purposes. These rates apply from mid-2014, at which time, the previous basic household rate is being doubled. The tax has raised €125-€130 million in recent years, or 0.02% of GDP, which is expected now to double.

In Denmark, a national tax (introduced 1994) is payable on water extraction from all freshwater bodies. The tax is paid on the quantity of water supplied to the consumer, where this is not less than 90 % of the extracted quantity. This arrangement provides an incentive for water suppliers to monitor leakages more carefully, and they have been considerably reduced in Denmark as a result. Whereas spills and leakages at the level of 30-40% are usual in many European cities, Denmark has recorded a leakage rate of 10%. The tax was DKK 5.23 per m³ in 2012, and 5.46 per m³ in 2013 – or €0.73 per m³.

In addition to the national tax, a temporary surtax is due for the purpose of protecting groundwater aquifers, this surtax amounts to DKK 0.67 per m³ or €0.09 per m³.

Denmark's water tax raised DKK 1,333 million in 2011, equivalent to 0.07% GDP, which is well above most other schemes. According to results from the EU-funded EPI-WATER project household consumption of drinking water has dropped by 40 per cent over the past 20 years in one representative Danish river catchment as a result of the full-cost water pricing scheme including this tax, due in part to many new and simple water saving installations being introduced. In turn, this has improved water flows, especially in smaller brooks and streams, where numerous red list species dependent on water are resident.

The majority of the new Member States that joined EU from 2004 and onwards have in place water abstraction charges, implying that the administrative requirements are in

place. Schemes are often differentiated and complex to capture adequately, in particular, because reporting to EU appears to be inadequate and, in some cases, absent. Table 1-21 below shows the case of Latvia.

Table 1-21: Tax Rates for the Extraction of Water, Lithuania

End Use	Tax Rate (per m ³)	
	LTL	EUR
Groundwater, with exception of mineral water:		
a) Provided by water supplier for household use and heating	0.06	0.02
b) Used by legal entities for commercial purposes, put up in a container	10.8	3.12
c) Other (not specified in a and b) groundwater	0.24	0.069
Mineral water, with exception of mineral water used in medical institutions	10.8	3.12
Mineral water used in medical institutions	5.4	1.6
Surface water used for industry and agriculture	0.007	0.002
Surface water used for cooling of thermal power plants	0.0007	0.0002
Surface water for fishery sector	0.0005	0.0001
Surface water hydropower	0.00003	0.000008
Surface water nuclear power plant	0.001	0.00028
Building Primer	0.64	0.19

Source: Republic of Lithuania (2012) Law on State Natural Resources, Actual version of the Law on 1st January 2012, Annex 2, Accessed 21st January 2014, www3.lrs.lt/pls/inter2/dokpaieska.showdoc_l?p_id=416294

1.9.2 Suggested Implementation

The suggested approach takes its starting point from the approaches in Denmark (€0.73 per m³ for households excl. surtax), the Netherlands (€0.36 per m³ for business), and the lowest Dutch rate for businesses which is applied to agriculture. The household and business tax rates have been adjusted to reflect purchasing power parities (see Table 1-22 and Table 1-23), and then, as a proxy for the seriousness of the problems related to the water resource, and recognising there is no perfect indicator in this regard, the Water Exploitation Index (WEI – see Figure 1-7).

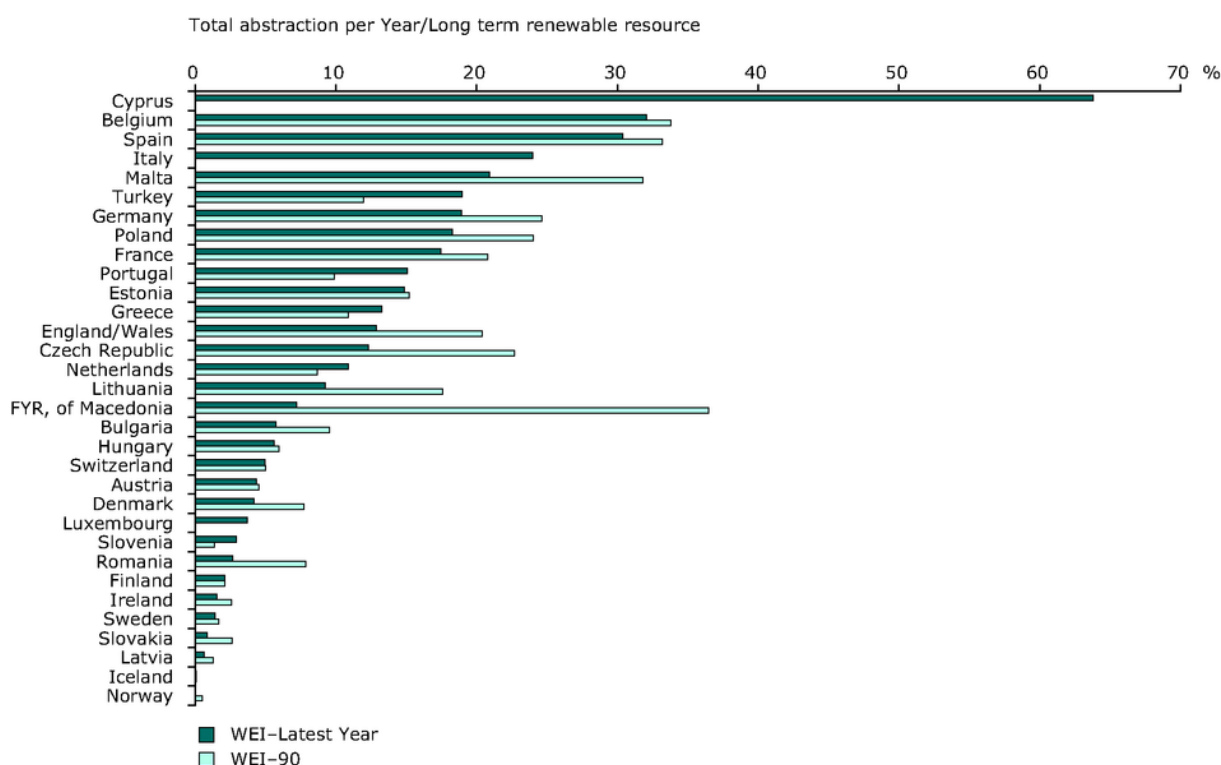
Table 1-22: PPP Adjustment for Tax Rates for Water Abstraction, Water Use in Households, in Countries under Assessment, EUR / m³

Member State	BG	CY	DK	FI	DE	EL	IE	LV	MT	NL	SI	ES	SE	UK
Tax Rate	0.24	0.45	0.00	0.65	0.55	0.45	0.58	0.50	0.40	0.25	0.43	0.48	0.71	0.58

Table 1-23: PPP Adjustment for Tax Rates for Water Abstraction, Business Use, in Countries under Assessment, EUR / m³

Member State	BG	CY	DK	FI	DE	EL	IE	LV	MT	NL	SI	ES	SE	UK
Tax Rate	0.15	0.28	0.45	0.41	0.34	0.28	0.36	0.31	0.25	0.36	0.26	0.30	0.44	0.36

Figure 1-7: Annual Total Water Abstraction as a Percentage of Available Long-term Freshwater Resources around 1990 (WEI-90) Compared to Latest Year Available (1998–2007) (WEI-Latest Year)



Source: EEA (see <http://www.eea.europa.eu/data-and-maps/figures/water-exploitation-index-wei-3>)

The PPP adjusted rates in Table 1-22 and Table 1-23 were multiplied by:

- 0.25 for Member States with a WEI <10%
- 0.50 for Member States with a WEI >10%, <20%
- 0.75 for Member States with a WEI between >20%, <30%
- 1 for Member States with a WEI between >30%

This leads to the rates shown in Table 1-24 below. These are assumed to be phased in over a period to 2018. After this, they are assumed to be indexed in line with inflation.

Table 1-24: Suggested Tax Rates for Water Abstraction (€ per 1,000 m³)

	Public Supply	Manufacturing	Agriculture
Bulgaria	60	40	5
Cyprus	460	280	40
Denmark	180	110	16
Finland	160	100	14
Germany	280	170	24
Greece	230	140	19
Ireland	150	90	12
Latvia	130	80	11
Malta	300	190	26
Netherlands	290	180	25
Slovenia	110	70	9
Spain	480	300	40
Sweden	180	110	15
United Kingdom	290	180	25

1.10 Discharges to Waste Water

1.10.1 Good Practice

Numerous Member States have some kind of tax, or other fiscal instrument addressing waste water discharges. Altogether, 14 Member States have reported a waste water levy to the Commission's 'Taxes in Europe database', or the OECD/EEA database on economic instruments. Member States that have not reported any such fiscal instrument include Austria, Croatia, Finland, Sweden, Ireland, Greece, Portugal, Italy, UK, Cyprus, Latvia, Malta and Bulgaria.

Revenues from several of these schemes are ring-fenced for water management purposes but, nevertheless, in most cases feature in Eurostat's revenue statistics, implying they are not simple user charges for sewage. This relates to the definition of environmental tax as an unrequited payment: even if there is some return regarding water management purposes, there is no direct relationship between the polluter being obliged to pay and the improvements that are achieved, over time, as a result of more general water management efforts.

Most of the schemes are fairly old and dating from the 1960's or 1970's, where water

pollution was more clearly on the agenda for many countries. Levy rates have been gradually increased in several Member States and the tax base has also been broadened to cover several different types of emissions.

A study by the European Environment Agency reviewed the application of waste water levies in a range of Member States (incl. France, Germany, Poland, Estonia, Spain, Denmark and Netherlands) and identified, in line with other previous studies, the Dutch scheme as the most comprehensive in terms of ‘good practice’.⁵⁰

The Dutch waste water levy was introduced with the Surface Waters' Pollution Act of 1970. In the Netherlands, the levy applies to discharges of organic material, nitrogen, mercury, cadmium, copper, zinc, lead, nickel, chromium and arsenic. The levy is imposed on all direct discharges to surface waters, as well as on all indirect discharges. The levy does not cover the costs of the sewer network, which is financed via a separate municipal fee. Insofar as the levy applies also to direct dischargers, i.e. industries and municipal treatment plants which discharge directly to surface waters, it provides a sound incentive to minimise discharges, and is in line with the polluter-pays principle.

Among the old Member States France has a well-developed system for waste water levies, based on the six regional Water Agencies. There is a comparable approach in the Flemish region of Belgium. Among the new Member States, Poland and Estonia have well institutionalised systems for waste water levies, the revenues from which are ring-fenced for Environmental Funds. The systems in Hungary, Lithuania and Romania are comparable in approach, but with lower rates and weaker frameworks for water management.

1.10.2 Suggested Implementation

The suggested approach takes, as its starting point, the approach applied in the Netherlands. The Netherlands tax rates have been adjusted using purchasing power parities in the various Member States result, giving applicable tax rates. Data availability for waste water discharges is not sufficient to allow the calculation of potential revenues generated by waste water taxes. For illustrative purposes, therefore, the tax is assumed to be implemented only for simple organic discharges (BOD/COD), this being responsible for reducing oxygen availability and depth of vision in surface waters. The Figures in Table 1-25 below reflect the application of PPP-adjustments to the Dutch tax rate for BOD, which is €2.47 per kg BOD in 2013. There is a high level of regional variability in the application of waste water levies.

Table 1-25: Rate of Tax Increase to be Applied for BOD, € per kg

Member State	BG	CY	DK	FI	DE	EL	IE	LV	MT	NL	SI	ES	SE	UK
Tax Rate	1.03	1.93	1.62	2.77	2.34	1.92	2.46	2.14	1.69	0.00	1.81	2.04	3.01	2.44

In principle, it would be interesting to extend this analysis to other pollutants, but the data available do not make this possible. Evidently, the strength of the rationale for

⁵⁰ EEA (2005) Effectiveness of urban wastewater treatment policies in selected countries: an EEA pilot study, EEA Report 2/2005, Copenhagen.

taxing discharges on other pollutants is likely to vary somewhat across the Member States.

1.11 Additional Analysis on Charges for Water Supply and Treatment

1.11.1 Good Practice

Article 9 of the EU's Water Framework Directive (2000/60/EC) (WFD) establishes that Member States “shall take account of the principle of the recovery of costs of water services” and requires that by 2010, they have ensured “that water-pricing policies provide adequate incentives for users to use water resources efficiently and thereby contribute to the environmental objectives of this directive”.

The preamble of the WFD states that “there is a need for a greater integration of qualitative and quantitative aspects of both surface waters and ground waters”. Although the WFD is primarily concerned with water quality, control of quantity is an ‘ancillary element’ to this purpose. The WFD specifically defines the ‘available groundwater resource’ for potable water in view of the need to respect the “long-term annual rate of flow required for achieving the ecological quality objectives for associated surface waters”. This definition is effectively linking water abstraction to ecological water quality, which in turn explains why the WFD mandates influencing the demand for water through the mechanism of water pricing.

Despite their financial difficulties, Member States have been slow to bring their policies on water pricing up to the wording and 2010 deadline of the Directive’s Article 9. The European Environment Agency, in its report from 2013 entitled, “Assessment of cost-recovery through pricing of water”,⁵¹ provided some insights on the practices in a number of Member States relating to water pricing. The report observes that “information on cost-recovery levels is not always easily accessible”, but that for the selected sample of Member States, the available data suggests there is a fairly high rate of *financial* cost-recovery. The report takes a bottom-up approach, whereby cost-recovery is explored in specific regions and countries. The charges for water are as complex as for using cell phones, and there is a confusing array of charging principles in place.

In the following analysis, the extent of water charging is explored on the basis of data retrieved by Eurostat from the national household budget surveys. The approach is more top-down in nature in that these surveys provide insights regarding the relative significance of expenditures for water supply and waste water services for consumers. As such, they are used on a regular basis to provide item weights for the computation of the harmonized indices for consumer prices (HICP). This dataset enables a somewhat better understanding of the general situation across all Member States. Value added taxes at national level (in several cases, at reduced rates) have been subtracted to allow for comparison of the pure water charging elements. Since HICP excludes imputed rents, care has been taken to subtract these from the final consumption aggregates when applying the two water service-related item weights.

⁵¹ European Environment Agency (2013) Assessment of cost-recovery through water pricing, EEA Technical Report No 16, Luxembourg:

Eurostat data for the share of population with access to public water supply, and who are being serviced with sewerage and waste water treatment, have been applied to allow for an estimate of the costs per individual in receipt of the service. Taking proper account of the share of the population being serviced plays a role when contrasting the present charges to the level of cost-recovery that could be expected on basis of best practice.⁵²

Provision of water services is based on employment of labor and capital, the costs for which can be expected to differ among Member States according to their relative price levels. Hence, a comparison across Member States ought to take account of these differences, and we have done this through adjusting for purchasing power parities across Member States.

We use the case of France as a point of reference for the best practice benchmark because the findings of the EEA report on cost-recovery shows that there is a fairly rigorous legal and economic regime in place, which allows for a good match between the costs of service provision and the (volumetric) user charges levied on consumers. The provisions allowing for contracting out of water services in France entail limited cross-subsidies from general tax revenue, whereby a reasonable match between costs (supervised closely by the authorities) and actual charging is to be expected. At the same time France has a technological mix of waste water treatment that is more representative for Europe as a whole compared with, say, more sophisticated (and costly) schemes in Germany and Denmark.

Figure 1-8 and Figure 1-9 show for each Member State the estimated water supply tariff and waste water charge per individual on an annual basis for 2013. The benchmark represents 2013 cost recovery levels for water pricing in France at PPP=100.

These illustrative estimates suggest that overall, there is better cost-recovery with tariffs for water supply than for charges for waste water services. This is hardly surprising when taking into account the generous subsidies that have been handed out for investments in waste water treatment, not only in “new” Member States (through Cohesion Funds, for example), but also in many old Member States. It is not clear from this dataset, though, whether the charging gap is entirely associated with investment subsidies, or whether general tax revenues are still required to enable proper operation in waste water treatment.

Ireland is notable as a Member States which had abandoned water pricing, but which now, as part of its budgetary consolidation effort, is reintroducing it.⁵³ The figures here suggest that cost recovery for water services in Ireland would involve annual costs of about €244 per individual. The actual scheme now being introduced by Irish Water will cap annual water bills at €176 per individual⁵⁴, but in fact falls short of full cost-recovery⁵⁵.

Charging for waste water appears to be at fairly low levels especially in Bulgaria, Spain, Portugal and Greece – Member States that are indeed confronted with severe budget challenges. The charging situation in Malta might be in transition following the

⁵² Desalination is playing a large role for Cyprus and Malta and is added to estimates at a cost of €1/m³.

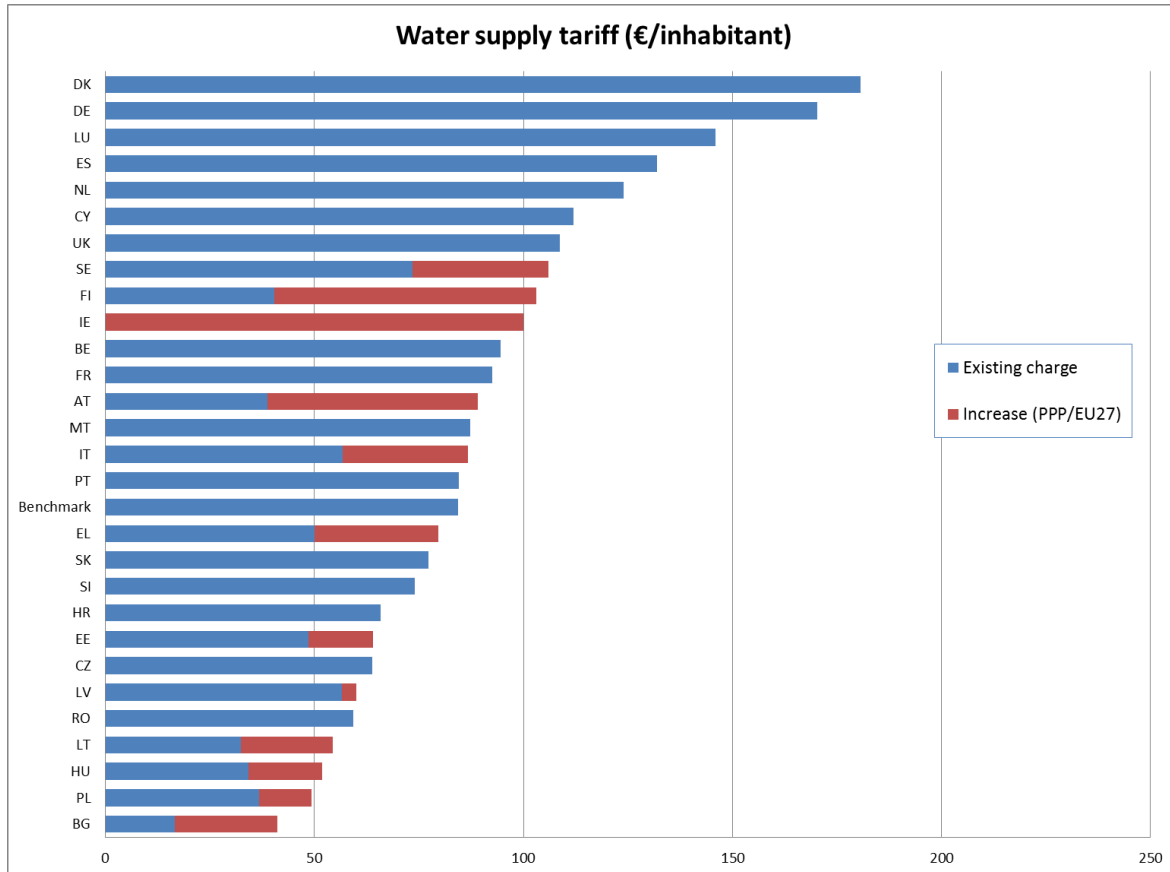
⁵³ <http://newswatch.nationalgeographic.com/2013/11/20/in-ireland-water-will-no-longer-be-free/>

⁵⁴ http://en.wikipedia.org/wiki/Water_supply_and_sanitation_in_the_Republic_of_Ireland

⁵⁵ Irish Water, personal communication, May 2014.

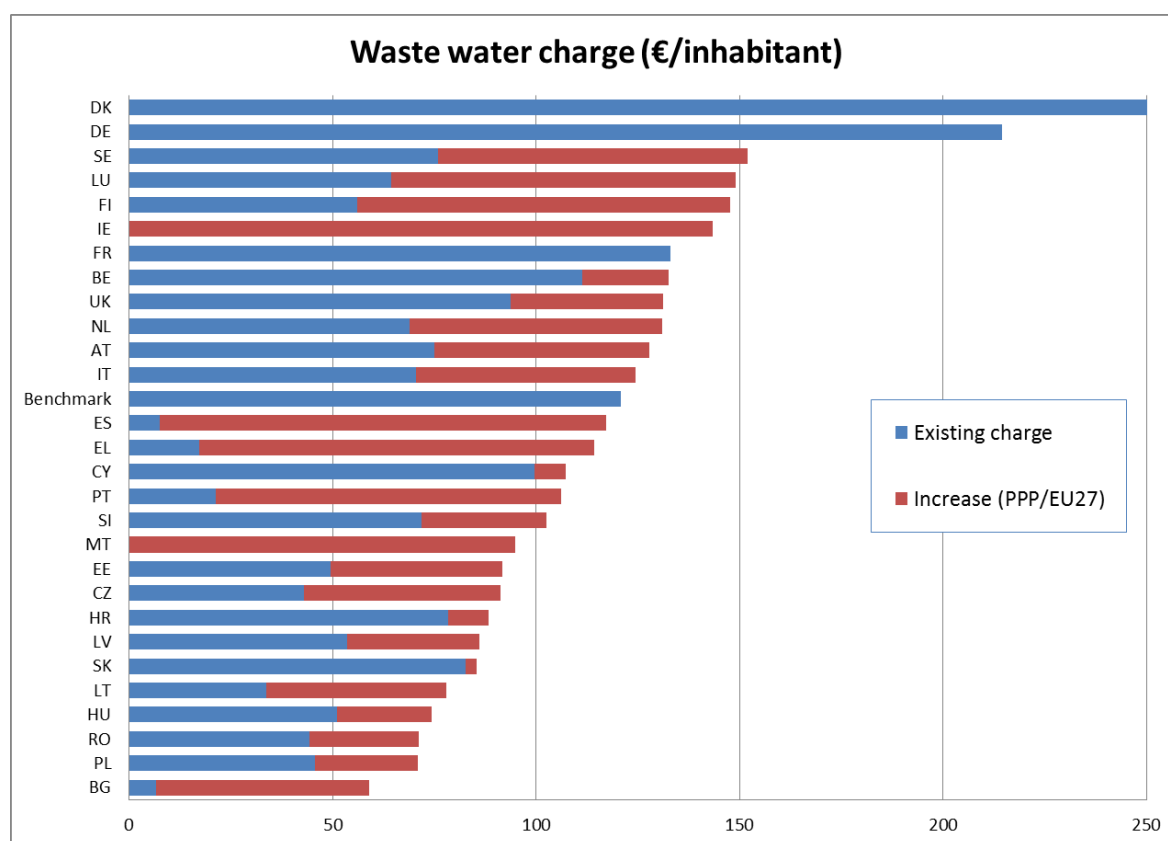
completion of its extended waste water treatment scheme. For the Netherlands the costs for the sewer networks are not included in water charges, but are covered by municipalities. Finland lacks a legal framework for water pricing.⁵⁶

Figure 1-8: Water Supply Tariff (EUR/inhabitant)



⁵⁶ EUREAU, 2009, Statistics overview on water and wastewater in Europe, Brussels, p. 36.

Figure 1-9: Waste Water Charge (EUR/inhabitant)



1.11.2 Suggested implementation

On November 14 2012 the European Commission adopted “A blueprint to safeguard Europe’s water resources”, commonly known as the Blueprint⁵⁷. The Blueprint includes 18 measures to increase the efficiency and effectiveness of European water policies, most of which relate to economic and financial aspects. In paragraph 2.3 of the Blueprint the Commission has specifically proposed a strengthening of the principle of cost recovery and pricing established in Article 9 of WFD;

“Article 9 of the WFD requires implementation of pricing policies that provide an incentive to use water efficiently. Pricing is a powerful awareness-raising tool for consumers and combines environmental with economic benefits, while stimulating innovation. Metering is a pre-condition for any incentive pricing policy. Article 9 also requires cost-recovery (including environmental and resource costs) for water services, taking into account the polluter pays principle. The 2007 Commission Communication on Water Scarcity and Droughts included options related to ‘putting the right price tag on water’, ‘allocating water more efficiently’ and ‘fostering water efficient technologies and practices’. These water efficiency measures fit into the overall resource-efficiency objective of Europe 2020”

⁵⁷ Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 2012, A Blueprint to safeguard Europe’s water resources, SWD(2012) 381 final.

To explore the revenue implications of the approach, it is assumed that Member States with water tariffs and sewage charges below the benchmark will gradually increase these. The rate increases would affect not only households, but all users that are serviced. Table 1-26 provides estimates for potential short-run revenues in the event that each Member State provides a framework that will allow water managers to recover costs.

Table 1-26: Results from Water Charging Analysis by Member State

Member State	Non-domestic water use	Households € per capita ⁵⁸		Non-domestic € per capita		SUM	POP	STATIC REVENUE, million €
	% of household use ⁵⁹	water	sewage	water	sewage	Euro	Million	€/YEAR
AT	49	45	50	22	24	141	8,3	1,168
BE	45		16		7	23	10,6	238
BG	22	24	29	5	6	64	7,6	496
CY	15	3	2	0.5	0.3	6	0,8	5
CZ	57		38		21	59	10,3	608
DE	23					0	82,2	0
DK	55					0	5,4	0
EE	35	12	35	4	12	63	1,3	82
EL	10	30	85	3	9	127	11,2	1,420
ES	49		105		52	157	45,2	7,083
FI	67	56	76	38	51	221	5,3	1,171
FR	17					0	63,7	0
HR	70		4		3	7	4,4	29
HU	13	17	17	2	2	38	10	387
IE	69	94	90	65	62	311	4,4	1,368
IT	34	29	39	10	13	91	59,6	5,439

⁵⁸ For the purpose of revenue estimates the price increase is normalized to the general population with MS service rates.

⁵⁹ EUREAU, 2009, Statistics overview on water and wastewater in Europe, Brussels.

LT	14	15	32	2	4	54	3,3	179
LU	43		80		34	115	0,48	55
LV	24	3	21	1	5	30	2,2	65
MT	73		95		70	164	0,4	66
NL	51		61		31	93	16,4	1,517
PL	32	11	17	3	5	36	38,1	1,375
PT	51		60		31	91	10,6	961
RO	64		11		7	18	21,5	380
SE	64	29	66	19	42	156	9,1	1,422
SI	59		17		10	27	2	55
SK	48		2		1	3	5,4	14
UK	44		36		16	52	61,1	3,205

Clearly this would be expected to have a certain impact on water use and in exploring the potential relief for the budget a short-run demand elasticity of 0.2 could be applied. However, these calculations were not carried out for this study.

1.12 Pesticides

1.12.1 Good Practice

A number of countries have implemented taxes on pesticides.

Denmark has a tax which, until recently was levied in the following manner:

Product	Tax Rate
Insecticides and Chemical products for disinfecting of soil	35 % of the retail value, including excise duty and VAT
Herbicides, Chemical products for reduction of plant growth, Chemical deterrents of insects and mammals and Fungicides	25 % of the retail value, including excise duty and VAT
Chemicals for destruction of alga, slime creating organisms in paper pulp, Deterrents of rats, mice, moles and rabbits, Microbiological pesticides.	3 % of the retail value, including excise duty and VAT.

This tax raised DKK 480 million in 2011, or 0.03% GDP.

The tax has recently been revised, so that it includes a 'flat rate' per kg of active ingredient used, and a variable tax level according to the pesticide's score against three

criteria: its environmental effect, its environmental fate and behaviour, and its human health effect.⁶⁰ Hence, the tax will be levied as follows:

- 1) Basic tax based on the amount (kg) of active substance in the product - 50 DKK per kg or litre active substances;
- 2) 107 DKK per kg or litre active substance multiplied by the score of the environmental effect;
- 3) 107 DKK per kg or litre active substance multiplied by the score of the environmental fate and behaviour effect; and
- 4) 107 DKK per kg plant protection product multiplied by the score of the human health effect.

This tax is expected to increase revenues (in 2012 prices) by DKK150 million per annum.

Sweden has a much simpler pesticides tax which is simply levied on the amount of active ingredient in the pesticide. The tax rate is SEK 30 per kilogram of active substance of the pesticide.

Norway has pioneered approaches (now adopted in Denmark) based on the risk profiling of pesticides. There are 5 different classes of pesticides for professional use, classified according to their health and environmental impact, and 2 classes of pesticide for private garden use. The tax is calculated using a 'basic tax' of 25 NOK/hectare (about €3.4 euros), and calculating either a tax per hectare equal to the basic tax, multiplied by a factor which lies between 0.5-9 for products for professional use, and 50-150 for products for private garden use. The equivalent tax per kg or litre = 25 NOK x factor x 1000 /SAD. The tax raised NOK 60-65 million per year (about €8.2-€8.9 million).⁶¹

In Italy, a flat tax of 0.5% was introduced in January 2000 (Law No 488/99) to all pesticides manufactured and sold with the following risks: R33 ("with risks of cumulative effects"), R40 ("limited evidence of carcinogenic effect", R45 ("may cause cancer") and R60 ("may impair fertility").⁶² In the case of pesticide imports, a flat tax of 1% over the final price was introduced. The income raised by this levy is used to develop organic farming and quality products. Under the Ministry of Finance, the Italian Government created a "Fund for the development of organic farming and quality products" in order to finance the following measures under the national and regional programmes:

- 1) financing research and experimenting on low environmental impact agriculture;
- 2) supporting promotion and information campaigns on organic agriculture, regional products and PDO (Protected Designation of Origin);
- 3) producing, revising and publicising the code for good agricultural practice.

⁶⁰ See note from the Danish Ministry of the Environment (2013) *Background and content of the new pesticide tax*, Pesticider og Genteknologi, Den 29. maj 2013

⁶¹ See Erlund Spikkerud (2012) *Pesticide Taxation in Norway*, presentation from the Norwegian Food Safety Authority.

⁶² Pesticides Action Network Europe (2005) *Pesticide taxes- national examples and key ingredients*, Briefing no. 6, December 2005 <http://www.pan-europe.info/Archive/publications/downloads/PesticideTax.pdf>

However, not all the income raised by the pesticide tax has been used; 5 million EURO was allocated to the national plan for organic farming but this plan is still to be implemented.

Belgium previously had a tax in place, but the tax was abolished in 2007 (and replaced with stricter regulation).⁶³

1.12.2 Suggested Implementation

It is suggested that there remains considerable potential for application of pesticide taxes. It remains possible, also, that this can improve the efficiency of agriculture by signalling to farmers the need to consider the rate of application of existing products. There are believed to be considerable differences in terms of impacts between the various active ingredients. Hence, basing the tax on the volume of active ingredients does not solve the problem.⁶⁴ The recent tendency has been for pesticide taxes to be banded in accordance with some measure of 'potential to do harm'. This is in response to past criticisms of pesticides taxes – that they were not necessarily reflective of actual environmental impact. The Norwegian and revised Danish taxes are deliberately banded in such a way as to improve efficiency of application of pesticides, and move the use of pesticides towards those which appear to have the potential to do least harm when they are used.

It has not been possible to gain data for each country disaggregated by the nature of the active ingredient. In the absence of that, we have applied the tax in a manner which is similar to the Danish scheme.

The Norwegian tax raises around €8.2 - €8.9 million on a tax base which is typically of the order 700 tonnes of active ingredient. The Danish tax raises €64.3 million on a tax base of around 4,000 tonnes of active ingredient. The average rate of tax per kg active ingredient is €15.80 and €12.21, respectively. We have based the application of a tax of the level of €15 per kg active ingredient. Even so, considering the broader experience in other Member States, the starting point here is a rate of €10 per kg active ingredient.

To implement this tax rate in Member States, the tax rate is adjusted with differences in relative price levels of the various national agricultural sectors. The adjustment index refers to the effective CAP support schemes per hectare of utilised agricultural area in Member States, and has been derived from the CAPRI-model.⁶⁵ The resulting tax rates at Member State level are indicated in Table 1-27 below.

⁶³ Vojtech, Vaclav (2010), "Policy Measures Addressing Agri-environmental Issues", *OECD Food, Agriculture and Fisheries Papers*, No. 24, OECD Publishing. <http://dx.doi.org/10.1787/5kmjrzg08vzb-en>

⁶⁴ See for example Szabó Z., 2011: Evaluation of external environmental impacts of crop production: Case study of an intensive farm and an ecological farm. LAP LAMBERT Publishing, pp.243. ISBN 978-3-8473-0980-2

⁶⁵ Annex III 'Intensity of spending for CAP pillar 1 and pillar 2 per hectare of UAA' in European Environment Agency (2009) *Distribution and Targeting of the CAP Budget from a Biodiversity Perspective*, EEA Technical Report 12/2009.

Table 1-27: Tax Rates Suggested for Member States for Pesticides Based on Relative Levels of CAP Support (€ per kg active ingredient)

Rate	€2.50	€5.00	€7.50	€10.00	€12.50	€15.00	€17.50	€20.00
Countries	LV	BG	ES	FI SE UK CY SI	IE	DK DE	NL	EL

In the application of the tax, some form of banding, rather a more crude approach based on a flat rate per active ingredient, would be appropriate. The application of a flat rate does, however, give a sensible indication of the likely order of magnitude of the potential revenue take.

The suggested transition period from existing rates, or where there is no pesticides tax in place, is from 2017 to 2019.

1.13 Fertilisers

1.13.1 Good Practice

Relatively few countries have currently taxes on fertilisers. Usually, the focus has been on nitrate pollution, with phosphate being of some interest also. A report for the OECD noted:⁶⁶

*Since 1998, the **Netherlands** has tackled the measurement problem by introducing a range of levies on off-farm nutrient emissions above a set limit. Since 2006, the system directly regulates the maximum amount of fertilizers (animal manure plus maximum amounts of nitrate and phosphate) that may be used on the farm. The former system (MINAS) regulated emissions, not usage, to comply with the EU nitrate directive. Similar taxes on the estimated on-farm generation of nutrients over set levels are also in place in **Belgium**. The **Czech Republic** applied, taxes on ammonia emissions per head of ruminants in large scale enterprises. Fertilizer levies are applied in **Italy**, **Sweden** and some states of the **United States**. Input-based taxes are generally inexpensive to administer, but may be less effective than a tax on pollution itself, as they do not discriminate on the basis of actual loading on the environment.*

Mineral fertilizer taxes were in place in Finland, Austria and Sweden for up to two decades before they joined the EU in 1995. Rougoor et. al. report that fertilizer use was relatively inelastic (price elasticities ranging from -0.1 to -0.5) in response to these taxes,

but nevertheless, they estimated the presence of significant impacts, in particular in Austria, with a tax rate at 70% of the fertilizer price.⁶⁷

A leaching tax was in operation in the Netherlands from 1998-2005.⁶⁸ To calculate the farm-specific losses, a comprehensive mineral accounting scheme (MINAS) was introduced. Farmers were obliged to account for nitrogen applications and offtakes, and were taxed accordingly. Tax rates were increased in steps from low initial levels, and in the final years, amounted to €5 per kg N and €20 per kg P, which is around 5-10 times the market price for mineral nitrogen fertilizer, for example. Still, it was only surplus losses of nitrogen and phosphorus that were addressed, with tax-exempted allowance thresholds of 40 kg N per ha and 10 kg P per ha. The European Court in its decision on the Dutch implementation of the Nitrate Directive assessed the compatibility of this taxation scheme with the Nitrates Directive and raised a question mark over leaching taxation due to the inherent uncertainties, and the discretion with book-keeping, which led to the MINAS scheme coming to an end.

A nutrient input taxation scheme has been introduced in Denmark for phosphorus. Traded animal fodders are subject to the tax rate of €0.50 per kg of P. A 20 per cent P-reduction was observed within 3 years from the start in 2005. Denmark also has a tax on nitrogen fertilisers with a rate of €0.67 per kg N, but this tax exempts farmers (see EPI-WATER).⁶⁹

1.13.2 Suggested Implementation

It follows from the decision by the European Court in the MINAS case, that input taxation is required for a scheme to be compatible with the Nitrates Directive: the justification as followed by the Court stresses that the legal requirements of the Directive relate to the input of nutrients, and not to surpluses over a specified level (as in the Dutch scheme, now abandoned).⁷⁰ Hence the tax base for a scheme needs to refer to the input of nutrients, as is the case for the mineral fertiliser tax in Croatia.

As for a nitrogen tax rate, the 'best practice' identified is presumably Austria, with rates up to €0.47 per kg N. Even so, considering the broader experience in other Member States, the starting point here is a rate of €0.2 per kg N.

To implement this tax rate in Member States, the tax rate is adjusted with differences in relative price levels of the various national agricultural sectors. The adjustment index refers to the effective CAP support schemes per hectare of utilised agricultural area in Member States, and has been derived from the CAPRI-model.⁷¹ The resulting tax rates at Member State level are indicated in Table 1-28 below.

⁶⁷ Rougoor CW, van Zeijts H, Hofreither MF and S Bäckman, 2001, Experiences with fertilizer taxes in Europe, *Journal of Environmental Planning and Management* 44:6, 877-887.

⁶⁸ Oenema O and Berentsen P, 2005, Manure policy and MINAS: Regulating nitrogen and phosphorus surpluses in agriculture of the Netherlands, OECD OM/ENV/EPOC/CTPA/CFA(2004)67/FINAL.

⁶⁹ <http://www.feem-project.net/epiwater/pages/download-public-deliv.html>; Synthesis report

⁷⁰ European Court, 2002, Case C-322/00, Commission v. Netherlands, Opinion of Advocate General Léger.

⁷¹ Annex III 'Intensity of spending for CAP pillar 1 and pillar 2 per hectare of UAA' in European Environment Agency (2009) *Distribution and Targeting of the CAP Budget from a Biodiversity Perspective*, EEA Technical Report 12/2009.

Table 1-28: Tax Rates Suggested for Nitrogen Fertilisers Based on Relative Levels of CAP Support (€ per kgN)

Rate	0.05€ per kg N	0.10€ per kg N	0.15€ per kg N	0.20€ per kg N	0.25€ per kg N	0.3€ per kg N	0.35€ per kg N	0.4€ per kg N
Member States	LV	BG	ES	CY FI SE SI UK	IE	DK DE MT	NL	EL

The suggested transition period from existing rates, or where there is no such tax in place, from zero rates, is from 2016 to 2018.

1.14 Aggregates and Raw Materials

1.14.1 Good Practice

The objectives for introducing a tax on aggregates vary depending upon the country in which it is being implemented. The policy can have four main effects on aggregates:

- Reduce the amount of virgin aggregate material extracted (reduced consumption leads to less disposal);
- Increase the amount of aggregate re-use;
- Increase the use of substitutes for primary aggregate; and
- Increase the recycling of, and use of, secondary aggregates

A tax on aggregates is a fiscal measure which usually works by shifting the price differential against virgin, and in favour of secondary aggregates, making it financially more beneficial to recycle aggregate and use secondary aggregate. The recycled aggregate is mainly derived as waste from the construction and demolition industry.

Denmark, Sweden, the UK, Belgium (Flanders) and Italy (at a regional level) have all implemented a pure aggregate levy.⁷² The main policy objectives and the year in which the policy was introduced are outlined in Table 1-29.

Table 1-29: Main Aggregate Levy Policy Objectives

	Denmark	Sweden	UK
Name of Policy	Tax on Waste and Certain Raw Materials	The Law Concerning Tax on Natural Materials	Aggregate Levy
Year Policy	1990	1996	2002

⁷² R. Bleischwitz and b. Bahn-Walkowiak (2007) Aggregates and Construction Markets in Europe: Towards a Sectoral Action Plan on Sustainable Resource Management, Minerals and Energy, *Raw Materials Report*, 22:3, 159-176.

Introduced			
Objective 1	To reduce resource extraction	To safeguard gravel resources and water quality	To reduce demand for aggregates and encourage recycling
Objective 2	To increase aggregate recycling	To increase material substitution to crushed rock and recycled material	To compensate for environmental externalities caused by quarry activities

The Danish raw material extraction tax⁷³ was introduced in 1987, alongside the waste tax. In 1990, the tax was modified to become an extracted raw materials tax (sand, gravel, stones, peat, clay and limestone), to reduce the use of these natural materials and to promote the use of recycled products, such as construction and demolition waste. The combined aggregate and waste taxes have produced a greater demand for recycled substitutes: in 1985 only 12% of construction and demolition waste was recycled, compared with 94% in 2004. The following are described by an ECOTEC report as being exempt from the tax:⁷⁴

- Raw materials extracted for coastal projects to protect the beaches against erosive action;
- Sea bed materials, which originate from maintenance and capital dredging projects and which are utilised as raw materials;
- Residual products and waste products, which are extracted from already closed depots;
- Top soil and peat, which are delivered without payment; and
- Raw materials commercially extracted or imported by a business, when the annual amount is less than 200 m³ of raw materials.

The tax in Denmark is based on volume (m³) of material extracted and the tax currently stands at DKK 5 per m³. The revenue generated goes directly to the State's general budget as well as towards subsidy schemes, which support waste-related initiatives in the fields of waste prevention, recovery and recycling.

In Sweden, gravel is a very important resource due to necessity for aquifers on which much of the country relies for drinking water. It was also recognised that gravel is an easily extractable, finite resource. This was leading to a shortage of gravel in some parts of Sweden. The tax was therefore introduced for environmental reasons and aimed to make gravel-alternatives more cost-competitive, therefore increasing use of recycled aggregates, and reducing consumption of gravel. Sweden's 'Tax on Natural Materials', commonly referred to as 'Gravel Tax', applies to gravel, which consists mainly of sand, gravel, cobble and boulder size fractions.

In Sweden the tax is levied on the basis of weight and the current level of tax is SEK 13 per tonne of extracted material.

⁷³ Söderholm, P. (2011); ec.europa.eu/environment/integration/research/newsalert/pdf/262na1.pdf

⁷⁴ ECOTEC Research and Consulting (2001) *Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the EU and its Member States*, Accessed 21st October 2008, http://ec.europa.eu/environment/enveco/taxation/pdf/ch11_aggregated_taxes.pdf

The UK's 'Aggregate Levy' applies to aggregate which in the UK is deemed to consist of sand, gravel and rock, with the following exceptions:

- Materials such as clay, slate and shale, which are not strictly aggregates but which are used for similar purposes;
- Minerals (mainly for industrial use) whose extraction necessarily involves the extraction of stone, gravel or sand; and
- Coal, metals and peat.

The levy is applied to materials which are:

- Quarried in the UK;
- Mined underground in the UK;
- Dredged from UK waters; or
- Imported into the UK.

In the UK the aggregate levy is also levied on a weight basis and currently stands at £2.00 (approx. €2.40) per tonne (increased from £1.60 (€1.92) per tonne in April 2008 to account for inflation).⁷⁵

The level of tax implemented is considerably higher in the UK, as a proportion of price, than elsewhere. In the UK the tax on aggregates equates to 20% of the average price for sand, rock and gravel compared to the case of Sweden, where the tax equates to only 12% of the average price.

The UK recently saw an increase in the rate of the levy, but generally, the level of aggregate tax has been fairly stable over time. Sweden, however, has introduced incremental increases in the tax over time.

The taxes raised 0.02% of GDP in UK, and less than 0.01% of GDP in Sweden. The Danish figures reported are combined with those derived from the tax on incineration and landfilling so the contribution is less easy to discern.

In Latvia, taxes are levied on the extraction or use of natural resources or environmental pollution. The taxes are paid by the person who has received or is under obligation to receive a permit, and who in the territory of the Republic Latvia, continental shelf or exclusive economic area obtains taxable natural resources, or realizes taxable natural resources, obtained in an economic activity which is not related to the output of mineral deposits. The tax rates are set out in Table 1-30.

Table 1-30: Tax Rates for Resource Extraction and Use in Latvia

Type of Resource	Unit of Measurement	Rate, LVL
Soil	m ³	0.3
Sandy loam and clay loam, aleirite	m ³	0.1
Quartz sand	m ³	0.25

⁷⁵ Converted using an exchange rate of €1.2 = £1.

Type of Resource	Unit of Measurement	Rate, LVL
Sand	m ³	0.15
Sand-gravel (fragments > 5 mm content > 15%)	m ³	0.25
Clay, other clayey rock for the production of construction materials	m ³	0.15
Dolomite for decoration (finishing)	m ³	0.25
Dolomite	m ³	0.15
Limestone	m ³	0.2
Freshwater limestone (friable and chunky)	m ³	0.1
Travertine	m ³	1
Gypsum	m ³	0.35
Field stones	m ³	0.4
Pigmentary soil	m ³	0.1
Peat (moisture – 40%)	ton	0.3
Organogenic sapropel (algal and zoogenic – algal) and organogenic lime with ash, < 30% (moisture – 60%)	ton	0.5
Other sapropel (moisture – 60%)	ton	0.1
All types of medicinal mud	ton	0.5
Edible park snails (<i>Helix pomatia</i> L), collected for further economic utilisation	kg	0.03

In Lithuania, the relevant tax rates are set for one cubic meter of extracted natural resources, except in the case of amber and for hunting. The rate on amber is set per 1 kg of extracted resource, and the hunting tax is set for each hectare of hunting area. The natural resource tax is applied tenfold in cases where the amount of extracted resources is concealed. The tax raised 0.06% GDP in 2011 (the amount having tripled since 2006).

In France, under the TGAP, there is a tax on the release for consumption and supply on the domestic market of aggregates: the tax is levied according to weight at € 0.20 per tonne.

In Estonia, economic operators pay a mineral resources extraction charge for the extraction and use of mineral resources belonging to the state. Mineral resources for which such a tax is payable include dolomite, granite, gravel, sand, limestone, clay, peat, phosphate rock, oil shale, and crystalline building stone.

Czech Republic and Italy are not included in this review because these taxes are mining charges, not aggregate product taxes, and do not impact upon aggregate waste and recycling in any significant way.

1.14.2 Suggested Implementation

It is suggested that the implementation of such taxes should be such that the rates applied to aggregates in the UK (€2.40 per tonne) are applied to the types of materials covered by such taxes.

There appears to be little reason to phase this tax in. It is suggested that where there is no aggregates tax in place, or where there are taxes already in place, the tax is implemented at, or raised to, this rate by the start of 2016.

Data on the following categories of aggregates was obtained from Eurostat material flow accounts as the tax base for revenue calculations:⁷⁶

- Marble;
- Chalk and dolomite;
- Slate;
- Limestone and gypsum; and
- Sand and gravel.

As with the UK tax, it is assumed that the tax is levied on the first use or sale and that those who export are effectively given a tax credit for aggregate that is exported from the country on provision of relevant documentary evidence.

1.15 Power Sector and the ETS

In Phases I (2005-2007) and II (2008-2012) of the EU Emissions Trading Scheme (EU ETS), the Member States could auction up to 5% and 10% of allowances, respectively, as they saw fit. For the first trading period of the EU ETS (2005-2007) only 4 countries (Denmark, Hungary, Ireland and Lithuania) used auctioning or direct selling, as opposed to grandfathering, for allocating EU allowances (EUAs) to the companies covered by the scheme. Although only Denmark chose to auction the full 5% allowed, it finally decided to sell them directly on the market. In Phase II, a larger number of countries auctioned or sold allowances. These are shown in Table 1-31, along with the total sold or auctioned over the Phase II period. The sale of allowances by year is shown in Table 1-32.

Table 1-31: Auctioned or Sold Allowances in Phase II of the EU-ETS, '000 emission units (kt CO₂-eq), all stationary sectors (1-9 and 99)

Country	Allowances Auctioned / Sold in Phase II ('000 EUAs)
Austria	2,000
Belgium	9,565

⁷⁶ http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_mfa&lang=en

Country	Allowances Auctioned / Sold in Phase II (‘000 EUAs)
Bulgaria	130
Cyprus	0
Czech Republic	2,569
Denmark	2,837
Estonia	0
Finland	0
France	0
Germany	220,181
Greece	18,750
Hungary	7,675
Iceland	0
Ireland	557
Italy	0
Latvia	0
Liechtenstein	0
Lithuania	3,331
Luxembourg	4
Malta	0
Netherlands	16,000
Norway	35,019
Poland	210
Portugal	0
Romania	638
Slovakia	0
Slovenia	0
Spain	0
Sweden	0

Country	Allowances Auctioned / Sold in Phase II (‘000 EUAs)
United Kingdom	122,819

Source: EEA EU Emissions Trading System (ETS) data viewer, <http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-trading-viewer>

Table 1-32: Auctioned or Sold Allowances by Year, ‘000 emission units (kt CO₂-eq), all stationary sectors (1-9 and 99)

Year	Allowances Auctioned / Sold in Phase II (‘000 EUAs)
2005	0
2006	6,782
2007	1,730
2008	53,130
2009	79,315
2010	91,862
2011	92,943
2012	125,034

Article 10(1) of Directive 2003/87/EC requires Member States to auction allowances covered by Chapter III of that Directive not allocated free of charge. Thus, Member States must auction allowances not allocated free of charge. They may not use any other means of allocation, nor could they withhold or cancel allowances not allocated for free instead of auctioning them.

In 2013 over 40% of all allowances were expected to be auctioned, and the ETS legislation sets the goal of phasing out free allocation completely by 2027. Regular auctions take place in accordance with Commission Regulation (EU) No. 1031/2010 (the "Auctioning Regulation").

For the power generation sector, the rule is that operators no longer receive any free allowances but have to buy them. However, eight of the Member States which have joined the EU since 2004 - Bulgaria, Cyprus, as well as 6 of the countries being considered as part of this study, Czech Republic, Estonia, Hungary, Lithuania, Poland and Romania - have made use of a derogation (under Article 10c of the revised EU ETS Directive) which allows them to allocate, free of charge, a decreasing number of allowances to existing power plants for a transitional period. Latvia and Malta were also eligible to use this derogation but chose not to. The derogations require that the number of free allowances allocated declines progressively to reach zero no later than 2020. In exchange, the eight Member States concerned are required to implement national plans to modernise their electricity sectors and diversify their energy mix through investments

worth at least as much as the value of the free allowances.

Because of the rules governing the way in which the EU-ETS functions, we have not made major suggestions regarding how the power sector should be taxed other than in respect of air pollution (i.e., excluding greenhouse gases). In principle, it is possible for Member States to consider setting price floors (the UK, for example, has already done so – see below), but we have taken the view that in the absence of a process being led at the European level, the implied message would be that the cap within the EU-ETS was insufficiently tight. Evidently, the EU-ETS is intended to address only those greenhouse gases covered by the scheme. However, it should also be considered that a minimum rate of tax for electricity (on the output side) exists under the existing (and proposed) Energy Taxation Directive. In addition, we have considered the situation in respect of the level of taxes on air pollution. For these reasons, we have not proposed changes other than in relation to air pollution taxation. Perhaps more important is the way in which the relationship between the power sector and the EU-ETS influences whether or not one interprets some exemptions from energy excise duties as ‘environmentally harmful subsidies’ or not.

Evidently, the auctioning of revenues provides a source of additional revenue to Member States relative to the situation where they are allocated free of charge. By way of comparison, the quantity sold or auctioned in the last year of Phase II was 125 million across the EU (see Table 1-32 above). In 2013, the quantity sold or auctioned is expected to have been around a billion (eight times the number in 2012). At the same time, the allowance values have not been particularly high. For UK allowances, the figures for auctions in 2013 and for the first auction in 2014 are shown below. For 2013, the average value of allowances was €4.31 per EUA. For the UK auction, revenue raised was €410 million, or around 0.03% of GDP, in 2013.

Nonetheless, this provides an additional – albeit potentially unstable (because of the potential for allowance values to change) - source of revenue to the countries under examination in this study. It might also be noted that six of the eight countries availing themselves of derogations under Article 10c of the ETS Directive are included within this study. As such, they will be auctioning a progressively increasing number of allowances between now and 2020.

1.15.1 Setting Floor Prices for EUAs

The decline in economic activity which followed the 2008 crisis led to a reduction in demand for EUAs relative to their availability. This led to concerns that the value of allowances under the EU-ETS would remain low, and that the incentive for abatement of greenhouse gases was too weak. This was particularly the case in those countries who had set their own targets to reduce emissions below what was suggested by the EU-ETS. In April 2013, for example, the UK implemented a price floor for allowances through the mechanism of its existing Climate Change Levy. Carbon Price Support rates of the Levy are applied to the use of gas, solid fuels and LPG used in power generation.

Whilst potential exists, therefore, to generate additional revenue from such mechanisms, we have not suggested them in this study.

Table 1-33: Key Results from UK Auctions of EUAs

Date	Allowances	Clearing Price	Notional

16-Jan-13	4,134,000	€ 5.81	€ 24,018,540.00
30-Jan-13	4,134,000	€ 3.72	€ 15,378,480.00
13-Feb-13	4,134,000	€ 4.57	€ 18,892,380.00
27-Feb-13	4,134,000	€ 4.23	€ 17,486,820.00
13-Mar-13	4,134,000	€ 3.60	€ 14,882,400.00
27-Mar-13	4,134,000	€ 4.68	€ 19,347,120.00
10-Apr-13	4,134,000	€ 4.58	€ 18,933,720.00
24-Apr-13	4,134,000	€ 2.93	€ 12,112,620.00
08-May-13	4,134,000	€ 3.51	€ 14,510,340.00
22-May-13	4,134,000	€ 3.43	€ 14,179,620.00
05-Jun-13	4,134,000	€ 3.96	€ 16,370,640.00
19-Jun-13	4,134,000	€ 4.52	€ 18,685,680.00
03-Jul-13	4,134,000	€ 3.85	€ 15,915,900.00
17-Jul-13	4,134,000	€ 4.06	€ 16,784,040.00
31-Jul-13	4,134,000	€ 4.10	€ 16,949,400.00
14-Aug-13	2,075,000	€ 4.26	€ 8,839,500.00
28-Aug-13	2,075,000	€ 4.56	€ 9,462,000.00
11-Sep-13	4,134,000	€ 4.94	€ 20,421,960.00
25-Sep-13	4,134,000	€ 5.30	€ 21,910,200.00
09-Oct-13	4,134,000	€ 4.70	€ 19,429,800.00
23-Oct-13	4,134,000	€ 4.59	€ 18,975,060.00
06-Nov-13	4,134,000	€ 4.76	€ 19,677,840.00
20-Nov-13	4,134,000	€ 4.40	€ 18,189,600.00
04-Dec-13	4,134,000	€ 4.42	€ 18,272,280.00
15-Jan-14	4,630,000	€ 4.91	€ 22,733,300.00
TOTAL 2013	95,098,000	€4.31	€409,625,940.00

Source: <https://www.theice.com/marketdata/reports/ReportCenter.shtml#report/148>

1.15.2 Aviation in the EU-ETS

EU Aviation Allowances (EUAAAs), which were introduced in January 2012, had been expected to be auctioned in a similar way as for power in Phase III. However following the announcement by the European Commission of 12 November 2012, proposing a deferral of the enforcement of the requirements under the EU Emissions Trading System for aircraft operators to monitor and report emissions as well as surrender allowances in April 2013 for emissions from flights into and out of Europe during 2012, auctioning of EUAAAs has been suspended (the ETS Directive provides for 15% of aviation allowances to be auctioned).

Given this situation, and given also that the expected proposal from ICAO may not be implemented until 2020, we have suggested that taxes on aviation could be introduced. It is recognised that Member States may want to consider the 'fit' of such an instrument with any proposal once its nature becomes clearer. It is possible that such a proposal could include auctioning of allowances (as had been expected under the EU-ETS), in which case, it might be appropriate to scale back such taxes.

1.16 HGV Externality Charging

We also suggest that Member States give consideration to their approach to taxing HGVs in line with Directive 2011/76/EU. A recent report indicates that there is wide variation in the extent to which Member States are aligned with the approach set out in the Directive.⁷⁷ In some additional analysis (relative to the previous work), we have considered the potential revenues which could be generated from what Directive 2011/76/EC refers to as external cost charges related to air pollution and noise. The estimates assume – in line with the study’s focus on revenue potential – that vehicles have applied to them maximum rates of externality charge for air pollution and noise as set out in Annex IIIb of the Directive. We have, however, applied the (lower) rates applicable to interurban roads (for air pollution and noise) and the (lower) rates applicable for daytime for noise.

Data on the estimated number of vehicles miles driven per country and for each class of vehicle was taken from the TREMOVE database.⁷⁸ Table 1-34 shows the revenue figures derived from this analysis for the air quality and noise elements, and the total per country.

⁷⁷ See Ricardo-AEA (2014) *Evaluation of the Implementation and Effects of EU Infrastructure Charging Policy since 1995*, Final Report to DG MOVE, January 2014.

⁷⁸ <http://www.tmlleuven.com/methode/tremove/home.htm>

Table 1-34: Revenue Potential from HGV Externality Charges

Country	Air Pollution	Noise	Total
AT	122	9.7	132
BE	285	15.6	301
BG	127	5.9	133
CY	52	1.7	54
CZ	320	15.9	336
DE	1,253	93.7	1,346
DK	103	6.5	110
EE	47	2.3	49
ES	1,840	87.6	1,927
FI	203	9.2	212
FR	1,230	83.8	1,313
EL	279	11.1	290
HR	70	3.3	73
HU	177	9.8	187
IE	80	7.0	87
IT	1,276	59.8	1,336
LT	146	6.9	153
LU	22	1.4	24
LV	66	3.9	70
MT	4	0.2	5
NL	287	18.5	306
PL	825	43.2	868
PT	213	11.0	224
RO	440	25.6	466
SE	128	9.0	137
SI	51	2.9	54
SK	145	7.0	152
UK	1,611	84.0	1,695

2.0 Revenue Calculations

2.1 Estimating Revenue Breakdown by Fuel Type

2.1.1 Introduction

In this section we outline the methodological approach used to estimate revenue breakdowns by fuel type and usage for each of the 14 Member States analysed.

The primary sources for revenue data were the DG-TAXUD *Taxes in Europe Database*, the National Tax List published by DG-ESTAT, and information obtained from government statistical sources.^{79,80} This information was supplemented with revenue data from the *OECD Database on Instruments used for Environmental Policy and Natural Resources Management*. In addition, some revenue data was obtained directly from Member States' environmental and finance ministries.⁸¹

In most cases, excise duty revenues are not broken down by fuel type, rather, a summary figure is available for all excise duty revenues, or for the revenues relating to each of the major energy carriers / types (mineral oils, natural gas, solid fuels and electricity) without their being broken down by end use. In order to estimate baseline revenues for each individual excise duty going forward, and to compare these to the potential revenues realised through 'good practice', a methodology was designed to estimate revenue breakdowns by fuel type and usage.

In essence, we made a 'bottom up' estimation of the revenues based on current tax rates and energy consumption. Tax rates were gathered from the latest *Excise Duty Tables*.⁸² Energy balance data was obtained for each Member State from the 2011 Energy Balance Sheets, published by Eurostat.⁸³ The proportions of calculated revenue by fuel type over the total calculated revenue figure, were used to pro-rate the actual total revenue figure to each fuel type.

2.1.2 Estimating Energy Consumption for ETD Categories

The Energy Balance Sheets publish energy consumption data for each fuel type, which is further grouped according to the final use of the fuel, using the following categories: industry, transport, and other sectors (including a subsector for households). Conversely, excise duty rates are specified within the Energy Tax Directive (ETD) according to the

⁷⁹ European Commission (2013) *Taxes in Europe Database*, Accessed 2nd December 2013, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=553/1357119977&taxType=Other+indirect+tax

⁸⁰ Eurostat (2013) *National Tax List*, Accessed 30th December 2013, http://epp.eurostat.ec.europa.eu/statistics_explained/images/b/ba/National_tax_lists_20130717.xls

⁸¹ OECD/EEA (2013) *OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management* <http://www2.oecd.org/ecoinst/queries/index.htm>

⁸² 2012 - European Commission (2013) *Excise Duty Tables*, Accessed 2nd December 2013, p.6, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/ra/tes/excise_duties-part_ii_energy_products_en.pdf

⁸³ Eurostat (2013) *Energy Balance Sheets 2010-11*, 2013, April 2013, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-EN-13-001/EN/KS-EN-13-001-EN.PDF

following fuel usages: motor fuels, industry and commercial motors, and business and non-business heating.⁸⁴

Relating Eurostat data for transport and household fuel consumption to specific excise duties (motor fuels and non-business heating) is relatively straightforward – these categories already exist within the Energy Balance Sheets. For the other excise duty categories – industry and commercial motors and business heating – it was necessary to make a number of assumptions in order to make use of the Eurostat data. In Table 2-1 we specify which Eurostat categories, for each fuel type, were assigned to each ETD category.

Table 2-1: Relating Energy Balance Sheet Categories to ETD Categories

ETD Category	Eurostat Category	Eurostat Fuel
Motor Fuels		
Motor spirit (petrol)	Transport	Motor spirit
Light fuel oil (diesel)	Transport	Gas/diesel oil
LPG	Transport	LPG
Kerosene	Transport	Kerosenes, jet fuels
Natural gas	Transport	Natural gas
Industry and Commercial Motors		
Light fuel oil (diesel)	Industry	Gas/diesel oil
Kerosene	Industry	Kerosenes, jet fuels
LPG	-	LPG
Natural gas	-	Natural gas
Business Heating		
Light fuel oil (diesel)	Other sectors (excluding households)	Gas/diesel oil
Heavy fuel oil	Industry and other sectors (excluding households)	Residual fuel oil
Kerosene	Other sectors (excluding households)	Kerosenes, jet fuels
LPG	Industry and other sectors (excluding households)	LPG
Natural gas	Industry and other sectors (excluding households)	Natural gas
Coal	All energy consumption excluding households	Hard coal + Coke + Lignite
Non-Business Heating		
Light fuel oil (diesel)	Households	Gas/diesel oil
Heavy fuel oil	Households	Residual fuel oil
Kerosene	Households	Kerosenes, jet fuels
LPG	Households	LPG
Natural gas	Households	Natural gas
Coal	Households	Hard coal + Coke + Lignite

⁸⁴ Official Journal of the European Union (2003) *Council Directive 2003/96/EC*, 27th October 2003, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:283:0051:0070:EN:PDF>

ETD Category	Eurostat Category	Eurostat Fuel
	Electricity	
Electricity - business use	All energy consumption excluding households	Electrical Energy
Electricity - non-business use	Households	

In summary, our assumptions were as follows:

- All industrial consumption of light fuel oil (diesel) and kerosene is used to supply industrial and commercial motors, and was not used for heating purposes;
- All industrial consumption of heavy fuel oil, LPG and natural gas, was for heating purposes. The assumption was made because the IEA tables did not differentiate between the use of some fuels by when used for motor fuels or heating in the industrial and commercial sectors. In the absence of any robust data to estimate a split in the revenues, this simplifying assumption was made, in order to gain as much granularity in the revenue estimations as possible;
- All fuel consumption by 'other sectors' (excluding households) was for business heating purposes.

2.1.3 Revenue Breakdown Estimates

Given the above assumptions, we were able to calculate the tax base (total fuel consumption) relating to each of the fuels in the ETD, subcategorised by usage. By taking the product of the tax base and tax rate we calculated the revenues which each Member State should, in theory, have received from energy taxes in 2011. This information was used to estimate the percentages of total revenue relating to fuel usage, presented in Table 2-2 for each Member State.

Table 2-2: Approximate % Revenue Breakdowns by Member State

ETD Category	% of Total Revenues from Excise Duties on Energy													
	Bulgaria	Cyprus	Denmark	Finland	Germany	Greece	Ireland	Latvia	Malta	Netherlands	Slovenia	Spain	Sweden	United Kingdom
Motor Fuels														
Motor spirit (petrol)	22.77%	41.10%	13.84%	25.87%	28.48%	52.42%	33.81%	25.72%	29.15%	24.28%	30.15%	18.57%	32.39%	
Light fuel oil (diesel)	57.93%	25.82%	26.33%	30.32%	32.55%	14.48%	43.55%	52.38%	27.73%	22.05%	56.51%	58.09%	35.30%	
LPG (propellant)	5.35%	0.00%	0.00%	0.00%	0.20%	0.51%	0.01%	1.39%	0.00%	0.55%	0.08%	0.01%	0.00%	
Kerosene	6.17%	24.41%	10.09%	12.85%	13.34%	6.53%	11.73%	9.99%	29.30%	11.81%	0.76%	15.22%	8.08%	
Natural gas (prop)	0.45%	0.00%	0.00%	0.04%	0.16%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.04%	0.17%	
Industry and Commercial Motors														
Gas oil	1.11%	1.58%	0.44%	2.11%	0.13%	2.13%	0.77%	0.73%	0.00%	1.56%	0.25%	0.69%	0.59%	
Kerosene	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Business Heating														
Gas oil	0.41%	1.16%	5.37%	3.27%	0.74%	1.94%	2.41%	2.00%	0.00%	1.87%	2.20%	1.93%	1.00%	
Heavy fuel oil	0.16%	0.07%	1.01%	1.78%	0.08%	0.17%	0.39%	0.02%	0.00%	0.02%	0.04%	0.06%	1.00%	
Kerosene	0.00%	0.03%	0.00%	1.10%	0.00%	1.16%	0.15%	0.00%	0.00%	0.13%	0.00%	0.00%	0.00%	
LPG	0.00%	0.00%	0.38%	0.00%	0.05%	0.35%	0.13%	0.00%	0.00%	0.15%	0.15%	0.05%	0.62%	
Natural gas	1.01%	0.00%	8.76%	1.91%	2.62%	0.81%	1.65%	1.21%	0.00%	5.59%	1.99%	2.16%	0.81%	
Coal	1.83%	3.39%	0.42%	0.44%	0.04%	0.40%	0.71%	4.25%	11.68%	0.12%	1.64%	0.14%	0.29%	
Non-Business Heating														
Gas oil	0.00%	2.01%	3.07%	1.97%	1.74%	14.84%	0.91%	0.37%	0.00%	0.18%	2.41%	1.06%	0.30%	
Heavy fuel oil	0.00%	0.00%	0.03%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	
Kerosene	0.00%	0.44%	0.00%	0.00%	0.00%	0.01%	1.48%	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	
LPG	0.00%	0.00%	0.17%	0.00%	0.08%	0.02%	0.05%	0.00%	0.50%	0.04%	0.11%	0.12%	0.00%	
Natural gas	0.00%	0.00%	6.28%	0.10%	2.69%	0.39%	0.91%	0.44%	0.00%	3.53%	0.54%	0.69%	0.25%	
Coal	0.21%	0.00%	0.00%	0.00%	0.01%	0.00%	0.63%	0.04%	0.00%	0.00%	0.00%	0.02%	0.00%	
Electricity														
Electricity - business use	1.59%	0.00%	0.24%	8.98%	11.63%	2.46%	0.28%	1.09%	1.10%	21.45%	2.35%	0.60%	0.72%	

Electricity - non-business use	1.01%	0.00%	23.56%	9.24%	5.46%	1.37%	0.29%	0.38%	0.54%	6.61%	0.80%	0.54%	18.49%
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2.1.4 Pro-rating Actual Revenues based on Approximate Revenue Percentages

These estimated revenue breakdowns were then applied to aggregated revenue data (i.e., published revenues for all excise duties on energy). This enabled approximate revenues, disaggregated by fuel type and usage, to be obtained for each Member State, to be used in forward projections of the baseline and 'good practice' scenarios.

2.2 Revenue Projections for Energy Taxation

2.2.1 Baseline Projections

The following approach was taken to estimate future revenue projections for energy taxes:

- Existing Tax Base for Energy Related Excise Duties:
 - The tax base for each fuel type, and electricity, was estimated by dividing the total estimated revenues figures (see Section above) by the excise duty rates.
- Tax Base Projections for Energy Related Excise Duties:
 - A simple approach was taken in projecting the tax base for fuels and electricity generation. This was to keep the tax bases constant going forwards.
- Approach to Setting Future Energy Related Excise Duty Rates:
 - The approach for energy excise duty rates was to keep the levels constant in real terms. It is clear that energy excise duties are not always increased in line with inflation. On the other hand, it might be considered good practice to index rates in order to maintain their incentive effect. Article 4(4) of the proposed ETD also indicates the desirability of indexing, if only periodically.
 - The minimum levels of general energy consumption taxation laid down in this Directive shall be adapted every three years starting from 1 July 2016 in order to take account of the changes in the harmonised index of consumer prices excluding energy and unprocessed food as published by Eurostat. The Commission shall publish the resulting minimum levels of taxation in the *Official Journal of the European Union*.
- Future Revenue Projections:
 - Future revenue figures were calculated by multiplying the future rate by the projected tax base for each fuel type and electricity.

2.2.2 Price Elasticities for Good Practice Projections of Tax Bases

The approach for projecting the tax base forwards was to use own-price elasticities to calculate the estimate change in demand, and use, of the different fuels based upon the change in their price associated with the suggested changes in duty levels.

Elasticities indicate the responsiveness of consumer behaviour with respect to changes in explanatory variables, in this case, the price of the fuel. Using the example of energy use, determining the price elasticity of demand permits us to estimate the effects that

changes in duties, and in turn, overall energy prices, will have on consumer demand. This is also referred to as the 'own-price' elasticity of demand.

It is important to understand that changes in the demand for a good, such as fuel, are affected not only by the price of the good itself, but also by the price of other goods. So, for example, if the price of diesel increases whilst the price of other fuels do not, the demand for these other fuels may increase, especially if the fuels are close substitutes. The strength of this response is represented by another elasticity, the cross-price elasticity (the elasticity of demand for the fuel with respect to the price of diesel). Demand for goods relative to the price of the good itself and the price of other goods is characterised not by one 'own-price' elasticity, but a matrix of own- and cross-price elasticities.

The figures within this matrix are likely to vary according to the country under study, but they are not so well known in any given country. The figures also differ in the short- and long-term – some factors affecting demand, such as the stock of vehicles, change only over extended periods of time.

In the absence of a complete matrix of own and cross-price elasticities, we opted for a simple approach, using a single own-price elasticity figure for fuel use. This is clearly a simplified way of estimating a reduction in the tax base, and hence, revenue projections, based upon the increased price of the fuels. Modelling no decrease at all would simply not have been a realistic assumption to make, especially as the proportionate change in the price of some fuels is not insignificant.

A number of studies have looked at price elasticities of demand for energy at specific level. For example, a meta-study of residential energy usage from 2004 demonstrated that in the short-run a 1% rise in domestic electricity prices reduces demand by 0.35%, whereas in the long-run demand falls by 0.85%.⁸⁵ The fact that demand is more inelastic in the short-run is not surprising. Short-run changes in demand tend to be limited due to the long lifetimes and slow turnover of energy-using appliances and capital equipment. If, however, an increase in energy prices is persistent, this will be more likely to significantly affect adoption of energy efficiency measures leading to a greater reduction in consumption, as consumers replace older capital equipment (and firms develop new processes and products).⁸⁶

A range of estimates of energy own-price elasticities (both short- and long-run) covering the residential, commercial and industrial sectors, for electricity, natural gas and fuel oil (albeit with a focus on the US) are presented in a 2009 publication from Resources for the Future (RFF).⁸⁷ These are summarised in Table 2-3.

⁸⁵ James, A. Espey, and Molly Espey (2004) *Turning on the Lights: A Meta-Analysis of Residential Electricity Demand Elasticities*, April 2004, p.66.

⁸⁶ Gillingham, K., Newell, R.G., and Palmer, K. (2009) *Energy Efficiency Economics and Policy*, April 2009

⁸⁷ Gillingham, K., Newell, R.G., and Palmer, K. (2009) *Energy Efficiency Economics and Policy*, April 2009

Table 2-3: Ranges of US Estimates of Energy Own-Price Elasticities (all values are negative)

	Short-run	Long-run
Residential		
Electricity	0.14 - 0.44	0.32 - 1.89
Natural Gas	0.03 - 0.76	0.26 - 1.47
Fuel Oil	0.15 - 0.34	0.53 - 0.75
Commercial		
Electricity	0 - 0.46	0.24 - 1.36
Natural Gas	0.14 - 0.29	0.40 - 1.38
Fuel Oil	0.13 - 0.49	0.39 - 3.5
Industrial		
Electricity	0.11 - 0.28	0.22 - 3.26
Natural Gas	0.51 - 0.62	0.89 - 2.92
Fuel Oil	0.11	0.5 - 1.57

A number of studies with a European focus provide elasticity estimates that fall within (or close to) to ranges identified in Table 2-3. A 2004 study using time series data from 1986 to 1999 estimated the long-run price elasticity of residential electricity demand in Greece to be -0.41.⁸⁸ A similar study in Cyprus, also using a time series approach, (from 1960 to 2004) estimated the long-run price elasticity of residential electricity demand to be -0.43.⁸⁹

For residential gas, a Norwegian study from 2005 analysed the price elasticity of demand in 12 European countries during the period from 1978 to 2002. Short-run own-price elasticities were typically in the range 0 to -0.3. Long run own-price elasticities were typically between 0 and -1.5.⁹⁰ These are broadly consistent with those shown in Table 2-3.

⁸⁸ Hondroyannis, G. (2004) *Estimating Residential Demand for Electricity in Greece*, 2004 in Table 2 E.ON Energy Research Center (2011) *Econometric Estimation of Energy Demand Elasticities*, October 2011

⁸⁹ Zachariadis, T., Pashourtidou, N. (2007) An empirical analysis of electricity consumption in Cyprus, p.191.

⁹⁰ Odd Bjarte Nilsen, Frank Asche, and Ragnar Tveteras (2005) *Natural Gas Demand in the European Household Sector*, August 2005

Another Norwegian study estimated price elasticities of demand for several energy goods in OECD countries over 1978 to 1999.⁹¹ The authors estimated elasticities for electricity, and natural gas, in the residential and industrial sectors, as shown in Table 2-4.

Table 2-4: Own-price elasticity estimates for OECD Countries (all values are negative). (Figures from Table 2-3 shown in parentheses)

	Short-run	Long-run
Residential		
Electricity	0.029 - 0.043 (0.14 - 0.44)	0.132 - 3.692 (0.32 - 1.89)
Natural Gas	0.114 - 0.196 (0.03 - 0.76)	0.369 - 0.774 (0.26 - 1.47)
Industrial		
Electricity	0.007 - 0.012 (0.11 - 0.28)	0.037 - 0.045 (0.22 - 3.26)
Natural Gas	0.074 - 0.121 (0.51 - 0.62)	0.266 - 0.507 (0.89 - 2.92)

The authors note that there exists ‘discernible divergence among the estimates of energy demand elasticities from empirical studies due to the differences in modelling methodologies and/or data sets applied in these studies’. This is clearly demonstrated, through comparison with the figures reported in Table 2-3, which are shown in parentheses in Table 2-4.

In order to illustrate the elasticity of demand with respect to fuel price, the European Environment Agency draws upon a 2004 literature review undertaken for the UK Government.⁹² With a focus on cars, the authors reviewed 69 new empirical studies, published since 1990, identifying the effects of price and income on fuel consumption, traffic levels, and where available, other indicators including fuel efficiency and car ownership.

Based on the best defined results, the authors state that if the real price of fuel rises by 10% and stays at that level, the result is a dynamic process of adjustment such that the following occur:

⁹¹ Gang Liu (2004) *Estimating Energy Demand Elasticities for OECD Countries: A Dynamic Panel Data Approach*, March 2004

⁹² See Table 3 in Goodwin, P., Gargay, J. And Hanly, M. (2004) *Elasticities of Road Traffic and Fuel Consumption with Respect to Price and Income: A Review*, May 2004, illustration sourced from European Environment Agency (2012) *Elasticity of Transport Demand with Respect Fuel Price*, Accessed December 2013, <http://www.eea.europa.eu/data-and-maps/figures/elasticity-of-transport-demand-with-respect-to-fuel-price>

1. Volume of traffic will fall by approximately 1% within about a year, building up to a reduction of about 3% in the longer run (about 5 years or so); and
2. Volume of fuel consumed will fall by about 2.5% within a year, building up to a reduction of over 6% in the longer run.

The authors state that the reason why fuel consumed falls by more than the volume of traffic is probably because price increases trigger a more efficient use of fuel, by a combination of:

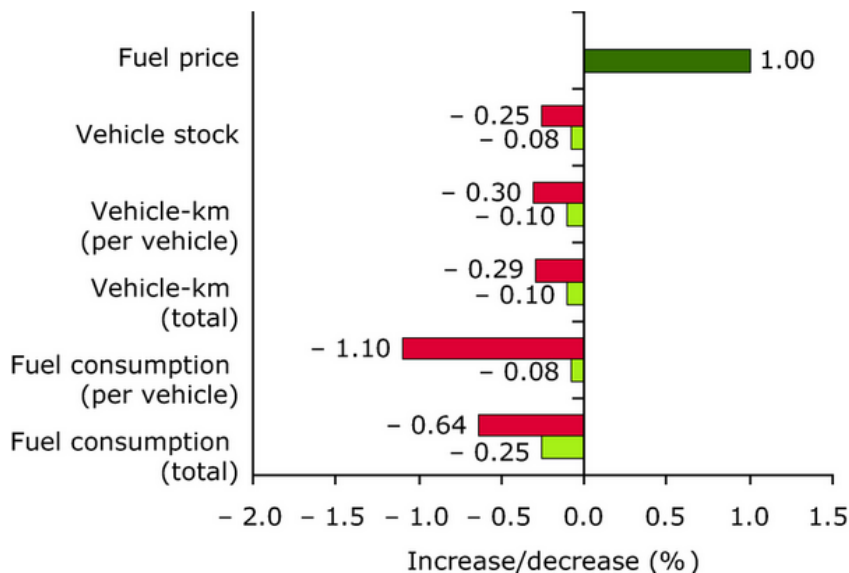
- Technical improvements to vehicles;
- More fuel-conserving driving styles; and
- Driving in easier traffic conditions.

A further probable differential effect is between high- and low-consumption vehicles, since with high prices, 'gas guzzlers' are more likely to be left at home or scrapped. Therefore, further consequences of the 10% price increase (albeit the authors suggest the evidence is not as strong as for the effects noted above) are as follows:

- Efficiency of the use of fuel rises by about 1.5% within a year, and around 4% in the longer run: and
- Total number of vehicles owned falls by less than 1% in the short run and by 2.5% in the longer run.

The headline results of the study, a short run elasticity of -0.25 and a long run elasticity of -0.6, are illustrated in Figure 2-1.

Figure 2-1: Elasticity of Transport Demand with Respect to Fuel Price



The authors of a parallel review, also undertaken in 2004 for the UK Government, draw similar conclusions, based on 1083 fuel demand elasticity estimates, from 113 studies

published between 1966 and 2000. The authors state that the weight of evidence in the literature suggests that:⁹³

- Long-run price elasticity of demand for fuel falls between -0.6 and -0.8; and
- Short-run price elasticity of demand for fuel lies between -0.2 and -0.3.

In 2012, the UK Government's Department of Energy and Climate Change commissioned research to review academic literature of price elasticities for the industrial sector.⁹⁴ This showed that there is a wide range of possible elasticities, with the UK Government applying what they believed to be a conservative estimate of -0.2 in their analysis of meeting Article 7 of the Energy Efficiency Directive.⁹⁵ However, there is no differentiation in the publicly available document between elasticities for natural gas and electricity.

A 2010 study for Transport and Environment reviewed the literature on road freight elasticities.⁹⁶ The authors identified a best estimate of fuel price elasticity with regard to total fuel demand of -0.3, stating that this includes three behavioural responses:

1. Changes in fuel efficiency;
 - a. Using more fuel efficient vehicles
 - b. Improving fuel efficient driving
2. Changes in transport efficiency; and
 - a. Improving the load factor
 - b. Changing the route and time of day
 - c. Increasing the shipment size
3. Changes in road freight transport demand.
 - a. Changing mode: to rail, inland waterways, sea or air

Given the paucity of data relating to specific Member States, and moreover, given the likely range of differing approaches applied in terms of both datasets and methodologies, the choice of elasticities for use in the model has been made on pragmatic grounds.

Reflecting that some long-run effects would take place we take the upper end of the short-run elasticity to reflect the potential for some these long-run effects over the period during for which revenue forecasts are made. Table 2-5 shows the elasticities we have chosen to apply to the fuels and uses set out in the ETD. Clearly, the choice is subjective, but it should be considered that the main rationale for the application of these elasticities is to overlay some degree of realism on how the tax base is affected by changes in price (consumers are not completely indifferent to price increases).

⁹³ Graham and Glaister (2004) *Road Traffic Demand Elasticity Estimates: A Review Transport Reviews*, 2004

⁹⁴ Paul Ekins (2012) *Energy Price Elasticities: A Critical Survey*, for DECC - unpublished

⁹⁵ Communication of the United Kingdom's Proposed Approach and Analysis to Meet Article 7 of the Energy Efficiency Directive, available at http://ec.europa.eu/energy/efficiency/eed/doc/article7/2013_uk_eeed_article7_en.pdf

⁹⁶ De Jong, G., Schrotten, A., Van Essen, H., Otten, M., and Bucci, P. (2010) *Price Sensitivity of European Road Freight Transport – Towards a Better Understanding of Existing Results*, June 2010, p.iv.

Table 2-5: Application of High-level Elasticities to ETD Categories

Fuel Type	Elasticity	Notes
MOTOR FUELS-ENERGY		
Motor spirit (petrol)	-0.30	Upper end of transport fuels elasticity
Light fuel oil (diesel)	-0.30	Upper end of transport fuels elasticity
LPG (propellant)	-0.30	Upper end of transport fuels elasticity
Kerosene	-0.30	Upper end of transport fuels elasticity
Natural gas (prop)	-0.30	Upper end of transport fuels elasticity
INDUSTRY AND COMMERCIAL MOTORS		
Gas oil	-0.30	Average upper end of commercial and industrial fuel oil range
Kerosene	-0.30	Average upper end of commercial and industrial fuel oil range
LPG	-0.30	Average upper end of commercial and industrial fuel oil range
Natural gas	-0.46	Average upper end of commercial and industrial natural gas range
BUSINESS HEATING		
Gas oil	-0.30	Average upper end of commercial and industrial fuel oil range
Heavy fuel oil	-0.30	Average upper end of commercial and industrial fuel oil range
Kerosene	-0.30	Average upper end of commercial and industrial fuel oil range
LPG	-0.30	Average upper end of commercial and industrial fuel oil range
Natural gas	-0.46	Average upper end of commercial and industrial natural gas range
Coal	-0.46	Average upper end of commercial and industrial natural gas range
NON-BUSINESS HEATING		
Gas oil	-0.34	Upper end of residential fuel oil range
Heavy fuel oil	-0.34	Upper end of residential fuel oil range
Kerosene	-0.34	Upper end of residential fuel oil range

Fuel Type	Elasticity	Notes
LPG	-0.34	Upper end of residential fuel oil range
Natural gas	-0.76	Upper end of residential natural gas range
Coal	-0.76	Upper end of residential natural gas range
ELECTRICITY		
Electricity - business use	-0.37	Average upper end of commercial and industrial electricity range
Electricity - non-business use	-0.44	Upper end of residential electricity range

The formula used for calculating the change in demand for the different fuels and electricity was as follows:

$$Q_1 = Q_0 \times ((Fuel\ Price + P_1) / (Fuel\ Price + P_0))^\varepsilon$$

Where:

- Q₁ = Final quantity of fuel / electricity
- Q₀ = Initial quantity of fuel / electricity
- Fuel Price = Unit price of fuel /electricity in real terms
- P₁ = Suggested tax rate in real terms
- P₀ = Existing tax rate in real terms
- ε = elasticity of demand (see Table 2-5)

The unit prices of the fuels were taken from the following sources:

- Energy.eu provides data on oil products: unleaded petrol, diesel, LPG and heating oil prices (2014) <http://www.energy.eu/fuelprices/>
- The commission website also holds oil products price statistics (2014): http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm
- Eurostat provides Electricity and Natural gas prices (2012) for industry and domestic consumers
 - http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Energy_price_statistics
 - <http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/database>
- Coal prices were taken from IEA coal industry prices:
 - <http://www.iea.org/media/training/presentations/statisticsmarch/CoalInformation.pdf>

The following assumptions were made to fill data gaps in the energy prices:

- The price of kerosene was assumed equivalent to gas oil;

- Price of natural gas used as a propellant was assumed the same price as natural gas for business heating;
- Gas oil for C&I motors and business heating was based upon non-business heating use, but factored down based upon the relative difference in natural gas prices between non-business and business heating;
- LPG used in C&I motors used the propellant price but factored down based upon the difference in gas oil prices between the two uses;
- Natural gas used in C&I motors was assumed to be the same price as natural gas used for business heating;
- Price for non-business heating coal was assumed to be the same price as business heating coal;
- Industrial electricity price based upon the following band as an average, Band ID: 2,000 MWh < 20,000 MWh;
- Domestic electricity price based upon the following band as an average, Band DC: 2,500 kWh < 5,000 kWh;
- Where there were gaps in the data for certain Member States an average figure from the Member States with data was used.

2.2.3 Good Practice Revenue Projections

These largely follow the approach set out above for baseline revenue projections:

- Approach to Setting Future Energy Related Excise Duty Rates
 - The approach for energy excise duty rates was to keep the levels constant in real terms (see above).
- Future Revenue Projections
 - Future revenue figures were calculated by multiplying the future rate, in real terms, by the adjusted tax base (adjusted based on the application of the elasticities as discussed above) for each fuel type and electricity.

2.3 Revenue Projections for Transport (excluding fuels) Taxation

2.3.1 Vehicle Taxes

As highlighted in the Good Practice Appendix, the approach to suggesting changes in transport taxation is a pragmatic one based on the level of revenue currently generated from taxes on motor fuels and vehicles. The complexity and diversity of the existing tax structures makes it a major exercise to model the way in which the tax base and the tax rates lead to specific revenue outcomes.

The approach adopted, therefore, is relatively simple. For the baseline, the latest revenue figure for total vehicle taxes was projected forward based upon annual GDP growth in real terms. In other words the annual percentage change in vehicle taxation is equal to the annual percentage change in real GDP growth. It should be considered that this might overstate revenues given that in the absence of specific interventions, transport tax revenues have not always maintained a constant share of GDP over time. This means that the additional revenue take associated with suggested increases in revenue might be greater than suggested here.

That having been said, the suggested increase in revenue that might be derived from vehicle taxes in the good practice scenario is also maintained as a constant proportion of GDP. For the good practice projections, the suggested increase in revenues (expressed as a proportion of GDP) is maintained at a constant level in real terms in future years.

2.3.2 Aviation Taxes

2.3.2.1 Baseline Revenue Projections

The latest revenue figure for total aviation taxes was projected forward based upon annual GDP growth in real terms. In other words the annual percentage change in aviation taxation is equal to the annual percentage change in real GDP growth.

2.3.2.2 Good Practice Revenue Projections

For the good practice projections of revenues from passenger taxes an elasticity based approach has been taken. A long run price elasticity of demand of -0.6 across all passenger types is identified in the UK Government's 2013 Aviation Forecasts.⁹⁷ Given the mix of domestic, European and global destinations served from the UK, we take this as representative of the wider price elasticity of demand for air transport in other Member States.

The formula used for calculating the change in passenger flights was as follows:

$$Q_1 = Q_0 \times ((\text{Price of Flight} + P_1) / (\text{Price of Flight} + P_0))^\varepsilon$$

Where:

Q_1 = Final number of flights

Q_0 = Initial number of flights

Price of Flight = Unit price of passenger flight in real terms

P_1 = Suggested tax rate in real terms

P_0 = Existing tax rate in real terms

ε = elasticity of demand (-0.6)

Data on the existing number of flights was taken from the Eurostat database on '*National air passenger transport by reporting country*' and used as the tax base for the revenue calculations.⁹⁸ Projections for the number of flights out to 2025 were based upon historic trends. An estimate of the price of existing flights was taken for all countries, and is as follows:

- National €150 per flight

⁹⁷ UK Department for Transport (2013) *UK Aviation Forecasts*, January, 2013, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/223839/aviation-forecasts.pdf

⁹⁸ Eurostat (2014) *National air passenger transport by reporting country* [avia_panc], Accessed 22th January 2014, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=avia_panc&lang=en

- Intra-EU €250 per flight
- Extra-EU €500 per flight

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

2.3.2.3 Air-freight Taxes

Data on existing levels of air-freight was taken from the Eurostat database on ‘National freight and mail air transport by reporting country’ and used as the tax base for the revenue calculations.⁹⁹ Projections for the volume of air-freight out to 2025 were based upon historic trends. For taxes on air-freight no literature on price elasticities was found, therefore to represent a reduction in the demand for air-freight a basic reduction of 5% was introduced in the model over the transition period from existing (or no) rates to maximum good practice rates.

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

2.4 Revenue Projections for Pollution and Resource Taxation

2.4.1 Waste Disposal Taxes

The latest revenue figures for waste disposal taxes, where these are in place and at a constant rate, were projected forward based upon annual GDP growth in real terms. In other words the annual percentage change in waste disposal taxation is equal to the annual percentage change in real GDP growth.

2.4.1.1 Non-hazardous Waste Landfill Tax (excluding construction and demolition wastes)

For the good practice projections of revenues from non-C&D waste landfill taxes an elasticity based approach has been taken. The calculated price elasticity of demand for waste disposal shows some variation between different studies, but in general is relatively inelastic. One study from 1993 gathered data from 14 municipalities in the United States (including 10 municipalities that charged a unit-based price) over several years, and reported a price elasticity of -0.12.¹⁰⁰ This is comparable to that identified in a 1976 US study of -0.13.¹⁰¹ A 1994 study used a household production model to simulate responses to different pricing schemes using calibration techniques. The authors estimated that the elasticity of demand for waste disposal services was in the range

⁹⁹ Eurostat (2014) *National freight and mail air transport by reporting country* [avia_gonc], Accessed 22nd January 2014, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=avia_gonc&lang=en

¹⁰⁰ Jenkins, Robin R(1993) *The Economics of Solid Waste Reduction*, Hants, England: Edward Elgar Publishing Limited

¹⁰¹ Wertz, Kenneth L. (1976) Economic Factors Influencing Households’ Production of Refuse, *Journal of Environmental Economics and Management*, Vol.2, pp.263–272

between -0.51 and -0.6.¹⁰² A study in 2000, expanding on the 1976 study reported above, used a 1991 cross-section of 959 towns, of which 114 implemented user fees. A price elasticity of demand of -0.28 was identified.¹⁰³

Based on the range identified above (from -0.12 to -0.6), using the approximate mid-point, we will apply a price elasticity of demand of -0.3.

The formula used for calculating the change in quantity of waste landfilled was as follows:

$$Q_1 = Q_0 \times \left(\frac{\text{Landfill Gate Fee} + P_1}{\text{Landfill Gate Fee} + P_0} \right)^\varepsilon$$

Where:

Q_1 = Final quantity of waste landfilled

Q_0 = Initial quantity of waste landfilled

Landfill Gate Fee = Landfill gate fee in real terms

P_1 = Suggested tax rate in real terms

P_0 = Existing tax rate in real terms

ε = elasticity of demand (-0.3)

To calculate the tax base data from the European Reference Model on Municipal Waste (currently under development by Eunomia) was taken from the Business as Usual scenario. The figures were then factored up using data from Eurostat on the deposit into or onto land of all wastes excluding major mineral wastes in order to obtain future projections for the landfilling of all non-inert wastes in the countries (i.e. a ratio between total landfilling and landfilling of municipal waste only – the latter is only available from the European reference model).¹⁰⁴ The landfill gate fees used in the model are shown in Table 2-6.

Table 2-6: Gate Fees Used in the Model

Country	Landfill Gate Fee (pre-tax)	Incin. (pre-tax)	MBT
Bulgaria	20.42	80	17.89
Cyprus	56	80	75

¹⁰² Morris, G.E., and Holthausen, D.M. (1994) The Economics of Household Solid Waste Generation and Disposal, *Journal of Environmental Economics and Management*, Vol.26, pp.215–234

¹⁰³ Kinnaman, T., C., and Fullerton, D. (2000) Garbage and Recycling with Endogenous Local Policy, *Journal of Urban Economics*, Vol.48, pp.419–442

¹⁰⁴ Eurostat (2014) *Waste excluding major mineral wastes*, http://epp.eurostat.ec.europa.eu/portal/page/portal/waste/key_waste_streams/waste_excluding_major_mineral_wastes

Country	Landfill Gate Fee (pre-tax)	Incin. (pre-tax)	MBT
Denmark	44	36	95
Finland	59.4	100	95
Germany	140	174	100
Greece	23.5	80	40.14
Ireland	70	100	110
Latvia	30	80	65
Malta	20	80	65
Netherlands	25	95	95
Slovenia	105.5	113	55
Spain	32.75	57	75
Sweden	106.5	110	95
United Kingdom	26.8	87.55	89

Source: Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, www.wastemodel.eu, E. Watkins, D. Hogg, A. Mitsios, S. Mudgal, A. Neubauer, H. Reisinger, J. Troeltzsch, M. van Acoleyen (2012) *Use of Economic Instruments and Waste Management Performances, Final Report to DG Environment*, 10 April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf, p.74-75 for incin, pp44-49 for landfill and Expert judgement.

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

2.4.1.2 Construction and Demolition Waste Landfill Tax

The basis for the calculated revenues from the tax on construction and demolition wastes is also data from Eurostat reported under the Waste Statistics Regulation (Treatment of waste database).¹⁰⁵ The waste type 'Mineral waste from construction and demolition' was chosen to represent the tax base for a landfill tax on C&D waste. We recognise that this is an underestimate of the amount of C&D waste landfilled, other wastes such as soils, but also mixed C&D wastes (i.e. plastics, metals etc) will also be landfilled. However, data on treatment reported under the Waste Statistics Regulation

¹⁰⁵ Eurostat (2013) *Treatment of waste*, Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wasrt&lang=en

does not categorise the waste by sector, therefore to avoid overestimating the revenue potential (which will not be significant for a tax of this nature anyway) we choose the above mentioned category only. Levels of landfilling of C&D wastes were assumed to remain constant for all future years as no robust estimates were available. There is less literature on the price elasticity of demand for C&D landfill services, therefore to represent a reduction in the demand for C&D wastes a basic reduction of 40% was introduced in the model over the transition period from existing (or no) rates to maximum good practice rates.

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

2.4.1.3 Incineration / MBT Tax

For the good practice projections of revenues from incineration / MBT taxes an elasticity based approach has been taken. The elasticity of demand used is the same as used in the method for the non-hazardous landfill tax (i.e. -0.3).

To calculate the tax base data from the European Reference Model on Municipal Waste (currently under development by Eunomia) was taken from the Business as Usual scenario. As some wastes from MBT plants ultimately end up in incineration plants in the same country, there is the potential for double counting of some tax revenues. To reflect this the tax base for MBT plants has been factored down by 25%.

The average gate fees for incineration and MBT plants used in the model are shown in Table 2-6. Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

2.4.2 Plastic Bags

Data on the consumption of single-use plastic bags was taken from the Assessment of the Socio-economic Costs and Benefits of Options to Reduce the Use of Single-use Plastic Carrier Bags in the EU was used as the tax base for the revenue calculations.¹⁰⁶ The baseline number of carrier bags were projected forward based upon annual GDP growth in real terms.

The Irish Plastic Bag Levy was introduced in March 2002. Initially the levy was set at €0.15 per bag. The tax is passed directly to consumers at the point of sale, and has thus been reported to provide a clearer, more consistent message than systems where retailers are responsible for the levy (such as in Denmark and South Africa. Prior to the implementation of the levy, 1.3 billion plastic bags were given away free of charge each year. This fell by over 90% in the first five months after the introduction of the levy.

On the basis of modelling a levy of €0.10 per bag (adjusted to national prices), we assume a slightly more conservative level of reduction, of 80%.

¹⁰⁶ Eunomia (2012) *Assistance to the Commission to Complement an Assessment of the Socio-economic Costs and Benefits of Options to Reduce the Use of Single-use Plastic Carrier Bags in the EU*, Final Report to European Commission - DG Environment, 25th October 2012

Good practice tax rates were assumed to stay constant in real terms for future years. Revenues were calculated by multiplying the tax rate (in real terms) by the tax base (after the reduction in demand was applied).

2.4.3 Other Pollution and Resource Taxes

The approach to calculating the revenue projections for the remaining pollution and resource taxes is broadly the same and so the general approach is described in this section, without repeating much of the detail. For these remaining taxes little data was easily available on either the price elasticity or the price of the product, making the calculations for change in demand difficult. Taking a pragmatic approach the reductions in demand were estimated based upon any *ex post* assessments on the effects of introducing environmental taxes, or by taking a simple reduction figure.

Data for the different tax bases comes from the following sources:

- **Air pollution:** Data from the European Environment Agency on emissions of air pollutants was used as the tax base for the revenue calculations.¹⁰⁷ Emissions for the following sectors only were included in the tax base:
 - Energy production and distribution (NFR 1A1a, b, c, 1A3e and 1B1a, b, c, 1B2a, b, c and 1B3)
 - Energy use in industry (NFR 1A2a, b, c, d, e, f)
 - Industrial processes (NFR 2A1-7, 2B1-5, 2C1-5 (except 2C4), 2D1-3, 2E, 2F, 2G)
 - Solvent and other product use (NFR 3A1-3, 3B1-2, 3C, 3D1-3)
 - Waste (NFR 6A, 6B, 6Ca-e, 6D)
- **Water abstraction:** Data on 'Annual freshwater abstraction by source and sector' (surface water and groundwater) was obtained from Eurostat as the tax base for the revenue calculations.¹⁰⁸
- **Waste water:** Data taken from EEA on urban waste water discharge.¹⁰⁹
- **Pesticides:** Data on active ingredients in pesticides was taken from Eurostat and OECD sources as the tax base for the revenue calculations.¹¹⁰ However, the latest year available from Eurostat was 2008 and not all countries were covered. For those countries with no data from the Eurostat or OECD databases, pesticide

¹⁰⁷ Eurostat (2013) *Air pollution (source: EEA)* [env_air_emis], Accessed, 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_air_emis&lang=en

¹⁰⁸ Eurostat (2014) *Annual freshwater abstraction by source and sector* [env_wat_abs], Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wat_abs&lang=en

¹⁰⁹ EEA (2013) *Urban waste water treatment (CSI 024) - Assessment published Jan 2013*, <http://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment/urban-waste-water-treatment-assessment-3>

¹¹⁰ Eurostat (2014) *Pesticide sales (1997-2008)*, Accessed, 20th December 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=AEI_FM_SALPEST

sales were estimated by taking an average figure per unit of GDP for the countries with data available and multiplying by GDP in the countries concerned.

- **Fertilisers:** Data on 'Use of inorganic fertilizers [aei_fm_usefert]' was obtained from Eurostat as the tax base for the revenue calculations.¹¹¹
- **Aggregates:** Data on the following categories of aggregates was obtained from Eurostat material flow accounts as the tax base for revenue calculations:¹¹²
 - Marble;
 - Chalk and dolomite;
 - Slate;
 - Limestone and gypsum;
 - Sand and gravel.
- **Packaging:** Data reported to Eurostat under the Packaging and Packaging Waste Directive was used as the tax base for the revenue calculations.¹¹³

All tax base data was projected forwards to 2025 based upon historic trends.

For air pollution some evidence on the effects of taxes on air emissions were available. In Sweden the charge on NO_x emissions (€1,600 per tonne) from industrial boilers is automatically and fully refunded to the industries that paid the tax on the basis of their energy use. This has led to a large number of abatement investments, fuel switching and other measures that reduced emission coefficients by about 50% within just 5 years for the 190 large plants that were first targeted.¹¹⁴

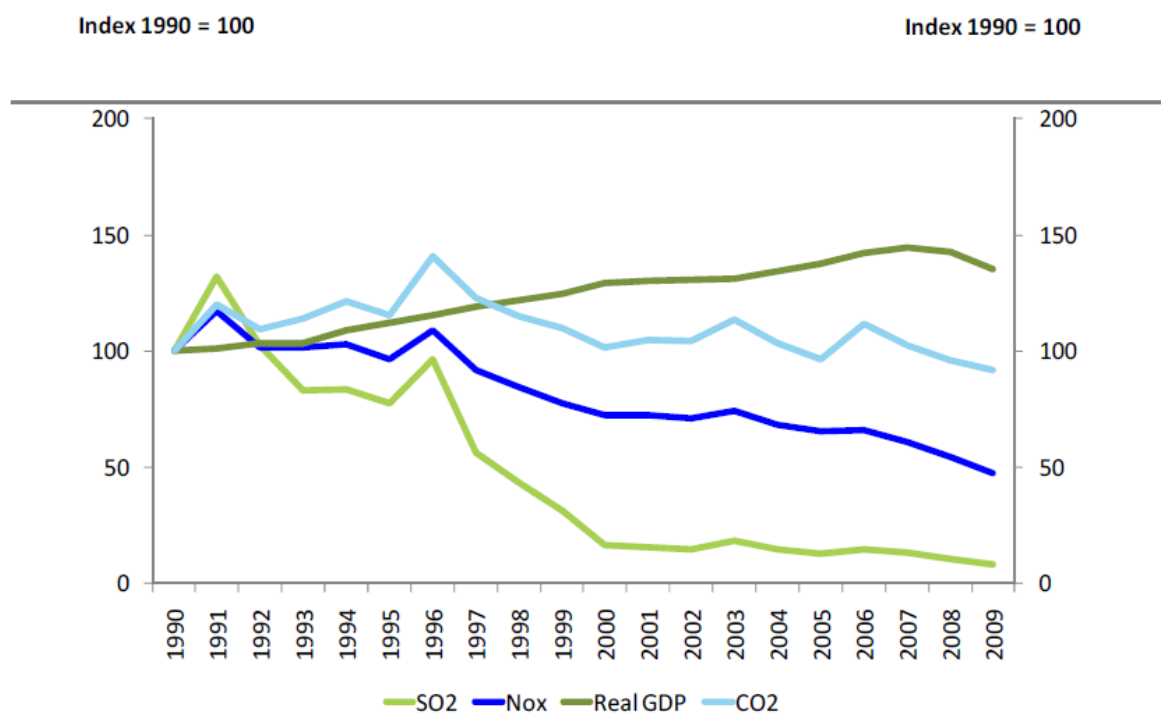
In addition, as can be seen in Figure 2-2, emissions of SO₂ in Denmark dropped considerably between 1996 and 1997, and then again further between 1997 and 2000. However, the extent to which this is due to the tax on SO₂ alone is not clear.

¹¹¹ Eurostat (2013) *Use of inorganic fertilizers*, [aei_fm_usefert], Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=aei_fm_usefert&lang=en

¹¹² Eurostat (2013) *Material flow accounts* [env_ac_mfa], Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_mfa&lang=en

¹¹³ Eurostat (2013) *Packaging waste* [env_waspac], Accessed 20th December 2013, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_waspac&lang=en

Figure 2-2: Danish Emissions of NO_x, SO₂ and CO₂



Source: Danish Skatteministeriet, 2011

For the purposes of this study we assume a 20% reduction in emissions of air pollutants from stationary sources after the level of the tax reaches good practice rates.

Also in Denmark a water supply tax was introduced in 1993. The current Danish rate equates to just over €0.70 per m³. The main environmental aim of the tax was to reduce household consumption of water, which had increased through the 1980s, reaching a peak in 1989. From 1989 to 1998 consumption decreased from 360 million m³ to 266 million m³, i.e. by about 26 per cent. About half of the reduction took place prior to the introduction of the water tax, with the remaining half since its inception. There are no studies which explore the precise effect of the tax but it is thought likely to represent less than a 13 per cent reduction since 1994. We assume a 10% reduction in the abstraction of waste from any source for this study.

Table 2-7 indicates the remaining assumptions used in the model to estimate some reduction in demand based upon increase to good practice rates.

Table 2-7: Assumptions for Reduced Demand of Products and Services

Tax	Max Reduction
Waste Water Discharge Tax	-10%
Pesticides Tax	-5%
Aggregates	-40%
Packaging Tax	-5%

Tax	Max Reduction
Fertiliser Tax	-5%

The latest revenue figures for the any other pollution and resource taxes were projected forward based upon annual GDP growth in real terms. In other words the annual percentage change in taxation is equal to the annual percentage change in real GDP growth.

3.0 Indirect Benefits

3.1 Damage Costs for Air Pollutants

The set of data that we have used for the assessment of the externalities associated with emissions to air is based on modelling recently undertaken for the European Environment Agency (EEA).¹¹⁵ Table 3-1 and Table 3-2 present the assumptions used in the model for the pollutants affecting air quality, reflecting the damage to human health (the damage costs were updated in the model to 2014 prices).

Reflecting the approach taken in Estimating Revenues based upon the proposed ETD, a carbon price of EUR 20 per tonne of CO₂ eq was used to reflect the externalities associated with emissions of greenhouse gases. The figure was kept constant in real terms out to 2025.

¹¹⁵ The methodology used is summarised in: European Environment Agency (2011) *Revealing the Costs of Air Pollution from Industrial Facilities in Europe*, EEA Technical Report No 15/2011, November 2011

Table 3-1: Damage Costs Applied to the Air Pollutants (2010 Prices) – Key Air Pollutants

Country	NH3	NOx	PM2.5	PM10	SO2	VOCs
Croatia	€ 15,583	€ 5,326	€ 25,322	€ 16,443	€ 8,033	€ 1,007
Austria	€ 15,696	€ 12,383	€ 30,569	€ 19,850	€ 10,094	€ 812
Belgium	€ 27,980	€ 8,566	€ 44,388	€ 28,823	€ 11,392	€ 1,980
Czech Republic	€ 1,372	€ 665	€ 13,288	€ 8,629	€ 1,441	-€ 49
Estonia	€ 8,011	€ 3,919	€ 11,231	€ 7,293	€ 4,835	€ 735
France	€ 4,639	€ 1,470	€ 7,333	€ 4,762	€ 3,024	€ 253
Hungary	€ 5,214	€ 1,694	€ 18,724	€ 12,158	€ 3,238	€ 62
Italy	€ 2,420	€ 4,109	€ 15,656	€ 10,166	€ 5,960	€ 642
Lithuania	€ 5,882	€ 3,106	€ 9,961	€ 6,468	€ 4,570	€ 381
Poland	€ 20,319	€ 7,970	€ 40,980	€ 26,610	€ 13,180	€ 1,432
Romania	€ 4,806	€ 1,389	€ 24,644	€ 16,002	€ 3,682	€ 331
Slovakia	€ 7,722	€ 9,256	€ 21,448	€ 13,927	€ 6,323	€ 162

Table 3-2: Damage Costs Applied to the Air Pollutants (2010 Prices) – Heavy Metals

Country	Arsenic	Cadmium	Chromium	Nickel	1, 3 Butadiene	Benzene	PAH	Form-aldehyde	Dioxins/furans
Croatia	€ 349,000	€ 23,000	€ 31,000	€ 3,100	€ 390	€ 60	€ 1,309,000	€ 160	€ 28,000,000
Austria	€ 369,000	€ 29,000	€ 39,000	€ 4,000	€ 500	€ 80	€ 1,315,000	€ 220	€ 28,000,000
Belgium	€ 435,000	€ 50,000	€ 67,000	€ 6,700	€ 840	€ 120	€ 1,332,000	€ 360	€ 28,000,000
Czech Republic	€ 371,000	€ 30,000	€ 40,000	€ 4,100	€ 500	€ 80	€ 1,315,000	€ 220	€ 28,000,000
Estonia	€ 301,000	€ 8,300	€ 11,000	€ 1,100	€ 140	€ 30	€ 1,296,000	€ 60	€ 28,000,000
France	€ 390,000	€ 33,000	€ 49,000	€ 4,800	€ 610	€ 90	€ 1,320,000	€ 270	€ 28,000,000
Hungary	€ 368,000	€ 29,000	€ 39,000	€ 3,800	€ 480	€ 70	€ 1,314,000	€ 210	€ 28,000,000
Italy	€ 380,000	€ 33,000	€ 44,000	€ 4,400	€ 540	€ 80	€ 1,317,000	€ 240	€ 28,000,000
Lithuania	€ 316,000	€ 13,000	€ 17,000	€ 1,700	€ 220	€ 40	€ 1,300,000	€ 90	€ 28,000,000
Poland	€ 358,000	€ 26,000	€ 35,000	€ 3,500	€ 430	€ 70	€ 1,312,000	€ 190	€ 28,000,000
Romania	€ 339,000	€ 20,000	€ 27,000	€ 2,700	€ 330	€ 50	€ 1,306,000	€ 140	€ 28,000,000
Slovakia	€ 366,000	€ 28,000	€ 38,000	€ 3,700	€ 470	€ 70	€ 1,313,000	€ 210	€ 28,000,000

3.2 Energy

3.2.1 Marginal sources of Electricity and Heat Generation

The model used data on the electricity generation mix from the International Energy Agency (IEA) and European Commission. Table 3-3 shows the energy mix for each of the 14 countries included in this study. Some of the data included in this table comes directly from Member States and was obtained as part of Eunomia's work in developing the European Reference Model on Municipal Waste Management.¹¹⁶

Table 3-3: Electricity Generation Mix, 2011

Member State	Coal	Gas	Nuclear	Renewables ¹	Other ²
Bulgaria	48.71%	5.17%	31.47%	13.79%	0.86%
Cyprus ³	0.00%	0.00%	0.00%	0.00%	100.00%
Denmark ⁴	91%	5%	0%	24.84%	4%
Finland ⁴	100%	0%	0%	0%	7%
Germany	43.40%	13.31%	22.77%	16.18%	4.33%
Greece	55.71%	17.96%	0.00%	13.78%	12.54%
Ireland ³	28%	62%	0%	8%	3%
Latvia ⁴	0.00%	100%	0.00%	0%	0.00%
Malta ⁴	0.00%	0.00%	0.00%	2%	98%
Netherlands	23.44%	60.53%	3.73%	8.16%	4.14%
Slovenia ⁴	100%	0%	0%	0%	0%
Spain ³	9%	32%	21%	31%	8%
Sweden ⁴	0%	100%	0%	0%	0%
UK ⁴	0%	100%	0%	0%	0%

Notes:

1. Includes biofuels and biomass.
2. Includes oil and waste.
3. Fuel mix data supplied by Member State as part of work undertaken by Eunomia in developing the European Reference Model on Municipal Waste Management.
4. Marginal source data supplied by Member State as part of work undertaken by Eunomia in developing the European Reference Model on Municipal Waste Management.

¹¹⁶ Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Sources: IEA Statistics (available from www.iea.org/stats/); European Commission Country Factsheets, Available from <http://ec.europa.eu/energy/observatory/countries/doc/2012-country-factsheets.pdf>, Eunomia Municipal Waste Model Report

3.2.2 Emissions Factors

The emissions factors used to estimate the impacts of electricity generation for the different generation sources considered within the model are shown in Table 3-5. Table 3-6 presents the emissions factors which have been used to estimate the impacts of heat generation.

Table 3-7 presents the emissions factors used for diesel combustion. The source of the emissions data is the ecoinvent database, which includes for the majority of fuels a dataset considered to be representative of European facilities.

Where required the conversion factors shown in Table 3-4 were used to convert to MWh.

Table 3-4: Conversion Factors to Convert Energy Units to MWh

Fuel Type	Unit	kWh
Oil (Heavy Fuel Oil)	billion litres	11,080,000,000
Kerosene	billion litres	9,695,000,000
LPG	million tonnes	12,714,300,000
Natural Gas	1,000 TJ	277,777,000
Coal	million tonnes	7,105,050,000

Source: 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting, www.gov.uk/government/publications/2012-greenhouse-gas-conversion-factors-for-company-reporting

Table 3-5: Emissions Factors for Electricity Generation (tonnes pollutant per kWh)

Fuel Type	CO ₂ e	NH ₃	NO _x	PM	SO ₂	VOCs	Arsenic	Cadmium
Gas	4.00E-04	1.4034E-10	2.5304E-07	1.275E-09	1.6263E-09	1.5578E-09	2.76E-15	2.3269E-15
Coal	8.00E-04	2.6636E-10	7.1098E-07	2.428E-09	4.1141E-08	1.6624E-08	6.735E-12	1.7428E-12
Nuclear	1.00E-06	1.4504E-10	3.8024E-09	6.398E-10	1.6195E-08	1.8067E-10	2.006E-13	3.1833E-13
Renewables	1.00E-06	3.675E-11	8.6228E-09	1.619E-09	1.3942E-08	2.3682E-09	3.126E-13	8.2309E-14
Fuel Type	Chromium	Nickel	1, 3 Butadiene	Benzene	PAH	Formaldehyde	Dioxins/furans	
Gas	1.2903E-16	2.2382E-12	2.0709E-19	1.7024E-12	2.4785E-13	1.9003E-12	6.3519E-19	
Coal	1.3353E-13	1.4377E-11	6.5556E-19	1.0881E-14	6.5846E-13	2.996E-11	1.5426E-18	
Nuclear	8.9085E-15	6.4668E-12	1.3962E-18	1.6996E-11	2.5287E-13	1.0827E-11	4.2164E-19	
Renewables	3.0718E-14	2.623E-12	6.548E-19	2.8188E-11	2.1087E-13	5.3271E-12	3.6474E-18	

Source: Source: Ecoinvent Centre (2007) Ecoinvent Data v2.2. Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

Table 3-6: Emissions Factors for Heat Generation (tonnes pollutant per kWh)

Fuel Type	CO ₂ e	NH ₃	NO _x	PM	SO ₂	VOCs	Arsenic	Cadmium
Gas	0.2	2.97E-11	1.37E-07	1.18E-09	9.53E-09	1.09E-09	1.47E-13	9.46E-14
Coal	0.3	1.52E-10	9.13E-07	1.82E-07	2.27E-06	8.03E-09	1.14E-10	7.35E-12
Nuclear	0.25	6.47E-11	1.23E-07	5.97E-09	2.35E-07	2.22E-09	1.31E-12	2.95E-12
Renewables	0.001	8.31E-09	7.31E-07	5.61E-07	1.73E-08	5.19E-08	4.91E-12	3.47E-12
Fuel Type	Chromium	Nickel	1, 3 Butadiene	Benzene	PAH	Formaldehyde	Dioxins/furans	
Gas	6.94E-15	4.75E-12	6.74E-18	1.46E-09	3.65E-11	3.72E-10	1.36E-18	
Coal	1.02E-10	9.36E-11	1.21E-17	2.28E-09	5.38E-13	3.79E-10	9.08E-17	
Nuclear	1.95E-14	3.59E-11	2.13E-18	6.37E-10	1.95E-12	3.59E-11	9.77E-19	
Renewables	2.00E-13	3.06E-11	1.41E-17	4.38E-09	5.33E-11	6.27E-10	1.59E-16	

Source: Source: Ecoinvent Centre (2007) Ecoinvent Data v2.2. Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

Table 3-7: Emissions Factors for Diesel Combustion (tonnes per litre)

	CO _{2e}	NH ₃	NO _x	PM	SO ₂	VOCs	Arsenic	Cadmium
Diesel	0.00026	6.83E-10	1.30E-06	5.78E-08	2.48E-06	2.34E-08	1.39E-11	3.12E-11
	Chromium	Nickel	1, 3 Butadiene	Benzene	PAH	Formaldehyde	Dioxins/furans	
Diesel	2.06E-13	3.79E-10	2.25E-17	6.73E-09	2.05E-11	3.79E-10	1.03E-17	

Source: Ecoinvent Centre (2007) Ecoinvent Data v2.2. Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

The externalities from emitting air pollutants from vehicles at ground level are higher than when emitted from industrial facilities (Table 3-1 and Table 3-2 relates to the latter). However, there is evidence on the damages from emissions from vehicles. Brandt et al provide some tables with external costs of HGVs in Member States (see Table 3-8).¹¹⁷ These are in the order of 4 /5 times greater than those in Table 3-1 and Table 3-2 above. This is reflected in the modelling of air pollution externalities from transport.

Table 3-8: Unit Costs of Air Pollutants, € per kg

Unit Costs of Air Pollutants		PM _{2.5}	N	NO _x
		€ per kg		
AT	Austria	46.656	59.022	17.963
BE	Belgium	82.991	48.345	14.714
BG	Bulgaria	30.941	39.132	11.910
CH	Switzerland	70.860	88.693	26.994
CY	Cyprus	3.263	5.897	1.795
CZ	Czech Republic	50.388	48.863	14.871
DE	Germany	62.981	60.142	18.304
DK	Denmark	25.182	29.769	9.060
EE	Estonia	15.351	16.434	5.002
EL	Greece	23.620	22.486	6.844
ES	Spain	25.992	26.271	7.996
FI	Finland	12.605	11.469	3.491
FR	France	47.489	56.983	17.343
HU	Hungary	52.613	53.859	16.392
IE	Ireland	27.070	36.308	11.050
IT	Italy	48.584	58.838	17.907

¹¹⁷ Brandt, J., Silver, J. D., Gross, A. & Christensen, J. H. (2010) *Marginal Damage Cost per unit of Air Pollution Emissions*, Roskilde: National Environmental Research Institute. 23 p. Specific agreement 3555/B2010/EEA.54131 implementing framework contract ref. no. EEA/IEA/09/002.

Unit Costs of Air Pollutants		PM _{2.5}	N	NO _x
LT	Lithuania	20.513	28.783	8.760
LU	Luxembourg	61.534	60.581	18.438
LV	Latvia	17.932	21.760	6.623
MT	Malta	7.085	8.692	2.645
NL	Netherlands	86.140	51.402	15.644
NO	Norway	13.755	17.881	5.442
PL	Poland	46.547	43.428	13.217
PT	Portugal	37.078	14.725	4.481
RO	Romania	40.816	61.353	18.673
SE	Sweden	18.021	20.342	6.191
SI	Slovenia	37.238	53.076	16.154
SK	Slovakia	44.665	49.917	15.192
TR	Turkey	23.325	19.733	6.006
UK	United Kingdom	61.544	40.188	12.231

3.3 Transport

3.3.1 Vehicles

The approach to calculating good practice revenues was to assume a benchmark % of GDP. This approach therefore did not include any analysis of the number of types of vehicles in use in the countries, or how the behavioural patterns or drivers (and consumers) would change following increases in the level of vehicle taxation. However, taxes of the type being suggested, with incentives to choose and use vehicles with lower emissions, would be expected to deliver some behavioural change, albeit that any effect might take several years to occur (because the change relates to the nature of the vehicle stock). In order to reflect some environmental benefits a proxy to increases in efficiency and change in driver behaviour was factored into the model. The assumption was that national petrol and diesel consumption would fall by 10% by the time the full increase of the vehicle taxes had come into effect (by 2020), for the country with the greatest reduction. The fall in consumption for the other countries was pro-rated based upon the relative increases in vehicle taxes. So a country which only increased vehicle taxes by one half of the maximum would only see a reduction in consumption of 5%.

The method for valuing the change in emission was the same as described above.

3.3.2 Aviation

The model differentiates between three types of journeys:

1. National – journeys within a single country;
2. Intra-EU – journeys within the European Union; and
3. Extra-EU – journeys outside of the European Union.

The amount of carbon emitted by passengers per km travelled on different types of journeys is summarised in Table 3-9. This table also shows the assumed distance that is seen to be typical of the three types of journeys.

Table 3-9: Tonnes of Carbon Emitted per km for Passenger Flights and Average Distances Travelled

Type of Journey	Tonne CO ₂ eq per km
National	1.67E-04
Intra-EU	9.52E-05
Extra-EU	1.09E-04
Type of Journey	Average Distance per Journey (km)
National	463
Intra-EU	1,108
Extra-EU	6,482

Source: UK Department of Environment, Food and Rural Affairs (2012) 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting, www.gov.uk/government/publications/2012-greenhouse-gas-conversion-factors-for-company-reporting

The amount of carbon emitted per tonne of freight transported on national, intra-EU, extra-EU flights is summarised in Table 3-10.

Table 3-10: Tonnes of Carbon Emitted per km for Freight

Type of Journey	Kg CO ₂ eq per km
National	2.06
Intra-EU	1.24
Extra-EU	0.64
Type of Journey	Average Distance per Journey (km)
National	463
Intra-EU	1,108
Extra-EU	6,482

Source: 2012 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting, www.gov.uk/government/publications/2012-greenhouse-gas-conversion-factors-for-company-reporting

3.4 Resource Taxes

3.4.1 Diversion of Waste from Landfill

The externalities associated with landfilling various waste streams are summarised in Table 3-11. These were calculated during the development of the European Reference Model on Municipal Solid Waste Management.¹¹⁸

Table 3-11: Externalities Associated with Landfilling per Material (Euro, 2014 Real Term Prices)

Year	Food	Garden	Paper	Wood	Textiles	Fines	Other
2011	€ 39	€ 41	€ 45	€ 70	€ 67	€ 29	€ 31
2012	€ 39	€ 41	€ 46	€ 71	€ 67	€ 29	€ 31
2013	€ 39	€ 41	€ 47	€ 72	€ 68	€ 29	€ 32
2014	€ 39	€ 42	€ 48	€ 74	€ 69	€ 29	€ 32
2015	€ 39	€ 42	€ 48	€ 75	€ 70	€ 29	€ 32
2016	€ 39	€ 43	€ 49	€ 76	€ 71	€ 30	€ 32
2017	€ 40	€ 43	€ 50	€ 78	€ 72	€ 30	€ 33
2018	€ 40	€ 44	€ 51	€ 80	€ 73	€ 30	€ 33

¹¹⁸ Eunomia Research & Consulting and Copenhagen Resource Institute (2014) *European Reference Model for Municipal Waste Management*, Accessed 31st January 2014, www.wastemodel.eu

Year	Food	Garden	Paper	Wood	Textiles	Fines	Other
2019	€ 40	€ 44	€ 53	€ 82	€ 74	€ 30	€ 33
2020	€ 41	€ 45	€ 54	€ 84	€ 76	€ 31	€ 34
2021	€ 41	€ 46	€ 55	€ 86	€ 77	€ 31	€ 34
2022	€ 42	€ 47	€ 57	€ 88	€ 79	€ 31	€ 35
2023	€ 43	€ 48	€ 58	€ 91	€ 81	€ 32	€ 35
2024	€ 43	€ 49	€ 60	€ 94	€ 83	€ 33	€ 36
2025	€ 45	€ 50	€ 62	€ 97	€ 86	€ 33	€ 37
2026	€ 46	€ 52	€ 64	€ 100	€ 89	€ 34	€ 38
2027	€ 47	€ 54	€ 67	€ 104	€ 91	€ 35	€ 40
2028	€ 49	€ 56	€ 69	€ 107	€ 95	€ 37	€ 41
2029	€ 51	€ 58	€ 72	€ 111	€ 98	€ 38	€ 43
2030	€ 53	€ 60	€ 74	€ 116	€ 102	€ 40	€ 44

The assumed composition of residual waste in the countries under consideration in this study is shown in Table 3-12.

Table 3-12: Assumed Residual Waste Composition used in the Model

Material	Proportion
Food	25%
Garden	10%
Paper	15%
Wood	5%
Textiles	5%
Fines	3%
Other	3%
Inerts	35%
Total	100%

The reduction in the amount of inert waste going to landfill can save 0.0134 tonnes of

CO_{2 eq} per tonne of waste diverted. This figure is based on the provided by PE International and was used to assess the environmental impacts associated with diverting inert wastes from landfill once a landfill tax on construction and demolition waste is introduced.¹¹⁹

3.4.2 Diversion of Waste from Incineration and MBT

Data from WRATE shows that the incineration of 1 tonne of residual waste can result in 0.567 tonnes of CO_{2 eq} being emitted.¹²⁰ Thus, in situations where an incineration tax is introduced and waste is diverted from incineration it is assumed that this quantity of CO_{2eq} is avoided for every tonne of waste diverted.

Given that MBT recovers some materials recycling the process actually results in a net benefit relative to landfilling. For materials sent to MBT, rather than to landfill, 0.012 tonnes of CO_{2 eq} can be saved per tonne of waste processed.¹²¹ Where a tax causes waste to be diverted away from MBT the model assumes that this benefit is forgone. However, the benefits associated with recycling are far greater. This is not reflected in the model as it would require one to understand the current waste management systems in all the countries considered, and thus is a conservative estimate of the environmental benefits associated with reduced landfilling.

3.4.3 Water Abstraction and Effluent Treatment

For the purposes of modelling the impacts of water extraction and treatment a figure from PE International was used.¹²² According to this source every m³ of water abstracted and treated results in the emission of 0.00073 tonnes of CO_{2 eq}.

3.4.4 Pesticides

For the impact of pesticides on the environment data was taken from the Ecoinvent database. This database indicates that one tonne of pesticide is associated with 10.1 tonnes of CO_{2 eq}.¹²³

3.4.5 Aggregates

Data on the impact of sand and gravel quarrying and processing on the environment was obtained from the PE International. This source indicates that every tonne of aggregate extracted results in 0.002 tonnes of CO_{2eq} being emitted.¹²⁴

¹¹⁹ PE International AG, LBP-GaBi, University of Stuttgart (2011) *GaBi Software System*, Leinfelden-Echterdingen, Germany, www.gabi-software.com/deutsch/index/

¹²⁰ UK Environment Agency (2014) *Waste and Resources Assessment Tool for the Environment (WRATE)*, www.environment-agency.gov.uk/research/commercial/102922.aspx

¹²¹ UK Environment Agency (2014) *Waste and Resources Assessment Tool for the Environment (WRATE)*, www.environment-agency.gov.uk/research/commercial/102922.aspx

¹²² PE International AG, LBP-GaBi, University of Stuttgart (2011) *GaBi Software System*, Leinfelden-Echterdingen, Germany, www.gabi-software.com/deutsch/index/

¹²³ Ecoinvent Centre (2007) *Ecoinvent Data v2.2*, Ecoinvent Reports No.1-25, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

3.4.6 Packaging

Data on the climate change impacts of the production of packaging materials was taken from the WRATE database and is summarised in Table 3-13.

Table 3-13: Environmental Damages Associated with Production of Different Packaging Materials

Packaging Material	Tonne CO ₂ eq per Tonne of Packing Material
Paper and card	0.30
Plastic	1.18
Wood	0.00
Metals (combined) ¹	4.35
Non-ferrous metals	1.62
Ferrous metals	10.72
Glass	0.09

Note: 1. Assumes a 70%/30% split between ferrous/non-ferrous metals.

3.4.7 Single Use Plastic Bags

For the purposes of modelling the impact of single use plastic bags on the climate, data was extracted from the PE International database. This data suggests that every tonne of polyethylene film is associated with the emission of 2.4 tonnes of CO₂ eq.¹²⁵ It was assumed that an average single use plastic bag weighs 8.5g.

3.4.8 Fertilisers

Data on the climate change impact of fertilisers was taken from the Ecoinvent database, which indicates that every tonne of nitrogen fertiliser is associated with the emission of 5.3 tonnes of CO₂ eq.¹²⁶

¹²⁴ PE International AG, LBP-GaBi, University of Stuttgart (2011) *GaBi Software System*, Leinfelden-Echterdingen, Germany, www.gabi-software.com/deutsch/index/

¹²⁵ PE International AG, LBP-GaBi, University of Stuttgart (2011) *GaBi Software System*, Leinfelden-Echterdingen, Germany, www.gabi-software.com/deutsch/index/

¹²⁶ Ecoinvent Centre (2007) *Ecoinvent Data v2.2, Ecoinvent Reports No.1-25*, Swiss Centre for Life Cycle Inventories, Dübendorf, www.ecoinvent.org

3.4.9 Omissions

The above analysis concentrates only on emissions of greenhouse gases, and other air pollutants. The major omissions are related to those activities where the main benefits are not experienced in these terms. Key omissions from the above analysis are, therefore:

1. The wider suite of impacts of improved water flows and enhanced water quality;
2. The wider benefits from reduced use of pesticides and fertilisers;
3. Disamenity effects from:
 - a. Avoidance of litter through reduced littering of plastic bags;
 - b. Reduced landfilling;
 - c. Reduced incineration / MBT
 - d. Reduced extraction of aggregates.

The analysis is, therefore, incomplete, but highlights some of the benefits expected to flow from the taxes.

4.0 Environmental Fiscal Reform and Employment

Even before the financial downturn in 2008 there was significant interest in environmental tax policies which can promote sustainable economic growth and increase employment.¹²⁷ The protracted economic recovery has further stimulated interest in environmental tax reform which has now become a core objective of the European Commission. The Roadmap to a Resource Efficient Europe, for example, includes the following objective:

*“By 2020 a major shift from taxation of labour towards environmental taxation, including through regular adjustments in real rates, will lead to a substantial increase in the share of environmental taxes in public revenues, in line with the best practice of Member States”.*¹²⁸

Since the Roadmap’s publication in 2011 a number of reports have been issued by the Commission focusing on the need for EFR as means of promoting sustainable growth.¹²⁹ This chapter examines some of the research that has been conducted in the area of EFR and its impact on employment.

In 1991 Pearce suggested that environmental taxation could lead to a ‘double dividend’ as well structured schemes could help to curb harmful environmental activities and at the same time boost employment opportunities.¹³⁰ According to a recent review the rationale behind this claim was the idea that:

“...environmental taxes not only produce improvements in the environment but they also generate substantial amounts of government revenue. This new revenue allows governments to reduce the rates of other taxes in the economy while maintaining a constant level of total revenue and expenditure”.

Employment can be increased either directly through private actors responding to the tax by finding innovative ways to reduce their tax burden (and therefore pollution), or indirectly through Government offsetting the revenue raised by the environmental tax against taxes on labour.¹³¹ Although it is widely accepted that EFR can help to stimulate

¹²⁷ See for example: European Commission (2007) *Green Paper on Market-Based Instruments for Environmentally and Related Policy Purposes*, COM(2007) 140 final, http://ec.europa.eu/environment/enveco/green_paper.htm; European Environment Agency (2005) *Market-Based Instruments for Environmental Policy in Europe*, www.eea.europa.eu/publications/technical_report_2005_8

¹²⁸ European Commission (2011) *Roadmap to a Resource Efficient Europe*, COM(2011) 571 final, http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm, p. 11.

¹²⁹ See for example: European Commission (2013) *Tax Reforms in EU Member States 2013: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf; European Commission (2012) *Tax Reforms in EU Member States 2012: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*; and European Commission (2011) *Taxation Papers – Quality of Taxation and the Crisis: Tax Shifts from a Growth Perspective*, http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_29_en.pdf

¹³⁰ Pearce, D. (1991) The Role of Carbon Taxes in Adjusting to Global Warming, *Economic Journal*, Vol. 101, pp. 938-948.

¹³¹ European Environment Agency (2012) *Environmental Tax Reform in Europe: Opportunities for Eco-innovation*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-opportunities

employment (see Table 4-1), the degree to which this occurs is very much dependent on the specifics of the environmental tax being considered, how the revenues will be spent, and the employment/economic dynamics within a country (e.g. the size of the informal sector, extent of unemployment, and the flexibility of different elements of the labour force).

Over the last few decades a growing body of literature has emerged which has looked at the relationship between EFR and employment. Although a substantial amount of work has been done much of this is based on theoretical modelling as opposed to the gathering of empirical evidence (this may not be surprising given the difficulties of gathering empirical data and assigning cause and effect to a particular policy intervention). Nevertheless, the findings appear to be relatively consistent and suggest that gains in employment are likely to be achieved where offsetting reductions in other taxes are made. Some of these studies are summarised in Table 4-1 from where it can be seen that the majority of studies appear to show that there are slight gains in employment as a result of EFR; however, some studies have suggested that unemployment may rise as a result of environmental tax reform.

It is reasonably obvious that in terms of absolute levels of employment, it is better to recycle the revenues to create positive economic and social outcomes. On this point the EEA notes:

*“The recycling of revenues is especially important for the acceptability and equity of the tax reforms. This is because shifting the burden of tax increases some costs and reduces others, and since no two individuals in society will have exactly the same earning and spending patterns, the impacts will vary”.*¹³²

Probably what matters rather more is not the effect of environmental taxes on absolute levels of employment, but the effects relative to the most plausible counterfactual. If the most plausible counterfactual would involve resorting to taxes other than environmental ones to generate the same revenue, then it might be expected that the use of environmental taxes still has a positive effect relative to the alternatives.

¹³² European Environment Agency (2012) *Environmental Tax Reform in Europe: Implications for Income Distribution*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-in-europe

Table 4-1: Short Summary List of Studies on EFR and Employment Outcomes

Nature of Study	Nature of the Environmental Tax	Distribution of Revenue	Impacts on Employment
Employment Effects of selected scenarios from the Energy Roadmap 2050 ¹³³	ETS and a carbon tax – a range of options are considered in relation to the implementation of the Commission’s Energy Roadmap.	Revenue raised from the carbon tax and ETS are used to offset labour taxes.	All scenarios examined showed a positive impact on both GDP and employment over the longer-term. Employment for all scenarios was calculated to be 1.3% above the baseline.
Study uses QUEST model to analyse the impact of a consumption tax in the EU27. ¹³⁴	Consumption tax equal to 1% of GDP.	The tax is offset by a 1% reduction in labour taxes.	The central scenario showed employment increasing from 0.11% above the baseline in year 1 to 0.24% in year 10.
This paper models the impacts of a carbon tax in Germany. ¹³⁵	Introduction of a carbon tax on the non-ETS sector which increased incrementally to €68 per tonne in 2020.	The model assumes recycled through reductions in income tax and social security contributions.	The model projected an additional employment of 58,200 in 2010 relative to the baseline scenario (an increase of 0.2%). This increases 122,000 additional employment opportunities in 2015 (0.3% above the baseline), and 152,000 by 2020 (0.4% above the baseline).
Model to study the impact of an EU wide carbon tax such that	Carbon tax. The rate was varied for different model scenarios.	Different forms of revenue recycling were modelled under a number of scenarios.	The authors conclude that: <i>“Results show positive employment effects and only small negative impacts on GDP. Economic impacts depend on the level of international energy prices, the recycling mechanism, country specifics such as carbon and energy intensity and structure of</i>

¹³³ Cambridge Econometrics, exergia, Ernst & Young, and Warwick Institute for Employment Research (2013) *Employment Effects of Selected Scenarios from the Energy Roadmap 2050*, Report for DG Energy at the European Commission, October 2013

¹³⁴ European Commission (2013) *Tax Reforms in EU Member States 2013: Tax Policy Challenges for Economic Growth and Fiscal Sustainability*, http://ec.europa.eu/economy_finance/publications/european_economy/2013/pdf/ee5_en.pdf, p. 49

¹³⁵ European Environment Agency (2012) *Environmental Tax Reform in Europe: Implications for Income Distribution*, January 2012, www.eea.europa.eu/publications/environmental-tax-reform-in-europe

Nature of Study	Nature of the Environmental Tax	Distribution of Revenue	Impacts on Employment
would allow a 20% reduction in emissions by 2020. ¹³⁶			<i>energy consumption</i> ".
This paper models the impact of a carbon tax in Spain. ¹³⁷	An economy wide tax on CO ₂ . Different levels of tax were considered in this study.	The model included different scenarios each of which assumed that revenues were recycled in different ways: 1. via lump sum transfers; 2. via reducing income tax; and 3. by reducing taxes on capital (in all instances it was assumed that the proposed tax was revenue neutral).	The results were strongly related to the way in which the tax revenues were recycled back into the economy and the assumed flexibility of the labour market and the unemployed. With a carbon tax of US\$62.40 per tonne – the amount deemed necessary to achieve a 15% reduction in CO ₂ emissions - the model results suggest that unemployment could fall by 3.5% if revenues are used to reduce income tax (see cited reference for further details on the assumptions). When revenues were used to make lump sum payments or reduce taxes on capital it was found that unemployment may increase by 1.4%. Under these two scenarios, which also sought to reduce emissions by 15%, the CO ₂ tax was lower at US\$46 per tonne.
This paper models the impact of a carbon tax in Spain ¹³⁸	A 10% tax on all energy products and a 15% tax on petrol and other petroleum products		If the wage curve is assumed to be infinitely elastic the authors showed that unemployment could fall by 2.43% for a carbon tax of an estimated US\$31.90 per tonne (the authors in the cited report provided this estimate). If the wage elasticity is assumed to be 0.15 then unemployment only falls by 0.65%. This suggests that the rate is likely to be somewhere between these two points.
A simple model to calculate the impact of the UK's Climate	This study looked at the UK Climate Change Levy that was introduced in 2001.	Not stated in the study.	The results of the study suggest that the following employment impacts could be expected in six sectors: <ul style="list-style-type: none"> • Food and Tabaco – 0.07% increase; • Rubber and plastics – 0.08% increase;

¹³⁶ Lutz, C., and Meyer, B. (2010) Environmental Tax Reform in the European Union: Impact on CO₂ Emissions and the Economy, *Zeitschrift Für Energiewirtschaft*, Vol.34, No.1, pp.1–10

¹³⁷ Markandya, A., González-Eguino, M., and Escapa, E. (2012) *Environmental Fiscal Reform and Unemployment in Spain*, BC3 Working Paper Series 2012-04, Report for Basque Centre for Climate Change, April 2012

¹³⁸ Cited in the above study.

Nature of Study	Nature of the Environmental Tax	Distribution of Revenue	Impacts on Employment
Change Levy on employment. ¹³⁹			<ul style="list-style-type: none"> • Non-metallic minerals – 0.13% decrease; • Machinery – 0.26% increase; • Electrical and optical equipment – 0.23% increase; and • Financial intermediation – 0.45% increase.
A simple model to calculate the impact of Germany's EFR on employment. ¹⁴⁰	A range of environmental taxes which were introduced in the late 1990s and early 2000s are considered as part of this analysis.	Reduction in the social security contributions made by employees and employers.	<p>The results of the study suggest that the following employment impacts could be expected in four sectors:</p> <ul style="list-style-type: none"> • Pulp, paper and printing – 0.82% decrease; • Rubber and plastics – 0.05% decrease; • Non-metallic minerals – 0.40% increase; and • Wholesale and retail trade – 0.04% decrease.
This paper models the employment double dividend in a segmented labour market in 15 Member States. ¹⁴¹	Energy tax (based on carbon emissions). The study determines the 'optimal tax' for each Member State (€3 to €33 per tonne).	The model considers various mechanisms whereby revenues are recycled to reduce gross wages and increase employment (e.g. varying the distribution of the revenue between skilled and unskilled labour).	The authors of the study conclude that: <i>"i) an employment double dividend can be achieved in the short run only, even if a trade-off between environment and employment always exists; ii) the effect on employment is larger when the fiscal revenue is recycled into all workers' gross wages rather than into unskilled workers only; iii) a co-operative policy leads to even larger benefits in terms of employment provided that an adequate redistribution of fiscal revenues is adopted by EU countries"</i> .

¹³⁹ Agnolucci, P. (2009) The Effect of the German and British Environmental Taxation Reforms: A Simple Assessment, *Energy Policy*, Vol.37, No.8, pp.3043–3051

¹⁴⁰ Ibid.

¹⁴¹ Bosello, F., and Carraro, C. (2001) Recycling Energy Taxes: Impacts on a Disaggregated Labour Market, *Energy Economics*, Vol.23, No.5, pp.569–594

The effects of EFR are most well documented in relation to energy and carbon taxes. Other forms of environmental taxes, such as resource taxes, or taxes on pollution, have received less attention. One reason for this is that the modelling studies have tended to address effects at the level of the macro-economy, whilst the level of revenue generation by some pollution and resource taxes is rather low (so that the net effects estimated by models are likely to lie within, or close to, their limits of resolution). The sections below examine, as far as is possible given the time constraints of this study, the employment impacts of a number of environmental taxes.

4.1 Energy/Carbon Taxes

Although slightly outdated, a compressive review in 2000 looked at 139 model simulations coming from a total of 59 studies.¹⁴² Seventy-five of the 108 simulations which were reviewed for employment impacts (i.e. 73%) predicted that EFR would result in net job creation (Figure 4-1). The authors note that:

*“...the best results in terms of employment are obtained when recycling occurs through cuts in SSC [social security contributions]. This is because employers’ SSC directly influence the price of labour; the higher employers’ SSC, the more costly it is to hire labour, similarly, the higher employees’ SSC, the greater the disincentive to supply labour”.*¹⁴³

These employment impacts were also divided up by the time horizon of the modelled simulations. This showed, as demonstrated in Figure 4-2, that short to medium term projections have similar employment outcomes (again positive and negative impacts were identified - the latter, however, being less common).

The authors go on to say that:

*“One important caveat is that for employment gains to materialize, the labour market must be flexible”.*¹⁴⁴

These authors also suggest that job losses may result if the revenue raised from EFR is not recycled in such a way as to offset the price rises:

*“Indeed, certain models suggest that sharp increases in the real wage rate on account of higher energy and consumer prices must be prevented. The tax increase cannot be fully passed on to sales prices as the rest of the world is prepared to absorb only a fraction of the price increase. The rest must, thus, be split between domestic capital and labour. For jobs to be created, most of the residual cost increase will be borne by labour in the form of reductions in real wage costs. If, instead, wages are rigid, high losses of employment may result”.*¹⁴⁵

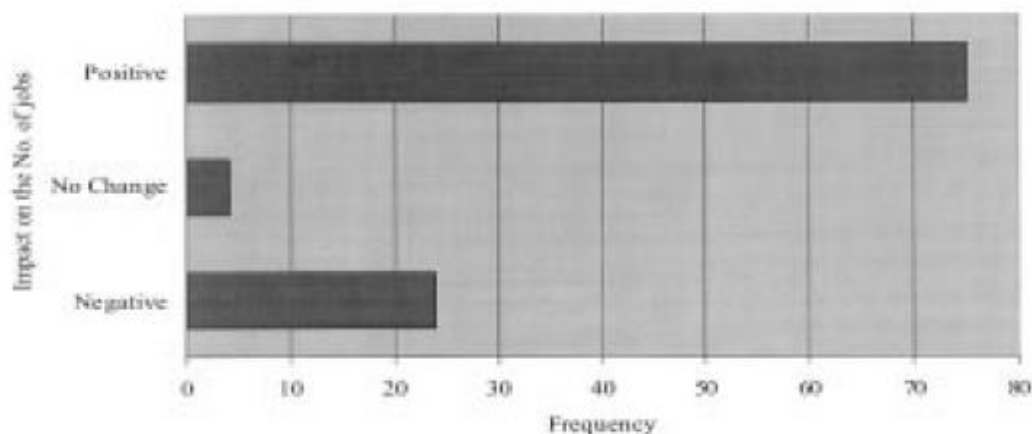
¹⁴² Bosquet, B. (2000) Environmental Tax Reform: Does it Work? A Survey of the Empirical Evidence, *Ecological Economics*, Vol.34, No.1, pp.19–32

¹⁴³ *Ibid.*, p. 24

¹⁴⁴ *Ibid.*, p. 24

¹⁴⁵ *Ibid.*, p. 25

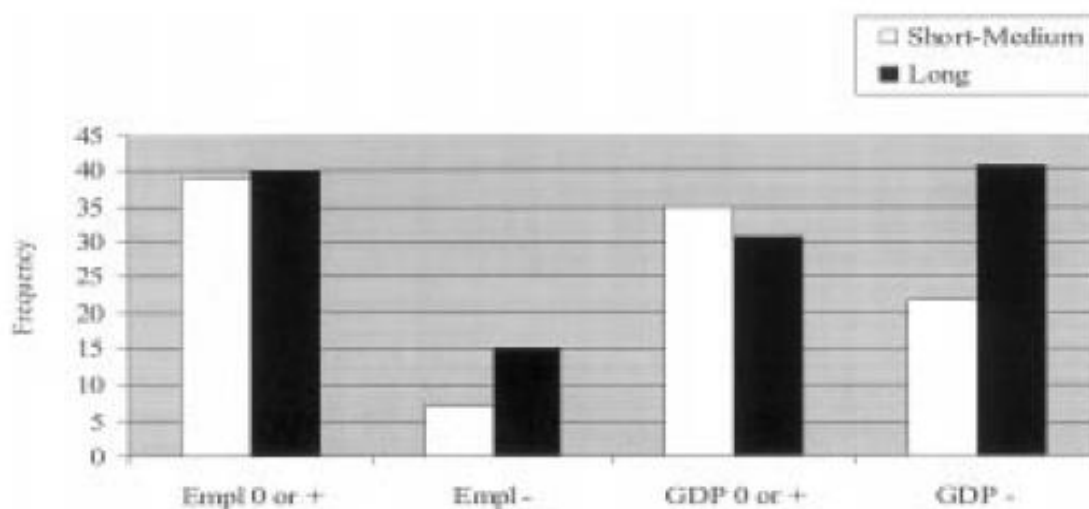
Figure 4-1: EFR and its Impact on Employment



Note: Based on 103 simulations. Positive means that EFR allows gains in employment. No change means that EFR causes neither gains no losses in employment. Negative means that EFR leads to losses in employment.

Source: Figure 2 in Bosquet, B. (2000) *Environmental Tax Reform: Does it Work? A Survey of the Empirical Evidence*, *Ecological Economics*, Vol.34, No.1, pp.19–32, p. 24

Figure 4-2: Time Horizon and Impact on Employment



Note: Based upon 46 short- to medium-term simulations of employment impact, 55 long-term simulations of employment impact, 57 short- to medium-term simulations of GDP impact, and 72 long-term simulations of GDP impact. ‘Empl 0 or +’ means positive or zero employment effect; ‘Empl -’ means negative employment effect; ‘GDP 0 or +’ means positive or zero GDP effect; ‘GDP -’ means negative GDP effect. Short- to medium term means less than 10 years; long-term means 10 years or more.

Source: Figure 3 in Bosquet, B. (2000) *Environmental Tax Reform: Does it Work? A Survey of the Empirical Evidence*, *Ecological Economics*, Vol.34, No.1, pp.19–32, p. 25

The paper concludes by saying that:

“Substantial empirical evidence exists on the predicted effect of ETR. This paper has reviewed 139 modelling simulations. The general findings are that reductions in carbon emissions may be significant, marginal gains in employment and marginal gains or losses in [economic] activity may be recorded in the short- to

medium-term, and investments decrease and prices increase moderately".¹⁴⁶

A review of ETR conducted in 2005 updated the findings from the study discussed above. This work looked at a total of 186 model simulations from 61 separate studies.¹⁴⁷ These simulations were grouped according to different characteristics, for example, "the type of economic model used, the length of the simulation period employed, and the type of environmental policies considered".¹⁴⁸ The results of this work are summarised in Table 4-2, from which it can be seen that, on average, all of the different groupings of studies predicted net job creation with significant reductions in CO₂ emissions. The authors stated that:

"...the magnitude of the environmental effect is much larger than the other effects. This difference suggests that, despite the importance attached to the economic aspect of ETR, ETR policies are more efficient on the environmental side than on the economic side. At the same time, it appears possible to improve the environment with a low or negligible variation in the economic sector".¹⁴⁹

The authors of the above cited study provide the following conclusion:

"We observed that the environmental effect of ETR is consistently evident in terms of CO₂ emissions reduction. The effects of ETR on the economy are, however, less clear and, undoubtedly, much smaller than the environment effects. The data show that it is possible to obtain a DD [double dividend] and maintain it over the long run. From [Table 4-2], it seems that an employment DD is uncontroversial, whereas the GDP DD shows mixed results. The result on the employment DD is robust with respect to long-term analyses and different model types".¹⁵⁰

Table 4-2: Average Results (in %) of a Large Number of ETR Model Simulations

	CO ₂ Emissions	Employment	GDP	Firm Investments	Consumer Prices
Average Variation	-9.70	0.44	-0.05	-0.23	1.18
Europe	-9.40	0.71	-0.07	-0.14	1.42
Rest of the World	-12.86	0.31	0.24	0.95	n.a.
Mediterranean Countries	-2.85	0.3	0.15	-0.58	2.7
Nordic Countries	-11.03	1.07	-0.03	-0.02	1.23
Short- to Medium-term Simulations	-6.02	0.44	0.06	-0.42	1.23
Long-term Simulations	-13.08	0.97	-0.05	0.48	1.17
EC Tax	-6.39	0.33	0.01	-0.85	1.69
Other Taxes	-11.22	0.85	-0.07	0.38	0.97

¹⁴⁶ *Ibid.*, p. 29

¹⁴⁷ Patuelli, R., Nijkamp, P., and Pels, E. (2005) Environmental Tax Reform and the Double Dividend: A Meta-analytical Performance Assessment, *Ecological Economics*, Vol.55, No.4, pp.564–583

¹⁴⁸ *Ibid.*, p. 568

¹⁴⁹ *Ibid.*, p. 568

¹⁵⁰ *Ibid.*, p. 577

	CO ₂ Emissions	Employment	GDP	Firm Investments	Consumer Prices
SSC Recycling ¹	-7.99	1.04	0.15	0.24	1.2
Other Recycling	-12.10	0.05	-0.17	-0.16	1.72
Macroeconomic Model	-7.57	0.46	-0.12	-0.86	1.51
General Equilibrium model	-12.89	1.06	0.26	0.73	0.38
Journal/Book Papers	-11.85	0.79	0.22	0.37	1.33
Non-Published Papers	-7.40	0.48	-0.06	-0.51	1.2

Notes: 1. SSC = Social Security Contributions

Source: Table 1 in Patuelli, R., Nijkamp, P., and Pels, E. (2005) *Environmental Tax Reform and the Double Dividend: A Meta-analytical Performance Assessment*, *Ecological Economics*, Vol.55, No.4, pp.564–583, p. 569

As discussed above, this paper also highlights the importance of recycling the revenues to help offset price rises or wage inflation. In this regard it is noted that:

*“The usual formulation of ETR, with a carbon/energy tax recycled through SSC reductions, continues to be a valid model, which could produce the above-mentioned DD (viz. a better environment and more jobs). Our meta-analysis showed a significant and positive effect, generated on employment, by the CO₂ tax/SSC recycling policy combination. However, these results still need to be properly tested against different model specifications”.*¹⁵¹

As might be expected, the outcomes of the model projections which have looked at the impact of EFR on employment are very much dependent on the explicit and implicit assumptions made when setting up the model scenarios and choosing the type of model that will be used.^{152,153} Thus, although the consensus appears to be that there is a clear double dividend in relation to energy/carbon taxes it is important to bear in mind that the results of these studies can vary quite significantly at times.

The 2011 Impact Assessment which was developed to support the proposed amendments to the Energy Taxation Directive (Directive 2003/96/EC) (ETD) used the E3ME model (developed by Cambridge Econometrics) and the QUESTIII model to assess the impact of various EFR options on GDP and employment.¹⁵⁴ As part of the modelling the impacts of various energy and carbon taxes were examined. The results of the E3ME modelling showed that the *“impact on employment is positive in all options and in all Member States”*.¹⁵⁵ However, it is noted that:

¹⁵¹ *Ibid.*, p. 577

¹⁵² Anger, N., Böhringer, C., and Löschel, A. (2010) *Paying the Piper and Calling the Tune?: A Meta-Regression Analysis of the Double-Dividend Hypothesis*, *Special Section: Ecosystem Services Valuation in China*, Vol.69, No.7, pp.1495–1502

¹⁵³ Berck, P., and Hoffmann, S. (2002) *Assessing the Employment Impacts of Environmental and Natural Resource Policy*, *Environmental and Resource Economics*, Vol.22, No.1-2, pp.133–156

¹⁵⁴ For a more detailed discussion of these models see Annex 2 of the IA, p. 59

¹⁵⁵ European Commission (2011) *Impact Assessment on the Proposal for a Council Directive Amending Directive 2003/96/EC Restructuring the Community Framework for the Taxation of Energy Products and Electricity*,

*“This positive impact on GDP and employment is driven by the modelling assumption that additional revenue from energy taxation would be used to reduce the employers' social security contributions. Lower labour costs boost employment and decrease domestic price levels increasing private consumption. This assumption reflects the practices of many Member States which have carried out environmental tax reforms (cf. Annex 2, point 5) and is in line with the general orientation in the ETD itself (recital 11), which promotes the principle of tax neutrality as a means to modernise national tax systems in favour of both the environment and employment”.*¹⁵⁶

The QUESTIII modelling was undertaken to determine if the effects of the recent financial crisis and protracted economic recovery have altered the case for EFR. The results showed that there was still a strong case for reform, but that Member States may want to consider how the revenues from the energy taxes were recycled back into the economy. The impact of different approaches to revenue recycling on GDP and employment are shown Table 4-3. The results if this table are summarised as follows:

*“When revenue is recycled via lump-sum payments to households or is retained in the public budget to reduce public debt, the positive economic impacts would not materialise. However, the modelling showed that the impacts of fiscal consolidation via a carbon tax would be slightly better than effects of lump-sum tax recycling. Use of revenue is a matter for Member States to decide and will also depend on how Member States would implement any possible ETD revision”.*¹⁵⁷

Table 4-3: GDP and Employment Effects from Carbon Taxes (Percent Deviation from Baseline)

Parameter	Labour Tax Recycling		Lump-sum Tax Recycling		Fiscal Consolidation	
	2020	2030	2020	2030	2020	2030
GDP	0.014	0.028	-0.082	-0.099	-0.085	-0.062
Employment	0.028	0.036	-0.122	-0.158	-0.087	-0.098

Source: European Commission (2011) *Impact Assessment on the Proposal for a Council Directive Amending Directive 2003/96/EC Restructuring the Community Framework for the Taxation of Energy Products and Electricity*, http://ec.europa.eu/taxation_customs/resources/documents/taxation/sec_2011_409_impact_assessment_part1_en.pdf, Table 17, p. 30.

The Impact Assessment on the Energy Taxation Directive goes on to say:

http://ec.europa.eu/taxation_customs/resources/documents/taxation/sec_2011_409_impact_assessment_part1_en.pdf, p. 28

¹⁵⁶ *Ibid.*, p. 29

¹⁵⁷ *Ibid.*, p. 30.

“Member States might need to raise taxes in order to carry out fiscal consolidation in any event.¹⁵⁸ Increasing labour taxes – as an alternative to fiscal consolidation via a carbon tax - would be more distortive, hindering job creation and economic activity even more.¹⁵⁹ In addition, the beneficial impact on the energy mix and the environment would not materialise and other measures (possibly costlier) would have to be taken to achieve the climate policy targets. So, the overall results would be worse compared to fiscal consolidation via a carbon tax that combines environmental benefits with certain short to medium term economic costs” (footnotes are included in the original).¹⁶⁰

Further work by Pollitt *et al.* has looked at the impact of carbon taxation on employment when the revenues are used for budget consolidation and are not recycled back into the economy. The authors (who used Cambridge Econometrics’ E3ME model) showed that using carbon taxes to plug fiscal deficits can lead to reduced employment; however, they argue that the increase in unemployment resulting from carbon taxes would be less than if the money were raised through labour taxes. The authors conclude that:

*“Recognising that raising tax revenues typically reduces GDP, the tax portfolio ought to be weighted towards tax bases associated with the lowest macroeconomic costs. This paper has shown that, at both national and European level, energy and carbon taxes (ETS at EU level) perform well in comparison to direct and indirect taxes, when assessing their impacts on GDP and employment. This is due to a combination of factors, but notably the opportunity to reduce the bill for fossil fuel imports as well as different labour market dynamics. The findings for the three case study countries should hold for all countries with a large dependency on imported fuel”.*¹⁶¹

The work cited above is based on a detailed report undertaken by Vivid Economics and published in 2012.¹⁶² Interested readers are referred to this report and the cited journal article for further details.

¹⁵⁸ “For more details see Monitoring tax revenues and tax reform in the EU Member States 2010, European Commission Taxation papers (working paper 24/2010)”.

¹⁵⁹ “Various studies have shown that taxes on income are usually associated with lower economic growth (and so lower steady-state GDP) and that property and consumption taxes (including environmentally related taxes) are the least detrimental to growth. See e.g., Johannson, A., Heady, C., Brys, B. and L. Vartia (2008), Taxation and Economic Growth, OECD Economics Department Working Papers, 620, OECD publishing. Arnold, J. (2008), Do Tax Structures Affect Aggregate Economic Growth?: Empirical Evidence from a Panel of OECD Countries, OECD Economics Department Working Papers, No. 643, OECD Publishing. Myles, G. D. (2009), Economic Growth and the Role of Taxation – Aggregate Data, OECD Economics Department Working Papers, No. 714, OECD publishing”.

¹⁶⁰ *Ibid.*, p. 30.

¹⁶¹ Pollitt, H., Zhao, Y., Ward, J., Smale, R., Krahe, M. and Jacobs, M. (2012) The Potential Role for Carbon Pricing in Reducing European Deficits, Global Policy Essay, Vol. 3 (3), pp. 1-22

¹⁶² Vivid Economics (2012) *Carbon Taxation and Fiscal Consolidation: the Potential of Carbon Pricing to Reduce Europe’s Fiscal Deficits*, Report for the European Climate Foundation and Green Budget Europe, May 2012

The above research was built upon in a subsequent report and further supported the idea that energy taxes may be an efficient way of raising revenue relative to conventional taxes. The authors of the follow on study state:

“A review of current carbon-energy taxes across a sample of nine EU member states reveals a great discrepancy in the tax rates used within and across countries. Without a common set of signals, various economic problems can emerge, from inappropriate investments in fuels and technologies, to carbon and economic leakage between countries and, ultimately, overall loss of welfare.

*Raising or adjusting national taxes on energy and carbon can help to correct these discrepancies, while generating useful revenues that can contribute to fiscal re-balancing. The analysis compares such carbon-related taxes with conventional direct and indirect taxes raising similar amounts of revenue. It reveals that carbon fiscal measures can indeed raise significant revenues while having less detrimental macro-economic impact than other tax options”.*¹⁶³

Further research has been undertaken to assess the likely employment impacts of the Commission’s Energy Roadmap 2050. This work looked at wide ranging interventions which included actioned ETS allowances and a carbon tax for sectors not covered by the ETS. This work assumed that revenues would be used to offset labour taxes and concluded that:

*“Despite the differences in GDP results, both models show positive results for employment and both models show quite consistent impacts across scenarios. The E3ME sensitivity analysis showed that the revenue recycling (and choice of method applied) was an important determinant of final outcomes.”*¹⁶⁴

From the above it would appear that energy taxes can play a key role in helping to reduce carbon emissions, while at the same time provide an efficient means for raising revenues, which can either be used for the purposes of fiscal consolidation or for boosting employment by offsetting the revenue gained against labour taxes.

4.2 Transport Taxes

4.2.1 Vehicles

There are a range of taxes, which may or may not have environmental underpinnings, that can be applied to vehicles, for example:

- Excise duties levied on motor fuels (in this work these taxes are covered under ‘energy taxes’);

¹⁶³ Jacobs, M., Ward, J., Smale, R., Krahé, M. and Bassi, S. (2012) *Less Pain, More Gain: the Potential of Carbon Pricing to Reduce Europe’s Fiscal Deficits*, November 2012, Report for Centre for Climate Change Economics and Policy Grantham Research Institute on Climate Change & the Environment, www.lse.ac.uk/GranthamInstitute/publications/Policy/docs/PP-carbon-pricing-europe-fiscal-deficits.pdf, p. 3

¹⁶⁴ Cambridge Econometrics, exergia, Ernst & Young, and Warwick Institute for Employment Research (2013) *Employment Effects of Selected Scenarios from the Energy Roadmap 2050*, Report for DG Energy at the European Commission, October 2013, p. 138

- Sales tax (e.g. VAT);
- Annual registration fees; and
- Import duties on vehicles.

A brief search of the literature did not yield any studies which have aimed to quantify the impact that the introduction of vehicle taxes could have on employment. To the extent that sales, registration, and import taxes act to encourage improvements in environmental performance it could be argued that there may be a slight increase in employment opportunities in Europe. Economic modelling undertaken as part of an economic assessment of the Commission's Transport White Paper, which aims to cut transport emission by 60% by 2050, found that a transition to low-carbon cars and vans could result in an additional 356,000 direct and indirect jobs. The report states:

"The model results show that a shift to low-carbon cars and vans increases spending on vehicle technology, a sector in which Europe excels, therefore generating direct employment impacts. This shift will also reduce the total cost of running Europe's auto fleet, leading to mildly positive economic impacts including indirect employment".¹⁶⁵

This work, however, does not relate explicitly to the above mentioned taxes and it is therefore hard to draw any concrete conclusions about how individual vehicle taxes may impact on employment opportunities within a country.

4.2.2 Aviation

The body of research that has been carried out on the impact of air passenger duties/taxes on economic output and employment appears to be relatively polarised due to heavy lobbying by airlines and the tourism industry in both Europe and abroad. Research conducted in the UK, on behalf of commercial airliners, has stated that such taxes can lead to job losses in the transport and tourism sectors.^{166,167,168} For example, an industry commissioned report published by PricewaterhouseCooper (PwC) claims that:

"Should the rise in output associated with APD [Air Passenger Duty] abolition materialise as our modelling suggest, then it could be possible that almost 60,000 jobs could be created between now [2013] and 2020 [in the UK]".¹⁶⁹

¹⁶⁵ Cambridge Economics and Ricardo – AEA (2013) *An Economic Assessment of Low Carbon Vehicles*, March 2013, www.ricardo-aea.com/cms/assets/MediaRelease/Economic-Assessment-Vehicles-FINAL2.pdf, p. 2

¹⁶⁶ frontier economics (2011) *The Impacts of Proposed Changes in Air Passenger Duty*, Report for Easy Jet, May 2011, www.frontier-economics.com/publications/the-impacts-of-proposed-changes-in-air-passenger-duty/

¹⁶⁷ PricewaterhouseCoopers (2013) *The Economic Impact of Air Passenger Duty*, Report for British Airways, EasyJet, Virgin Atlantic and Ryanair, February 2013

¹⁶⁸ Oxford Economics (2011) *An Alternative APD regime*, Report for American Airlines, Continental/United Airlines and Delta Airlines, July 2011, www.oxfordeconomics.com/Media/Default/economic-impact/public-policy-assenment/an-alternative-apd-regime.pdf

¹⁶⁹ PricewaterhouseCoopers (2013) *The Economic Impact of Air Passenger Duty*, Report for British Airways, EasyJet, Virgin Atlantic and Ryanair, February 2013, p. 2

The claims of the commercial airliners have been contested by the UK Government, who see the passenger duty as an important means of plugging the country's substantial fiscal deficit.

The air passenger duty in the UK has been effective because the country is an island and it is therefore a lot harder for passengers to make use of foreign airports which are not subject to such duties. The Dutch government was forced to abolish its tax on passenger flights ('ticket-tax') after a year (it ran from July 2008 to July 2009) once it was found that significant numbers of passengers were making use of airports in neighbouring countries (the reduction of passenger numbers leaving from Dutch airports was compounded by the onset of the financial crisis in 2008, which, at the time, added further fuel to the opposition against the ticket-tax).¹⁷⁰ Research conducted on this short-lived tax suggested that it led to job losses as a result of reduced passenger numbers and fewer visiting tourists.¹⁷¹

A report on the Irish air passenger tax – again commissioned by private airlines – used very high level “*rule of thumb*” assumptions to estimate possible job losses as a result of the Irish air travel tax. The authors of the report estimated that airport and airline job losses could amount to 1,500 to 2,000 across Ireland, with a further 2,000 to 3,000 jobs potentially being lost from the tourism industry as a result of lost revenue.¹⁷²

A number of other studies exist which look at the impact of air passenger taxes, but it is hard to obtain an objective, unbiased view on employment impacts. In addition, detailed ex post assessments of these schemes, which also give due consideration to the environmental costs/benefits, appear to be in short supply. Nevertheless, a slight fall in employment would be expected, particularly if passengers can easily make use of airports in neighbouring countries which do not tax passenger flights.

4.3 Pollution and Resource Taxes

4.3.1 Waste Taxes

A brief search was conducted on the impacts of landfill tax on employment. Unfortunately, the body of literature in this area appears to be very limited.

Shortly after the landfill tax was implemented in the UK, an *ex ante* assessment of the employment impact of the tax only, as predicted by Cambridge Econometrics, suggested the effect was relatively small. In the case of an escalating tax, with revenue used to fund offsetting reductions in employer social security contributions, net employment generation was estimated at 7,200 in 1997, 21,000 in 2000 and 36,200 in 2005 for the whole UK economy. The study noted, importantly, that if the revenue is not used to offset reductions in employer social security contributions, there is still a net employment

¹⁷⁰ KiM Netherlands Institute for Transport Policy Analysis (2011) *Effects of the Air Passenger Tax: Behavioural Responses of Passengers, Airlines and Airports*, Report for Dutch Ministry of Infrastructure and the Environment, February 2011, www.kimnet.nl/sites/kimnet.nl/files/effects-of-the-air-passenger-tax.pdf

¹⁷¹ SEO Economisch Onderzoek (2009) *Implicaties van de Invoering van de Ticket-Tax*, March 2009, www.seo.nl/pagina/article/implicaties-van-de-invoering-van-de-ticket-tax/

¹⁷² SEO Economisch Onderzoek (2009) *The Implications of the Irish Air Travel Tax*, Report for Aer Lingus, Ryanair, and Cityjet, November 2009, www.ryanair.com/doc/news/2009/irish_air_travel_tax.pdf, p. 17

gain. The contribution of the revenue refunding mechanism over the 'tax only' scenario (representing structural adjustment owing to the changes set in place) was estimated at 1,600 in 1997, and still only 4,700 by 2005 under an escalating tax scenario

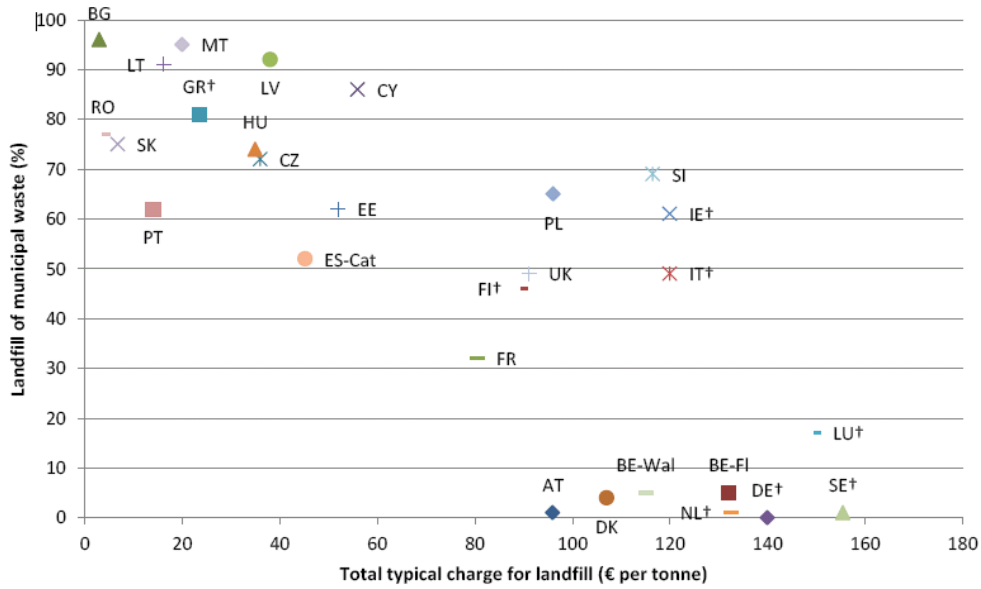
This resonates with the way in which responses to landfill taxes tend to occur. It is fairly uncontroversial that landfill taxes help to divert waste away from landfill to other forms of residual waste treatment and/or recycling (Figure 4-3).^{173,174} Research into the employment intensity of different waste treatment options clearly indicates that, per tonne of waste treated/disposed, landfilling produces the least number of job opportunities. Indeed, the number of job opportunities appear to increase as one moves up the waste hierarchy. For example, for every 10,000 tonnes of waste disposed of in landfill, one job may be created, compared to between 2 and 67 for recycling. Table 4-4 and

¹⁷³ Bio Intelligence Service with IEEP, Eunomia, Ecologic, Arcadis and Umweltbundesamt (2012) *Use of Economic Instruments and Waste Management Performances*, April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf

¹⁷⁴ The individual country reports produced by the EAA have shown how the quantity of waste going to landfill falls significantly with the introduction of well-priced landfill taxes. See: European Environment Agency (2013) *Managing Municipal Solid Waste - a Review of Achievements in 32 European Countries*, February 2013, www.eea.europa.eu/publications/managing-municipal-solid-waste

Table 4-5 provide a summary of the employment intensities (FTEs per 10,000 tonnes per annum) associated with various waste treatment and disposal operations.

Figure 4-3: Municipal Waste Landfilling and Landfill Costs



- S

Source: Figure 20 in Bio Intelligence Service with IEEP, Eunomia Research & Consulting, Ecologic, Arcadis and Umweltbundesamt (2012) Use of Economic Instruments and Waste Management Performances, April 2012, http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf, p. 55

Table 4-4: Employment Intensities from Various Literature Sources (FTEs per 10,000 tonnes per annum)

Study	Landfill	Incinerator	MBT	Composting Sites	Windrow	In-vessel	AD	MRF	Recycling Collection	Residual Waste Collection	Reprocessing	Reprocessing: Glass/ Aluminium	Reprocessing: Plastics
SWAP, 1997 (UK) ¹⁷⁵								28			3-67	3-11	67
Murray, 1999 (UK) ¹⁷⁶	≈1	≈1							21-40	6	2		
Lepu, 2004 (UK) ¹⁷⁷								18			4-19	4	
Seldman, 2006 (USA) ¹⁷⁸	1	1		4				10			25	26	93
WRAP, 2012 (UK) ¹⁷⁹			5		2		2						
Eunomia, 2012 (EU) ¹⁸⁰					4		2	11					
TBU and Eunomia, 2003 ¹⁸¹			2 - 3										
University of Glamorgan, 2007 (AU) ¹⁸²			5										
Greenpeace, 2009 ¹⁸³		5											

¹⁷⁵ Save Waste and Prosper (SWAP) (1999) *Employment in the UK Recycling Industry*, National Recycling Forum.

¹⁷⁶ Murray, R. (1999) *Creating Wealth From Waste*, DEMOS, www.demos.co.uk/files/Creatingwealthfromwaste.pdf

¹⁷⁷ Gray, A., Jones, A., and Percy, S. (2004) *Jobs from Recycling: Report on Stage II of the Research*, Report for Local Economic Policy Unit (Lepu), August 2004, http://warr.org/446/1/Jobs_from_recycling_-_Report.pdf

¹⁷⁸ Seldman, N. (2006) *Recycling Means Business*. PhD Institute for Local Reliance, Waste to Wealth Program, www.ilsr.org/recycling/recyclingmeansbusiness.html

¹⁷⁹ Urban Mines and Walker Resource Management (2012) *A Survey of the UK Organics Recycling Industry in 2010*, Report for WRAP, www.organics-recycling.org.uk/uploads/article2439/ASORI%20Final%20Report%202010.pdf

¹⁸⁰ Eunomia's micro study on employment conducted as part of the European Reference Model on Municipal Waste Management, www.wastemodel.eu

¹⁸¹ TBU and Eunomia (2003) *Cool Waste Management*, Report for Greenpeace, www.greenpeace.org.uk/MultimediaFiles/Live/FullReport/5574.pdf

¹⁸² University of Glamorgan (2007) *Kahlenberg (ZAK) MBT Plant*, www.walesadcentre.org.uk/Controls/Document/Docs/Kahlenberg_Comp_F.pdf

Study	Landfill	Incinerator	MBT	Composting Sites	Windrow	In-vessel	AD	MRF	Recycling Collection	Residual Waste Collection	Reprocessing	Reprocessing: Glass/ Aluminium	Reprocessing: Plastics
Cottica & Kaurlard, 1995 ¹⁸⁴	≈1	2-4											
DETR/DTI, 1999 (UK) ¹⁸⁵								15-30					
European Commission, 2006 ¹⁸⁶											12		
Various											16	3 -5	70

Notes: Figures are rounded to nearest integer. It is important to note that whilst Seldman's study was published in 2006, the data was collected in 1997.

¹⁸³ Greenpeace (2009) *Incineracion de Residuos: Malos Humos para el Clima*, November 2009, www.greenpeace.org/espana/Global/espana/report/costas/091124-02.pdf

¹⁸⁴ Cottica & Kaurlard (1995) *The Costs, Environmental Benefits, and Direct Employment Implication of Greening Municipal Waste Management in Europe: An Engineering Estimation*, NOMISA, Bologna

¹⁸⁵ Cited in Waste Watch, (1999) *Jobs from Waste: Employment Opportunities in Recycling*, <http://wasteonline.brix.fatbeehive.com/resources/WasteWatch/JobsFromWaste.htm>

¹⁸⁶ European Commission (2006) *Report from the Commission to the Council and the European Parliament on the Implementation of Directive 94/62/EC on Packaging and Packaging Waste and its Impact on the Environment as well as on the functioning of the Internal Market*, www.europen.be/download_protected_file.php?file=109

Table 4-5 - Employment Intensity of Recycling from Friends of the Earth Report, 2010 (FTEs per 10,000 tonnes per annum)

Material	2004	2020	Average	Source
Glass	7.5	7.5	8	European Data
Paper	35	18	27	European Data
Plastic	156	93	125	European Data
Iron & Steel	54	54	54	European Data
Aluminium	110	110	110	European Data
Wood	7.5	7.5	8	European Data
Textiles	50	50	50	European Data
Biowaste	13	4	9	European Data
Mixed Metal	65.2	65.2	65	European Data
WEEE	-	-	400	UK Data
Furniture	-	-	140	UK Data

Source: Friends of the Earth (2010) *More Jobs, Less Waste: Potential for Job Creation Through Higher Rates of Recycling in the UK and EU*, September 2010, www.foe.co.uk/sites/default/files/downloads/jobs_recycling.pdf

Recent work by Cambridge Econometrics investigated the likely impacts of waste taxes on GDP and employment in the European Union. As part of this work they looked at seven scenarios:

1. A tax of €50 per tonne on municipal waste to landfill;
2. Number 1 + €50 per tonne tax on waste from construction waste to landfill;
3. Number 2 + €50 per tonne tax on other mineral waste to landfill;
4. Number 3 + €50 per tonne tax on all other waste to landfill;
5. A tax of €50 per tonne on discharges to water;
6. A tax of €25 per tonne on waste that is incinerated without energy recovery; and
7. Number 4+5+6 (i.e. all of the above).

The modelling assumed that the mining sector was compensated in full for all of the taxes on mineral waste. For all of the other taxes it was assumed that the revenues were used to offset labour taxes (employers' social contributions). The results of the modelling are summarised in Table 4-6. It is important to note that the modelling takes a very broad macroeconomic approach and used very crude estimates to model waste flows and how they may be altered as a result of the taxes. For example, it was assumed that 50% of all non-mining waste diverted from landfill would go to incineration and the other 50% would be recycled/recovered. The authors of the report acknowledged that this is an "arbitrary figure" that could be improved upon in the future.¹⁸⁷

Table 4-6: Cambridge Econometrics Summary Results for the EU28 in 2020 (Unless Stated Otherwise all Figures shown as % Difference from Baseline)

Parameter	Scenario						
	1	2	3	4	5	6	7
Revenue (€2005 million)	3,689	5,276	30,627	30,966	2,842	648	34,680
GDP	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
Employment	0.01	0.02	0.04	0.04	0.00	0.00	0.04
Household Consumption	-0.01	0.00	0.01	0.01	0.00	0.00	0.00
Investment	-0.01	-0.01	-0.01	-0.01	0.00	0.00	-0.01
Exports	0.00	0.00	-0.03	-0.03	-0.01	0.00	-0.03
Imports	0.00	0.00	-0.01	-0.01	0.00	0.00	-0.01
Consumer Prices	0.01	0	0.02	0.02	0.01	0	0.03
Waste Generation	-1.53	-2.36	-10.28	-10.47	-0.78	-0.42	-11.67

Source: Cambridge Econometrics (2013) *Modelling Milestones for Achieving Resource Efficiency: Economic Analysis of Waste Taxes*, Report for DG Environment of the European Commission, November 2013, http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/Task%203-waste.pdf, Table 4.1, p. 17.

In terms of the impact on employment Cambridge Econometrics notes that there is:

¹⁸⁷ Cambridge Econometrics (2013) *Modelling Milestones for Achieving Resource Efficiency: Economic Analysis of Waste Taxes*, Report for DG Environment of the European Commission, November 2013, http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/Task%203-waste.pdf, footnote 9, p. 13

“...a small but noticeable increase in employment. The potential 0.04% increase in total EU employment translates to around 100,000 jobs. This is driven by the use of the revenues to reduce labour taxes and lower the cost of employment; although there will be some new jobs in the waste processing sector, the net increase in employment comes from a range of different economic sectors”.¹⁸⁸

Given the employment intensities discussed above (Table 4-4 and

¹⁸⁸*Ibid.*, p. 18.

Table 4-5) it is clear that the degree to which waste is pushed up the hierarchy will have a significant impact on employment. Some of the high level assumptions made as part of Cambridge Econometric's modelling may not accurately reflect the actual levels of material recovery/recycling that may be achieved as a result of landfill and incineration taxes which will no doubt force materials up the waste hierarchy. The figure of 100,000 jobs may therefore be a conservative estimate.

The above analysis shows that there can be employment benefits derived from waste taxes in Europe.

4.3.2 Taxes on Aggregates

The Danish Raw Materials Tax was introduced in 1990 and at the time of an extensive review by ECOTEC *et al* in 2001 it had been held steady at DKK5.00 per m³. In terms of the tax's impact on Employment ECOTEC *et al* state that:

*"No figures are available but the effect of the tax is so minimal that no effects would be expected unless coming from the recycling of demolition wastes (used for construction and at sea), but this is mainly due to the waste tax".*¹⁸⁹

With regards to Sweden's aggregates tax the authors of the above report state the following:

*"It is unknown to what extent the Gravel tax has affected the aggregates industry. Whilst gravel pits may have shut, the overall labour involved with the industry may have remained stable. It seems likely that the relatively low labour intensity of the industry would make it likely that the net impact of the tax might be positive in employment terms as the use of these funds for public expenditure would be more employment intensive".*¹⁹⁰

Again the rate of Sweden's aggregate tax was very low at the time the review was undertaken and had also been held constant at SEK5.00 (€0.57) since it started in 1996 and the time of the review in 2000.¹⁹¹

ECOTEC *et al* examined other resource taxes, such as the Danish Water Supply Tax¹⁹² and the Dutch Groundwater Tax¹⁹³, but reported that no information was available on the impact that these tax have had on employment. However, with regards to the Danish tax, ECOTEC *et al* do report that although the impacts have not been quantified, anecdotal evidence suggests that:

"The tax has a positive influence on employment, in particular for sanitary engineering companies, which renovate water installations. New products have

¹⁸⁹ ECOTEC, CESAM, CLM, University of Gothenburg, UCD, and IEEP (2001) *Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States*, Report for DG Environment, European Commission, April 2001, http://ec.europa.eu/environment/enveco/taxation/pdf/ch1t4_overview.pdf, p. 193.

¹⁹⁰ *Ibid.*, p. 205.

¹⁹¹ *Ibid.*, p. 198.

¹⁹² *Ibid.*, p. 73.

¹⁹³ *Ibid.*, p. 70.

*been developed and are being marketed such as new types of water-saving sanitations, in particular low-flush toilets”.*¹⁹⁴

Efforts were made to identify more recent studies on the employment impacts of resource taxes; however, information on this subject is sparse and it was not possible to gather a robust database as part of this limited review.

4.3.3 Pesticide Taxes

Denmark introduced a pesticide tax in 1996 as part of a broader strategy of reducing the amount of pesticide use in the country. The tax rate in 1998 was 53.85% of the retail price for insecticides and 33.33% of the retail price for fungicides and herbicides (no differentiation was made on the basis of toxicity). Writing in 2001 ECOTEC *et al* report the following:

*“Given the marginal nature of changes thus far, the (expected) implications for employment would not be expected to be significant. Demand for pesticides (measured in tonnes) has fallen but this reflects, in part, changes unrelated to the pesticides tax per se. Note that since, as we understand the situation, the majority of Danish production of pesticides is exported, the employment impact on domestic industry of any tax-related reduction in demand is also likely to be small”.*¹⁹⁵

Under more extreme forms of taxes one would expect greater job losses and ECOTEC *et al* cite Bichel’s (1999) work on this. They report that:

*“Banning the use of pesticides in Denmark would reduce the employment in the agricultural sector by 16000 employees. Reducing pesticide consumption by 80% would reduce employment by 8000 employees. The optimisation scenario 3 (approximately 50% reduction in use) would have no or very limited employment effects given a 10 year implementation period. This suggests that given the tax’s broad intention to refund revenue to the sector through land tax reductions, the current level of tax would not affect employment significantly”.*¹⁹⁶

4.3.4 Taxes/Charges on Single Use Carrier Bags

It is widely reported that the implementation of a tax on single use carrier bags can result in a significant reduction in the number of bags being issued by retailers.^{197,198} There is

¹⁹⁴ *Ibid.*, p. 73.

¹⁹⁵ *Ibid.*, p. 367.

¹⁹⁶ *Ibid.*, p. 367. At the time farming employed around 84,000 people in Denmark – 3.5% of the workforce.

¹⁹⁷ See, for example: Eunomia Research & Consulting (2011) *A Comparative Study on Economic Instruments Promoting Waste Prevention*, Report for Bruxelles Environnement, December 2011, www.ibgebim.be/uploadedFiles/Contenu_du_site/Professionnels/Formations_et_s%C3%A9minaires/Waste_Prevention_Conference/Formulaire_WPC/Waste%20Prevention%20Final%20Report%2008.11.2011%202.pdf?langtype=2060, p. 91

¹⁹⁸ Welsh Government (2012) *Reduction in Single-use Carrier Bags*, Date Published: 3rd July 2012, Date Accessed: 18th August 2014, Available at: http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/substance/carrierbags/reduction/?lang=en

very limited data on the employment intensity associated with the production of single use carrier bags, and thus it is very difficult to understand what the marginal job losses may be for a given reduction in the use of single-use carrier bags. Work undertaken by Eunomia – based on fairly high level assumptions – suggests that 15 FTEs are employed in the production of every thousand tonnes of plastic carrier bags. The employment rate for single use paper bags is slightly lower at 1.5 FTEs per thousand tonnes.¹⁹⁹ This work fed into the Commission’s Impact Assessment to reduce the consumption of lightweight plastic carrier bags in Europe, which estimated that an outright ban on such bags by all EU Member States could reduce employment by 1,641 FTEs relative to the baseline scenario.²⁰⁰ If, as an alternative, a prevention target was set with economic instruments – that is, taxes/charges – being used to drive changes in consumer behaviour, it was estimated that employment would fall by 1,340 FTEs across Europe. These figures are relatively small and in the context of the work being undertaken here – which focuses on individual Member States – the impact will likely only be a fraction of this. This, however, does not take into account indirect job losses, but these are also likely to be limited.

4.3.5 Air Pollution Taxes

An early study carried out in 2001 suggested that the Swedish tax on NO_x is likely to have had a negligible impact on employment:

*“It is possible to argue that the NO_x charge has increased the demand for abatement technologies significantly in some sectors, and, hence, more people would be employed in the abatement technology sector, but these effects are likely to be small at least in the short and medium term. The employment effects at firm level are probably also of negligible size. Finally, SEPA’s [Swedish Environmental Protection Agency] administration of the charge implies no significant employment effects (0.3% of revenues of the NO_x charge are administration costs, and this allows roughly two people to be employed full-time). To sum up, the effects on employment from the NO_x charge are negligible”.*²⁰¹

The authors of this report reviewed NO_x taxes in three countries and concluded by saying that given the low rate of the taxes in each country there were no “traceable effects regarding effects on internal market, trade impacts, employment effects, competitiveness effects”.²⁰² This work has been followed up by more recent studies

¹⁹⁹ Eunomia Research & Consulting (2012) *Assistance to the Commission to Complement an Assessment of the Socio-economic Costs and Benefits of Options to Reduce the Use of Single-use Plastic Carrier Bags in the EU*, Report for European Commission Directorate-General for the Environment, October 2012, http://ec.europa.eu/environment/waste/packaging/pdf/study_options.pdf, p. 13

²⁰⁰ European Commission (2013) Executive Summary of the Impact Assessment Accompanying the Document Proposal for a Directive of the European Parliament and of the Council Amending Directive 94/62/EC on Packaging and Packaging Waste to Reduce the Consumption of Lightweight Plastic Carrier Bags, SWD(2013) 443 final, November 2013, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013SC0443>, p. 5

²⁰¹ ECOTEC, CESAM, CLM, University of Gothenburg, UCD, and IEEP (2001) *Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States*, Report for DG Environment, European Commission, April 2001, http://ec.europa.eu/environment/enveco/taxation/pdf/ch1t4_overview.pdf, p. 58

²⁰² *Ibid.*, p. 65.

which have also shown that taxes on emission to air are likely to have a negligible impact on employment. For example, Ščasný *et al*, who studied the Czech Republic, have shown that under a scenario of revenue recycling a tax on particulates, sulphur dioxides, nitrous oxides, and volatile organic compounds could increase employment by 0.1% against the baseline scenario. Where revenue from the tax is not recycled back into the economy – that is, where it is used for fiscal consolidation – these authors showed that there was likely to be a very slight negative impact on employment.²⁰³

4.3.6 Water Abstraction/Usage Charges/Taxes

There is a growing focus within Europe on the effective implementation of costs recovery programmes to ensure that water is used more sustainably across all sectors of the economy (including households).^{204,205} There are some concerns that the implementation of charges on large-scale users of water resources, such as agriculture, mining and industry, could, by impacting on profit margins, have a negative impact on job numbers. However, research undertaken in South Africa has shown that water charging can help to improve water efficiency while also improve economic growth and employment if the revenue is used to offset other taxes.²⁰⁶

Writing in 2001 ECOTEC *et al* report on the Danish water supply tax by stating that:

*“The tax has a positive influence on employment, in particular for sanitary engineering companies, which renovate water installations. New products have been developed and are being marketed such as new types of water-saving sanitations, in particular low-flush toilets. However, the impacts cannot be quantified. And no analysis is available on the net effects of the employment effects of the tax, i.e. taking into account losses in employment related to “old” technology production”.*²⁰⁷

The report does not quantify the employment impacts of the tax, possibly because of the difficulty associated with doing this in practice.

Reporting on the abandonment of the Dutch groundwater tax in 2011, Schuerhoff *et al* state that, despite claims of double dividend returns, no evidence could be found for the

²⁰³ Ščasný, M., Piša, V., Pollitt, H., and Chewpreecha, U. (2009) Analyzing Macroeconomic Effects of Environmental Taxation in the Czech Republic with the Econometric E3ME Model, Vol.59, No.5, pp.460–491

²⁰⁴ See for example: European Environment Agency (2013) *Assessment of Cost Recovery Through Water Pricing*, September 2013, <http://www.eea.europa.eu/publications/assessment-of-full-cost-recovery/download>

²⁰⁵ ARCADIS, InterSus, Fresh Thoughts Consulting, Eco Logic, and TYPISA (2012) *The Role of Water Pricing and Water Allocation in Agriculture in Delivering Sustainable Water Use in Europe*, Report for European Commission Directorate-General for the Environment, February 2012, www.enorasis.eu/uploads/files/Water%20Governance/role_water_pricing.pdf

²⁰⁶ Letsoalo, A., Blignaut, J., de Wet, T., de Wit, M., Hess, S., Tol, R., and van Heerden, J. (2007) Triple Dividends of Water Consumption Charges in South Africa, Vol.43, pp.1–11

²⁰⁷ ECOTEC, CESAM, CLM, University of Gothenburg, UCD, and IEEP (2001) *Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and its Member States*, Report for DG Environment, European Commission, April 2001, http://ec.europa.eu/environment/enveco/taxation/pdf/ch1t4_overview.pdf, p. 71

tax generating additional employment opportunities or helping to raise wages by offsetting income taxes. The authors report that:

*“This lack of an empirical result does not mean that the GWT had no effect on the margin; it’s just difficult to measure the impact of a small tax on a single input for operations affected by many taxes on many inputs”.*²⁰⁸

4.3.7 Taxes on Chemical Fertilizers

The use of fertilisers are associated with extensive environmental damages arising from both their production and use – by one estimate, the external costs associated with the use of nitrogen fertilisers in Europe can be as much as 60% of the market price of the fertiliser.²⁰⁹ Taxes on fertilisers can act as a clear mechanism for internalising these costs; however, they can pose a significant burden on farmers. For example, von Blottnitz *et al* conclude that:

*“A tax equal to the external cost would be so large as to create serious problems for farmers and should be avoided in favour of tradable permits that are issued free. It would be especially perverse to make farmers pay a tax equal to the total external cost, since a large portion is caused by the producers of the fertilizer”.*²¹⁰

These authors do not calculate the actual number of job losses, but it can be assumed that they would likely be substantial if the full external costs were suddenly to be internalised through the use of a tax. There is an extensive body of literature on the use of taxes in relation to the improved use of fertilisers within the agriculture sector. However, there is less focus on how these taxes have impacted on- and off-farm employment opportunities in the European context.

²⁰⁸ Schuerhoff, M., Weikard, H., and Zetland, D. (2013) The Life and Death of the Dutch Groundwater Tax, *Water Policy*, Vol.15, No.6, pp.1064–1077

²⁰⁹ von Blottnitz, H., Rabl, A., Boiadjev, D., Taylor, T., and Arnold, S. (2006) Damage Costs of Nitrogen Fertilizer in Europe and their Internalization, *Journal of Environmental Planning and Management*, Vol.49, No.3, pp.413–433

²¹⁰ *Ibid.* p. 428.

5.0 Bulgaria

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

5.1 Energy Taxes

Excise duties for energy in Bulgaria, as of 1st July 2014 are as follows:²¹¹

- Petrol:
 - Leaded petrol:
 - Leaded petrol is forbidden from sale in Bulgaria.
 - Rate (2014): BGN 830.00 (€424.38) per 1,000 litres of fuel.
 - Unleaded petrol:
 - Rate (2014): BGN 710.00 (€363.02) per 1,000 litres of fuel.
 - Unleaded petrol containing minimum 4% biofuel: BGN 688.00 (€351.77) per 1,000 litres of fuel.²¹²
- Gas oil (diesel):
 - Gas oil used as a propellant or for industrial or commercial use:
 - Rate (2014): BGN 645.00 (€329.79) per 1,000 litres of fuel.
 - Under a voucher system, farmers are entitled to a BGN 310.00 (€158.50) discount per 1,000 litres of fuel.²¹³
 - Gas oil used for heating, both business and non-business use:
 - Rate (2014): BGN 50.00 (€25.56) per 1,000 litres of fuel.
- Kerosene:
 - Kerosene used as a propellant or for industrial or commercial use:

²¹¹ European Commission - Taxation and Customs Union (2014) Excise Duty Tables: Part II - Energy Products and Electricity, July 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/ra/tes/excise_duties-part_ii_energy_products_en.pdf

²¹² Ministry of Finance (Bulgaria) (no date) Excise Duties and Tax Warehouses Act, no date, <http://www.minfin.bg/document/12064:2>

²¹³ Council of Ministers (Republic of Bulgaria) (2014) Minister Grekov: The Distribution of Vouchers for Reduced Excise Duty on Diesel to Farmers Started, accessed 20 September 2014, <http://www.government.bg/cgi-bin/e-cms/vis/vis.pl?s=001&p=0234&n=437&g=>

- Rate (2014): BGN 645.00 (€329.79) per 1,000 litres of fuel.
- Kerosene used for heating, both business and non-business use:
 - Rate (2014): BGN 50.00 (€25.56) per 1,000 litres of fuel.
- Heavy fuel oil:
 - Heavy fuel oil used for heating, both business and non-business use:
 - Rate (2014): BGN 50.00 (€25.56) per 1,000 kg of fuel.
- Liquefied Petroleum Gas (LPG):
 - Propellant and industrial or commercial use:
 - Rate (2014): BGN 340.00 (€173.84) per 1,000 kg of fuel.
 - LPG for heating use (business and non-business):
 - Rate (2014): BGN 0.00 (€0.00) per 1,000 kg of fuel.
- Natural gas:
 - When used as a propellant or for industrial or commercial use:
 - Rate (2014): BGN 0.85 (€0.43) per GJ of fuel.
 - This rate is below the EU Directive minimum and Bulgaria has applied to the European Commission to use a provision in the Directive allowing lower rates of the tax on natural gas when less than 15% of the total energy consumption is natural gas.²¹⁴
 - Natural gas used for heating (business use):
 - Rate (2014): BGN 0.60 (€0.31) per GJ of fuel.
 - Natural gas used for heating (non-business use):
 - Rate (2014): BGN 0.00 (€0.00) per GJ of fuel.
- Coal and Coke:
 - Heating (business and non-business use):
 - Rate (2014): BGN 0.60 (€0.31) per GJ of fuel.
- Electricity:
 - Business and non-business use:
 - Rate (2014): BGN 2.00 (€1.02) per MWh.
 - Household usage of electricity is exempt from the excise duty.
- Revenue: The total revenue of all excise duties on energy products in 2012, the latest year for which figures are available were BGN 1.95 billion (€995 million),

²¹⁴ Sofia News Agency (2013) Bulgaria Asks EC to Keep Reduced Excise Rate on Natural Gas for Motor-Fuel Use, accessed 20 September 2014, <http://www.novinite.com/articles/153735/Bulgaria+Asks+EC+to+Keep+Reduced+Excise+Rate+on+Natural+Gas+for+Motor-Fuel+Use>

equivalent to 2.5% of GDP. This total revenue is broken down into the following constituent parts:²¹⁵

- BGN 1.90 billion (€972 million) from fuels;
- BGN 33 million (€17 million) from electricity;
- BGN 6.1 million (€3.1 million) from coal and coke; and
- BGN 6.1 million (€3.1 million) from natural gas.

5.2 Transport Taxes (Excluding Transport Fuels)

- There is no vehicle registration tax in Bulgaria.
- Circulation (Road) Tax:^{216 217}
 - All vehicles, aircraft and ships pay an annual circulation tax to the relevant local Municipality.
 - The range of rates of the tax is set by the government, with each Municipality able to determine the level they wish to charge within this range.
 - For passenger cars, the rate is set according to the engine power and age of the vehicle. These are the following:
 - Engine power up to 37 kW: BGN 0.34 (€0.17) – BGN 1.02 (€0.52) per kW
 - Engine power from 37 kW to 55 kW: BGN 0.40 (€0.20) – BGN 1.20 (€0.61) per kW
 - Engine power from 55 kW to 74 kW: BGN 0.54 (€0.28) – BGN 1.62 (€0.83) per kW
 - Engine power from 74 kW to 110 kW: BGN 1.10 (€0.56) – BGN 3.30 (€1.69) per kW
 - Engine power over 110 kW: BGN 1.23 (€0.63) – BGN 3.69 (€1.89) per kW
 - The rates above are multiplied by a specific coefficient which depends on the age of the vehicle. For vehicles older than 14 years, the coefficient is 14, for vehicles between 5 and 14 years old the coefficient is 1.5; for vehicles less than 5 years old, it is 2.8.
 - Rates for motorcycles are based on the engine size and are the following:

²¹⁵ Eurostat (2014) Revenue Data by Individual Tax (National Tax List), accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

²¹⁶ European Commission (2014) Taxes in Europe Database, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

²¹⁷ Republic of Bulgaria, Local Taxes and Fees Act (Закон за местните данъци и такси), Chapter 2, Section IV, Transport Vehicle Tax.

- Up to 125 cc: BGN 12.00 (€6.14) – BGN 36.00 (€18.41)
- From 125 cc to 250 cc: BGN 25.00 (€12.78) – BGN 75.00 (€38.35)
- From 250 cc to 350 cc: BGN 35.00 (€17.90) – BGN 105.00 (€53.69)
- From 350 cc to 490 cc: BGN 50.00 (€25.57) – BGN 150.00 (€76.70)
- From 490 cc to 750 cc: BGN 75.00 (€38.35) – BGN 225.00 (€115.04)
- Over 750 cc: BGN 100.00 (€51.13) – BGN 300.00 (€153.39)
- The rate for buses is BGN 50.00 (€25.57) – BGN 150.00 (€76.70) for buses with up to 22 seats and BGN 100.00 (€51.13) – BGN 300.00 (€153.39) for buses with more than 22 seats. Lorries up to 12 tonnes pay BGN 10.00 (€5.11) – BGN 30.00 (€15.34) per tonne of maximum permissible weight. Lorries above 12 tonnes pay according to the number of axles and maximum permissible weight, with rates ranging from BGN 30.00 (€15.34) to 3,150.00 (€1,610.59).
- As of 1 January 2013, electric vehicles are exempt from this tax.²¹⁸
- For vehicles with engine power up to 74 kW, the following rate reductions apply:
 - Vehicles fitted with catalytic converters which do not conform to Euro III, Euro IV, Euro V and Euro VI emissions standards: 20% – 40%
 - Vehicles conforming to emissions standards Euro III and Euro IV: 50%
 - Vehicles conforming to emissions standards Euro V and Euro VI: 60%
- Revenue in 2012 (the latest year for which figures are available) was BGN 180 million (€92 million), equivalent to 0.23% of GDP.

➤ Other Taxes:

- Bulgaria implemented an aircraft noise tax in November 2012. This tax is levied on all aircraft traffic at one of five international airports in Bulgaria.²¹⁹

²¹⁸ Ministry of Finance (Bulgaria) (no date) *Transport Vehicle Tax*, accessed 21 September 2014, <http://www.minfin.bg/en/page/779>

²¹⁹ Ministry of Transport (Bulgaria) (2012) *Ordinance on the taxes for use of public airports and navigational services in Bulgaria*, 30th November 2012, http://caa.gateway.bg/upload/docs/NAREDBA_za_taksite_za_izpolzvane_na_letisata_za_obsestveno_polz_vane_i_za_aeronavigacionno_obs_lujvane.pdf

- The tax rate is calculated as a multiple of a “base noise unit” (set at EUR 3.74 since 01.01.2013). The multiplier used varies according to the maximum takeoff weight of the aircraft (helicopters and aircraft under 9 tonnes MTOW are exempt) as well the time of the day of the takeoff or landing and the noise categorization of each aircraft type.
- The revenue from this tax is used by the airport to fund noise-monitoring and noise limitation activities.
- Revenue for the 1-year period from July 2013 to June 2014 for Sofia airport is estimated at BGN 641 thousand (€328 thousand), equivalent to 0.0008% of GDP. The other 4 Bulgarian international airports may be expected to generate significantly less revenue from the noise tax, based on traffic volumes.²²⁰
- Bulgaria also uses a road vignette system, where cars must pay an annual fee to use public highways. The rate depends on the type of the vehicle (with heavy goods vehicles paying a much higher rate than passenger vehicles), the validity period of the vignette and, for some vehicles, the emissions class. From 1 January 2014, annual vignette fees range from €34 for passenger vehicles to €665 for heavy goods vehicles with emissions classes Euro 0, Euro I or Euro II.²²¹

5.3 Pollution and Resource Taxes

The following section outlines the pollution and resources taxes in Bulgaria.

➤ Landfill tax:²²²

- Bulgaria is one of the most recent EU Member States to impose a tax on landfilling waste, having introduced the tax from 1 January 2011.
- Rates have increased each year from 2011 through 2014. The current rate for all waste types (including municipal waste and construction and demolition waste) is BGN 22 (€11.25) per tonne, with plans to increase this rate to BGN 95 (€48.57) by 2020.²²³

²²⁰ Sofia Airport (2014) *Airport Taxes Income and Expenses*, 28th February 2014, http://www.sofia-airport.bg/UserFiles/%D0%9F%D1%80%D0%B8%D0%BB%D0%BE%D0%B6%D0%B5%D0%BD%D0%B8%D0%B5%203_%D0%A0%D0%B0%D0%B7%D1%85%D0%BE%D0%B4%D0%B8%20%D0%B8%20%D0%9F%D1%80%D0%B8%D1%85%D0%BE%D0%B4%D0%B8.pdf

²²¹ Road Infrastructure Agency (Bulgaria) (2014) *Vignette Stickers*, accessed 21 September 2014, <http://www.api.bg/index.php/en/vinetni-stikeri>

²²² European Topic Centre on Sustainable Consumption and Production (2012) *Overview of the Use of Landfill Taxes in Europe*, Report for European Environment Agency, April 2012, http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1, pp. 24-25.

²²³ MOEW (2013) *Landfill Tax Ordinance 7/2013*, http://www.moew.government.bg/files/file/Waste/Legislation/Naredbi/waste/NAREDBA_7_ot_19.12.2013_g_za_reda_i_nachina_za_izchislqvane_i_opredelqne_razmera_na_obezpecheniqta_i_otchisleniqta_izis_kvani_pri_deponirane_na_otpadaci.pdf

- Landfill tax is paid on a quarterly basis by municipalities to the Regional Inspectorates for Environment and Water.
 - Total revenues in 2012 amounted to BGN 27.4 million (€14 million), equivalent to 0.035% of GDP.²²⁴
- Single use bag levy:^{225 226}
- Bulgaria has imposed a product tax on single use plastic bags since October 2011. The tax was first imposed at a rate of BGN 0.15 (€0.08) per bag.²²⁷ Since then it has increased annually to the current rate (2014), which is BGN 0.55 (€0.28) per bag. All producers and importers of plastic bags are required to pay the tax, the cost of which is usually passed on to the consumer.
 - Revenues from the plastic bag tax are not known.
- Although there are no further pollution and resources taxes in Bulgaria, there are a number of additional relevant charges. These include the following:
- Municipal waste collection charges for households and companies, based on the value of the property, are intended to cover the direct costs of collection and treatment only, not externalities associated with these activities. Rates vary across municipalities.²²⁸ Revenues from the charges amount to BGN 463 million (€237 million) in 2012, equivalent to 0.59% of GDP.²²⁹ This is among the most significant sources of revenue for many municipalities. These charges are out of scope of this work, but have been included here for completeness.
 - Environmental product fees (under a producer responsibility scheme) are also paid by producers of certain items within six waste streams, including packaging materials, batteries, WEEE and vehicles. These can be avoided by producers arranging collection and recycling of a specific percentage of the waste associated with their products; most producers and importers are members of a producer responsibility scheme and thus pay a licence

²²⁴ MOEW (2013) *Landfill Tax Ordinance 7/2013*, http://www.moew.government.bg/files/file/Waste/Legislation/Naredbi/waste/NAREDBA_7_ot_19.12.2013_g_za_reda_i_nachina_za_izchislqvane_i_opredelqne_razmera_na_obezpecheniqta_i_otchisleniqta_izis_kvani_pri_deponirane_na_otpadaci.pdf

²²⁵ Earth Policy Institute (2014) *Plan B Updates: The Downfall of the Plastic Bag: A Global Picture*, accessed 3 September 2014, http://www.earth-policy.org/plan_b_updates/2013/update123

²²⁶ Adamowski, J. (2012) *Bulgaria to Increase Plastic Bag Tax by 233%*, accessed 22 September 2014, <http://www.europeanplasticsnews.com/subscriber/headlines2.html?id=1643>

²²⁷ Using the average exchange rate for 2011.

²²⁸ BiPRO, Arcadis, and Enviroplan (2012) *Support to Member States in Improving Waste Management Based on Assessment of Member States' Performance - Roadmap for Bulgaria*, Report for European Commission - DG Environment, 2012, http://ec.europa.eu/environment/waste/framework/pdf/BG_Roadmap_FINAL.pdf, pp. 5-6.

²²⁹ Ministry of Environment and Water of Bulgaria (2014) *National Waste Management Plan (draft)*, www.moew.government.bg/?show=html&hid=173

fee to these.²³⁰ Current rates (2014) vary from BGN 0.13 (€0.07) per kg of metal-based packaging material to BGN 2.33 (€1.19) per kg of plastics.²³¹ Total revenues for the product fees in 2013 amount to BGN 2.1 million (€1.1 million), equivalent to 0.0027% of GDP.²³²

- Finally, some previous studies suggest that taxes on water abstraction and waste water were due to be implemented in 2013, following the publication of the National Strategy for Management and Development of the Water Sector in 2012.²³³ It is not known whether these taxes have been implemented, though progress updates on water management reported in Bulgaria's 2014 National Reform Programme indicate that it is unlikely that they have been implemented.²³⁴
- Water Abstraction Charges:
 - Water abstraction and use is charged at volumetric rates in Bulgaria. The Water Act, which was first enacted in 1999 provides the regulatory foundation for fees which can be charged on water abstraction of surface water and groundwater and on waste water discharge.²³⁵ Despite this, no uniform pricing structure exists across the country.
 - The foundation for new (higher) rates was introduced in an amendment to the Water Act in 2011 as rates had previously remained the same since they were first introduced more than ten years previously.²³⁶ The charges depend on the customer type, the type of water abstracted and is either area based (for irrigation) or volumetric. The charge is made up of two elements, the abstraction fee and the water supply charge; charges do not ensure full cost recovery.²³⁷ The rates for volumetric based charges are provided in Table 5-1.

Table 5-1: Water Abstraction Tax Rate

Tax Type	Water Usage	Tax Rate (BGN per m ³)	Tax Rate (€ per m ³)
Surface water	Drinking water	0.02	0.01

²³⁰ IEEP (2013) Steps to Greening Country Report: Bulgaria, Report for the European Commission, p.19

²³¹ See <http://www.ecopack.bg/en/why-choose-ecopack/178/view/>

²³² EMEPA (2013) *Report of the Company for Management Activities 2013*, <http://pudoos.bg/%D0%BE%D1%82%D1%87%D0%B5%D1%82%D0%B8/>

²³³ IEEP (2013) Steps to Greening Country Report: Bulgaria, Report for the European Commission, pp. 6-7

²³⁴ Republic of Bulgaria (Ministry of Finance) (2014) *Europe 2020: National Reform Programme - 2014 Update*, April 2014, http://ec.europa.eu/europe2020/pdf/csr2014/nrp2014_bulgaria_en.pdf, pp.95-97.

²³⁵ Ministry of Environment and Water (2013) *Water Act*, http://www.moew.government.bg/files/file/Water/Legislation/Zakoni/English_versions/Water_act.pdf

²³⁶ IEEP (2013) Steps to Greening Country Report: Bulgaria, Report for the European Commission, pp. 6-7

²³⁷ ARCADIS, InterSus, Fresh Thoughts Consulting, Eco Logic, and TYP SA (2012) *The Role of Water Pricing and Water Allocation in Agriculture in Delivering Sustainable Water Use in Europe*, Report for European Commission Directorate-General for the Environment, February 2012, www.enorasis.eu/uploads/files/Water%20Governance/role_water_pricing.pdf

Tax Type	Water Usage	Tax Rate (BGN per m ³)	Tax Rate (€ per m ³)
abstraction	Irrigation of agricultural crops, livestock, aquaculture	0.001	0.0005
	Cooling	0.0003	0.0002
	Industrial water	0.045	0.023
	Other purposes	0.065	0.033
			0.01
	Own drinking water supply	0.75	0.38
	Cooling	0.0008	0.0004
	Irrigation of agricultural crops, livestock, aquaculture	0.01	0.005
	Industrial water supply and own drinking water supply, when water used for production of food, pharmaceuticals and cosmetics	0.07	0.036
	Other purposes	0.16	0.082
	Self-abstraction for human consumption	0.75	0.38

Source: Ministry of Environment and Water (2012) *Tariff of Fees for Water Use*, 1st January 2012

➤ Other Water Taxes

- Water pollution taxes are also in place.²³⁸ A tax rate of BGN 0.005 (€0.0026) per m³ for discharge to surface water bodies applies. From 2021 onwards the tax rate will be increased to BGN 0.020 (€0.010) per m³. The tax rate for discharge to groundwater bodies is dependent on a number of variables according to the following equation.

$$T = K_i \times \sum (M_i \times E_i)$$

Where:

- T = total annual tax in BGN
- K = coefficient depending on the chemical status of the groundwater body that gets the wastewater (ranges from 1 to 100)
- M = pollution load in kg per year
- E = tax in BGN per kg or BGN per 1 degree C or BGN per m³
- i = pollutant
- The tax rates can range from a maximum of BGN 1 (€0.51) per kg of pollutant to a minimum of BGN 0.0001 (€0.000051) per kg of pollutant.

²³⁸ Ministry of Environment and Water (2012) *Tariff of Fees for Water Use*, 1st January 2012

- A tax also applies to the extraction of inert materials from water bodies. The current tax rate is BGN 1 (€0.51) per m³ of inert materials.²³⁹
 - The total revenue from all water taxes in 2013 amounts to BGN 51.4 million (€26.3 million), equivalent to 0.066% of GDP. This is the single most important revenue source for EMEPA (Enterprise for Management of Environmental Protection activities, a fund operated by the Ministry of Environment and Water).²⁴⁰
- Water Consumption Charges
- Residential and commercial consumers are charged for the consumption of water. Different prices are charged in different cities. For example, in Sofia a volumetric pricing system is in place, made up of the following three components:
 - Water supply: BGN 0.99 (€0.51) per m³;
 - Sewerage collection: BGN 0.20 (€0.10) per m³; and
 - Wastewater treatment: BGN 0.28 (€0.14) per m³.
 - For residential and commercial consumers the tariffs are regulated for each individual water and wastewater operators (a total of 62 including more than 20 regional companies, some municipal companies, 1 private operator in Sofia and several large industrial companies who treat municipal water) by the state regulator: the State Commission for Energy and Water Regulation (SCEWR).
 - The tariffs are calculated taking into account the “necessary annual income” for each company to operate without a loss, the metered volumes of supplied water and collected and treated wastewater (supplied drinking water is metered at the household while wastewater is only metered at central collectors and wastewater treatment plants, if at all, or is calculated based on the supplied water), as well as certain allowances for drinking water losses and sewerage groundwater infiltration. Industrial companies sign individual contracts with their water and wastewater operators, which also use SCEWR-regulated tariffs for treatment of wastewater. These are much higher and depend on the level of pollution of the wastewater.

5.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

²³⁹ Ministry of Environment and Water (2012) *Tariff of Fees for Water Use*, 1st January 2012

²⁴⁰ EMEPA (2013) *Report of the Company for Management Activities Environmental Protection in 2013*, February 4th 2013, http://pudoos.bg/wp-content/uploads/2014/03/GOD-OT4ET-2013_FINAL.doc

Table 5-2: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	993	979	-14
Petrol	million litres	319	319	0
Kerosene	million litres	95	95	0
LPG	thousand tonnes	157	141	-16
Heavy Fuel Oil	thousand tonnes	32	31	-1
Natural Gas	TJ (GCV)	21,973	20,481	-1,492
Coal	thousand tonnes	1,309	1,303	-6
Electricity	GWh	12,941	12,941	0

Figure 5-1: Change in Internal Passenger Flights, flights per year

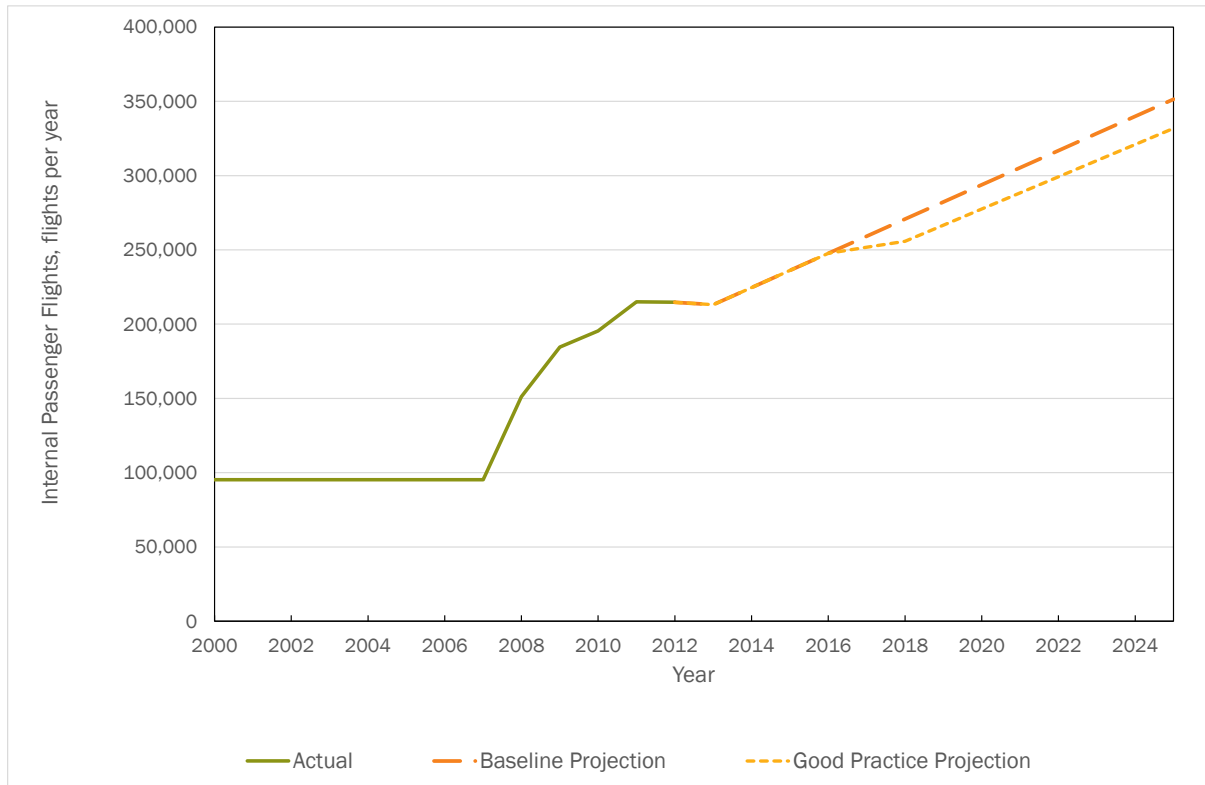


Figure 5-2: Change in Intra-EU Passenger Flights, flights per year

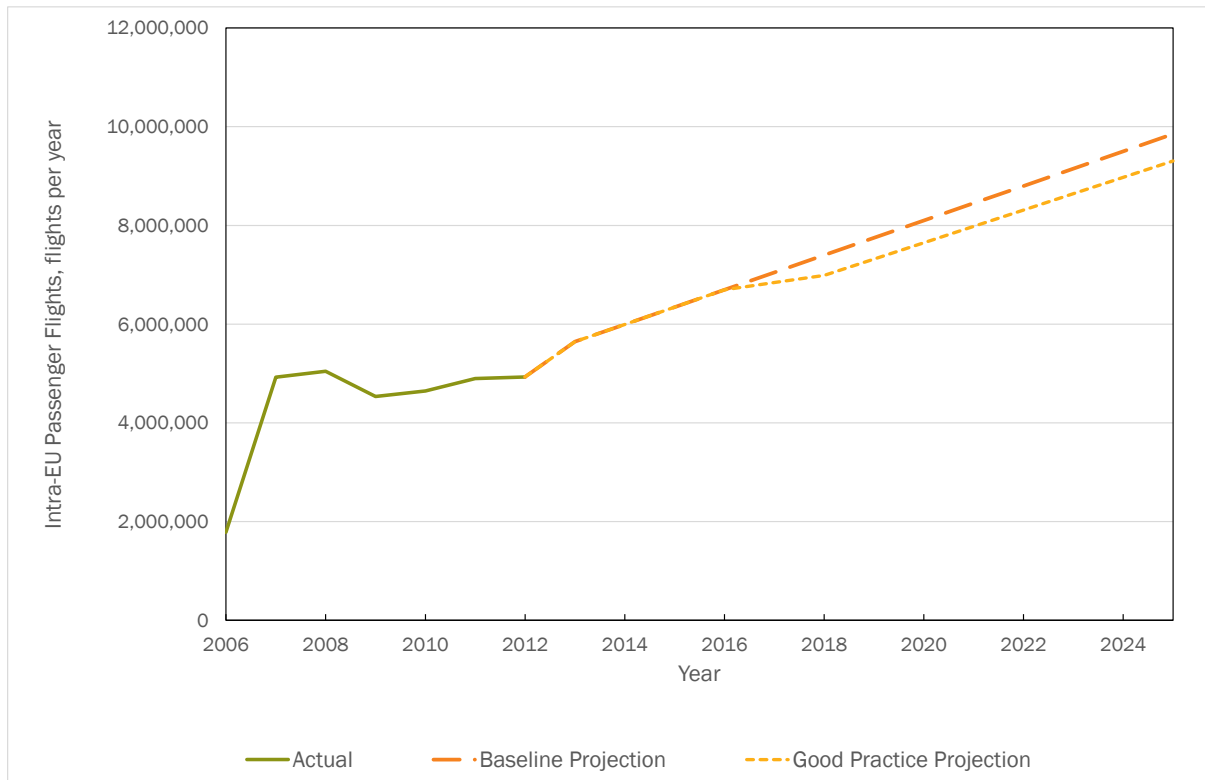


Figure 5-3: Change in Extra-EU Passenger Flights, flights per year

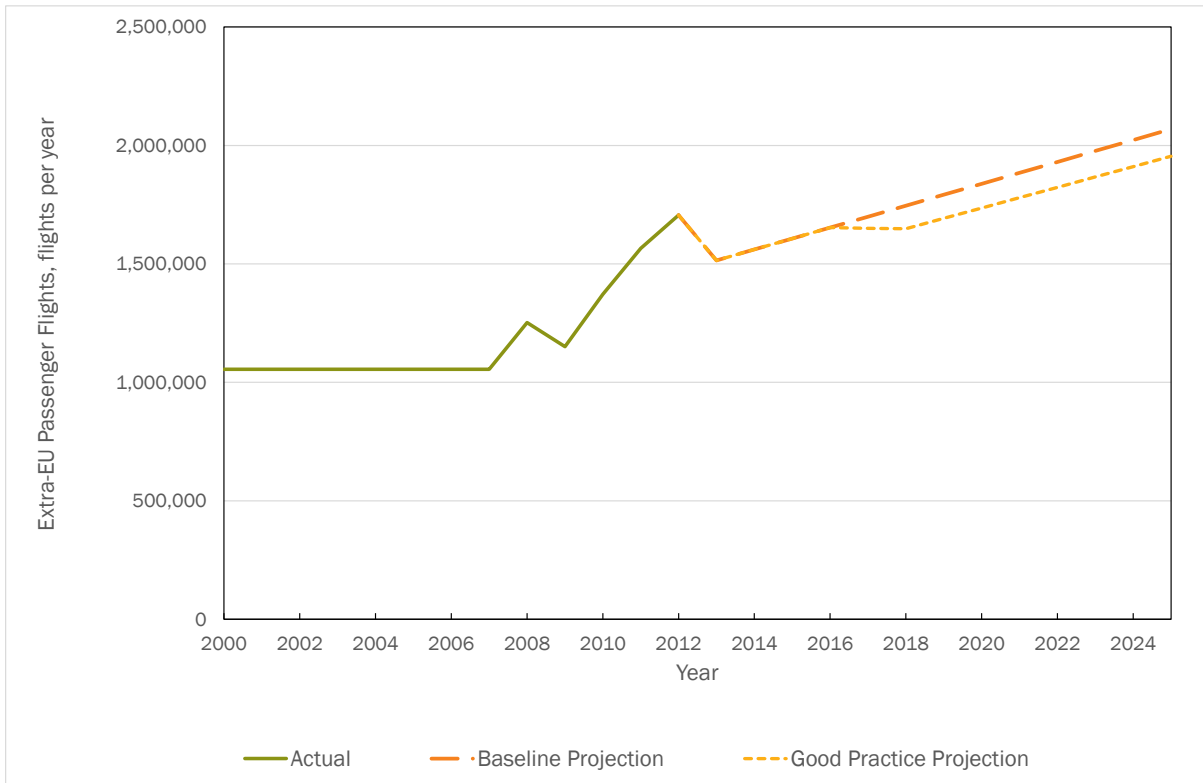


Figure 5-4: Change in Internal Air-freight, tonnes

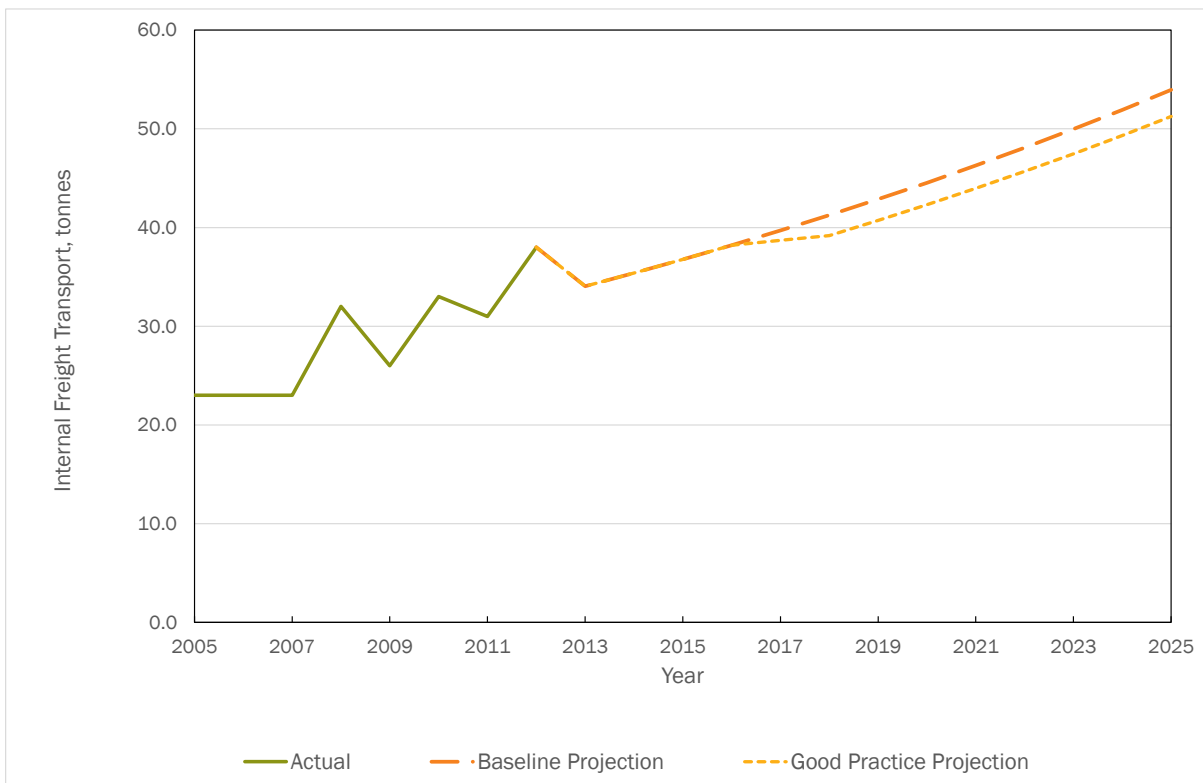


Figure 5-5: Change in Intra-EU Air-freight, tonnes

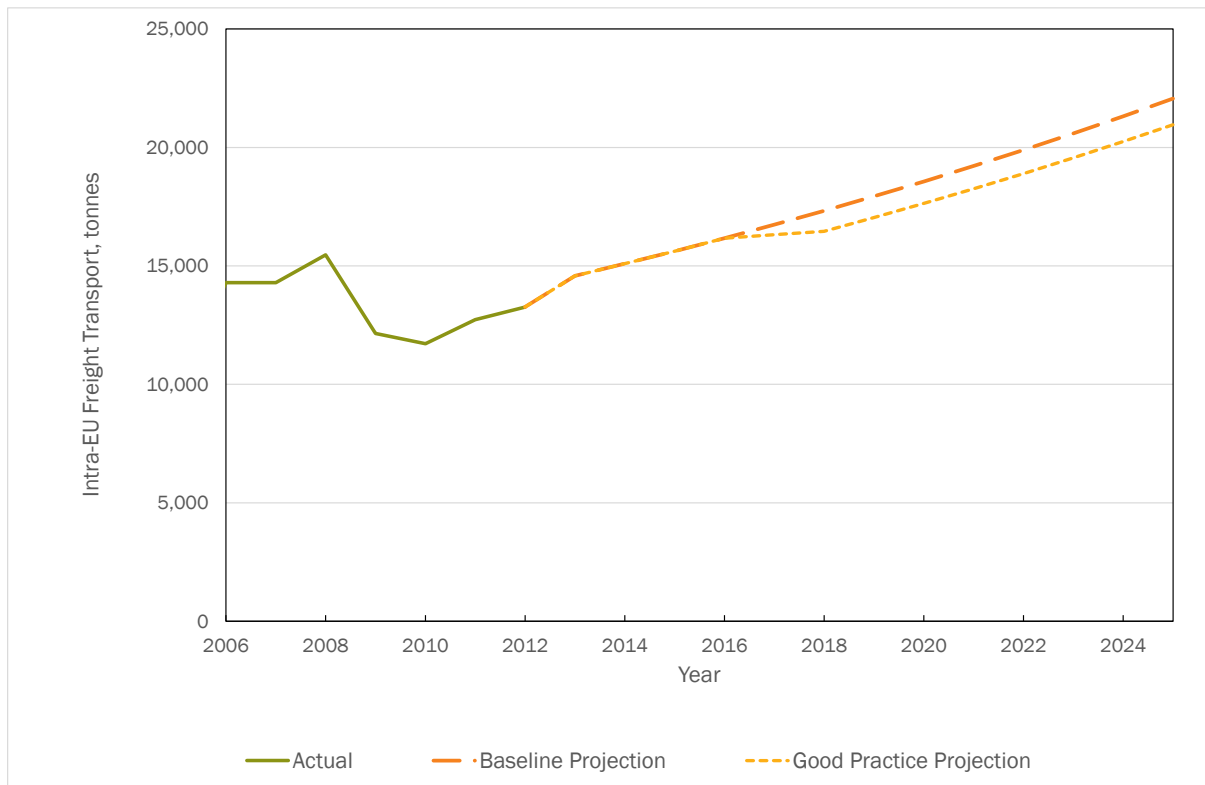


Figure 5-6: Change in Extra-EU Air-freight, tonnes



Figure 5-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

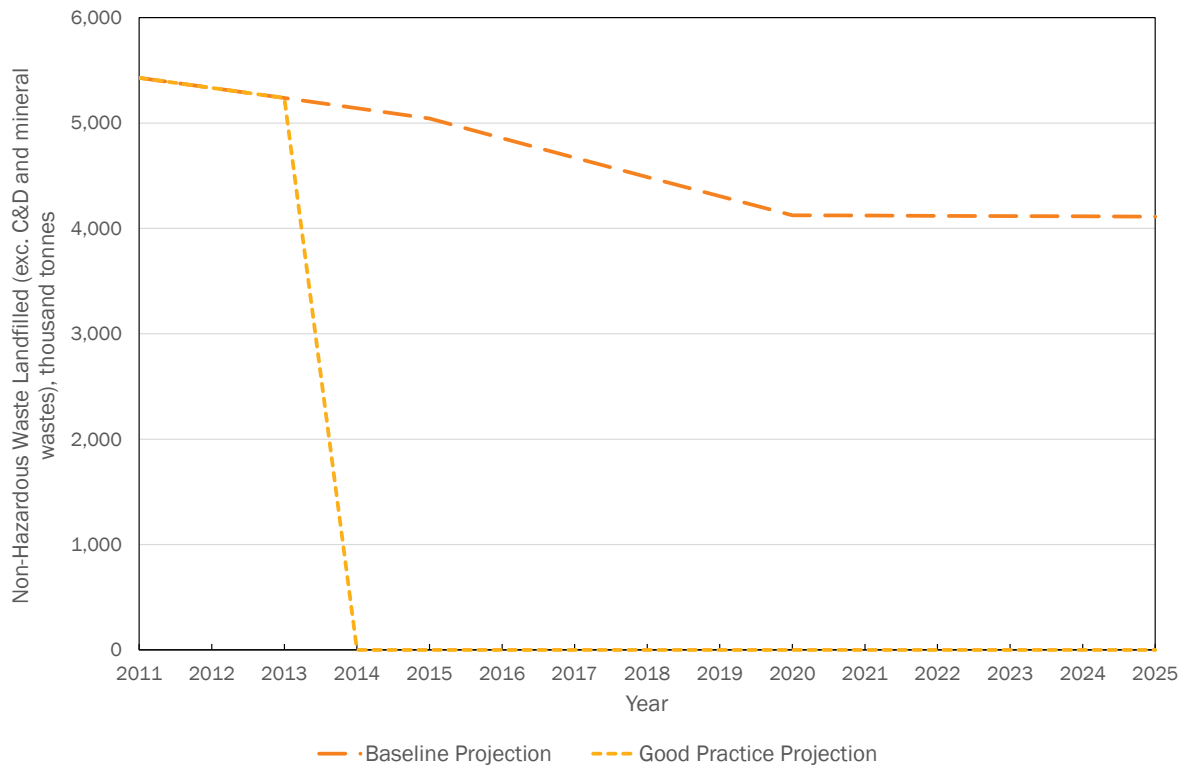


Figure 5-8: Change in MBT/ Incineration, thousand tonnes

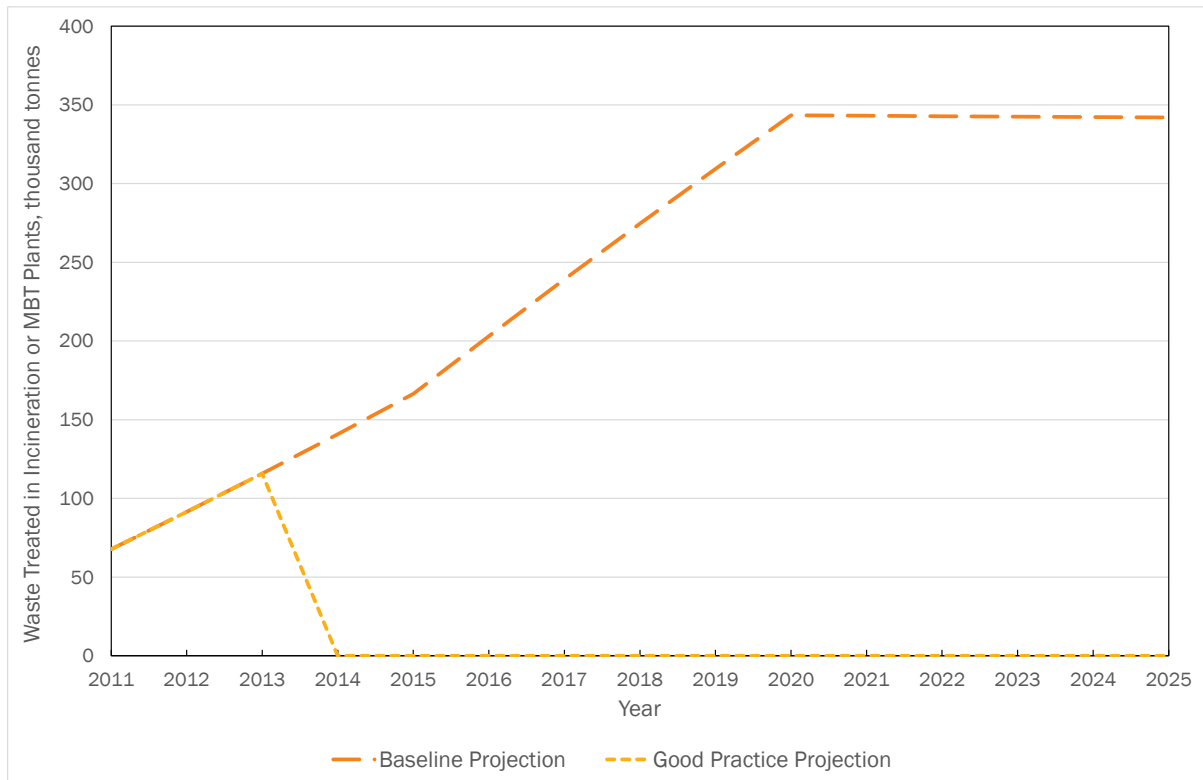


Figure 5-9: Change in SOx Emissions, tonnes

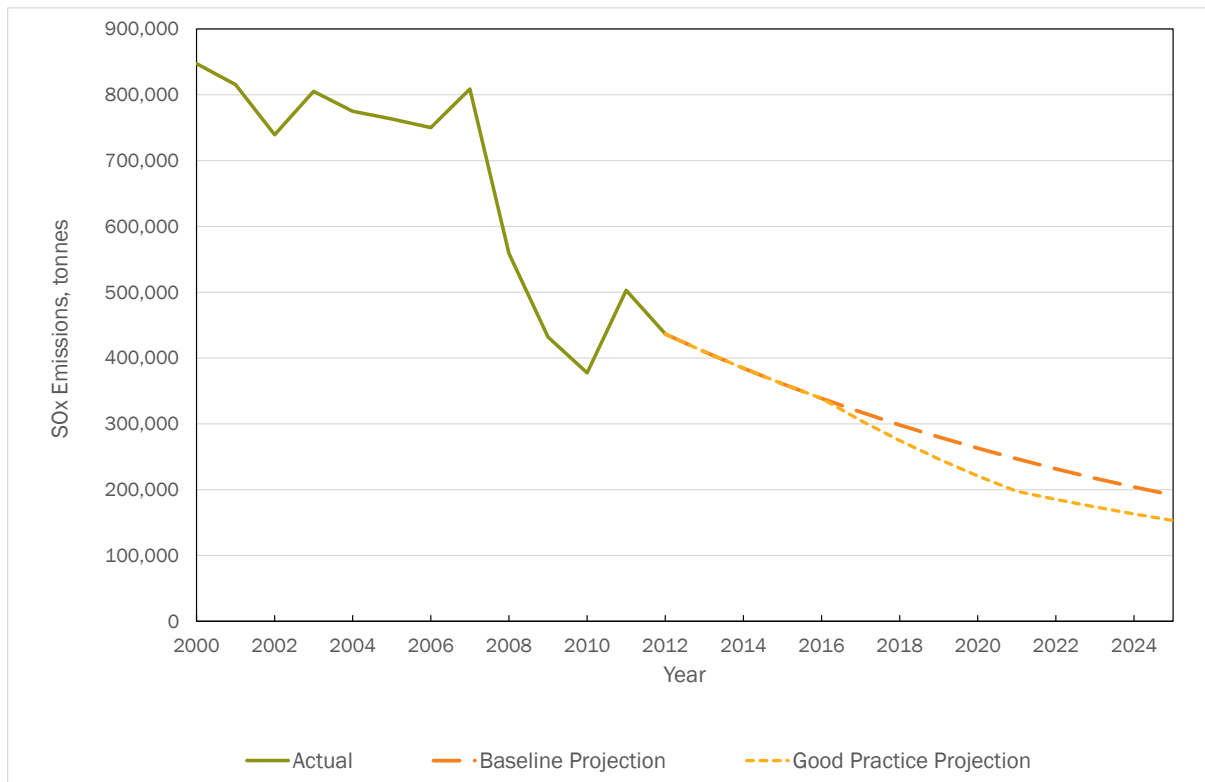


Figure 5-10: Change in NOx Emissions, tonnes

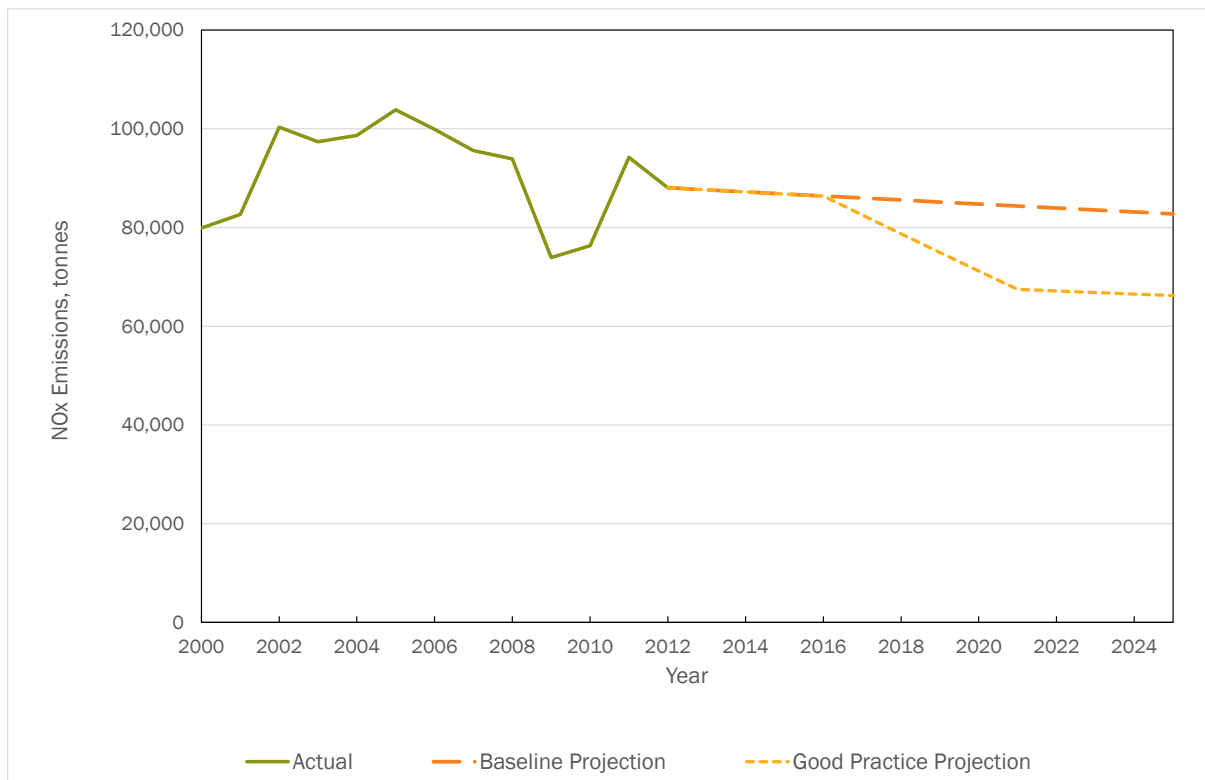


Figure 5-11: Change in PM₁₀ Emissions, tonnes

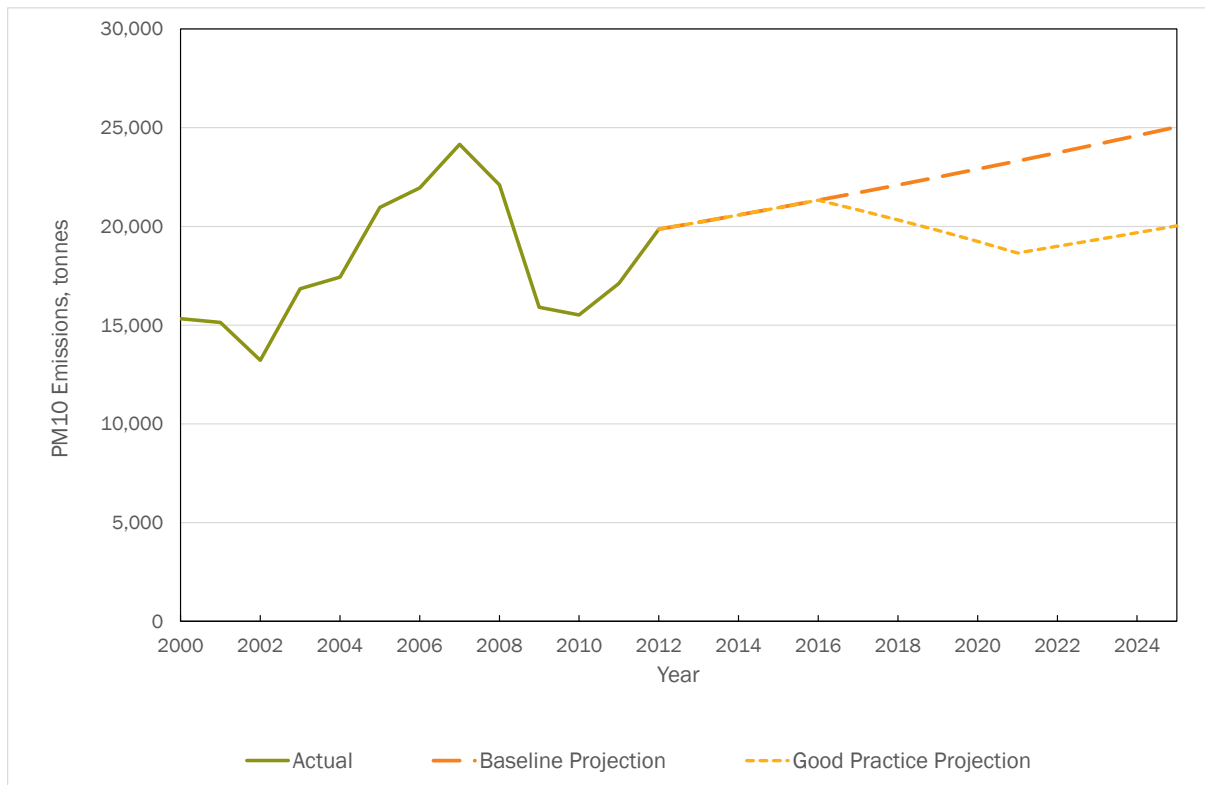


Figure 5-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

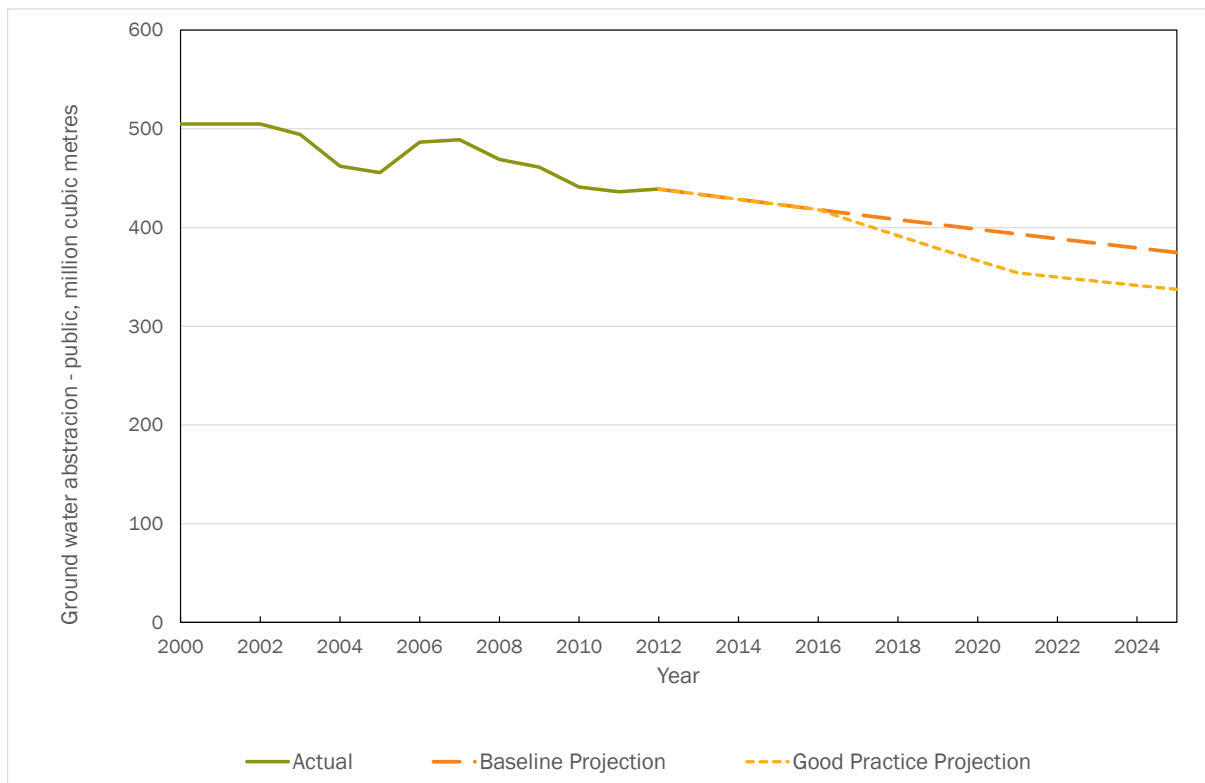


Figure 5-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

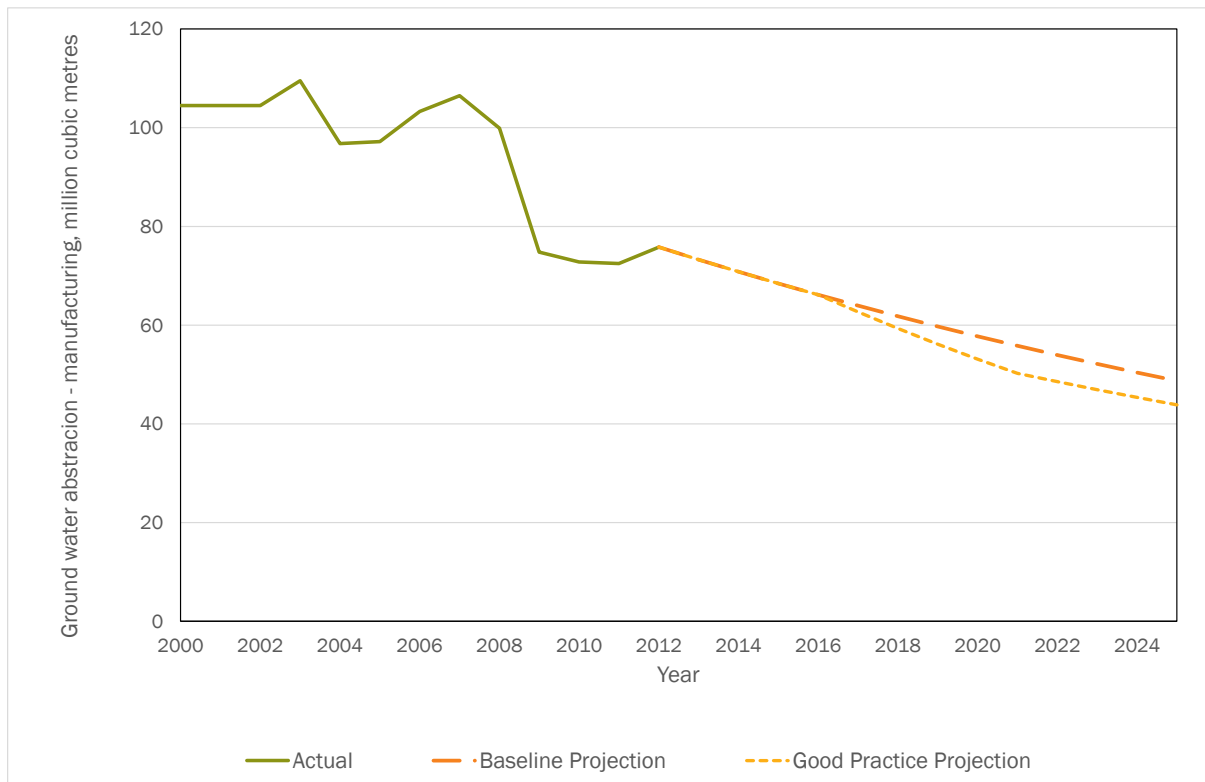


Figure 5-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

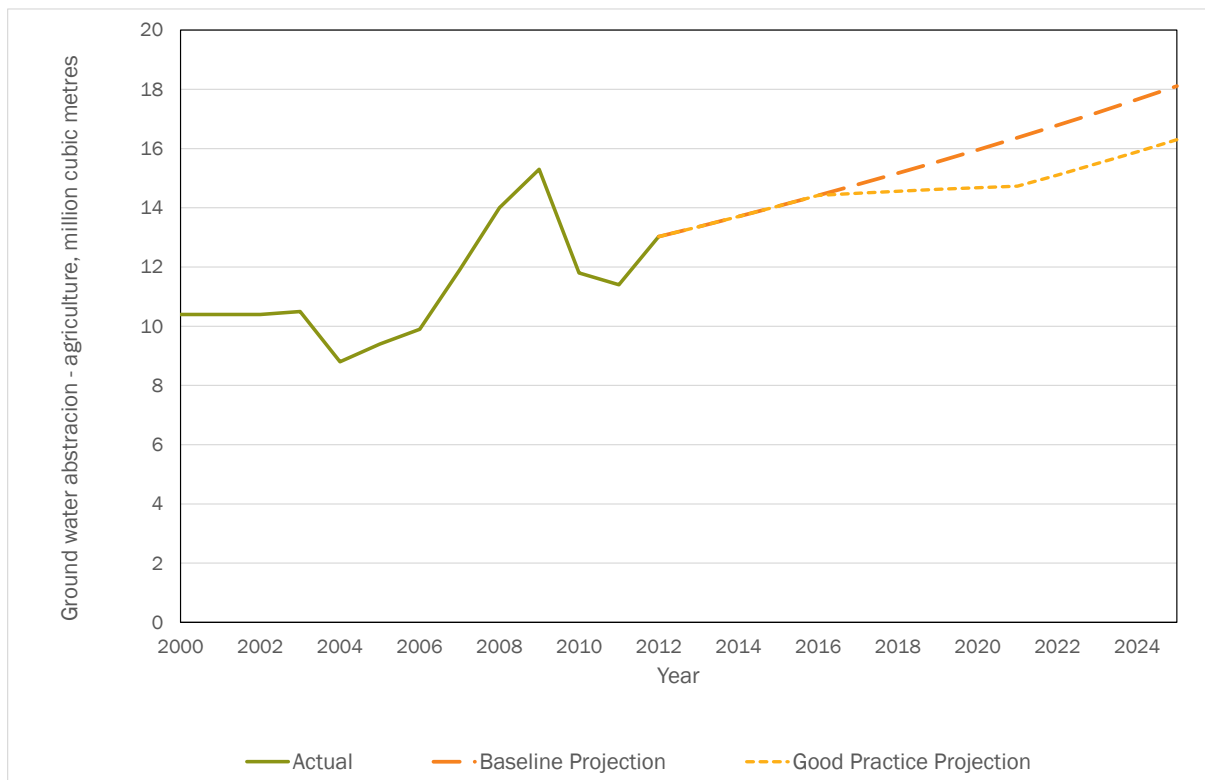


Figure 5-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

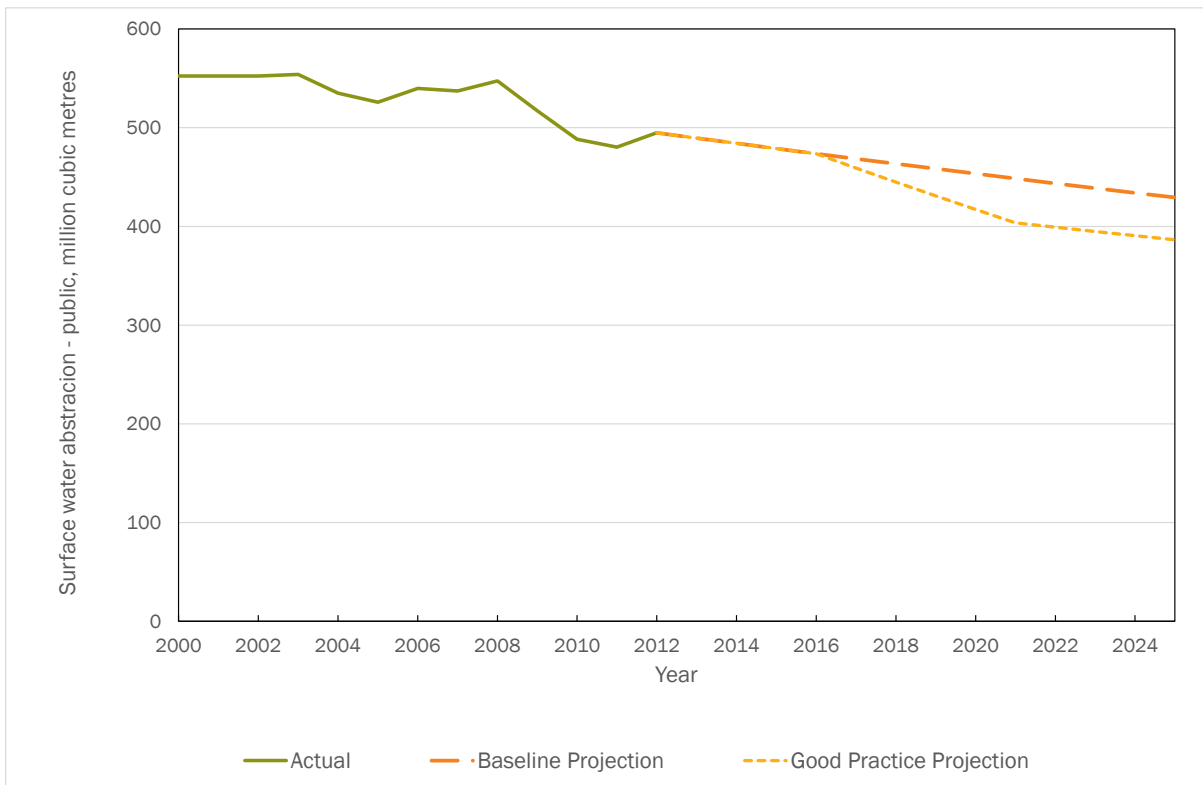


Figure 5-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres

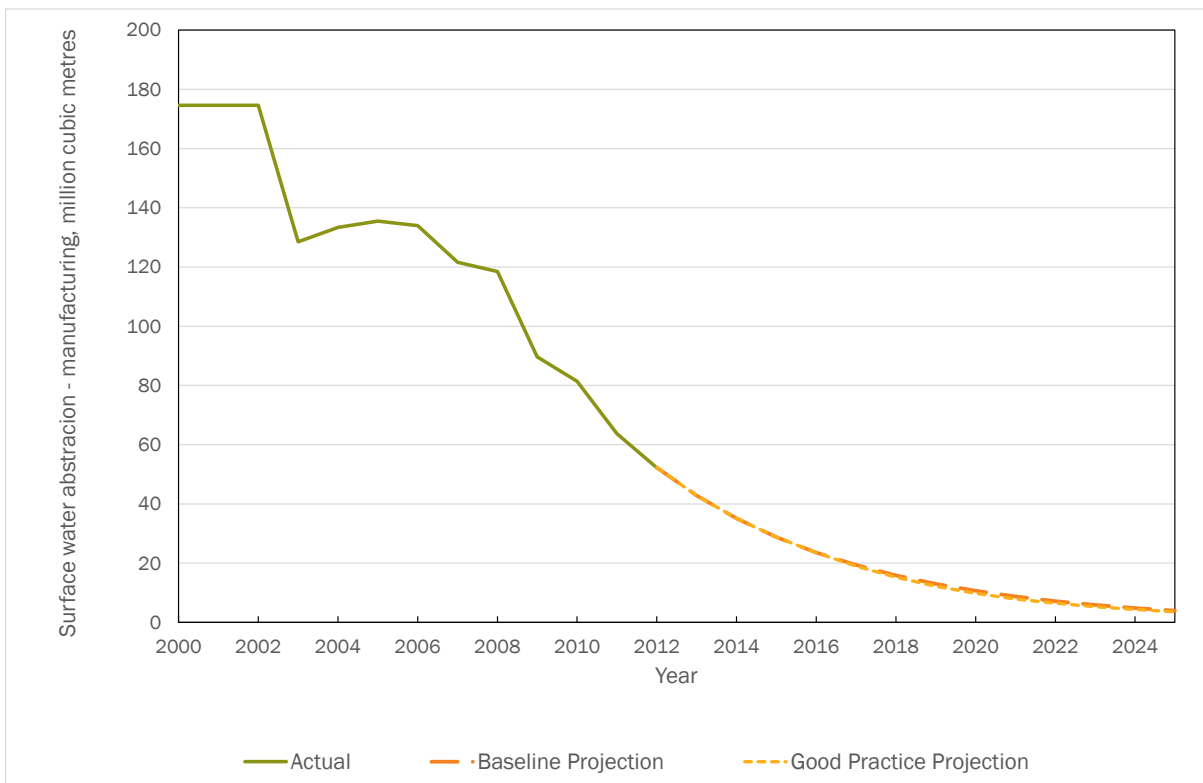


Figure 5-17: Change in Surface Water Abstraction – Agriculture, million cubic metres



Figure 5-18: Change in Active Ingredients in Pesticides, tonnes

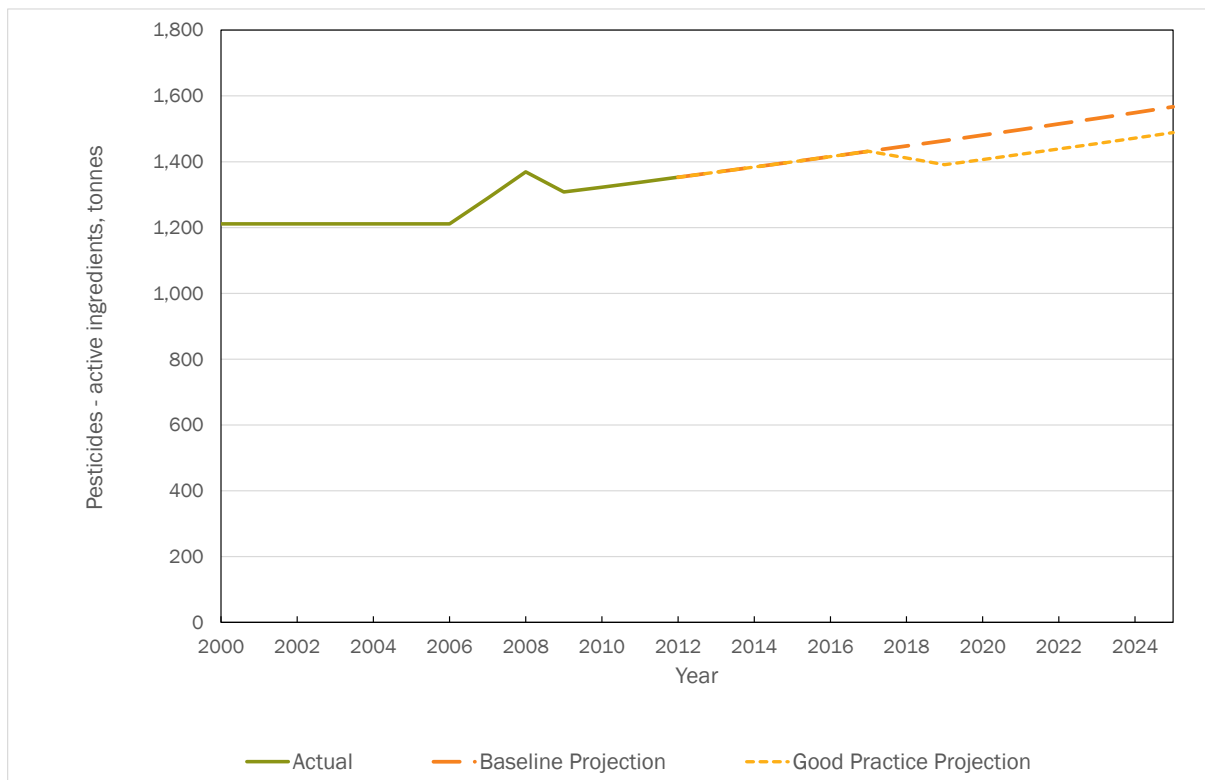


Figure 5-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes



Figure 5-20: Change in Aggregates Extraction, thousand tonnes



Figure 5-21: Change in Paper & Card Packaging Generation, thousand tonnes

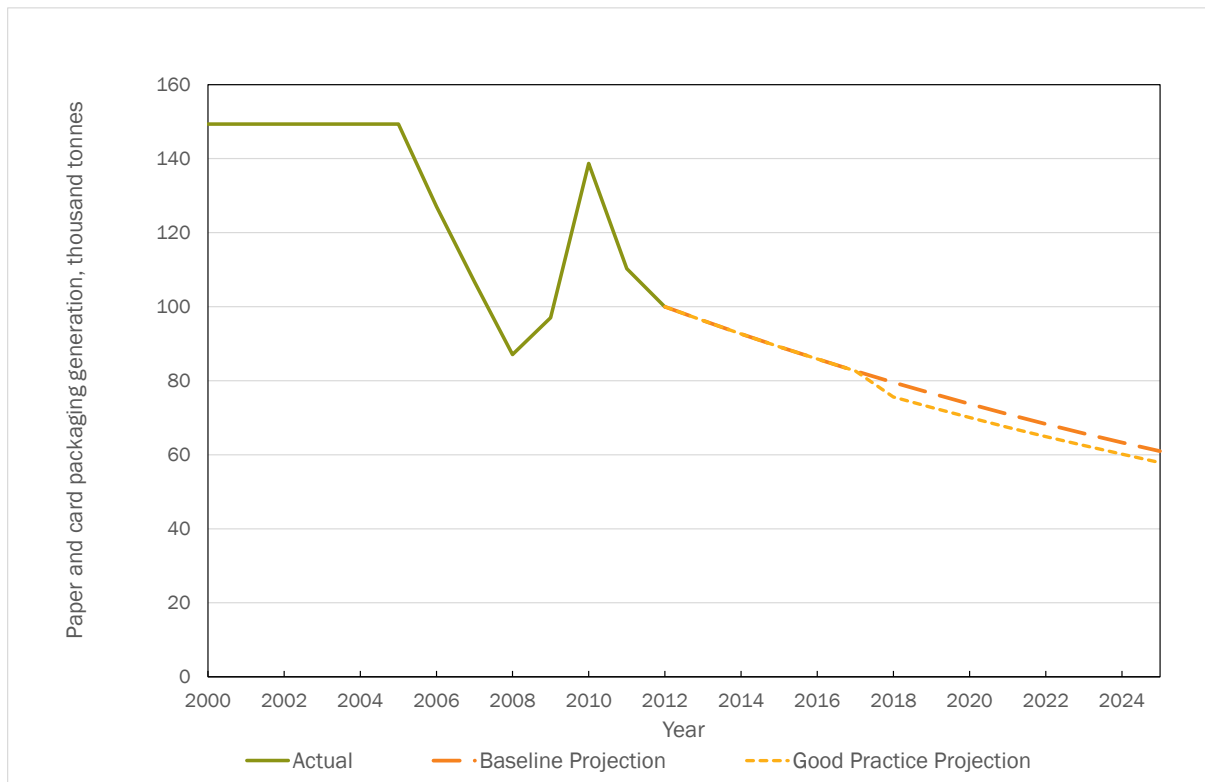


Figure 5-22: Change in Plastic Packaging Generation, thousand tonnes

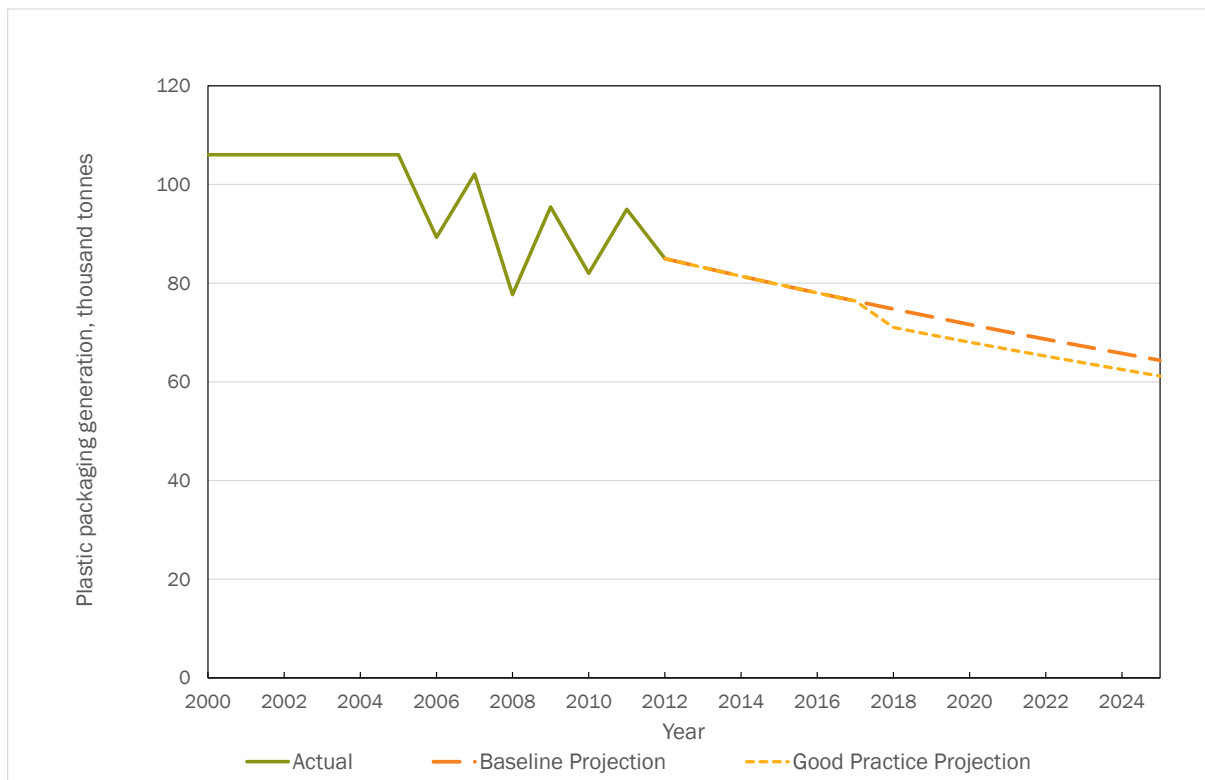


Figure 5-23: Change in Wood Packaging Generation, thousand tonnes



Figure 5-24: Change in Metal Packaging Generation, thousand tonnes

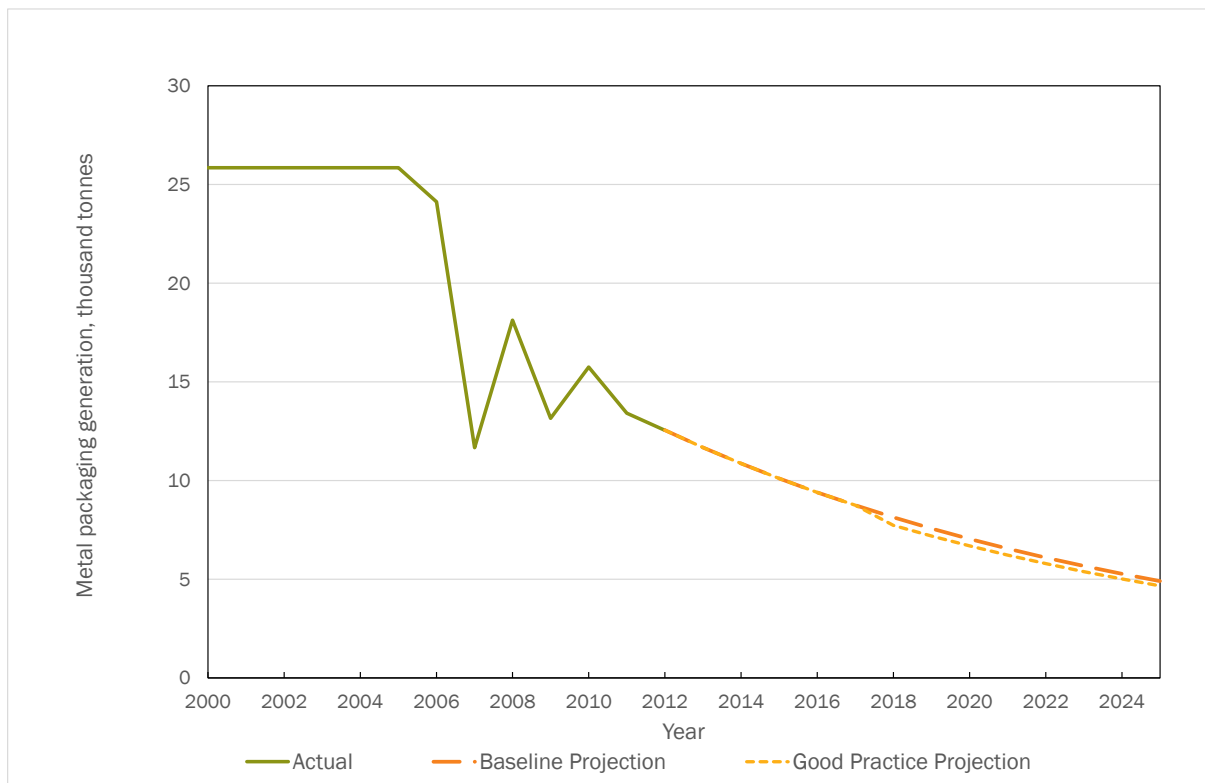


Figure 5-25: Change in Glass Packaging Generation, thousand tonnes



Figure 5-26: Change in Consumption of Single Use Carrier Bags, million bags



5.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 5-3: Revenue Outturns from Model, million BGN (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	44	87	128	169	208	247	285	285	285
	C&I / Heating	0	0	76	151	151	151	151	151	151	151	151
	Electricity	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million BGN	0	0	120	238	280	320	360	399	437	437	437
	Sub-total Energy, % GDP	0.0%	0.0%	0.1%	0.3%	0.3%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	0	0	0	0	0	0	0	0	0
	Passenger Aviation Tax	0	0	252	510	531	552	573	593	614	635	656
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Transport, million BGN	0	0	252	510	531	552	573	594	614	635	656
	Sub-total Transport, % GDP	0.0%	0.0%	0.3%	0.6%	0.6%	0.7%	0.7%	0.7%	0.7%	0.8%	0.8%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	21	41	60	79	47	9	9	9	9	9
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	1	3	6	8	9	9	9	9	9	9

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	183	336	462	565	646	591	568	546	526	507
	Water Abstraction Tax	0	4	7	11	14	17	17	17	17	17	17
	Waste Water Tax	0	12	23	33	32	32	32	32	32	32	32
	Pesticides Tax	0	0	7	14	14	14	14	14	14	14	15
	Aggregates Tax	0	0	201	176	150	124	125	127	128	129	131
	Packaging Tax	0	0	16	14	14	13	13	12	12	12	11
	Single Use Bag Tax	0	0	0	0	0	0	0	0	0	0	0
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million BGN	0	221	634	776	876	903	810	788	768	749	732
	Sub-total Pollution & Resource, % GDP	0.0%	0.3%	0.8%	0.9%	1.0%	1.1%	1.0%	0.9%	0.9%	0.9%	0.9%
Total Revenue Stream	Total, million BGN	0	221	1,006	1,525	1,686	1,775	1,743	1,781	1,819	1,821	1,824
	Total, % GDP	0.0%	0.3%	1.2%	1.8%	2.0%	2.1%	2.1%	2.1%	2.2%	2.2%	2.2%

6.0 Cyprus

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

6.1 Energy Taxes

In Cyprus, the following excise duties on energy currently apply.²⁴¹ Many of these rates increased significantly in 2013 as a part of fiscal consolidation measures undertaken by the government in order to eliminate its budget deficit as required by the Economic Adjustment Programme that has been implemented since April 2013:

➤ **Petrol:**

- Leaded petrol:
 - Rate (2014): €421.00 per 1,000 litres of fuel
- Unleaded petrol:
 - Rate (2014): €479.00 per 1,000 litres of fuel

➤ **Gas oil (diesel):**

- When gas oil is used as a propellant or for industrial/commercial use, one rate applies:
 - Rate (2014): €450.00 per 1,000 litres of fuel
 - When rate gas oil is used as a motor fuel in a stationary motor, a reduced rate applies: €124.73 per 1,000 litres of fuel.
- When gas oil is used for heating (business and non-business use), a different rate applies:
 - Rate (2014): €124.73 per 1,000 litres of fuel
- Full exemptions from excise duty apply for gas oil used in certain machineries in agricultural, horticultural and piscicultural works and in forestry.

➤ **Kerosene:**

- For kerosene the same rates apply as for gas oil:

²⁴¹ European Commission - Taxation and Customs Union (2014) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- Rate (2014): €450.00 per 1,000 litres of fuel for propellant or industrial/commercial use
- When kerosene is used as a motor fuel in a stationary motor, a reduced rate applies: €124.73 per 1,000 litres of fuel.
- Rate (2014): €124.73 per 1,000 litres of fuel for heating, both business and non-business use.
- Full exemptions from excise duty apply for kerosene used in certain machineries in agricultural, horticultural and piscicultural works and in forestry.
- **Heavy fuel oil:**
 - Heating for business and non-business use are taxed the same.
 - Rate (2014): €15.00 per 1,000 kg of fuel
- **Liquefied Petroleum Gas (LPG):**
 - For propellant and industrial/commercial use:
 - Rate (2014): €125.00 per 1,000 kg of fuel
 - LPG for heating, both business and non-business use, is not taxed.
- **Natural Gas:**
 - All uses of natural gas are taxed at the same rate:
 - Rate (2014): €2.60 per GJ
- **Coal and Coke:**
 - Both business and non-business use of coal and coke for heating is taxed at the same rate:
 - Rate (2014): €0.31 per GJ
 - Other uses of coal and coke are not taxed.²⁴²
- **Electricity:**
 - No excise duty is applied to electricity in Cyprus, however a levy is applied to all uses of electricity (see below for further details). For the purposes of the Energy Tax Directive, Cyprus is considered to be taxing electricity above the minimum rate specified in the Directive, due to the existence of this levy.
- General exemptions to the excise duties include the following:²⁴³

²⁴² European Commission (2014) *Taxes in Europe Database*, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

²⁴³ Customs & Excise Department (Cyprus) (no date) *Excise Duties - Frequently Asked Questions*, accessed 12 September 2014, <http://www.mof.gov.cy/mof/Customs/customs.nsf/All/722042670E887148C2257BF10032FAD1?OpenDocument>

- Fuels used by the armed forces;
 - Fuels used for the purpose of air and sea navigation (the latter within EU waters only);
 - Fuels used for the production of electricity (minimum 100 MWh per annum);
 - For agricultural, horticultural and piscicultural works and in forestry; and
- Revenue from all excise duties on energy products in 2012 (the latest year for which figures are available): €317 million (equivalent to 1.8% of GDP)²⁴⁴
- **Electricity levy ('Tax on Energy Conservation (Funds)')**:²⁴⁵
- A levy is applied to all uses of electricity. The income from this levy is dedicated to supporting renewable electricity and energy conservation projects (through the Special Fund for Renewable Energy Sources and Energy Conservation).
 - The levy is collected by the Electricity Authority of Cyprus.
 - Rate: €5.00 per MWh.²⁴⁶
 - Revenue from the Electricity Levy in 2012 (the latest year for which figures are available): €21 million (equivalent to 0.12% of GDP).²⁴⁷

6.2 Transport Taxes (Excluding Transport Fuels)

- **Registration Tax / Vehicle Excise Duty (Φόροι κατανάλωσης)**:²⁴⁸
- Cars imported into Cyprus are required to pay excise duty (registration tax) before being registered in Cyprus.²⁴⁹ This is a 'one-off' tax.

²⁴⁴ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

²⁴⁵ Partasides, G. (2013) *Feed-In Tariff Specifications, Features, Amendments, and Current and Future Challenges in Cyprus*, paper given at Third IRENA Assembly Meeting: Workshop on Renewable Energy Policies, 12 January 2013, <https://www.irena.org/DocumentDownloads/2013/January/Workshop/Country%20Case%20Study%20-%20Cyprus%20-%20George%20Partasides.pdf>

²⁴⁶ European Commission - Taxation and Customs Union (2014) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/ra tes/excise_duties-part_ii_energy_products_en.pdf

²⁴⁷ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

²⁴⁸ Customs & Excise Department (Cyprus) (2013) *Vehicles from Member States of the European Union - On Payment of Excise Duties and VAT*, accessed 31 August 2014, <http://www.mof.gov.cy/mof/Customs/customs.nsf/All/505369EB35BEDE8B422579040055CC92?Open Document>

²⁴⁹ This is in addition to customs duties, which vehicles from outside the EU must also pay.

- The level of taxation is based on the CO₂ emissions, engine capacity or, in the case of a few specific vehicles, the value of the vehicle.
- Prior to September 2013, the tax rate was mainly based on engine capacity and to a lesser extent on CO₂ emissions.
- Electric vehicles and hybrids are exempt from the excise duty, as are trucks, buses and vehicles with more than 9 seats.
- The level of the duty is reduced for used vehicles according to specific measures issued by the Customs Department. This takes the age, type, condition and mileage of the vehicle into account and is also applicable to motorcycles.
- The basic rates of the excise duty are outlined in Table 6-1. Additionally, regardless of any relief of the excise duty (in respect of used vehicles) an additional €0.02 per cc of engine capacity is charged for each vehicle.
- Revenue in 2013 (the latest year for which figures are available): €14.8 million (equivalent to 0.09% of GDP). Revenue from vehicle excise duties has steadily decreased since 2008, when they were €133 million (equivalent to 0.78% of GDP).²⁵⁰

➤ **Road Tax (for a Circulation License):**²⁵¹

- Cars registered in Cyprus are required to pay an annual ‘road tax’ in order to receive a circulation license.
- All vehicles are required to pay this tax, including both public and private vehicles.
- Prior to 2014, the rate was determined based on the type of vehicle, engine size and CO₂ emissions.
- The tax was amended with effect from 1 January 2014. Vehicles registered in Cyprus after this date pay according to the CO₂ emissions of the vehicle, whilst vehicles registered prior to this date pay the same rate as prior to 2014 (based on engine size), though with an added malus payment depending on CO₂ emissions and engine size.
- Rates and other discounts and exemptions are outlined in Table 6-2.
- Revenue in 2012 (the latest year for which a total figure is available): €91.9 million (equivalent to 0.52% of GDP).²⁵² This revenue is derived from €28.6 million received for public use vehicles and €63.3 million for

²⁵⁰ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

²⁵¹ Cyprus Advanced Driving and Road Safety Network (2014) *Road Tax - Circulation Licence*, accessed 31 August 2014, http://www.cyprusdriving.net/documents/Road_Tax_Cyprus.php

²⁵² Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

private use vehicles. Revenue for 2013 for public use vehicles was €26.5 million.²⁵³

Additionally, there are a number of fees and charges relating to transport in Cyprus, all of which are considered 'taxes' within a variety of sources (e.g. they appear in Eurostat's National Tax List and are discussed as taxes in academic literature). This study does not consider these as taxes, but outlines them here for completeness:

➤ **Registration fee for all vehicles since January 2014:** ²⁵⁴

- Rate: €150 per vehicle.
- Prior to January 2014, this fee was based on the type of vehicle and its engine power and generated a more substantial amount of income.²⁵⁵
- The change in fee was due to car owners from other EU member states being charged registration fees twice (once in the country their vehicles was originally registered in and once in Cyprus). Following a series of lawsuits against the Cypriot state the fee was changed and is now the same for all vehicle types and is not paid by owners who have already paid a registration fee in another EU member state.
- Revenue in 2012 (the latest year for which figures are available): €10.4 million (equivalent to 0.06% of GDP). This revenue is derived from €1.6 million received for public use vehicles and €8.8 million for private use vehicles. This is down from €36.5 million total received in 2008 (equivalent to 0.21% of GDP).²⁵⁶

➤ **Fees for driving licences and road use permits:**

- Rate: unknown.
- Revenue for driving licences: €1.8 million in 2012 (equivalent to 0.01% of GDP). Revenue for road use permits: €0.3 million in 2012 (equivalent to 0.002% of GDP).²⁵⁷

²⁵³ European Commission (2014) *Taxes in Europe Database*, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

²⁵⁴ Τμήμα Οδικών Μεταφορών (Road Transport Department) (no date) *Οχήματα - Τέλος Εγγραφής (Vehicles - Registration Fee)*, accessed 3 September 2014, <http://www.mcw.gov.cy/mcw/RTD/rtd.nsf/All/FFDD4D44F29E862DC2257824002B1F92?OpenDocument>

²⁵⁵ Adamou, A., and Clerides, S. (2013) Tax Reform in the Cypriot Road Transport Sector, *Cyprus Economic Policy Review*, Vol.7, No.1, pp.87–114

²⁵⁶ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

²⁵⁷ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

➤ **Additional transport ‘taxes’ included within the Eurostat National Tax List include:**²⁵⁸

- Ship registration fees (revenue in 2012: €1.3 million, equivalent to 0.007% of GDP);
- Fees for professional licenses of road transporters (revenue in 2012: €0.0 million);
- Ships’ wireless licence fees (revenue in 2012: €0.1 million, equivalent to 0.001% of GDP); and
- Tax on ship management services (revenue in 2012: €1.9 million, equivalent to 0.011% of GDP).

There are no air transport taxes in Cyprus.

Table 6-1: Vehicle Excise Duty (Cyprus, 2014)²⁵⁹

Category A¹			
CO₂ Emissions (g per km)	Minimum	Tax Rate Calculation	Maximum
Up to and including 120	N/A	€0.00	N/A
121 – 150	€25.00	€25 per additional g per km CO ₂ emissions above 120	€750.00
151 – 180	€800.00	€750 + €50 per additional g per km CO ₂ emissions above 150	€2,250.00
181 and above	€2,650.00	€2250 + €400 per additional g per km CO ₂ emissions above 180	None
Category B²			
Tax Rate Calculation			
€0.26 per cc (engine size)			
Category C³			
Tax Rate Calculation			
15% of the value of the vehicle			

²⁵⁸ Ibid.

²⁵⁹ Customs & Excise Department (Cyprus) (2013) *Vehicles from Member States of the European Union - On Payment of Excise Duties and VAT*, accessed 31 August 2014, <http://www.mof.gov.cy/mof/Customs/customs.nsf/All/505369EB35BEDE8B422579040055CC92?OpenDocument>

Motorcycles	
Engine Capacity (cc)	Tax Rate
600 – 1,000	€1.71 per cc
1,001 and above	€2.56 per cc

Notes:

1. Category A includes “motor vehicles classified under CN 8703 21 – 8703 90 (excluding ambulances and hearses as well as pick-up type vehicles with two rows of seats known as double cabins) and Van type motor vehicles classified under CN 8704 with a Gross Vehicle Weight not exceeding 2032 kgs and a net cargo area not exceeding 2 cubic meters.”
2. Category B includes “motor vehicles classified under CN 8703 & 8704 with two rows of seats, known as “double cabin”, with a maximum Gross Vehicle Weight not exceeding 3.5 tonnes.”
3. Category C includes: “motor vehicles of the “go-kart” type; amphibious motor vehicles, of a gross weight not exceeding 1,000 kg, having three rows of wheels, six-wheel drive and which can transport two to four persons; motor vehicles of the “hovercraft” type designed to travel both on water and on land; motorized caravans of CN Code 8703; old vehicles as specified in the Motor Vehicles and Road Traffic Law of 1972 as amended; and vehicles with four wheels, having the appearance of a motor cycle and which are not registered for the purposes to be driven on public roads.”

Table 6-2: Annual Road Tax (Cyprus, 2014)²⁶⁰

Vehicles registered after 1 January 2014			
CO ₂ emissions (g per km)	Minimum	Tax Rate Calculation	Maximum
Up to and including 120	€10.00	€0.50 per g per km CO ₂	€60.00
121 – 150	€63.00	€60 + €3 per additional g per km CO ₂ emissions above 120	€150.00
151 – 180	€153.00	€150 + €3 per additional g per km CO ₂ emissions above 150	€240.00
181 and above	€248.00	€240 + €8 per additional g per km CO ₂ emissions above 180	None
Vehicles (except vans) registered prior to 1 January 2014 ¹			
Basic Tax Rate			
Engine capacity (cc)	Minimum	Tax Rate Calculation	Maximum
Up to and including	~ €10	€0.04272 per cc	~ €62

²⁶⁰ Cyprus Advanced Driving and Road Safety Network (2014) *Road Tax - Circulation Licence*, accessed 31 August 2014, http://www.cyprusdriving.net/documents/Road_Tax_Cyprus.php

1,450			
1,451 – 1,650	~ €87	€0.05980 per cc	~ €99
1,651 – 2,050	~ €198	€0.11960 per cc	~ €246
2,051 – 2,250	~ €297	€0.14523 per cc	~ €326
2,251 and above	~ €443	€0.19649 per cc	None
Vans with a Gross Weight of up to 3.5 tonnes			
Basic Tax Rate			
Engine capacity (cc)	Minimum	Tax Rate Calculation	Maximum
Up and including 1,650	Unknown	€0.05 per cc	€82.50
1,651 and above	€165.10	€0.10 per cc	€299.00
Malus for all vehicles registered prior to 1 January 2014			
Engine Capacity (cc)	CO₂ Emissions (g per km)	Tax Rate	
Up to and including 2,250	Up to and including 100	€12.00	
	101 and above	€22.00	
2,251 and above	N/A	€32.00	
Notes:			
1. Certain types of vehicles are eligible for discounts or maximum tax rate ceilings: ²⁶¹			
a. Rates for heavy trucks (up to 12 tonnes) are discounted by 55% - 65%.			
b. Rates for taxis and many types of heavy vehicles are discounted by 65%.			
c. Public buses and tractors are exempt from the tax.			

6.3 Pollution and Resource Taxes

There are no pollution or resources taxes in Cyprus, apart from property and land ownership taxes which are not considered in this study.

Although no waste taxes are in place, there are charges for municipal waste disposal. Across all municipalities, the rate does not depend on the amount of waste produced; however, in some areas the rate does depend on the size of the household; in other areas they are flat-rate for all households. As an example, the rate in the municipality in

²⁶¹ Cyprus Advanced Driving and Road Safety Network (no date) *Cyprus Road Tax Rates*, no date, http://www.cyprusdriving.net/documents/Road_Tax_Rates_Cyprus.pdf

Nicosia is €159 per household, whereas the rate in Strovolos ranges from €30 to €141 per household.

Additionally, there are also some producer responsibility schemes in place, such as fees for packaging waste (ranging from €21.28 for aluminium to €105.89 for plastic), WEEE and batteries.²⁶² However, these are out of scope of this work.

➤ **Water Abstraction Charge:**

- Due to its dry climate, Cyprus has a long history of charging for water, with a specific water abstraction charge introduced in 1984, around the same time as when water distribution systems were installed in households. Initially it was charged on a fixed rate basis, but has since been changed to a banded volumetric basis.²⁶³
- Rates were increased in 2004 following Cyprus' accession to the EU. Following this, prices for irrigation water were standardised across all regions. Prices for water used for irrigation depend on whether they come from a state or private source and what their final use is. Prices (for state sources, using untreated surface water) range from €0.05 - €0.34 per m³.²⁶⁴ Example domestic charges in Nicosia from 1st April 2012 are provided in Table 6-3.
- Cost recovery for state owned irrigation infrastructure is reported to be around 40%.²⁶⁵ A report from 2004 estimated that the level of cost recovery following the rate increases in 2004 would be around 77% by 2007 for irrigation water and 73% by 2005 for domestic water.²⁶⁶ The national River Basin Management Plan of 2011 revised these to 96% for domestic water and 56% for irrigation water – 41% for state owned

²⁶² IEEP (2013) *Steps to Greening Country Report: Cyprus*, Report for the European Commission, p.11

²⁶³ Ecorys, Cambridge Econometrics, and Cowi (2011) *The Role of Market-Based Instruments in Achieving a Resource Efficient Economy*, Report for European Commission - DG Environment, October 2011, http://ec.europa.eu/environment/enveco/taxation/pdf/role_marketbased.pdf

²⁶⁴ See Table 12 in ARCADIS, InterSus, Fresh Thoughts Consulting, Eco Logic, and TYPSA (2012) *The Role of Water Pricing and Water Allocation in Agriculture in Delivering Sustainable Water Use in Europe*, Report for European Commission Directorate-General for the Environment, February 2012, www.enorasis.eu/uploads/files/Water%20Governance/role_water_pricing.pdf, p. 98

²⁶⁵ ARCADIS, InterSus, Fresh Thoughts Consulting, Eco Logic, and TYPSA (2012) *The Role of Water Pricing and Water Allocation in Agriculture in Delivering Sustainable Water Use in Europe*, Report for European Commission Directorate-General for the Environment, February 2012, www.enorasis.eu/uploads/files/Water%20Governance/role_water_pricing.pdf, p. 81

²⁶⁶ Delft Hydraulics, Enveco S.A., and D. Argyropoulos & Associates (2004) *Volume 12: Assessment of the Current Levels of Cost Recovery of Water Services*, Report for Ministry of Agriculture, Natural Resources and Environment (Cyprus), December 2004, [http://www.cyprus.gov.cy/moa/wdd/wdd.nsf/0/5200107061E29326C22573750039A08B/\\$file/Volume%2012%20-%20Assessment%20of%20the%20current%20levels%20of%20cost%20recov%20E2%80%A6.pdf](http://www.cyprus.gov.cy/moa/wdd/wdd.nsf/0/5200107061E29326C22573750039A08B/$file/Volume%2012%20-%20Assessment%20of%20the%20current%20levels%20of%20cost%20recov%20E2%80%A6.pdf), page vi

irrigation and 61% for other irrigation infrastructure. Cost recovery for recycled water was estimated at 34%.²⁶⁷

Table 6-3: Domestic Water Prices in Nicosia from 1st April 2012 (Cyprus, 2014)²⁶⁸

Fixed Charge: €7.00 per m ³	
Bi-Monthly Consumption-Based Charge	
Consumption (m ³)	Charge (per m ³)
1 – 10	€0.90
11 – 20	€1.05
21 – 30	€1.25
31 – 40	€1.40
41 – 50	€2.20
51 – 60	€2.90
61 – 70	€3.60
71 – 80	€3.80
81 and above	€5.00

6.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 6-4: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	274	271	-3
Petrol	million litres	272	272	0
Kerosene	million litres	184	184	0

²⁶⁷ Τμήμα Αναπτύξεως Υδάτων (Water Development Department of the Republic of Cyprus), *River Basin Management Plan of Cyprus*, March 2011, [http://www.moa.gov.cy/moa/wdd/wdd.nsf/all/1AE1F4E1B33E432CC22578AF002C0E71/\\$file/ANNEX-L_low.pdf](http://www.moa.gov.cy/moa/wdd/wdd.nsf/all/1AE1F4E1B33E432CC22578AF002C0E71/$file/ANNEX-L_low.pdf)

²⁶⁸ Συμβούλιο Υδατοπρομήθειας Λευκωσίας (Water Board of Nicosia) (no date) *Τέλη νερού (Water Charges)*, accessed 5 September 2014, <http://www.wbn.org.cy/index.php/2014-02-09-23-32-44>

Fuel Type	Units	Baseline	After Tax Increase	Change
LPG	thousand tonnes	0	0	0
Heavy Fuel Oil	thousand tonnes	15	14	-1
Natural Gas	TJ (GCV)	0	0	0
Coal	thousand tonnes	1,344	1,333	-11
Electricity	GWh	0	0	0

Figure 6-1: Change in Internal Passenger Flights, flights per year

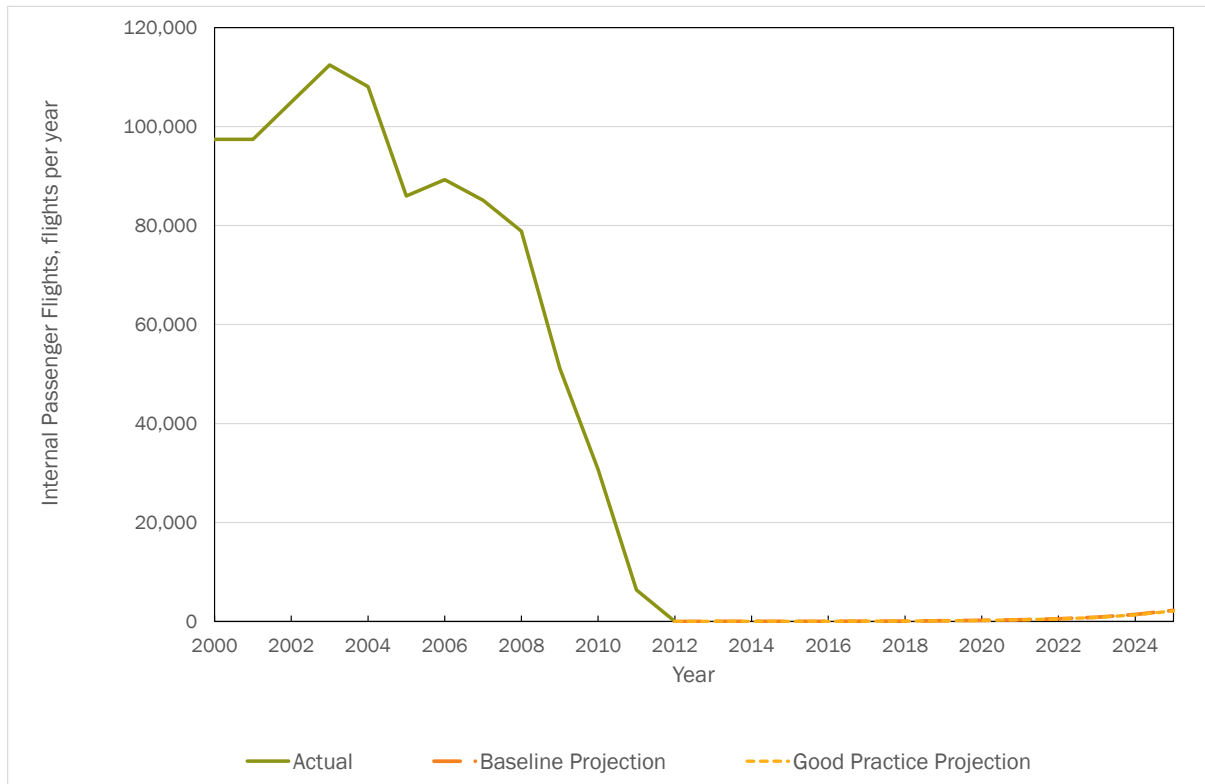


Figure 6-2: Change in Intra-EU Passenger Flights, flights per year

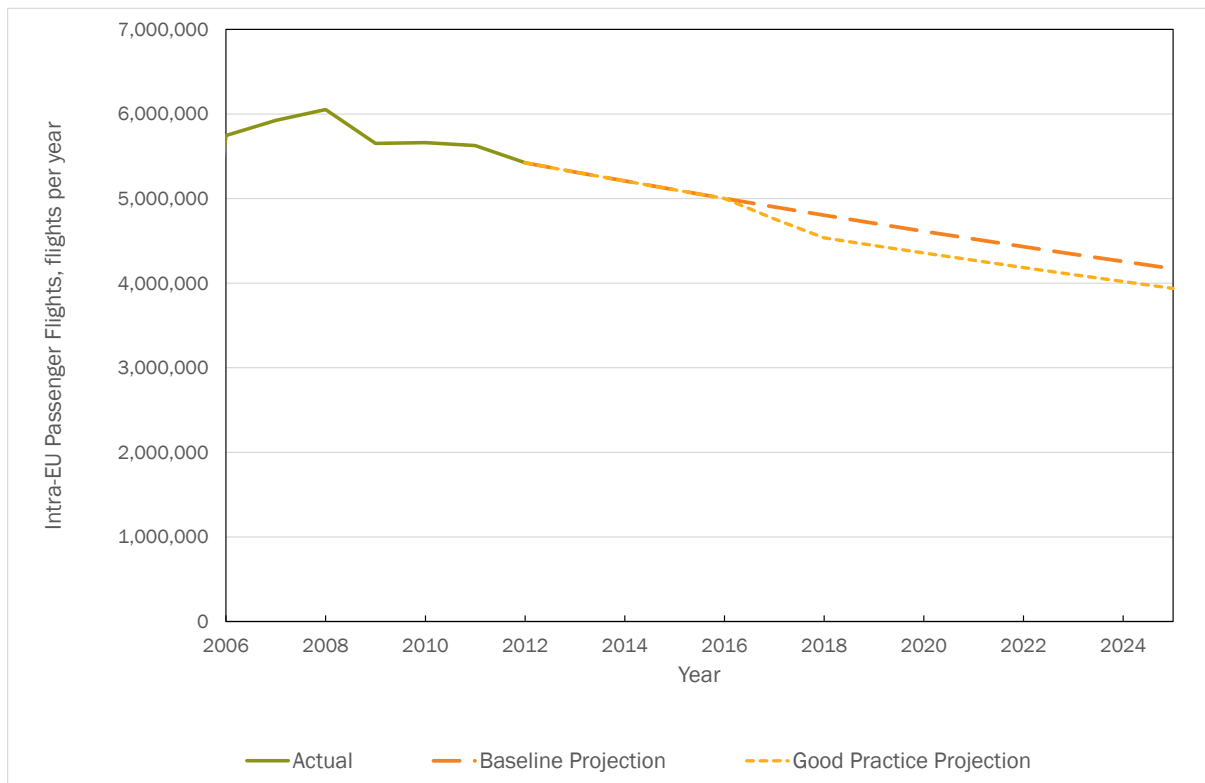


Figure 6-3: Change in Extra-EU Passenger Flights, flights per year

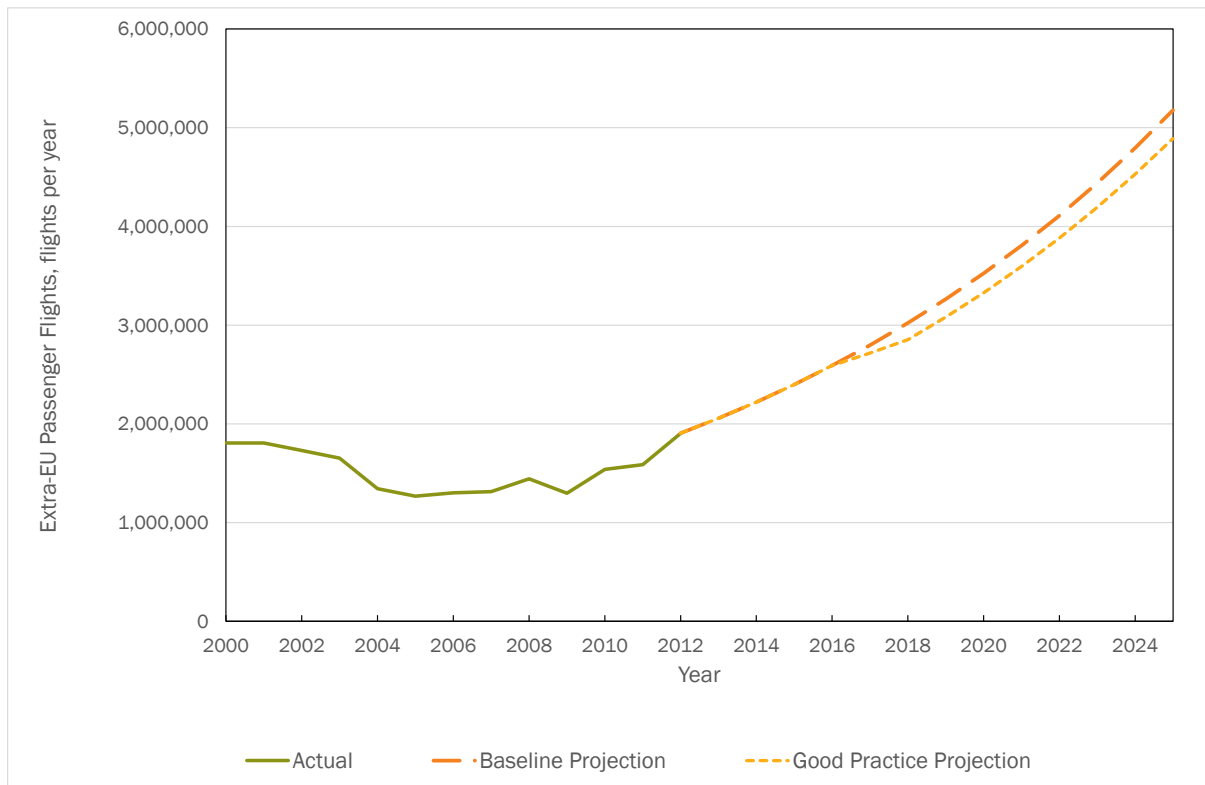


Figure 6-4: Change in Internal Air-freight, tonnes

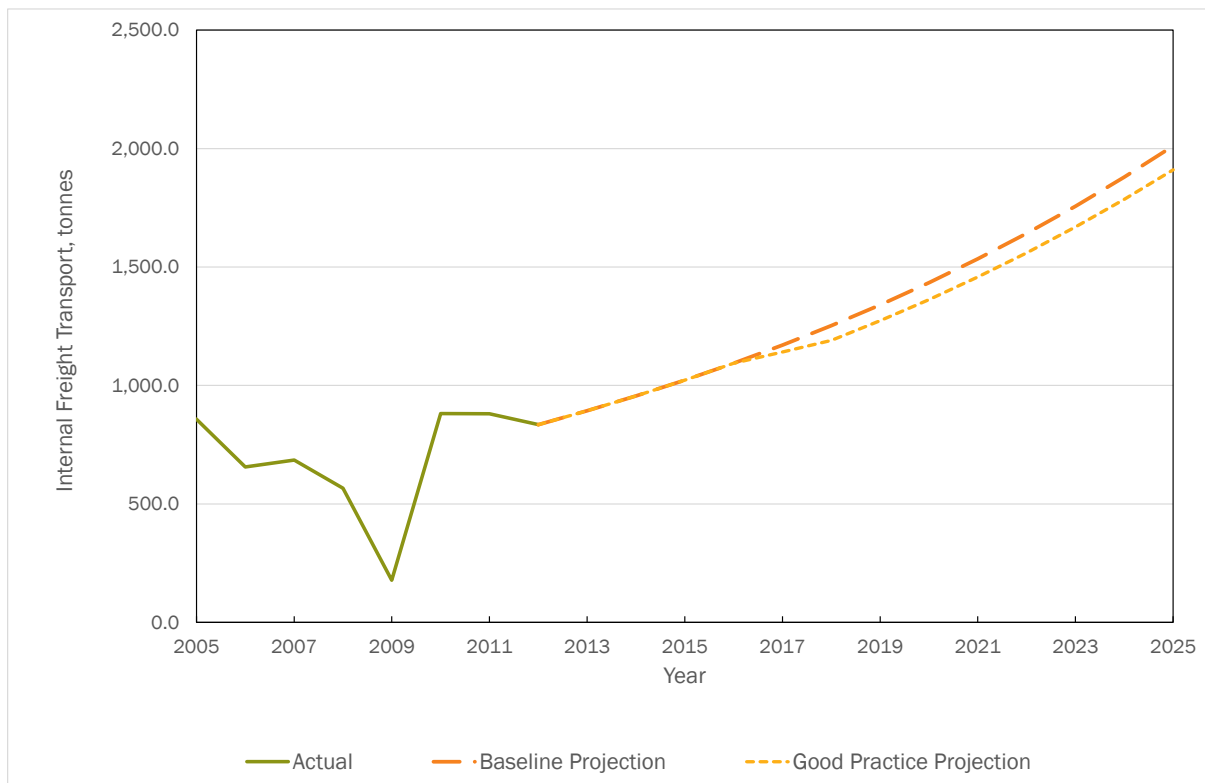


Figure 6-5: Change in Intra-EU Air-freight, tonnes

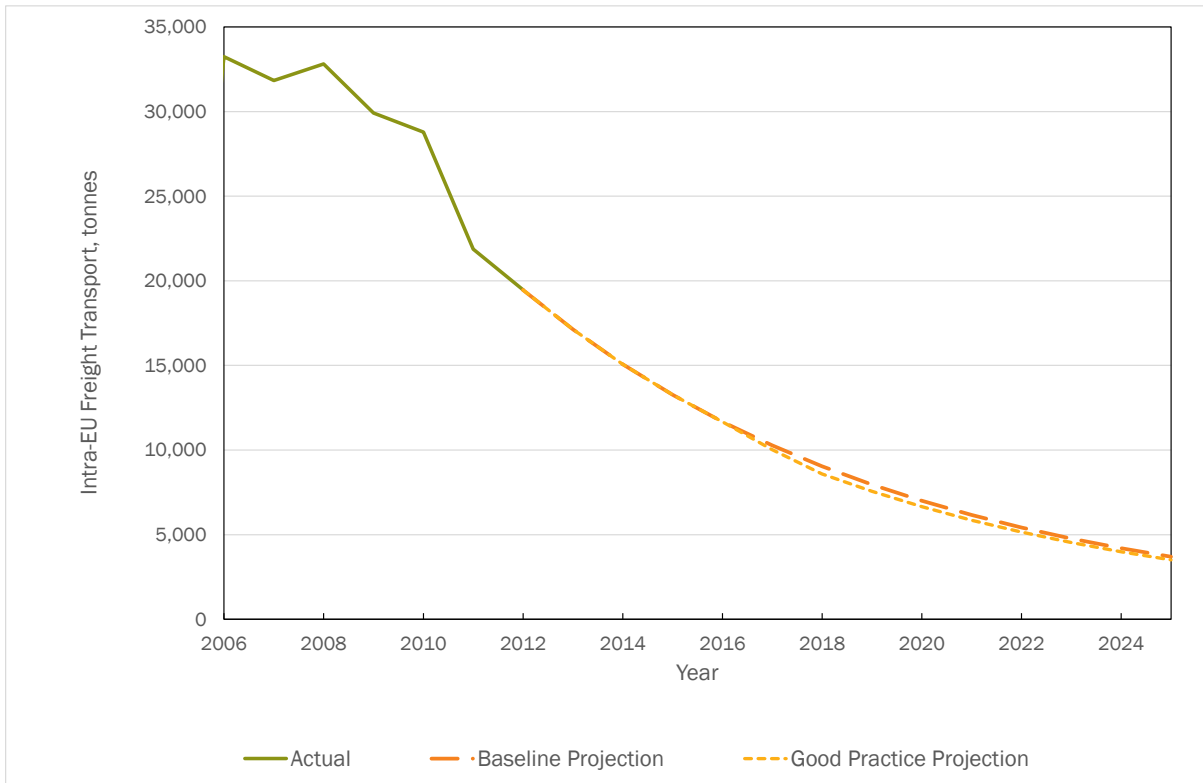


Figure 6-6: Change in Extra-EU Air-freight, tonnes

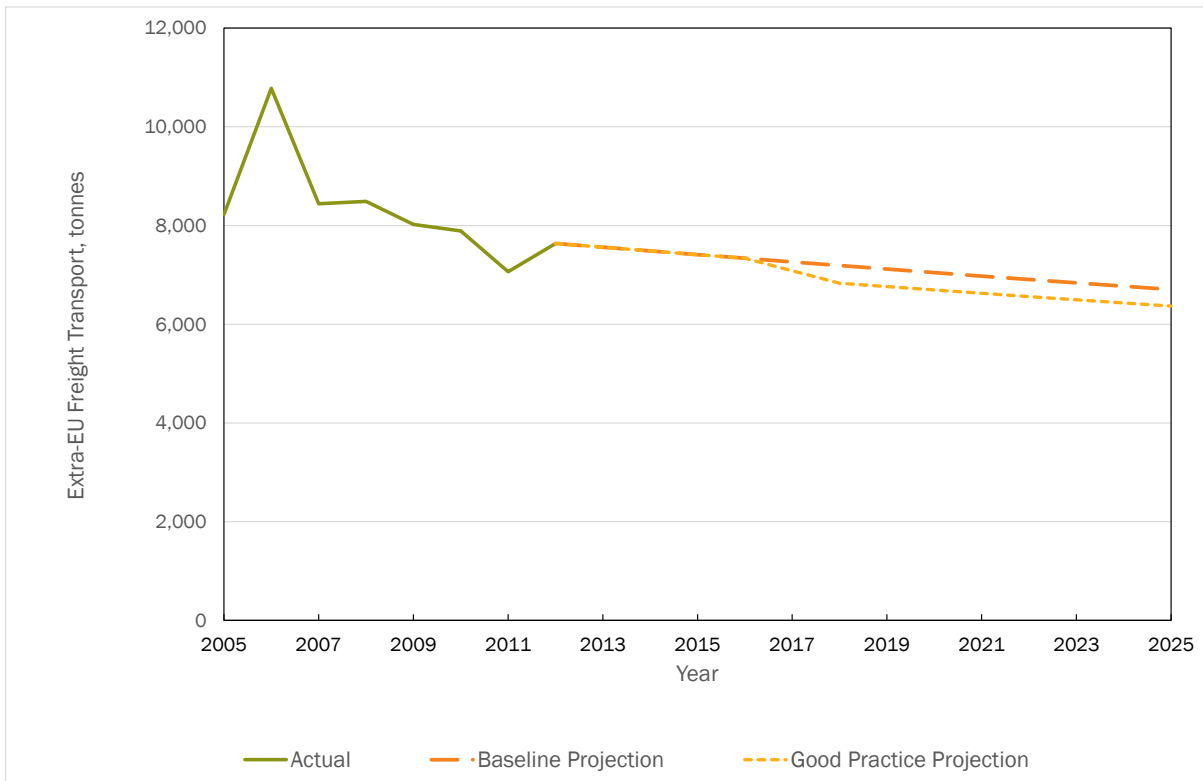


Figure 6-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

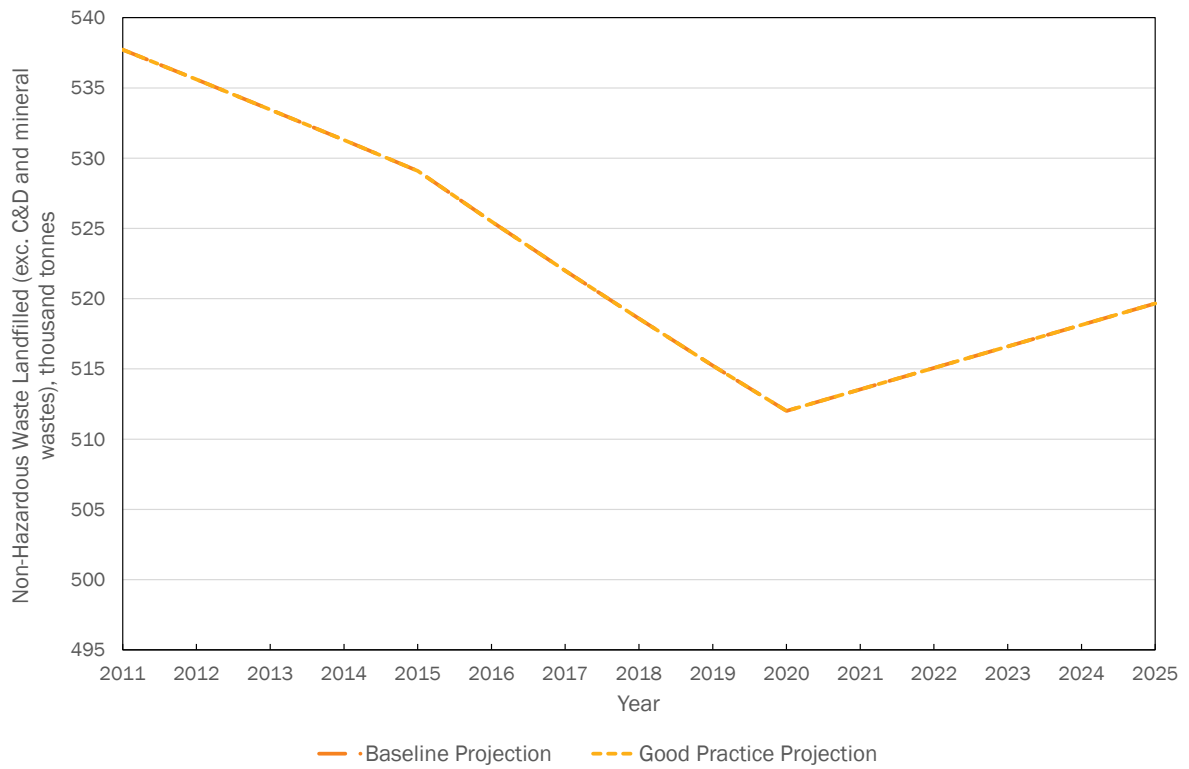


Figure 6-8: Change in MBT/ Incineration, thousand tonnes

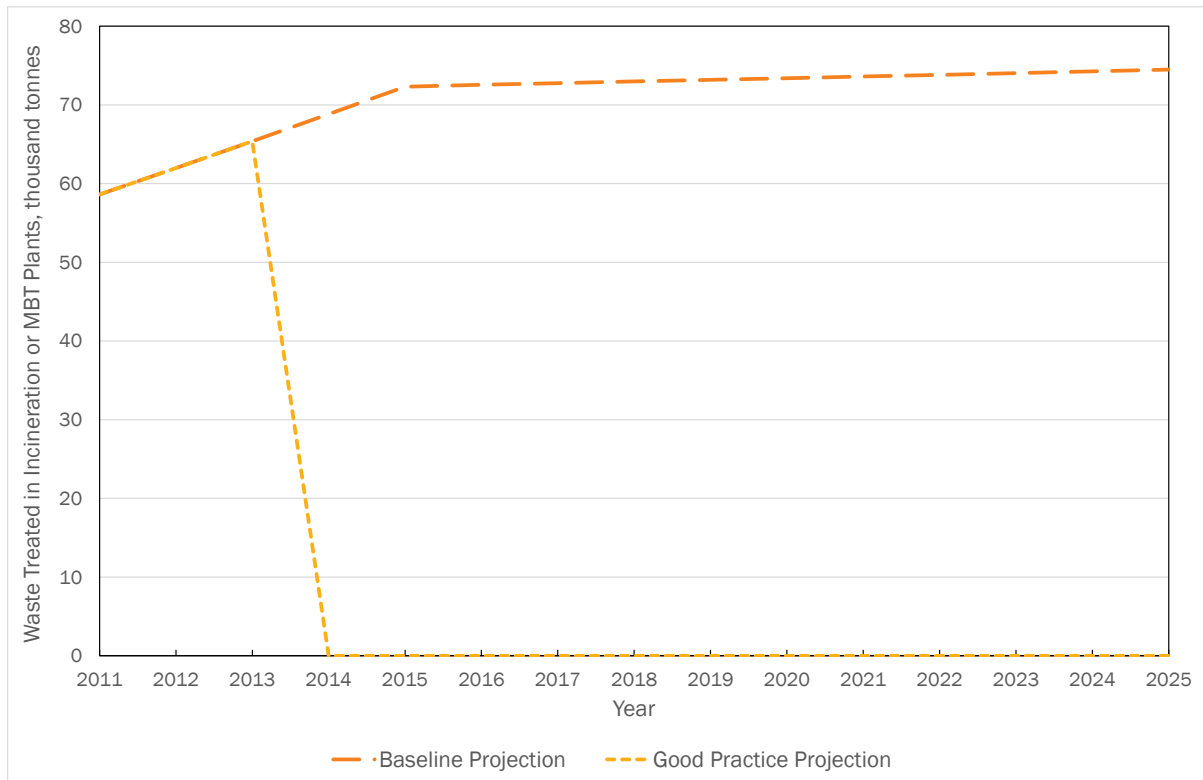


Figure 6-9: Change in SOx Emissions, tonnes

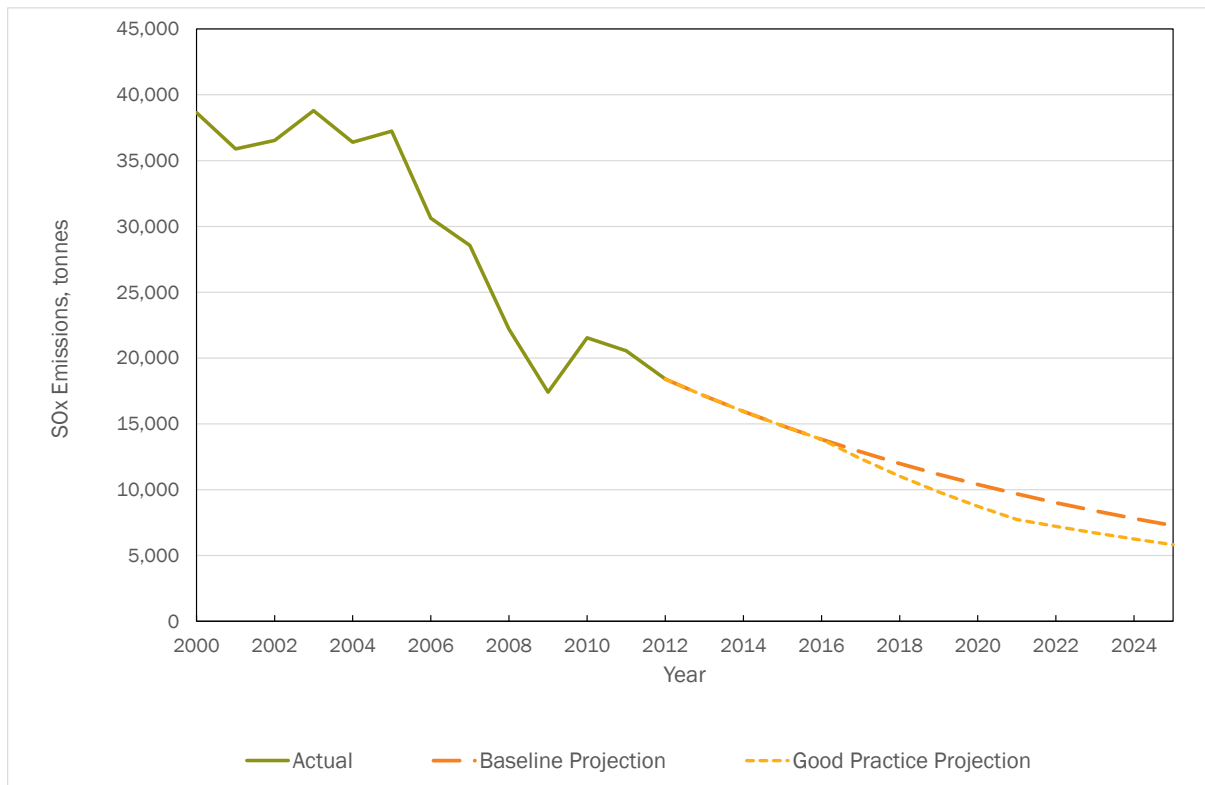


Figure 6-10: Change in NOx Emissions, tonnes

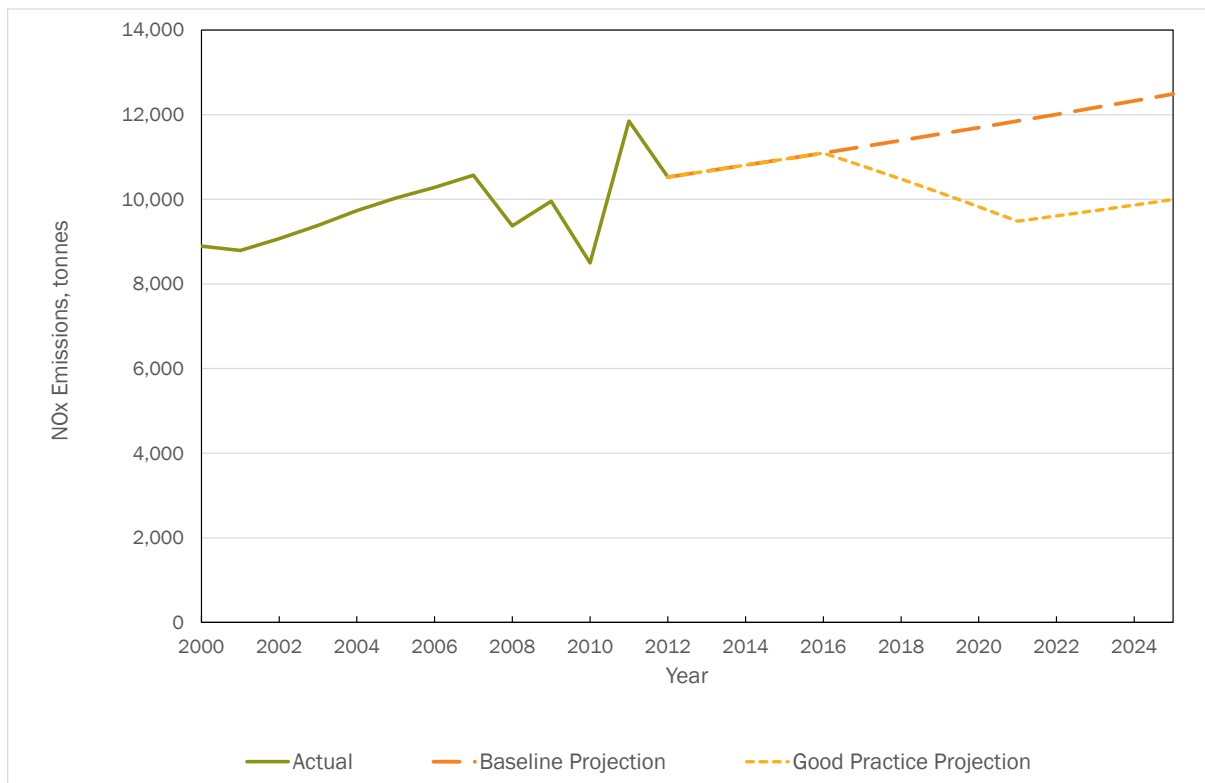


Figure 6-11: Change in PM₁₀ Emissions, tonnes

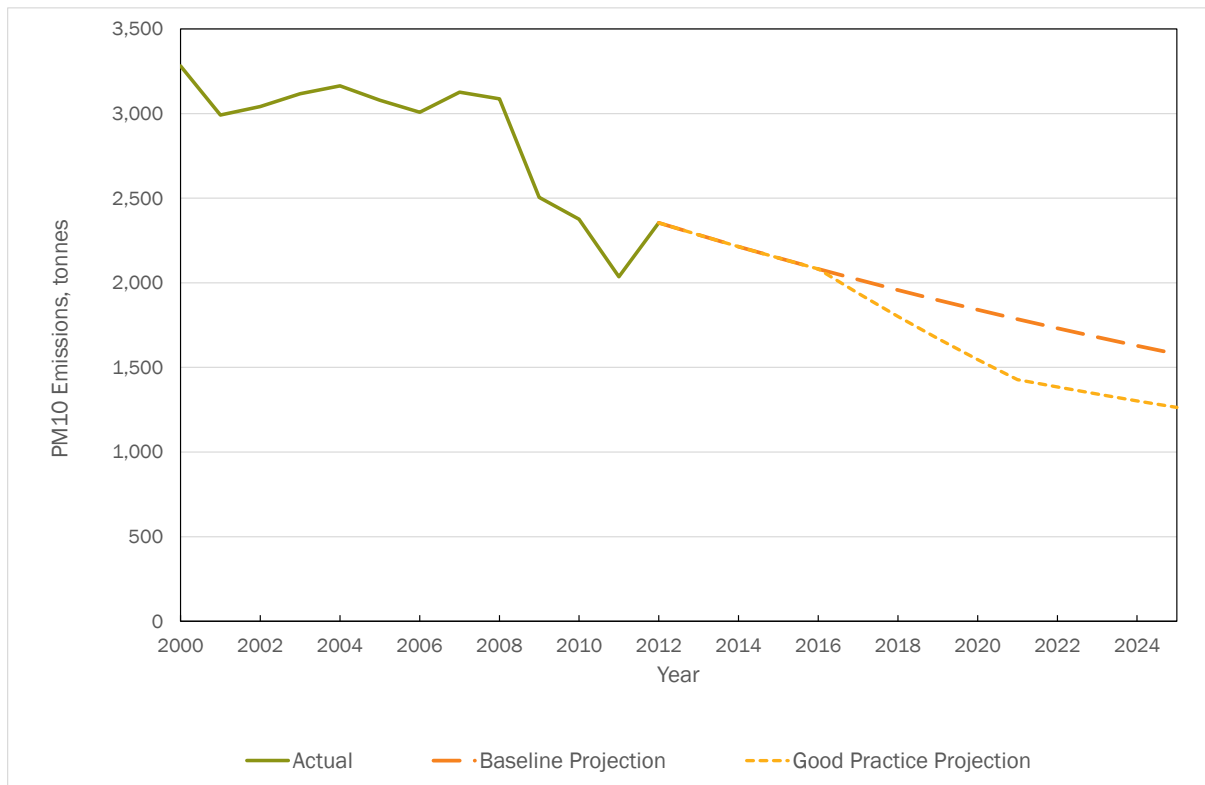


Figure 6-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

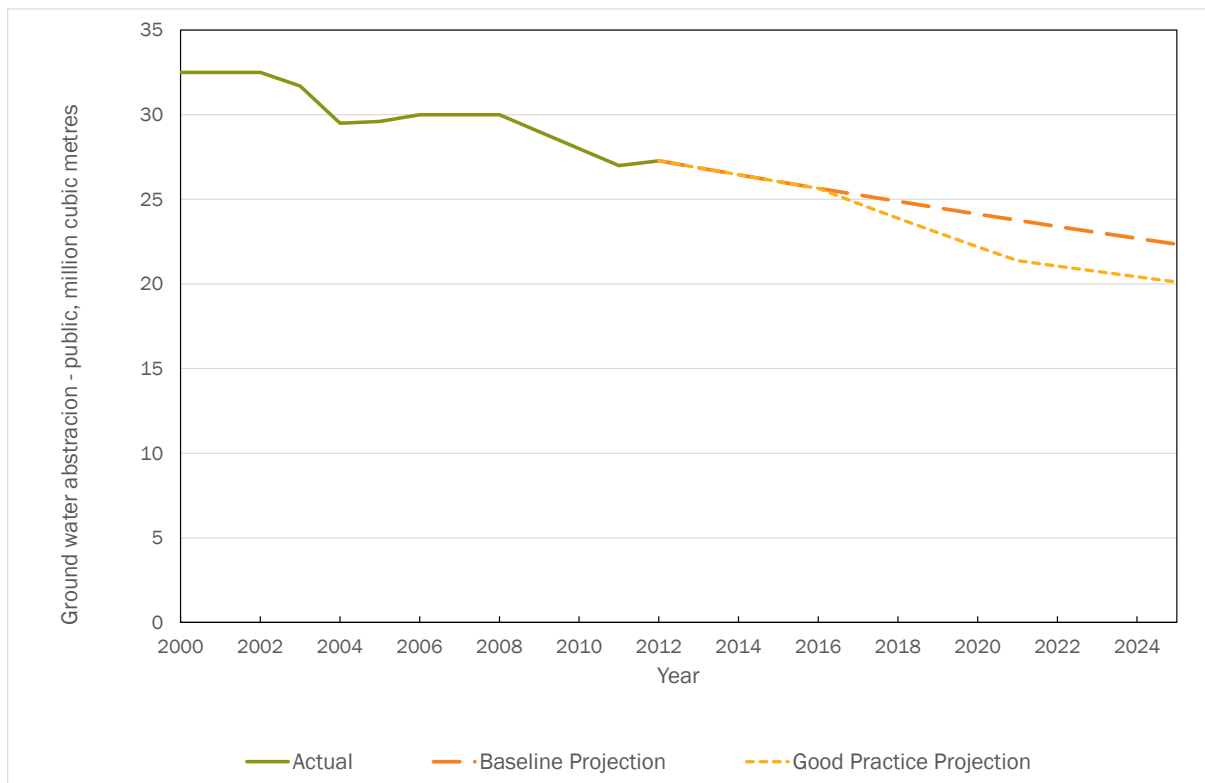


Figure 6-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

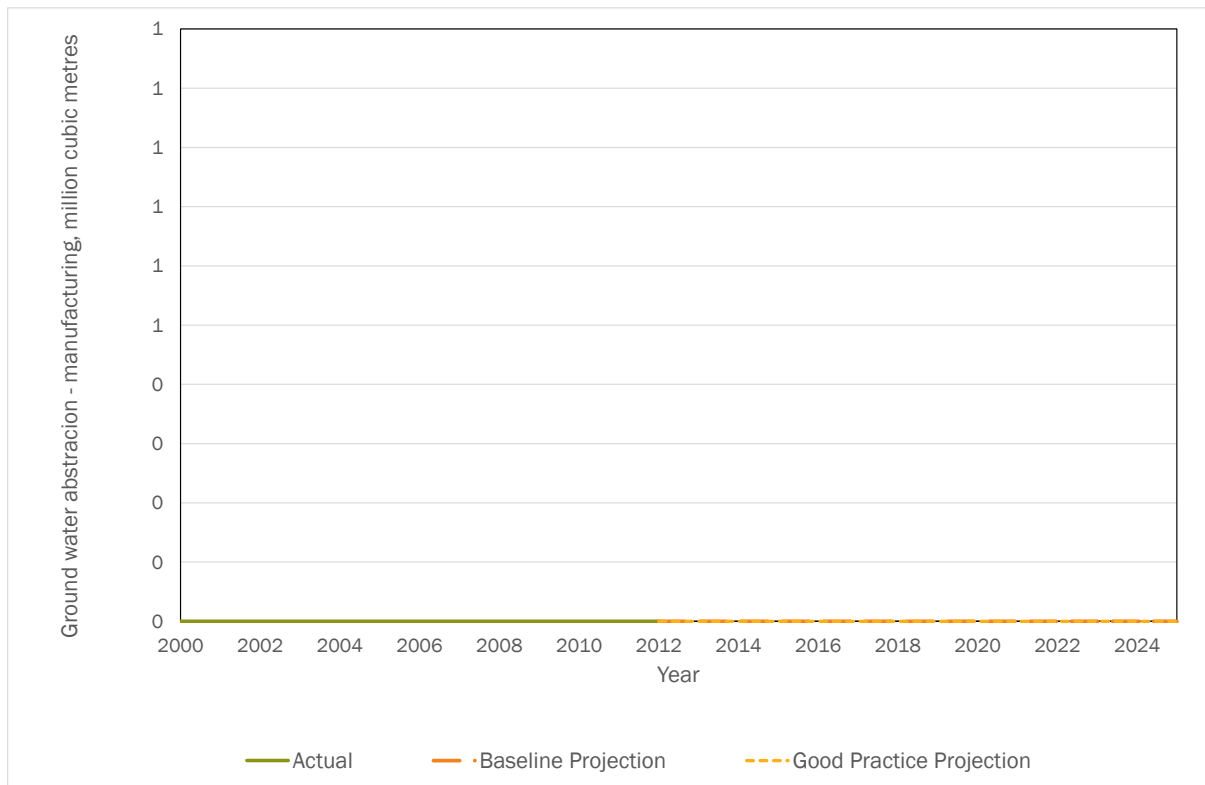


Figure 6-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

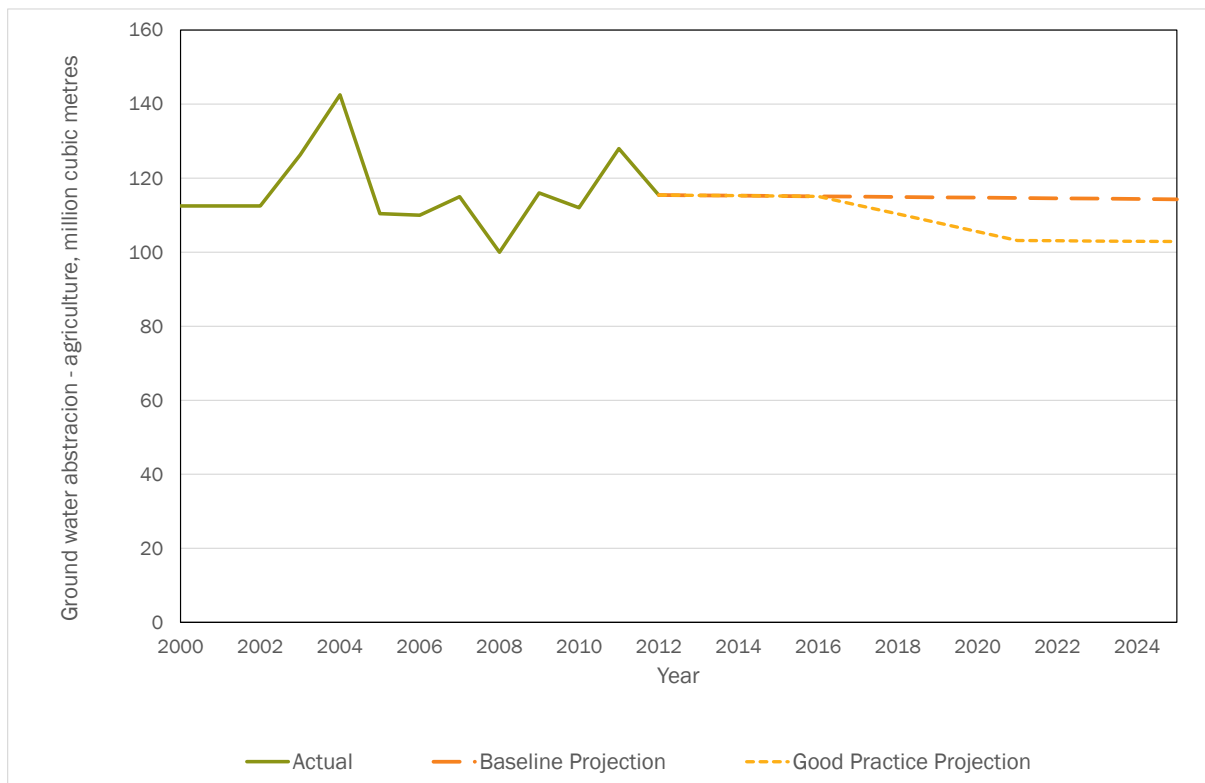


Figure 6-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

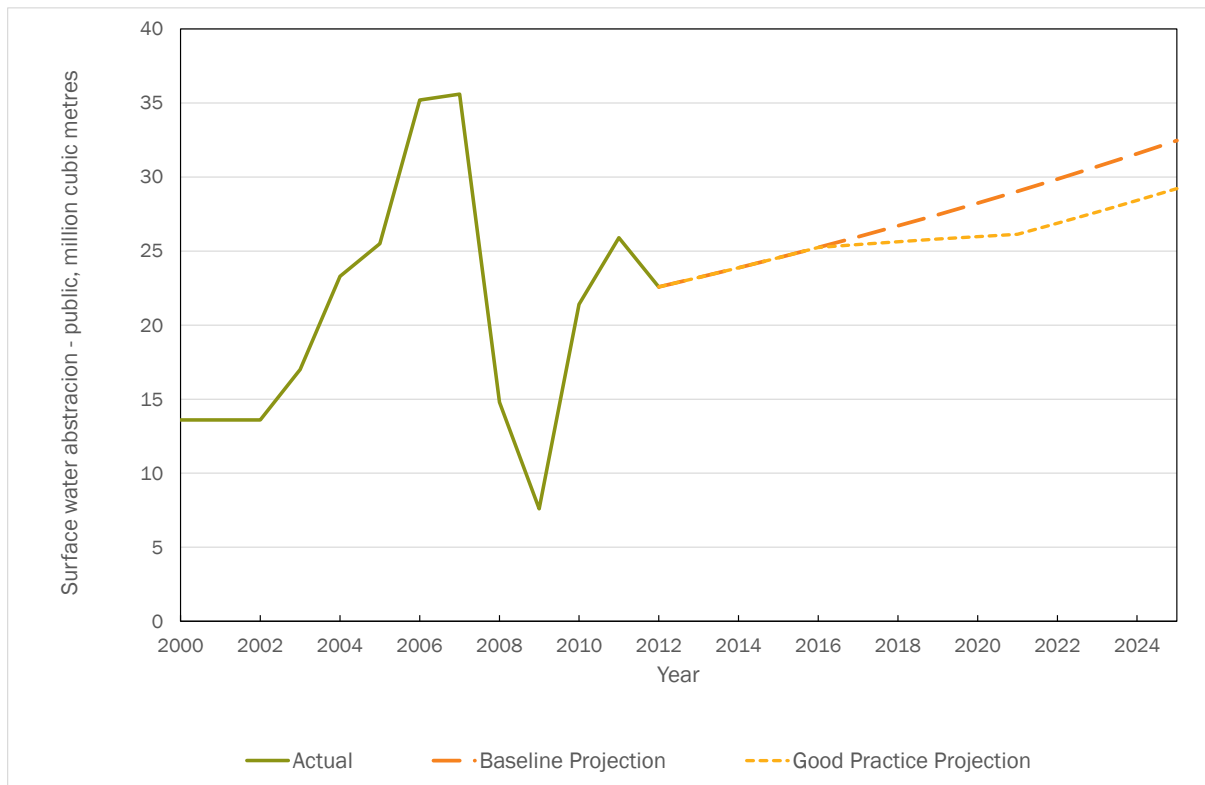


Figure 6-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres

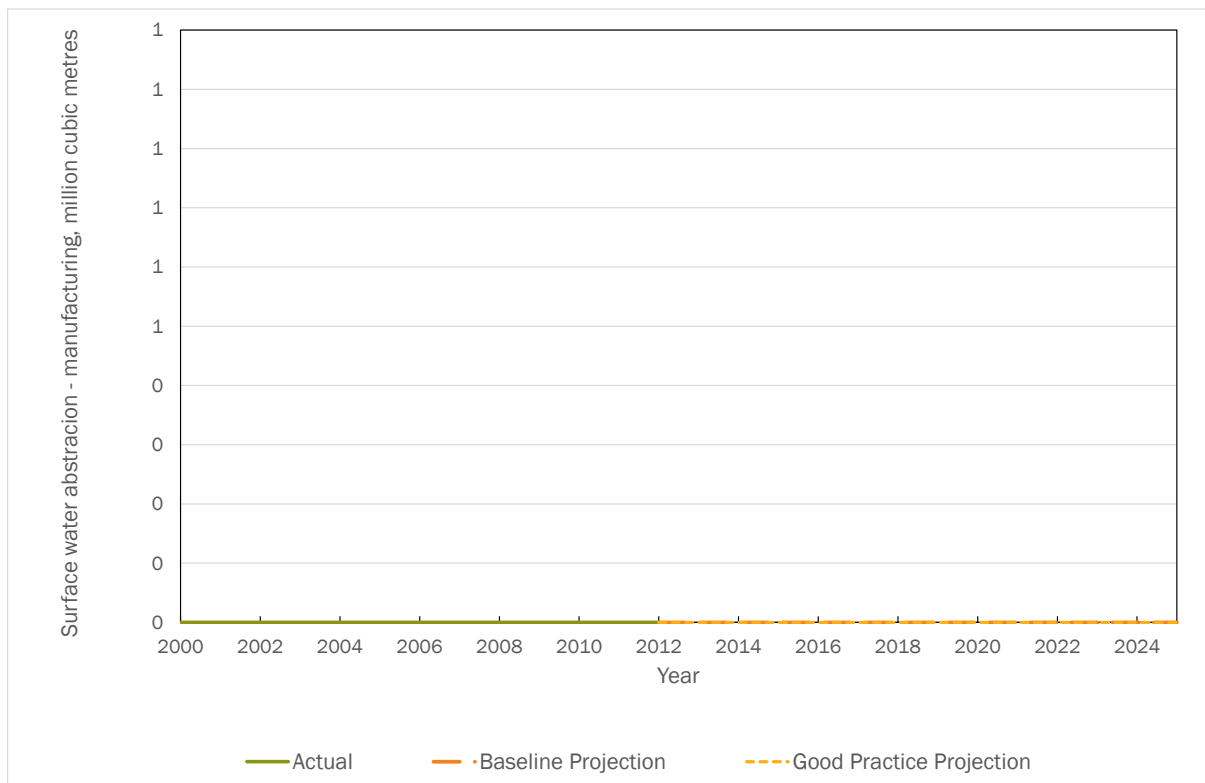


Figure 6-17: Change in Surface Water Abstraction – Agriculture, million cubic metres



Figure 6-18: Change in Active Ingredients in Pesticides, tonnes

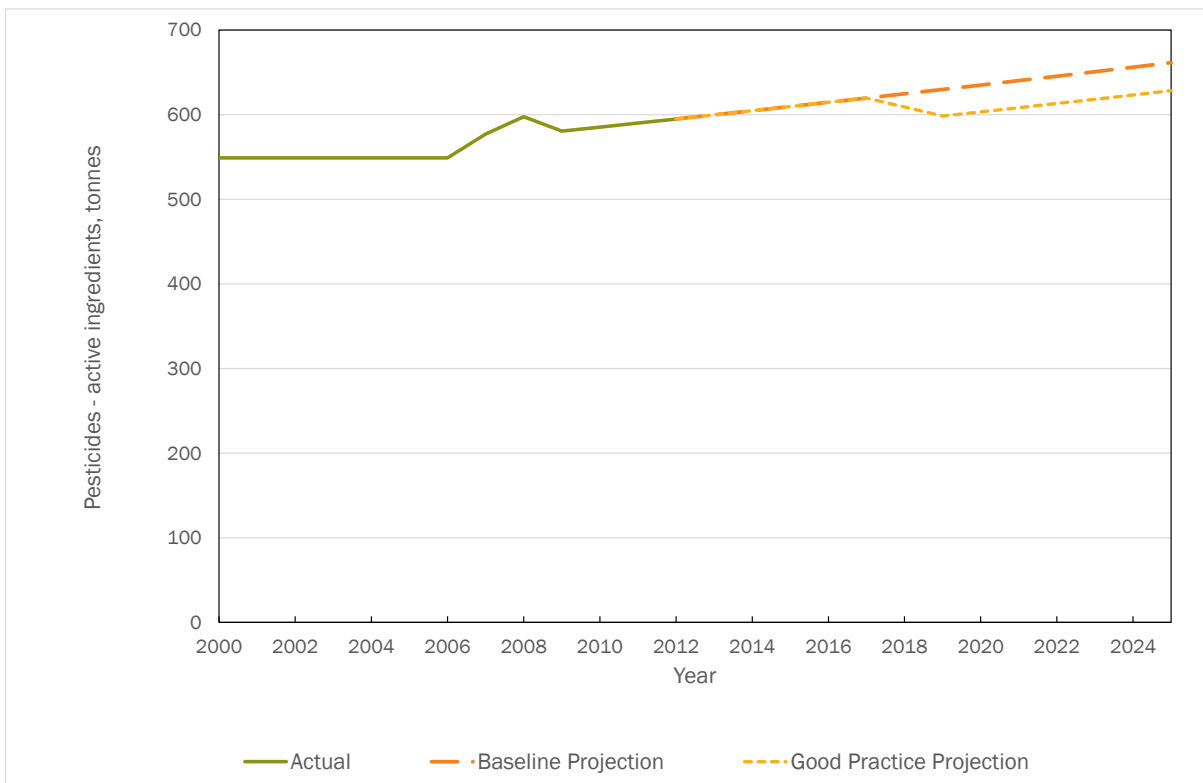


Figure 6-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

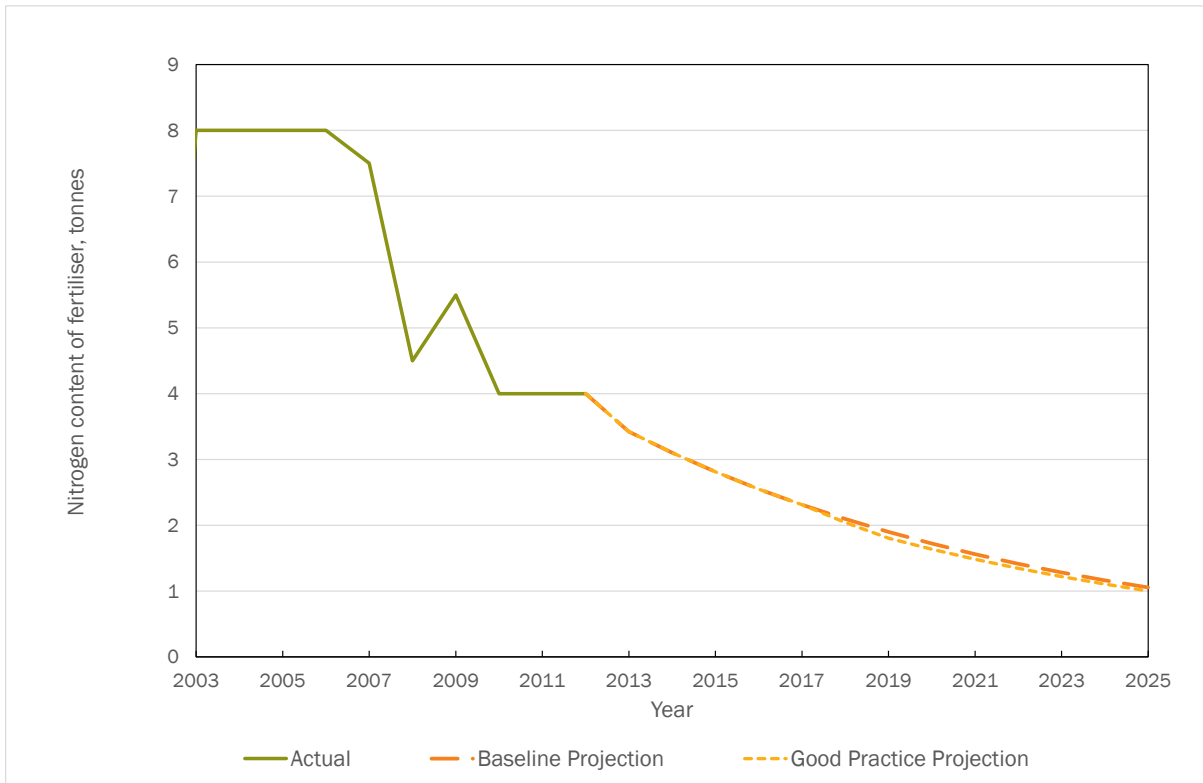


Figure 6-20: Change in Aggregates Extraction, thousand tonnes

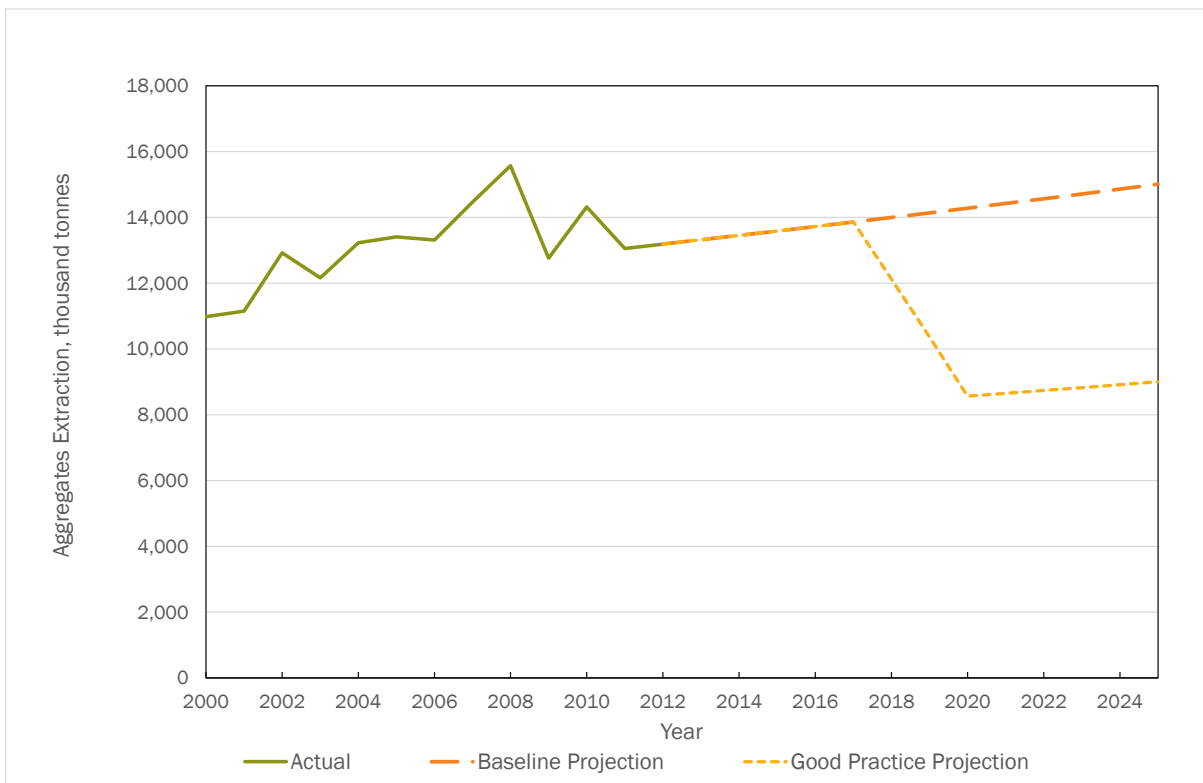


Figure 6-21: Change in Paper & Card Packaging Generation, thousand tonnes



Figure 6-22: Change in Plastic Packaging Generation, thousand tonnes

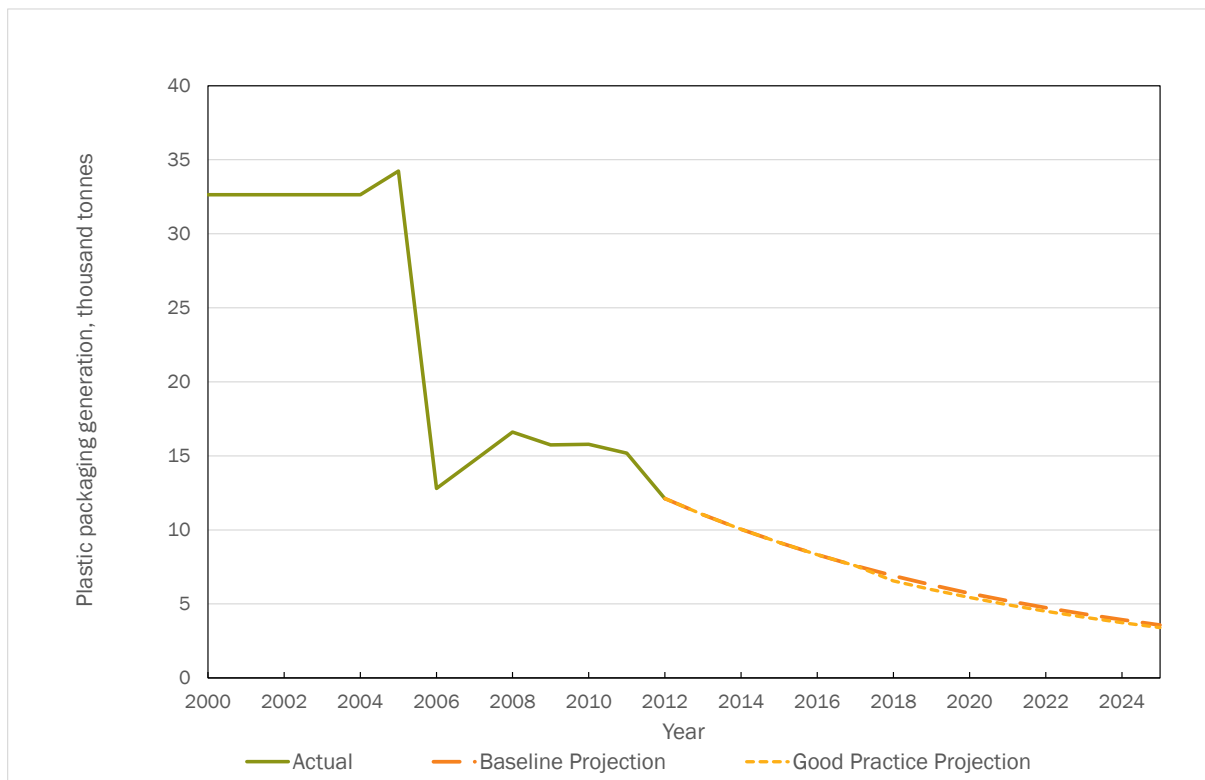


Figure 6-23: Change in Wood Packaging Generation, thousand tonnes

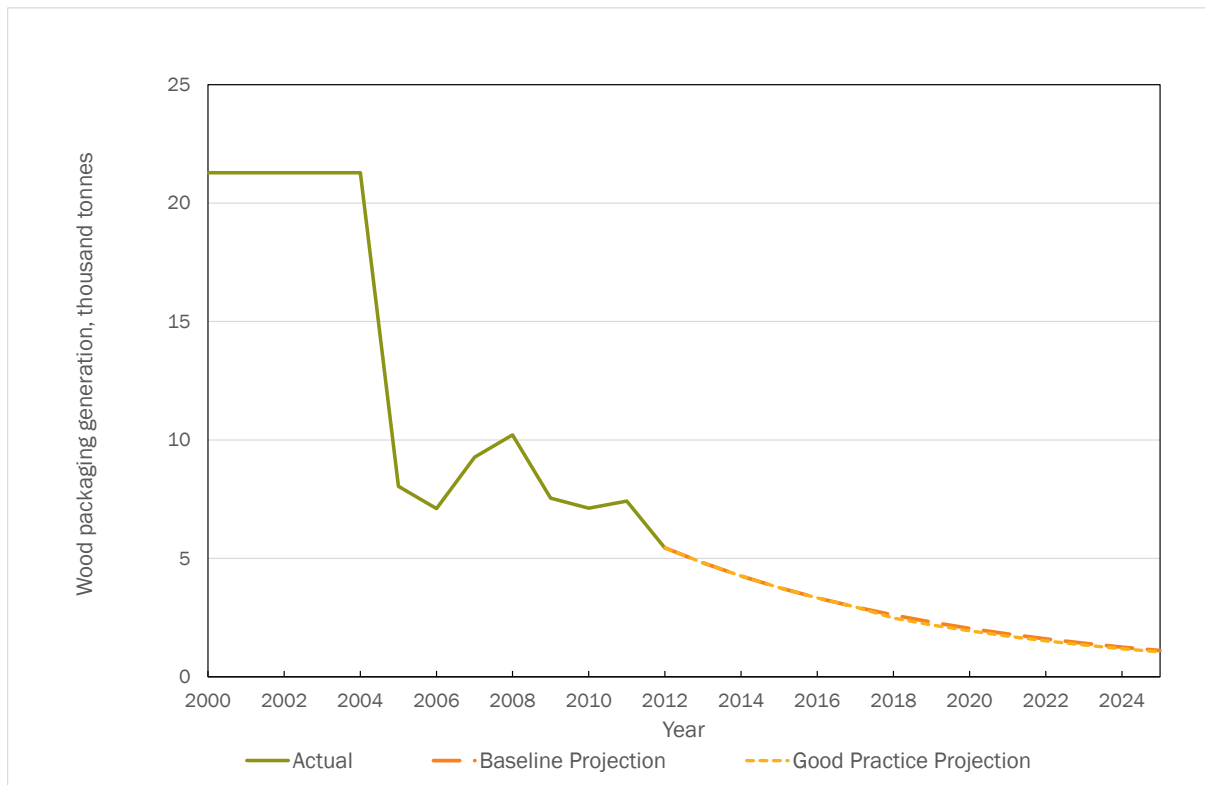


Figure 6-24: Change in Metal Packaging Generation, thousand tonnes

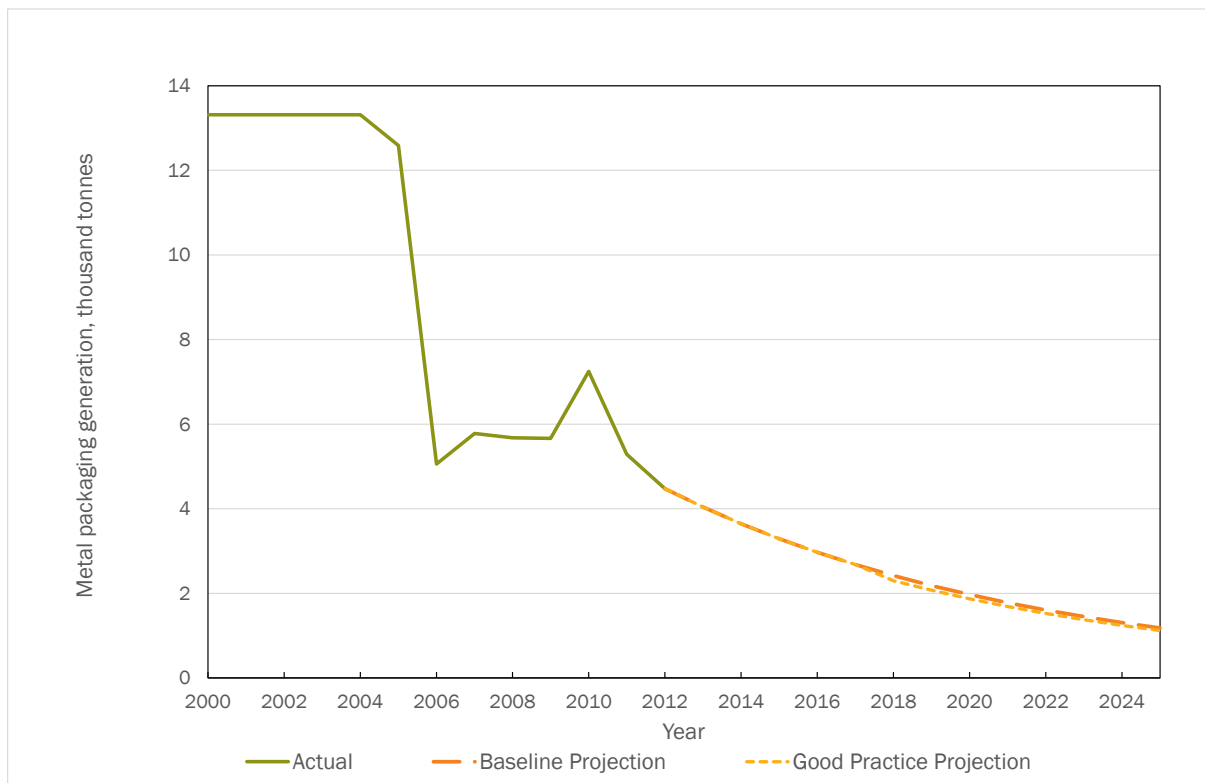
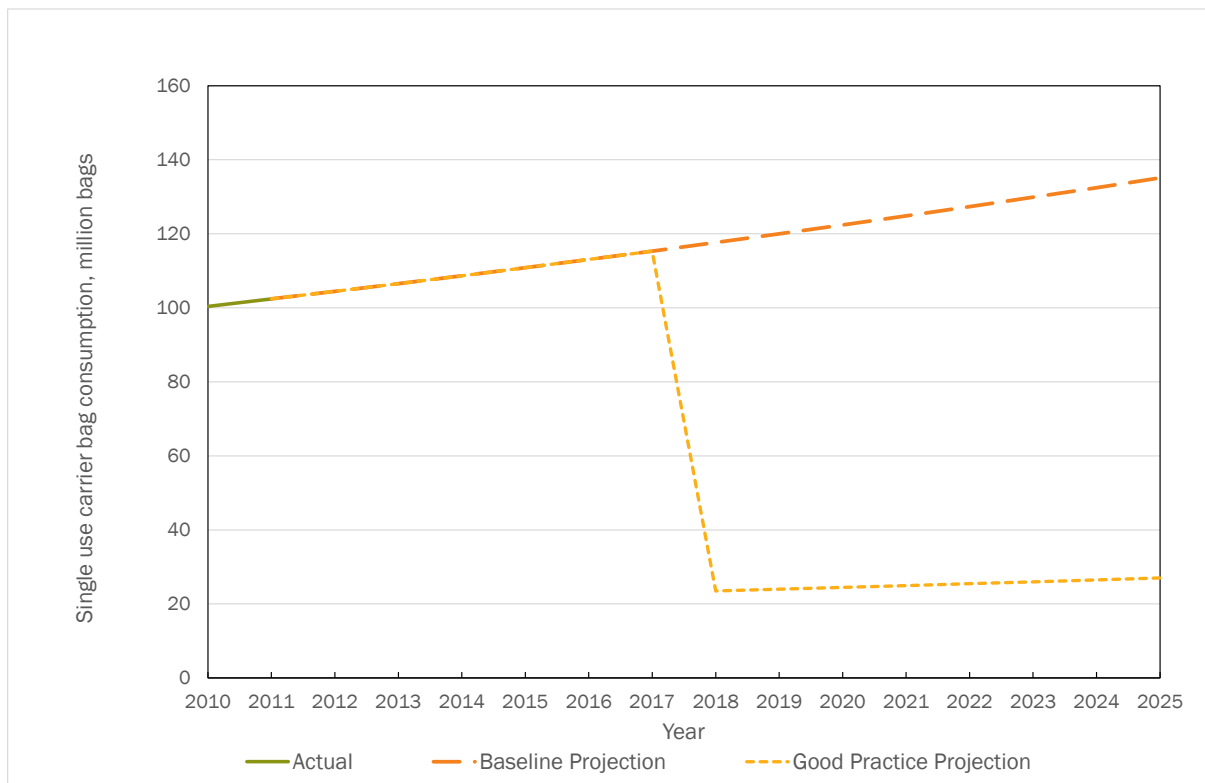


Figure 6-25: Change in Glass Packaging Generation, thousand tonnes



Figure 6-26: Change in Consumption of Single Use Carrier Bags, million bags



6.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 6-5: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	3	7	10	13	17	20	23	23	23
	C&I / Heating	0	0	15	31	46	61	76	92	107	107	107
	Electricity	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Energy, million EUR</i>	0	0	19	37	56	74	93	111	130	130	130
	<i>Sub-total Energy, % GDP</i>	0.0%	0.0%	0.1%	0.2%	0.3%	0.5%	0.6%	0.7%	0.8%	0.8%	0.8%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	0	0	0	0	0	0	0	0	0
	Passenger Aviation Tax	0	0	107	207	205	203	201	200	198	196	195
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Transport, million EUR</i>	0	0	107	207	205	203	201	200	198	197	195
	<i>Sub-total Transport, % GDP</i>	0.0%	0.0%	0.7%	1.3%	1.3%	1.3%	1.2%	1.2%	1.2%	1.2%	1.2%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	8	15	21	21	21	21	21	21	21	21
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	0	1	1	1	1	1	1	1	1	1

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
	Air Pollution Tax	0	6	11	15	19	22	20	20	19	19	18	
	Water Abstraction Tax	0	6	11	17	22	27	26	27	27	27	27	
	Waste Water Tax	0	0	1	1	1	1	1	1	1	1	1	
	Pesticides Tax	0	0	3	6	6	6	6	6	6	6	6	
	Aggregates Tax	0	0	33	29	25	21	21	21	21	21	22	
	Packaging Tax	0	0	1	1	1	1	1	1	1	1	1	
	Single Use Bag Tax	0	10	10	2	2	2	2	2	2	2	2	
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	30	87	94	98	102	100	100	100	100	100	100
	Sub-total Pollution & Resource, % GDP	0.0%	0.2%	0.5%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%
Total Revenue Stream	Total, million EUR	0	30	212	338	359	379	394	411	428	426	425	
	Total, % GDP	0.0%	0.2%	1.3%	2.1%	2.2%	2.4%	2.4%	2.5%	2.7%	2.6%	2.6%	

7.0 Denmark

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

7.1 Energy Taxes

➤ Energy Taxes:

- In Denmark there are excise duties on fuels and electricity. These taxes are shown in Table 7-1, which shows how they compare to the recommended minimum rates in the existing ETD and the EU-28 average and median rates.²⁶⁹ The tax rates include the CO₂-tax, for which the standard rate is DKK 90 per ton CO₂ (€12.08).

Table 7-1: Excise Duties on Fuels and Electricity in Denmark

Excise Duty	Unit	Rate Applied in Denmark (1€=7.4582DKK)	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels - Propellant					
Unleaded Petrol	€ per 1000 litres	€595.99	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€405.59	€330	€427	€405
Kerosene	€ per 1000 litres	€454.13	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€502.80	€125	€209	€180
Natural Gas	€ per GJ	€10.13	€2.60	€3.03	€2.66
Motor Fuels - Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€81.04	€21	€221	€163
Kerosene	€ per 1000 litres	€80.39	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€94.66	€41	€126	€125
Natural Gas	€ per GJ	€14.03	€0.30	€1.76	€1.50

²⁶⁹ European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Excise Duty	Unit	Rate Applied in Denmark (1€=7.4582DKK)	Existing ETD Minimum	EU-28 Average	EU-28 Median
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€404.92	€21	€221	€163
Kerosene	€ per 1000 litres	€404.92	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€462.58	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€502.80	€0.00	€82	€40
Natural Gas	€ per GJ	€81.47	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€11.76	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€404.92	€21	€179	€125
Kerosene	€ per 1000 litres	€404.92	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€462.58	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€502.80	€0	€111	€42
Natural Gas	€ per GJ	€81.47	€0.3	€2.04	€0.94
Coal and Coke	€ per GJ	€11.76	€0.3	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€0.54	€0.5	€8.42	€1.03
Non-Business Use	€ per MWh	€111.69	€1.0	€14.53	€2.06

Sources: European Commission - Taxation and Customs Union (2014) Excise Duty Tables: Part II - Energy Products and Electricity, July 2014,
http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/ra/tes/excise_duties-part_ii_energy_products_en.pdf

- There is a reduced rate for motor fuels used for agricultural purposes. The rate reflects the CO₂-tax, whereas no energy tax applies. Among Member States with such reduced rates for motor fuels used by agriculture Denmark's has one of the lowest rates, e.g. of €59.13 for diesel.²⁷⁰ The reduced motor fuel rate for diesel also applies for railways along with a reduced rate for coal.

²⁷⁰ Cf. TAXUD tables.

- Prior to the exemption of ETS-installations from CO₂-tax there was a very extensive set of arrangements available to allow reductions for energy-intensive industries. These arrangements are still available, though in an amended way, for the very limited number of energy-intensive non-ETS installations subject to CO₂-tax (e.g. some greenhouses).
- Fuels and electricity for business use heating are in principle subject to the same tax rates as households and the domestic sector. However, from 1.1.2012 it has been possible to receive a partial refund of metered electricity consumption, presently at a rate of DKK 0.42 (€0.06).

7.2 Transport Taxes (Excluding Transport Fuels)

➤ Registration Taxes:

- A bonus-malus adjustment complements the registration tax, pending on energy-efficiency (Table 7-2).

Table 7-2: Adjustment in Registration Tax for Passenger Cars and Other Vehicles Based on Relative Fuel Efficiency

Type of Vehicle	Threshold	Reduction for Fuel Efficiency Below Threshold	Penalty for Fuel Inefficiency Above Threshold
Petrol vehicles	16 km per l	€536 per km per l	€134 per km per l
Diesel vehicles	18 km per l	€536 per km per l	€134 per km per l

- For the ad-valorem registration tax, the costs for certain security devices can be deducted; these include >3 airbags, ESP and ABS. There is a penalty for cars with no or only one airbag.
- For light-duty vehicles (<4 tonnes) there is an ad-valorem registration tax at 50% of the list price above €2,300. A reduced registration tax at 30% (maximised at €7,624) applies for such vehicles (>2.5 tonnes) which are fit for goods transport by not having a window behind the driver's seat and in which there are no passenger seats behind the driver.²⁷¹
- The following vehicles are exempt from registration tax: freight vehicles larger than four tonnes; passenger vehicles and LDV used by state institutions; all fire engines, ambulances and hearses; vehicles owned by the royal family.
- Electric and hydrogen vehicles are exempt from registration tax until end of 2015.

²⁷¹ <https://www.skat.dk/SKAT.aspx?oID=1947292>

- Passenger vehicles that are used combined for private and business purposes can have the registration tax reduced to 50%, provided that a set of complex regulations are complied with.

➤ **Circulation Taxes:**

- The circulation tax for passenger vehicles ('grøn ejer-afgift') and light duty vehicles is dependent on relative energy efficiency. Diesel vehicles are subject to a surtax ('udligningsafgift'), which partly offsets the advantage conveyed with lower taxation of diesel motor fuel relative to petrol. Same exemptions apply as for registration tax. Rates are shown in Table 7-3.

Table 7-3: Circulation Tax Rates According to Energy Efficiency of Vehicles

Petrol (km per l)	Diesel km per l	Annual Tax	Surtax Diesel
	>32.1	0	€32
	28.1-32.1	0	€150
	25-28.1	0	€268
>20	22.5-25	€78	€293
18.2-20	20.5-22.5	€150	€322
16.7-18.2	18.8-20.5	€223	€346
15.4-16.7	17.3-18.8	€298	€376
14.3-15.4	16.1-17.3	€370	€403
13.3-14.3	15-16.1	€443	€432
12.5-13.3	14.1-15	€515	€464
11.8-12.5	13.2-14.1	€588	€494
11.1-11.8	12.5-13.2	€660	€526

Note: Converted from DKK to €. Further categories defined in legislation

➤ **Road user charging for heavy-duty vehicles:**

- There is a road user charge for heavy-duty vehicles (>12 tonnes), which is part of the Eurovignette scheme in which Denmark participates. The rates are shown in Table 7-4.

Table 7-4: Road User Charges for Heavy-Goods Vehicles Greater than 12 Tonnes

Number of Axles	Exhaust	Annual	Monthly	Weekly	Daily
Two or three	Euro 0	€960	€96	€26	€8
	Euro 1	€850	€85	€23	€8
	Euro 2+	€750	€75	€20	€8

Number of Axles	Exhaust	Annual	Monthly	Weekly	Daily
Three or more	Euro 0	€1,550	€155	€41	€8
	Euro 1	€1,400	€140	€37	€8
	Euro 2+	€1,250	€125	€33	€8

- Exempt from road user charge are vintage lorries older than 35 years; military and defence vehicles; fire engines; state rescue services; police and road services.
- Duty vehicles less than 12 tonnes are not subject to the road user charge, but to a weight-based circulation tax.²⁷²

7.3 Pollution and Resource Taxes

➤ Packaging taxes:

- To complement the deposit-refund system for beverage containers in Denmark a volume-related packaging tax has been in place for more than two decades. It relates to drinking containers containing beer, carbonated drinks, liquor, wine, ice-tea and mineral water. Different sizes are subject to different tax rates, according to the specific packaging material (Table 7-5).
- A producer, filler or importer pays the tax the first time the container is placed on the market. With a glass bottle which is reusable, say 30 times, the tax per fill is equivalent to 1/30 of the tax. The tax therefore favours reuse over recycling. It has a lower rate for cardboard based on life-cycle analysis demonstrating its lesser burdens.

Table 7-5: Denmark's Packaging Tax

Volume of Container	Containers of cardboard/laminates	Containers of other materials (e.g. glass, plastic, metals)	Containers in deposit-refund system
	Rate DKK (EUR) per Container		
Volume < 10 cl	0.08 (0.01)	0.13 (0.02)	0.05 (0.01)
10 cl to 40 cl	0.15 (0.02)	0.25 (0.03)	0.10 (0.01)
40 cl to 60 cl	0.25 (0.03)	0.40 (0.05)	0.16 (0.02)
60 cl to 110 cl	0.50 (0.07)	0.80 (0.11)	0.32 (0.04)
110 to 160 cl	0.75 (0.10)	1.20 (0.16)	0.48 (0.06)

²⁷² <http://www.skm.dk/skattetal/satser/satser-og-beloebsgraenser/vaegtafgiftsloven/#tabel4>

Volume of Container	Containers of cardboard/laminates	Containers of other materials (e.g. glass, plastic, metals)	Containers in deposit-refund system
	Rate DKK (EUR) per Container		
Volume > 160 cl	1.00 (0.13)	1.60 (0.21)	0.64 (0.09)

➤ **PVC tax**

- Certain product groups are subject to taxation according to contents of PVC. Product groups not mentioned in the law are liable too, when PVC exceeds 10% of product weight. The law provides definitions of phthalates. There is a border-tax adjustment whereby the tax is refunded for exports.

Table 7-6: Rates for the Danish PVC Tax

Product Group	Tax with Phthalates	Tax with Other Softeners
	DKK (EUR) per kg	
Soft pipes Tape and adhesives Roof-folios Membrane folios Roof plates Roof windows	3.50 (0.47)	1.40 (0.19)
PVC floor or wall cover Floor cork	0.30 (0.04)	0.16 (0.02)
Other floor and wall cover	3.00 (0.40)	1.60 (0.22)
Gloves PVC-protection Rain wear	3.60 (0.50)	1.08 (0.14)
Pipes for rain run-off	0.25 (0.03)	0.10 (0.01)

Note: there are other product groups covered by the law.

➤ **Waste tax:**

- Denmark taxes the deposition of waste to landfill on a per tonne basis. There are two rates – one for hazardous waste (introduced in 2012) and one for all other types of waste (including both municipal and construction and demolition waste).
- The tax has been imposed since 1987 with a rate that has increased

several times. The current rate for non-hazardous waste (2014) is DKK 475.00 (€63.67) per tonne. The same rate is paid for waste that is deposited in a landfill temporarily prior to incineration.

- The rate for hazardous waste is DKK 160.00 (€21.44) per tonne.
- The revenue from the landfill tax in 2013 was DKK 155 million (€20.8 million).
- The Danish waste tax on incineration was abolished on 1 January 2014 due to incineration of waste being taxed through energy taxation.

➤ **Pesticides tax:**

- The use of pesticides is taxed in Denmark. This is done on an estimated impact basis, i.e. on the basis of the degree of harm caused by the chemicals in the pesticide.
- Previously, the tax used to be an ad-valorem tax according to the type of pesticide but due to a change of law in 2013, the rate is now determined based on the sum-product of four parameters, each of which is multiplied by the pesticide's impact rating in the respective area:
 - Human health impact: DKK 107 (€14.34) per kg pesticide.
 - Environmental toxicity: DKK 107 (€14.34) per kg pesticide.
 - Environmental behaviour: DKK 107 (€14.34) per kg pesticide.
 - Base rate: DKK 50 (€6.70) per kg pesticide.
- The revenue from the pesticides tax was DKK 659 million (€88.3 million) in 2013.

Table 7-7: Pesticide Tax Rates

Tax Rates	June 30, 2013	From July 1, 2013	2014
Plant protection			
	Charge of price tag value excl. VAT		Pay per view. kg or litre plant protection
Chemical agents for disinfecting soil in order to plant	35 per cent.	-	-
Chemical agents for controlling plant growth excluding algae growth	25 per cent.	-	-
Chemical agents for controlling plant diseases	25 per cent.	-	-
Chemical agents for controlling plant growth except for the actual plant nutrients and soil conditioners	25 per cent.	-	-
The charge is the sum of the charges calculated in accordance with no. 1-4	-	107 kr.	107 kr.
1 Health charge, per. kg. or liter plant protection times the product's health impact per. kg or liter of medium	-	107 kr.	107 kr.

Tax Rates	June 30, 2013	From July 1, 2013	2014
2 Environmental Impact Fee, per. kg. or l active substance times the product's environmental impact load per. kg. or liters agent		107 kr.	107 kr.
3 Environmental Behaviour Effect, per. kg. or l active substance times the product's environmental performance load per. kg or liter of medium		50 kr.	50 kr.
4 Base charge, per. kg or liter of active substance			
Chemical biocides			
	Tax on the taxable value excl. VAT ^{1) 2)}		
Chemical biocides for controlling insects, etc.. except means to combat pests in wood	35 per cent.	40 per cent.	40 per cent.
Chemical biocides to deter insects, etc.. and wild mammals and birds.	25 per cent.	30 per cent.	30 per cent.
Chemical biocides to combat fungi and pests in wood	3 per cent.	3 per cent.	3 per cent.
Chemical biocides to control the growth of algae	3 per cent.	3 per cent.	3 per cent.
Chemical biocides for control of slime-forming organisms in pulp	3 per cent.	3 per cent.	3 per cent.
Chemical biocides to control rats, mice, voles, moles and rabbits	3 per cent.	3 per cent.	3 per cent.
Microbiological plant	3 per cent.	3 per cent.	3 per cent.

Notes:

1) If an agent is involved in several categories, paid the highest tax rate

2) When selling directly to consumers fixed charge value to the product's normal wholesale price. If there is a general wholesale price, the taxable value by selling directly to the consumer or by transfer to a private retailer product's retail price less 20 per cent.

➤ **Aggregates (Extraction) Tax:**

- Any extraction of materials from the ground for a commercial purpose is taxed on a per volume basis. Furthermore, imported extracted materials are also subject to taxation under the same law.
- Materials subject to taxation under this law include: sand, clay, chalk, granite, limestone, and granite.
- The law on the extraction tax sets out the weight-volume conversion factor for each material, but the tax rate is flat on a per volume basis for all materials: DKK 5.00 (€0.67) per m³.
- The revenue from the aggregates tax was DKK 134 million (€17.96 million).

➤ **Air pollution taxes:**

- There are several air pollution taxes in Denmark, each related to a separate compound.
- Sulphur: The tax is paid based on the amount of sulphur in the energy product that is combusted and subsequently released into the atmosphere:
 - Pollution related to fossil-fuel based energy products, such as gas oil, natural gas and coal, which have a sulphur content that exceeds 0.05% is taxed at the rate of DKK 22.60 (€3.03) per kg sulphur.
 - Industrial plants that burn biomass or waste materials in boilers which are larger than 1,000 kW pay according to the amount of sulphur dioxide emitted: DKK 11.30 (€1.51) per kg.
 - Plants that do not know the amount of sulphur dioxide emitted from combusted biomass or waste pay a set rate which ranges from DKK 10.00 (€1.34) per tonne for waste to DKK 44.50 (€5.96) per tonne for wood pellets.
 - Any plants that utilise flue gas desulphurisation or similar technology to mitigate against the release of sulphur are exempt from the tax.
 - The revenue for the sulphur air pollution tax was DKK 52 million (€7.0 million) in 2013.
- NO_x (nitrogen oxide compounds): Similarly, a tax is paid based on the amount (or assumed amount) of nitrogen oxide released through burning fuels.
 - If the amount of nitrogen oxide is known, the rate is DKK 25.50 (€3.42) per kg NO_x.
 - Other fuels have individual tax rates associated with them and are based on the volume or tonnage of fuel burnt.
 - Revenue from the nitrogen oxide aspect of the air pollution tax: DKK 875 million (€117 million).

➤ **Nitrogen Fertiliser Tax:**

- Denmark has imposed a tax on nitrogen to improve the efficiency of its use and prevent its escape into the environment.
- The tax base includes the following:
 - Ammonia falling under customs tariff items 2814;
 - Potassium nitrate and calcium nitrate falling under customs tariff items 2834;
 - Ammonium chloride falling under customs tariff items 2827;

- Manures and fertilizers falling under customs tariff items 3102 and 3105; and
 - Nitrate in manure which is pulverized, granulated or otherwise processed and which is determined for sale in packages of 50 kg or less.
- The tax rate is DKK 5.0 (€0.67) per kg of nitrogen.
 - Most farmers, gardeners and the forestry sector do not pay this tax – the tax is not paid if the total nitrogen content is less than 2% by weight of the manure or fertiliser.
- **Tax on phosphate in feed:**
- A tax of DKK 4 (€0.54) is applied per kg of mineral phosphates contained in feed phosphates.
- **Tax on CFCs:**
- The tax rates are presented in Table 7-8.

Table 7-8: Tax Rates on CFCs

Tax Rates	2013 DKK per kg	2014 DKK per kg
Chemical substances used in the manufacture and maintenance of district heating pipes, refrigerators, freezers, sealing foam, spray cans, etc..		
Trichlorofluoromethane (CFC-11)	30	30
Dichlorodifluoromethane (CFC-12)	30	30
Trichlorotrifluoroethane (CFC-113)	30	30
Dichlorotetrafluoroethane (CFC-114)	30	30
Chloropentafluoroethane (CFC-115)	30	30
Bromochlorodifluoro (halon-1211)	30	30
Bromotrifluoromethane (halon-1301)	30	30
Dibromotetrafluoroethane (halon-2402)	30	30
HFC-23 (R-23)	600	600
HFC-32 (R-32)	101	101
HFC-41 (R-41)	15	15
HFC 43-10mee (R-43-10mee)	246	246
HFC-125 (R-125)	525	525

Tax Rates	2013 DKK per kg	2014 DKK per kg
HFC-134 (R-134)	165	165
HFC-134a (R-134a)	215	215
HFC-143 (R-143)	50	50
HFC-143a (R-143a)	600	600
HFC-152a (R-152a)	19	19
HFC-227ca (R-227)	483	483
HFC-236fa (R-236-fa)	600	600
HFC-245ca (R-245ca)	96	96
HFC-245fa (R-245fa)	155	155
HFC-365mfc (R-365mfc)	119	119
R-404a (HFC-143a / HFC 125 / 134a)	588	588
R-407 (HFC-32 / HFC-125 / 134a)	266	266
R-410A (HFC-32 / HFC-125)	313	313
R-413A (HFC-134a / PFC-218 / HFC-600a)	308	308
R-507 (HFC-125 / HFC-143a)	598	598
R-508A (HFC-23 / PFC-116)	600	600
R-508B (HFC-23 / PFC-116)	600	600
Sulphur hexafluoride ($_{SF6}$)	600	600
Perfluoromethane (R-14)	600	600
Perfluoroethane (R-116)	600	600
Perfluoropropane (R-218)	600	600
Perfluorocyclobutane	600	600
Perfluorohexane	600	600
Perfluorobutane	600	600
Perfluoropentane	600	600

Note: Is a taxable substance (HFCs, PFCs and $_{SF6}$) are not subject to the above stated rates shall be paid a fee of DKK 600 per kg.

➤ **Tax on Batteries:**

- The tax applies to sealed nickel-cadmium batteries. The tax rates are summarised in Table 7-9.

Table 7-9: Tax Rate for Nickel-Cadmium Batteries

Tax Rates	2013	2014
Nickel-cadmium loose round cells, single or grouped button cells or fladpak	DKK 6,00	DKK 6,00
Grouped Nickel-Cadmium Cylindrical Cells - At least	DKK 36.00 per Package DKK 6.00 per Cell	DKK 36.00 per Package DKK 6.00 per Cell
Used items: the tax is the same as that of an equivalent new product, but at least	DKK 120 nickel- cadmium battery	DKK 120 nickel- cadmium battery

Note: The tax rate relates only nickel-cadmium batteries. The number of cells in a package will typically be determined by the number of volts (V), the package can supply divided by 1.2 V. Ex. will a package with a voltage of 9.6 V contain 8 cells.

➤ **Water abstraction tax (tax on piped distributed water):**

- Water that is abstracted from ground water or received from water works is taxed on a per volume basis.
- If the water is abstracted from own wells and used for specific purposes only, the company can be exempt from the tax – such as a farmer using water for irrigation only.
- The tax rate is made up of two parts: a base rate and an additional drinking water contribution. Both of these are charged on a volumetric basis. The rate has changed over the past few years, increasing since 2012 up through 2017, after which it is due to decrease again:
 - 2012: DKK 5.23 (€0.70) per m³ (base rate) + DKK 0.67 (€0.09) per m³ (drinking water contribution): DKK 5.90 (€0.79) per m³
 - 2013 - 2014: DKK 5.46 (€0.73) per m³ (base rate) + DKK 0.67 (€0.09) per m³ (drinking water contribution): DKK 6.13 (€0.82) per m³
 - 2015 - 2017: DKK 5.86 (€0.79) per m³ (base rate) + DKK 0.67 (€0.09) per m³ (drinking water contribution): DKK 6.53 (€0.88) per m³
 - 2018 - 2019: DKK 6.18 (€0.83) per m³ (base rate) + DKK 0.00 (€0.00) per m³ (drinking water contribution): DKK 6.18 (€0.83) per m³
- VAT-registered companies can be reimbursed for the water abstraction tax paid on water used for VAT-liable purposes, though not if the water is sold

on to other customers.

- The revenue from the water abstraction tax was DKK 1.58 billion (€212 million) in 2013.

➤ **Waste water tax:**

- A further water-related tax is the waste water tax, which is levied on all releases of waste water into lakes, rivers and the sea. The basis of the tax rate is the amount of active and harmful material in the water:
 - Total Nitrogen content: DKK 30.00 (€4.03) per kg.
 - Total Phosphorus content: DKK 165.00 (€22.15) per kg.
 - Organic material: DKK 16.50 (€2.21) per kg.
- Waste water treatment facilities with at least 15% household waste water pay according to the assumed likely concentration of harmful materials.
- Revenue from the waste water tax was DKK 147 million (€19.7 million).

7.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 7-10: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	668	647	-20
Petrol	million litres	170	170	0
Kerosene	million litres	163	163	0
LPG	thousand tonnes	8	8	0
Heavy Fuel Oil	thousand tonnes	16	16	0
Natural Gas	TJ (GCV)	10,082	10,048	-34
Coal	thousand tonnes	10	10	0
Electricity	GWh	4,852	4,460	-392

Figure 7-1: Change in Internal Passenger Flights, flights per year

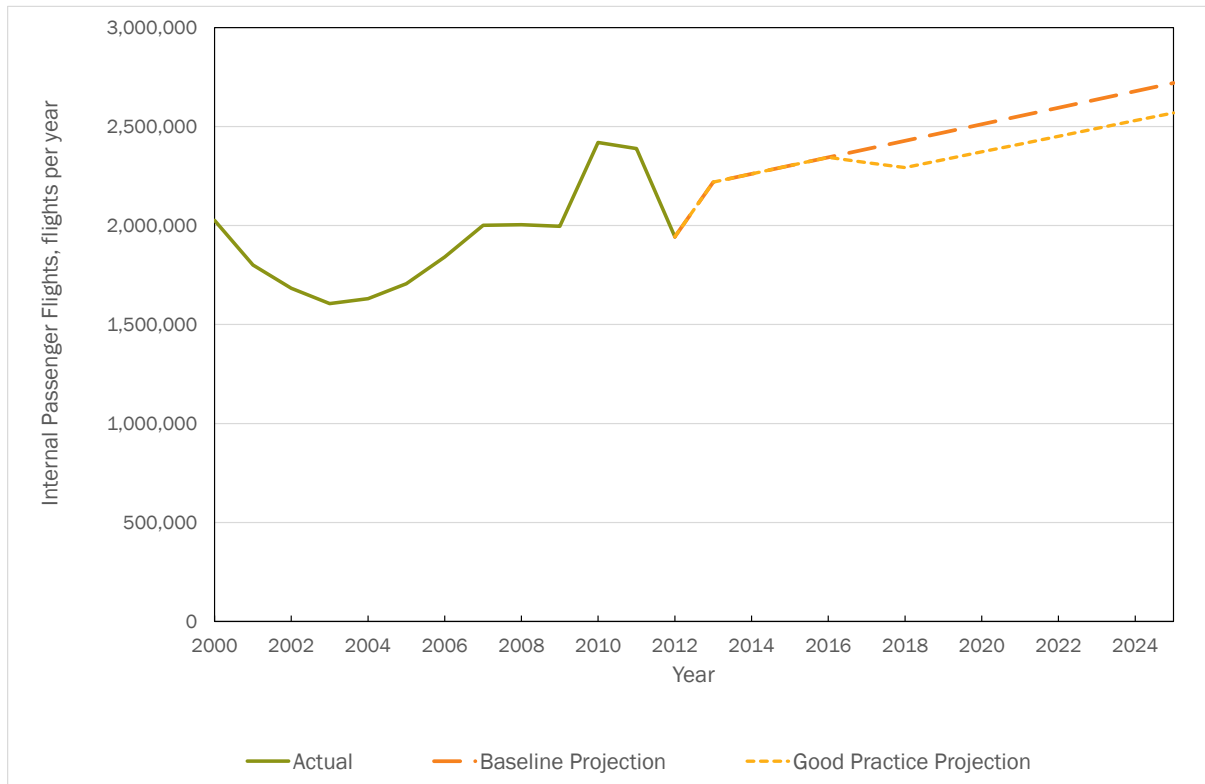


Figure 7-2: Change in Intra-EU Passenger Flights, flights per year

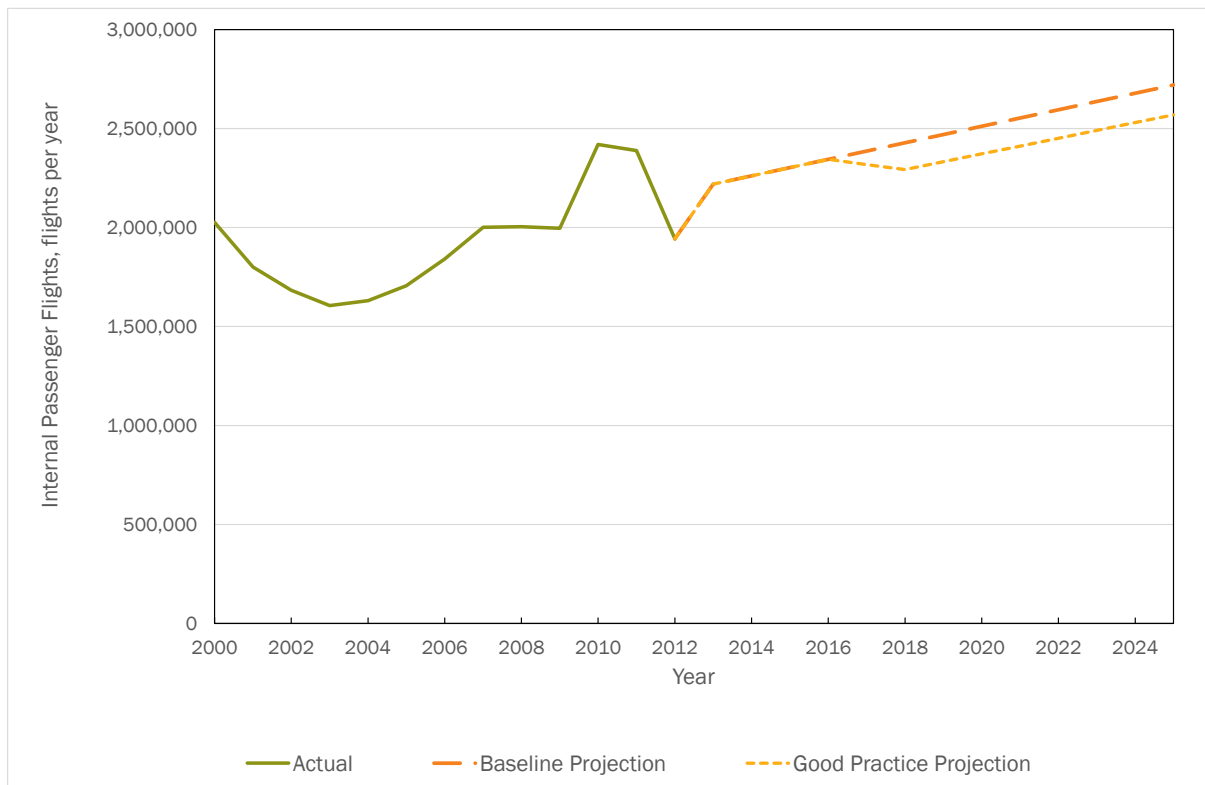


Figure 7-3: Change in Extra-EU Passenger Flights, flights per year

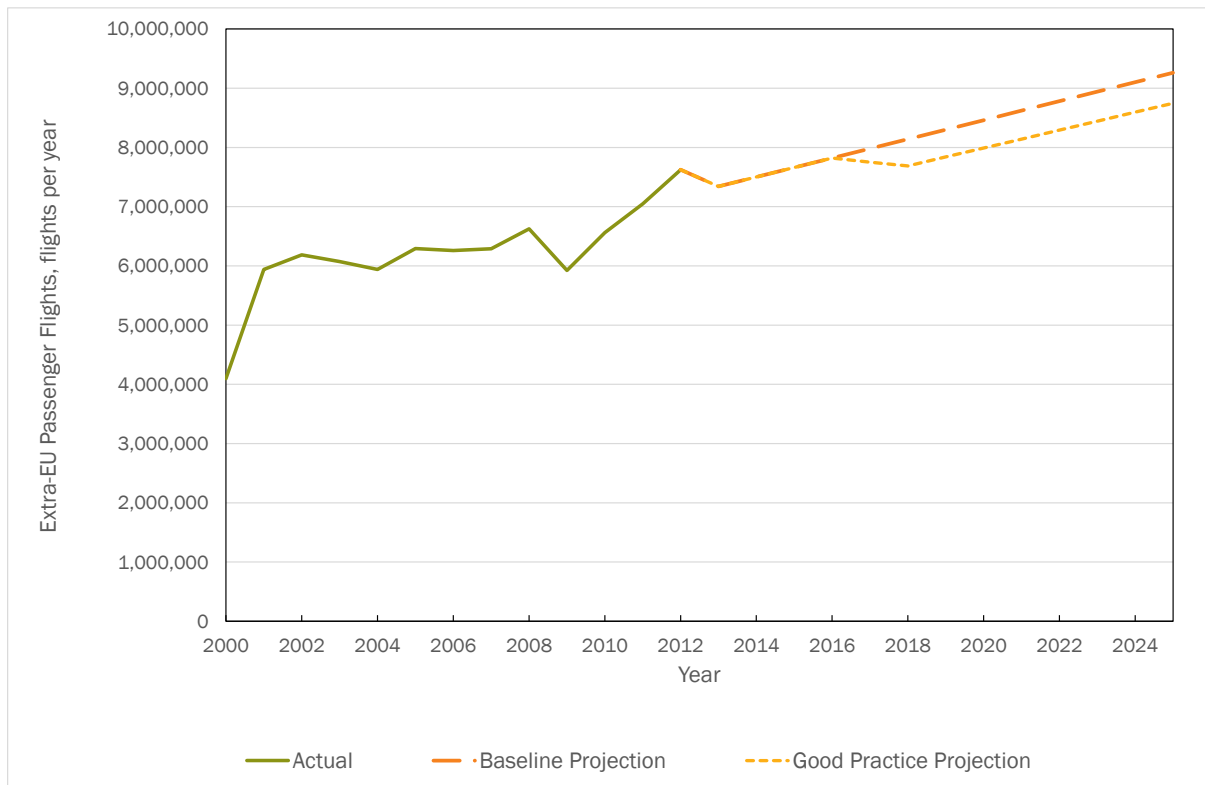


Figure 7-4: Change in Internal Air-freight, tonnes

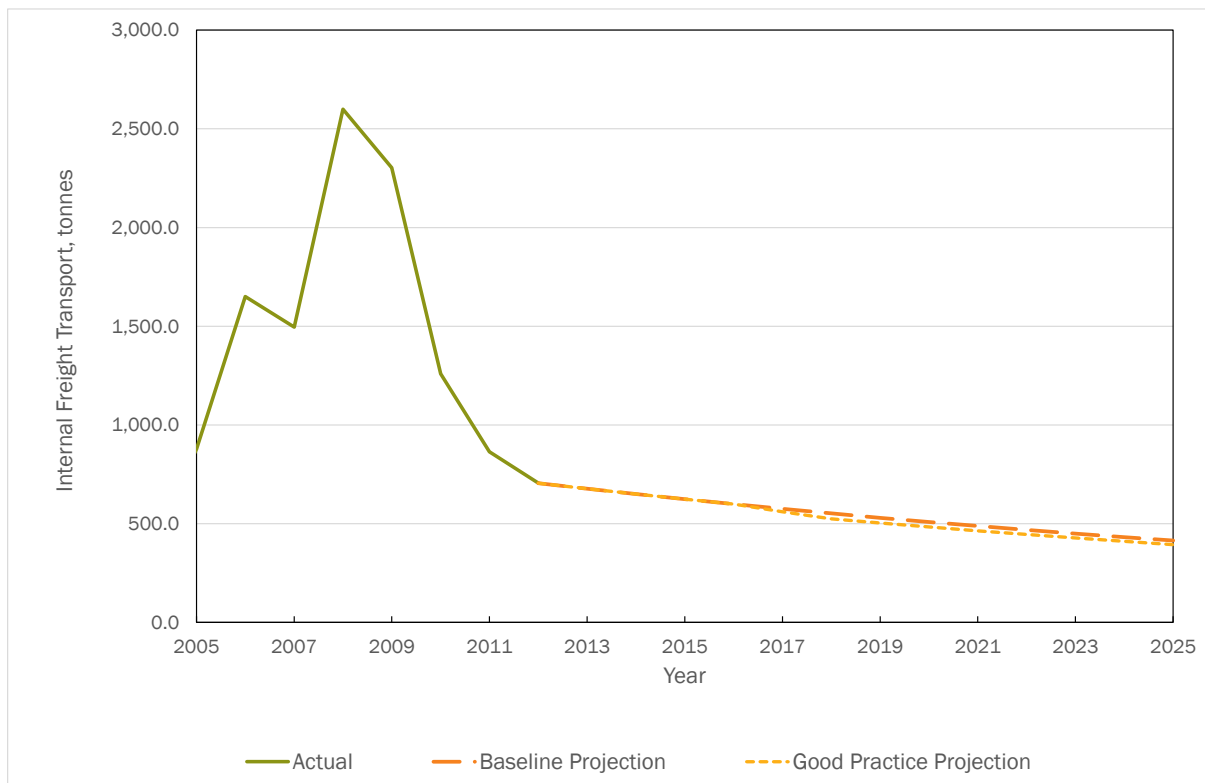


Figure 7-5: Change in Intra-EU Air-freight, tonnes

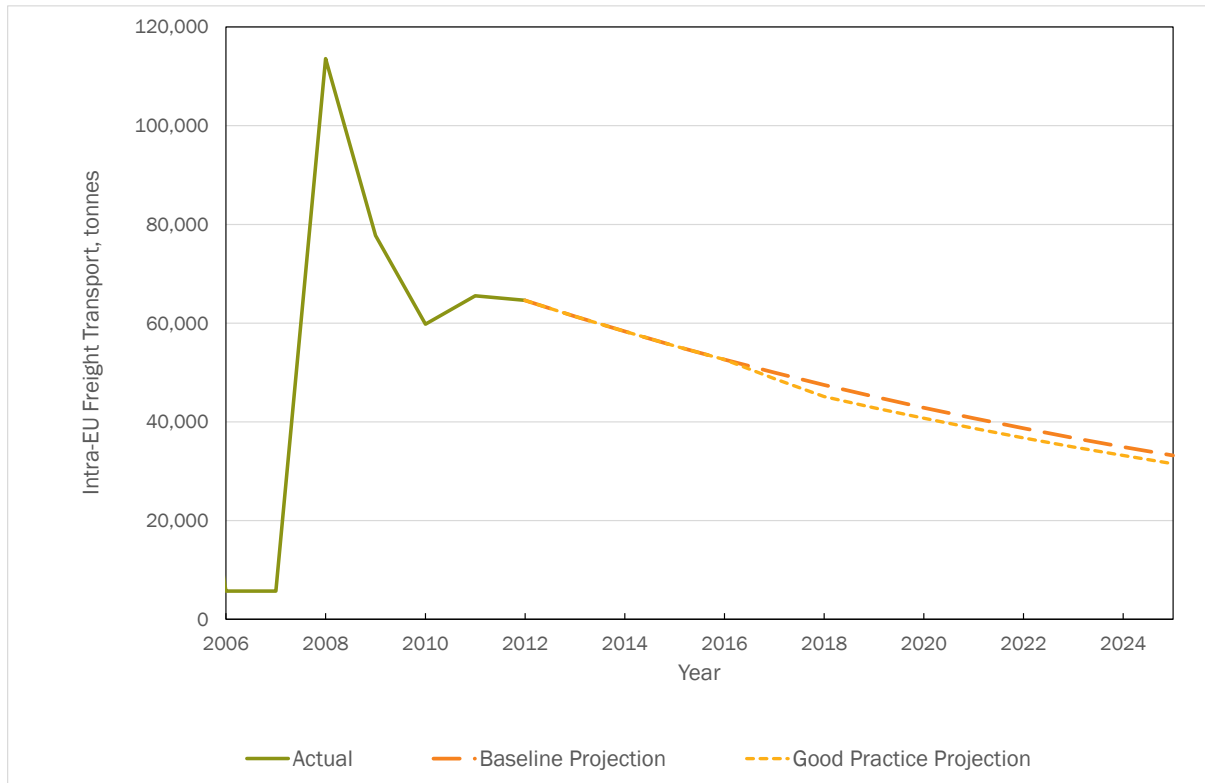


Figure 7-6: Change in Extra-EU Air-freight, tonnes

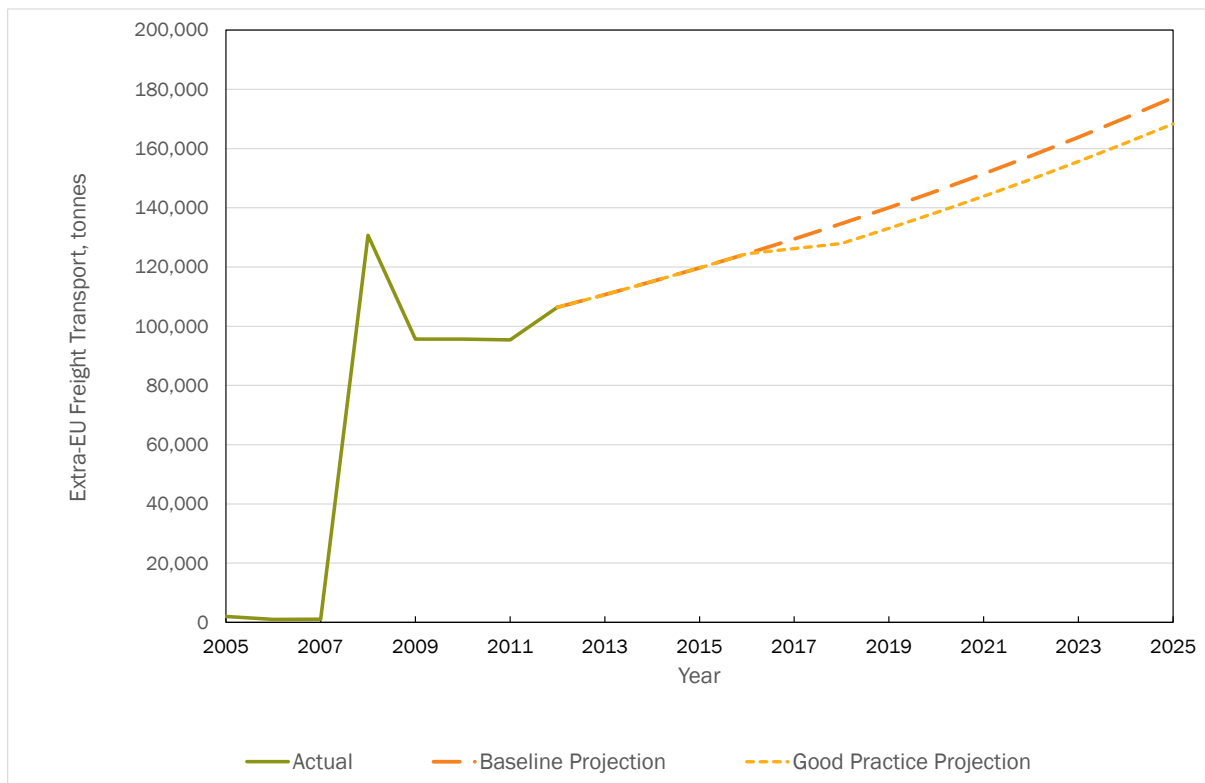


Figure 7-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

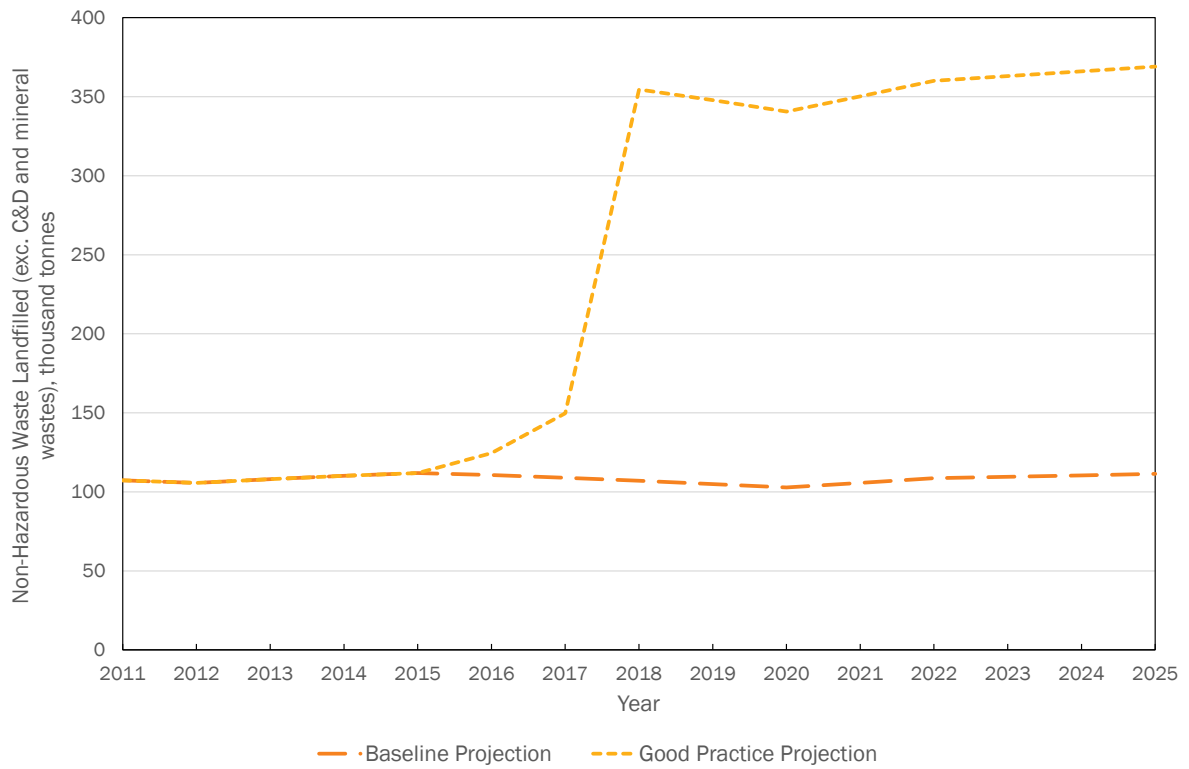


Figure 7-8: Change in MBT/ Incineration, thousand tonnes

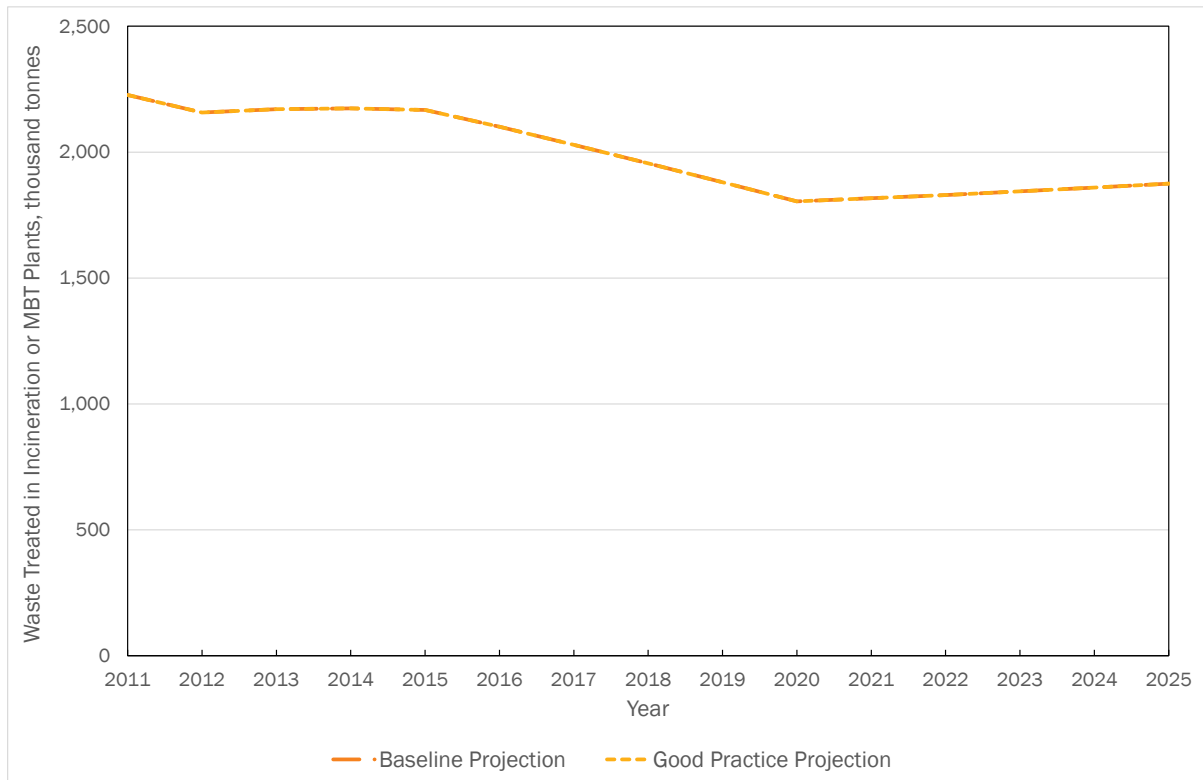


Figure 7-9: Change in SOx Emissions, tonnes



Figure 7-10: Change in NOx Emissions, tonnes

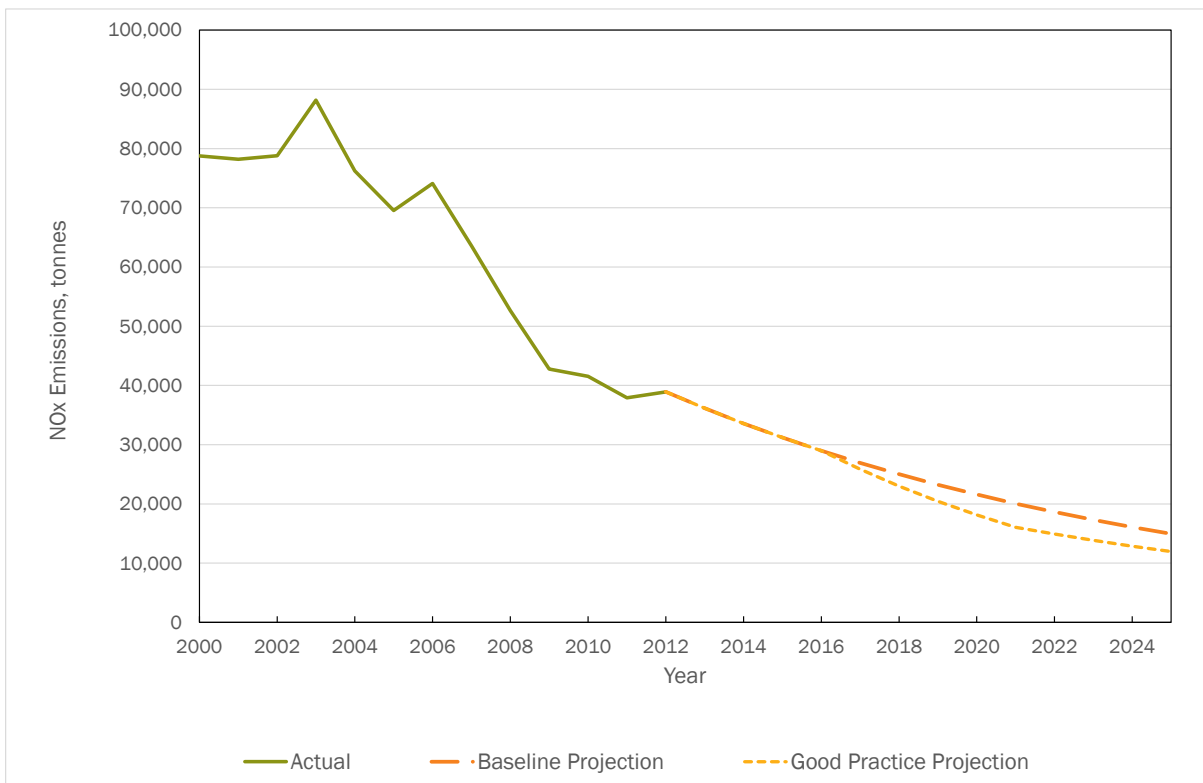


Figure 7-11: Change in PM₁₀ Emissions, tonnes

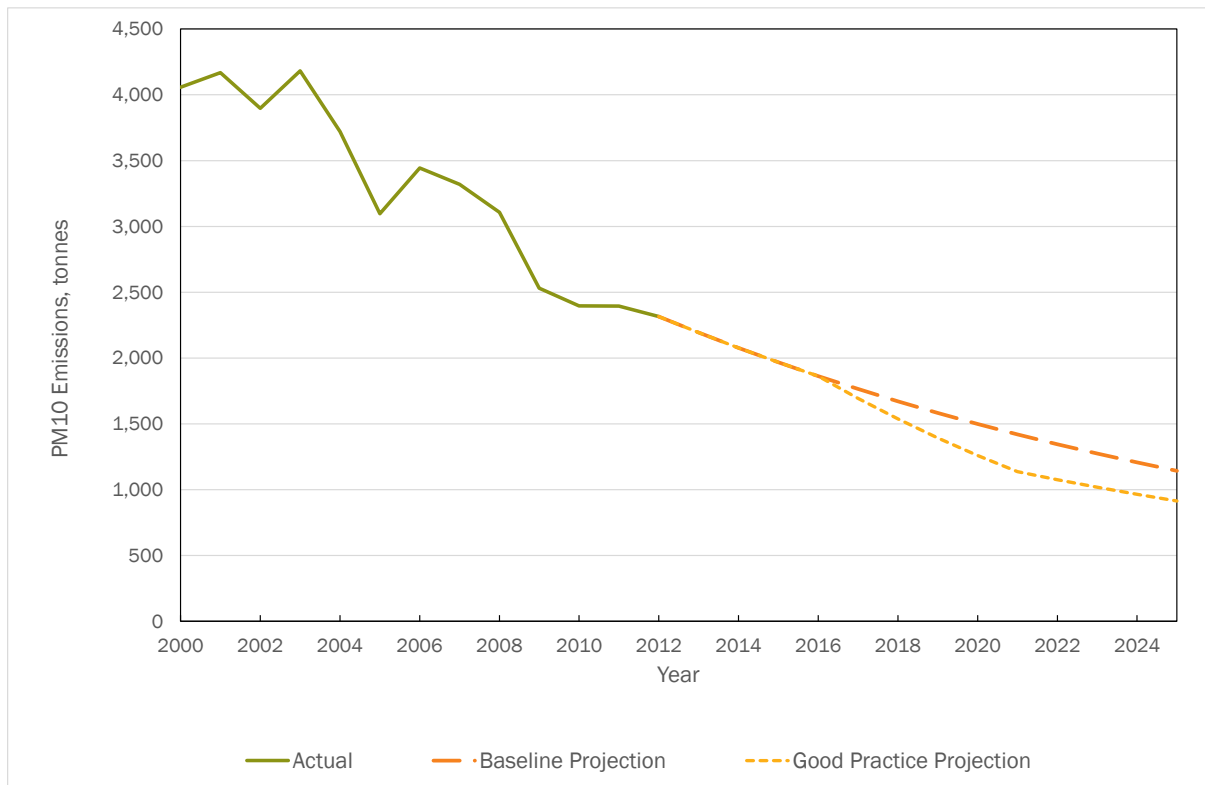


Figure 7-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

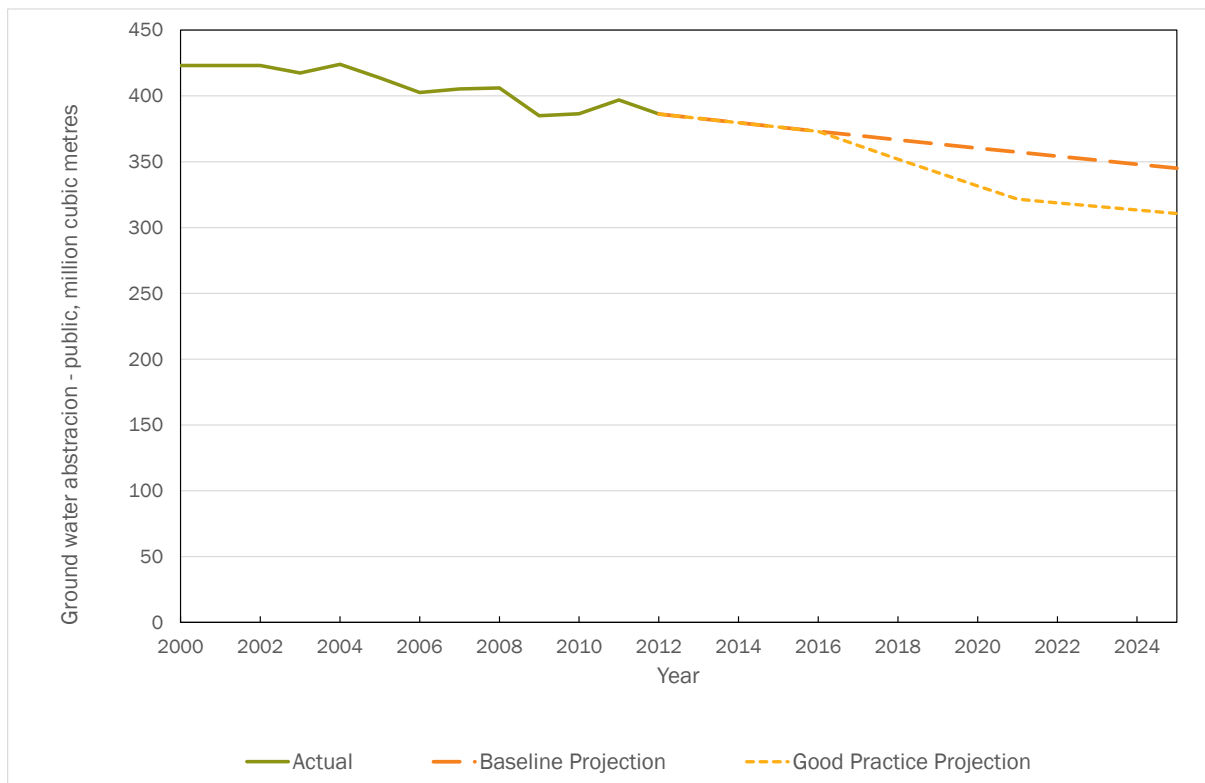


Figure 7-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

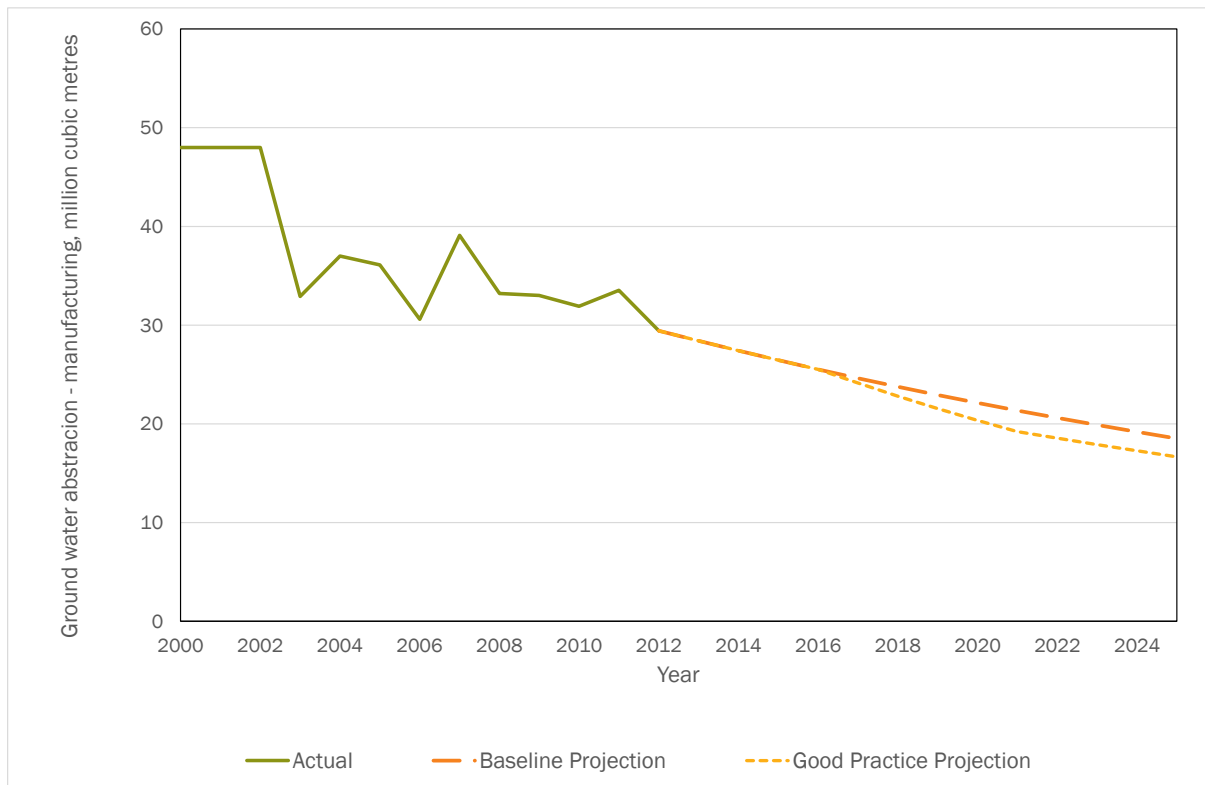


Figure 7-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

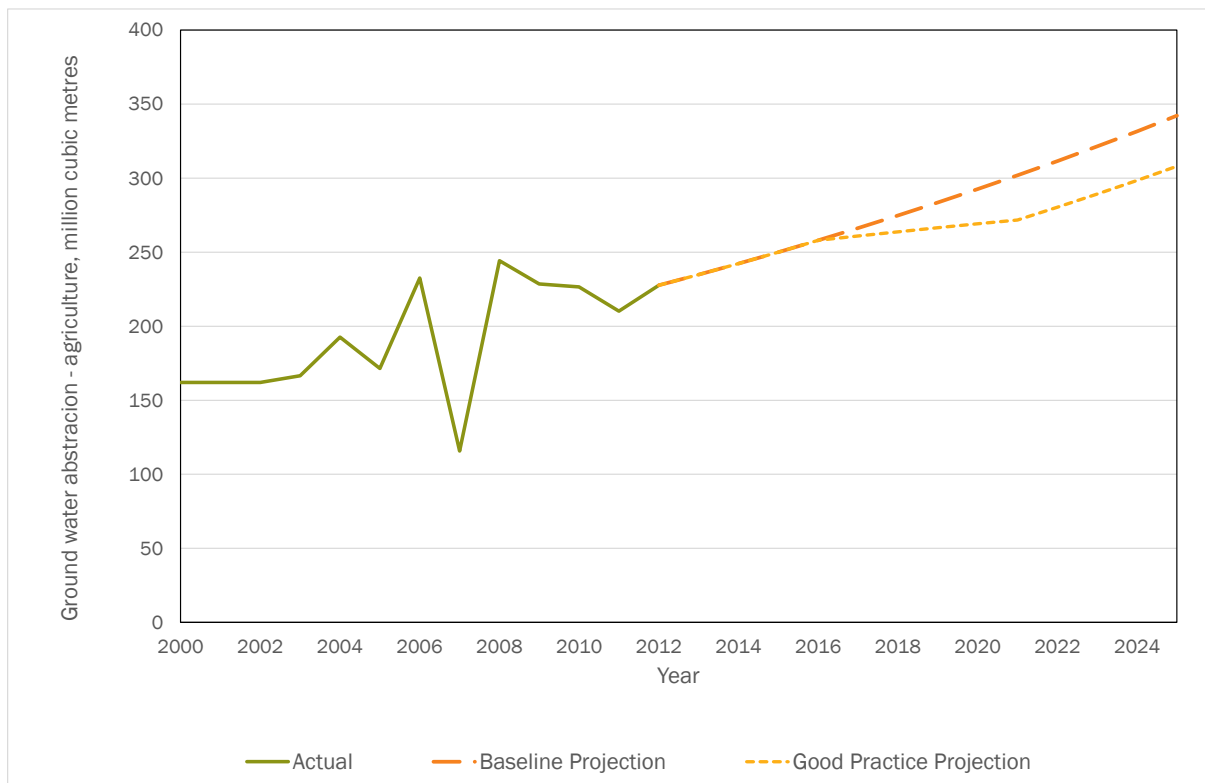


Figure 7-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

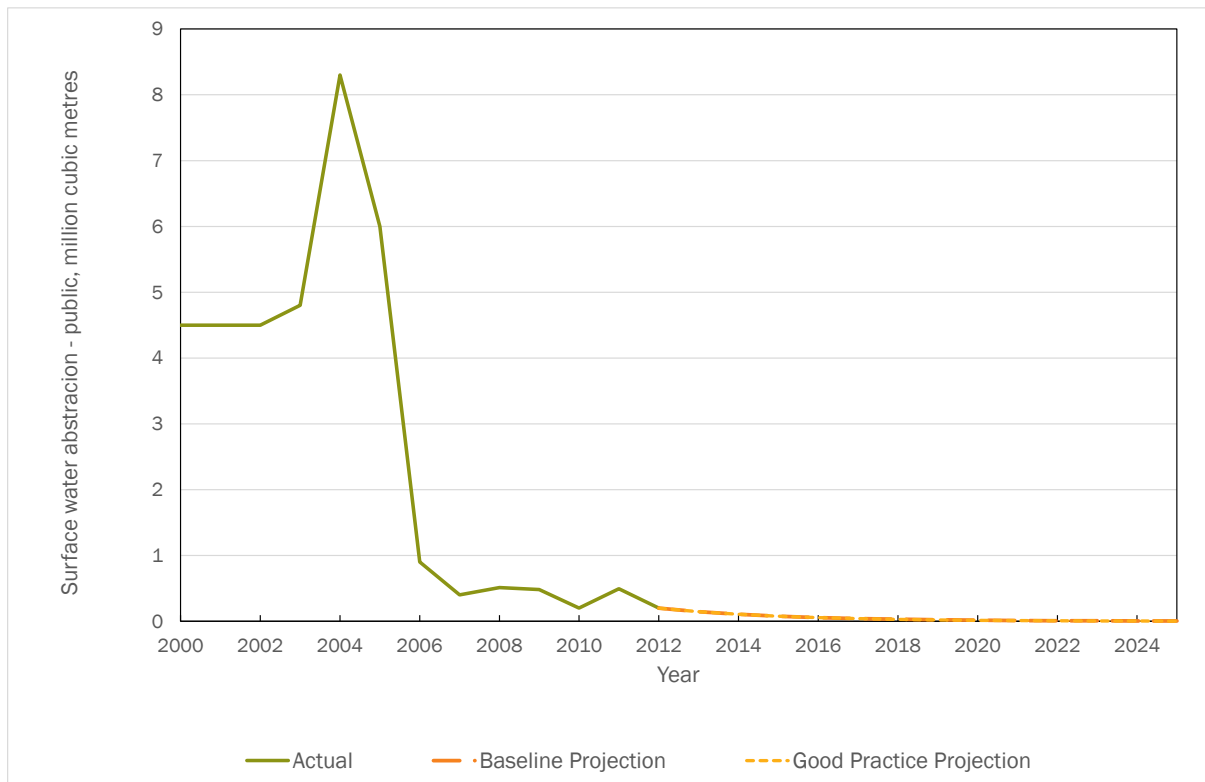


Figure 7-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres

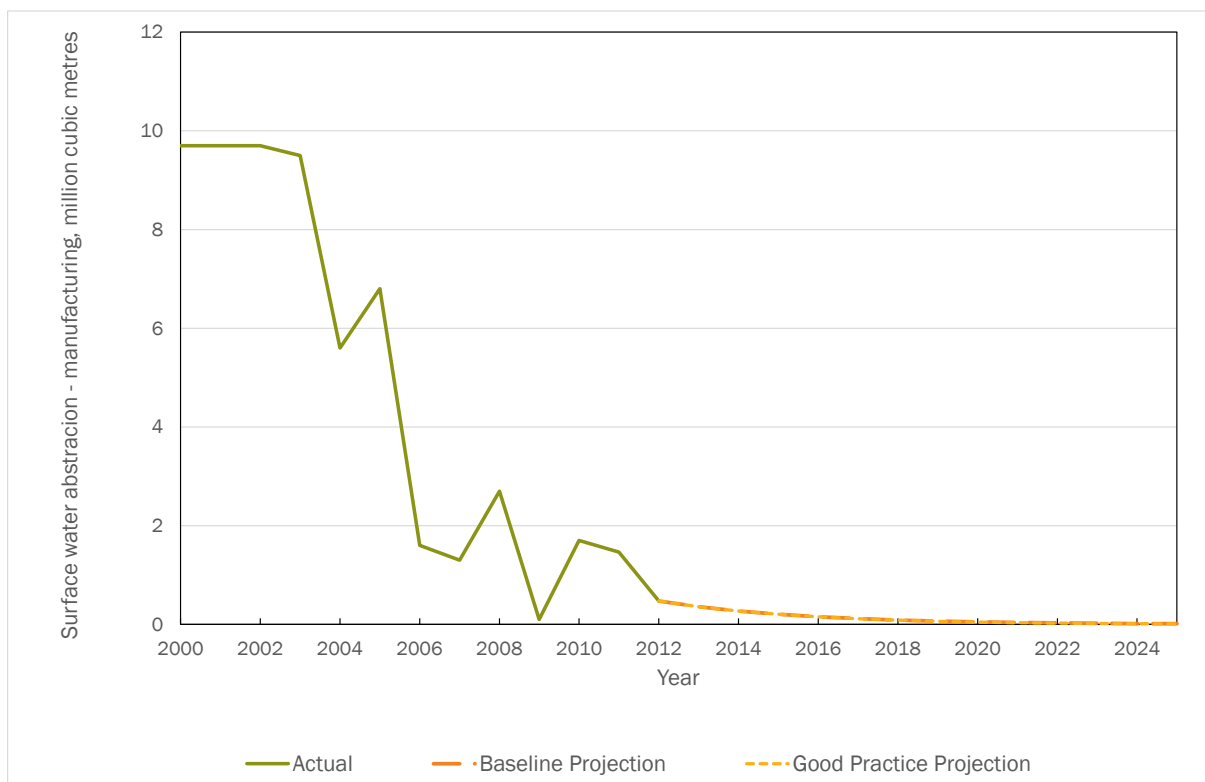


Figure 7-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

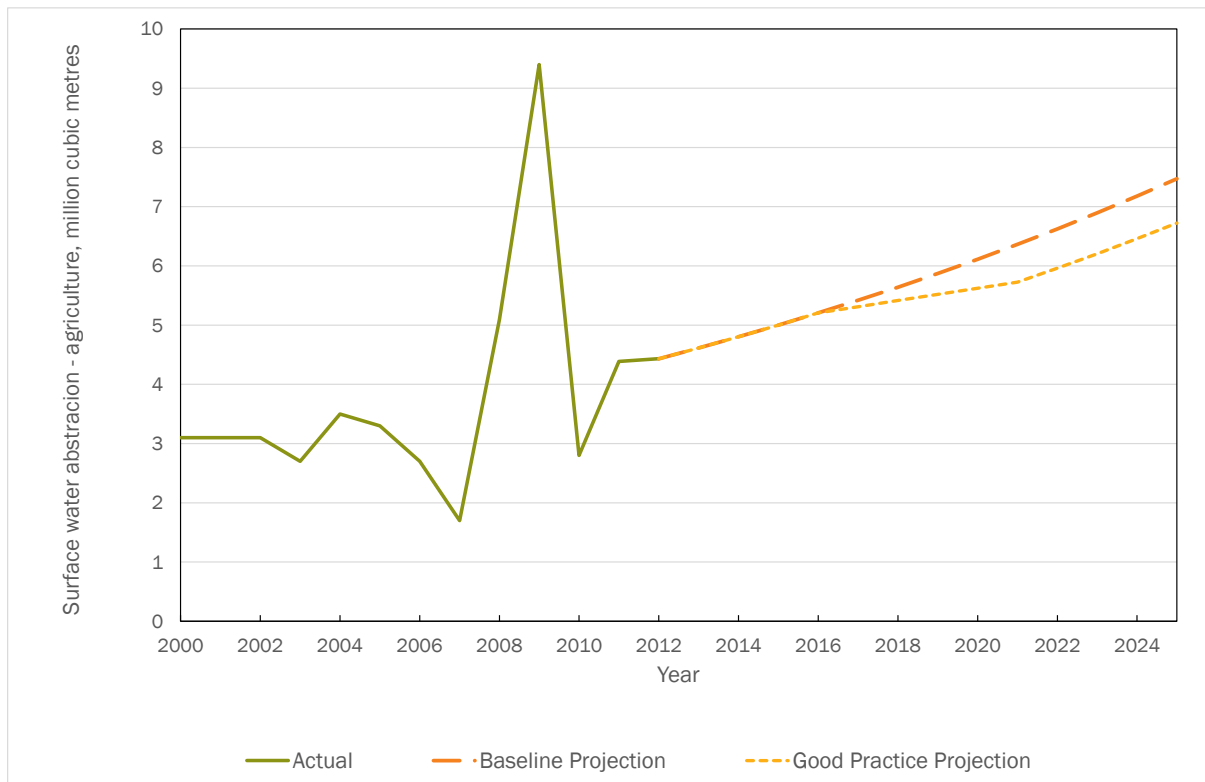


Figure 7-18: Change in Active Ingredients in Pesticides, tonnes

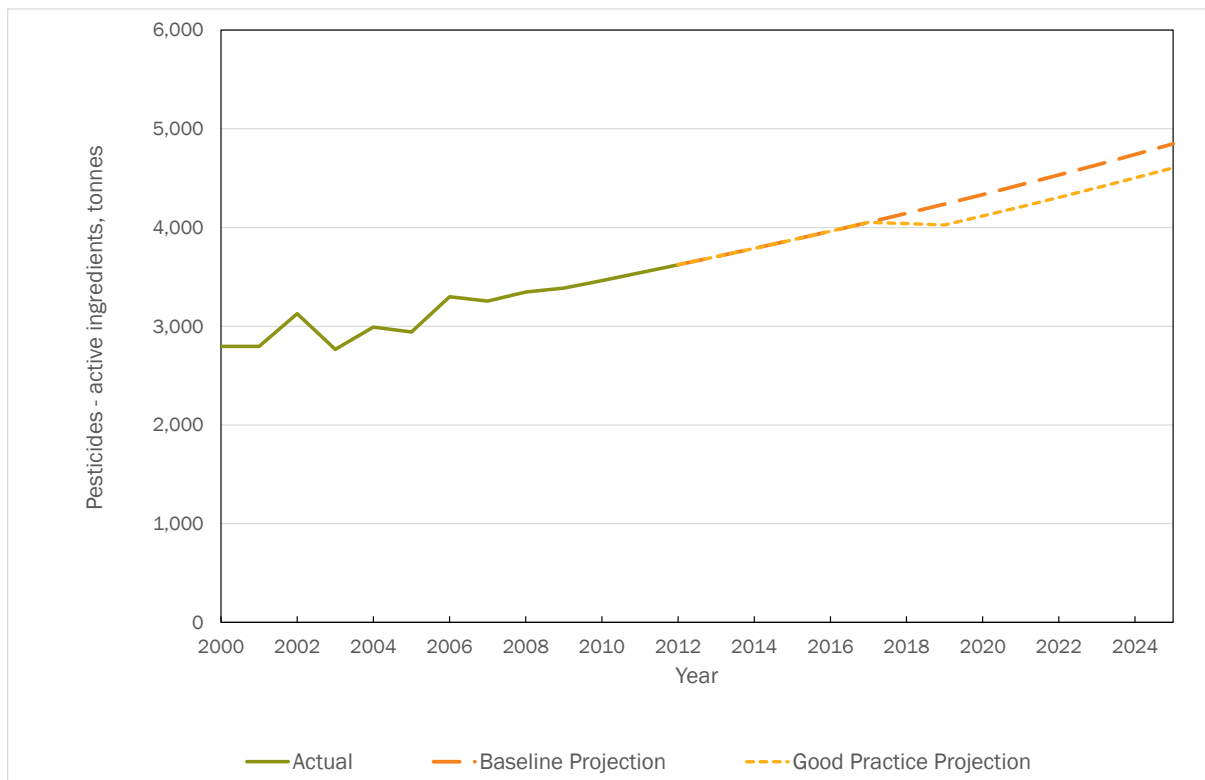


Figure 7-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes



Figure 7-20: Change in Aggregates Extraction, thousand tonnes

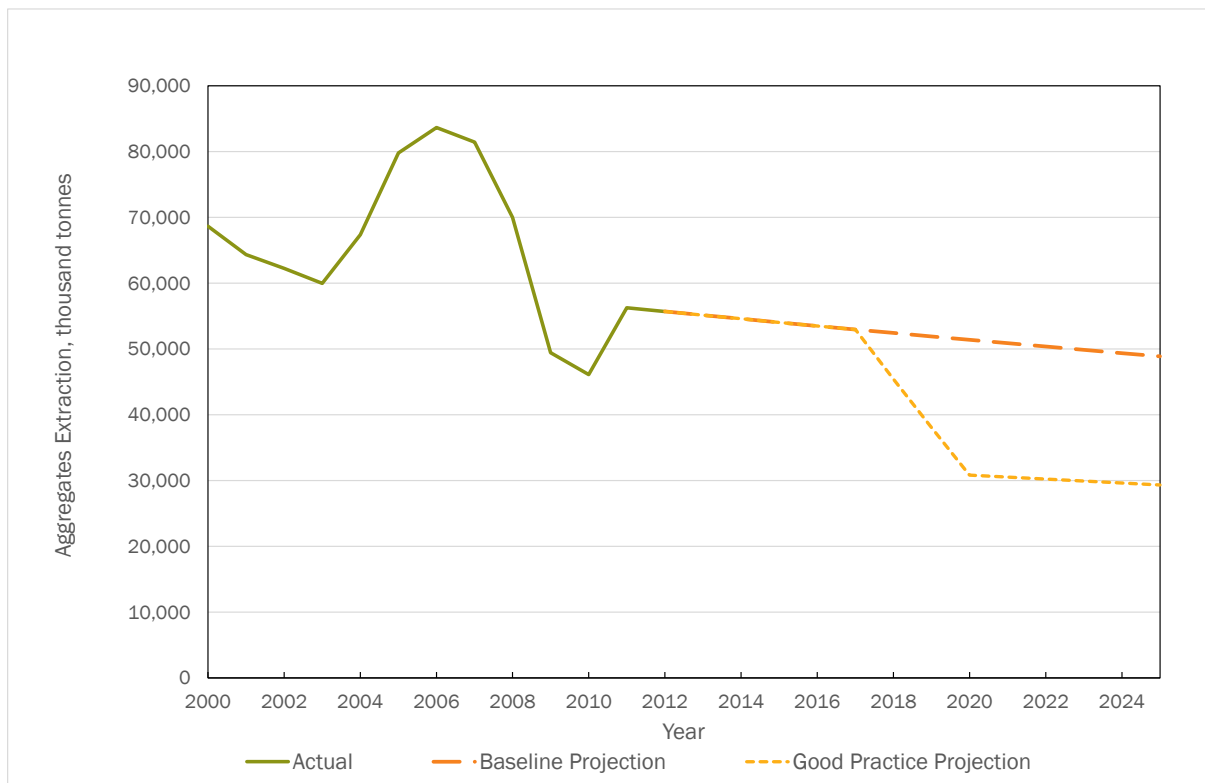


Figure 7-21: Change in Paper & Card Packaging Generation, thousand tonnes

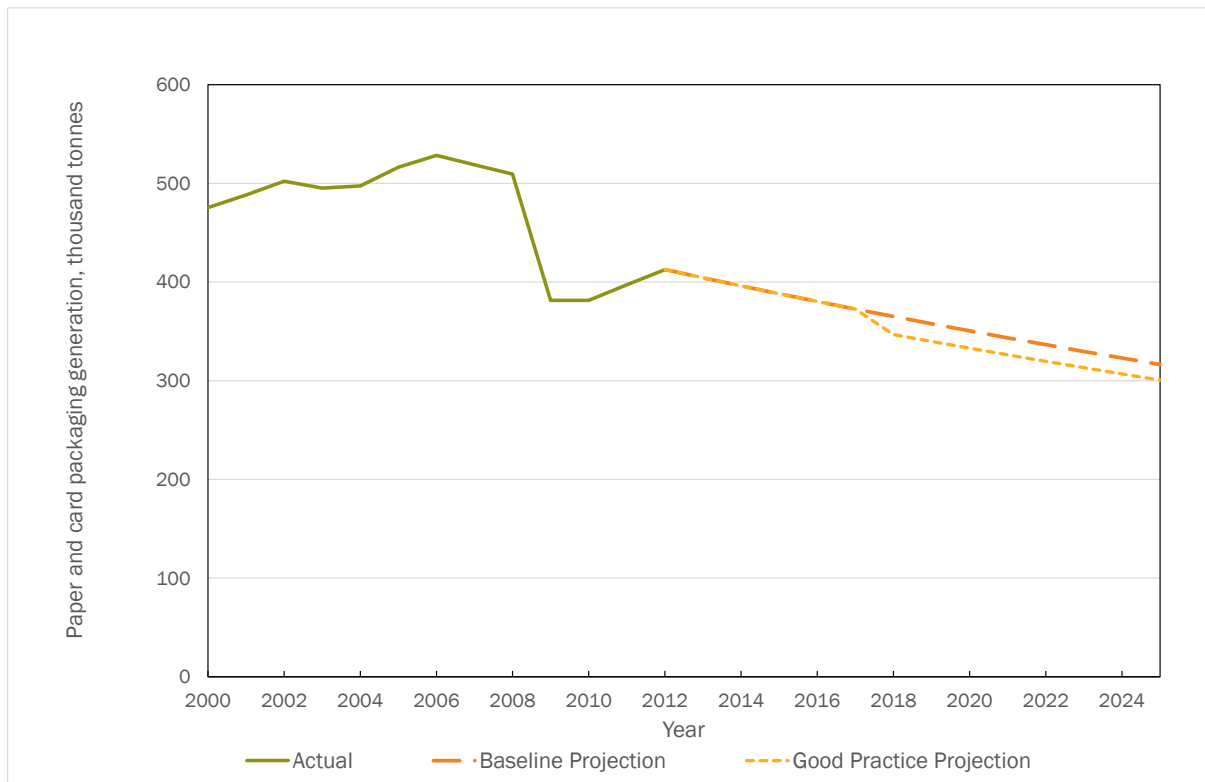


Figure 7-22: Change in Plastic Packaging Generation, thousand tonnes

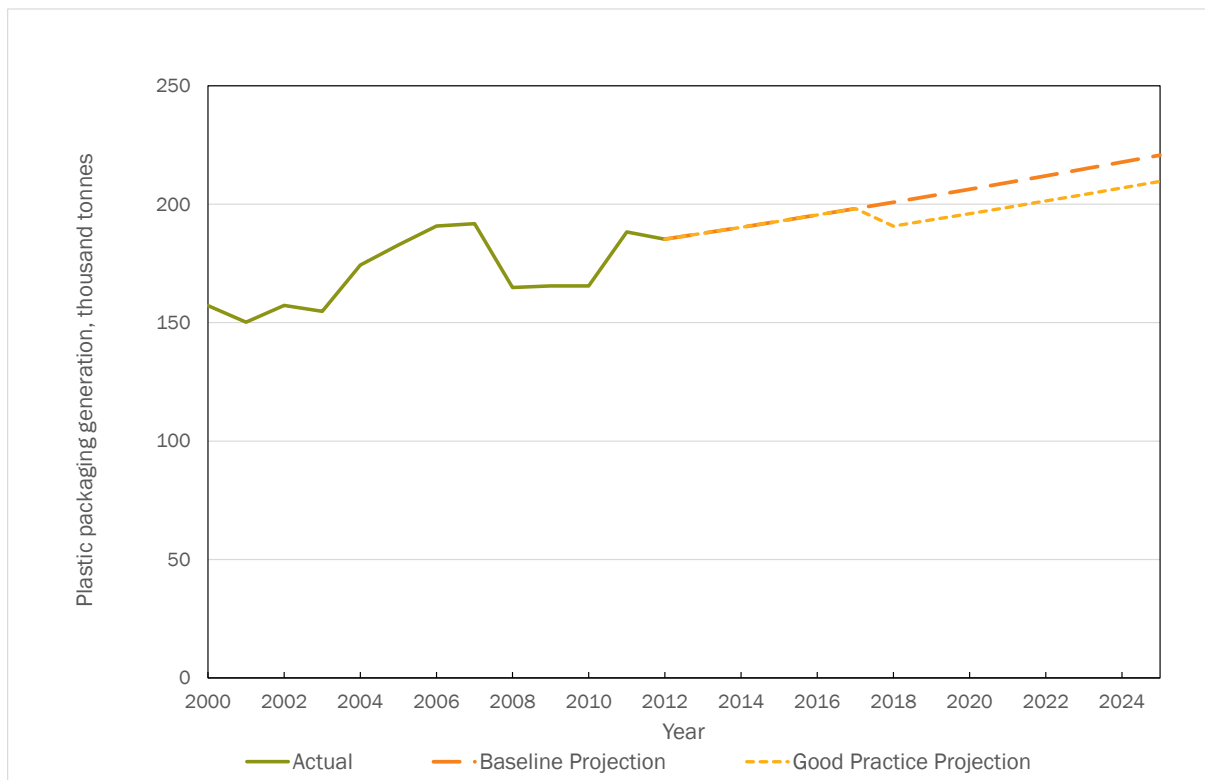


Figure 7-23: Change in Wood Packaging Generation, thousand tonnes

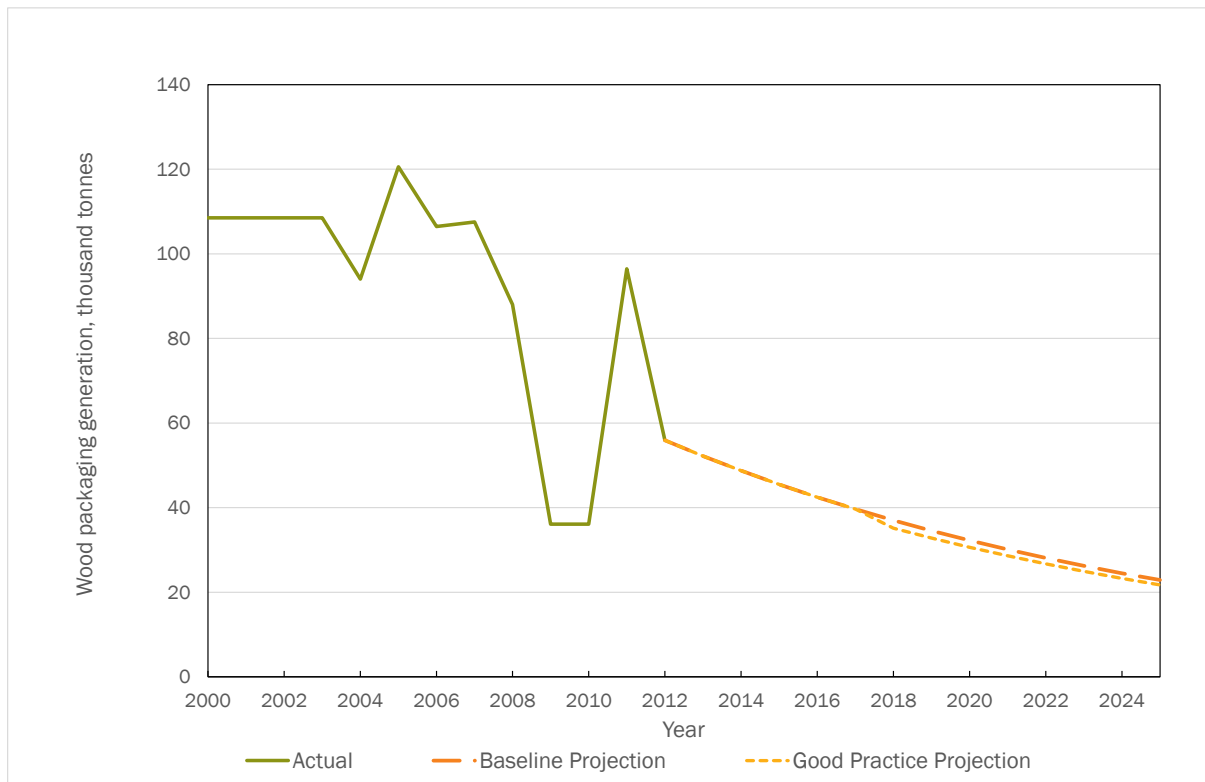


Figure 7-24: Change in Metal Packaging Generation, thousand tonnes

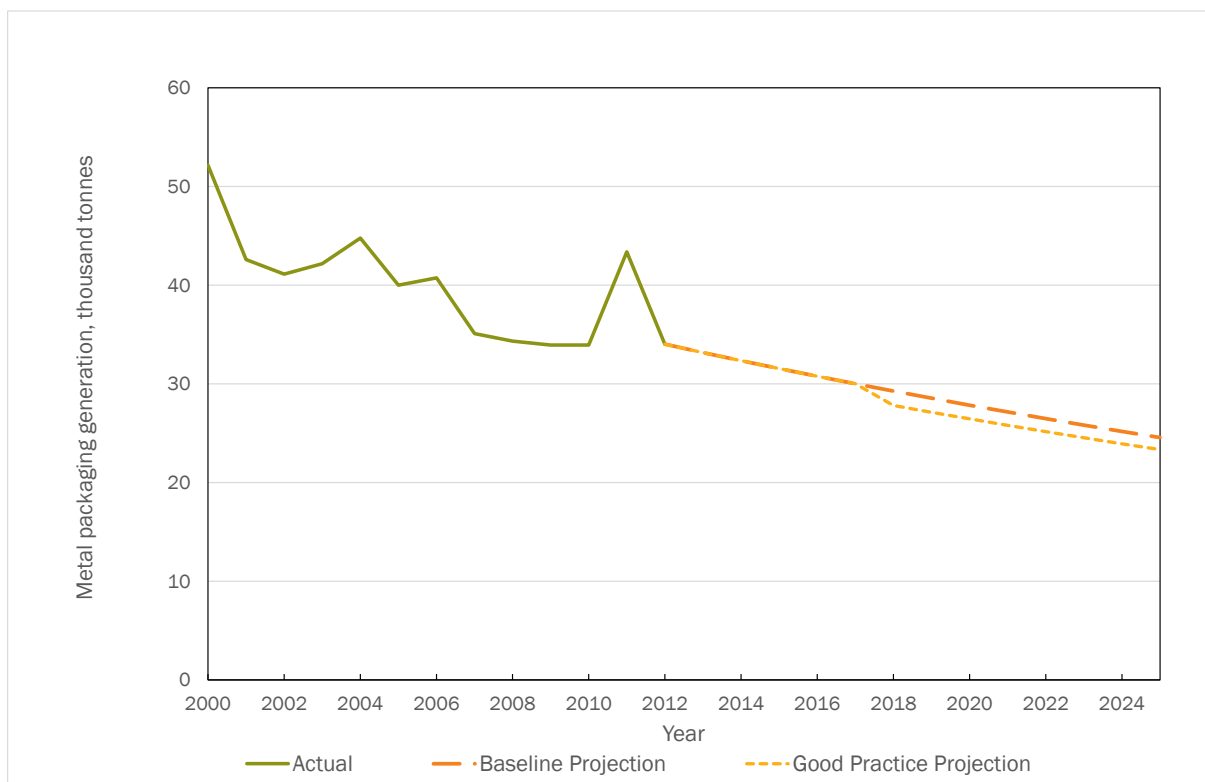


Figure 7-25: Change in Glass Packaging Generation, thousand tonnes

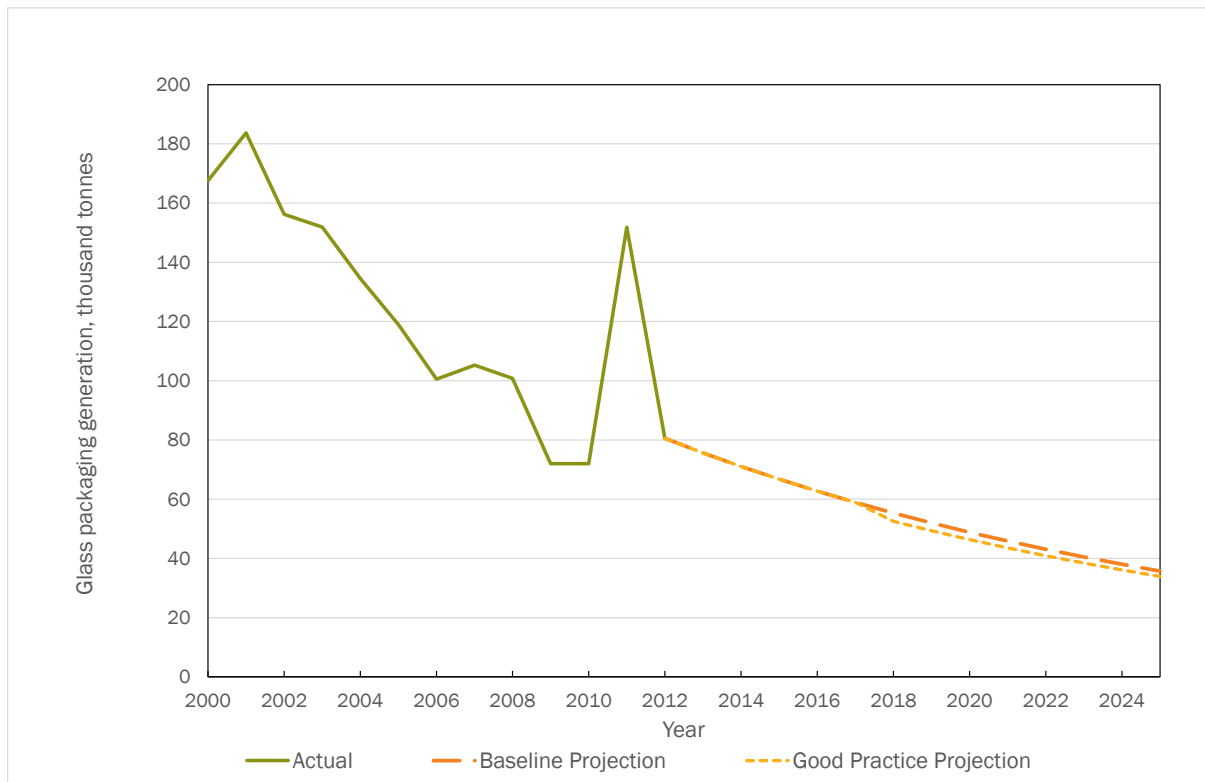
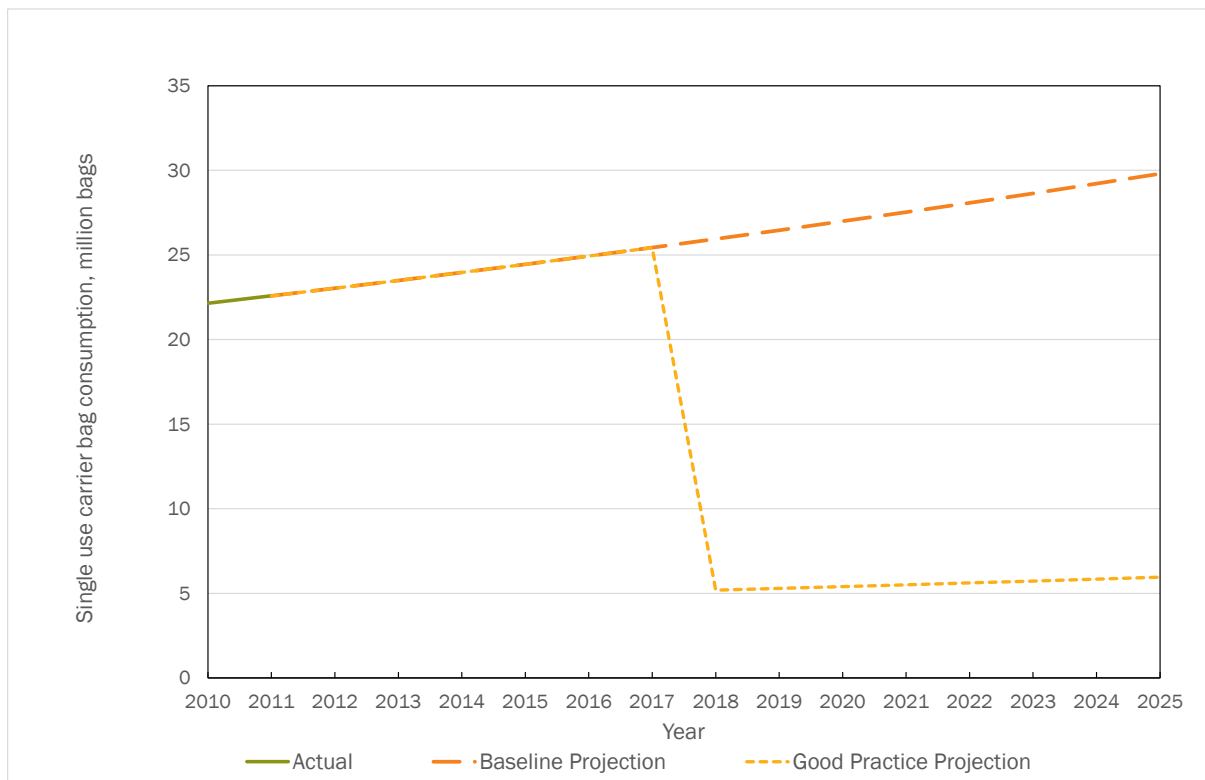


Figure 7-26: Change in Consumption of Single Use Carrier Bags, million bags



7.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 7-11: Revenue Outturns from Model, million DKK (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	143	285	426	565	704	841	977	977	977
	C&I / Heating	0	0	2	4	6	8	10	12	14	14	14
	Electricity	856	856	856	856	856	856	856	856	856	856	856
	Sub-total Energy, million DKK	856	856	1,001	1,145	1,288	1,429	1,570	1,709	1,847	1,847	1,847
	Sub-total Energy, % GDP	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	523	1,046	1,568	2,092	2,616	2,616	2,617	2,617	2,618
	Passenger Aviation Tax	0	0	3,300	6,557	6,696	6,835	6,975	7,114	7,253	7,392	7,531
	Freight Aviation Tax	0	0	1	2	2	2	2	2	2	2	2
	Sub-total Transport, million DKK	0	0	3,823	7,604	8,266	8,929	9,592	9,731	9,871	10,011	10,150
	Sub-total Transport, % GDP	0.0%	0.0%	0.2%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0
	Landfill Tax - Inerts (C&D)	0	1	2	3	2	2	2	2	2	2	2
	Incineration /MBT Tax	0	77	145	206	198	190	191	192	194	196	197

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	6	11	15	19	21	19	18	17	16	15
	Water Abstraction Tax	0	10	21	31	40	50	49	49	50	51	51
	Waste Water Tax	0	61	118	171	165	165	165	165	165	165	165
	Pesticides Tax	0	0	227	452	450	461	471	482	493	504	515
	Aggregates Tax	0	0	790	657	527	399	395	391	387	383	379
	Packaging Tax	0	0	181	171	170	169	168	168	167	167	166
	Single Use Bag Tax	0	26	26	5	5	6	6	6	6	6	6
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million DKK	0	181	1,521	1,711	1,576	1,461	1,466	1,473	1,480	1,488	1,497
	Sub-total Pollution & Resource, % GDP	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total Revenue Stream	Total, million DKK	856	1,037	6,346	10,460	11,130	11,819	12,627	12,913	13,198	13,346	13,495
	Total, % GDP	0.0%	0.1%	0.3%	0.5%	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%	0.7%

8.0 Finland

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

8.1 Energy Taxes

- **Excise Duty on Energy Products (“Nestelmäisten polttoaineiden valmistevero/Accis på flytande bränslen Sähkö ja eräiden polttoaineiden valmistevero/Accis på elström och vissa bränslen”):²⁷³**
 - An excise duty is levied on transport fuels, heating fuels and electricity. The excise duty is divided into three components: an energy content tax, a CO₂ tax, and an addition surcharge, the strategic stockpile fee which is levied on liquid fuels, electricity, coal, and natural gas. The energy component is largely based on energy content, while the CO₂ component is based on a life-cycle approach to CO₂ emissions.²⁷⁴
 - Rates: see Table 8-1 for details of overall standard rates applied. For specific rates of the three components of the excise duty see Table 8-2 and Table 8-3.
 - Main exemptions:²⁷⁵
 - Fuels used to generate electricity as an excise duty is levied on electricity.
 - Liquefied petroleum gas.
 - Fuels used in aviation other than private leisure flights.
 - Electricity for direct use in electric rail traffic.

²⁷³ DG TAXUD (2014) *Taxes in Europe Database, Finland Excise Duty – Energy Products*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=844/1395070212&taxType=Energy+products+and+electricity

²⁷⁴ Withana, S., ten Brink, P., Kretschmer, B., Mazza, L., Hjerp, P., Sauter, R., Malou, A., and Illes, A., (2013) Annexes to Final Report - Evaluation of environmental tax reforms: International experiences. A report by the Institute for European Environmental Policy (IEEP) for the State Secretariat for Economic Affairs (SECO) and the Federal Finance Administration (FFA) of Switzerland. Brussels. 2013. http://ieep.eu/assets/1282/ETR_study_by_IEEP_for_the_Swiss_Government_-_Annexes_-_21_June_2013.pdf

²⁷⁵ DG TAXUD (2014) *Taxes in Europe Database, Finland Excise Duty – Energy Products*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=844/1395070212&taxType=Energy+products+and+electricity

- Tax rate for fuel peat is lower than its calculated CO₂ emissions are. Note that the government decided in the budget proposal to cancel the next increase (€ 5.9 per MWh) for fuel peat, which should have come into force in 2015. Thus the rate remains at the 2014 level of € 4.9 per MWh.
- Excise duty on electricity is graded into two categories: lower (II) tax category applies for electricity used in industry or server rooms; and higher (I) category applies for all other consumption (households, agriculture, forestry, construction, public administration and services).
- If electricity is produced in a combined heat and power plant the duty is levied on the fuels used for producing heat.²⁷⁶
- A reduced rate (fifty per cent) applies for the CO₂ tax on fossil fuels used in combined heat and power production.²⁷⁷
- In cases where the excise duty paid by energy-intensive enterprise exceed 0.5% of the company's value added, the company may apply for a refund of 85 per cent of the amount of the excise duties paid. Only the part exceeding €50,000 (as a threshold) of the tax refund is repaid.
- If biofuels fulfil the requirements of the Renewable Energy Sources Directive a reduced rate of the CO₂ tax is applied.²⁷⁸
- A refund from the energy content tax is provided for gas oil, heavy fuel oil, biofuel and 1.2 c/kWh for electricity for professional agricultural use.²⁷⁹
- Revenue in 2012 (including all excise duties and the stockpile fee) was € 4,000 million (equivalent to 2% of GDP).²⁸⁰

Table 8-1: Standard Rates of Excise Duties on Energy Products in Finland²⁸¹

Excise Duty	Unit	Rate Applied in Finland
Transport Fuels		
Unleaded Petrol ¹	€ per 1000 litres	€672.9
Gas Oil (Diesel)	€ per 1000 litres	€496.6
Kerosene	€ per 1000 litres	€731.0

²⁷⁶ Ibid.

²⁷⁷ Ibid.

²⁷⁸ Ibid.

²⁷⁹ Ibid.

²⁸⁰ DG TAXUD (2014) *Taxes in Europe Database, Finland Excise Duty – Energy Products*, Accessed 19 August 2014,

http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=844/1395070212&taxType=Energy+products+and+electricity

²⁸¹ Ibid.

Excise Duty	Unit	Rate Applied in Finland
Liquefied Petroleum Gas	€ per 1000 kg	€0.0
Natural Gas	€ per GJ	€3.18
Motor Fuels – Industry/Commercial use		
Gas Oil (Diesel)	€ per 1000 litres	€163.4
Kerosene	€ per 1000 litres	€731.0
Liquid Petroleum Gas	€ per 1000 kg	€0.0
Natural Gas	€ per GJ	€3.18
Heating – Business Use		
Gas Oil (Diesel)	€ per 1000 litres	€163.4
Kerosene	€ per 1000 litres	€731.0
Heavy Fuel Oil	€ per 1000 kg	€192.1
Liquid Petroleum Gas	€ per 1000 kg	€0.0
Natural Gas	€ per GJ	€3.18
Coal and Coke	€ per GJ	€5.2
Lignite	€ per 1000 kg	€132.71
Heating – Non-Business Use		
Gas Oil (Diesel)	€ per 1000 litres	€163.4
Kerosene	€ per 1000 litres	€731.0
Heavy Fuel Oil	€ per 1000 kg	€192.1
Liquid Petroleum Gas	€ per 1000 kg	€0.0
Natural Gas	€ per GJ	€3.18
Coal and Coke	€ per GJ	€5.2
Lignite	€ per 1000 kg	€ 132.71
Electricity		
Tax category I ²	€ per MWh	€19.03
Tax category II ³	€ per MWh	€7.03

Excise Duty	Unit	Rate Applied in Finland
Notes:		
1. <i>Leaded petrol is no longer sold in Finland.</i>		
2. <i>Applies for private households, agriculture, forestry, construction, public administration and services.</i>		
3. <i>Applies for industry and server rooms.</i>		

Table 8-2: Detailed Excise Duty Rate Structure on Energy Products in Finland as of 1 January 2014²⁸²

Product (Currency/Unit)	Energy Content Tax	Carbon Dioxide Tax	Strategic Stockpile Fee	Total
Motor gasoline (c/l)	50.36	16.25	0.68	67.29
Small engine gasoline (c/l)	30.36	16.25	0.68	47.29
Diesel oil (c/l)	30.7	18.61	0.35	49.66
Diesel oil paraffin (c/l)	24	17.58	0.35	41.93
Heavy fuel oil (c/kg)	7.59	11.34	0.28	19.21
Light fuel oil (c/l)	9.3	9.34	0.35	18.99
Light fuel oil. sulphur-free (c/l)	6.65	9.34	0.35	16.34
Kerosene-type jet fuel (c/l)	54.76	17.99	0.35	73.1
Aviation gasoline (c/l)	49.88	16.1	0.68	66.66
Tall oil (c/kg)	19.21	n.a.	0	19.21
Coal, coal bricks, solid fuels produced from coal (€/t)	47.10	84.43	1.18	132.71
Fuel peat (€/MWh)	4.90	n.a.	0	4.90

²⁸² DG TAXUD (2014) *Taxes in Europe Database, Finland Excise Duty – Energy Products*, Accessed 19 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=844/1395070212&taxType=Energy+products+and+electricity

Product (Currency/Unit)	Energy Content Tax	Carbon Dioxide Tax	Strategic Stockpile Fee	Total
Natural gas (€/MWh)				
Between 1.1.2013 – 31.12.2014	4.45	6.93	0.084	11.464
From 1.1.2015	6.65	6.93	0.084	13.664
Electricity (c/kWh)				
Tax class I ¹	1.89	n.a.	0.013	1.903
Tax class II ²	0.69	n.a.	0.013	0.703
<p>¹: Excise duty of the higher (I) tax category is collected on electricity used by private households as well as agriculture, forestry, construction, public administration and services.</p> <p>²: Electricity used in industry or server rooms is subject to the lower (II) tax category.</p>				

Table 8-3: Detailed Excise Duty Rate Structure on Other Energy Products in Finland as of 1st January 2014²⁸³

Product (Currency/Unit)	Energy Content Tax	Carbon Dioxide Tax	Strategic Stockpile Fee	Total
Bioethanol (c/l)	33.05	10.67	0.68	44.4
Bioethanol R (c/l)	33.05	5.33	0.68	39.06
Bioethanol T (c/l)	33.05	0	0.68	33.73
MTBE (c/l)	40.91	13.21	0.68	54.8
MTBE R (c/l)	40.91	11.75	0.68	53.34
MTBE T (c/l)	40.91	10.3	0.68	51.89
TAME (c/l)	44.06	14.22	0.68	58.96
TAME R (c/l)	44.06	12.94	0.68	57.68
TAME T (c/l)	44.06	11.66	0.68	56.4

²⁸³ DG TAXUD (2014) *Taxes in Europe Database, Finland Excise Duty – Energy Products*, Accessed 19 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=844/1395070212&taxType=Energy+products+and+electricity

Product (Currency/Unit)	Energy Content Tax	Carbon Dioxide Tax	Strategic Stockpile Fee	Total
ETBE (c/l)	42.49	13.72	0.68	56.89
ETBE R (c/l)	42.49	11.18	0.68	54.35
ETBE T (c/l)	42.49	8.64	0.68	51.81
TAEЕ (c/l)	45.64	14.73	0.68	61.05
TAEЕ R (c/l)	45.64	12.59	0.68	58.91
TAEЕ T (c/l)	45.64	10.46	0.68	56.78
Biogasoline (c/l)	50.36	16.25	0.68	67.29
Biogasoline R (c/l)	50.36	8.13	0.68	59.17
Biogasoline T (c/l)	50.36	0	0.68	51.04
Ethanol-diesel (c/l)	13.97	10.9	0.35	25.22
Ethanol-diesel (c/l)	13.97	5.99	0.35	20.31
Ethanol-diesel (c/l)	13.97	1.07	0.35	15.39
Biodiesel oil (c/l)	28.14	17.06	0.35	45.55
Biodiesel oil R (c/l)	28.14	8.53	0.35	37.02
Biodiesel oil T (c/l)	28.14	0	0.35	28.49
Biodiesel oil paraffin (c/l)	24	17.58	0.35	41.93
Biodiesel oil paraffin R (c/l)	24	8.79	0.35	33.14
Biodiesel oil paraffin T (c/l)	24	0	0.35	24.35
Biofuel oil (c/l)	6.65	9.34	0.35	16.34
Biofuel oil R (c/l)	6.65	4.67	0.35	11.67
Biofuel oil T (c/l)	6.65	0	0.35	7
Methanol (c/l)	25.18	8.13	0.68	33.99
Methanol R (c/l)	25.18	4.06	0.68	29.92
Methanol T (c/l)	25.18	0	0.68	25.86

Product (Currency/Unit)	Energy Content Tax	Carbon Dioxide Tax	Strategic Stockpile Fee	Total
<i>R: From renewable energy sources</i>				
<i>T: For transport purposes</i>				

➤ **Windfall-tax on Hydro and Nuclear Power (abolished in 2014):**

- In December 2013, the Power Station Decree (Voimalaitosverolaki 1255/2013) came into force.²⁸⁴ It covers power stations (hydro, nuclear and wind power), which produce at least one megawatt and were built before 2004. The tax was planned to be applied on a staggered basis (from one megawatt to ten megawatts) with the full tax rate applied for power stations producing ten megawatts and upwards. The tax is not based on electricity produced but on the repurchase value of the power station. For larger power stations the tax was intended to be capped to 1.5% of the repurchase value. Note that the repurchase value was to be adjusted based on the age of the power stations, so that older power stations would pay less than newer ones.
- The tax would have covered 130 hydro power stations, four nuclear power stations and 10 to 15 wind farms. It was estimated that the windfall tax would generate around €50 million a year in revenues. The tax was initially introduced to compensate for the financial benefits power stations receive through the ETS.²⁸⁵ Nevertheless, besides the planned introduction of the tax in 2014 the tax was cancelled before it could even get off the ground (the tax was never paid, even when it was still in force for some time in 2014).²⁸⁶

8.2 Transport Taxes (Excluding Transport Fuels)

The existing tax regime on vehicles and cars was not originally intended as a transport policy tool, but rather as a means of generating tax revenue. It has been a significant source of government revenues over the years.²⁸⁷

➤ **Vehicle Tax (“Ajoneuvovero/Fordonsskatt”):²⁸⁸**

²⁸⁴ Ministry of State (2013), *Voimalaitosverolaki*, 1255/2013, 31.12.2013, <http://www.edilex.fi/smur/201312551>

²⁸⁵ YLE (2013), *Vesi- ja ydinvoimalle uusi vero*, 26.9.2013, http://yle.fi/uutiset/vesi-ja_ydinvoimalle_uusi_vero/6851642

²⁸⁶ Valtioneuvosto (2014) *Programme of Prime Minister Alexander Stubb’s Government*, <http://valtioneuvosto.fi/hallitus/hallitusohjelma/pdf-stubb/en.pdf>

²⁸⁷ Ministry of Transport and Communications (2014), *Fair and Intelligent Transport, Working Group Final Report*, 21 February 2014,

- The vehicle tax constitutes of two elements, which both are levied annually: 1) a base tax levied on all registered vehicles with a maximum permitted total mass of 3,500 kg under categories N or M (cars, vans, special purpose cars and lorries); and 2) a tax levied on the propelling force of the vehicle. This second component is levied on all vehicles which use fuel other than petrol, i.e. diesel oil, kerosene, LPG or electricity.²⁸⁹
- The base-tax component of vehicle tax has been based on CO₂ emissions from 1st March 2011. In the case of new vehicles it is based on the levels of CO₂ emissions reported by the vehicle manufacturer, while older vehicles are taxed on the basis of their total mass. If the car does not have emission data in the Vehicular and Driver Data Register, the tax is based on the total mass of the vehicle.²⁹⁰
- Both the propelling force tax and the base tax are levied for each day that the vehicles are registered for regular road use.
- The propelling force tax is levied on passenger cars to even out differences in fiscal burden between lower-taxed diesel vehicles and higher-taxed petrol vehicles based on annual total kilometres driven. The propelling force tax is not applied on petrol-fuelled vehicles. The propelling force tax levied on HGVs is not a “balancing tax”, but is intended to meet the requirements of the Euro-vignette Directive.²⁹¹
- Rates:
 - Basic tax rate in € per day= $0.0001 \text{ EM} * (8.1 + 0.1 * (\text{EM} - 66))$, where EM = CO₂ g per km²⁹²
 - For the rate structure of the tax on propelling force component see Table 8-4 above.
 - In 2013, for the base tax, the minimum emissions-based vehicle tax was 43.07€ per 365 days (11.8 cents per day at 0 g per km emissions; in practice this is for electric cars) and the maximum was 606.27€ per 365 days (166.1 cents per day). The lowest vehicle tax calculated on the basis of total mass is 125.93€ per 365 days (34.5 cents per day; total mass up to 1,300 kg) and the

²⁸⁹ DG TAXUD (2014) *Taxes in Europe Database, Finland Motor vehicles tax – Vehicle Tax*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=621/1388754737&taxType=Other+indirect+tax

²⁹⁰ Trafi, (n.d.) *Structure and amount of tax*, http://www.trafi.fi/en/road/taxation/vehicle_tax/structure_and_amount_of_tax, Accessed 19.9 2014.

²⁹¹ Ministry of Transport and Communications (2014), *Fair and Intelligent Transport, Working Group Final Report*, 21 February 2014,

²⁹² OECD (n.d.) *Database on instruments used for environmental policy, Taxes, fees or charges - Main characteristics for selected countries – Finland*, Accessed 27 August 2014, http://www2.oecd.org/eoicinst/queries/QueryResult_2.aspx?Key=35dc3924-70a4-43f1-8a72-1405dd944048&QryCtx=1&QryFlag=3

highest 535.46 € per 365 days (146.7 cents per day; total mass 3,401–3,500 kg).²⁹³

- Main exemptions: certain cars owned by the state, taxis (to be abolished in 2015) fire engines, ambulances, cars used by foreign diplomatic missions, buses etc.
- €50 is refunded on the tax paid on lorries transported by rail in Finland provided that the transport is partly international and the distance covered is more than 100 km radius.
- Revenue in 2012: €758 million (equivalent to 0.39% of GDP).²⁹⁴ Of this €434 million is from the base tax and €324 million is from the propelling force tax.
- Revenue in 2013: €866 million (equivalent to 0.44% of GDP).²⁹⁵

Table 8-4: Rate Structure of Tax on Propelling Force in Finland (2014)

Tax on propelling force	Unit	Rate applied per day
Passenger cars and dual-purpose cars		
Propelling force solely electricity	100 kg of the total weight or a fraction	1.5 cents
Propelling force electricity and petrol	100 kg of the total weight or a fraction	0.5 cents
Propelling force electricity and diesel	100 kg of the total weight or a fraction	4.9 cents
Propelling force gas	100 kg of the total weight or a fraction	3.1 cents
Propelling force other (e.g. diesel)	100 kg of the total weight or a fraction	5.5 cents
Motor caravans and delivery vans		
All types of motor caravans and delivery vans	100 kg of the total weight or a fraction	0.9 cents
Lorries		

²⁹³ Ministry of Transport and Communications (2014), *Fair and Intelligent Transport, Working Group Final Report*, 21 February 2014,

²⁹⁴ DG TAXUD (2014) *Taxes in Europe Database, Finland Motor vehicles tax – Vehicle Tax*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=621/1388754737&taxType=Other+indirect+tax

²⁹⁵ Valtiokonttori (2014), *Valtion tilinpaatos vuodelta 2013*, 9.4.2014, Accessed 19.9.2014 [http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013\(50407](http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013(50407)

Tax on propelling force	Unit	Rate applied per day
Two axle lorries	Per 100 kg up to 12,000 kg	0.6 cent
	Per 100 kg above 12,000 kg	1.3 cents
Three axle lorries	Per 100 kg	0.8 cents
Four axle lorries	Per 100 kg	0.7 cents
Five or more axle lorries	Per 100 kg	0.6 cents
Lorries with a bogie construction with two axles	Per 100 kg	2.2 cents
Lorries with a bogie construction with three axles	Per 100 kg	1.3 cents
Lorries with a bogie construction with four axles	Per 100 kg	1.2 cents
Lorries with a bogie construction with five or more axles	Per 100 kg	1.0 cents
Lorries with a bogie construction approved and used for the traction of semi-trailers or trailers with two axles	Per 100 kg	2.1 cents
Lorries with a bogie construction approved and used for the traction of semi-trailers or trailers with three axles	Per 100 kg	1.4 cents
Lorries with a bogie construction approved and used for the traction of semi-trailers or trailers with four axles	Per 100 kg	1.3 cents
Lorries with a bogie construction approved and used for the traction of semi-trailers or trailers with five or more axles	Per 100 kg	1.2 cents

Source: DG TAXUD (2014) *Taxes in Europe Database, Finland Motor vehicles tax – Vehicle Tax*, Accessed 27th August 2014,
http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=621/1388754737&taxType=Other+indirect+tax

➤ **Car Tax** :²⁹⁶

- A once-off car tax is tax levied on the first registration for road use of a new car or motorcycle purchased in Finland or a second-hand car or motorcycle imported to the country.
- Car tax is paid by the person who is registered as the owner of the car. Passenger cars, delivery vans, busses weighing less than 1,875 kg and motorcycles are subject to the tax.
- Rates:²⁹⁷
 - As with the base tax for the vehicle tax (see above), the tax on passenger cars is based on the CO₂ emissions and the taxable value of the car. The tax rate is between 5 and 50 % depending on the CO₂ emissions declared by the car manufacturer for a combination of city and road driving. In case no CO₂ emission information is available, the tax rate is based on the mass and the energy source of the vehicle.²⁹⁸
 - A calculation similar to the above is applied to used imported cars or vans.
 - The tax on motorcycles is detailed in Table 8-5.
 - The taxable value of the car is the vehicle's ordinary retail value on the Finnish car market at the time of taxation.
- Main exemptions:²⁹⁹
 - Fire engines, ambulances and lorries, motor caravans with un-laden weight of at least 1,875 kg, cars used by foreign diplomatic missions and consular posts headed by career consular officers, as well as members of their personnel who are not Finnish nationals, three wheeled delivery cycles, cycles for disabled people and mopeds etc.
 - Cars which are used by disabled people can be partly exempted.
- The CO₂ calculation of the tax can be reduced by 9.8% to 21.7% (depending on the weight of a van) provided it weighs more than 2,500 kg and fulfils certain requirements.
- Revenue in 2012: €1,066 million (equivalent to 0.55% of GDP).³⁰⁰

²⁹⁶ DG TAUxD (2014) *Taxes in Europe Database, Finland Motor vehicles tax – Car Tax*, Accessed 27 August, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=253/1388754737&taxType=Other+indirect+tax

²⁹⁷ Ibid.

²⁹⁸ Ibid.

²⁹⁹ Ibid.

³⁰⁰ Ibid.

- Revenue in 2013: €932 million (equivalent to 0.48% of GDP).³⁰¹

Table 8-5: Car Tax Rate of Motorcycles in Finland (2014)³⁰²

Engine Capacity in Cubic Centimetres (cc)	Rate of Tax as a Percentage of Taxation Value (%)
Up to 130	9.8
131-255	12.2
256-355	15.9
356-505	19.5
506-755	22
756 or more	24.4
Electric vehicles in category L	12.2

➤ **Air Traffic Supervision Charge:**³⁰³

- The charges should be paid by all flight passengers older than 2 years of age. It is fully earmarked for administration purposes.
- Rate in 2012: €1.2 per passenger.
- Revenue in 2010: €6.1 million (equivalent to 0.003% of GDP).³⁰⁴

➤ **Railway Tax:**³⁰⁵

- The railway tax is used to cover the costs of the building and maintenance of railway infrastructure.
- Rates in 2006:
 - Goods transport for diesel-driven trains: €0.001 per gross tonne-km.

³⁰¹ Valtiokonttori (2014), *Valtion Tilinpaatos Vuodelta 2013*, 9.4.2014, Accessed 19.9.2014
[http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013\(50407](http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013(50407)

³⁰² DG TAUXD (2014) *Taxes in Europe Database, Finland Motor vehicles tax – Car Tax*, Accessed 27 August,
http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=253/1388754737&taxType=Other+indirect+tax

³⁰⁵ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Main characteristics of selected countries – Finland, Accessed 28 August 2014,
http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=36808684-770f-4ed7-9a3b-5f000506834e&OryCtx=1&OryFlag=3

- Goods transport for electric trains: €0.0005 per gross tonne-km.
- Investment surtax on the Kerava-Lahti railway: €0.0050 per gross tonne-km (in addition to the basic tax).
- Passenger transport: €0.0001 per gross tonne-km.
- Revenue in 2010: €18 million (equivalent to 0.01% of GDP).³⁰⁶

8.3 Pollution and Resource Taxes

➤ Waste Tax (“Jätevero/Avfallskatt”):³⁰⁷

- Waste Tax is levied on waste deposited at public or private landfill sites and for which reuse and recycling is technically feasible and environmentally justifiable. Waste categories with no technical treatment or utilization alternative to disposal at landfills, or with utilization options that would do more harm than good, are tax exempt.
- Waste tax is paid by landfill site operators. Rate: €50 per tonne of waste in 2013. If the weight of the waste cannot be measured a special conversion coefficient is applied.
- Rate will be €55 per tonne of waste in 2015. The estimated revenue for 2015 is €69 million.³⁰⁸
- All waste specified in the tax table appended to the Waste Tax Act (1126/2010) is subject to tax.
- Exemptions:
 - Hazardous waste, waste utilised in the construction of the landfill site not including glass waste and some concrete waste.
 - Mineral waste and waste from inorganic chemical processes
 - Landfill sites where only soil and stone are deposited.
 - Sorted waste which is expected to be recycled or disposed can be stored tax-free for three years.
 - De-inking sludge.
- Revenue in 2012: €56 million (equivalent to 0.029% of GDP).
- Revenue in 2013: €55.8 million (equivalent to 0.029% of GDP).³⁰⁹

³⁰⁶ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Revenues raised by environmentally related taxes for selected countries – Finland, Accessed 28 August 2014, http://www2.oecd.org/eoconst/queries/QueryResult_3.aspx?Key=1e14c362-3df6-452d-a8c7-a3706593e75e&QryCtx=2&QryFlag=3#

³⁰⁷ DG TAUXD (2014) *Taxes in Europe Database, Finland Landfill Tax*, Accessed 27 August, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=252/1388754737&taxType=Other+indirect+tax

³⁰⁸ Valtiovarainministerio (2014), *Hallitus esittää useita muutoksia verolakeihin*, 138/2014. 15.9.2014, Accessed 19.9.2014. http://www.vm.fi/vm/fi/03_tiedotteet_ja_puheet/01_tiedotteet/20140915Hallit/name.jsp

- **Excise Duty on Certain Beverage Packages:**³¹⁰
 - This excise duty is levied on retail packages made of various materials for alcoholic beverages, soft drinks, water and certain other beverages.
 - Rates in 2014: 51 cents per litre of packaged product.³¹¹
 - Exemptions:³¹²
 - Small beverage manufacturers where the amount of beverages released for consumption does not exceed 50,000 litres.
 - Liquid packaging board containers.
 - Packages which are part of a package deposit system and can be recovered.
 - Revenue in 2012: €15 million (equivalent to 0.007% of GDP).³¹³
 - Revenue in 2013: €15 million (equivalent to 0.007% of GDP).³¹⁴
- **Fertiliser Tax (abolished in 1994):**
 - In 1994 when Finland joined the EU the fertiliser tax was abolished. When the tax was in place between 1976 and 1994, its primary goal was not to deal with environmental problems but to lower production levels of cereals for export and to provide funds to financially support export subsidies. The rate of the tax in 1994 was €0.44 per kg of nitrogen in the fertiliser.³¹⁵
- **Pesticide Fee (abolished in 2007):**
 - Between 1988 and 2006 a pesticide registration fee was levied on the pesticide industry in Finland. The revenues from the fee were used to finance the administrative costs of registering new pesticides.³¹⁶
- **Water Level Regulation Charge:**
 - Water abstraction charges are levied by municipal authorities.³¹⁷

³⁰⁹ Valtiokonttori (2014), *Valtion tilinpaatos vuodelta 2013*, 9.4.2014, Accessed 19.9.20114
http://www.valtiokonttori.fi/fi-FI/Tietoa_Valtiokonttorista/Media/Valtion_tilinpaatos_vuodelta_2013/50407

³¹⁰ DG TAUXD (2014) *Taxes in Europe Database, Finland Excise Duty – Beverage Packages*, Accessed 27 August,
http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=246/1388754737&taxType=Other+indirect+tax

³¹¹ Ibid

³¹² Ibid.

³¹³ Ibid.

³¹⁴ Valtiovarainministerio (2014), *Hallitus esittää useita muutoksia verolakeihin*, 138/2014. 15.9.2014, Accessed 19.9.2014. www.vm.fi/vm/fi/03_tiedotteet_ja_puheet/01_tiedotteet/20140915Hallit/name.jsp

³¹⁵ Ecotec et al (2001) *Study on Environmental Taxes and Charges in the EU*, Chapter 9: Fertiliser Taxes, http://ec.europa.eu/environment/enveco/taxation/pdf/ch9_fertilisers.pdf

³¹⁶ OECD (2009) *Environmental Performance Reviews: Finland*,

- The rate of the charge is separately set for every case via an environmental permit procedure.³¹⁸
- **Water Protection Charge (abolished in 2000):**
 - Water protection charges had to be paid by industry and fish farms nevertheless the charge was removed under the Environmental Protection Act 2000 and a permit system was introduced in 2006.³¹⁹
- **Water User Charges:³²⁰**
 - The water user charge is based on the amount of water consumed. Furthermore, fixed components are paid by users.
 - Average rate in February 2011: €1.51 per m³.
 - Revenue in 2010: €385.1 million (equivalent to 0.21% of GDP).³²¹
- **Wastewater User Charges:**
 - Rate: The rate of the charge is based on water consumption or on the volume and quality of waste water. Furthermore, fixed components, such as a connection charge or a meter charge, are added to the volume based charge. The average rate in February 2011 was €2.28 per m³ in total.³²²
 - Revenue in 2010: €516 million (equivalent to 0.28% of GDP).³²³
 - The consumer tariff covers the capital, operation and maintenance costs of water provision. In the irrigation sector, almost all water systems are constructed and operated by individual farmers; therefore there is no common pricing policy for irrigation. For industries obtaining their water

³¹⁷ EEA (2013) Assessment of cost recovery through water pricing, EEA Technical Report, No 16/2013, <http://www.eea.europa.eu/publications/assessment-of-full-cost-recovery>

³¹⁸ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Main characteristics of selected countries – Finland, Accessed 28 August 2014, http://www2.oecd.org/eoicst/queries/QueryResult_2.aspx?Key=36808684-770f-4ed7-9a3b-5f000506834e&QryCtx=1&QryFlag=3

³¹⁹ Nordic Council of Ministers (2006) The Use of Economic Instruments in the Nordic and Baltic Environmental Policy 2001-2005, TemaNord 2006:525, National Environmental Research Institute, Denmark, <http://norden.diva-portal.org/smash/get/diva2:701846/FULLTEXT01.pdf>

³²⁰ Ibid.

³²¹ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Revenues raised by environmentally related taxes for selected countries – Finland, Accessed 28 August 2014, http://www2.oecd.org/eoicst/queries/QueryResult_3.aspx?Key=1e14c362-3df6-452d-a8c7-a3706593e75e&QryCtx=2&QryFlag=3#

³²² OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Main characteristics of selected countries – Finland, Accessed 28 August 2014, http://www2.oecd.org/eoicst/queries/QueryResult_2.aspx?Key=36808684-770f-4ed7-9a3b-5f000506834e&QryCtx=1&QryFlag=3

³²³ OECD (n.d.) Database on instruments used for environmental policy, Taxes, fees or charges – Revenues raised by environmentally related taxes for selected countries – Finland, Accessed 28 August 2014, http://www2.oecd.org/eoicst/queries/QueryResult_3.aspx?Key=1e14c362-3df6-452d-a8c7-a3706593e75e&QryCtx=2&QryFlag=3#

through the public piped water supply system, the charge is based on water consumption.³²⁴

8.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 8-6: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	4,313	4,112	-201
Petrol	million litres	1,563	1,563	0
Kerosene	million litres	776	776	0
LPG	thousand tonnes	0	0	0
Heavy Fuel Oil	thousand tonnes	385	384	0
Natural Gas	TJ (GCV)	26,172	25,228	-944
Coal	thousand tonnes	133	133	0
Electricity	GWh	71,667	68,774	-2,893

³²⁴ EMWIS (2008), Water pricing in some EU countries, <http://www.emwis.org/topics/waterpricing/water-pricing-some-eu-countries>

Figure 8-1: Change in Internal Passenger Flights, flights per year

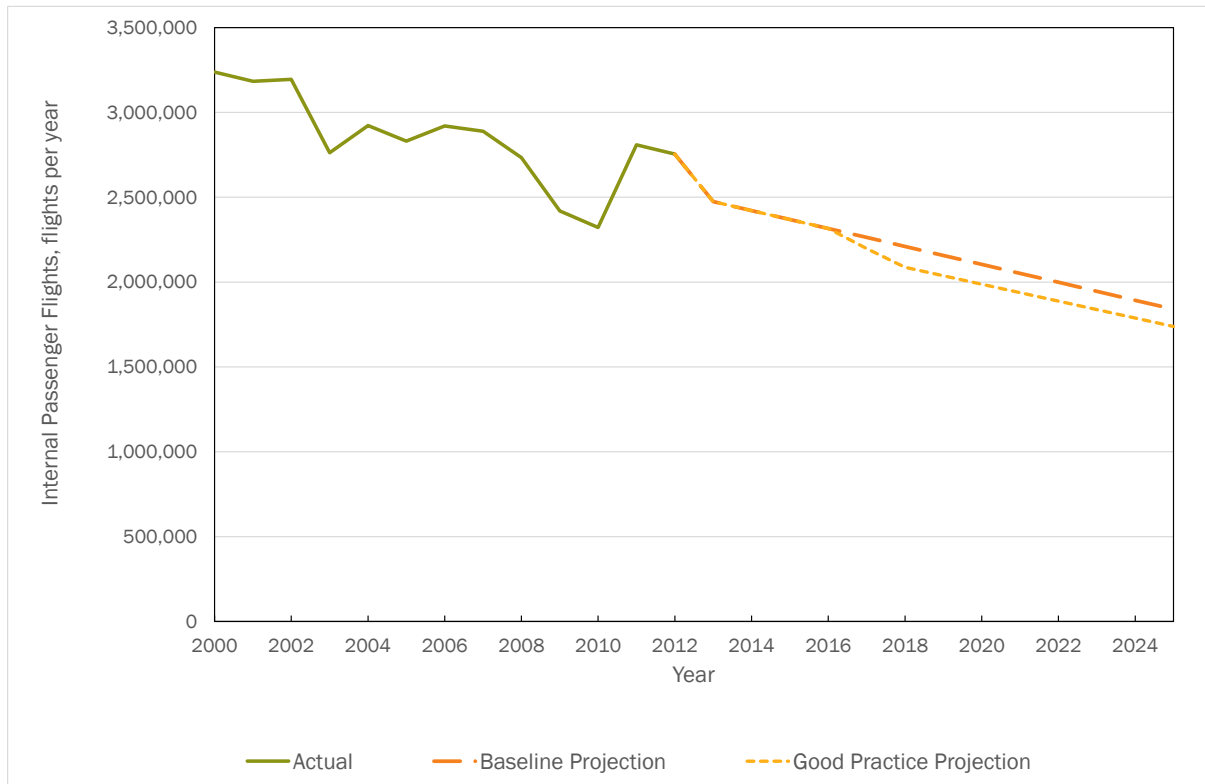


Figure 8-2: Change in Intra-EU Passenger Flights, flights per year

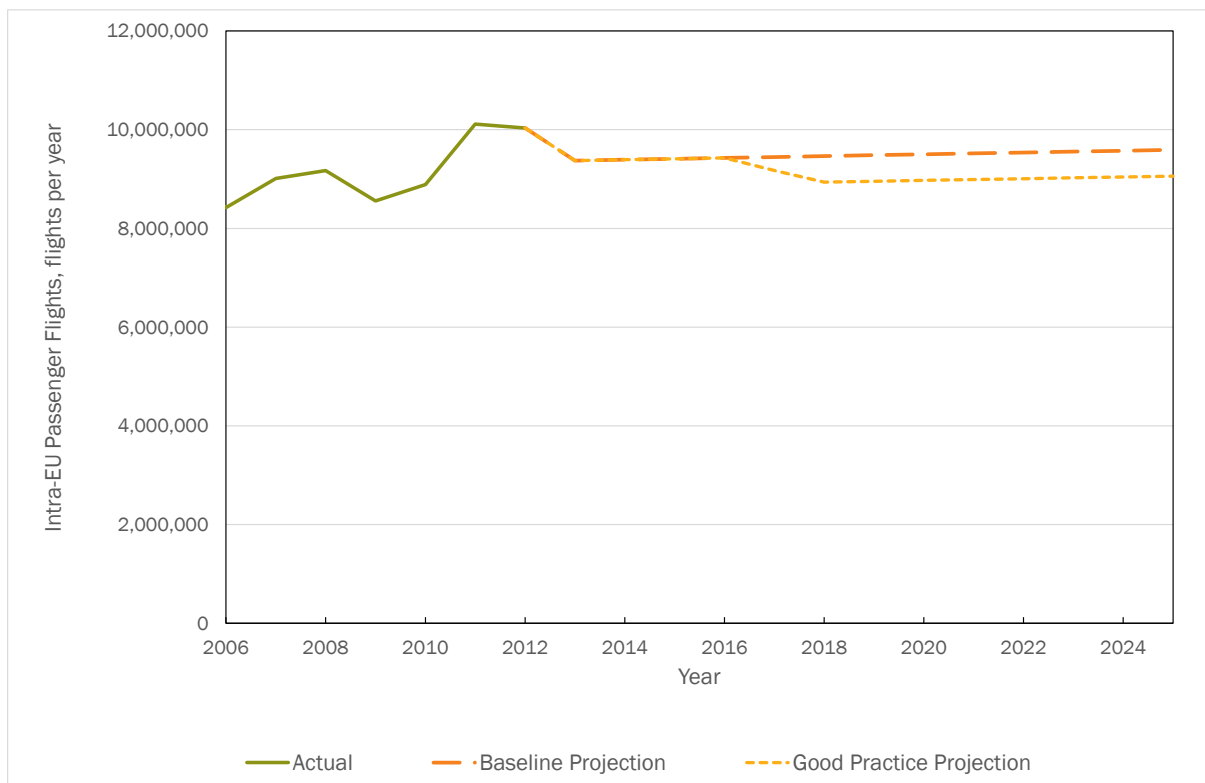


Figure 8-3: Change in Extra-EU Passenger Flights, flights per year

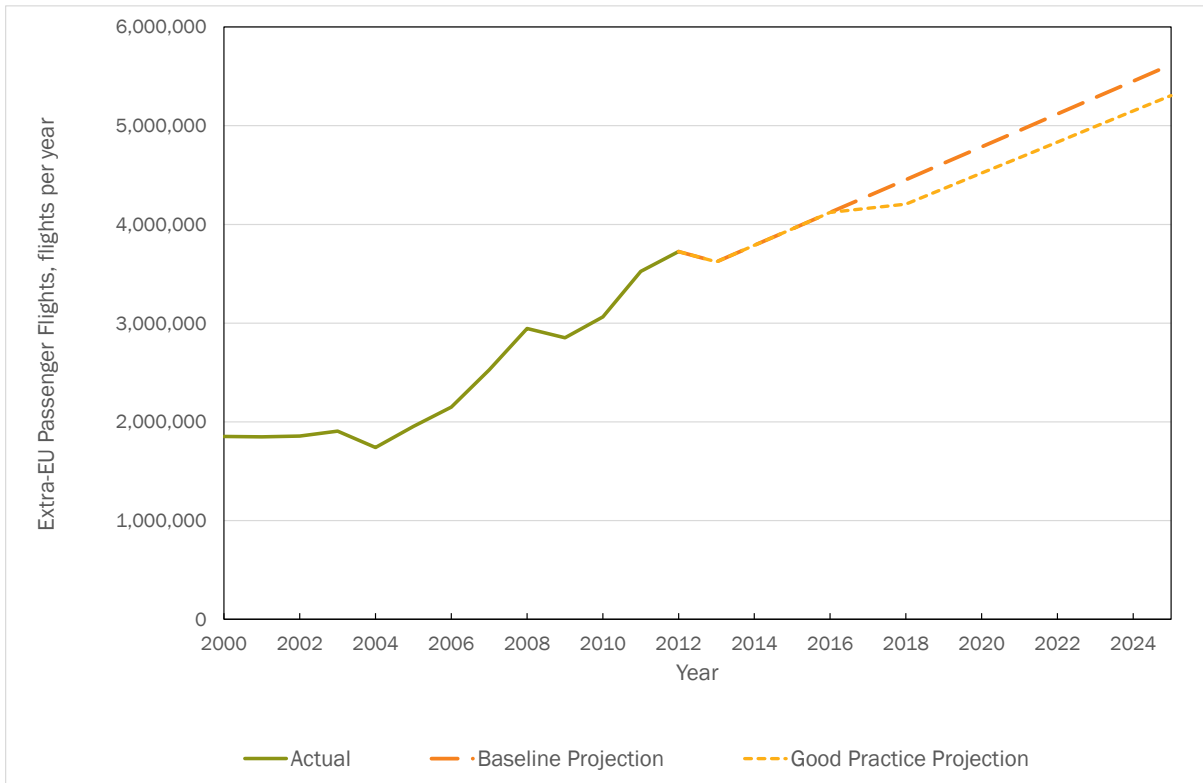


Figure 8-4: Change in Internal Air-freight, tonnes

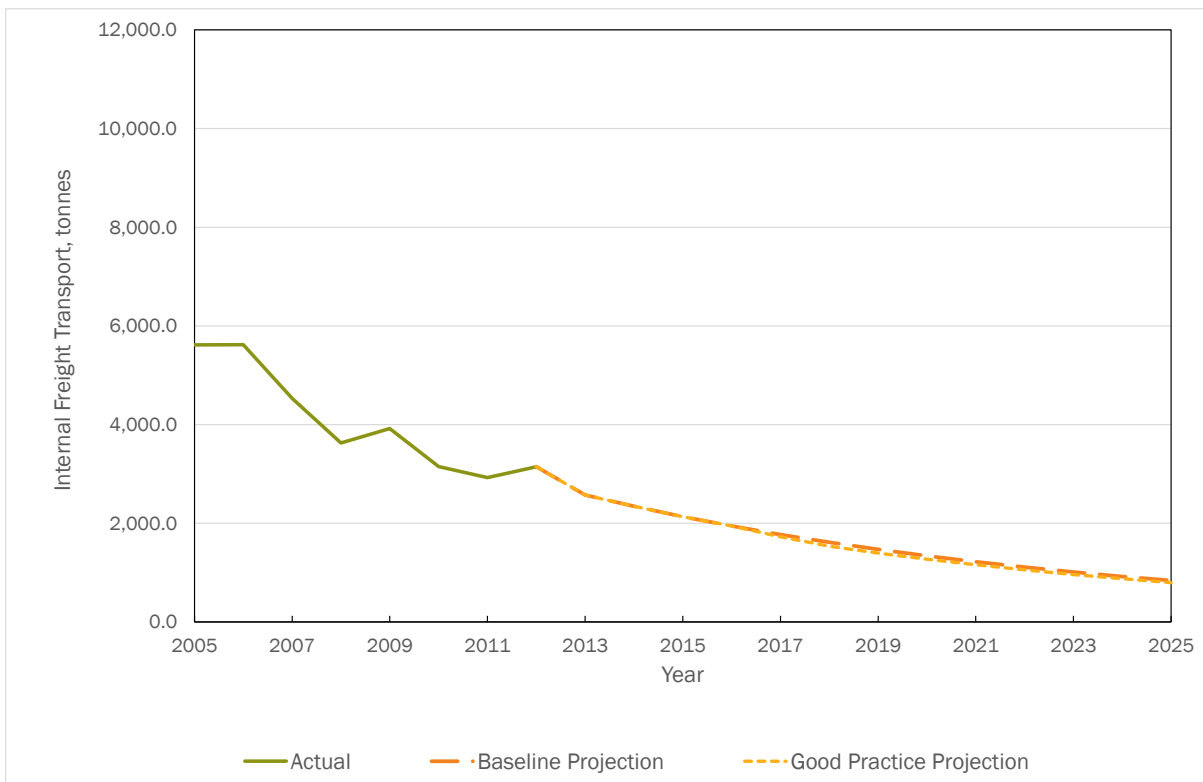


Figure 8-5: Change in Intra-EU Air-freight, tonnes

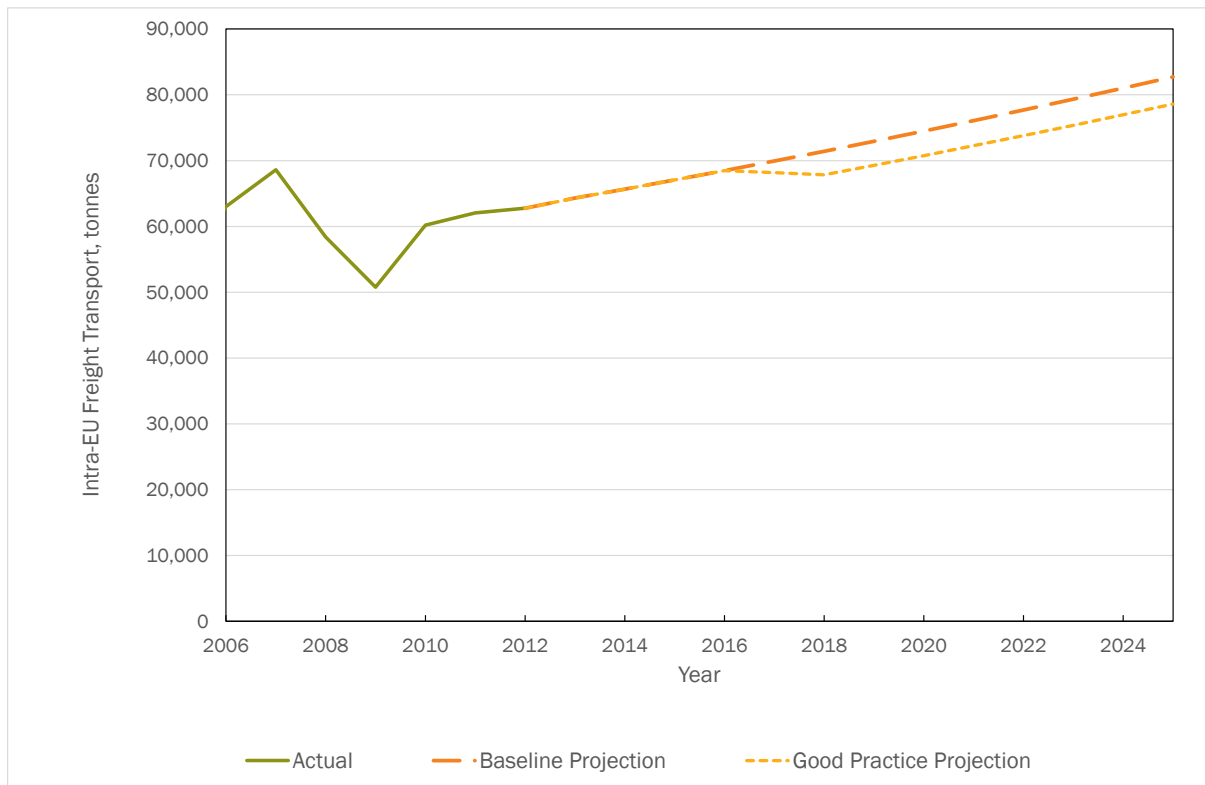


Figure 8-6: Change in Extra-EU Air-freight, tonnes

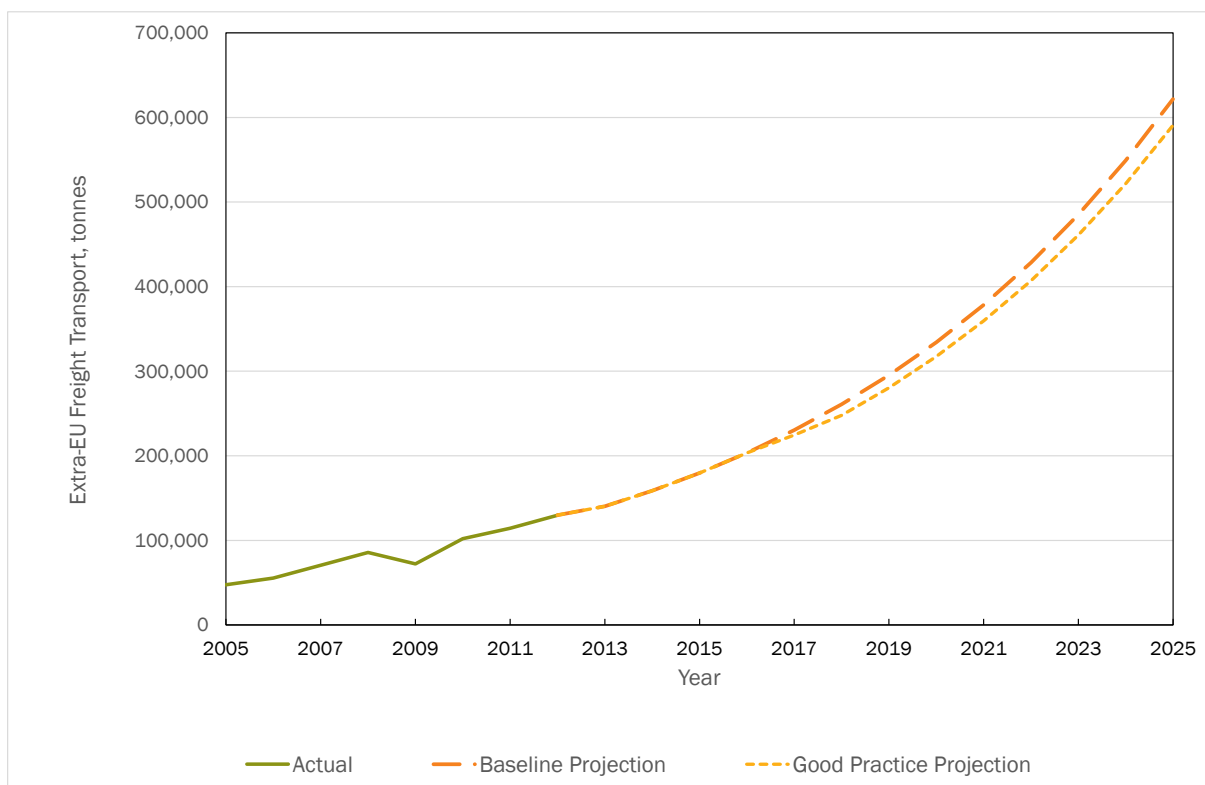


Figure 8-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

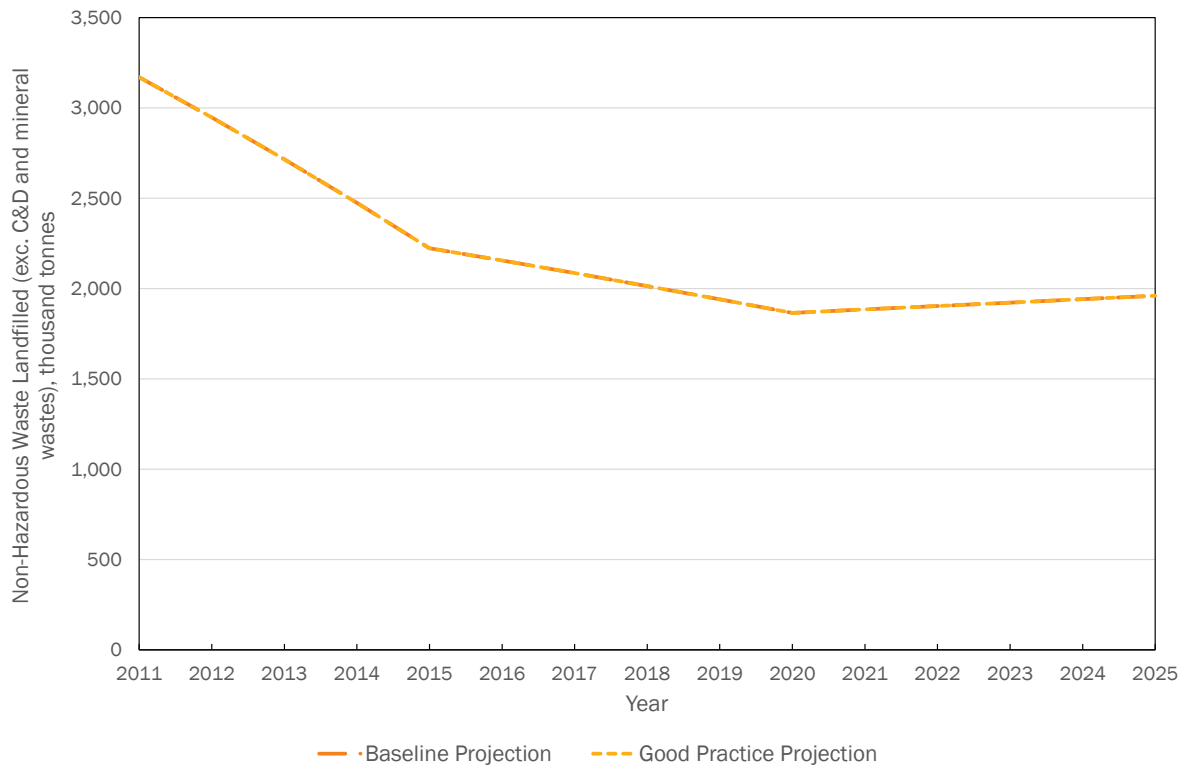


Figure 8-8: Change in MBT/ Incineration, thousand tonnes

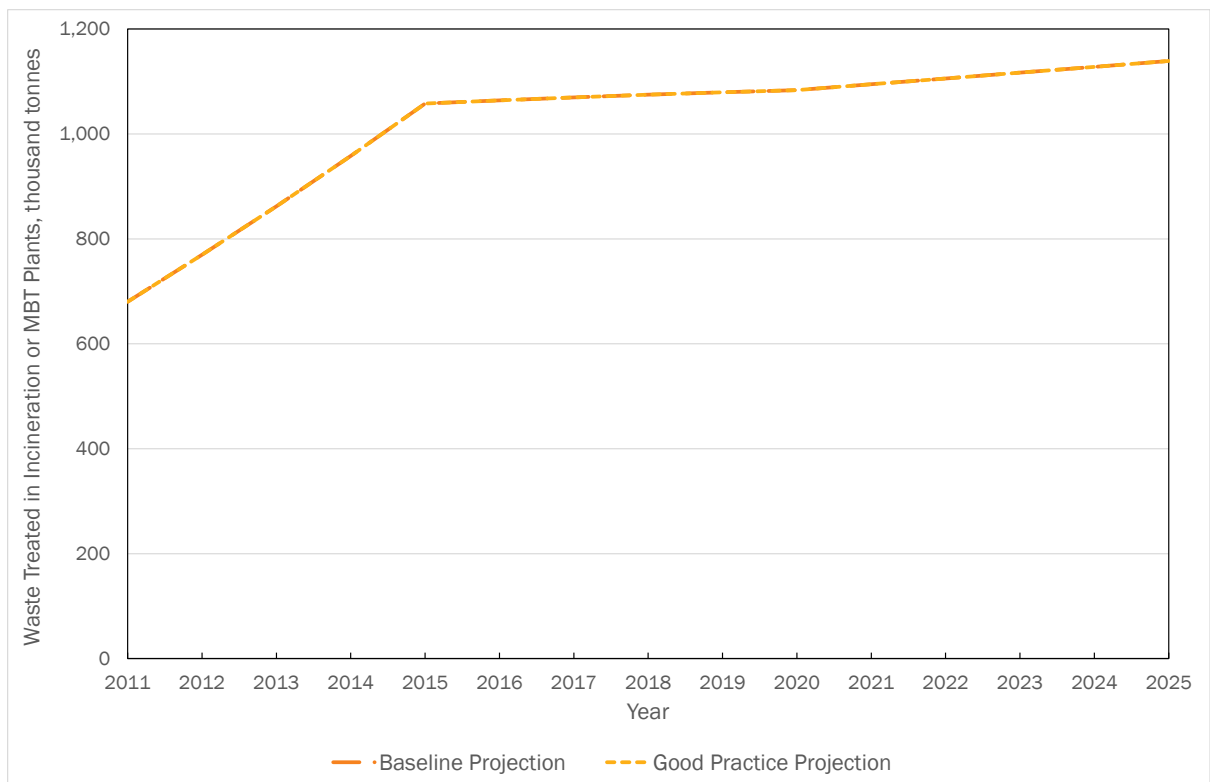


Figure 8-9: Change in SOx Emissions, tonnes

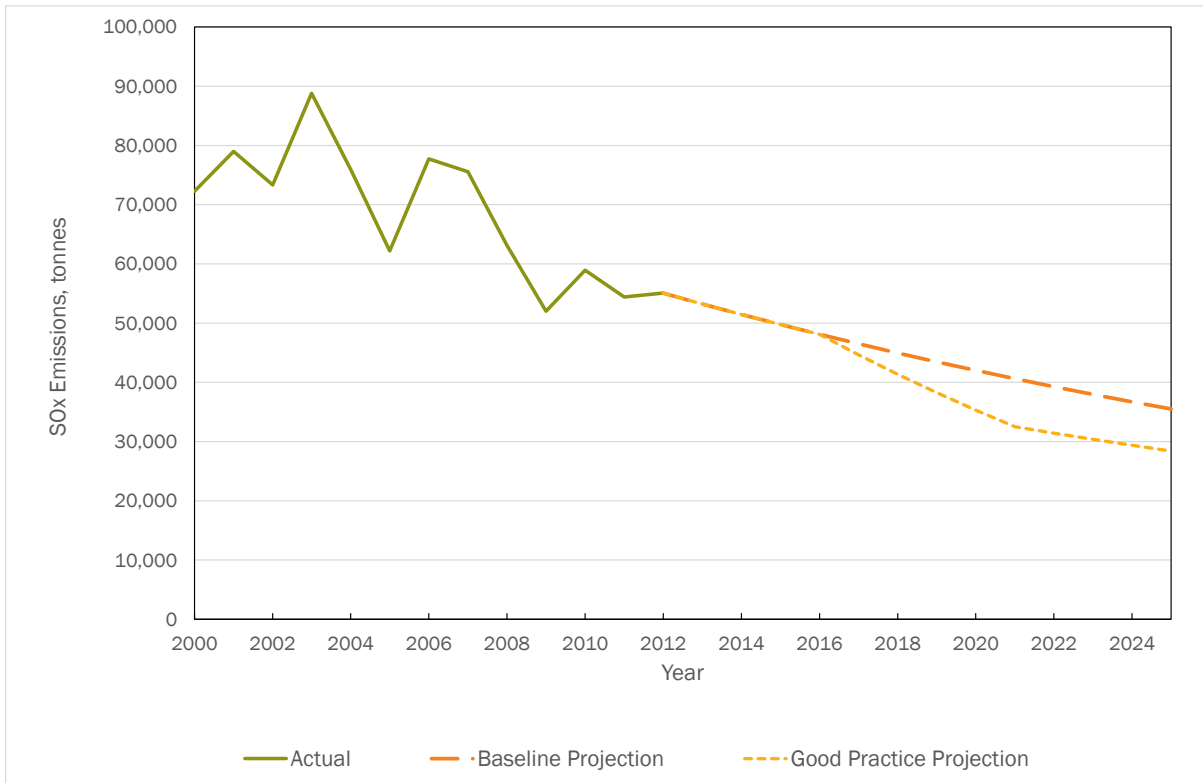


Figure 8-10: Change in NOx Emissions, tonnes

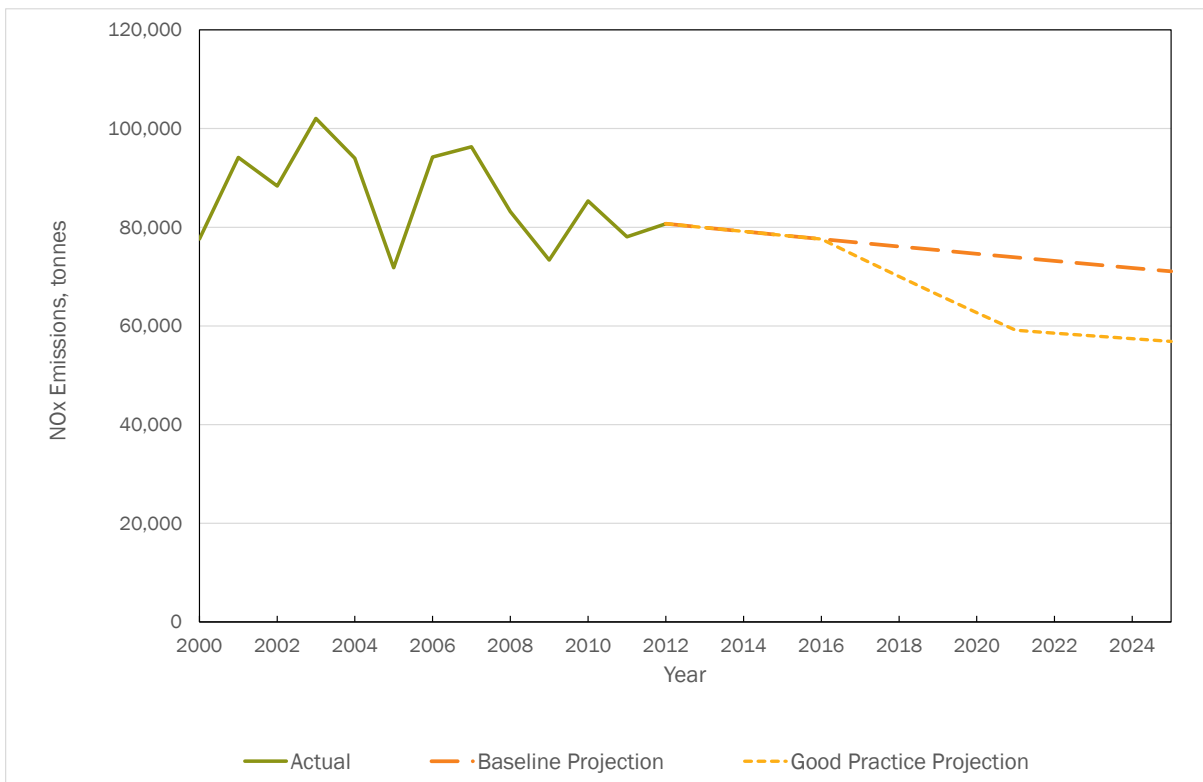


Figure 8-11: Change in PM₁₀ Emissions, tonnes



Figure 8-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

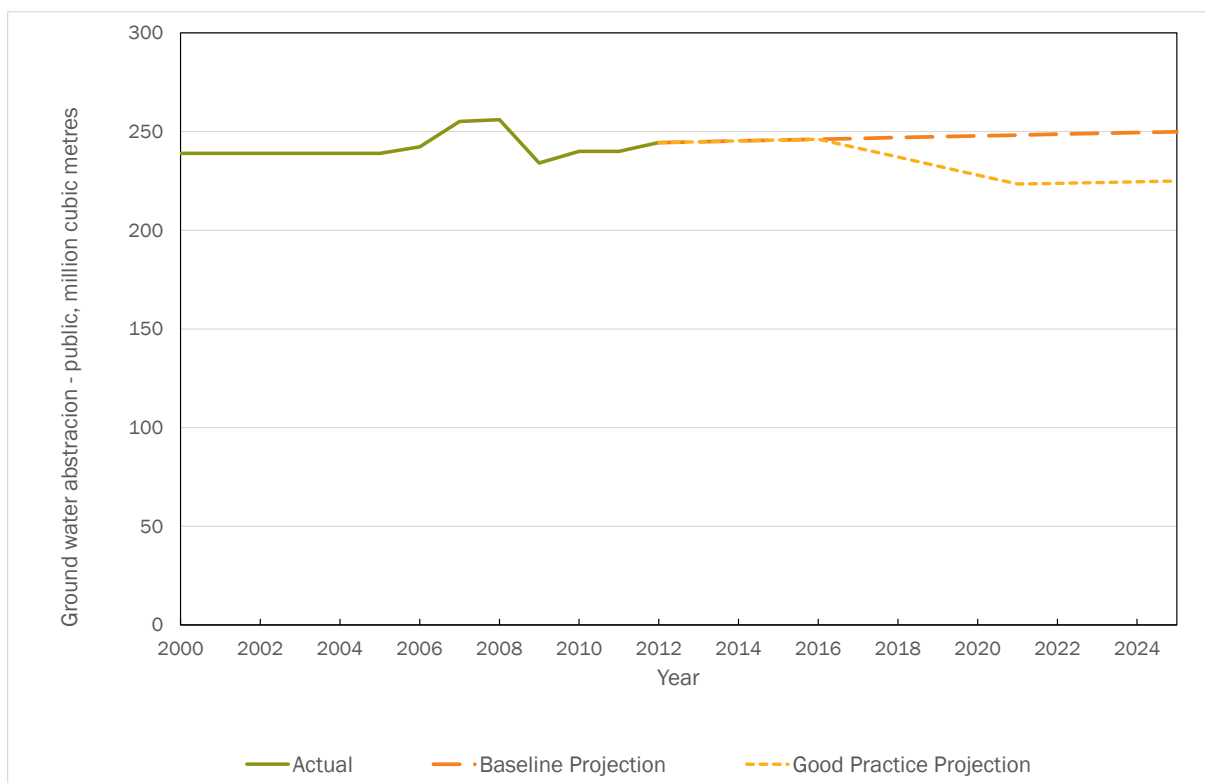


Figure 8-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

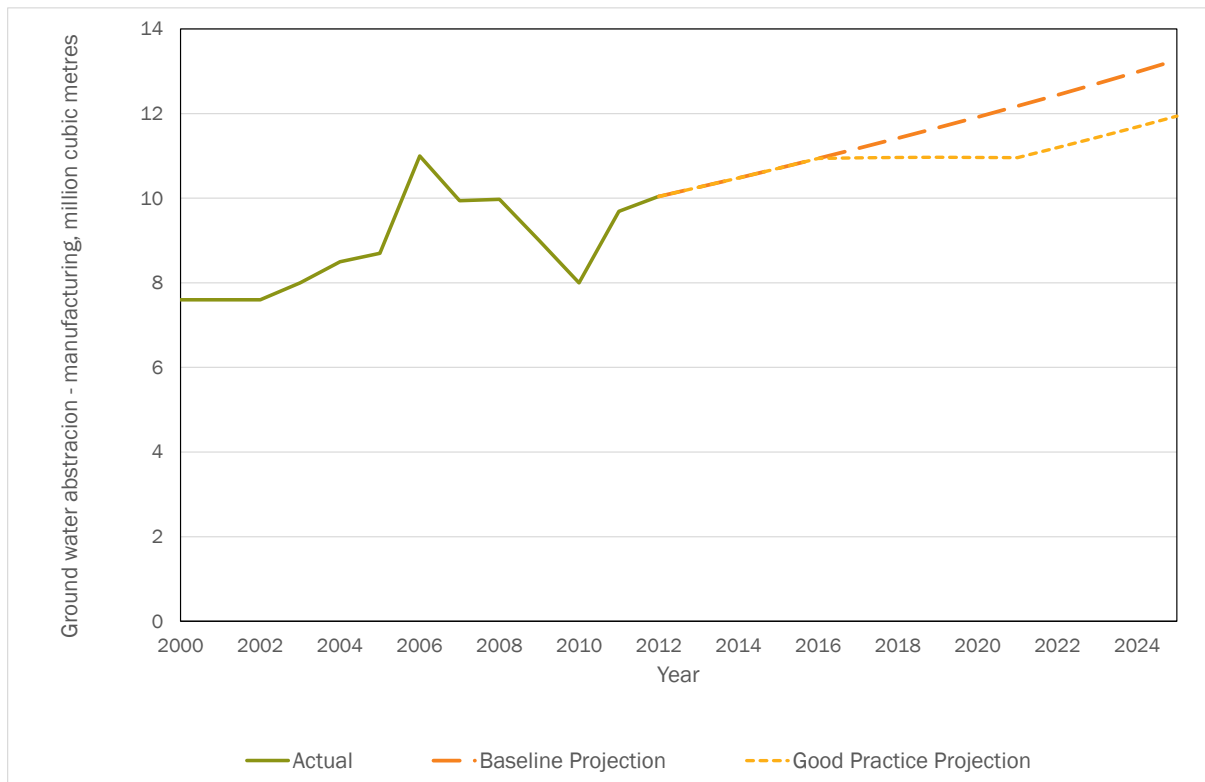


Figure 8-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

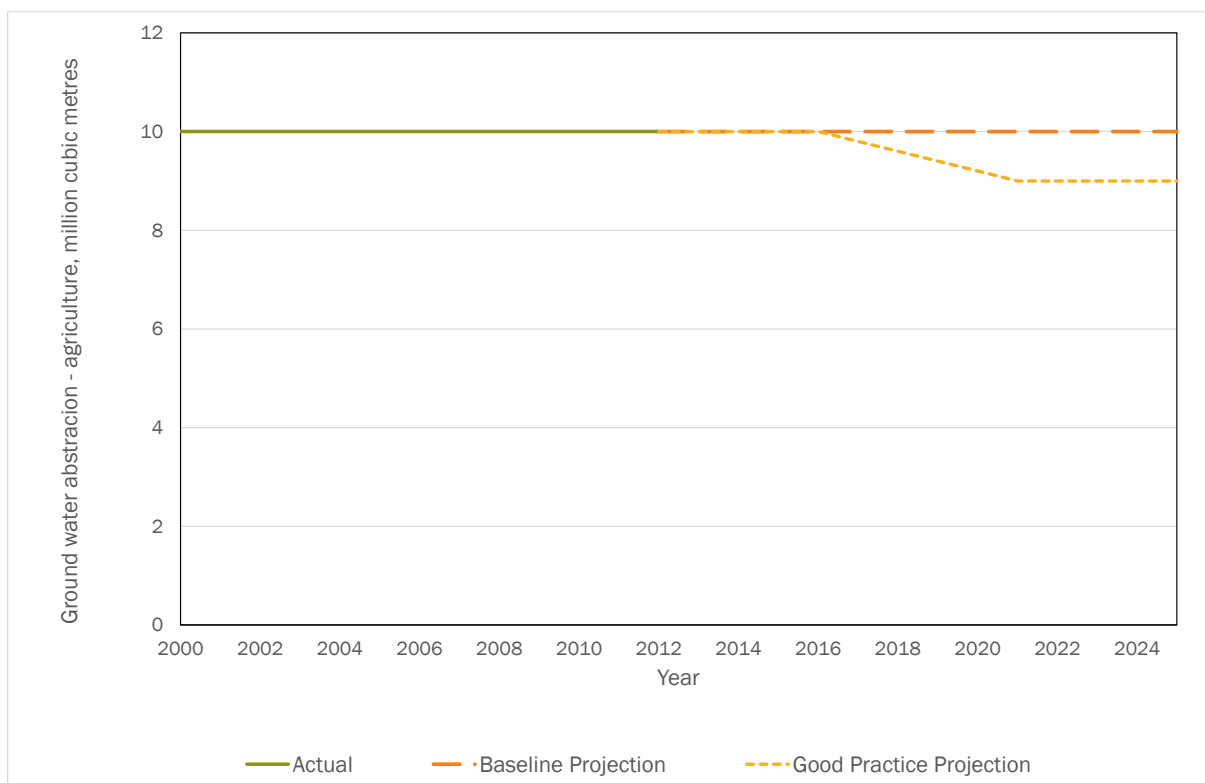


Figure 8-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

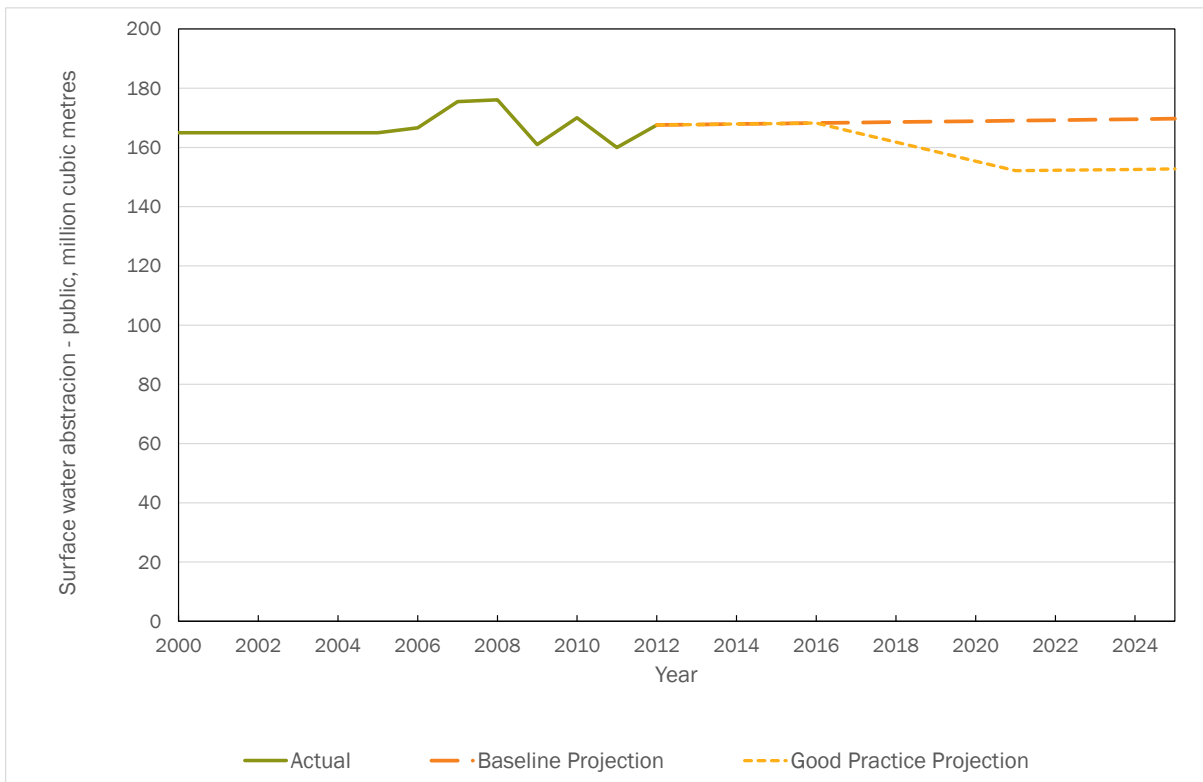


Figure 8-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres

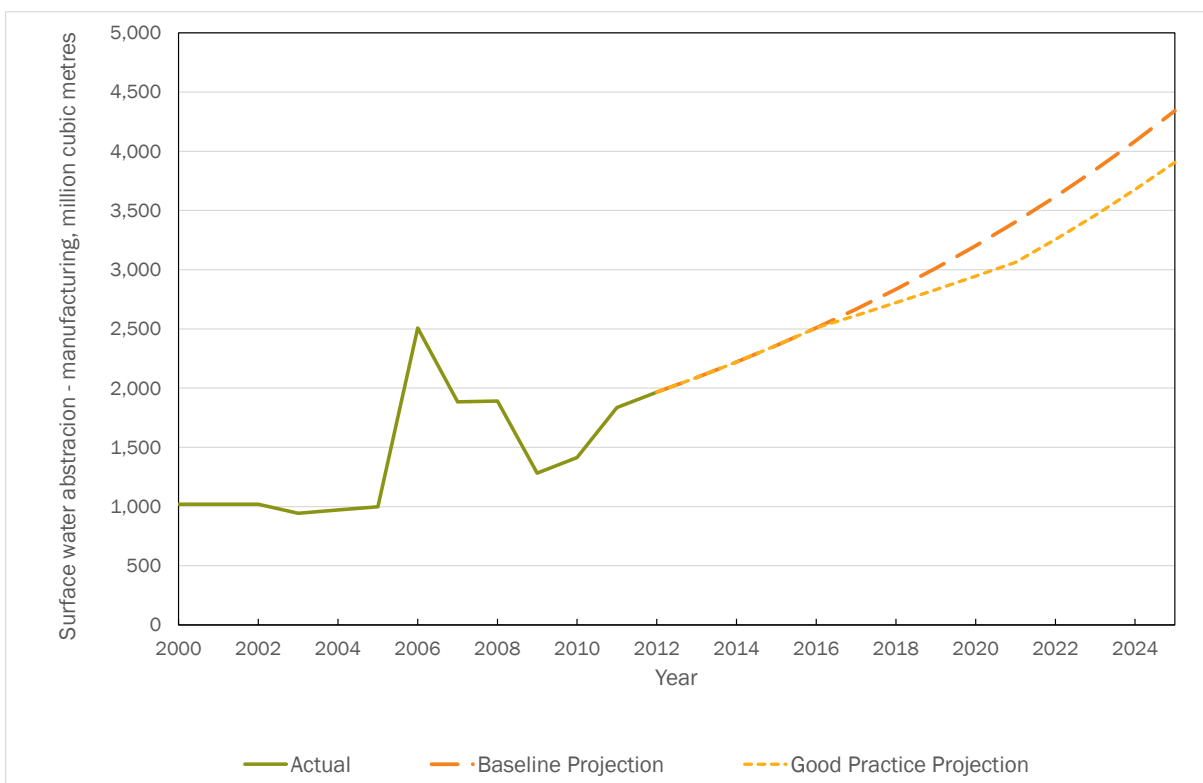


Figure 8-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

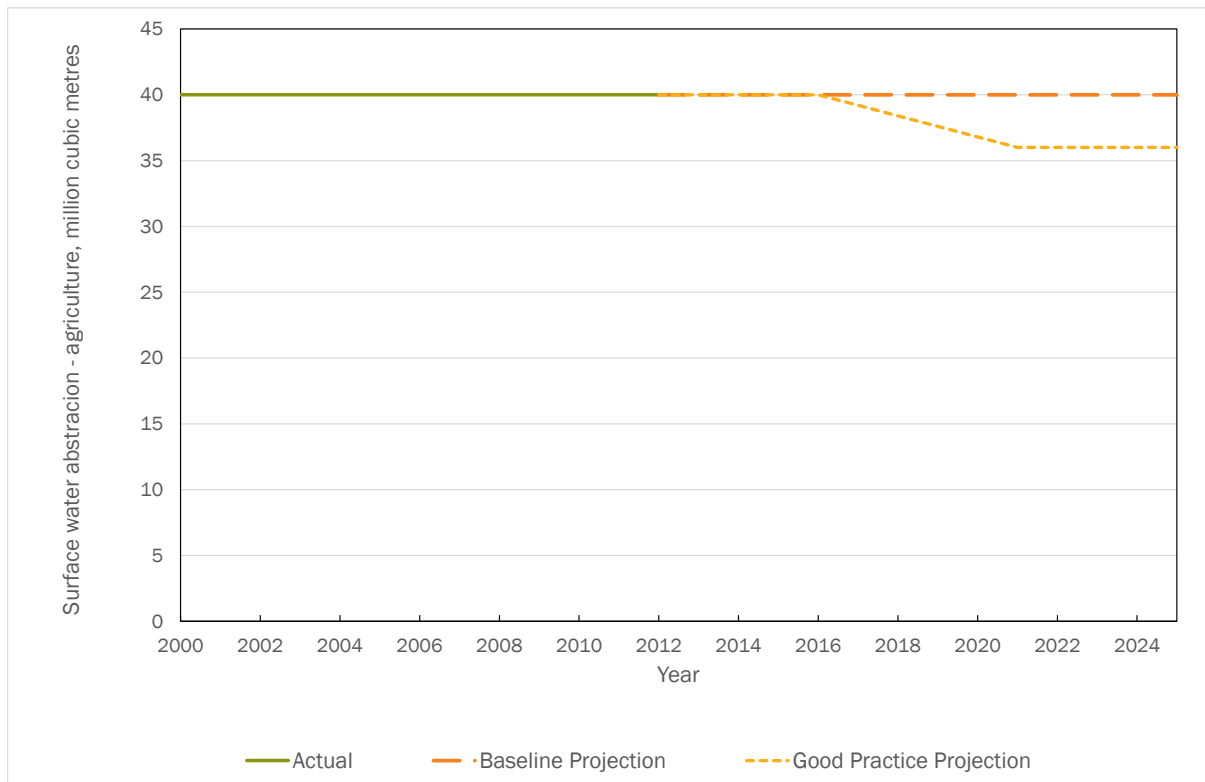


Figure 8-18: Change in Active Ingredients in Pesticides, tonnes

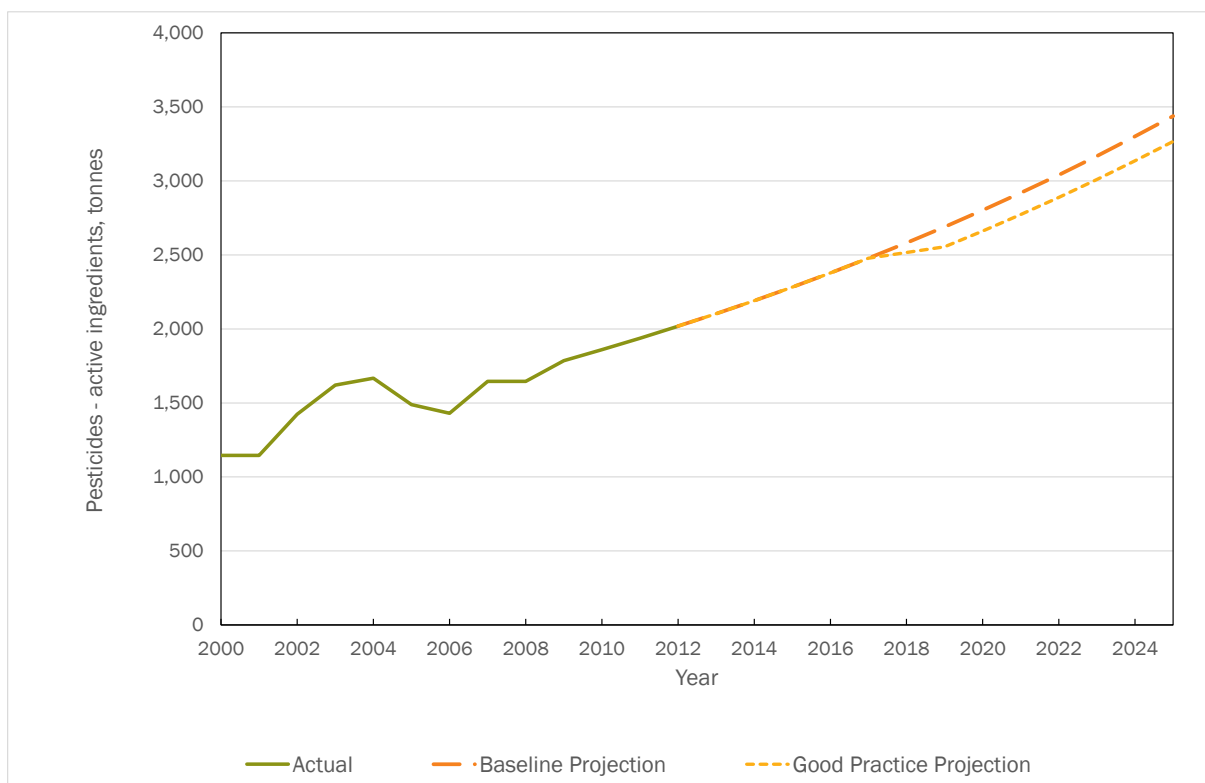


Figure 8-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes



Figure 8-20: Change in Aggregates Extraction, thousand tonnes

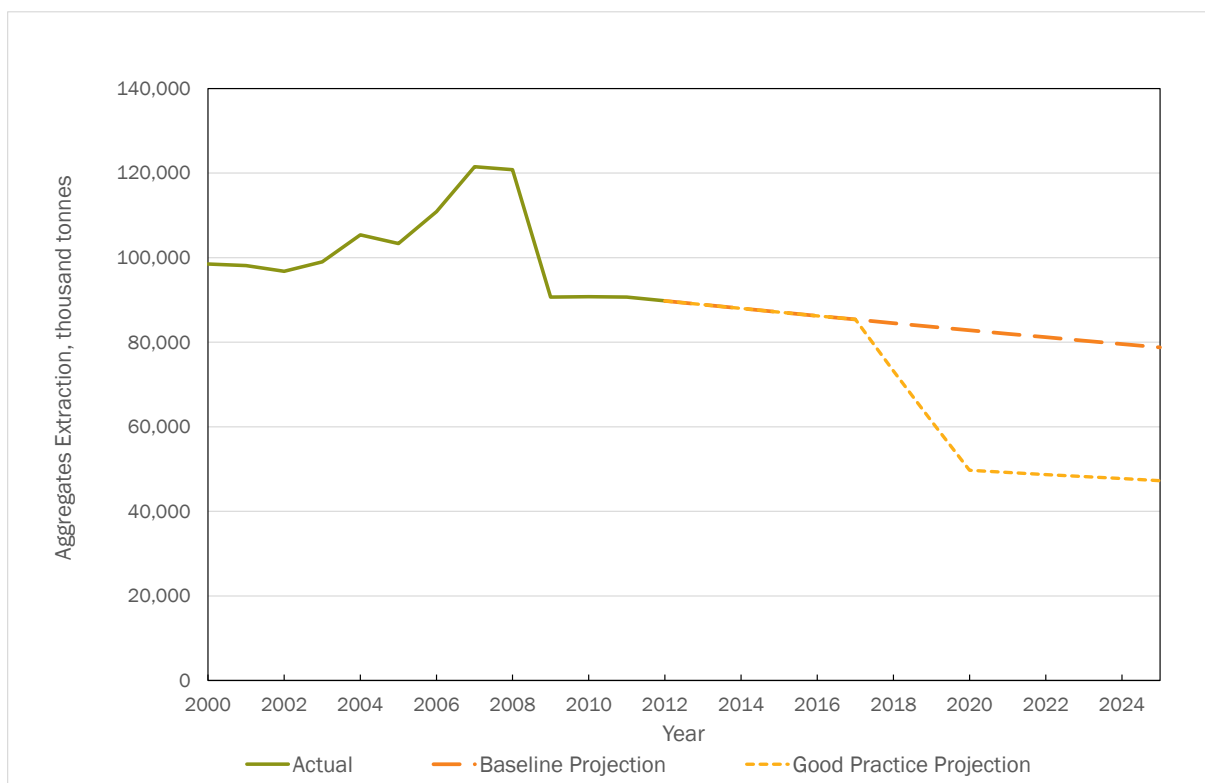


Figure 8-21: Change in Paper & Card Packaging Generation, thousand tonnes

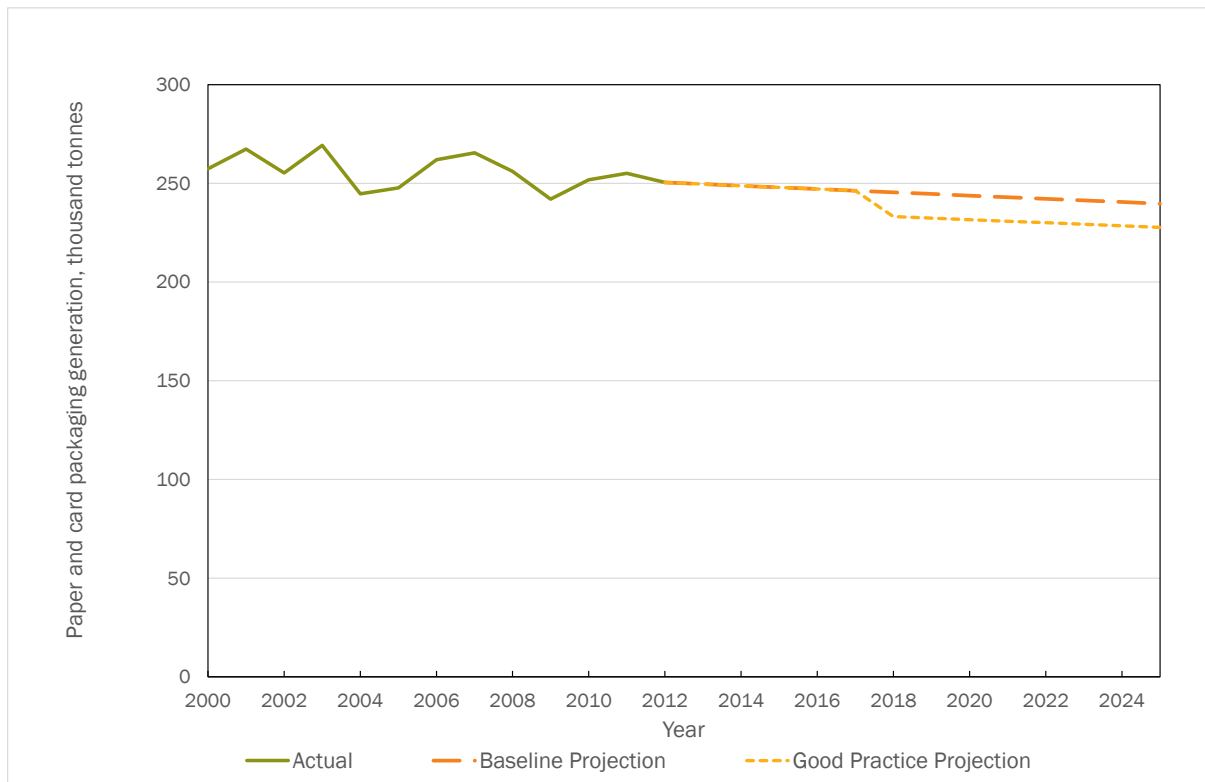


Figure 8-22: Change in Plastic Packaging Generation, thousand tonnes

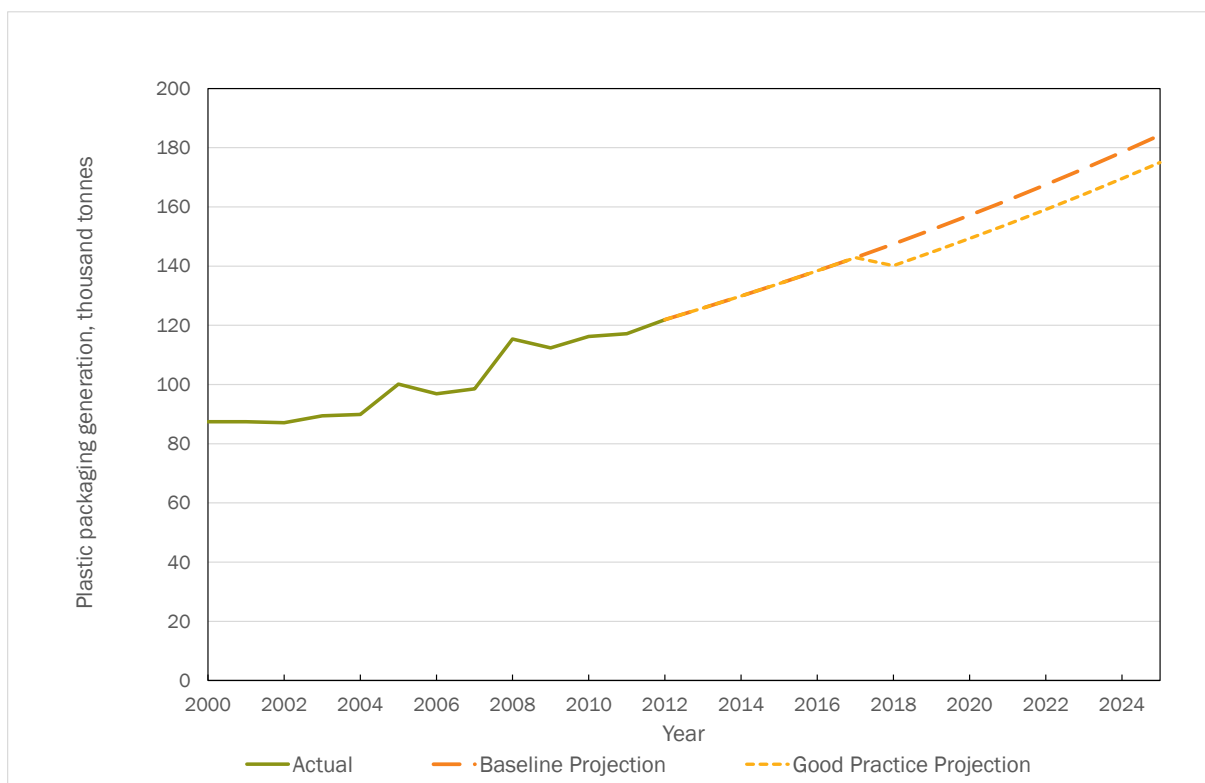


Figure 8-23: Change in Wood Packaging Generation, thousand tonnes

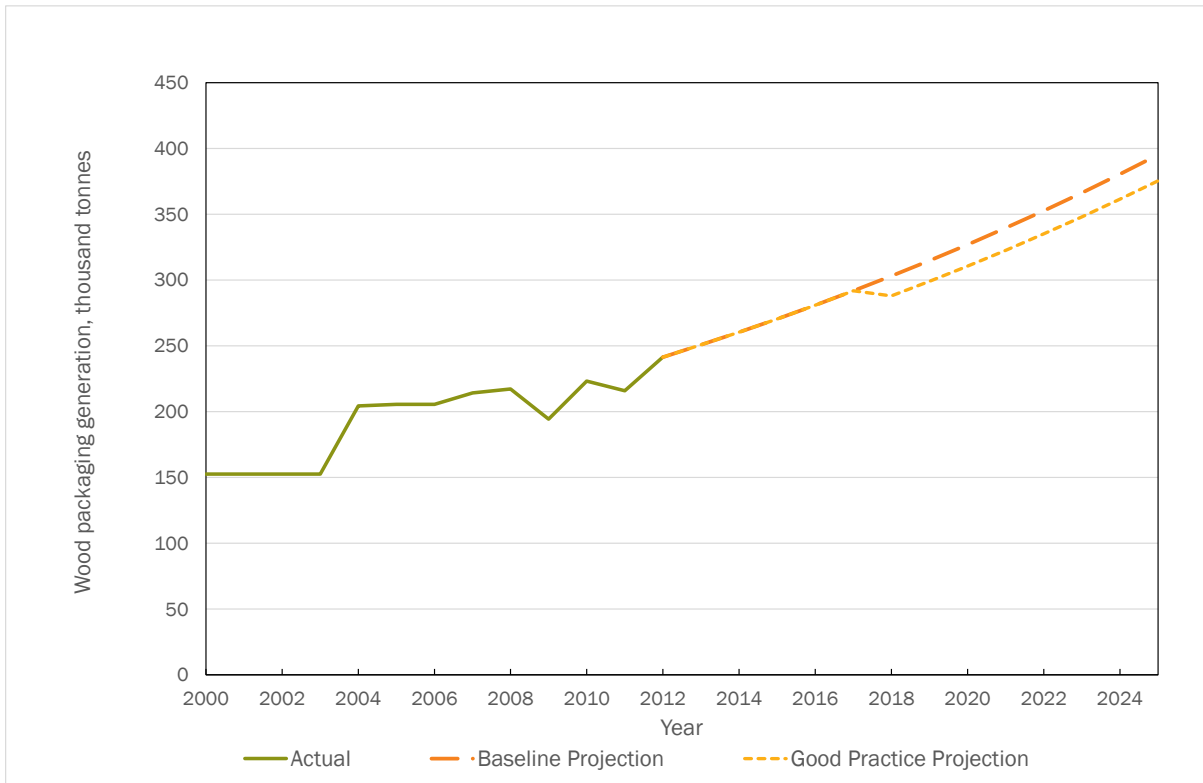


Figure 8-24: Change in Metal Packaging Generation, thousand tonnes

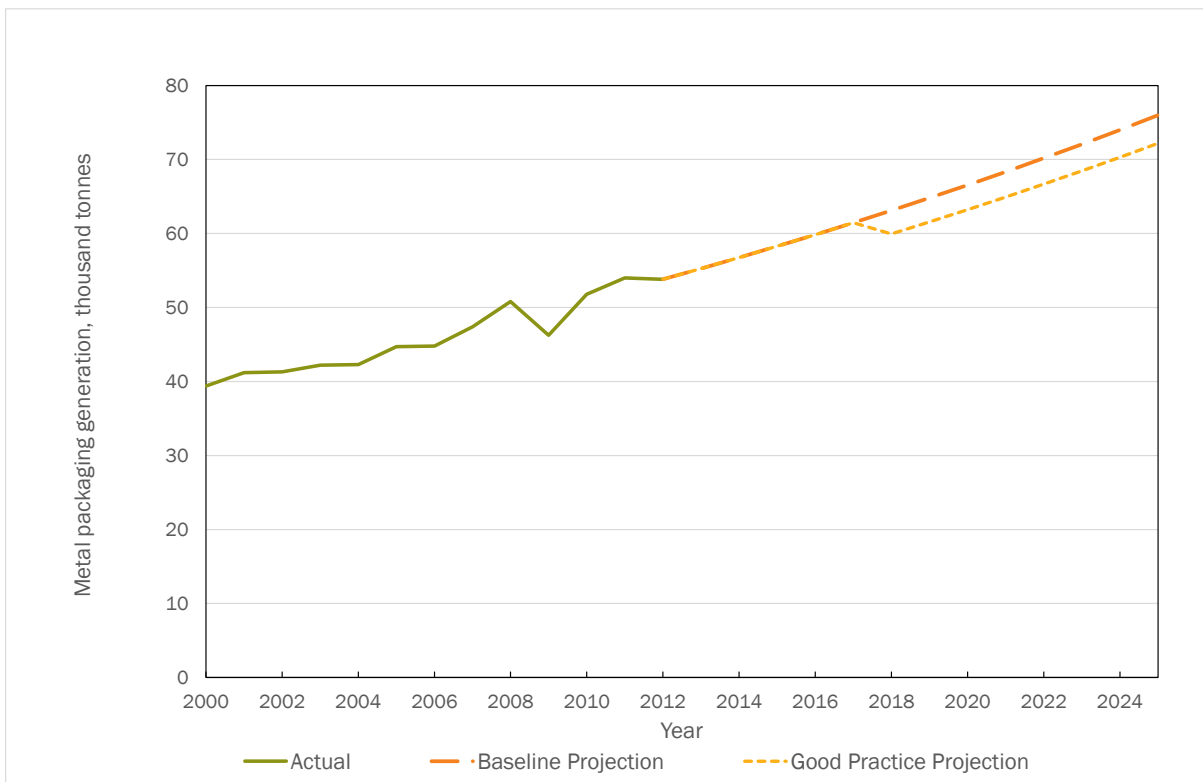


Figure 8-25: Change in Glass Packaging Generation, thousand tonnes

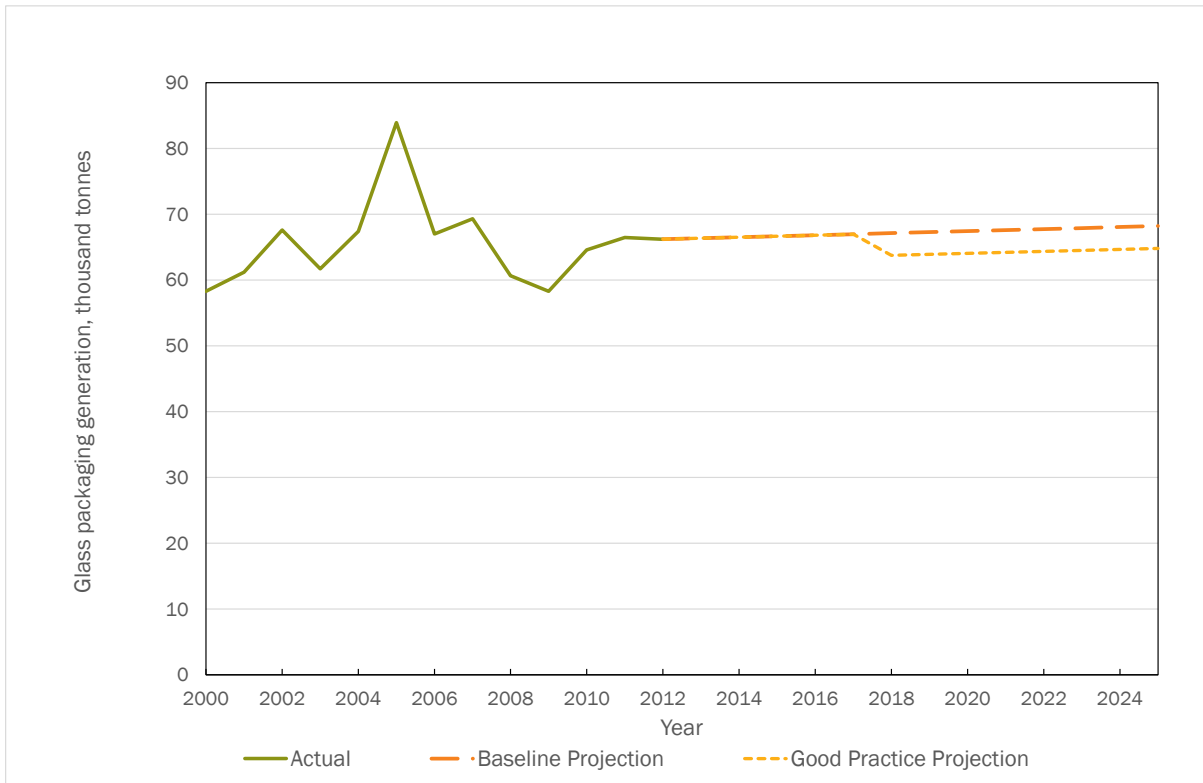
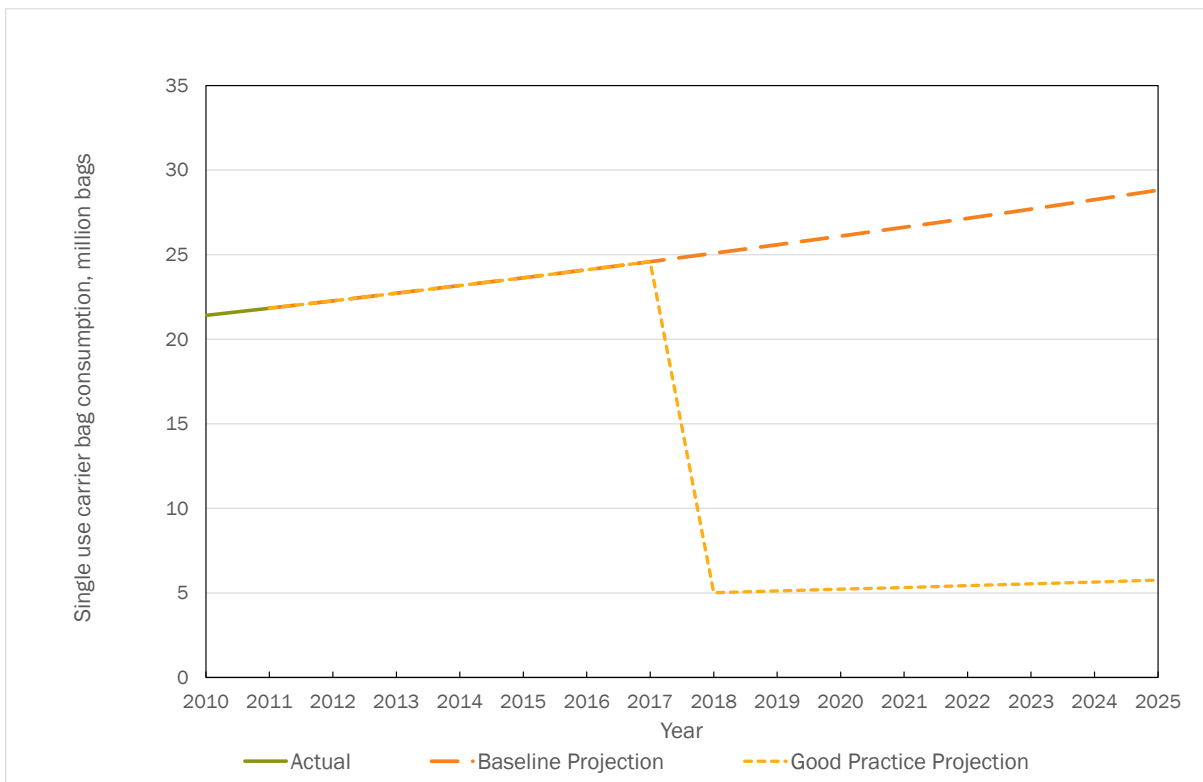


Figure 8-26: Change in Consumption of Single Use Carrier Bags, million bags



8.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 8-7: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	73	145	216	286	356	424	492	492	492
	C&I / Heating	0	0	43	84	123	161	198	234	269	269	269
	Electricity	559	559	559	559	559	559	559	559	559	559	559
	Sub-total Energy, million EUR	559	559	674	787	898	1,006	1,113	1,217	1,320	1,320	1,320
	Sub-total Energy, % GDP	0.3%	0.3%	0.3%	0.4%	0.4%	0.5%	0.5%	0.6%	0.6%	0.6%	0.6%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	92	185	277	370	462	462	462	462	462
	Passenger Aviation Tax	0	0	235	465	473	480	488	495	503	510	518
	Freight Aviation Tax	0	0	0	0	0	0	1	1	1	1	1
	Sub-total Transport, million EUR	0	0	328	650	750	850	950	958	966	973	981
	Sub-total Transport, % GDP	0.0%	0.0%	0.2%	0.3%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0
	Landfill Tax - Inerts (C&D)	0	19	37	49	41	34	34	34	34	34	34
	Incineration /MBT Tax	0	5	10	15	16	16	16	16	16	16	16

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	31	59	84	105	123	115	113	111	109	107
	Water Abstraction Tax	0	64	131	203	278	358	368	387	408	430	453
	Waste Water Tax	0	9	17	25	24	24	24	24	24	24	24
	Pesticides Tax	0	0	12	25	26	27	28	29	30	31	33
	Aggregates Tax	0	0	205	176	147	119	118	117	116	115	113
	Packaging Tax	0	0	24	24	24	25	25	26	27	27	28
	Single Use Bag Tax	0	3	3	1	1	1	1	1	1	1	1
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	131	500	600	661	725	728	746	766	787	809
	Sub-total Pollution & Resource, % GDP	0.0%	0.1%	0.2%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Total Revenue Stream	Total, million EUR	559	690	1,502	2,038	2,309	2,581	2,791	2,922	3,052	3,080	3,110
	Total, % GDP	0.3%	0.3%	0.7%	1.0%	1.1%	1.3%	1.4%	1.4%	1.5%	1.5%	1.5%

9.0 Germany

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

9.1 Energy Taxes

➤ **Excise duties on energy products:**

- The excise duties for Germany are summarised in Table 9-1.

Table 9-1: Excise Duties on Fuels and Electricity in Germany³²⁵ – nominal rates

Excise Duty	Unit	Rate Applied in Germany	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels - propellant					
Unleaded Petrol	€ per 1000 litres	€654.50 ¹	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€470.40 ²	€330	€427	€405
Kerosene	€ per 1000 litres	€654.50	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€180.32	€125	€209	€180
Natural Gas	€ per GJ	€3.86	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use (excl. non-manufacturing business)					
Gas Oil (Diesel)*	€ per 1000 litres	€46.01 ^{3, 4}	€21	€221	€163
Kerosene	€ per 1000 litres	€654.50	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€180.32	€41	€126	€125
Natural Gas	€ per GJ	€3.86	€0.30	€1.76	€1.50
Heating – Business Use (manufacturing industries)					
Gas Oil (Diesel)	€ per 1000 litres	€46.01 ⁴	€21	€221	€163
Kerosene	€ per 1000 litres	€654.50	€0.00	€270	€330

³²⁵ Exempt territories: Helgoland island and the Büsingen exclave within Switzerland.

Excise Duty	Unit	Rate Applied in Germany	Existing ETD Minimum	EU-28 Average	EU-28 Median
Heavy Fuel Oil	€ per 1000 kg	€25	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€45.45	€0.00	€82	€40
Natural Gas	€ per GJ	€1.14	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€0.3 ⁶	€0.15	€1.27	€0.31
Heating – Non-Business Use (and non-manufacturing business)					
Gas Oil (Diesel)	€ per 1000 litres	€61.35 ⁵	€21	€179	€125
Kerosene	€ per 1000 litres	€654.50	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€25	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€60.60	€0	€111	€42
Natural Gas	€ per GJ	€1.53	€0.3	€2.04	€0.94
Coal and Coke	€ per GJ	€0.3 ⁶	€0.3	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€15.37 ⁷	€0.5	€8.42	€1.03
Non-Business Use	€ per MWh	€20.50	€1.0	€14.53	€2.06
<p>Notes:</p> <p>1. This rate is for petrol with less than 10 mg sulphur per kg. Rate above this threshold is 669.80</p> <p>2. This rate is for diesel with less than 10 mg sulphur per kg. Rate above this threshold is 485.70</p> <p>3. €255.60 for agriculture, horticulture, pisciculture and forestry according to art 15(3); €61.35 for CHP with minimum 60% utilization rate (cf. note 5).</p> <p>4. This rate is for diesel with less than 50 mg sulphur per kg. Rate above this threshold is 61.01</p> <p>5. This rate is for diesel with less than 50 mg sulphur per kg. Rate above this threshold is 76.35</p> <p>6. The tax rate as related to the net calorific value is €0.33 per GJ Coal is exempt where used for electricity production.</p> <p>7. The effective rate is reduced about 50% due to the 'peak adjustment' (spitzenausgleich).</p> <p>*. TAXUD tables provide no single tax rate for Germany.</p>					

- Coal that is used for electricity production (>2MW) is exempt from taxation, according to EnergieStG §37. Gas oil used for electricity production (>2 MW) is taxed at a reduced rate (EnergieStG §53) of €15 per hectolitre. When the same units are also producing heat, the share of energy for that purpose will be taxed. Energy use for flue gas treatment is liable too. However, when a combined heat- and power unit is highly efficient with an energy utilization rate of at least 70% it may obtain a complete exemption.

- Table 1.4. lists the nominal tax rates without the more complex system of individual reductions which are available to business and including;
 - Process specific reductions in energy tax (§51 EnergieStG);
 - Peak adjustment (Spitzenausgleich) for energy tax (§55 EnergieStG);
 - Process specific reductions in electricity tax (§9b StromStG); and
 - Peak adjustment (Spitzenausgleich) for electricity tax (§10 StromStG).
- The following sectors are regarded as energy-intensive and may obtain the “process specific” reductions for energy and electricity use; production of glass and glass products; ceramic products; cement and gypsum; products of cement, chalk and gypsum; mineral insulation; asphalt; products of graphit; concrete products; mineral fertilizers; metals and metal products, surface treatment of metals; chemical processes. Reductions apply to producing purposes, heating and other purposes mainly as regards the use of coal, gas oil and electricity.
- For these and other producing entities it is also possible to obtain a refund of energy and electricity taxes when, for the individual company, the tax payments introduced under the ecological tax reform exceed the sum of the social security contributions lowered as part of the tax shift within ETR (with a base payment of €750 to €1,000). This ‘peak adjustment’ mechanism has been introduced to support energy-intensive industries that are not equally labour-intensive. While the peak adjustment allows for a reduction of 90%, the remaining payment should ensure that EU minimum rates for electricity are complied with.
- Effectively this is a cap on the tax payments, and annually the refunds amount to more than €2 billion, of which 90% relates to the electricity tax (Figure 9-1).³²⁶

³²⁶ BMF, 2010, Zweiundzwanzigster Subventionsbericht der Bundesregierung, Bonn
http://www.bundesfinanzministerium.de/Content/DE/Monatsberichte/Standardartikel_Migration/2010/03/analysen-und-berichte/b01-22-Subventionsbericht-der-Bundesregierung/22-Subventionsbericht-der-Bundesregierung.html

Figure 9-1: Reductions in Energy Taxation from Reduced Rates

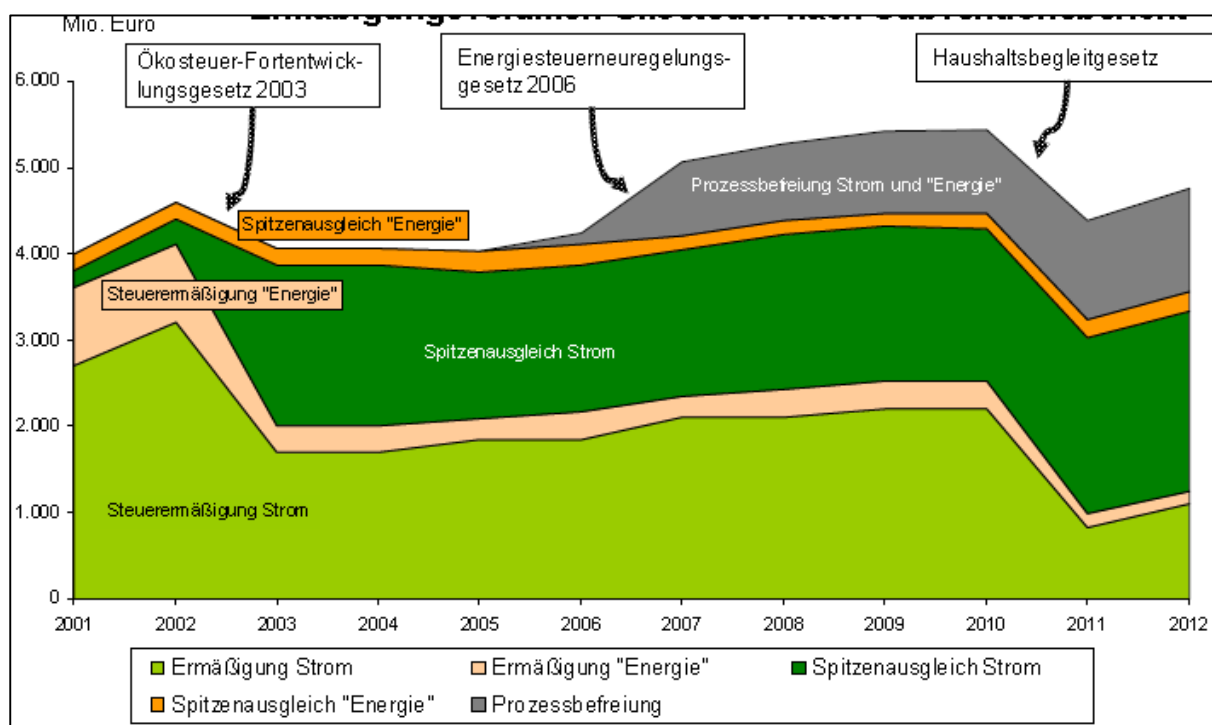


Figure: Reductions in energy taxation from reduced rates, process specific regulations and peak adjustment (from U. Beland, Deutscher Industrie- und Handelskammertag).

- Almost 100,000 companies have benefit from the 'peak adjustment', which seems a large number considering that there are about 50,000 manufacturing companies in Germany, but it includes also farmers and forestry. In 2010, it was about 162 TWh of electricity that was subject to 'peak adjustment' out of a total of 236 TWh used in industry and about 9 TWh in agriculture³²⁷ (BMW, 2011), implying that mainly industry benefits.
- Considering total revenues of about €7 billion from the electricity tax (of which €4 billion from business³²⁸) these figures indicate that the electricity tax is effectively a great deal lower for manufacturing industry than what the nominal rate suggests.³²⁹ The 'peak adjustment' is considered a subsidy under EU state aid regulations. To enable continuation of the scheme it is now required that manufacturing industries are certified to meet energy efficiency requirements. Industry as a whole must also obtain a 1.3% improvement in energy efficiency per year, according to the self-obligation agreement with the government, otherwise it will forfeit the peak

³²⁷ BMW, Energiedaten <http://bmwi.de/DE/Service/suche,did=589204.html>

³²⁸ Institut der Deutschen Wirtschaft in Köln, 2012, Alternative Möglichkeiten der steuerlichen Finanzierung der EEG-kosten, Kurzugutachten, p11 <http://www.iwkoeln.de>

³²⁹ Apparently the electricity tax revenues of €7 billion shrink to €5 billion after the refunds of €2 billion to business. The net tax burden for business is hence about €2 billion or half the nominal burden.

adjustment or see it reduced. After a two-year transition this takes effect from 2015.

9.2 Transport Taxes (Excluding Transport Fuels)

- There is no registration tax on the purchase and imports of cars in Germany.
- Circulation tax:
 - The annual circulation tax for cars (Kfz-Steuer) registered after 1st July 2009. The tax is based partly on CO₂ emissions, consisting of a base tax and a CO₂ tax. The base tax is €2 per 100 cm³ (petrol) and €9.5 per 100 cm³ (diesel). The CO₂ component is linear with €2 per g per km emitted above 95 g per km, whereas cars below the threshold are exempt.
 - The circulation tax applies to domestic and foreign vehicles, when the latter are used in Germany.
 - For heavy-goods vehicles the circulation tax depends on weight:
 - Up to 2,000 kg: €11.25 per 200 kg.
 - From 2,000 to 3,000 kg: € 12.02 per 200 kg.
 - From 3,000 to 3,500 kg: €12.78 per 200 kg.
 - The following vehicles are exempt from circulation tax: police, ambulances, fire engines, custom and tax vehicles, road repair vehicles, street cleaning vehicles and trolley-buses. Vehicles for agricultural and forestry purposes as well as for shows may obtain exemption.
 - The road user charge for heavy-goods vehicles (Maut) is differentiated according to vehicle exhaust classes for vehicles of at least 12 tonnes.

Table 9-2: Distance-Based Toll-Rates (“Maut”) for Heavy-Duty Vehicles of at Least 12 Tonnes in Germany

Maut Category	Vehicle Exhaust Class	No. of Axels	Toll Rate
Category A	Euro 5 EEV Class 1 Euro 6	Up to 3 axles	€0.141 per km
		Up to 4 axles	€0.155 per km
Category B	Euro 4 Euro 3 with PMK 2, 3 or 4	Up to 3 axles	€0.169 per km
		Up to 4 axles	€0.183 per km
Category C	Euro 3 without PMK Euro 2 with PMK 1, 2, 3 or 4	Up to 3 axles	€0.190 per km
		Up to 4 axles	€0.204 per km
Category D	Euro 2 without PMK Euro 1 Euro 0 - other	Up to 3 axles	€0.274 per km
		Up to 4 axles	€0.288 per km

PMK is Partikelminderungskategorie (particle reduction class)

9.3 Pollution and Resource Taxes

- Water Abstraction Tax:
 - Germany’s water abstraction tax (Wasserpfeennig) is a natural resource tax

that applies to water works and others abstracting from aquifers or surface waters. It is a volumetric tax, with tax rates that are decided by the individual Land government and which hence differ across Germany. The Länder also administrate the tax bases differently with respect to the rates for surface waters and groundwater. In most Länder the revenues are ring-fenced for regional compensation schemes, whereas others do not tie it to specific statutory purposes.³³⁰ Abstraction for irrigation purposes is exempted in several Länder or subject to reduced rates.

Table 9-3: Water Abstraction Levy (Wasserpfennig) in German Länder

	Tax Base GW:groundwater; SW:surface water	Tax Rate per m ³ (cents) ¹	Minimum Threshold p.a.	Ring-fenced	Annual Revenue (million €)
Baden-Württemberg	GW; SW	5.1	2,000 m ³	From 2013 ³³¹	85
Berlin	GW	31	6,000 m ³	Yes	52.6
Brandenburg	GW; SW	10; 2	3,000 m ³	Yes	19
Bremen	GW; SW	5	4,000 m ³	Yes	4.45
Hamburg	GW	31	10,000 m ³	No	4.85
Mecklenburg-West Pomerania	GW; SW	5; 2	2,000 m ³	Yes	5
Lower Saxony	GW; SW	5; 1	€260	Yes	60
North Rhine-Westphalia	GW; SW	4.5	3,000 m ³ per €150	Partly	86
Saarland	GW	7 or 8	€200	Partly	2.2
Saxony	GW; SW	1.5	2,000 m ³	Yes	5.6
Saxony-Anhalt (from 2012)	GW; SW	5 or 2-7	2,000 m ³	n.a.	n.a.
Schleswig-Holstein	GW; SW	5 or 11	€100	50%	58
Note:					
1. Where different tax rates for groundwater (GW) and surface water (SW) these are separated with.					

³³⁰ Water abstraction charges and compensation payments in Baden-Württemberg, EPI-WATER report; http://www.feem-project.net/epiwater/docs/d32-d6-1/CS13_Buden-Wuerttemberg.pdf

³³¹ <http://www.welt.de/regionales/baden-wuerttemberg/article131887573/Umweltminister-will-Wasserpfennig-anheben.html>

- There are a number of exemptions related to the above water abstraction charges, of which several are outlined in Table 9-4.³³²

Table 9-4: Exemptions to Water Abstraction Levies in German Länder

	Baden-Württemberg	Brandenburg	Bremen	Lower Saxony	Saxony	Schleswig-Holstein
Exemptions on the Grounds of Competitive Disadvantage	-	Water intensive production of businesses can be partly or totally freed from water abstraction charge in case of competitive disadvantages	-	-	-	-
Exemptions on the Grounds of Obtaining Heat	No fees for water extraction which aims to get heat	No fees for water abstraction which aims to get heat and where the water is discharged afterwards without any impairment	No fees for water abstraction which aims to get heat and where the water is discharged afterwards	No fees for water abstraction which aims to get heat and where the water is discharged afterwards	No fees for abstraction of surface water bodies for the purpose of using hydropower or getting heat	No fees for water abstraction from mineral springs which aims to get heat and is not used for commercial beverage production

- Germany's waste water tax (Abwasserabgabe) is linked to the discharge license, and when the concentration of the pollutant exceeds the 'Grenzwerte', the charge for the pollutant in question is raised by the percentage by which the value is exceeded. However, if the values are exceeded only once in the period of assessment, the charge is raised by half this percentage.
- Industries are considered for a charge reduction if the concentration values of the pollutants are below the minimum standards (Mindestanforderungen) specified by the federal authorities. Dischargers are also considered for charge reductions when they submit plans for installations of treatments plants, provided that at least a 20% reduction

³³² The full list of exemptions is available at http://www2.oecd.org/eoicinst/queries/QueryResult_5.aspx?Key=3c7d6fdf-5d64-46c7-982c-a74a553d7159&OryCtx=4&OryFlag=3

in pollution load is achieved. Communities can obtain somewhat comparable arrangements as industries for reductions.³³³

- As for inhabitants not connected to the communal treatments plants but discharging directly to surface water the communities are liable for a charge. In this connection there is a standard reduction of 50% for the number of pollution units.

9.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 9-5: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	53,919	52,130	-1,789
Petrol	million litres	20,158	20,158	0
Kerosene	million litres	9,444	9,444	0
LPG	thousand tonnes	1,572	1,470	-102
Heavy Fuel Oil	thousand tonnes	1,454	1,423	-30
Natural Gas	TJ (GCV)	1,899,249	1,882,956	-16,293
Coal	thousand tonnes	2,733	2,718	-15
Electricity	GWh	473,816	468,732	-5,084

³³³ RIZA (1995) Waste water charge schemes in the European Union Part I, p 103, Lelystad.

Figure 9-2: Change in Internal Passenger Flights, flights per year

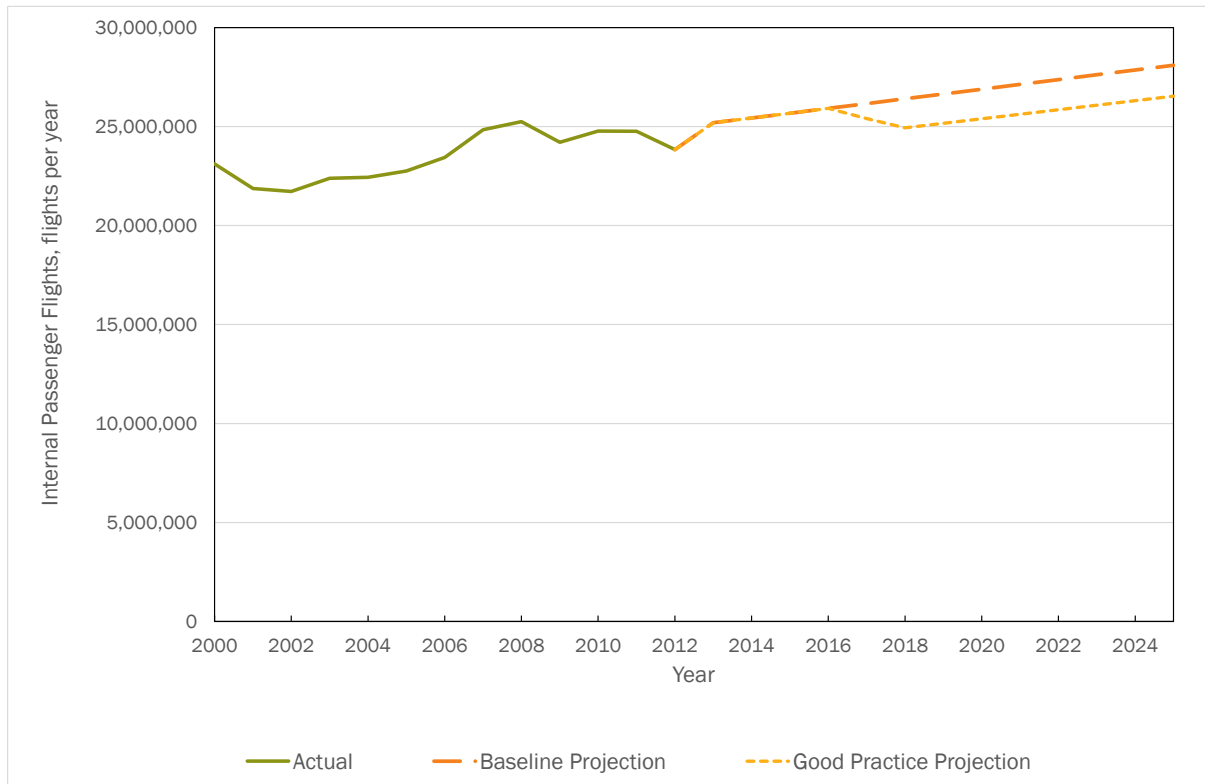


Figure 9-3: Change in Intra-EU Passenger Flights, flights per year

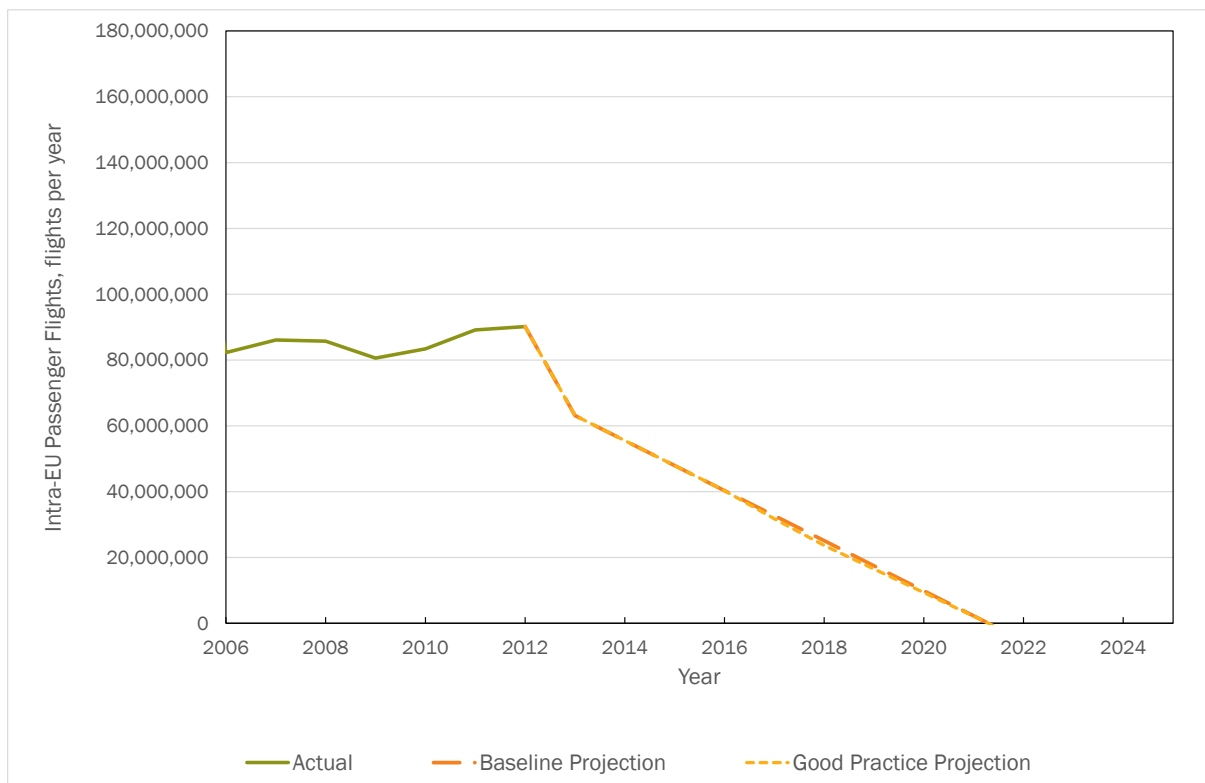


Figure 9-4: Change in Extra-EU Passenger Flights, flights per year

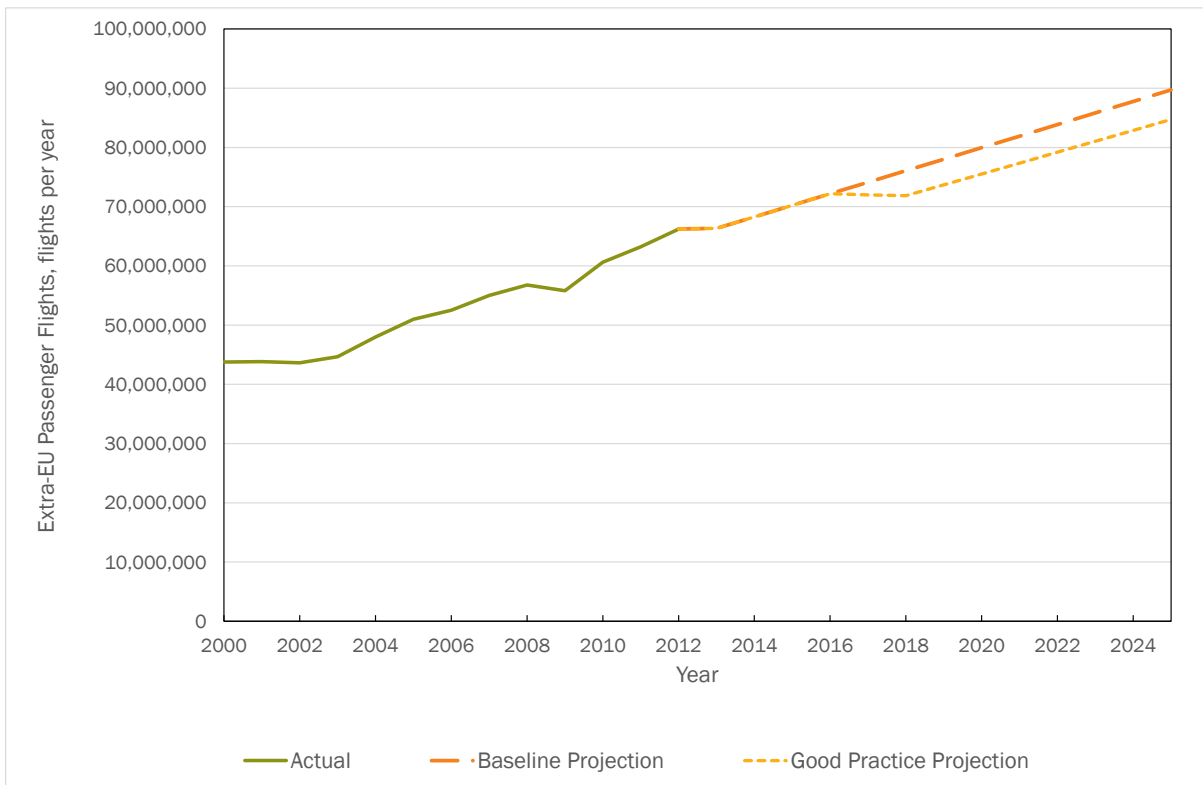


Figure 9-5: Change in Internal Air-freight, tonnes

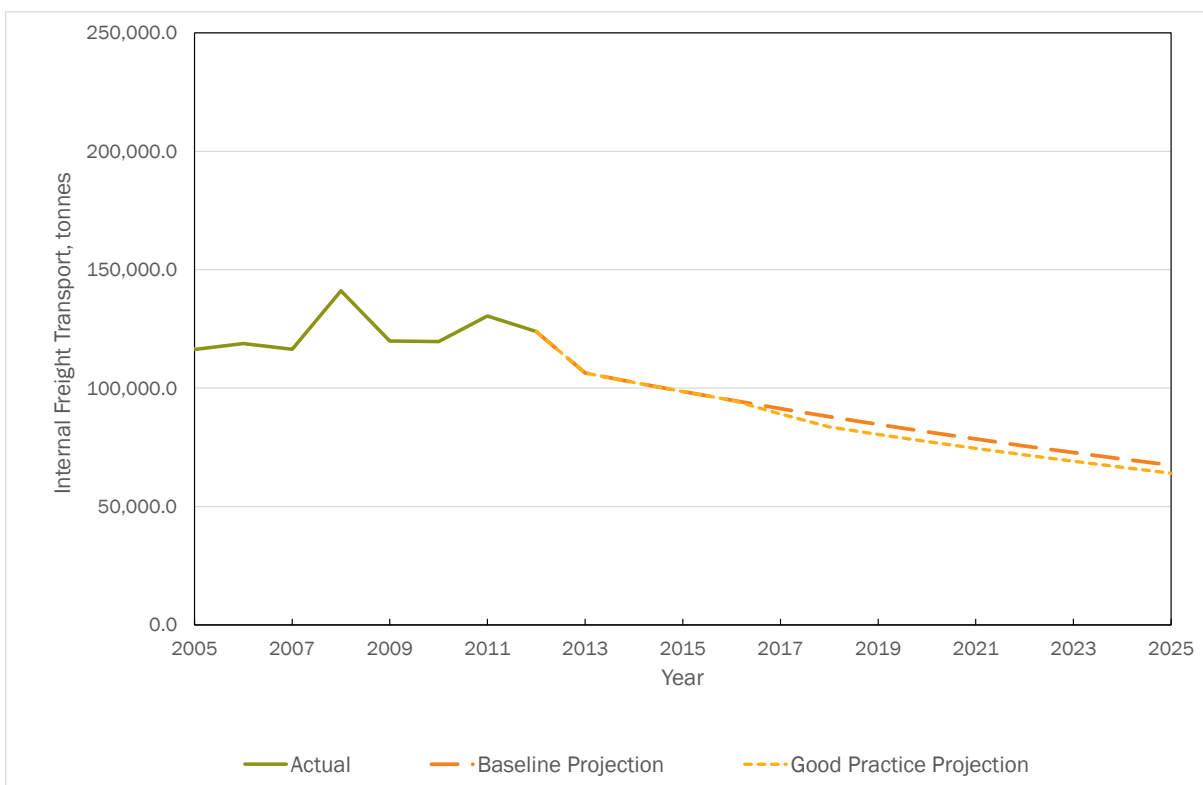


Figure 9-6: Change in Intra-EU Air-freight, tonnes

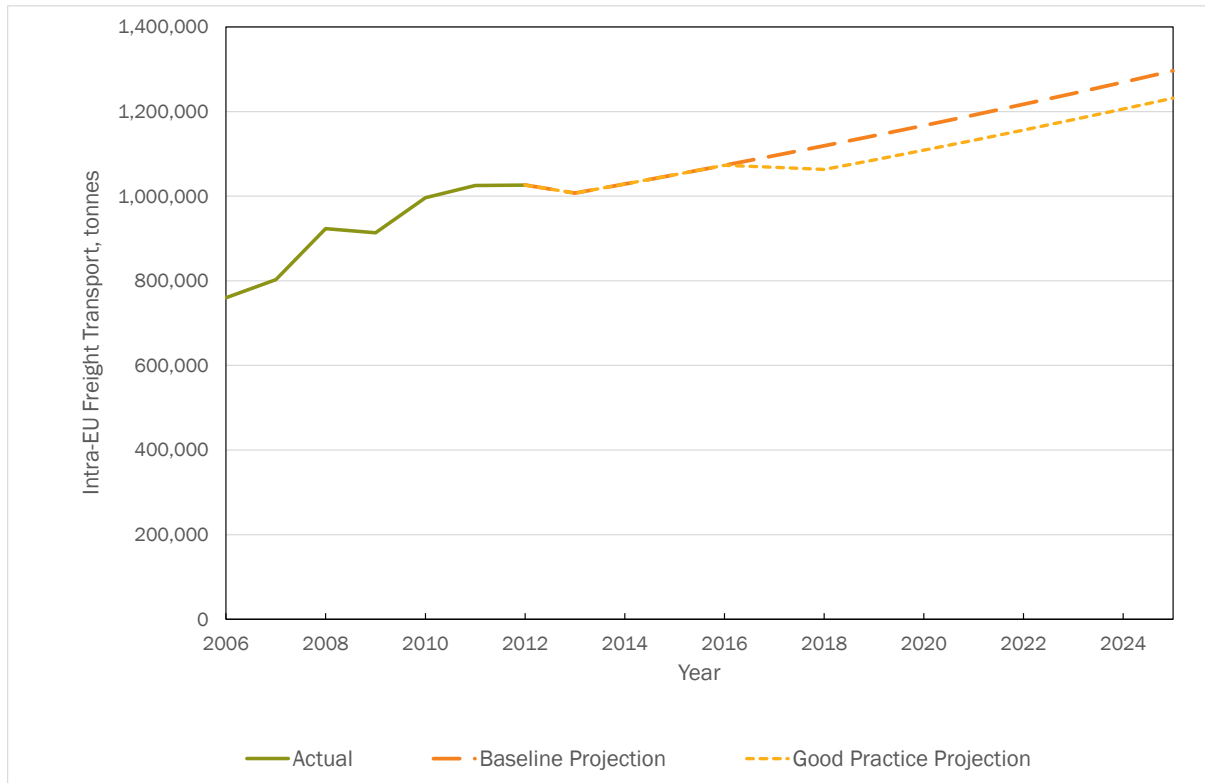


Figure 9-7: Change in Extra-EU Air-freight, tonnes

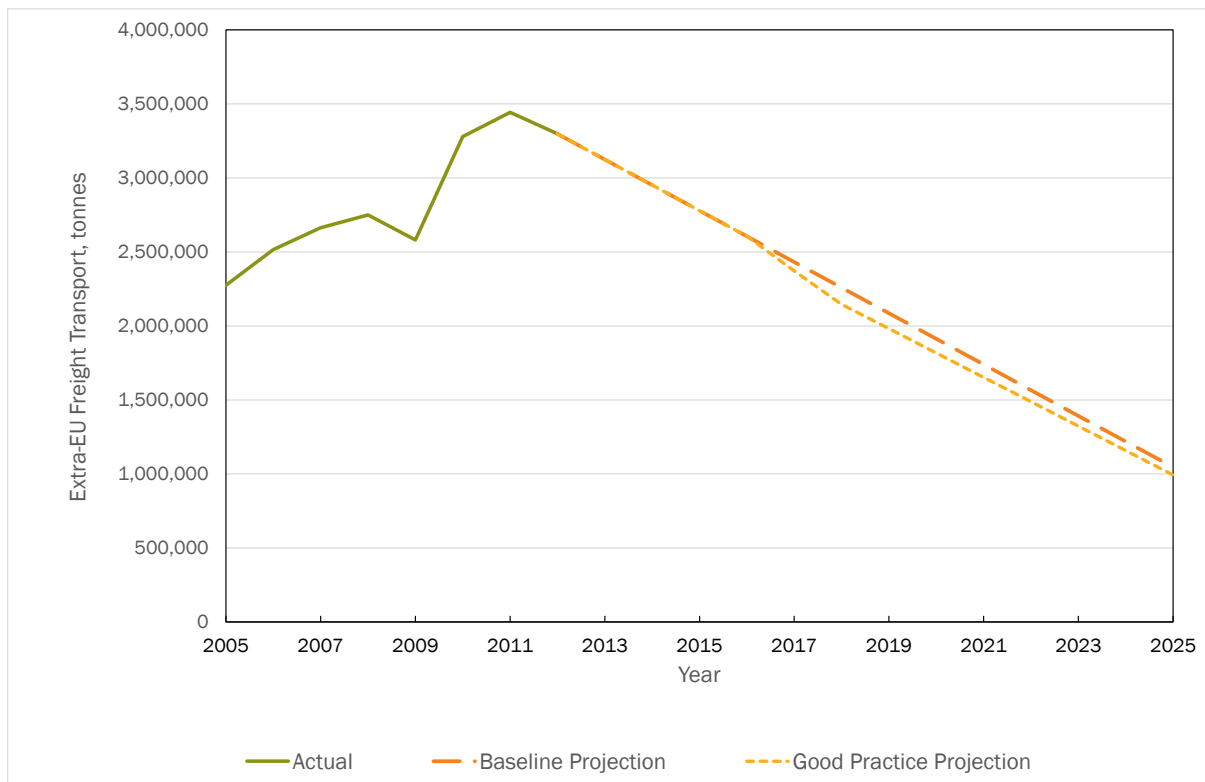


Figure 9-8: Change in Non-Hazardous Waste Landfilled, thousand tonnes

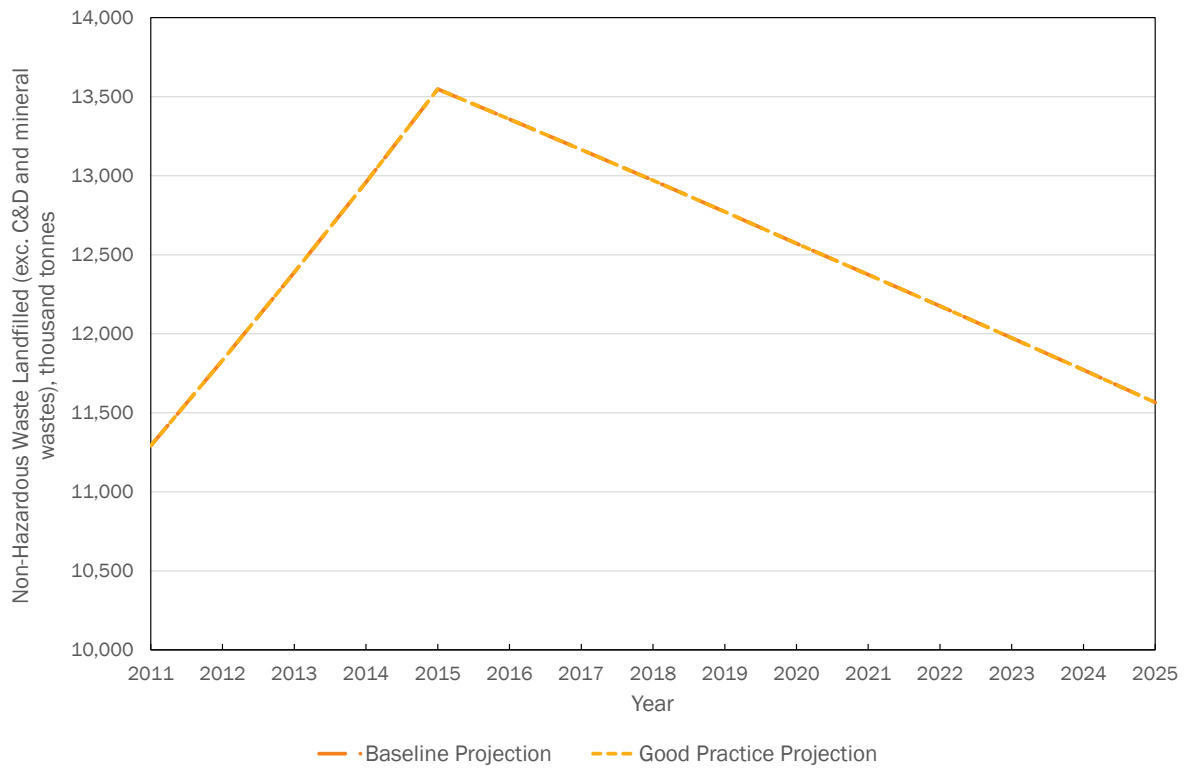


Figure 9-9: Change in MBT/ Incineration, thousand tonnes

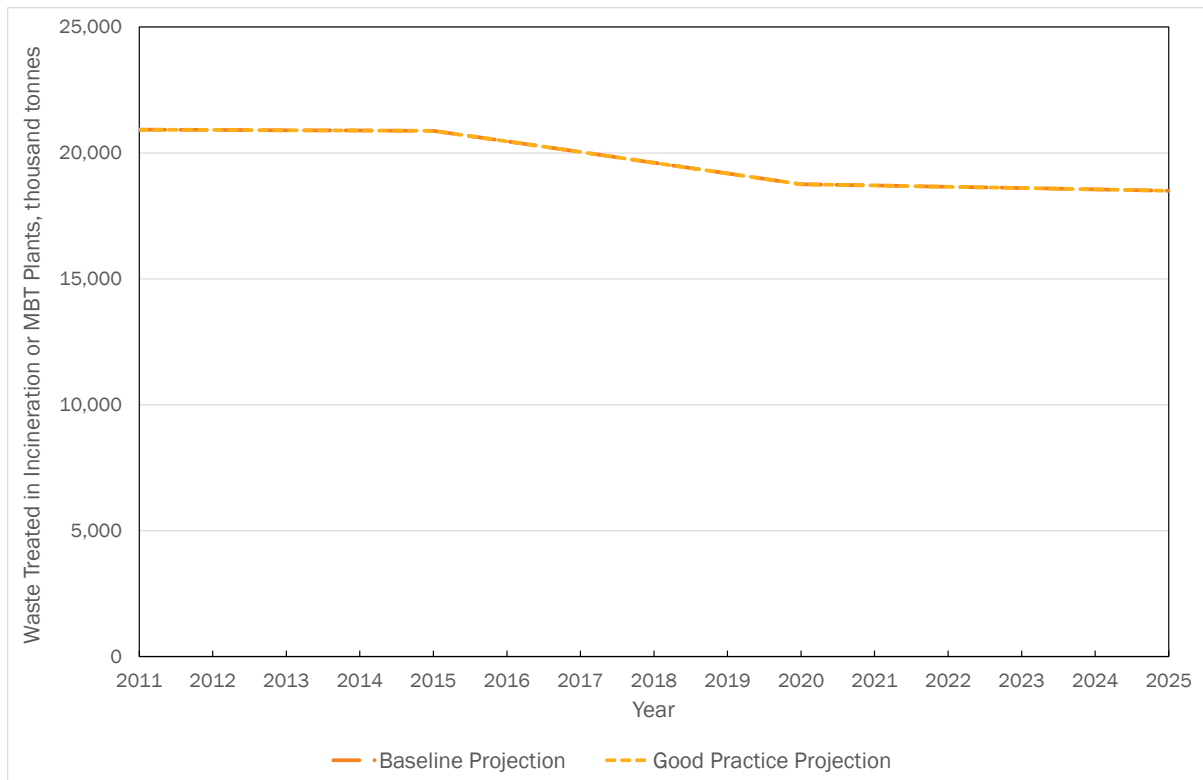


Figure 9-10: Change in SOx Emissions, tonnes

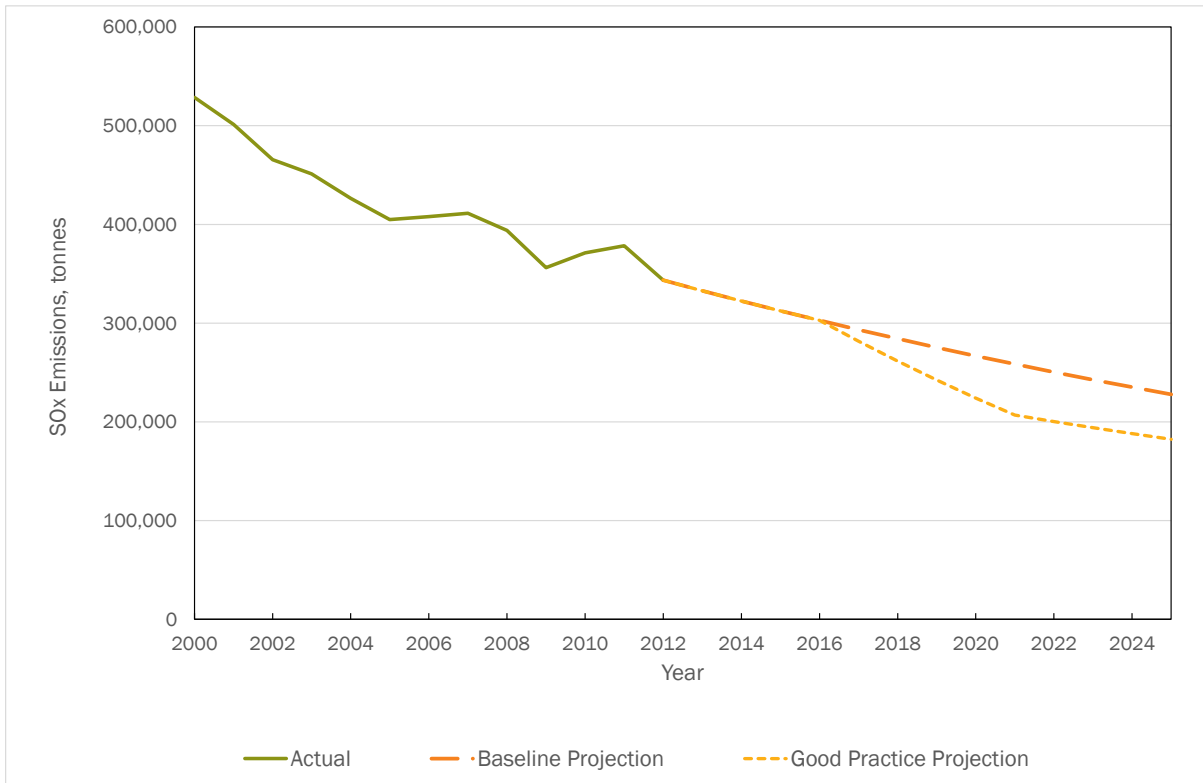


Figure 9-11: Change in NOx Emissions, tonnes

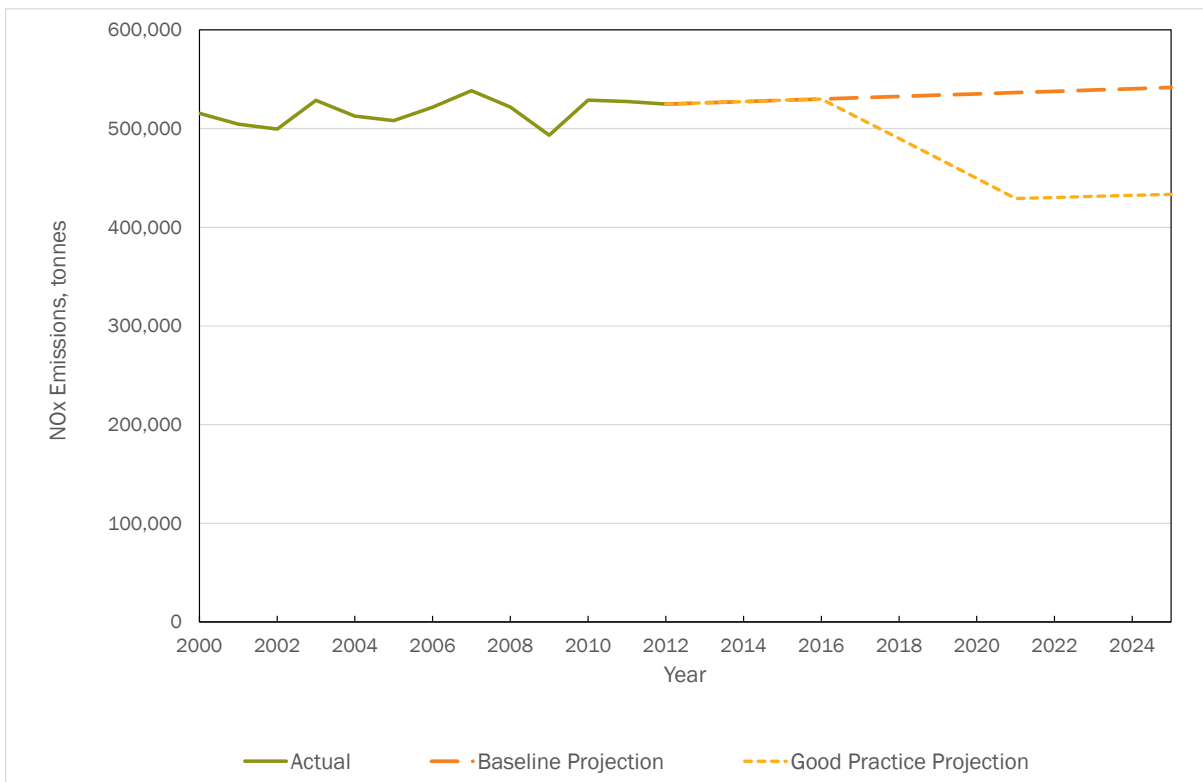


Figure 9-12: Change in PM₁₀ Emissions, tonnes

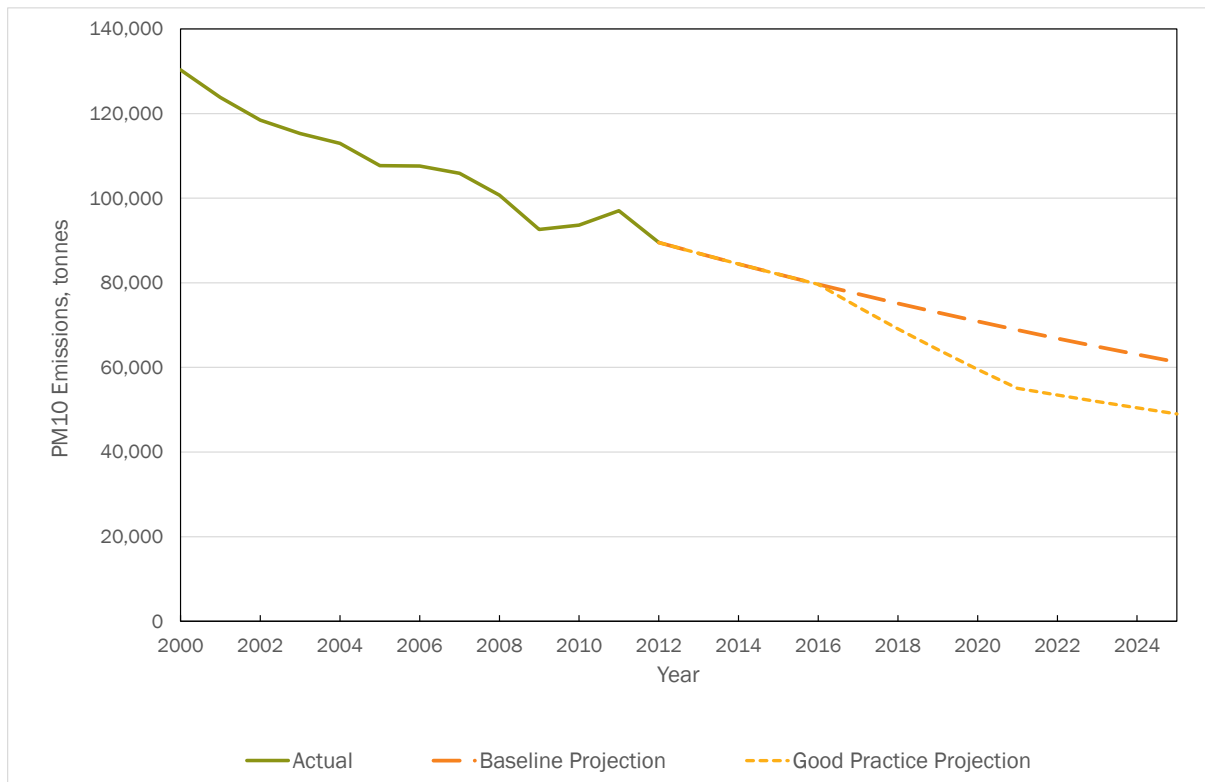


Figure 9-13: Change in Groundwater Abstraction – Public Supply, million cubic metres



Figure 9-14: Change in Groundwater Abstraction – Manufacturing, million cubic metres

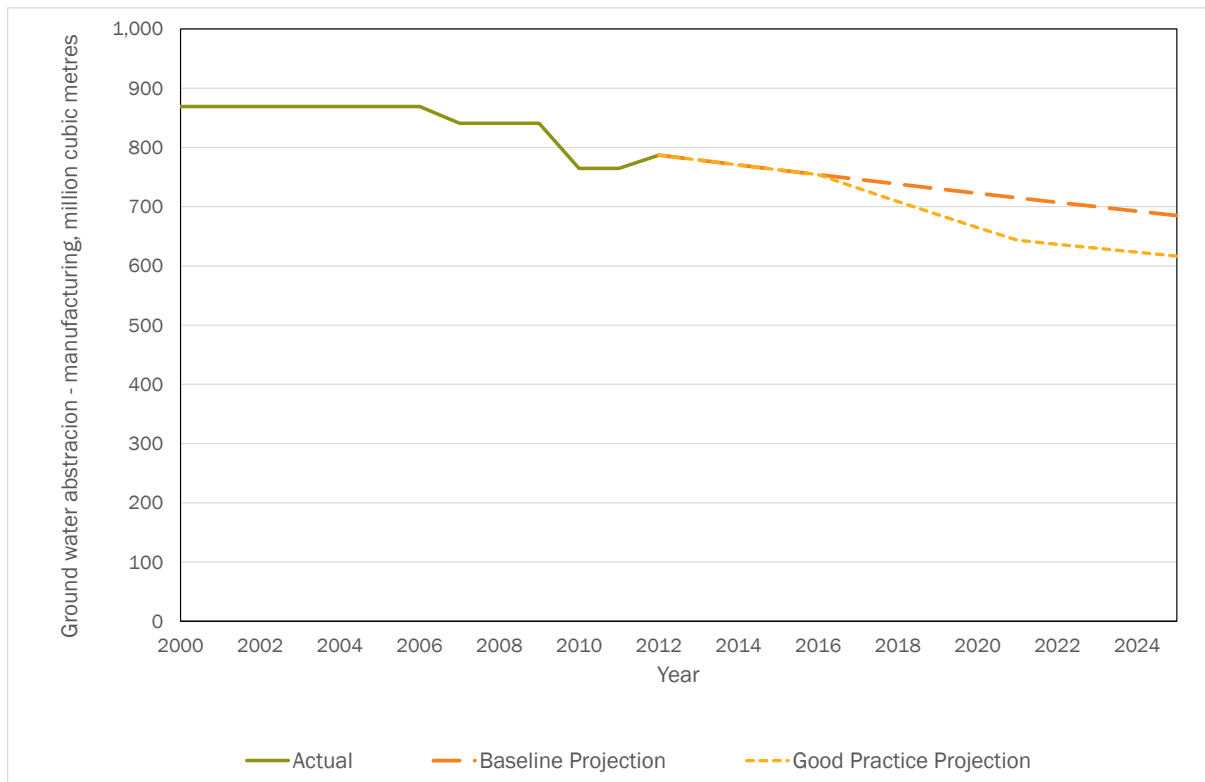


Figure 9-15: Change in Groundwater Abstraction – Agriculture, million cubic metres

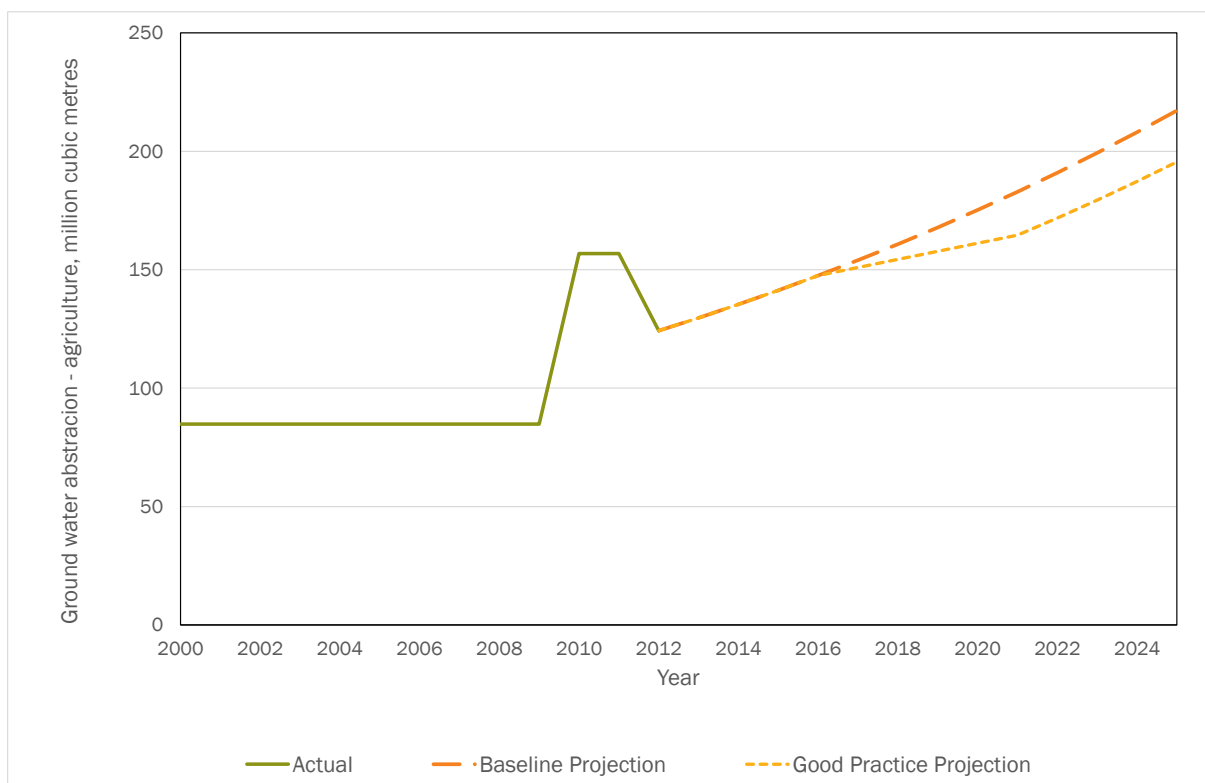


Figure 9-16: Change in Surface Water Abstraction – Public Supply, million cubic metres

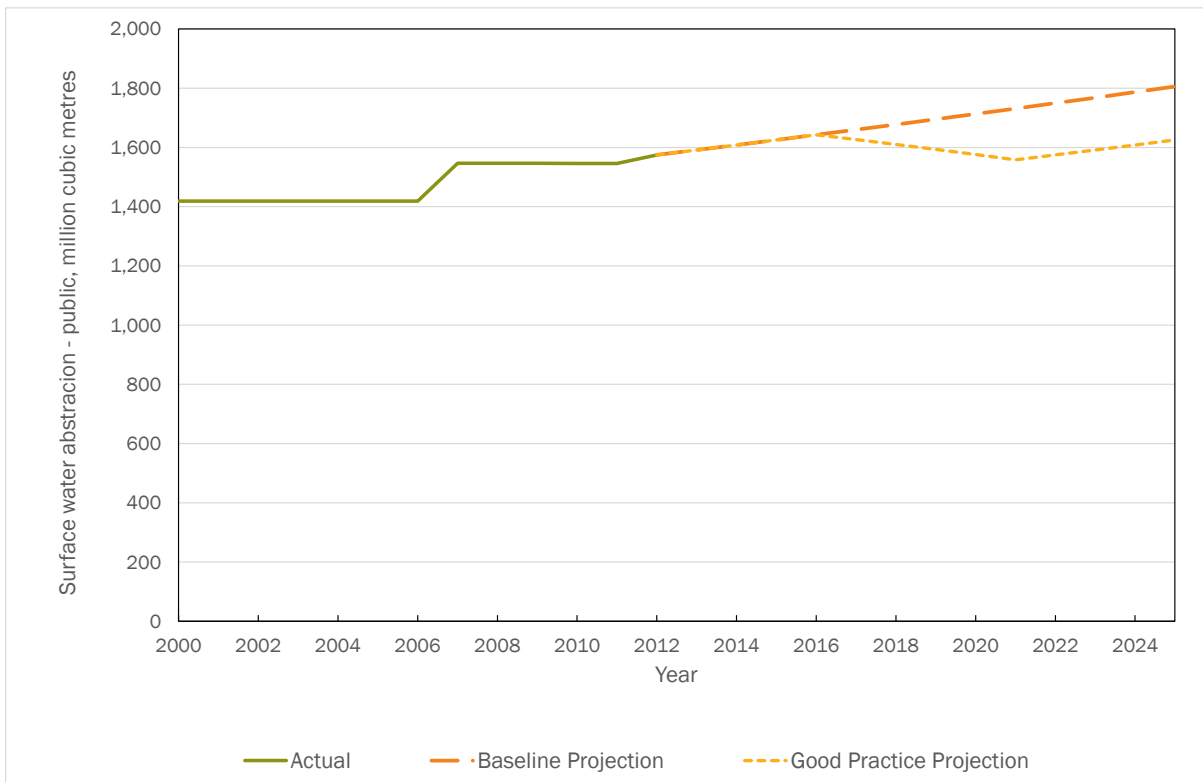


Figure 9-17: Change in Surface Water Abstraction – Manufacturing, million cubic metres

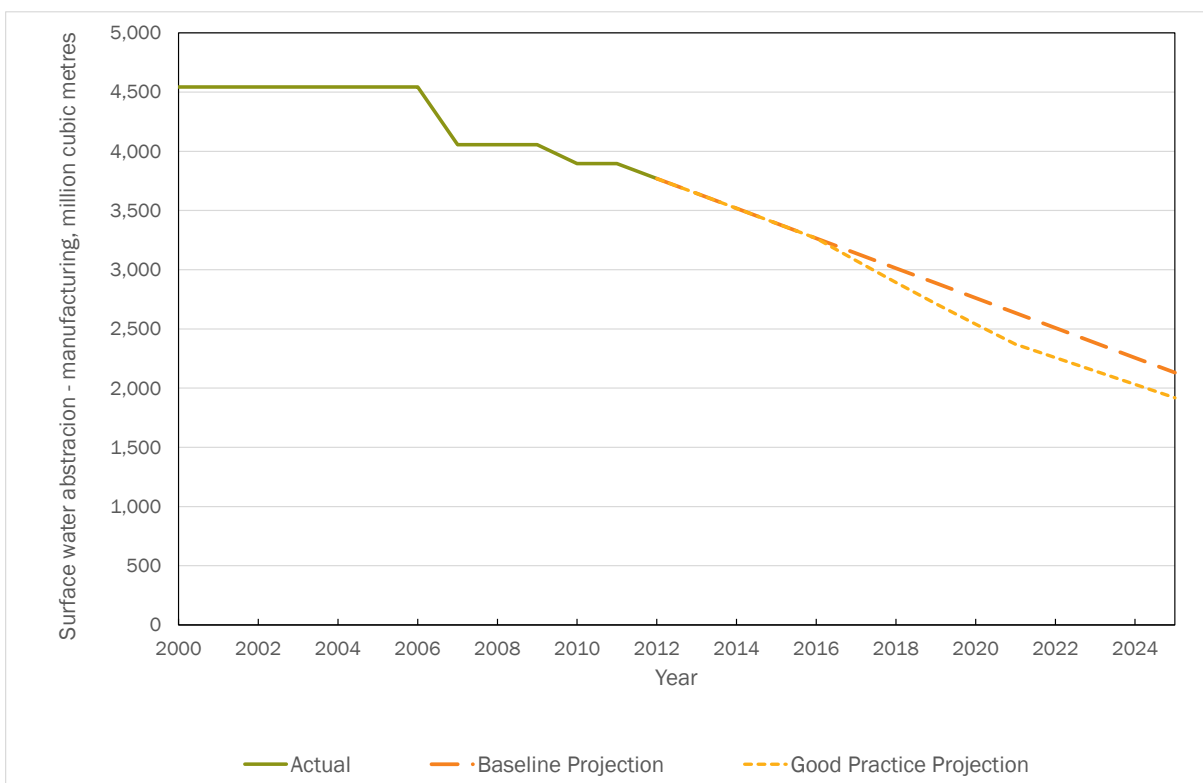


Figure 9-18: Change in Surface Water Abstraction – Agriculture, million cubic metres

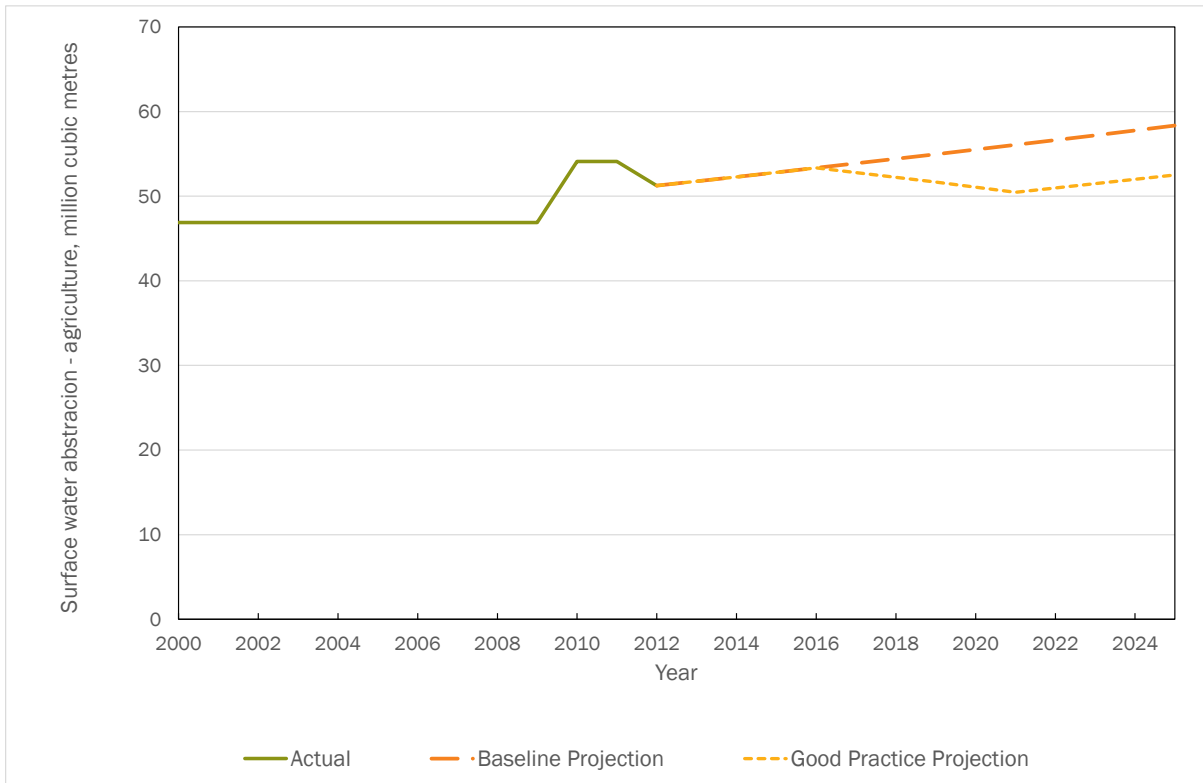


Figure 9-19: Change in Active Ingredients in Pesticides, tonnes

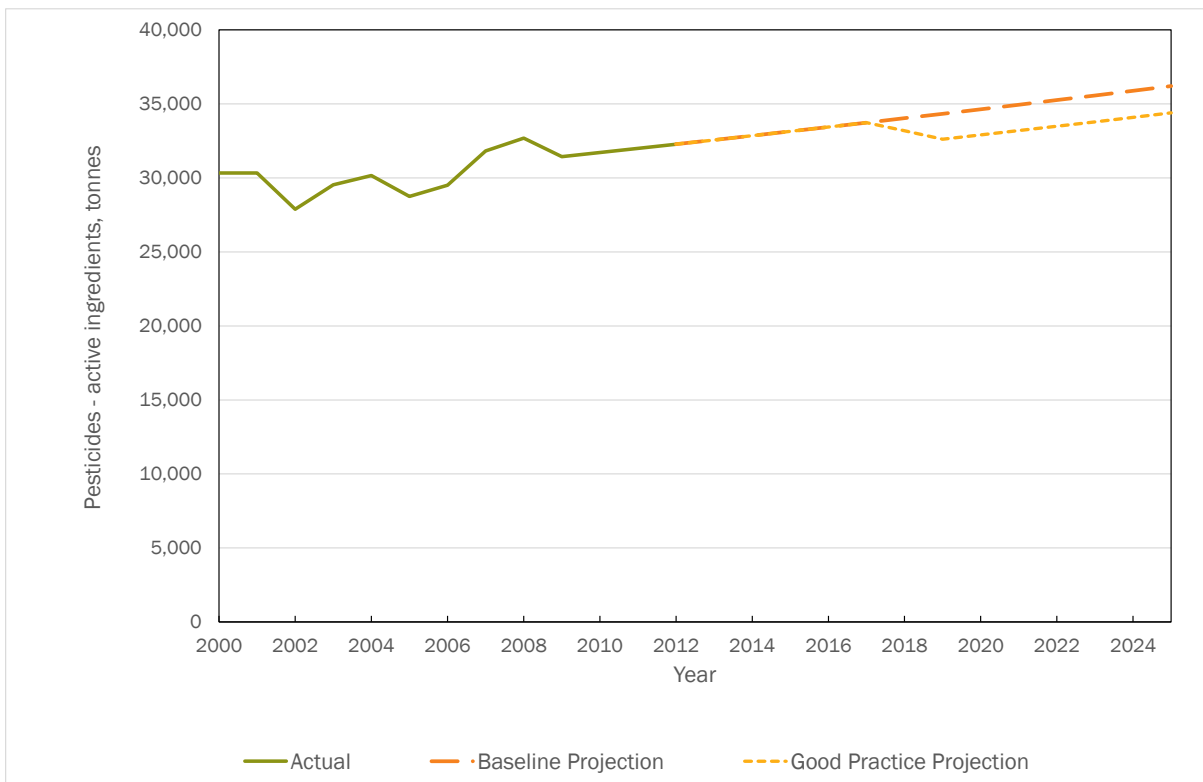


Figure 9-20: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes



Figure 9-21: Change in Aggregates Extraction, thousand tonnes

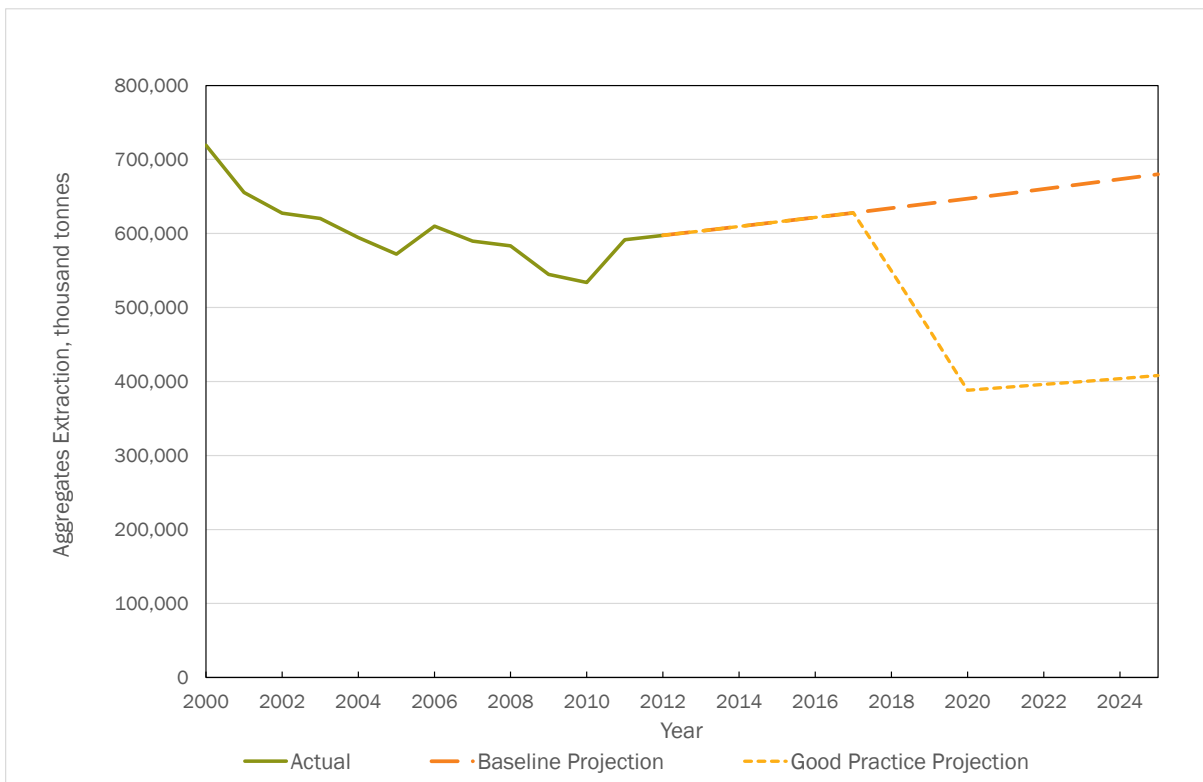


Figure 9-22: Change in Paper & Card Packaging Generation, thousand tonnes

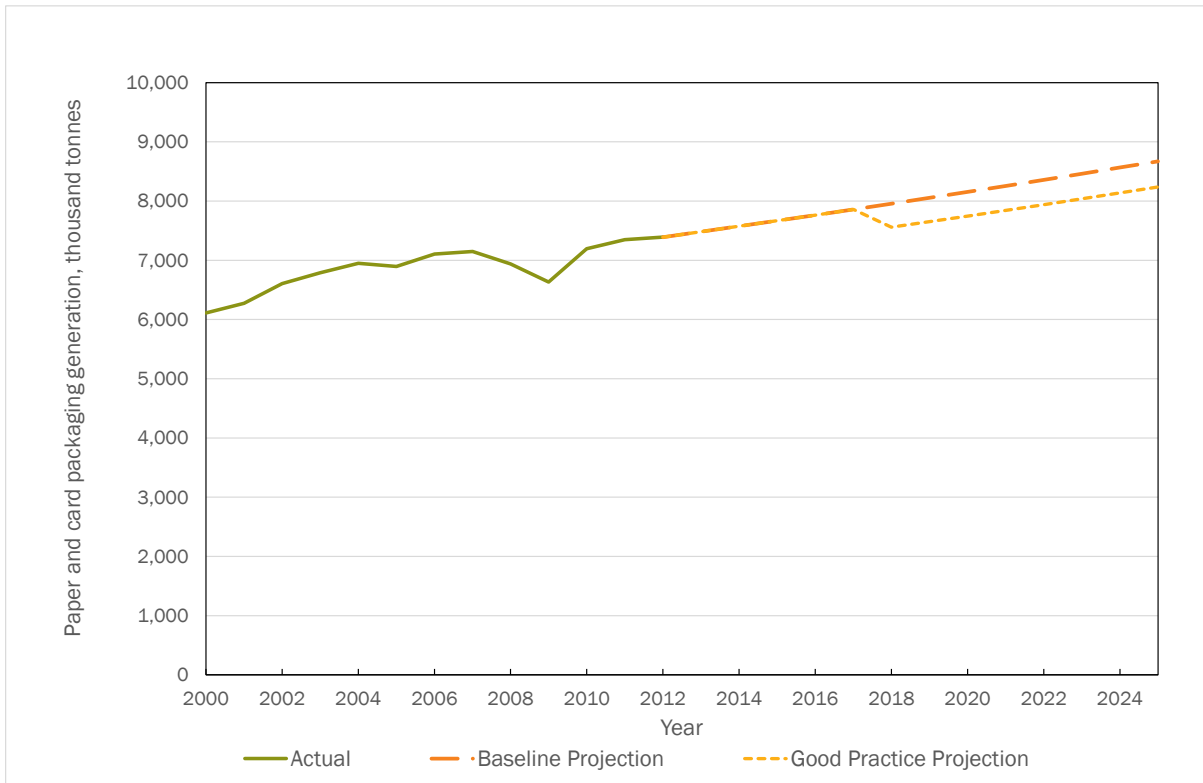


Figure 9-23: Change in Plastic Packaging Generation, thousand tonnes

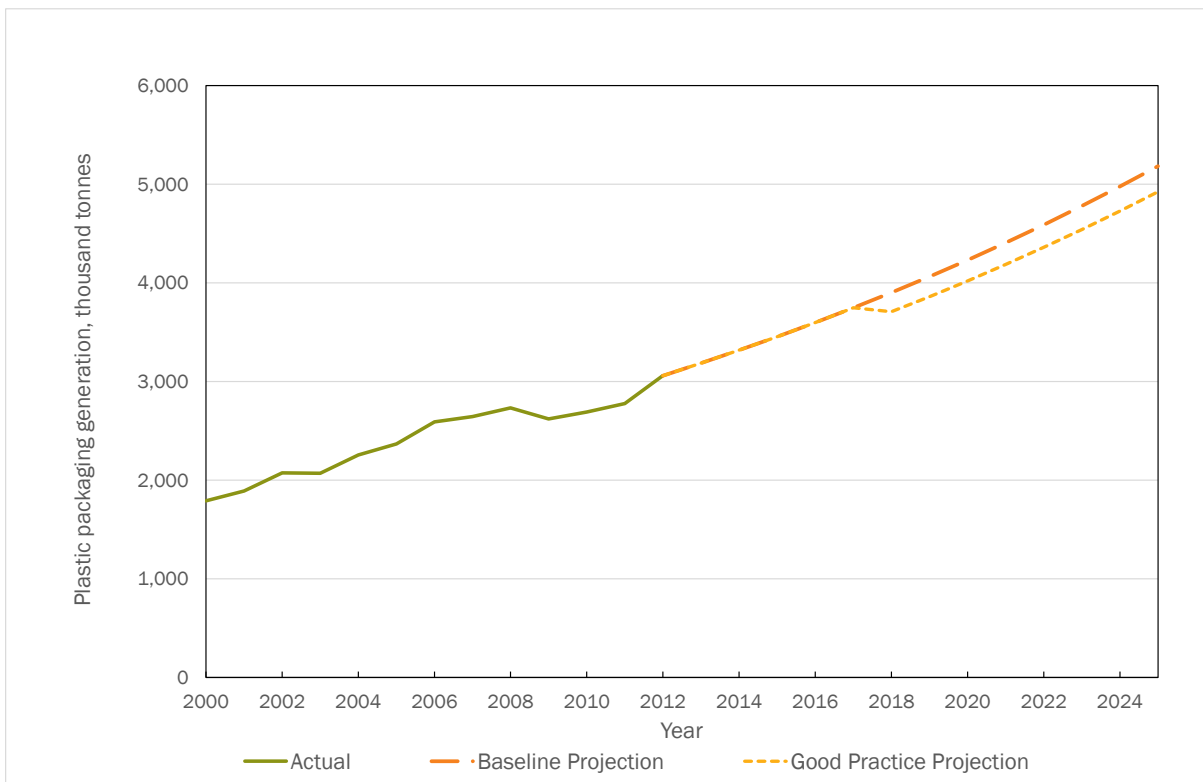


Figure 9-24: Change in Wood Packaging Generation, thousand tonnes

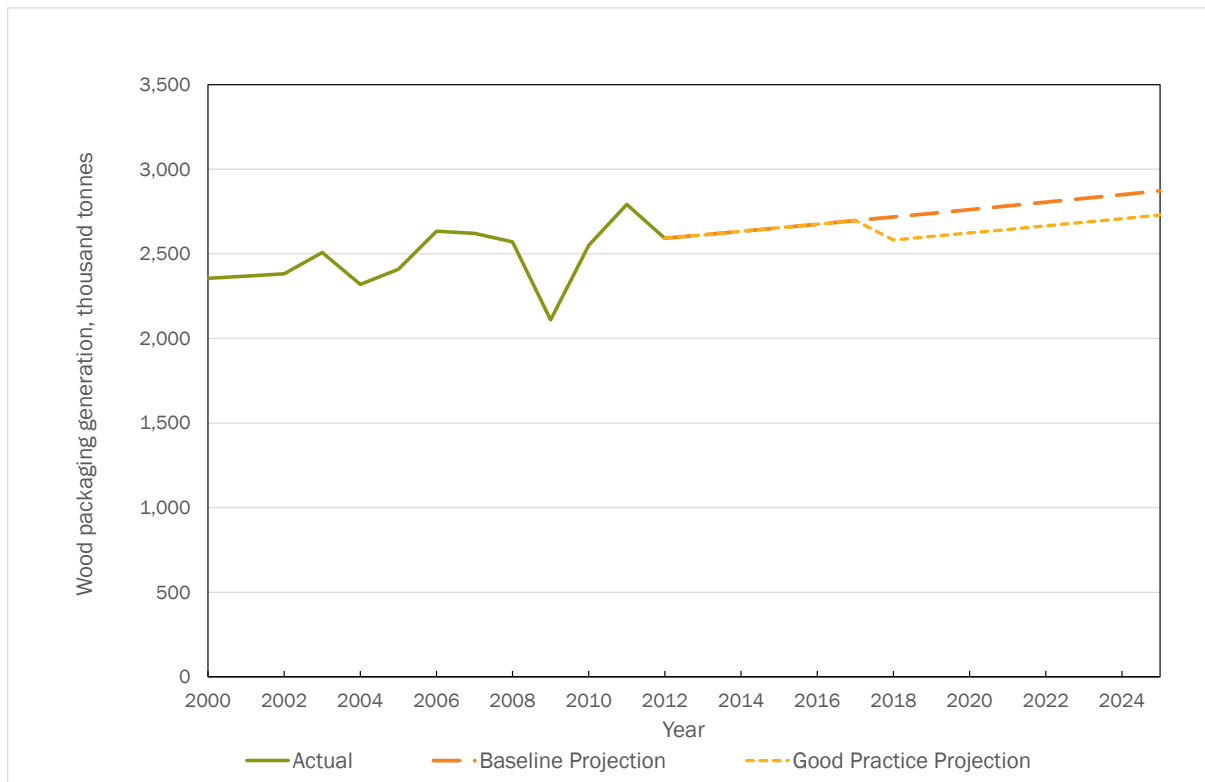


Figure 9-25: Change in Metal Packaging Generation, thousand tonnes

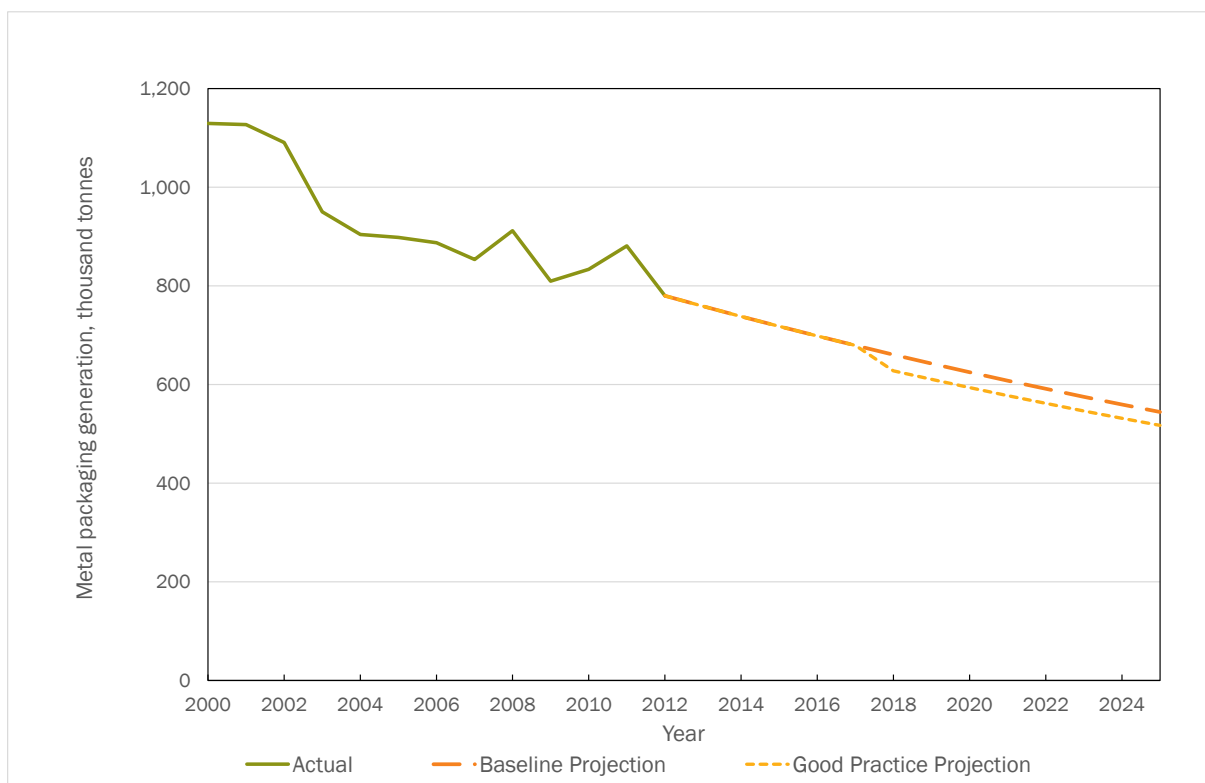


Figure 9-26: Change in Glass Packaging Generation, thousand tonnes

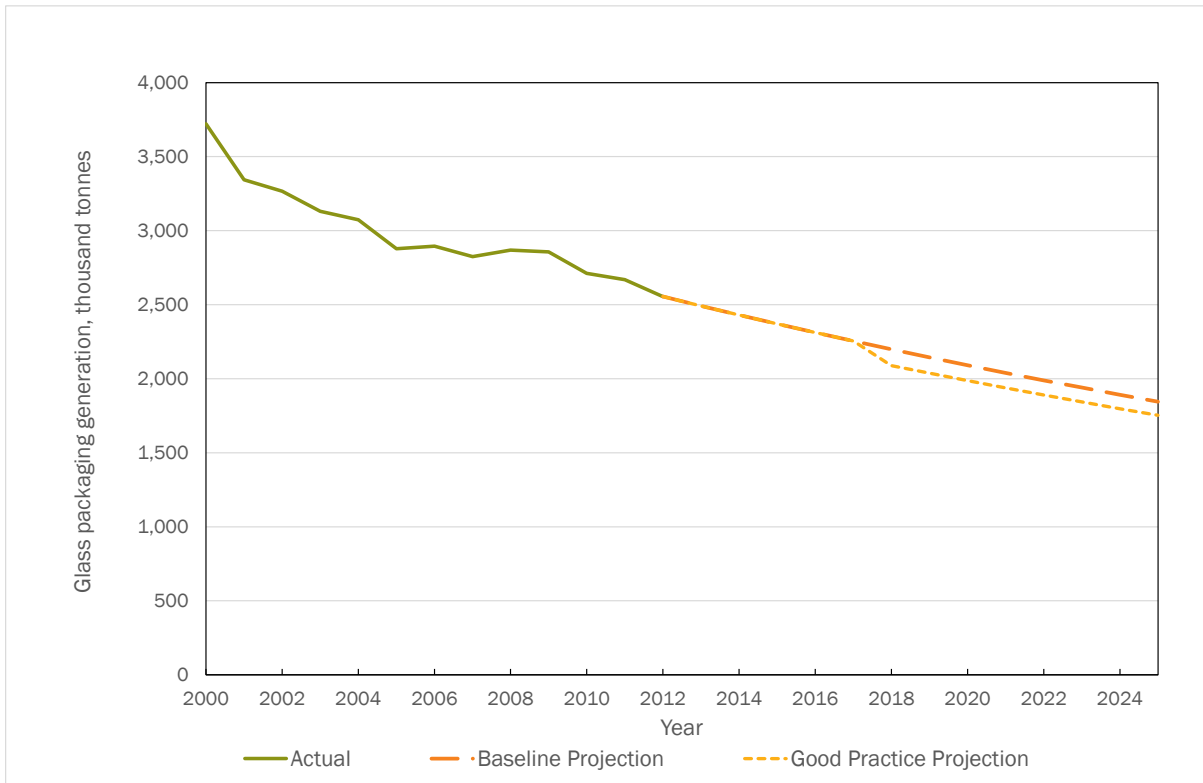
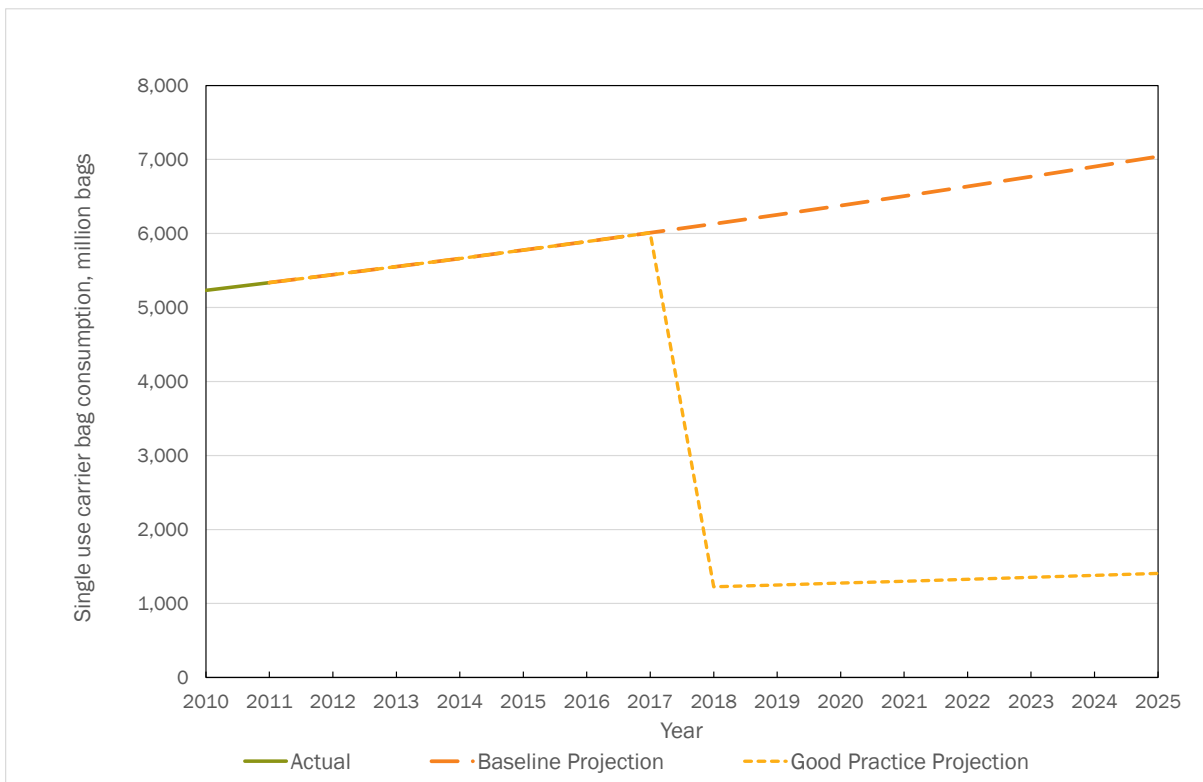


Figure 9-27: Change in Consumption of Single Use Carrier Bags, million bags



9.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 9-6: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	1,128	2,240	3,336	4,417	5,486	6,542	7,586	7,586	7,586
	C&I / Heating	0	0	231	454	671	884	1,092	1,296	1,497	1,497	1,497
	Electricity	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693	1,693
	Sub-total Energy, million EUR	1,693	1,693	3,052	4,387	5,700	6,994	8,271	9,531	10,777	10,777	10,777
	Sub-total Energy, % GDP	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.3%	0.3%	0.4%	0.4%	0.4%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	4,274	8,549	12,824	17,101	21,386	21,390	21,394	21,399	21,403
	Passenger Aviation Tax	0	0	2,387	4,559	4,474	4,390	4,306	4,222	4,138	4,053	3,969
	Freight Aviation Tax	0	0	2	4	4	4	4	3	3	3	3
	Sub-total Transport, million EUR	0	0	6,663	13,112	17,303	21,495	25,696	25,616	25,535	25,455	25,375
	Sub-total Transport, % GDP	0.0%	0.0%	0.2%	0.5%	0.6%	0.7%	0.9%	0.9%	0.9%	0.9%	0.9%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0
	Landfill Tax - Inerts (C&D)	0	3	6	8	7	5	5	5	5	5	5
	Incineration /MBT Tax	0	101	196	285	279	273	272	271	271	270	269

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	198	376	534	672	793	746	738	729	721	714
	Water Abstraction Tax	0	415	801	1,160	1,492	1,799	1,734	1,708	1,682	1,657	1,632
	Waste Water Tax	0	137	266	385	371	371	371	371	371	371	371
	Pesticides Tax	0	0	253	498	489	494	498	502	507	511	516
	Aggregates Tax	0	0	1,507	1,319	1,127	932	941	950	960	970	979
	Packaging Tax	0	0	530	513	523	533	543	554	566	578	591
	Single Use Bag Tax	0	615	627	128	130	133	136	138	141	144	147
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	1,469	4,562	4,829	5,091	5,332	5,246	5,239	5,233	5,228	5,224
	Sub-total Pollution & Resource, % GDP	0.0%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Total Revenue Stream	Total, million EUR	1,693	3,162	14,278	22,328	28,094	33,821	39,213	40,386	41,545	41,459	41,375
	Total, % GDP	0.1%	0.1%	0.5%	0.8%	1.0%	1.2%	1.4%	1.4%	1.4%	1.4%	1.4%

10.0 Greece

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

10.1 Energy Taxes

In Greece, there are two separate types of energy taxes:

1. Excise duties on mineral oil and other energy products; and
2. Two additional levies on electricity usage: Special Levy for the Reduction of GHGs (ETMEAP) and Special Duty 0.5%.

These taxes are outlined below.

- **The following excise duties on energy products apply. Unless otherwise noted, all information is sourced from the Excise Duty Tables:**³³⁴
 - Petrol:
 - Rate for leaded petrol (2014): €681 per 1,000 litres of fuel
 - Rate for unleaded petrol: rate (2014): €670 per 1,000 litres of fuel
 - Gas oil (diesel):
 - One rate applies whether the gas oil is used as a propellant, for industrial/commercial use or for heating (business and non-business use). The rate for 2014 is: €330 per 1,000 litres of fuel.
 - However, industrial use of gas oil in production activities is eligible for a refund of €125 per 1,000 litres and a refund of €264 per 1,000 litres is applied for gas oil used for agricultural purposes.
 - Up to 15th October 2012, reduced rates applied during the winter (15 October to 30 April). Following equalisation of the excise on gas oil for heating, with that used as propellant to €330 per 1,000 litres of fuel, a system of tax refunds which vary in accordance with income and geographical region (more in the north, less in the south) was introduced for households and a standard refund for farmers.
 - Bio-diesel is taxed at the same rate as gas oil.

³³⁴ European Commission - Taxation and Customs Union (2014) Excise Duty Tables: Part II - Energy Products and Electricity, July 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- Kerosene:
 - For kerosene the same rates apply as for gas oil, for all uses (2014): €330 per 1,000 litres of fuel.
 - The rate was increased from €200 per 1,000 litres in November 2012.
- Heavy fuel oil:
 - Heating for business and non-business use are taxed the same.
 - Rate (2014): €38 per 1,000 kg of fuel.
- Liquefied Petroleum Gas (LPG):
 - Rate for propellant use (2014): €330 per 1,000 kg of fuel.
 - Rate for industrial/commercial use (2014): €120 per 1,000 kg of fuel.
 - Rate for heating (business and non-business use)(2014): €60 per 1,000 kg of fuel.
 - A special rate of €0.29 per 1,000 litres is applied for LPG used in agriculture.³³⁵
- Natural Gas:
 - There is no tax on natural gas when used as a propellant. However, industrial/commercial use and use of natural gas for heating, both for business and non-business use is taxed.
 - Rate (2014): €1.50 per GJ.
 - This rate has remained the same since September 2011.
- Coal and Coke:
 - Both business and non-business use of coal and coke for heating is taxed at the same rate (2014): €0.30 per GJ.
 - When used for electricity production, mineralogical and metallurgical processes and for chemical reductions, an exemption on the excise duty on coal and coke is applied.
- Electricity:
 - There are several different tax rates for use of electricity in Greece, all of which have been in place since May 2010.
 - Rate for business use (high voltage)(2014): €2.50 per MWh.
 - Rate for business use (other)(2014): €5 per MWh.
 - Rate for non-business use (households)(2014): €2.20 per MWh

³³⁵ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Rate for non-business use (other)(2014): €5 per MWh
- Electricity of solar, wind, wave, tidal or geothermal origin is not subject to excise duties. Furthermore, electricity used in agriculture is also exempt.
- Other products:³³⁶
 - Aircraft petrol (2014): €697 per 1,000 litres
 - Benzol, tytolol, xylool, and other aromatic hydrocarbon mixtures (2014): €372 per 1,000 kg
 - White spirit (2014): €12 per 1,000 kg
 - Other light oils (2014): €12 per 1,000 litres
- Exemptions from all excise duties apply for the following:³³⁷
 - Energy products used by aircraft (except private leisure flights), sea transport vessels or vessels fishing within EU waters.
 - Diesel oil, kerosene, white spirit and other light oils used as raw material for production purposes.
- Revenue from all excise duties on mineral oil products in 2012 (the latest year for which figures are available): €3.97 billion (equivalent to 2.06% of GDP).³³⁸
- **Special Levy for the Reduction of GHGs ('Ειδικό Τέλος Μείωσης Εκπομπών Αερίων Ρύπων' (ETMEAP)):**
 - This was formerly known as the Renewable Energy Systems Levy and is a source of financing for the renewable energy special account which supports the installation of renewable energy systems.³³⁹
 - It is a levy charged on actual usage of electricity and is added to customer bills each month.
 - In December 2013, the Greek government decided to increase the levy by 97% on average to help close a large deficit in the Renewable Energy Sources special account, however this decision was revised in spring 2014 and the imposed increase on 1 April 2014 was restricted to an average of

³³⁶ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³³⁷ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³³⁸ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³³⁹ Ecologic Institute, and eclareon (2014) Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Greece, Report for European Commission - DG Clima, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/gr_2014_en.pdf

32%.^{340 341} The increase was required in order to cover the accumulated deficit of the Renewable Energy Sources Administrator, which has emerged as a result of the introduction of feed-in tariffs which were initially excessive, and which were, subsequently, drastically curtailed.

- The levy varies depending on the type of customer – after the increase on 1 April 2014, the average rate is of the levy is €19.73 per MWh, with domestic customers paying €26.30 per MWh.³⁴²
- Revenue: in 2012 (the latest year for which figures are available): €178 million (equivalent to 0.09% of GDP).³⁴³

➤ **Special Duty 0.5%:**³⁴⁴

- As with the previous levy, this is collected on all electricity bills.
- The rate for all types of electricity users is 0.5%. The basis of the calculation is the cost of the actual electricity usage plus the value of the excise duty (but excluding the value of the Special Levy for the Reduction of GHGs).
- Revenue: unknown.

10.2 Transport Taxes (Excluding Transport Fuels)

There are three types of transport taxes in Greece, excluding excise duties on transport fuels. These are a registration duty, a circulation duty and an additional annual ‘luxury tax’ imposed on large vehicles.

➤ **Motor vehicle registration duty (Τέλος ταξινόμησης οχημάτων):**³⁴⁵

- This is a one-off registration duty paid at the time of registration of a vehicle in Greece.
- The tax paid is a set percentage of the total wholesale price of the vehicle plus any insurance and transport costs. The percentage is determined by

³⁴⁰ Ecologic Institute, and eclareon (2014) Assessment of Climate Change Policies in the Context of the European Semester - Monthly Progress Update: 01 February - 30 February (Issue 11/2014), Report for European Commission - DG Clima, March 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/progress_201402_en.pdf

³⁴¹ Ecologic Institute, and eclareon (2014) Assessment of Climate Change Policies in the Context of the European Semester - Monthly Progress Update: 01 April - 30 April (Issue 13/2014), Report for European Commission - DG Clima, May 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/progress_201404_en.pdf

³⁴² Ibid.

³⁴³ Eurostat (2014) Revenue Data by Individual Tax (National Tax List), accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁴⁴ Public Power Corporation S.A.-Hellas (no date) Special Duty 5‰ (L. 2093/92), accessed 8 September 2014, <https://www.dei.gr/en/eidiko-telos-5-eidtel-5-n-209392>

³⁴⁵ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

the engine size and the emissions standard of the vehicle. For second-hand vehicles, the rates are reduced by a set percentage (ranging for cars from 8% to 95%), determined by the type, age and mileage of the vehicle.

- All electric vehicles and hybrid vehicles which comply with the European directives on emissions standards are exempt from the duty.
 - Additionally, vehicles used as ambulances, by people with disabilities and by certain faith-based organisations are also exempt.
 - Details of certain rates are included within Table 10-1. Full details of all rates are available on the TAX-UD database.³⁴⁶
 - Revenue in 2012 (the latest year for which figures are available): €100 million (equivalent to 0.05% of GDP).
- **Circulation duty on motor vehicles (Τέλη κυκλοφορίας):**³⁴⁷
- This is an annual duty paid on vehicles (including buses and lorries) and motorcycles.
 - The bases for the level of tax are the following:
 - Engine size for private cars registered up to 31 October 2010;
 - CO₂ emissions for private cars registered after 1 November 2010;
 - Engine size for motorcycles;
 - Gross weight for lorries; and
 - Number of passenger seats for buses.
 - Rates are outlined in Table 12-1 (for private use vehicles) and Table 10-3 (for public use vehicles).
 - Additionally the following rates apply:
 - For the use of provisional circulation license: €4 per day
 - For test drive circulation: motorcycles: €30 per annum and other vehicles: €150 per annum
 - Mopeds: €12 per annum
 - Exemptions related to emissions levels include:
 - Hybrid vehicles with engine sizes up to 1,929 cc
 - Electric vehicles registered up through 31 October 2010

³⁴⁶ European Commission (2014) Taxes in Europe Database – Motor Vehicles Tax: Car Registration Tax, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=216/1388754775&taxType=Other+indirect+tax

³⁴⁷ European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Private vehicles registered after 31st October 2010, with CO₂ emissions below 100 g per km.
 - Other exemptions include the following: state owned vehicles, diplomatic vehicles, vehicles belonging to specific non-profit institutions, vehicles for some people with disabilities.
 - The duty in its present form has been in place since 2011. Prior to this, the duty was based on the vehicle's engine capacity alone.³⁴⁸
 - Revenue in 2012 (the latest year for which figures are available): €1.21 billion (equivalent to 0.63% of GDP). This tax revenue can be further split according to the tax-payer: €817 million from individuals and €397 million for businesses.³⁴⁹
- **Tax on Luxurious Living (Φόρο Πολυτελούς Διαβίωσης):**
- An annual 'luxury tax' is imposed on owners of swimming pools, aircraft and vehicles with engines larger than 1,929 cc.³⁵⁰
 - The tax was initially imposed for one year in 2011 before being implemented as an annual tax in 2013.³⁵¹
 - The rate is flat-rate, based on the engine size and the age of the vehicle and ranges from just under €300 to over €5,000 per year. For vehicles with engine capacities of 1,929 – 2,500 cc, the rate is set at 5% of the presumed value of the vehicle; vehicles with engines larger than 2,500 cc are taxed at 10% of the presumed value of the vehicle. Details of rates are included within Table 10-4.³⁵²
 - Vehicles with engines smaller than 1,929 cc as well as vehicles more than 10 years old are exempt from the tax.³⁵³
 - The rate for aircraft is 10% of the presumed value.³⁵⁴

³⁴⁸ Ministry of Environment, Energy and Climate Change (Hellenic Republic) (2010) Fifth National Communication to the United Nations Framework Convention on Climate Change, January 2010, http://unfccc.int/resource/docs/natc/grc_nc5.pdf, p. 127

³⁴⁹ Eurostat (2014) Revenue Data by Individual Tax (National Tax List), accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁵⁰ Greek Reporter (2014) Rich Greeks Face Luxury Tax, accessed 28 August 2014, <http://greece.greekreporter.com/2013/09/13/rich-greeks-face-luxury-tax/>

³⁵¹ Ibid.

³⁵² TO BHMA (Tovima) (2013) Έρχονται τα σημειώματα του φόρου πολυτελείας για ΙΧ άνω των 1.929 κ.εκ., accessed 28 August 2014, <http://www.tovima.gr/finance/article/?aid=542754>

³⁵³ Ibid.

³⁵⁴ Greek Reporter (2014) Rich Greeks Face Luxury Tax, accessed 28 August 2014, <http://greece.greekreporter.com/2013/09/13/rich-greeks-face-luxury-tax/>

- The revenue generated by this tax is unknown but in 2013, the tax was expected to generate between €100 million and €130 million (0.05% to 0.07% of GDP).³⁵⁵
- **Air passenger tax ('spatosimo'):**³⁵⁶
 - This tax has been in place since 1992 and was implemented under Law 2065/1992 Government Gazette No 113. The tax is charged on all passengers flying into or out of Greek airports.
 - Revenues are used to modernise Greek airports.
 - Current tax rates are €12 per passenger for flights between 100 km and 750 km and €24 for flights above 750 km. These rates are higher than the original tax rates of €10 per passenger and €20 per passenger, respectively.
 - Proposals have been tabled to reduce the tax from October 2014.
 - There is no air freight tax in Greece.
 - Revenue: unknown.
- In addition, although not taxes, there are road tolls in place in many parts of Greece. These are levied for motorways and some tunnels and bridges. Per stretch of road or bridge, they range from €2 to €3 for several stretches of motorways to €13.20 for the Rio-Antirio Bridge.^{357,358}

Table 10-1: Vehicle Registration Tax Rate (Percentage of Wholesale Price) (Greece, 2014)

Passenger Cars, Based on the Environmental Class of the Vehicle ¹				
Engine Capacity (cc)	Euro Class V	Euro Class IV	Euro Class III, II, I	Conventional Technology
Up to 900	5%	14%	24%	37%
901 – 1,400	12%	27%	49%	66%
1,401 – 1,600	20%	45%	95%	128%
1,601 – 1,800	30%	56%	129%	148%

³⁵⁵ TO BHMA (Tovima) (2013) Έρχονται τα σημειώματα του φόρου πολυτελείας για ΙΧ άνω των 1.929 κ.εκ., accessed 28 August 2014, <http://www.tovima.gr/finance/article/?aid=542754>

³⁵⁶ GTP Headlines (2014) Greece's 'Spatosimo' Air Passenger Tax to be Revised, accessed 31 August 2014, <http://news.gtp.gr/2014/04/29/greeces-spatosimo-air-passenger-tax-revised/>

³⁵⁷ Rhino Car Hire (2013) Greek Toll Roads - A Guide to Toll Roads in Greece, accessed 8 September 2014, <http://www.rhinocarhire.com/Car-Hire-Blog/November-2013/Greek-Toll-Roads.aspx>

³⁵⁸ The AA (no date) European Tolls: Search Results for Greece, accessed 8 September 2014, http://www.theaa.com/allaboutcars/overseas/european_tolls_results.jsp?country=Greece

1,801 – 2,000	40%	83%	216%	266%
2,001 and above	50%	142%	334%	346%
Lorries and Trucks ²				
Engine Capacity (cc)	Closed Lorries (weight up to 3.5 tonnes)	Open Lorries (weight up to 3.5 tonnes)	All other Lorries (weight over 3.5 tonnes)	
Up to 900	6%	7%	5%	
901 – 1,400	14%			
1,401 – 1,800	18%			
1,801 – 2,000	21%			
2,001 and above	26%			
Motorcycles				
Engine Capacity (cc)	All Classes			
Up to 125	0%			
126 – 249	2%			
250 – 900	7%			
901 – 1,400	12%			
1,401 – 1,600	14%			
1,601 – 1,800	17%			
1,801 and above	25%			
Notes:				
1. Caravans pay 50% of the passenger car rates.				
2. Rates given for lorries are applicable to vehicles which meet the relevant European vehicle emissions directives. The tax rate is increased by 30% for those that do not meet the emissions directives.				

Source: European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Table 10-2: Motor Vehicle Road Tax, Private Use Vehicles (Greece, 2014)

Passenger Vehicles and Motorcycles Registered before or on 31 October 2010		
Category	Engine Size (cc)	Annual Tax
A	Up to 300	€22
B	301 – 785	€55

C	786 – 1,071	€120
D	1,072 – 1,357	€135
E	1,358 – 1,548	€240
F	1,549 – 1,738	€265
G	1,739 – 1,928	€300
H	1,929 – 2,357	€660
I	2,358 – 3,000	€880
J	3,001 – 4,000	€1,100
K	4,001 and above	€1,320
Passenger Vehicles and Motorcycles Registered on or after 1 November 2010		
CO₂ Emissions (g per km)		Annual Tax
0 – 100		€0 per g CO ₂
101 – 120		€0.90 per g CO ₂
121 – 140		€1.10 per g CO ₂
141 – 160		€1.70 per g CO ₂
161 – 180		€2.25 per g CO ₂
181 – 200		€2.55 per g CO ₂
201 – 250		€2.80 per g CO ₂
251 and above		€3.40 per g CO ₂
Lorries		
Category	Gross Weight (kg)	Annual Tax
A	Up to 1,500	€75
B	1,501 – 3,500	€105
C	3,501 – 10,000	€300
D	10,001 – 20,000	€600
E	20,001 – 30,000	€940
F	30,001 – 40,000	€1,320
G	40,001 and above	€1,490

Truck trailers	N/A	€300
Buses		
Category	Number of Seats	Annual Tax
A	Up to 33	€210
B	34 - 50	€410
C	51 and above	€510
Notes:		
<ol style="list-style-type: none"> 1. Vehicles not falling within the above classifications pay €535 per annum. 2. Ambulances and vehicles for funeral transport pay €300 per annum. 3. Passenger trailers and semi-trailers are taxed at €140 per annum. 4. Hybrid, electric and hydrogen cars registered before or on 31 October 2010 and with an engine size smaller than 1,929 cc do not pay motor vehicle tax. Those with an engine size greater than 1,929 cc pay 50% of the rates listed above. 		

Source: European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Table 10-3: Motor Vehicle Road Tax, Public Use Vehicles (Greece, 2014)

Taxis Registered on or after 1 November 2010		
CO ₂ Emissions (g/km)	Annual Tax	
0 - 100	€0 per g CO ₂	
101 - 150	€2.25 per g CO ₂	
151 and above	€2.80 per g CO ₂	
Lorries		
Category	Gross Weight (kg)	Annual Tax
A	Up to 3,500	€125
B	3,501 - 10,000	€195
C	10,001 - 19,000	€340
D	19,001 - 26,000	€495
E	26,001 - 33,000	€620
F	33,001 - 40,000	€925
G	40,001 and above	€1,460
Truck trailers	N/A	€300

Buses		
Category	Number of Seats	Annual Tax
Provincial/Urban A	Up to 50	€210
Provincial/Urban B	51 and above	€385
Inter-city A	Up to 50	€215
Inter-city B	51 and above	€300
Tourist coaches	Up to 40 (sitting)	€430
Tourist coaches	41 and above (sitting)	€595

Notes:

1. Taxis registered before 1 November 2010 pay €290 per annum.
2. Foreign lorries pay €100 for each trip

Source: European Commission (2014) Taxes in Europe Database, Accessed 14 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Table 10-4: Luxury Tax on Vehicles, Based on Vehicle Age and Size (Greece, 2014)

Engine Capacity (cc)	Less than 5 Years Old	5 - 10 Years Old
1,929 - 1,999	€418.70	€293
2,000 - 2,099	€440	€308
2,100 - 2,199	€485	€340
2,200 - 2,299	€530	€371
2,300 - 2,399	€575	€402
2,400 - 2,499	€620	€434
2,500 - 2,599	€665	€465
2,600 - 2,799	€1,420	€994
2,800 - 2,999	€1,600	€1,120
3,000 - 3,199	€1,780	€1,246
3,200 - 3,399	€2,020	€1,414
3,400 - 3,599	€2,260	€1,582
3,600 - 3,799	€2,500	€1,750
3,800 - 3,999	€2,740	€1,918

Engine Capacity (cc)	Less than 5 Years Old	5 – 10 Years Old
4,000 – 4,199	€2,980	€2,086
4,200 – 4,399	€3,220	€2,254
4,400 – 4,599	€3,460	€2,422
4,600 – 4,799	€3,700	€2,590
4,800 – 4,999	€3,940	€2,758
5,000 – 5,199	€4,180	€2,926
5,200 – 5,399	€4,420	€3,094
5,400 – 5,599	€4,660	€3,260
5,600 – 5,799	€4,900	€3,430
5,800 – 5,999	€5,140	€3,598
6,000 and above	€5,380	€3,766

Source: TO BHMA (Tovima) (2013) Έρχονται τα σημειώματα του φόρου πολυτελείας για ΙΧ άνω των 1.929 κ.εκ., accessed 28 August 2014, <http://www.tovima.gr/finance/article/?aid=542754>

10.3 Pollution and Resource Taxes

➤ Landfill Tax:³⁵⁹

- A landfill tax was included within the new framework Law 4042/2012 on waste management which transposes the Waste Framework Directive 98/2008/EC and the Directive 99/2008/EC. Translated, the title of law 4042/2012 is as follows: “The protection of the environment through Criminal Law – Compliance with Directive 2008/99/EC; Framework for waste generation and management – Compliance with Directive 2008/98/EC”.
- The tax was due to be implemented as of 1 January 2014.
- The landfill tax rate for 2014 is €35 per tonne, with planned increases of €5 per tonne per year to €60 per tonne by 2019.
- The tax is paid by organisations or companies disposing the following wastes into landfill without pre-treatment:
 - Biodegradable kitchen and canteen waste (EWC code 20 01 08);
 - Biodegradable waste (EWC code 20 02 01);

³⁵⁹ BiPRO, Arcadis, and Enviroplan (2012) Support to Member States in Improving Waste Management Based on Assessment of Member States' Performance - Country Factsheet for Greece, Report for European Commission - DG Environment, 2012, http://ec.europa.eu/environment/waste/framework/pdf/Final%20Report%20_130507.pdf

- Soil and stones (EWC code 20 02 02);
 - Mixed municipal (EWC code 20 03 01);
 - Waste from markets (EWC code 20 03 02);
 - Bulky waste (EWC code 20 03 07);
 - Concrete, bricks, tiles and ceramics (EWC code 17 01);
 - Wood, glass and plastic (EWC code 17 02);
 - Bituminous mixtures other than those containing coal tar (EWC code 17 03 02);
 - Soil and stones other than those containing dangerous substances (EWC code 17 05 04);
 - Dredging spoil other than those containing dangerous substances (EWC code 17 05 06); and
 - Mixed construction & demolition waste other than those containing various dangerous substances (EWC code 17 09 04).
- Revenue: unknown as the tax has only been in force since January 2014.

➤ **Water Charges:**

- Water charges in Greece are set by individual utility companies, the majority of which are public, though a few are partly privatised. Irrigation charges are set by users' associations at nominal levels. Prices vary relatively widely across regions but appear to have risen in recent years. In 2008, the prices for irrigation water ranged from €0.011 per m³ to €0.1 per m³, while in 2012 the range was €0.054 per m³ to €0.338 per m³.^{360,361} The average price of water in 2008 was reported to be €0.0243 per m³ for irrigation and €0.2911 per m³ for all uses.³⁶²
- Charges are made up of a standing charge which is based on the diameter of the pipe connecting the user to the supplier and a progressive volumetric rate based on consumption.³⁶³ Although required by the Water Framework Directive as of 2010, tariffs are not set high enough to ensure full cost recovery. It does appear that the level of cost recovery is increasing, however, with cost recovery in the mid-2000s reported to be around 55% for all users (59.5% for domestic customers and 36.5% for

³⁶⁰ See Table 7 in Garrido, A., and Calatrava, J. (2010) Agricultural Water Pricing: EU and Mexico, Report for OECD, 2010, <http://www.oecd.org/eu/45015101.pdf>, p.27

³⁶¹ IEEP (2013) Steps to Greening Country Report: Greece, Report for the European Commission, pp.4-5

³⁶² See Table 7 in Garrido, A., and Calatrava, J. (2010) Agricultural Water Pricing: EU and Mexico, Report for OECD, 2010, <http://www.oecd.org/eu/45015101.pdf>, p.27

³⁶³ Ministry of Environment, Energy and Climate Change (Hellenic Republic) (2014) Sixth National Communication and First Biennial Report Under the United Nations Framework Convention on Climate Change, January 2014, https://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6_greece%5b1%5d.pdf, p. 269

irrigation).³⁶⁴ In 2008, reported levels of cost recovery had increased to 64% overall (65% for domestic and industrial uses and 54% for irrigation).³⁶⁵

- The Special Secretariat for Water,³⁶⁶ which sits under the Ministry of Environment, Energy and Climate Change, is “developing a new regulatory framework for the pricing of water and sewerage services in Greece across the entire value chain, from ‘Catchment to tap’.”³⁶⁷ This includes setting out water pricing and tariff regulation that will ensure full cost recovery. The time scales for the completion of this framework are not known.
- It seems that there may be additional pollution taxes in Greece: Eurostat’s National Tax List data annex lists a pollution tax with the code D29FA and revenues from 2011 and 2012 amounting to €115 million and €54 million, respectively. It is unknown what this tax is and it was not possible to clarify this during the course of the study.³⁶⁸

10.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 10-5: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	4,021	3,884	-136
Petrol	million litres	3,109	3,109	0
Kerosene	million litres	931	931	0
LPG	thousand tonnes	306	297	-9
Heavy Fuel Oil	thousand tonnes	176	172	-3
Natural Gas	TJ (GCV)	31,673	31,673	0
Coal	thousand tonnes	2,044	2,033	-11

³⁶⁴ See Table 3.5 in OECD (2009) OECD Environmental Performance Reviews: Greece, 2009, 82.

³⁶⁵ See Table 7 in Garrido, A., and Calatrava, J. (2010) Agricultural Water Pricing: EU and Mexico, Report for OECD, 2010, <http://www.oecd.org/eu/45015101.pdf>, p.27

³⁶⁶ See <http://www.ypeka.gr/Default.aspx?tabid=246&locale=en-US&language=el-GR>

³⁶⁷ Special Secretariat for Water, Ministry of Environment, Energy and Climate Change (Greece) Regulating Urban Water and Sewerage Tariffs: Guiding Principles and General Approach, <http://www.ypeka.gr/LinkClick.aspx?fileticket=4I0g4UMdYxU%3D&tabid=248&language=el-GR>

³⁶⁸ Eurostat (2014) Revenue Data by Individual Tax (National Tax List), accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

Fuel Type	Units	Baseline	After Tax Increase	Change
Electricity	GWh	41,132	41,126	-6

Figure 10-1: Change in Internal Passenger Flights, flights per year

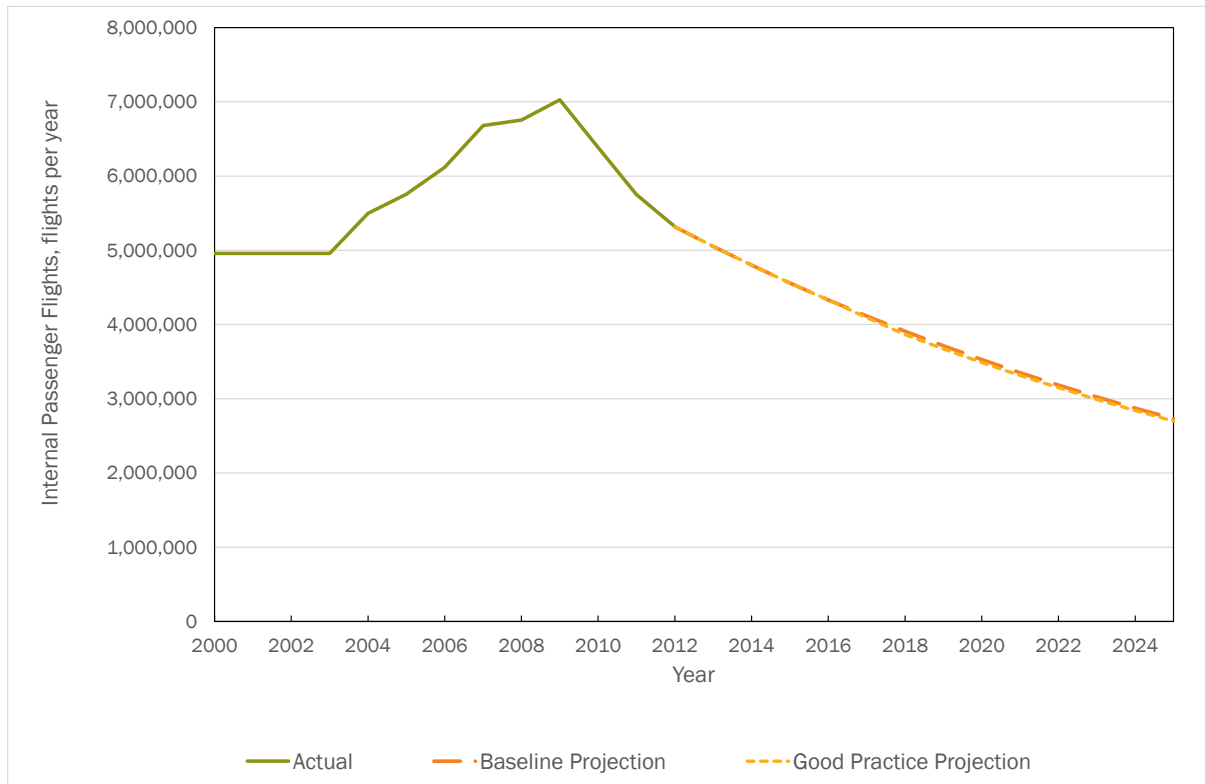


Figure 10-2: Change in Intra-EU Passenger Flights, flights per year

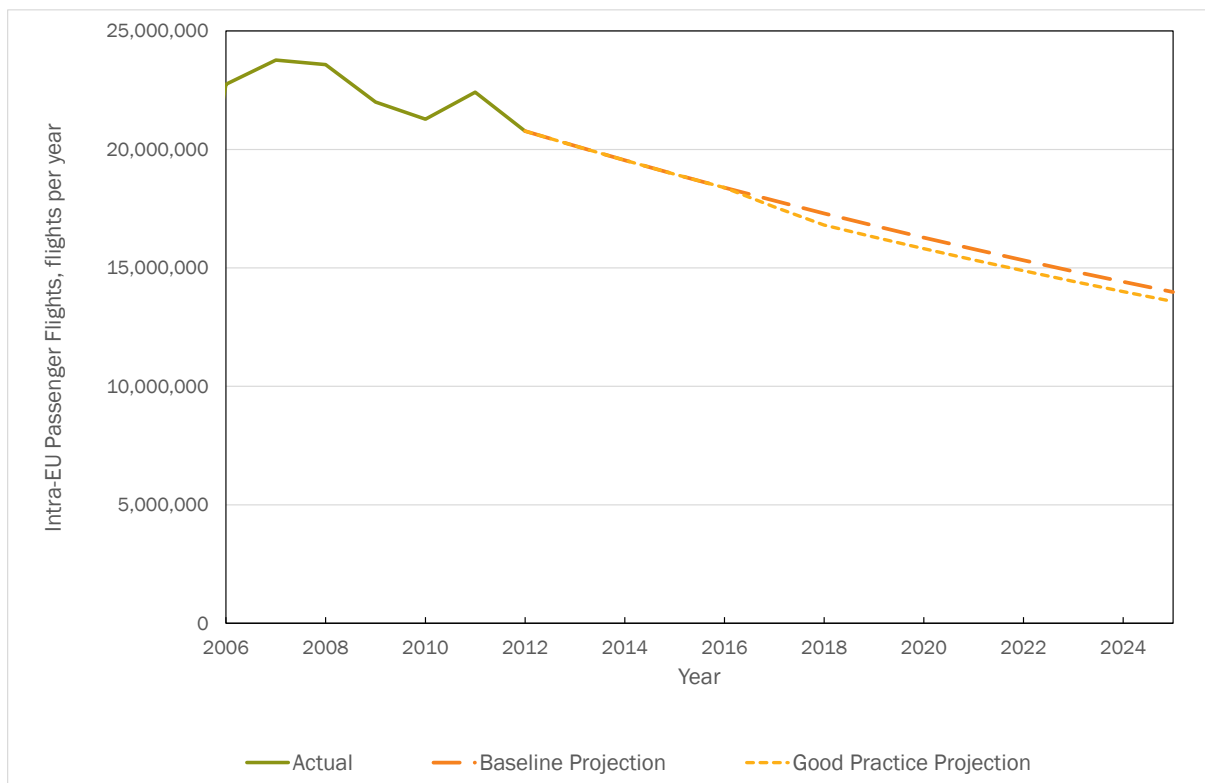


Figure 10-3: Change in Extra-EU Passenger Flights, flights per year

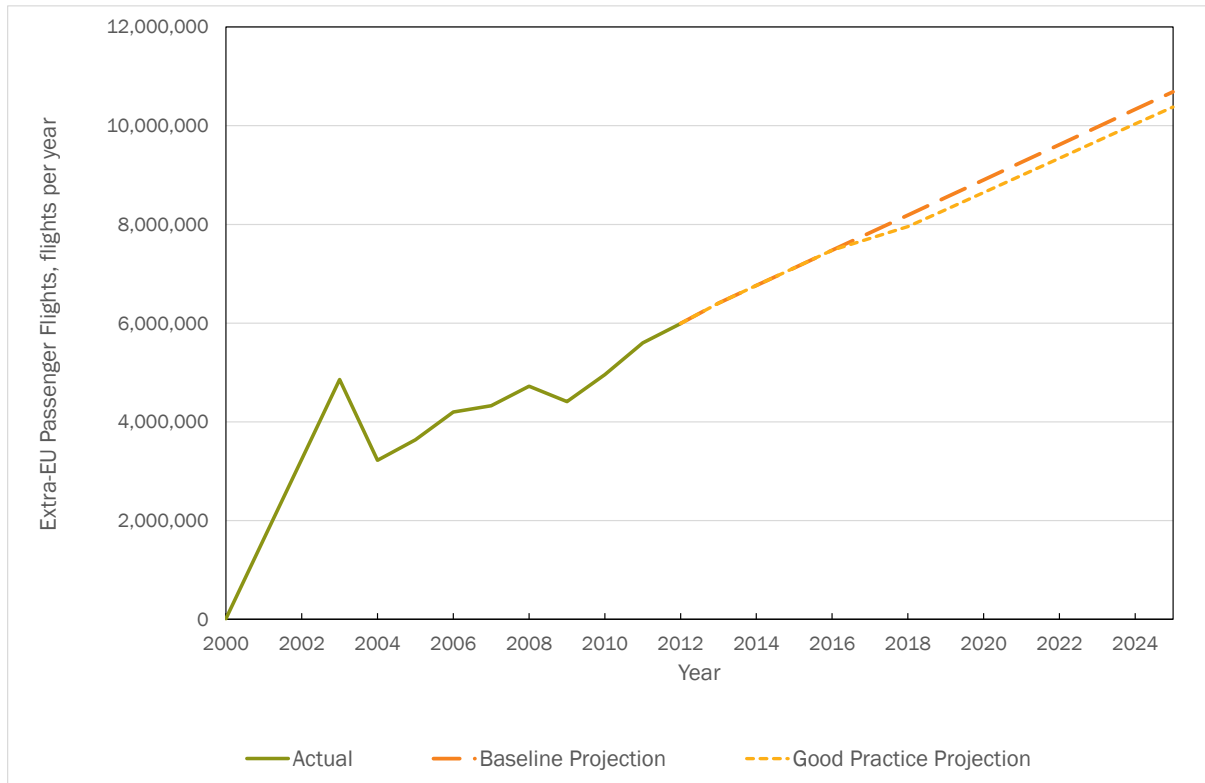


Figure 10-4: Change in Internal Air-freight, tonnes

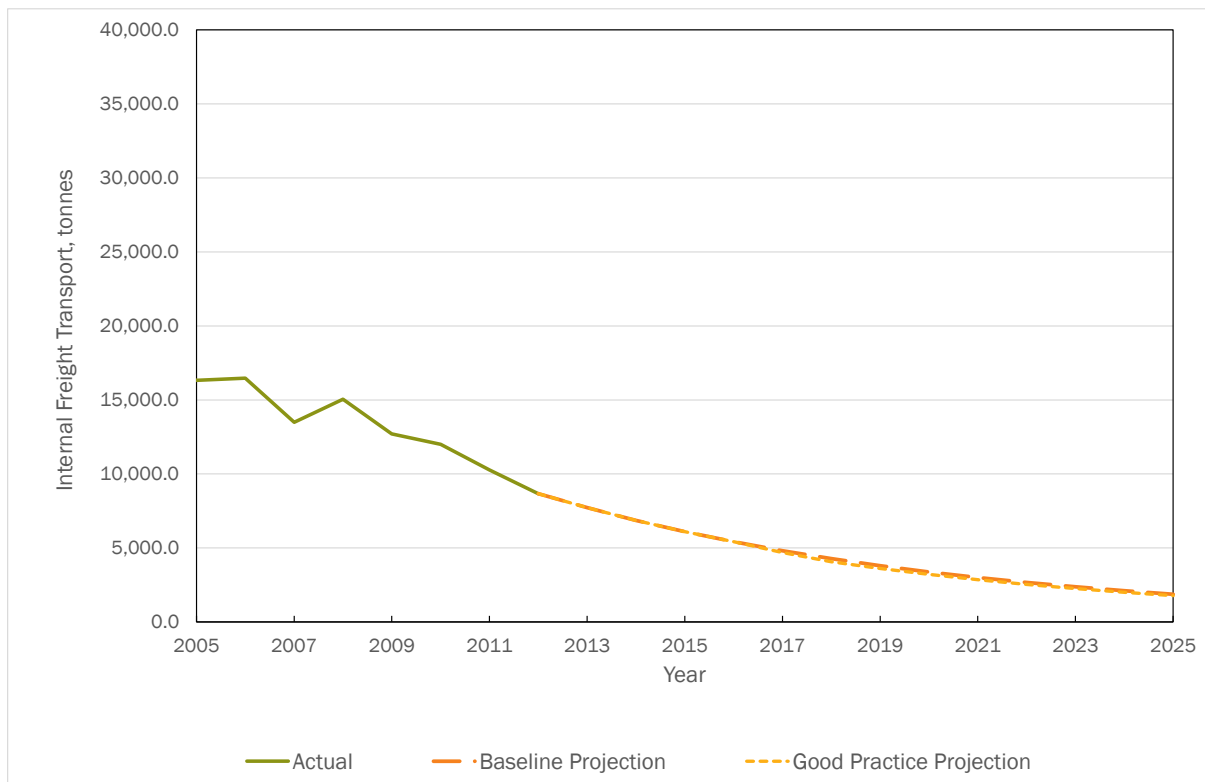


Figure 10-5: Change in Intra-EU Air-freight, tonnes

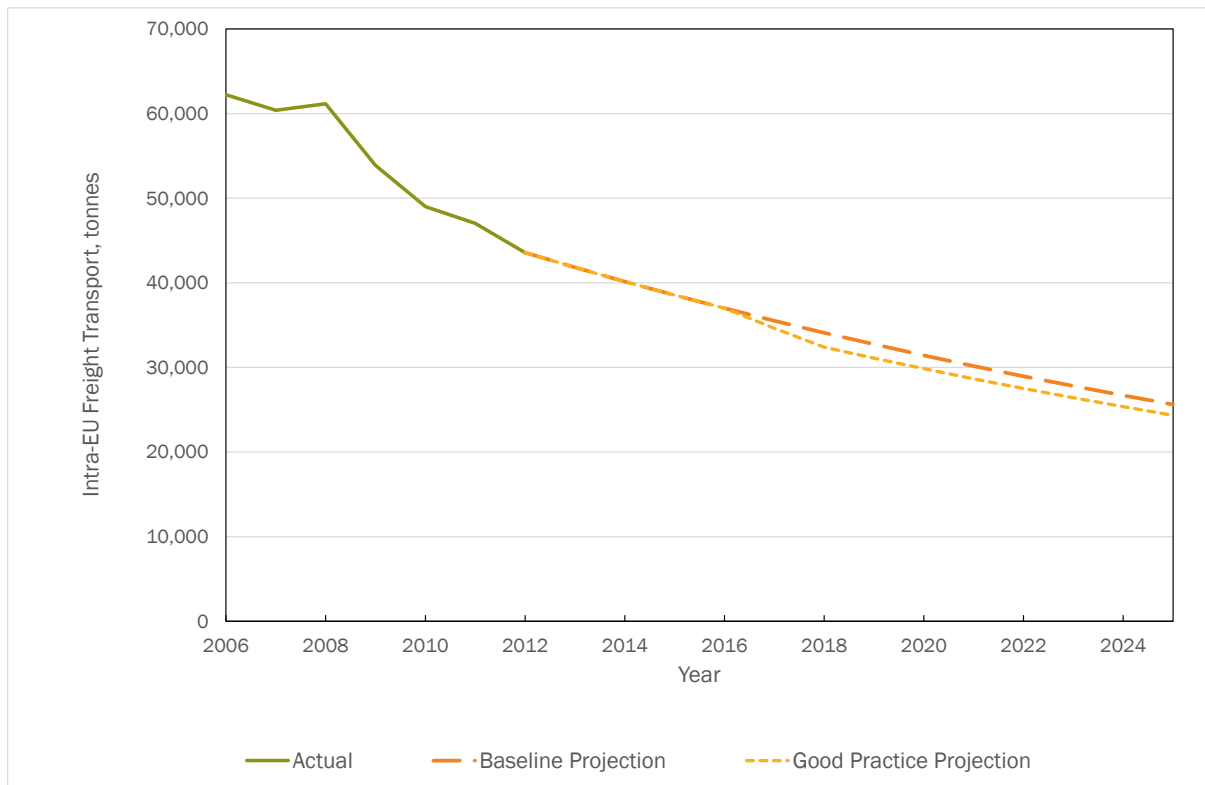


Figure 10-6: Change in Extra-EU Air-freight, tonnes

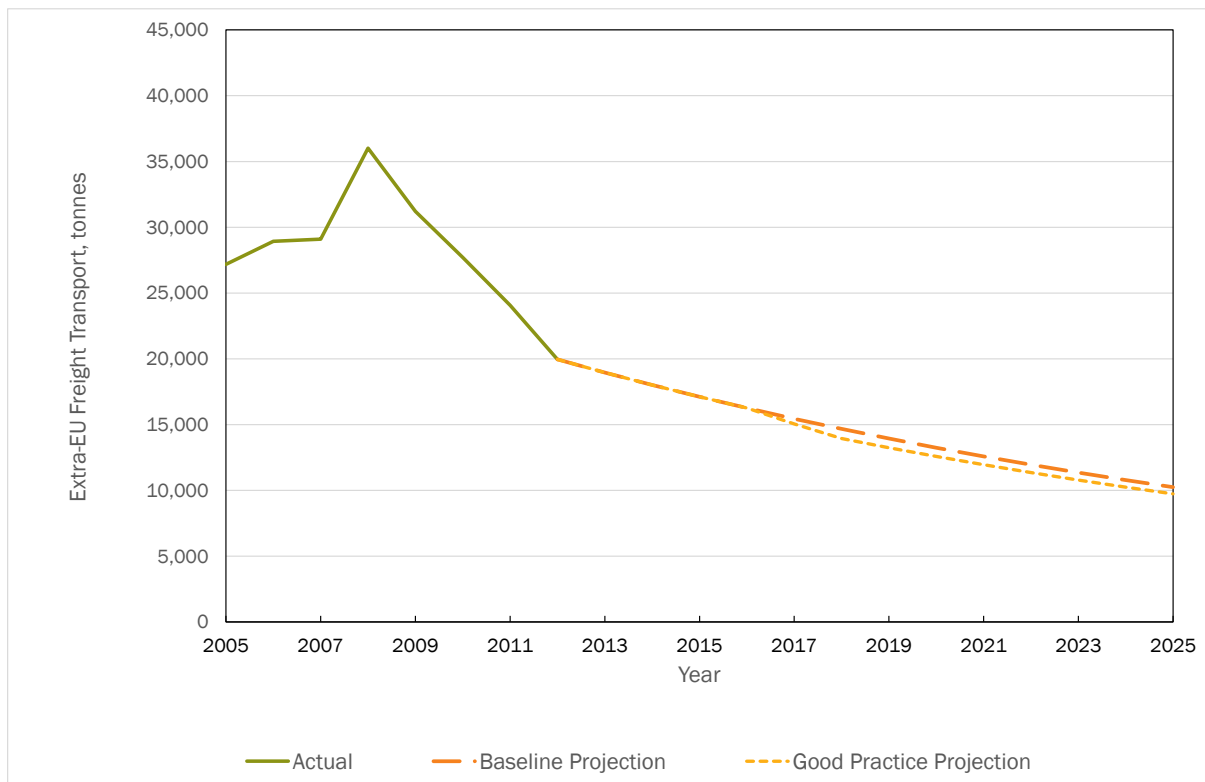


Figure 10-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

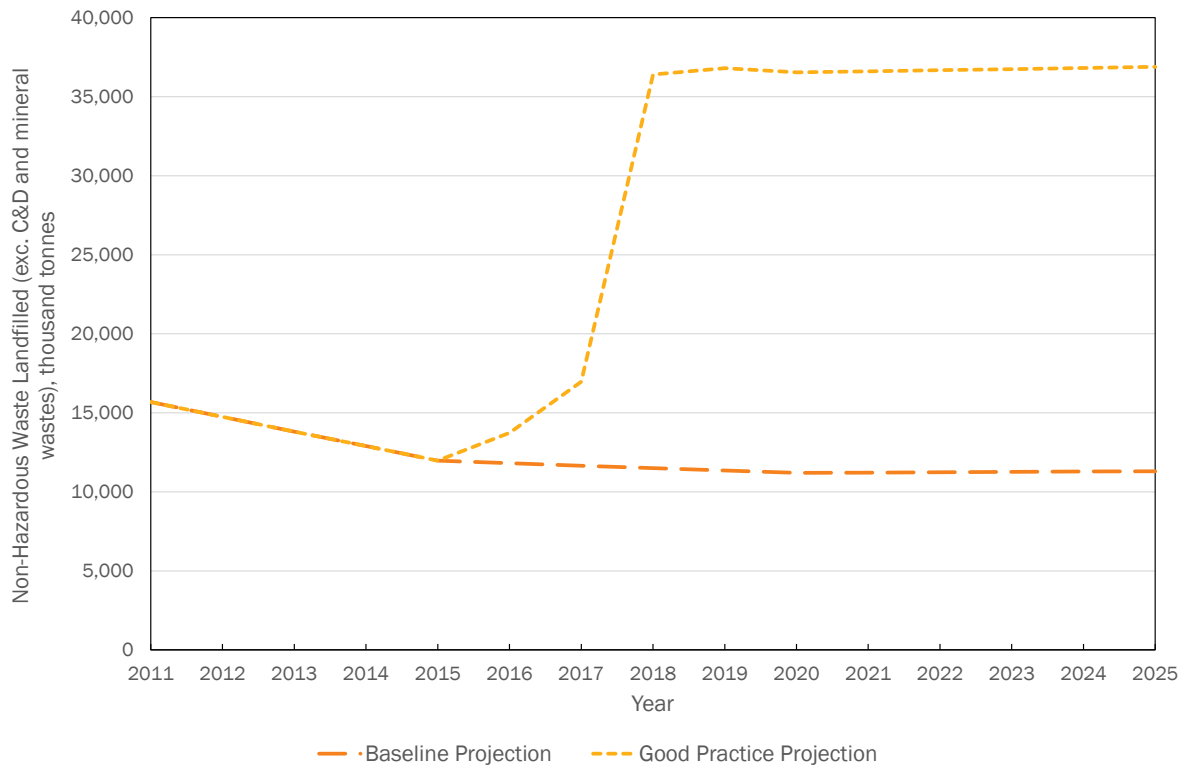


Figure 10-8: Change in MBT/ Incineration, thousand tonnes

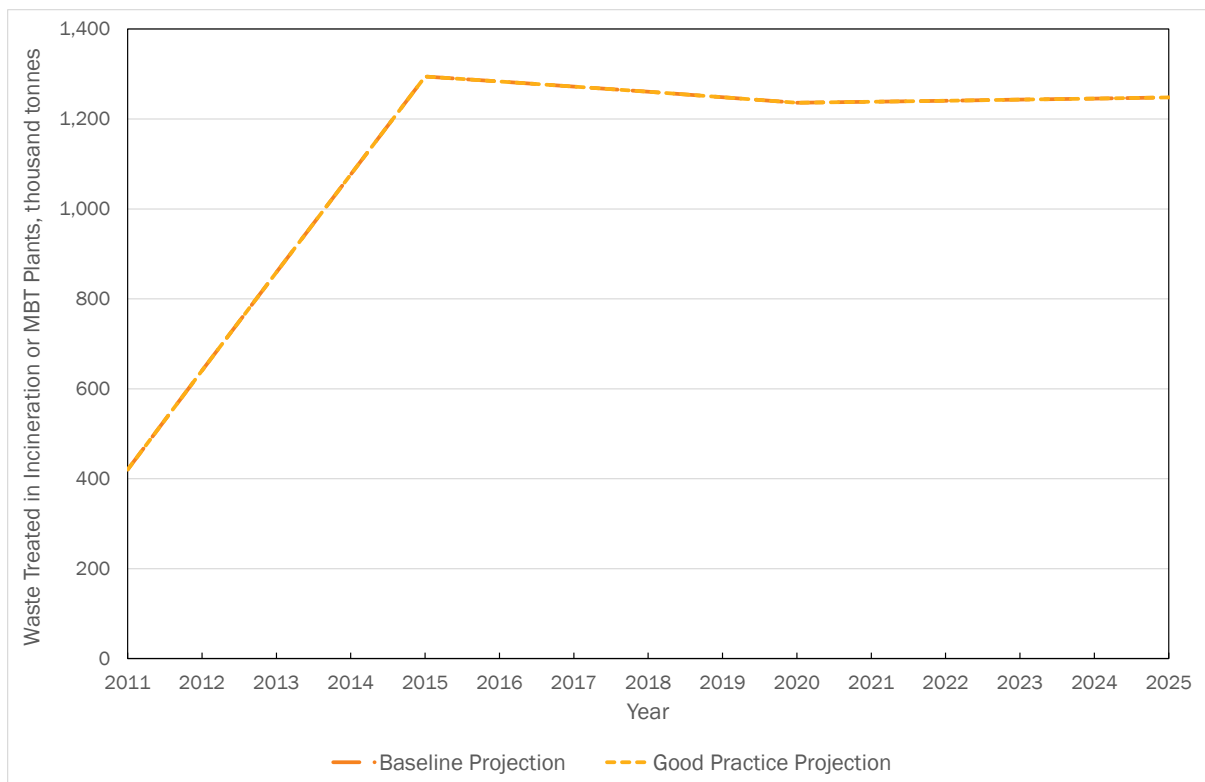


Figure 10-9: Change in SOx Emissions, tonnes



Figure 10-10: Change in NOx Emissions, tonnes

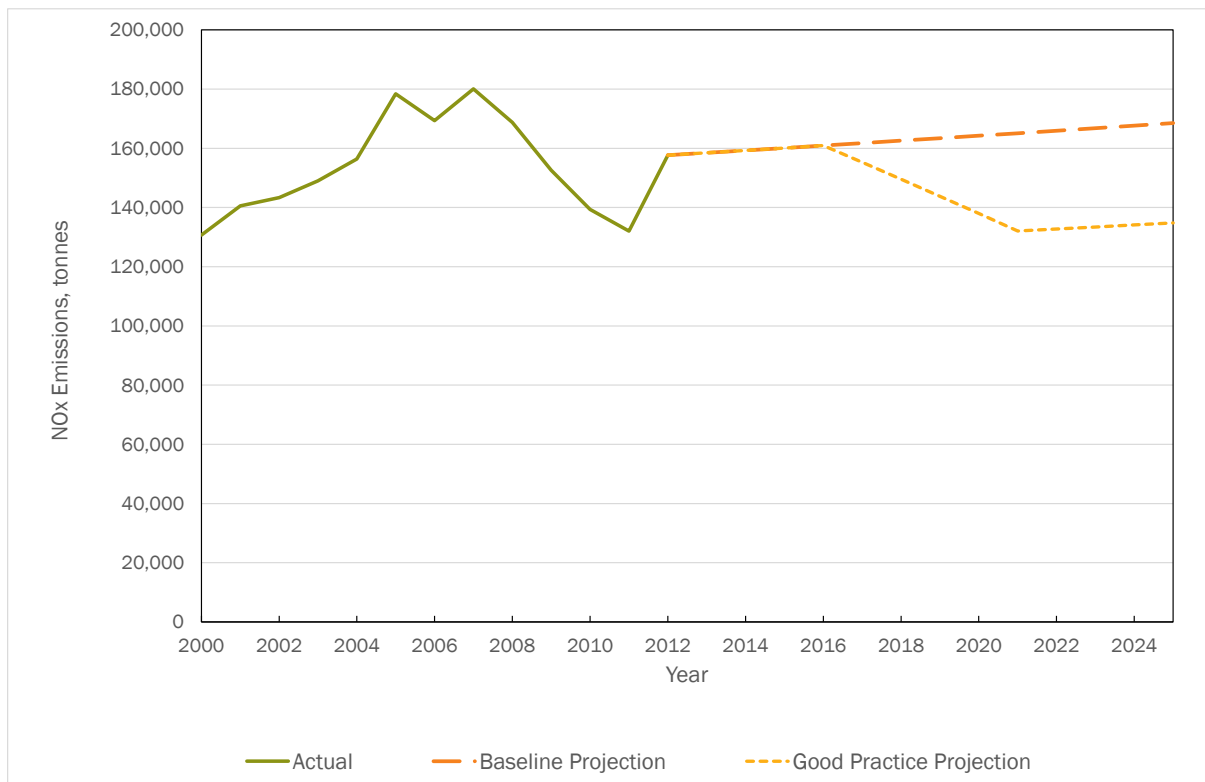


Figure 10-11: Change in PM₁₀ Emissions, tonnes

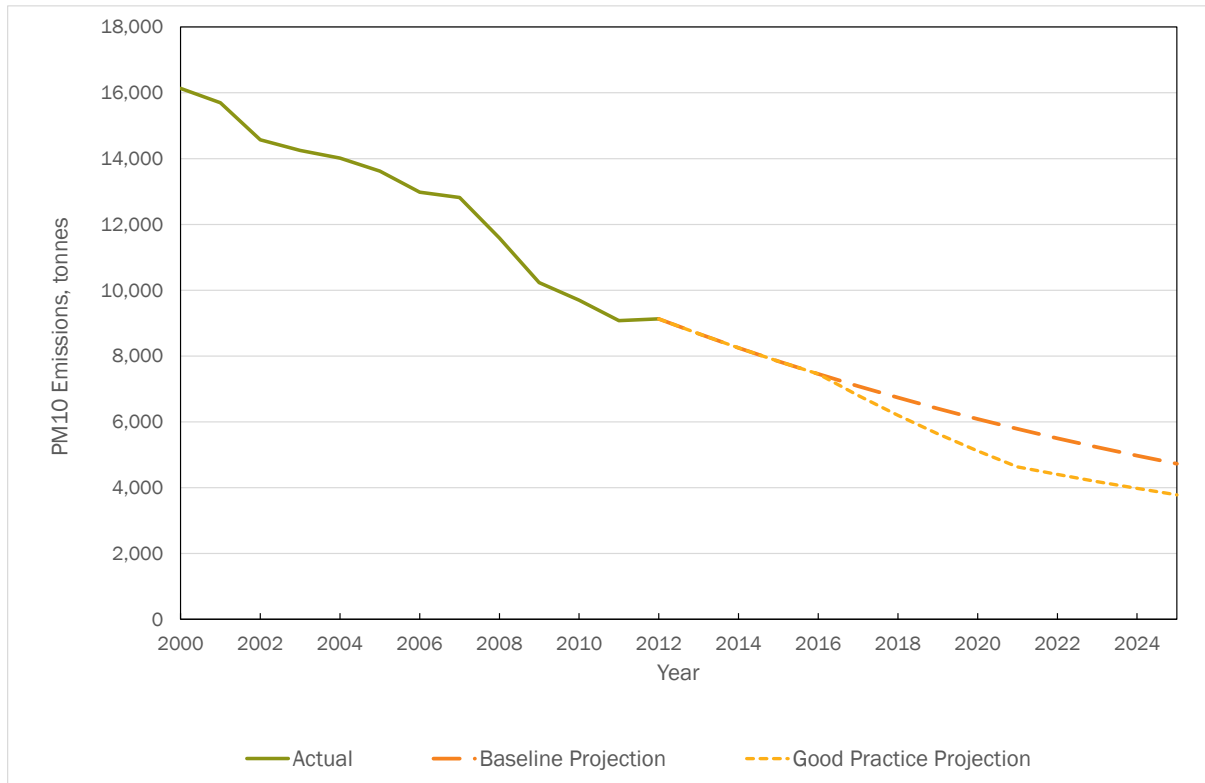


Figure 10-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

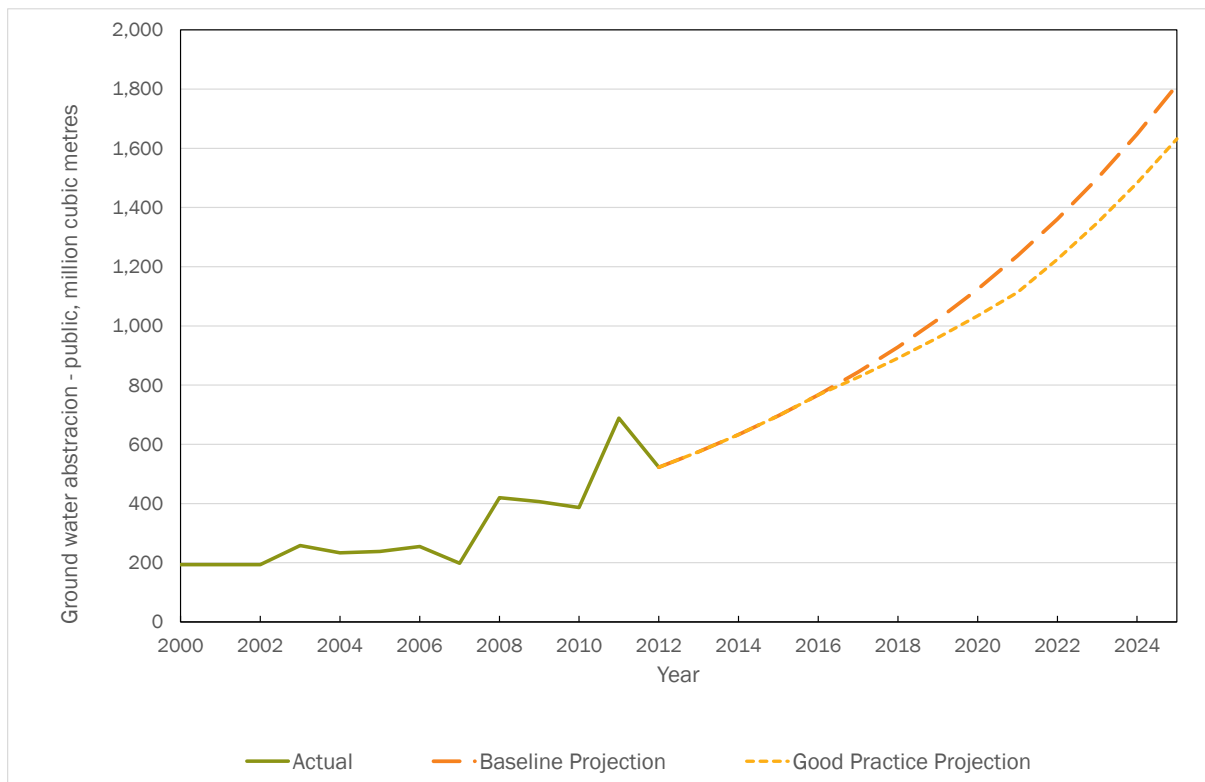


Figure 10-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

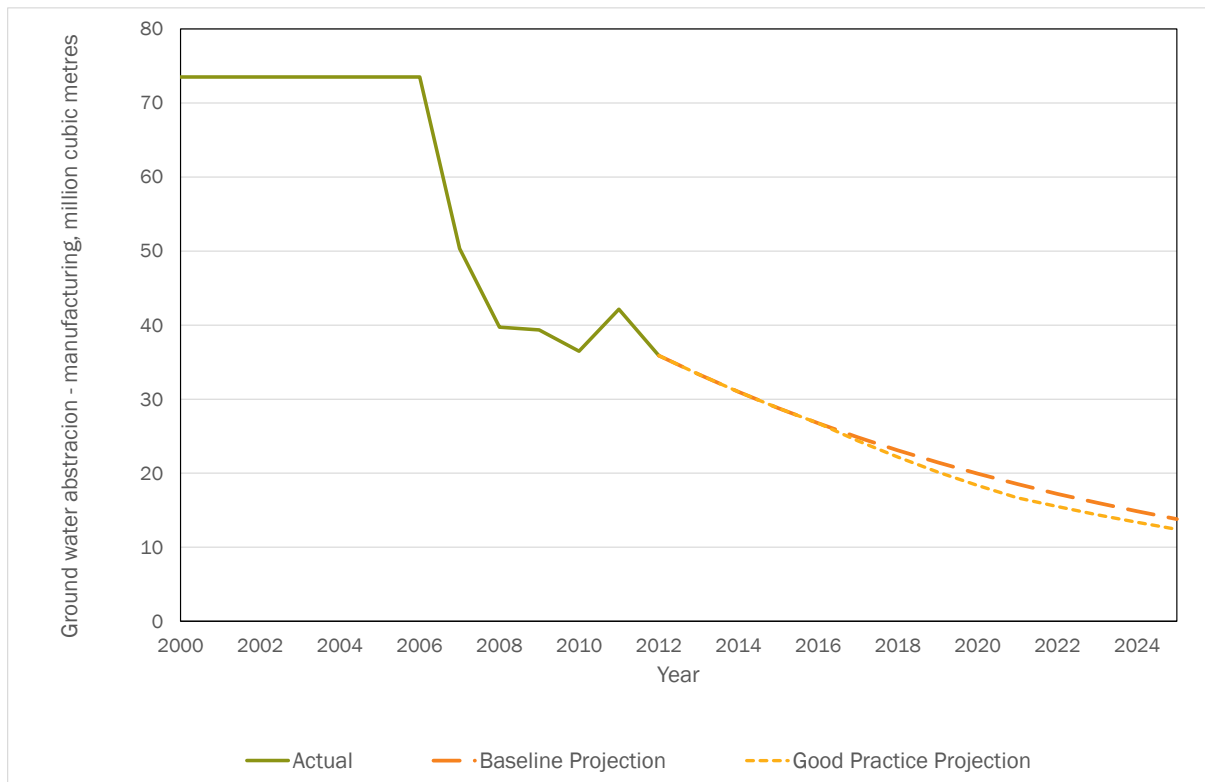


Figure 10-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

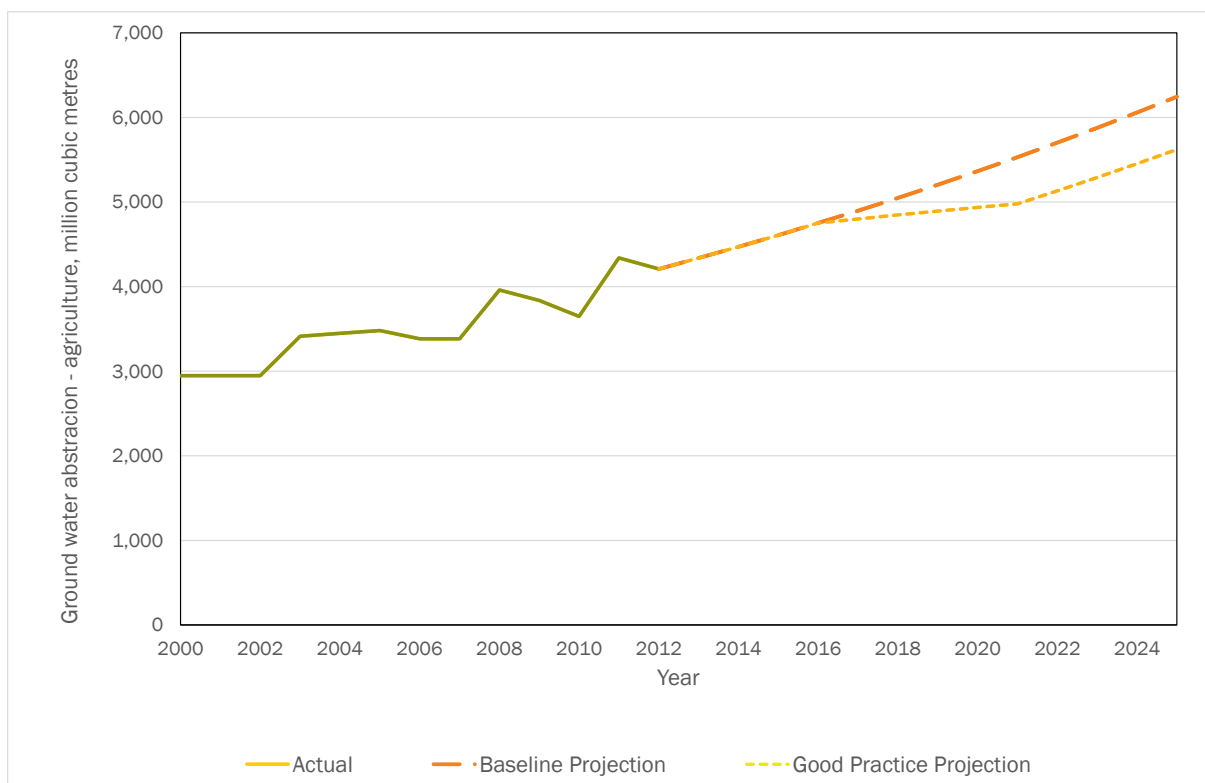


Figure 10-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

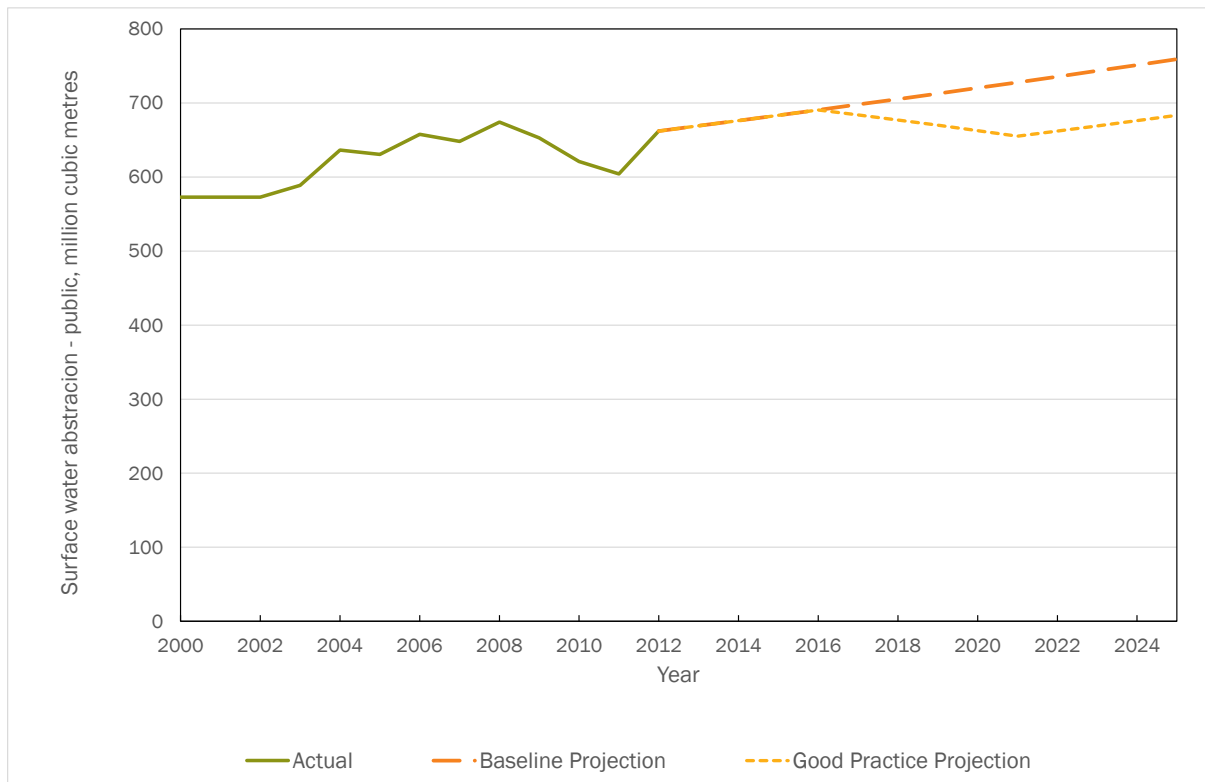


Figure 10-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres



Figure 10-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

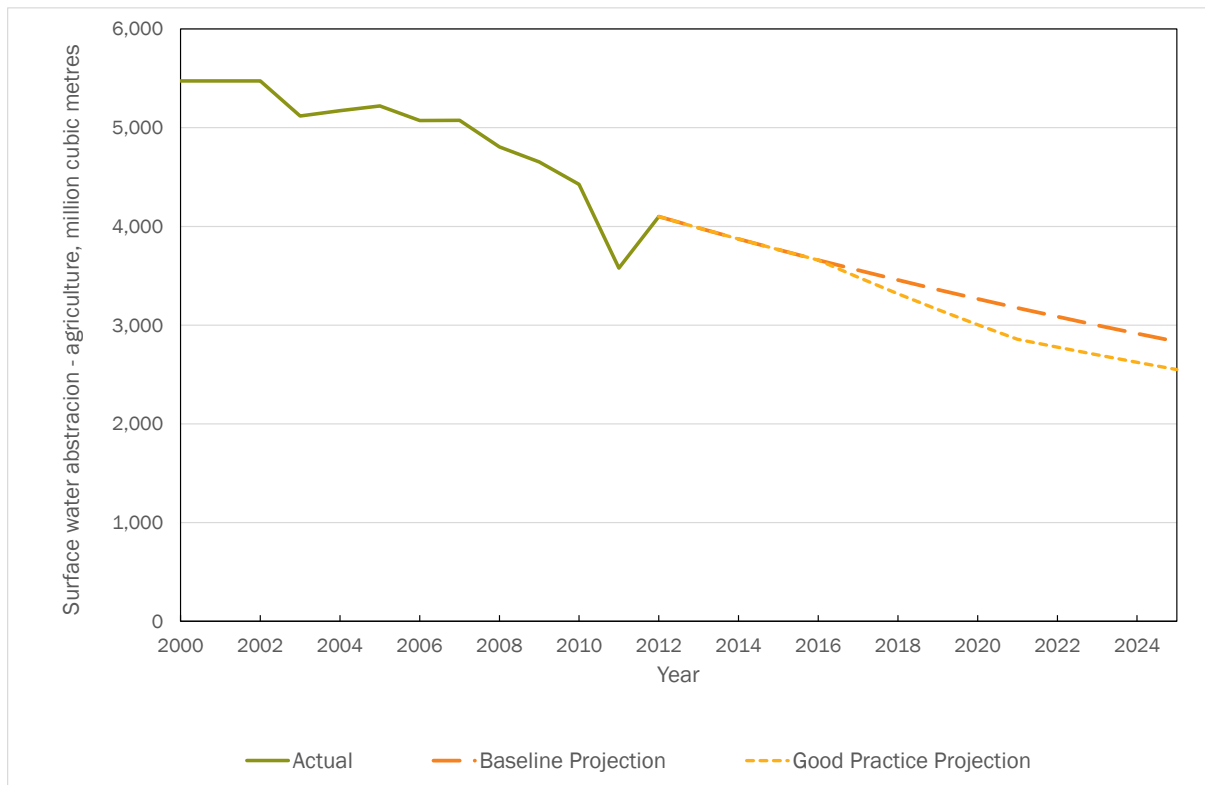


Figure 10-18: Change in Active Ingredients in Pesticides, tonnes

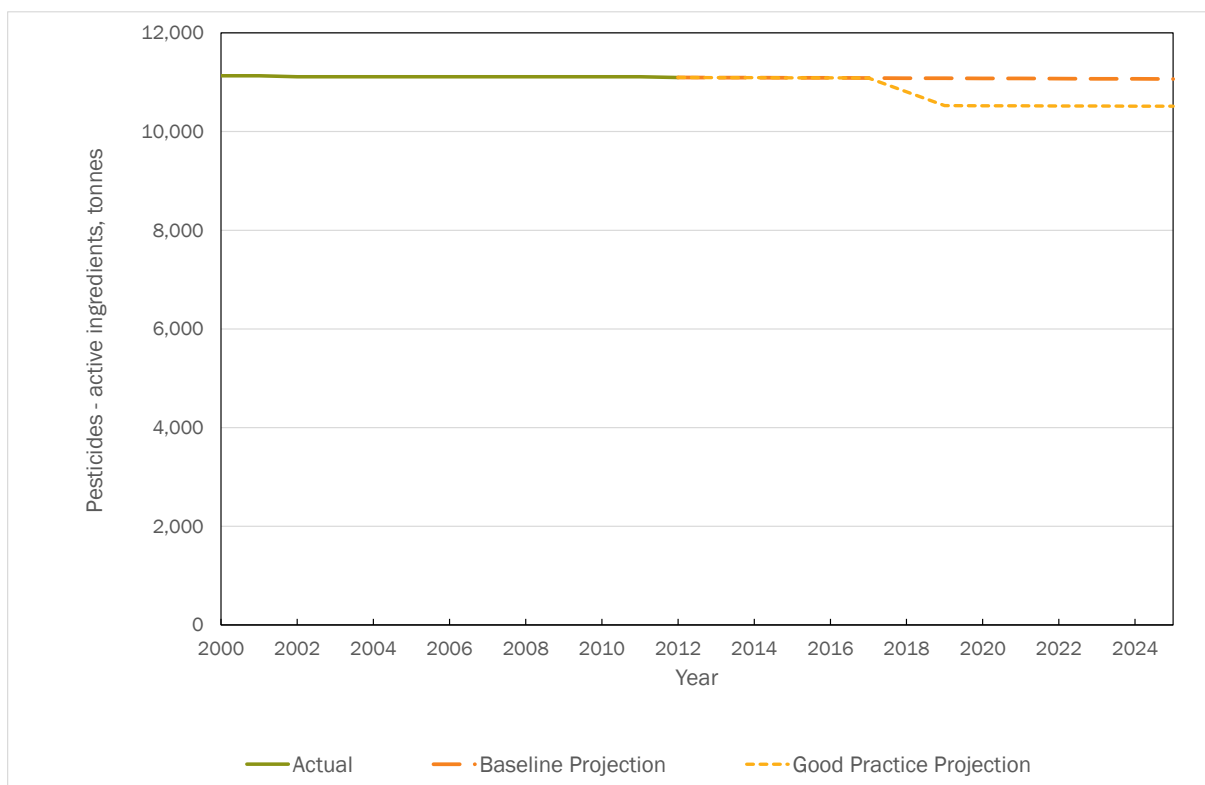


Figure 10-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes



Figure 10-20: Change in Aggregates Extraction, thousand tonnes

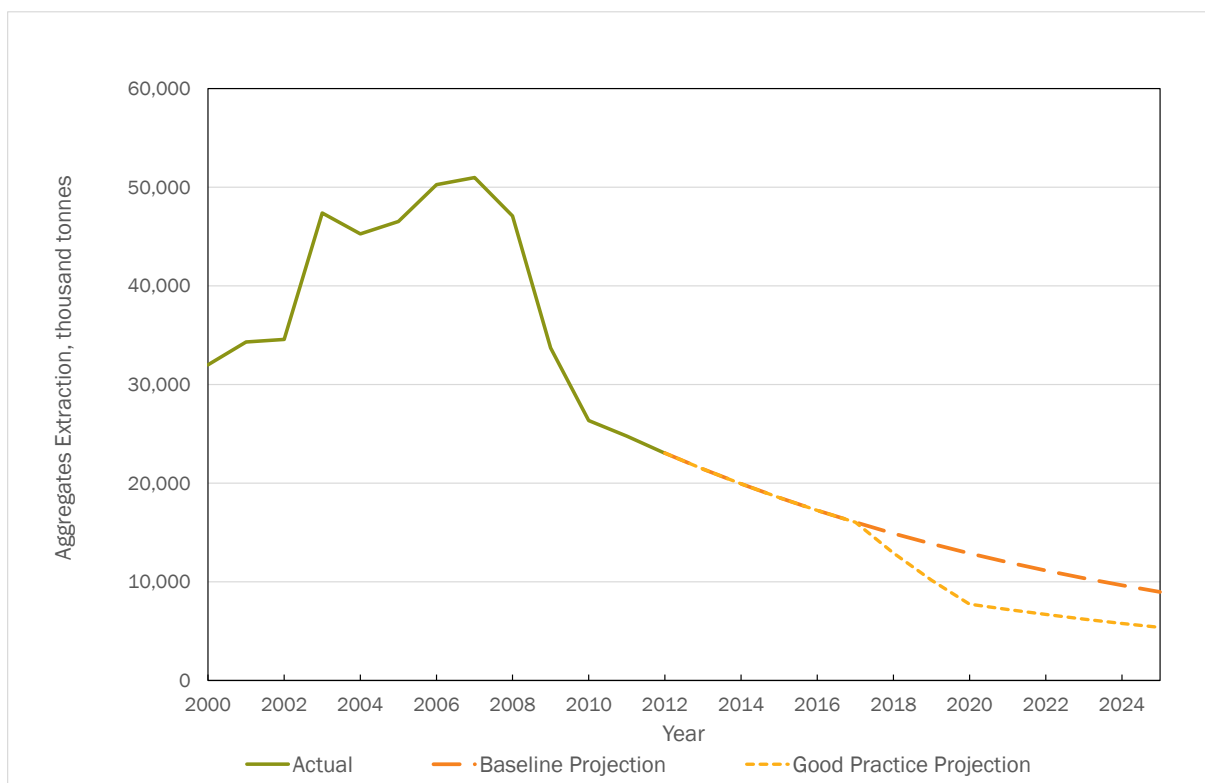


Figure 10-21: Change in Paper & Card Packaging Generation, thousand tonnes

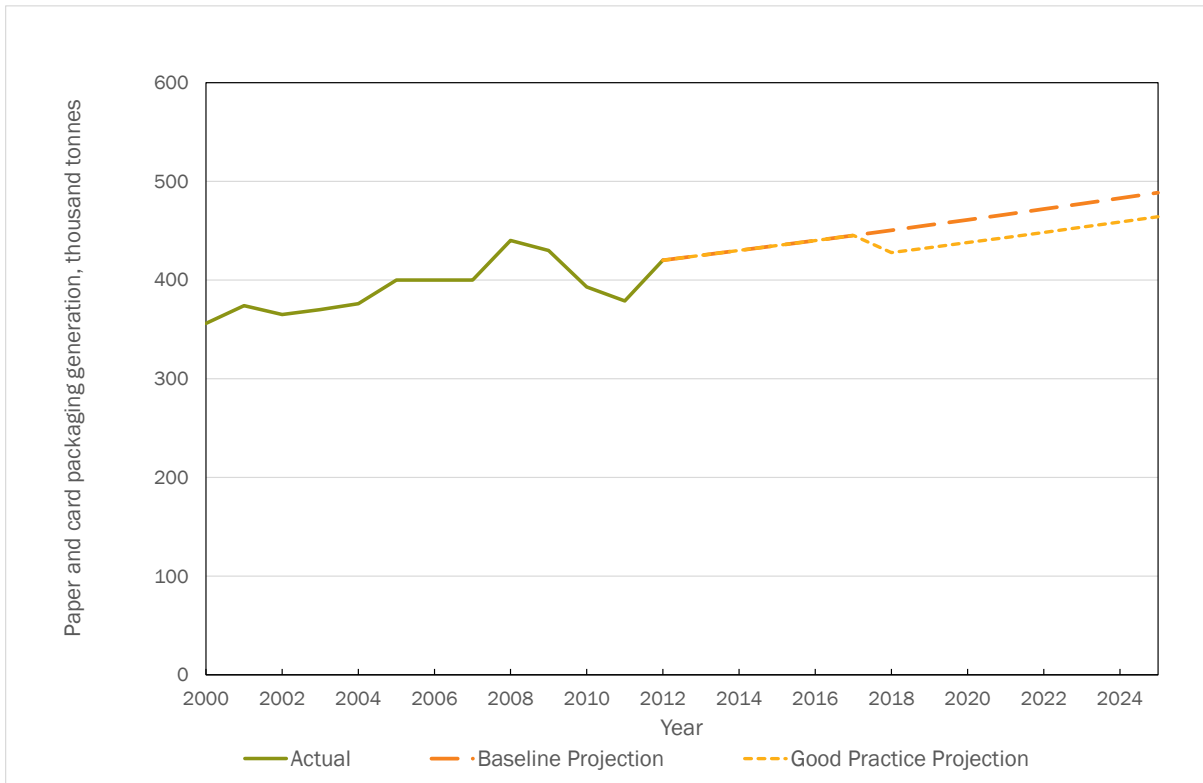


Figure 10-22: Change in Plastic Packaging Generation, thousand tonnes

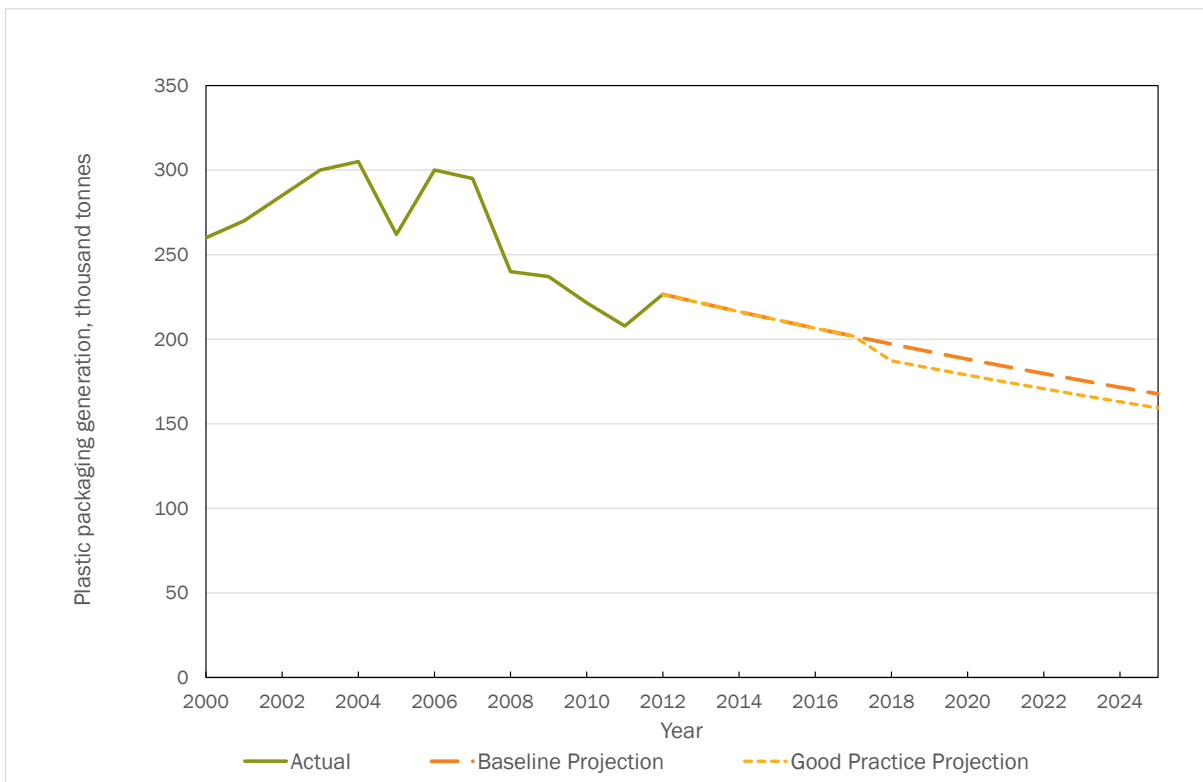


Figure 10-23: Change in Wood Packaging Generation, thousand tonnes

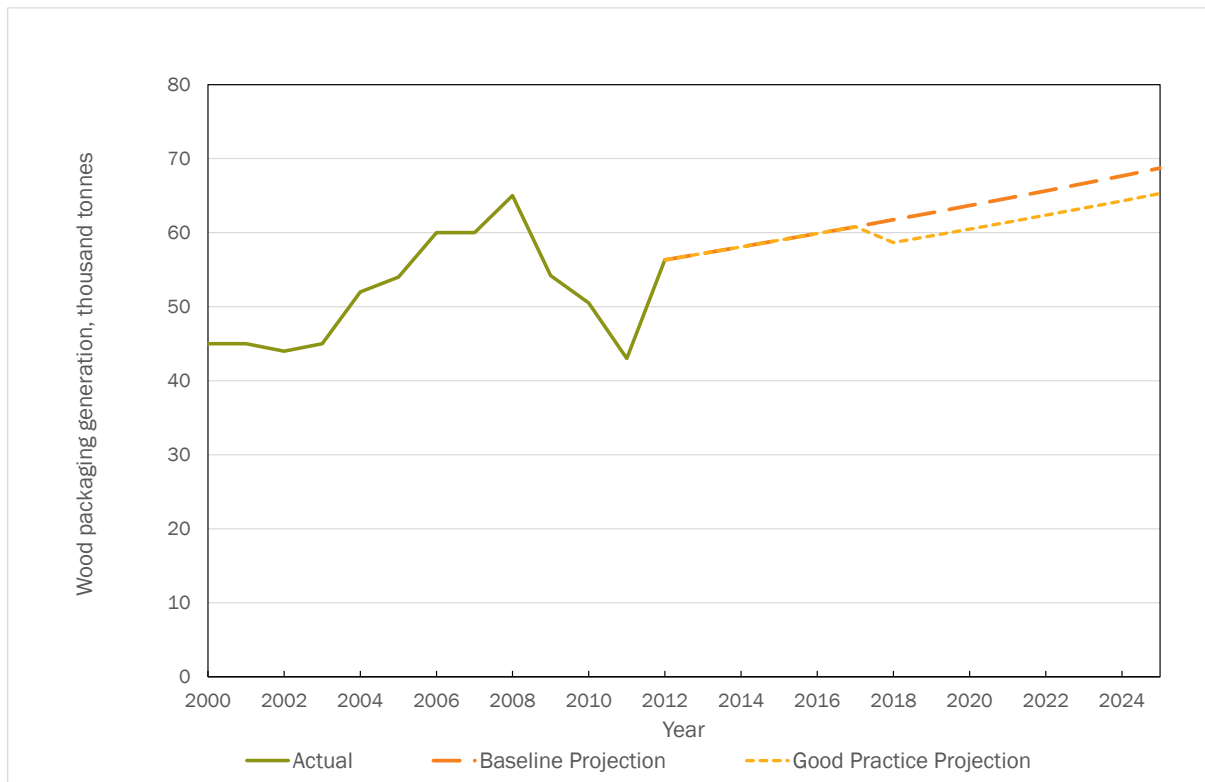


Figure 10-24: Change in Metal Packaging Generation, thousand tonnes

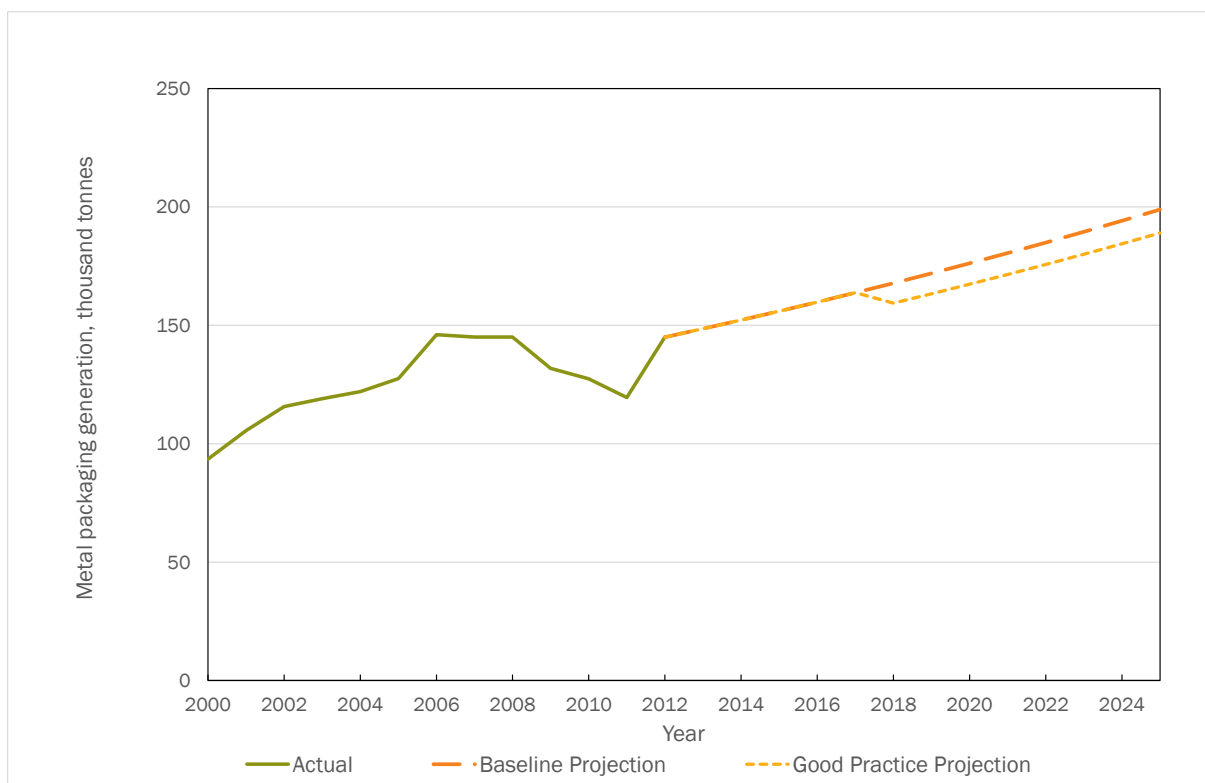


Figure 10-25: Change in Glass Packaging Generation, thousand tonnes

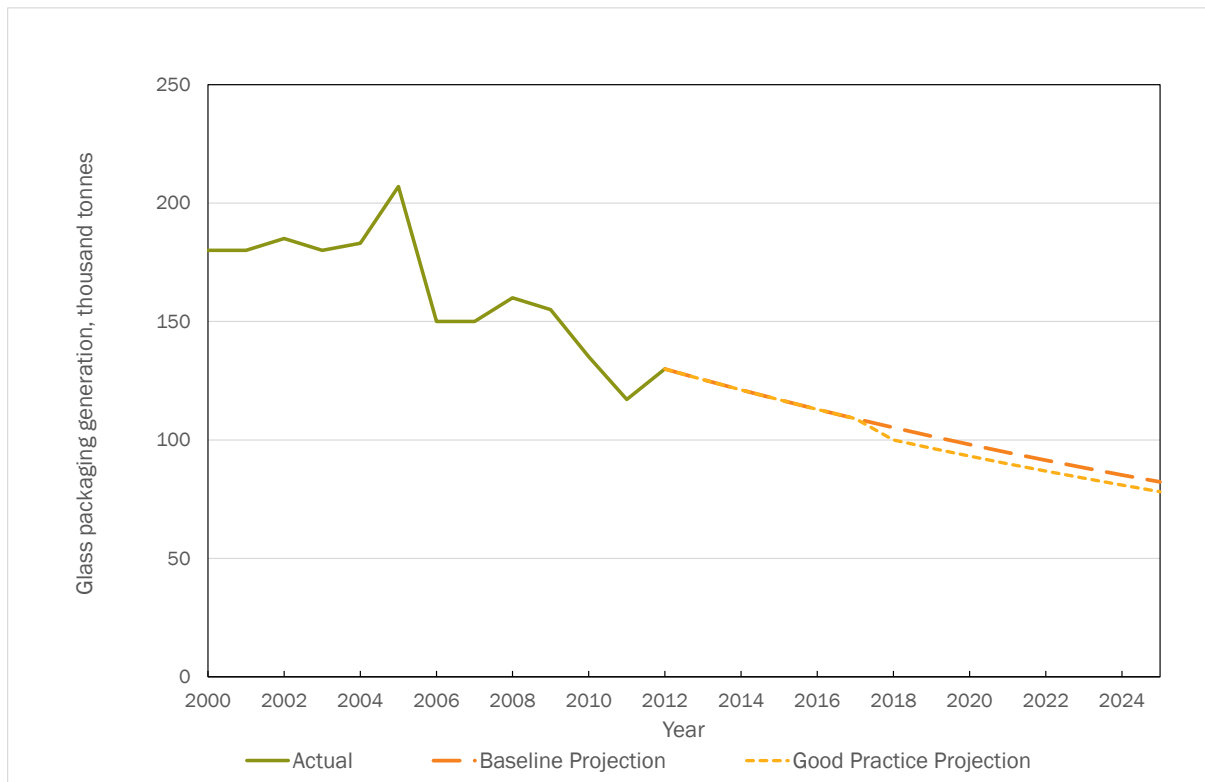
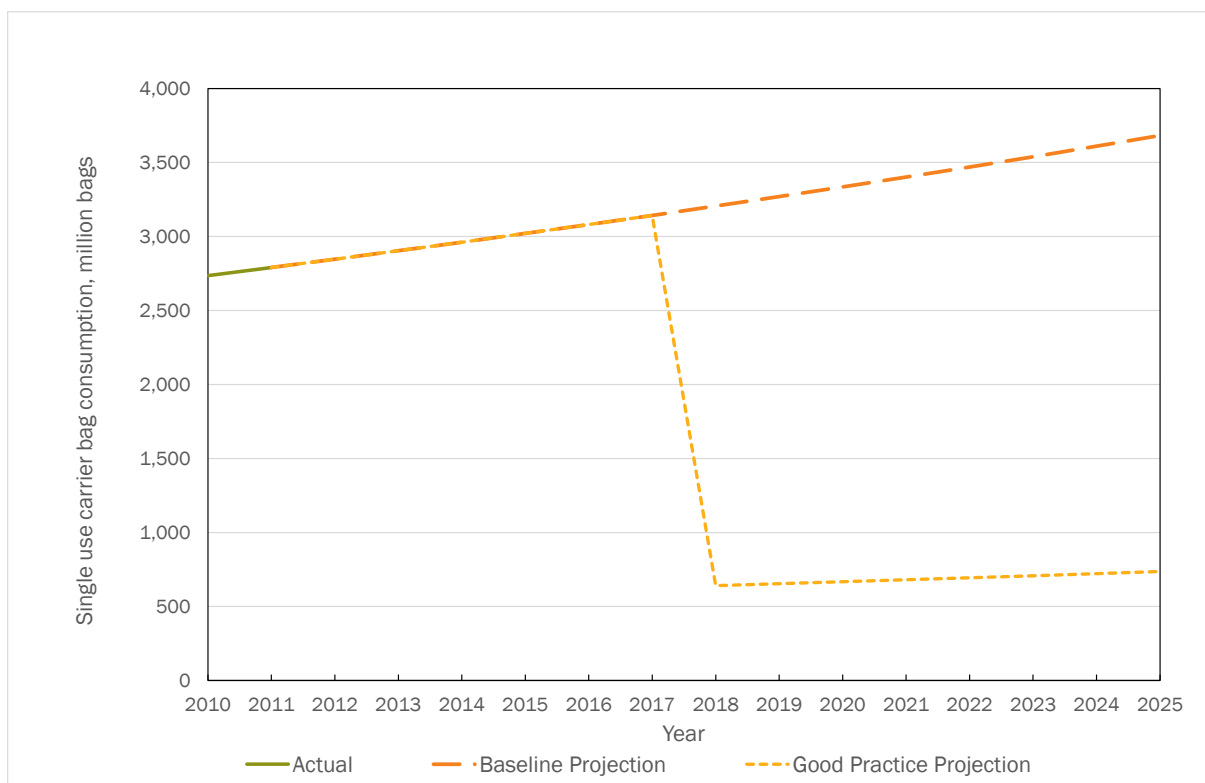


Figure 10-26: Change in Consumption of Single Use Carrier Bags, million bags



10.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 10-6: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	138	275	409	541	672	801	928	928	928
	C&I / Heating	0	0	16	33	49	65	81	97	113	113	113
	Electricity	2	2	2	2	2	2	2	2	2	2	2
	<i>Sub-total Energy, million EUR</i>	2	2	157	309	460	608	755	900	1,044	1,044	1,044
	<i>Sub-total Energy, % GDP</i>	0.0%	0.0%	0.1%	0.2%	0.2%	0.3%	0.4%	0.5%	0.6%	0.6%	0.6%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	17	33	50	66	83	83	83	83	83
	Passenger Aviation Tax	0	0	215	425	427	429	431	433	436	439	442
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Transport, million EUR</i>	0	0	231	458	476	495	514	516	519	522	525
	<i>Sub-total Transport, % GDP</i>	0.0%	0.0%	0.1%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0
	Landfill Tax - Inerts (C&D)	0	1	2	3	3	2	2	2	2	2	2
	Incineration /MBT Tax	0	6	12	18	18	17	17	17	17	17	18

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	78	146	203	251	291	269	262	255	249	243
	Water Abstraction Tax	0	101	206	316	430	550	564	592	623	657	695
	Waste Water Tax	0	14	28	40	39	39	39	39	39	39	39
	Pesticides Tax	0	0	111	216	211	210	210	210	210	210	210
	Aggregates Tax	0	0	38	31	24	19	17	16	15	14	13
	Packaging Tax	0	0	38	36	36	37	37	37	37	37	37
	Single Use Bag Tax	0	264	269	55	56	57	58	59	61	62	63
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	466	851	918	1,068	1,222	1,214	1,236	1,260	1,288	1,320
	Sub-total Pollution & Resource, % GDP	0.0%	0.2%	0.5%	0.5%	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%	0.7%
Total Revenue Stream	Total, million EUR	2	468	1,239	1,686	2,004	2,326	2,483	2,652	2,823	2,854	2,889
	Total, % GDP	0.0%	0.2%	0.7%	0.9%	1.1%	1.2%	1.3%	1.4%	1.5%	1.5%	1.5%

11.0 Ireland

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

11.1 Energy Taxes

➤ Energy Taxes:

- Ireland has excise duties on fuels and electricity. These taxes are shown in Table 11-1, which shows how they compare to the recommended minimum rates in the existing ETD and the EU-28 average and median rates.³⁶⁹

Table 11-1: Excise Duties on Fuels and Electricity in Ireland

Excise Duty	Unit	Rate Applied in Ireland	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels - propellant					
Unleaded Petrol	€ per 1000 litres	€587.71 ¹	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€479.02	€330	€427	€405
Kerosene	€ per 1000 litres	€479.02	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€176.33	€125	€209	€180
Natural Gas	€ per GJ	€0 ²	€2.60	€3.03	€2.66
Motor Fuels - Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€102.28	€21	€221	€163
Kerosene	€ per 1000 litres	€50.73	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€60.07	€41	€126	€125
Natural Gas	€ per GJ	€1.03	€0.30	€1.76	€1.50
Heating - Business Use					

³⁶⁹ European Commission (2013) *Taxes in Europe Database*, Accessed 13th December 2013, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

Excise Duty	Unit	Rate Applied in Ireland	Existing ETD Minimum	EU-28 Average	EU-28 Median
Gas Oil (Diesel)	€ per 1000 litres	€102.28	€21	€221	€163
Kerosene	€ per 1000 litres	€50.73	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€77.68	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€60.07	€0.00	€82	€40
Natural Gas	€ per GJ	€1.03	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€1.89	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€102.28	€21	€179	€125
Kerosene	€ per 1000 litres	€50.73	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€77.68	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€60.07	€0	€111	€42
Natural Gas	€ per GJ	€1.03	€0.3	€2.04	€0.94
Coal and Coke	€ per GJ	€1.89	€0.3	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€0.5	€0.5	€8.42	€1.03
Non-Business Use	€ per MWh	€1.0	€1.0	€14.53	€2.06
Notes:					
1. Including CO ₂ charge of 4.5 cents/liter (€20 per ton CO ₂) for non-ETS emitters.					
2. Gas not in use as propellant in Ireland.					

- The VAT rate is reduced for fuels (gas oil, kerosene, heavy fuel oil, LPG, natural gas, coal) used for industry motors, business heating and non-business. The reduced VAT rate is 13.5% against the standard VAT rate of 23%. The reduced VAT rate applies for electricity consumption too.
- No CO₂ tax applies to biofuels in Ireland, but otherwise biofuels substituting for diesel is taxed at the same rates.
- For agriculture propellants and railways the rates for industry motors apply, whereas other agricultural machinery benefits from a 50% reduction in these rates for diesel. Horticultural production has a reduced rate for heavy fuel oil.
- For commercial diesel (ETD art 7.2) a partial refund of up to €75 per hl, depending on market price levels, is available to qualified road transport

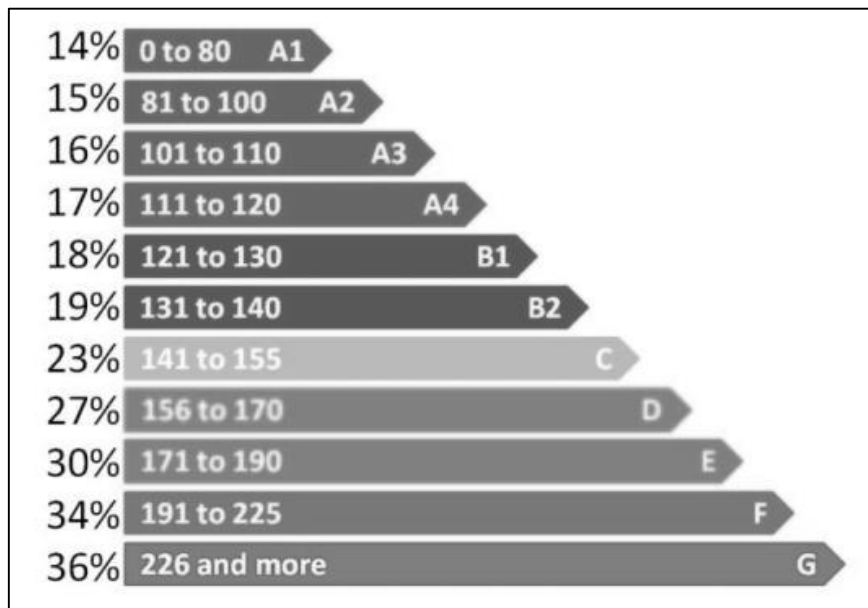
operators.³⁷⁰ It has recently been decided to include also the CO₂ tax under the refund scheme, adding €53 per hl to refunds.

11.2 Transport Taxes (Excluding Transport Fuels)

➤ Registration Tax:

- For Category A vehicles the Vehicle Registration Tax (VRT) is, since 2008³⁷¹, based on CO₂ emissions, with an ad-valorem rate between 14% and 36% of the market price (see Figure 11-1). Category A vehicles comprise passenger cars and minibuses with less than 10 to 12 seats.

Figure 11-1: VRT Taxes as a Percentage of Sales Price and Subject to CO₂ Emissions



- Category B vehicles comprise vans, motor caravans and light commercial vehicles (<3.5 tonnes). Passenger cars that have been modified to have less than four seats and have a technically permissible maximum laden mass weight greater than 130 per cent of the mass in service of the vehicle with body are category B. The rate applicable to category B vehicles is 13.3% of the open market selling price or a minimum of €125.
- Category C vehicles comprise commercial vehicles, buses or agricultural vehicles and the tax rate is a flat-rate unrelated to emissions at €200 per vehicle.³⁷²
- Category D vehicles exempt from VRT include ambulances, fire engines, and vehicles used in the transportation of road construction machinery.

³⁷⁰ <http://www.revenue.ie/en/tax/excise/diesel-rebate-scheme/faqs.html>

³⁷¹ <http://www.economicinstruments.com/index.php/climate-change/article/34->

³⁷² <http://vrt.ie/vrtDetail.php?page=20>

- It is possible to be exempted from VRT for owners that have had their residence outside Ireland for more than 12 months and who purchased the vehicle in another state with the associated taxes. Electric vehicles are exempt from VRT in any case.

➤ **Circulation Tax:**

- Ireland’s circulation tax (‘Motor Tax’) applies to vehicles of all categories as indicated in Table 11-2.

Table 11-2: Motor Tax (Annual Circulation Tax) Relative to CO₂ Emissions.

Vehicle Category	Gram CO ₂ per km	Tax Rate in €
A0	0	120
A1	1-80	170
A2	81-100	180
A3	101-110	190
A4	111-120	200
B1	121-130	270
B2	131-140	280
C	141-155	390
D	156-170	570
E	171-190	750
F	191-225	1,200
G	Above 225	2,350

11.3 Pollution and Resource Taxes

- The landfill tax which has been in place since 1996 and is paid on top of the normal gate fees by business and local authorities is subject to VAT.
- Certain types of waste are exempt from the landfill tax including non-hazardous construction waste and excavation spoil used for landfill site engineering, street-cleaning waste, illegal waste redeemed by the authorities, pre-approved clean-up waste from citizen groups, polymer recycling residues, shredding non-metallic residues and own-use landfills in mining.³⁷³
- The plastic bag levy applies to all sales outlets, both supermarkets and retailers. It has exemptions for specific purposes (e.g. fish, meat,

³⁷³ ETC/SCP Working paper 1/2012, Overview of the use of landfill taxes in Europe, Copenhagen, p 45-50. http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1

vegetables) for smaller size bags. Reusable bags costing more than 70 cents and shopping bags in airports are exempt too.³⁷⁴

11.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 11-3: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	2,653	2,597	-56
Petrol	million litres	1,166	1,166	0
Kerosene	million litres	1,205	1,196	-9
LPG	thousand tonnes	61	59	-2
Heavy Fuel Oil	thousand tonnes	103	101	-2
Natural Gas	TJ (GCV)	50,505	48,240	-2,265
Coal	thousand tonnes	555	553	-2
Electricity	GWh	17,323	17,305	-18

³⁷⁴ UCD Dublin, Economic instruments in environmental policy database, Plastic Bag Levy Ireland <http://www.economicinstruments.com/index.php/component/zine/article/214>

Figure 11-2: Change in Internal Passenger Flights, flights per year

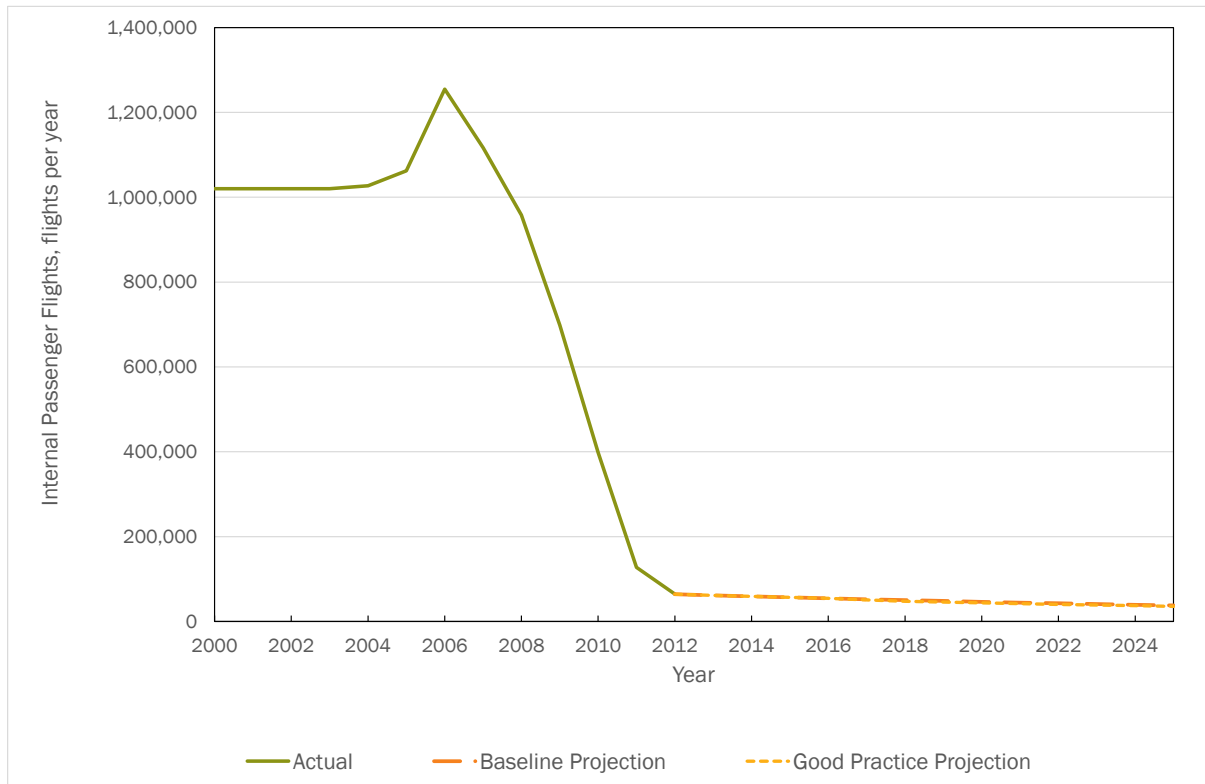


Figure 11-3: Change in Intra-EU Passenger Flights, flights per year

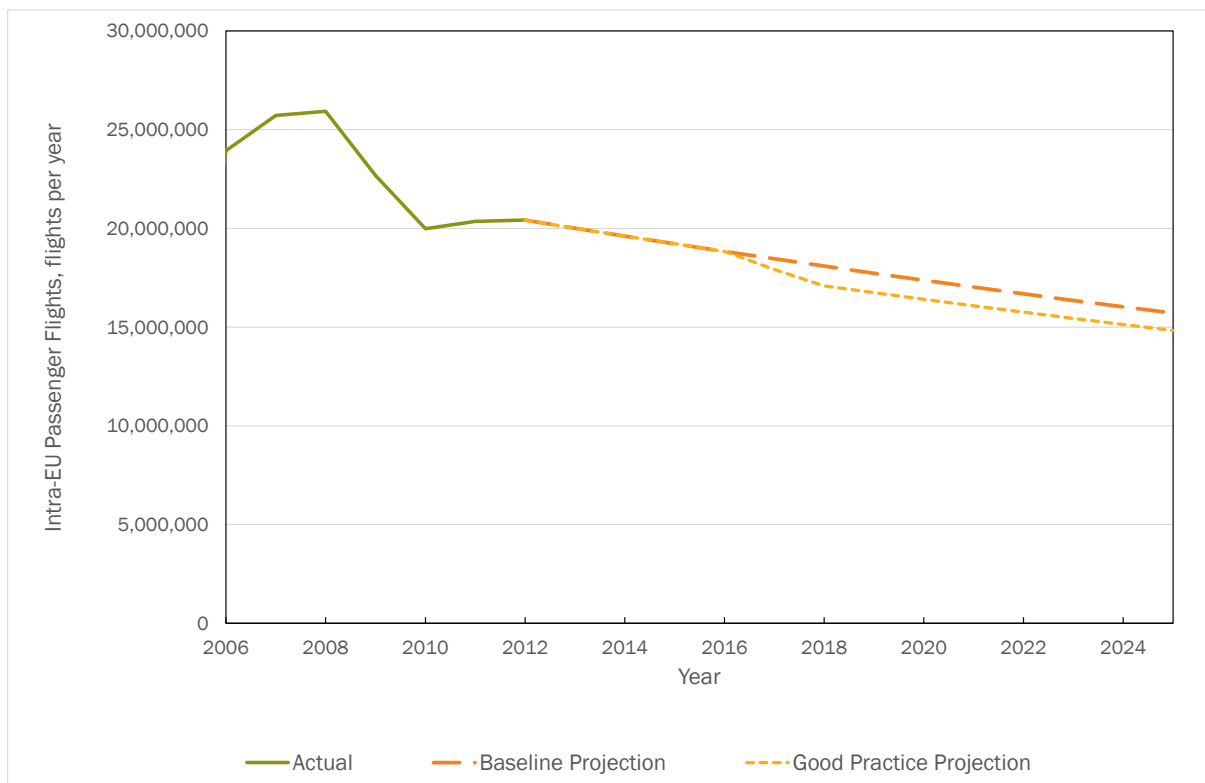


Figure 11-4: Change in Extra-EU Passenger Flights, flights per year

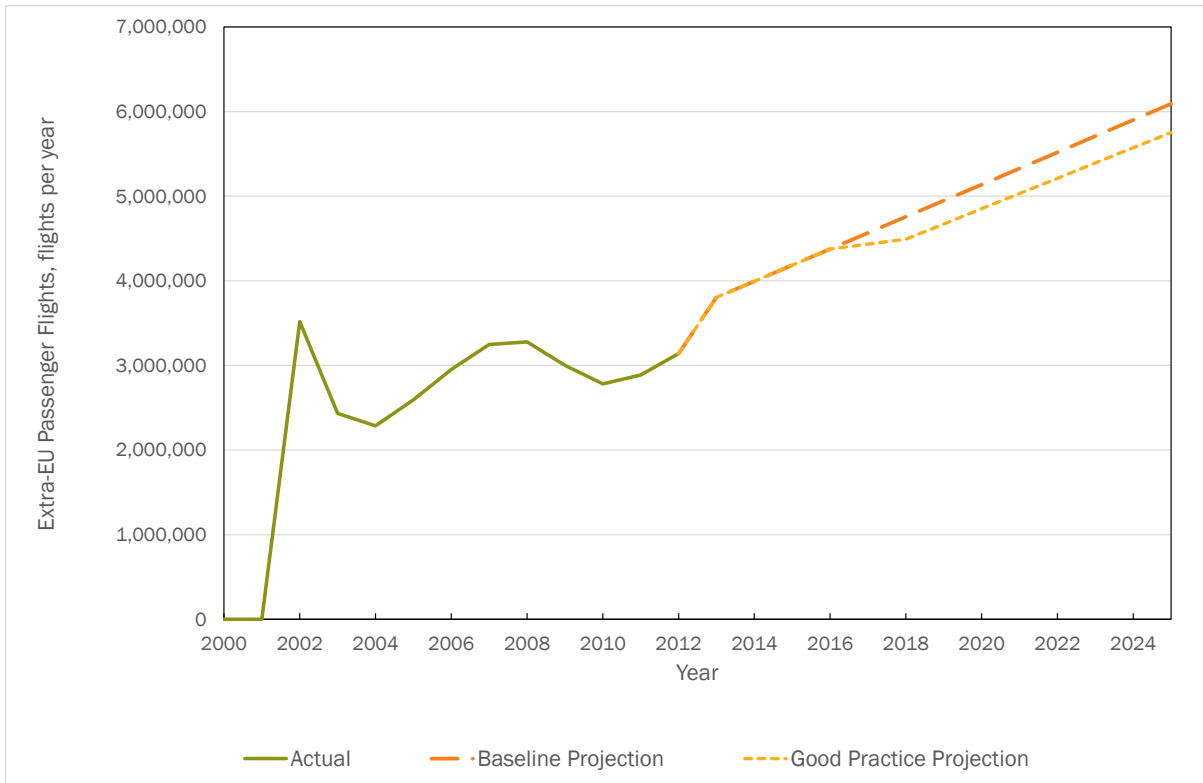


Figure 11-5: Change in Internal Air-freight, tonnes

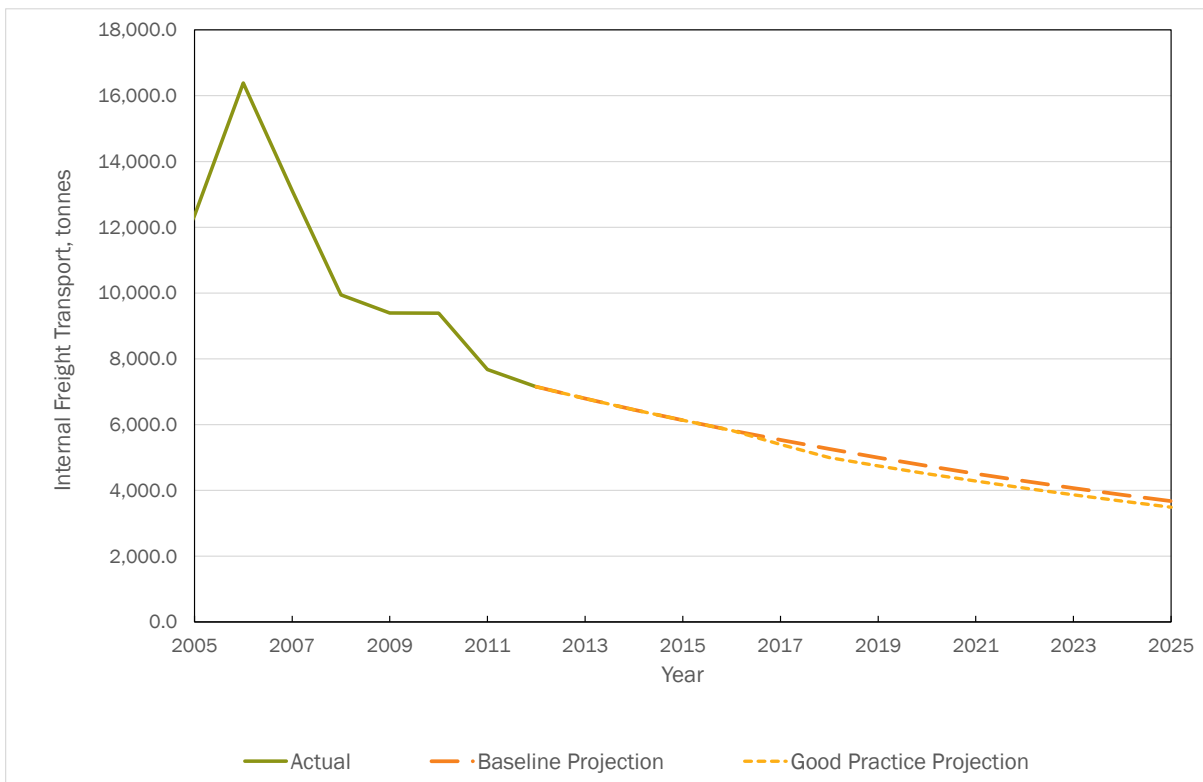


Figure 11-6: Change in Intra-EU Air-freight, tonnes

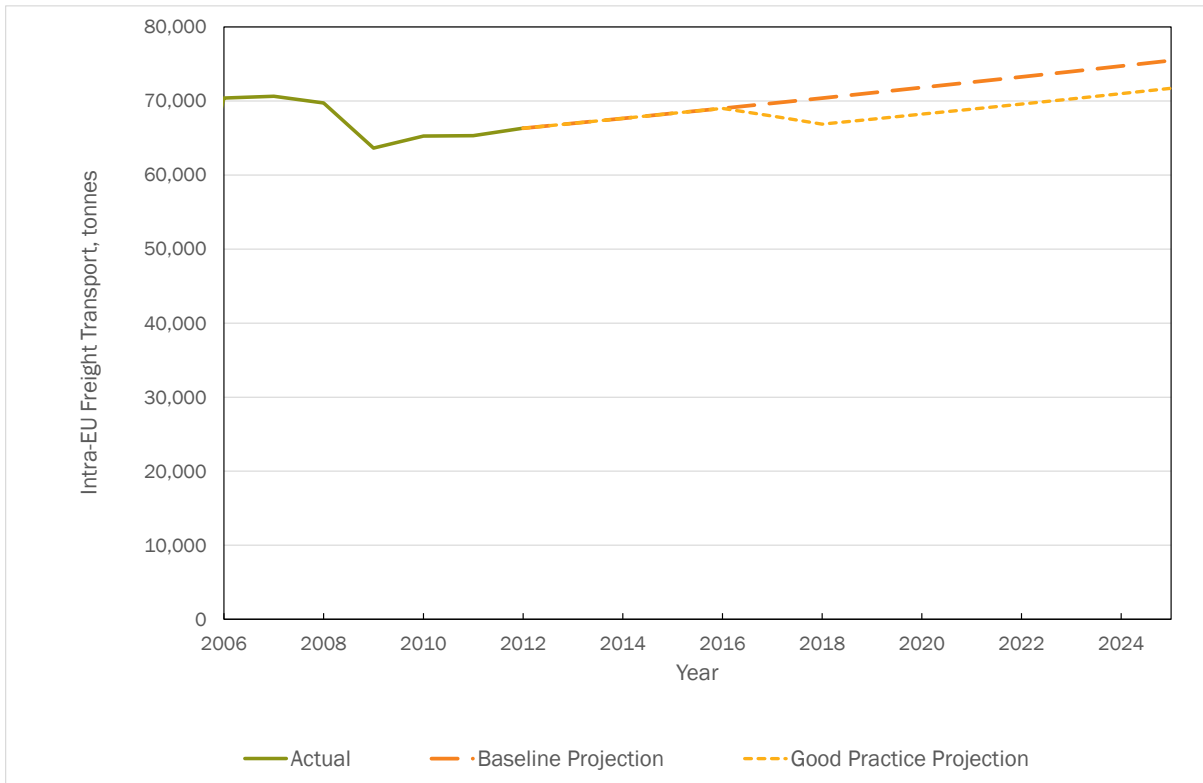


Figure 11-7: Change in Extra-EU Air-freight, tonnes

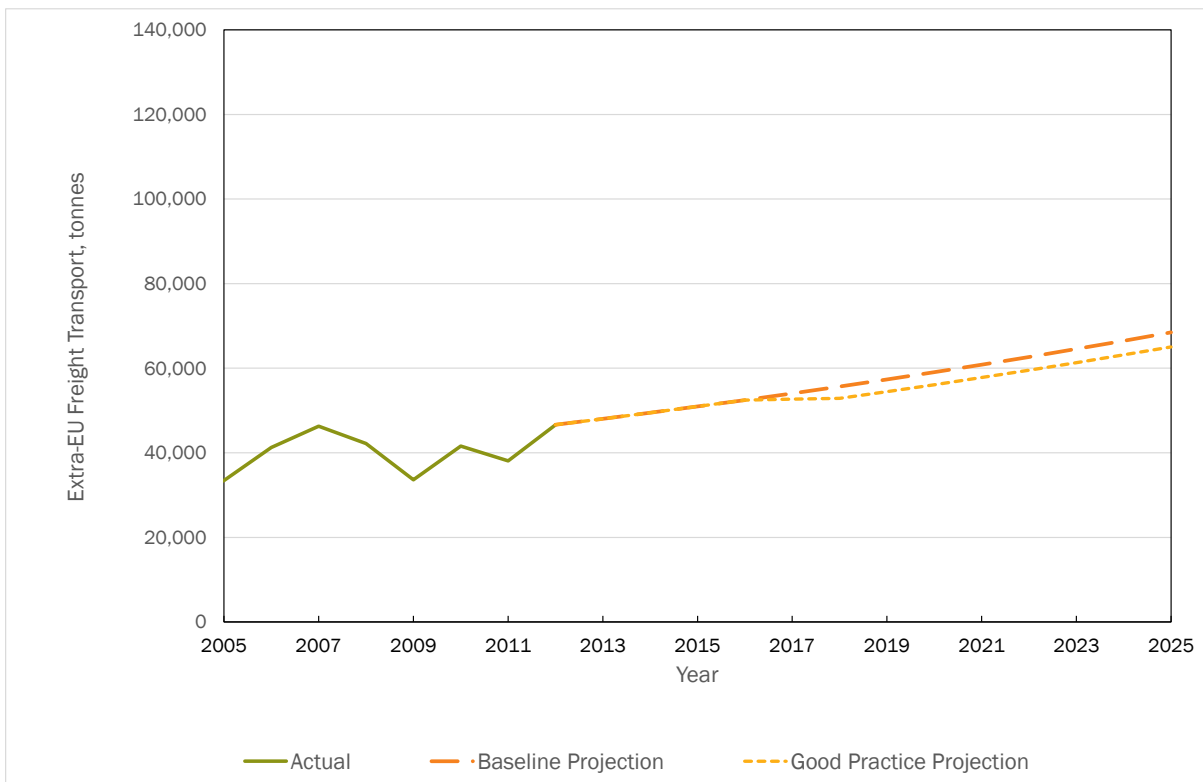


Figure 11-8: Change in Non-Hazardous Waste Landfilled, thousand tonnes

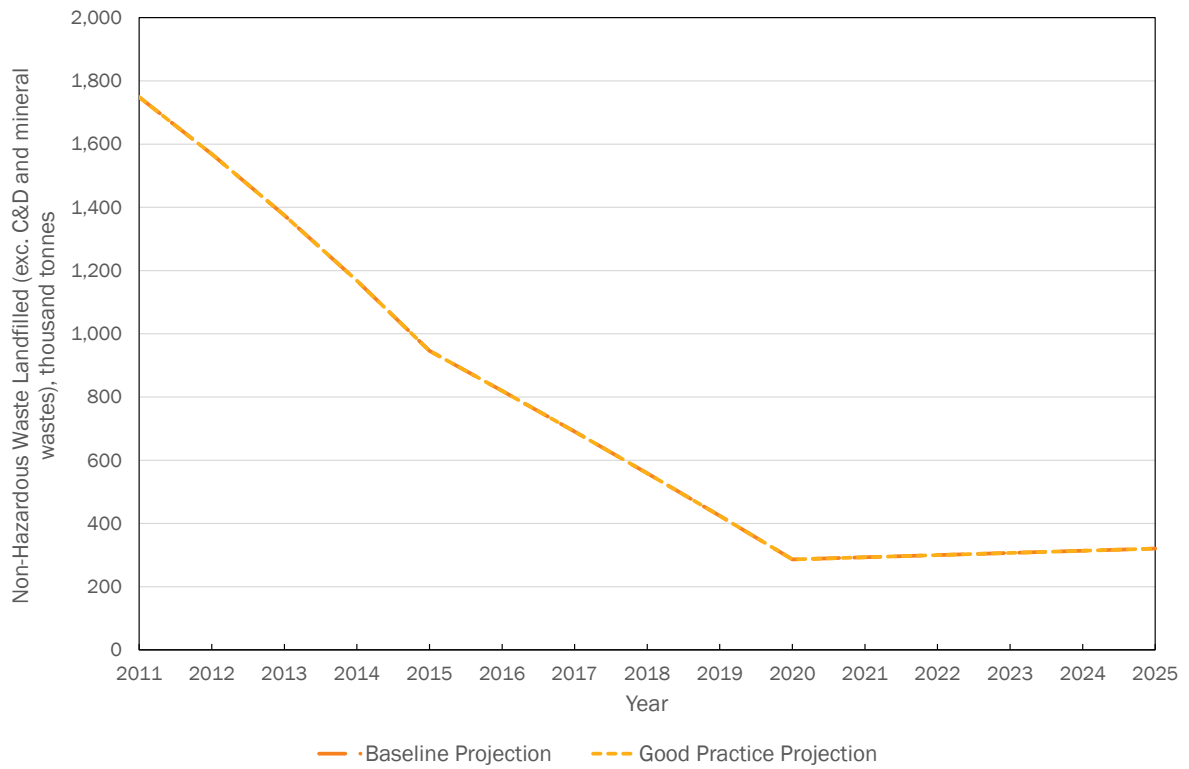


Figure 11-9: Change in MBT/ Incineration, thousand tonnes

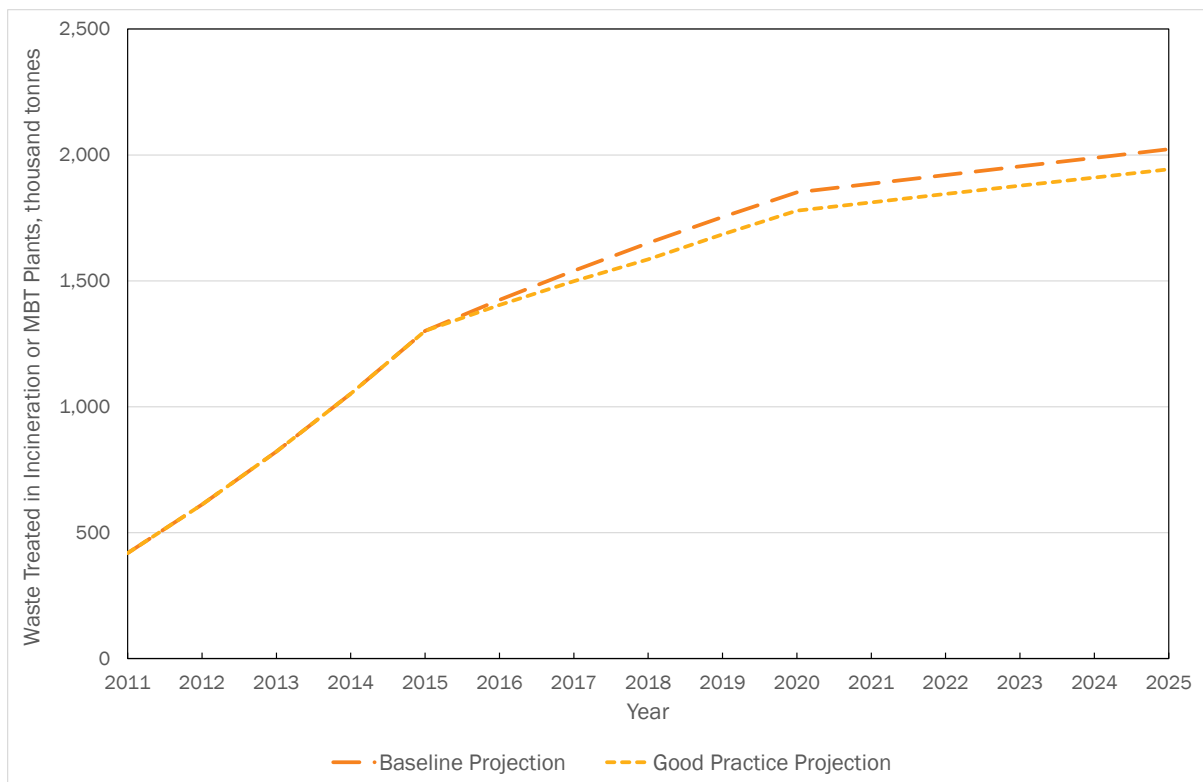


Figure 11-10: Change in SOx Emissions, tonnes

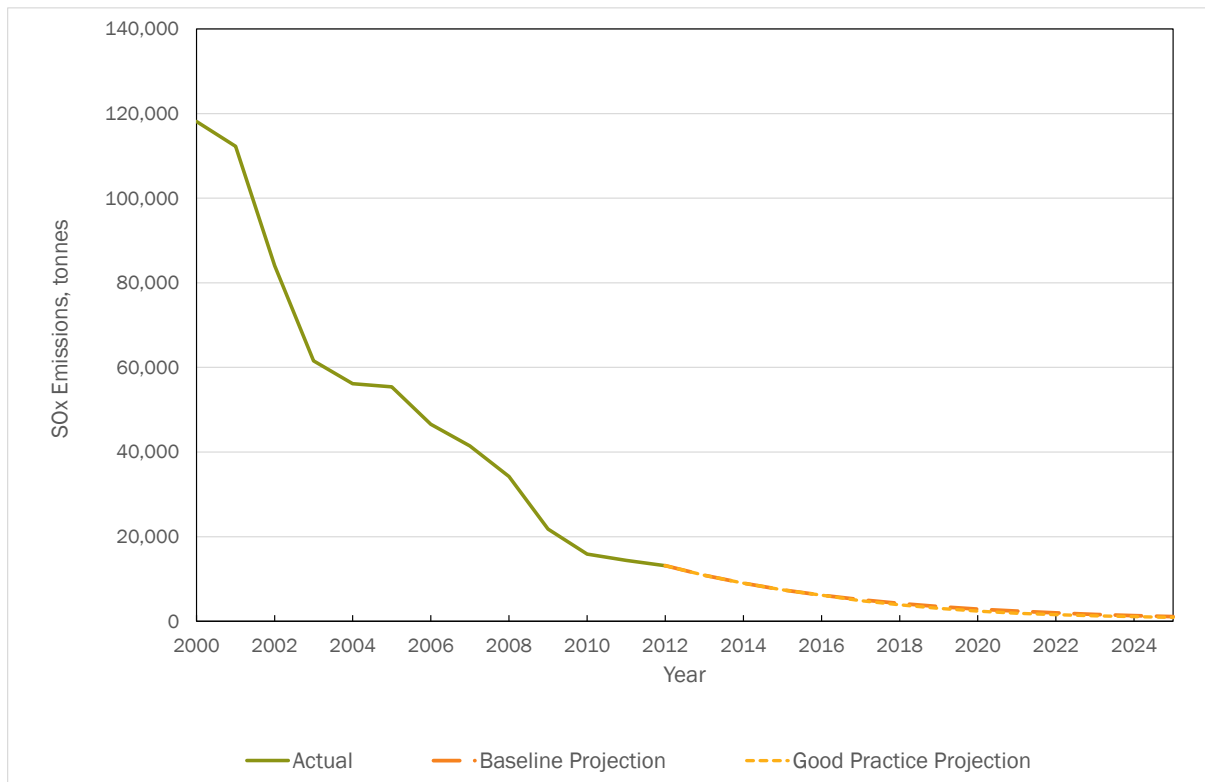


Figure 11-11: Change in NOx Emissions, tonnes



Figure 11-12: Change in PM₁₀ Emissions, tonnes

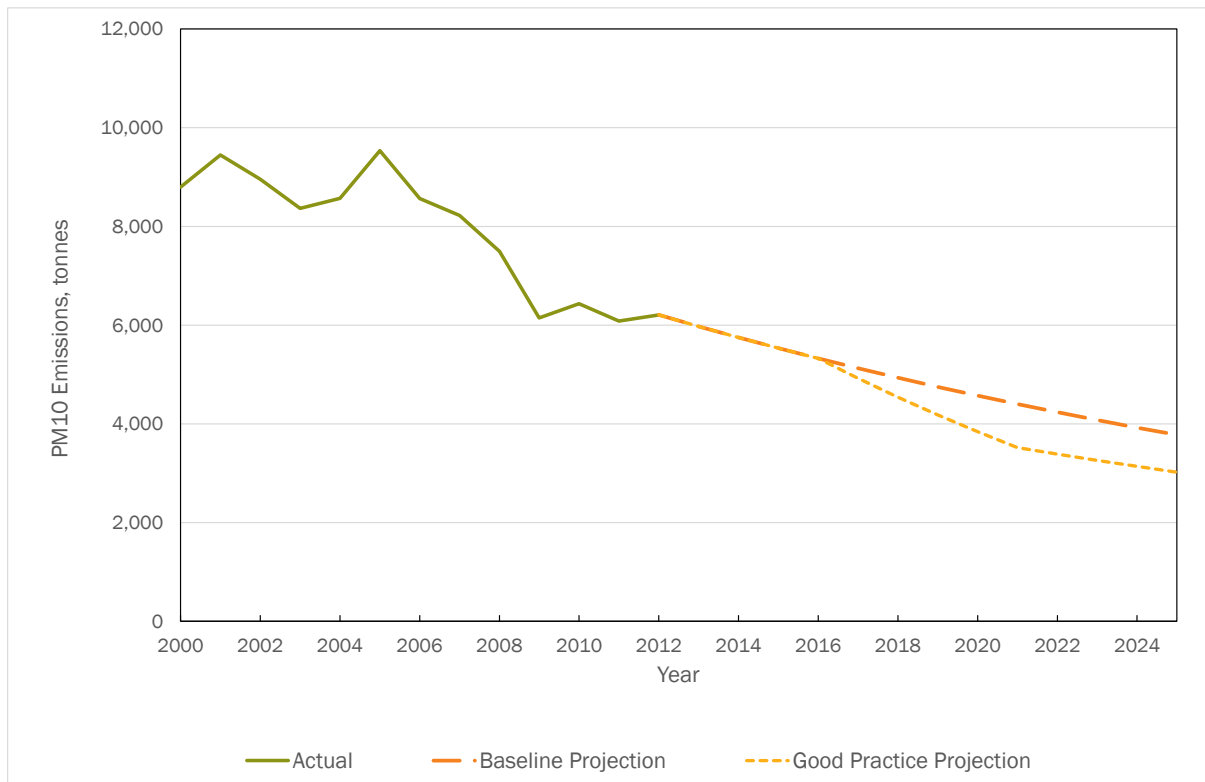


Figure 11-13: Change in Groundwater Abstraction – Public Supply, million cubic metres

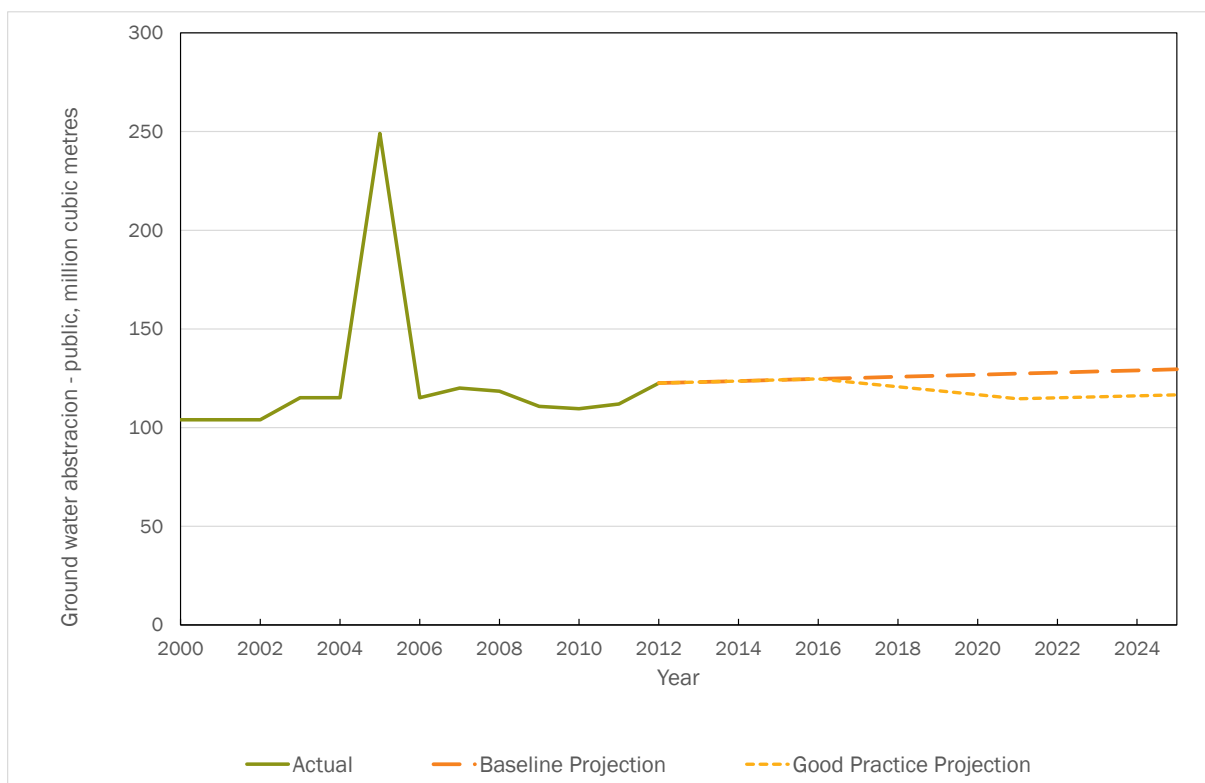


Figure 11-14: Change in Groundwater Abstraction – Manufacturing, million cubic metres

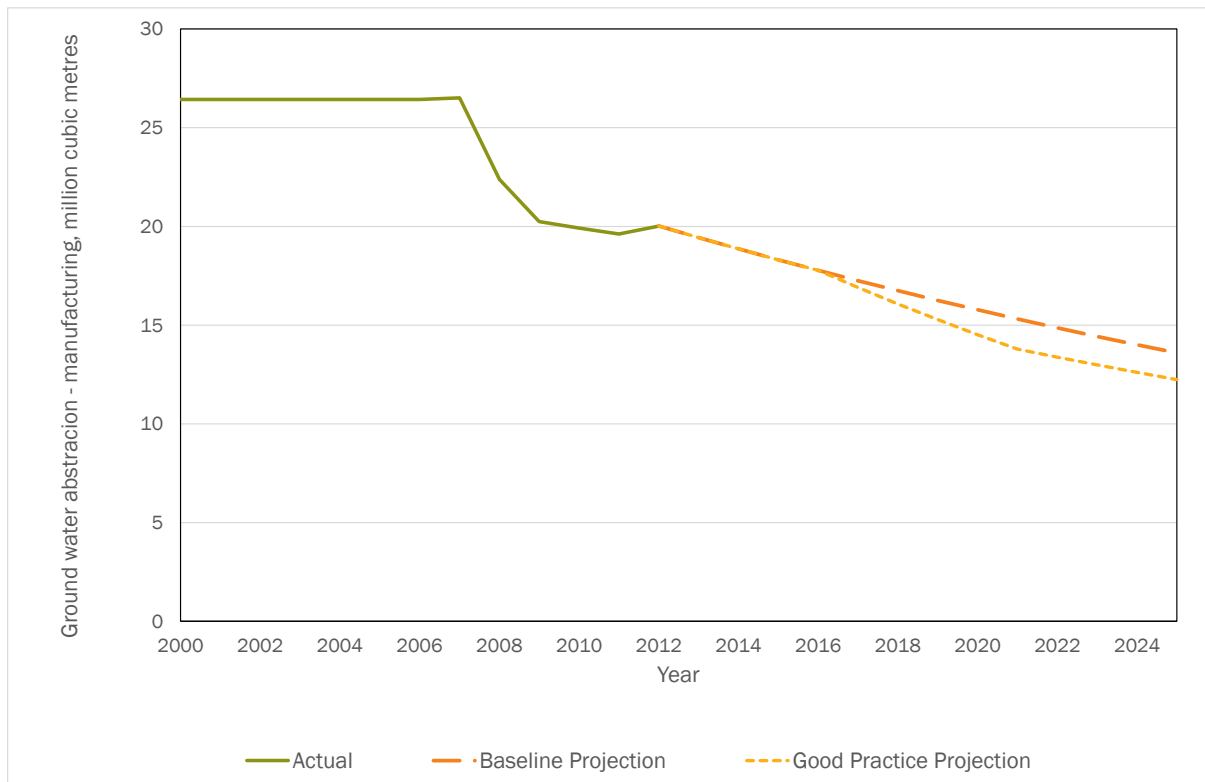


Figure 11-15: Change in Groundwater Abstraction – Agriculture, million cubic metres

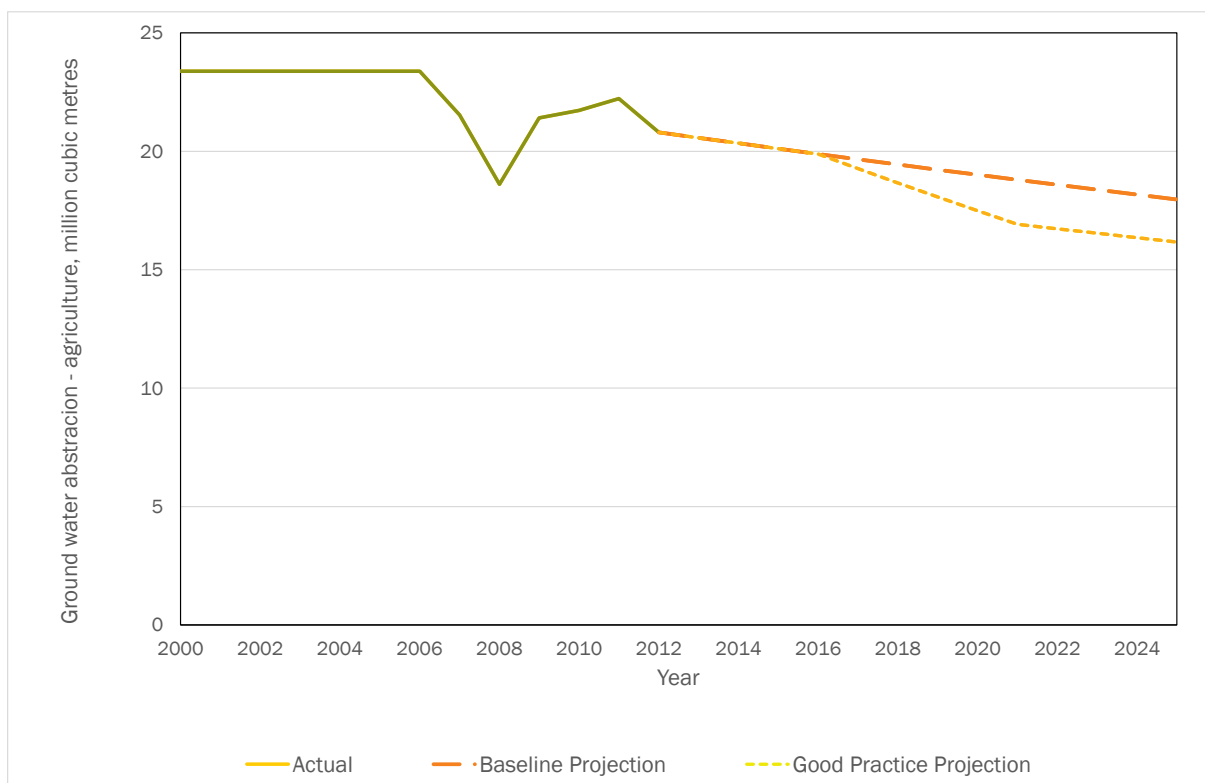


Figure 11-16: Change in Surface Water Abstraction – Public Supply, million cubic metres

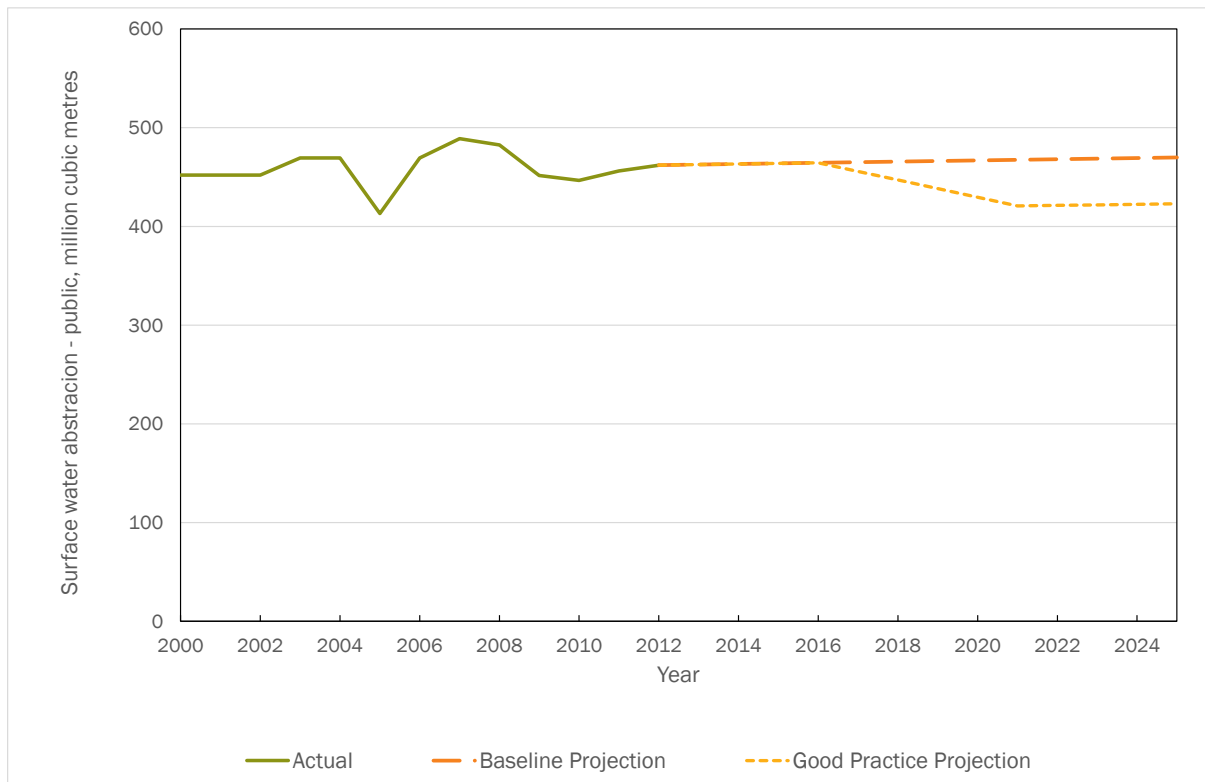


Figure 11-17: Change in Surface Water Abstraction – Manufacturing, million cubic metres



Figure 11-18: Change in Surface Water Abstraction – Agriculture, million cubic metres

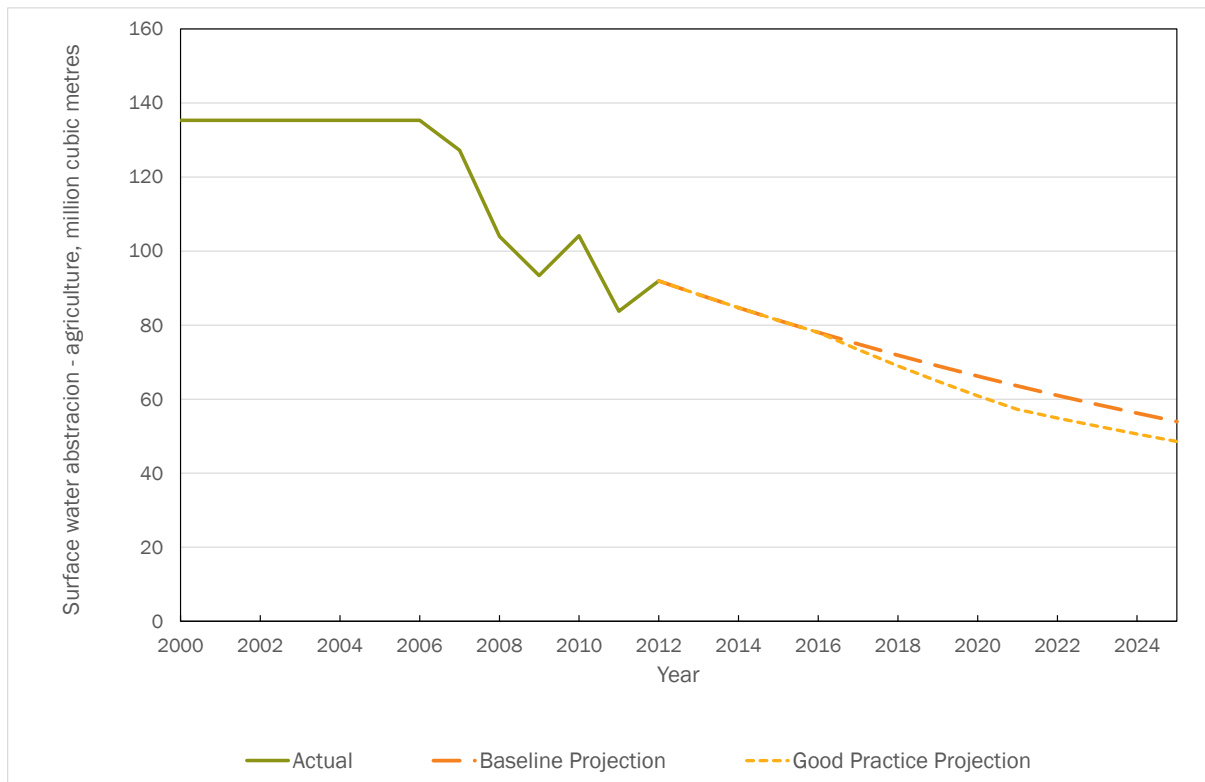


Figure 11-19: Change in Active Ingredients in Pesticides, tonnes

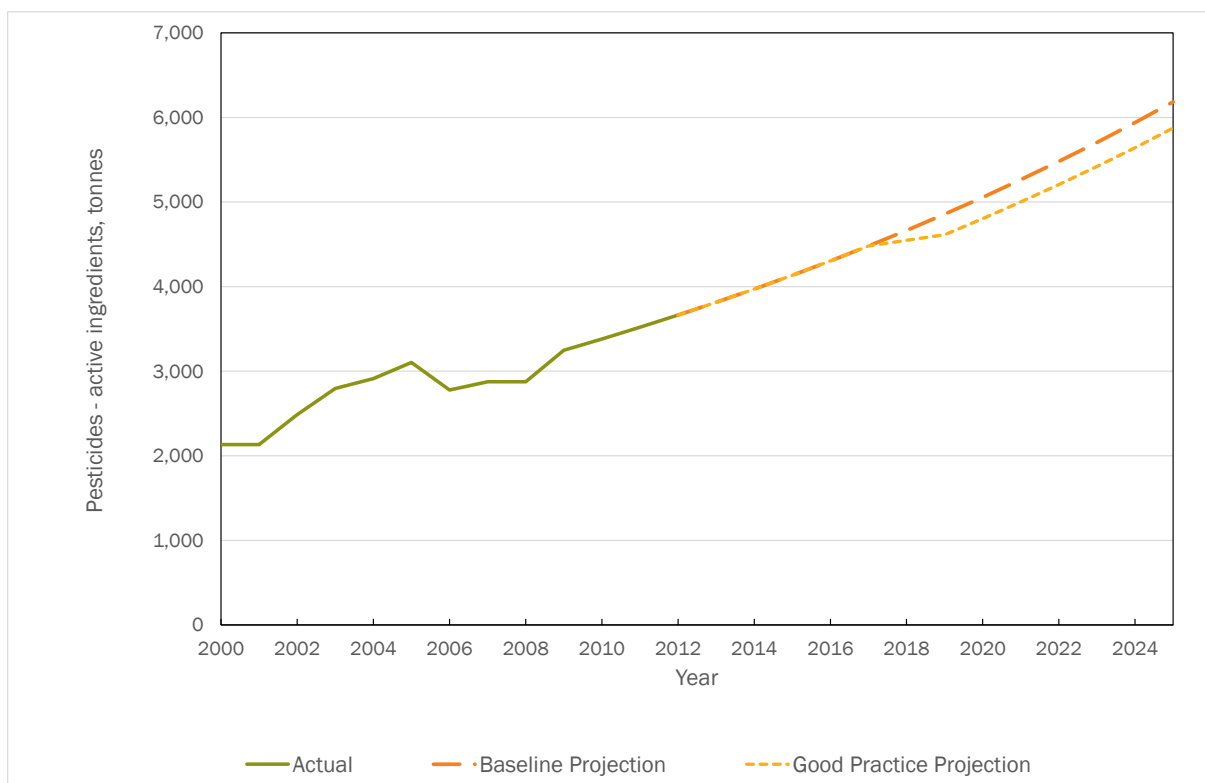


Figure 11-20: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

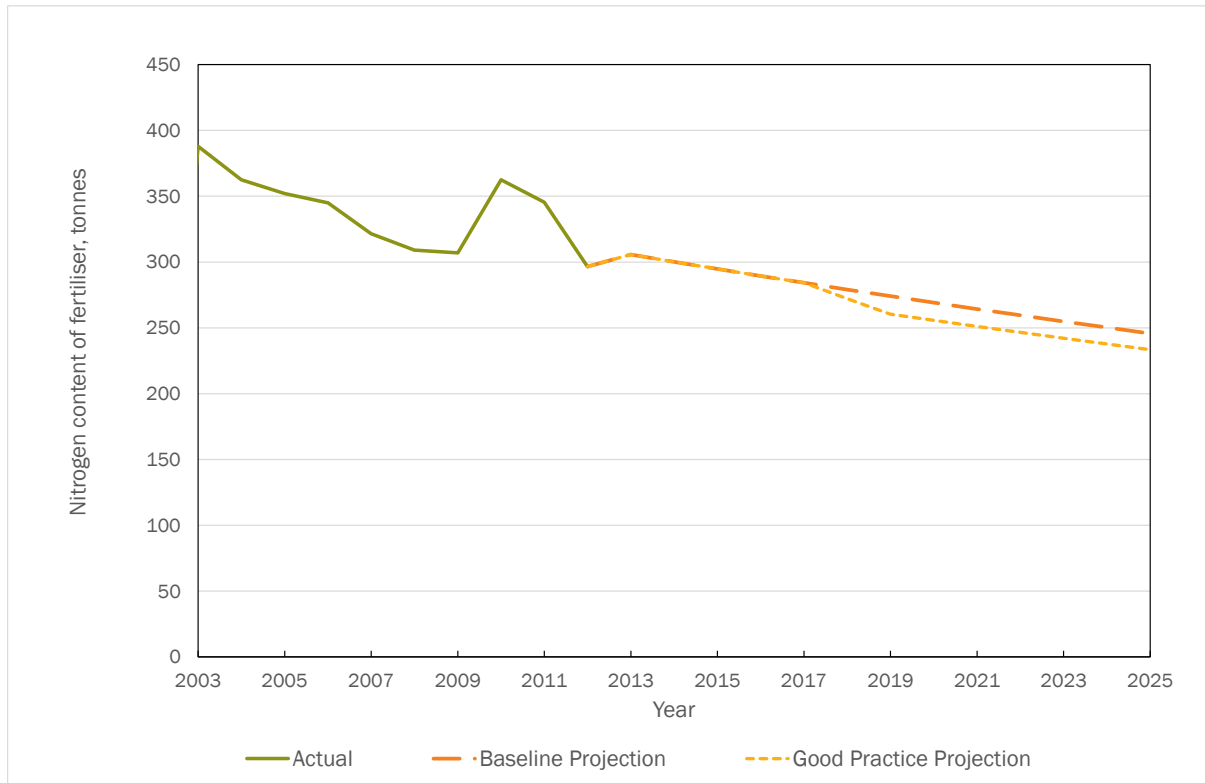


Figure 11-21: Change in Aggregates Extraction, thousand tonnes

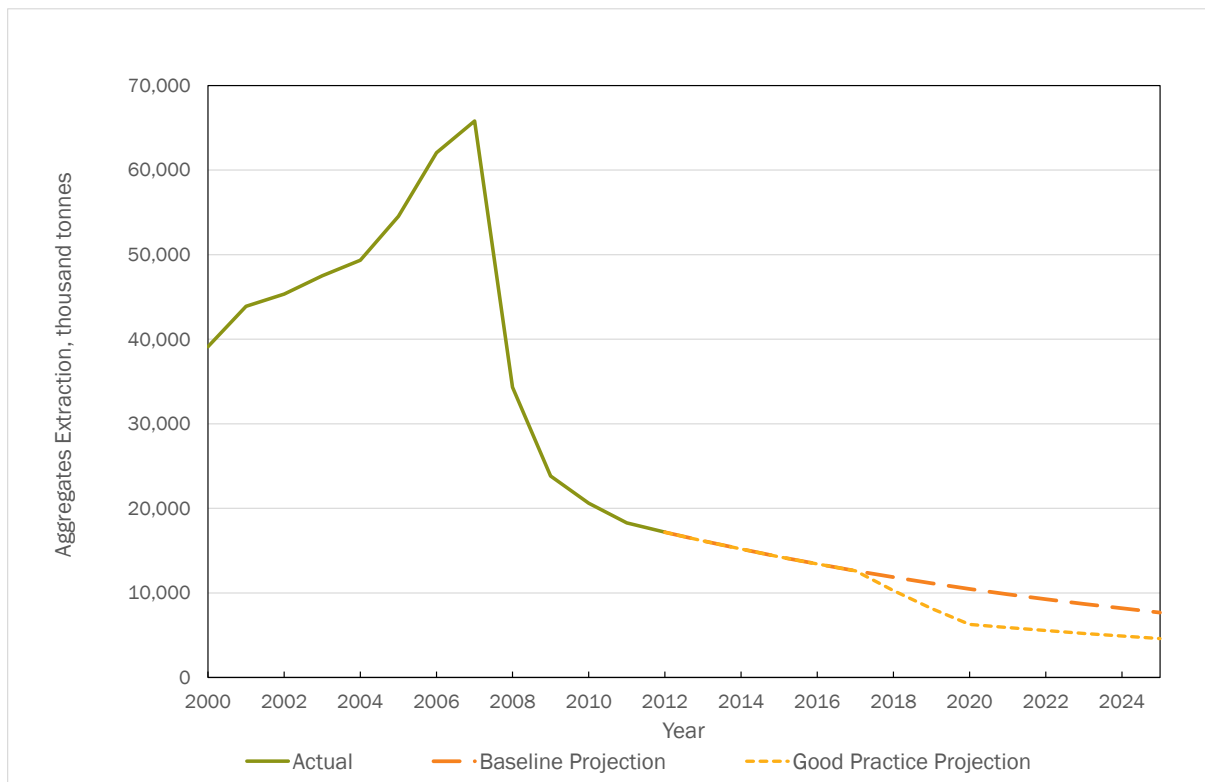


Figure 11-22: Change in Paper & Card Packaging Generation, thousand tonnes

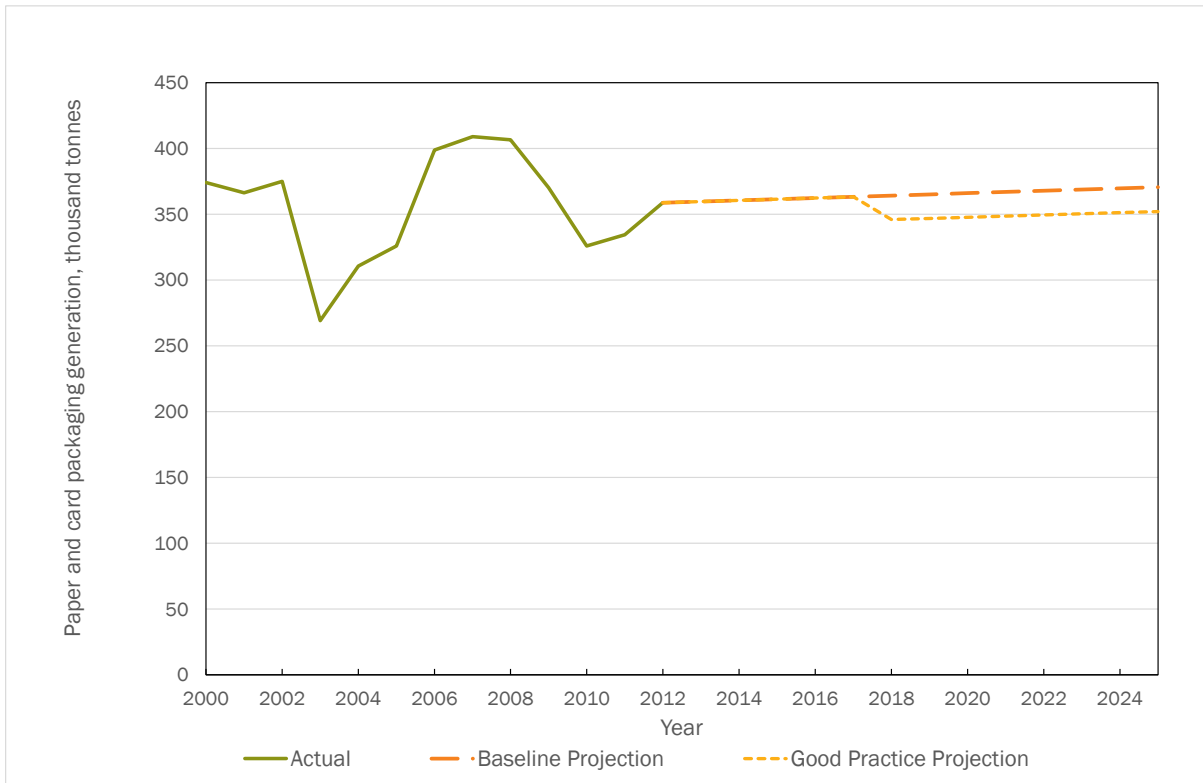


Figure 11-23: Change in Plastic Packaging Generation, thousand tonnes

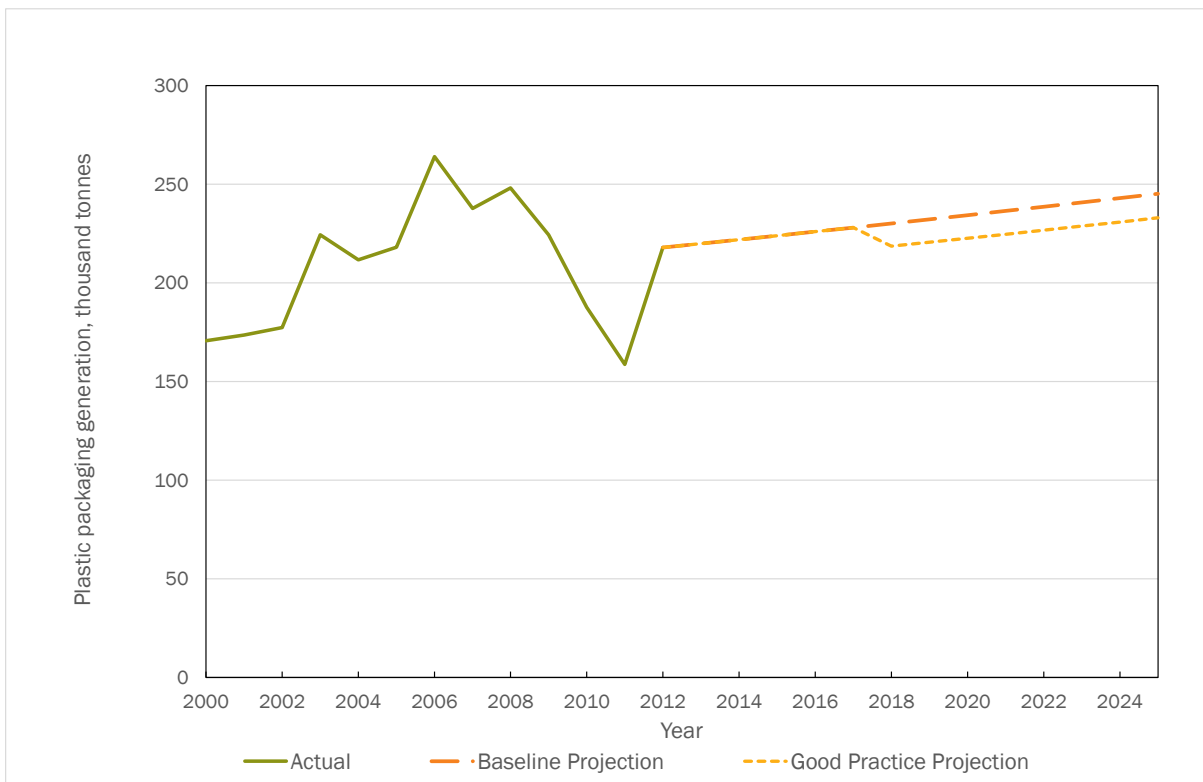


Figure 11-24: Change in Wood Packaging Generation, thousand tonnes

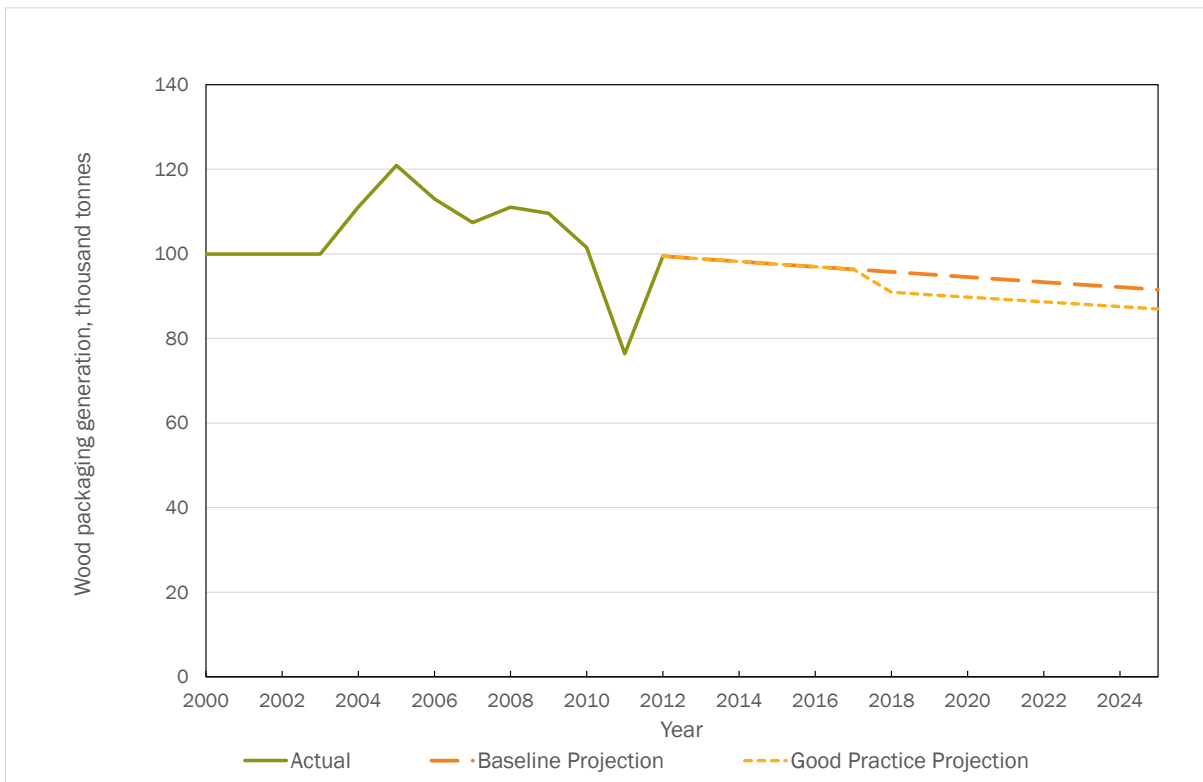


Figure 11-25: Change in Metal Packaging Generation, thousand tonnes

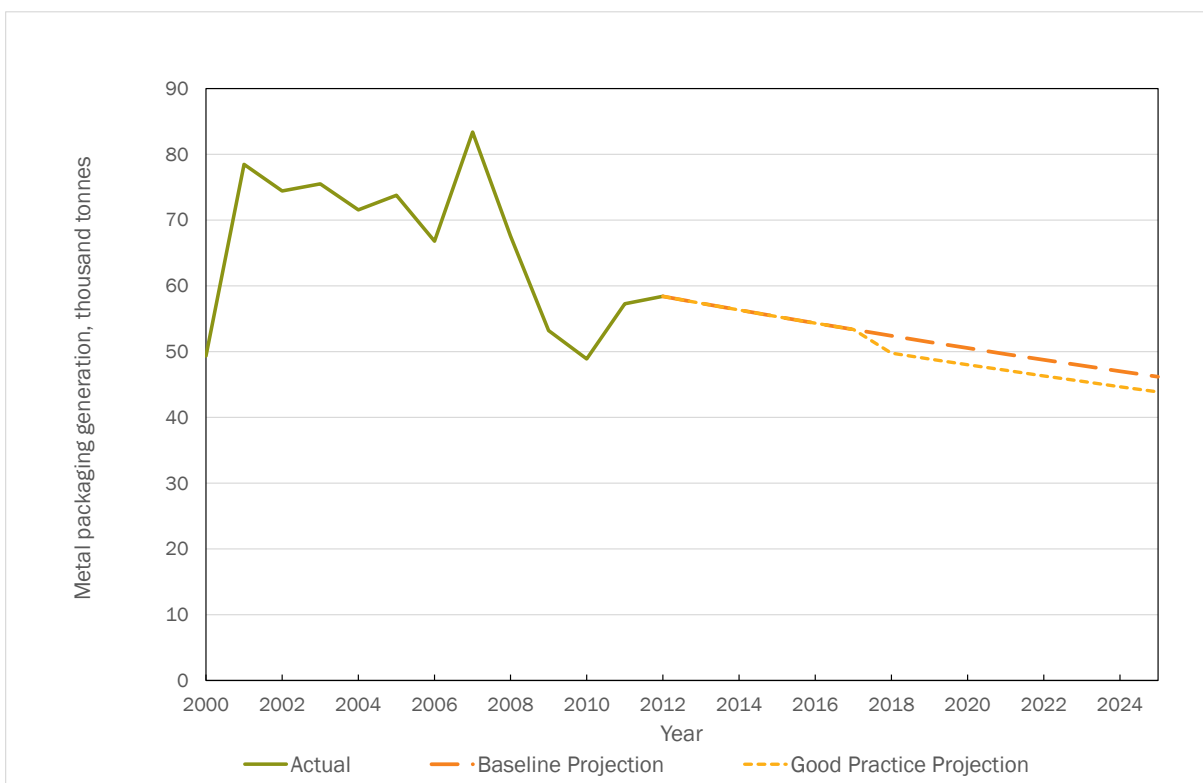


Figure 11-26: Change in Glass Packaging Generation, thousand tonnes

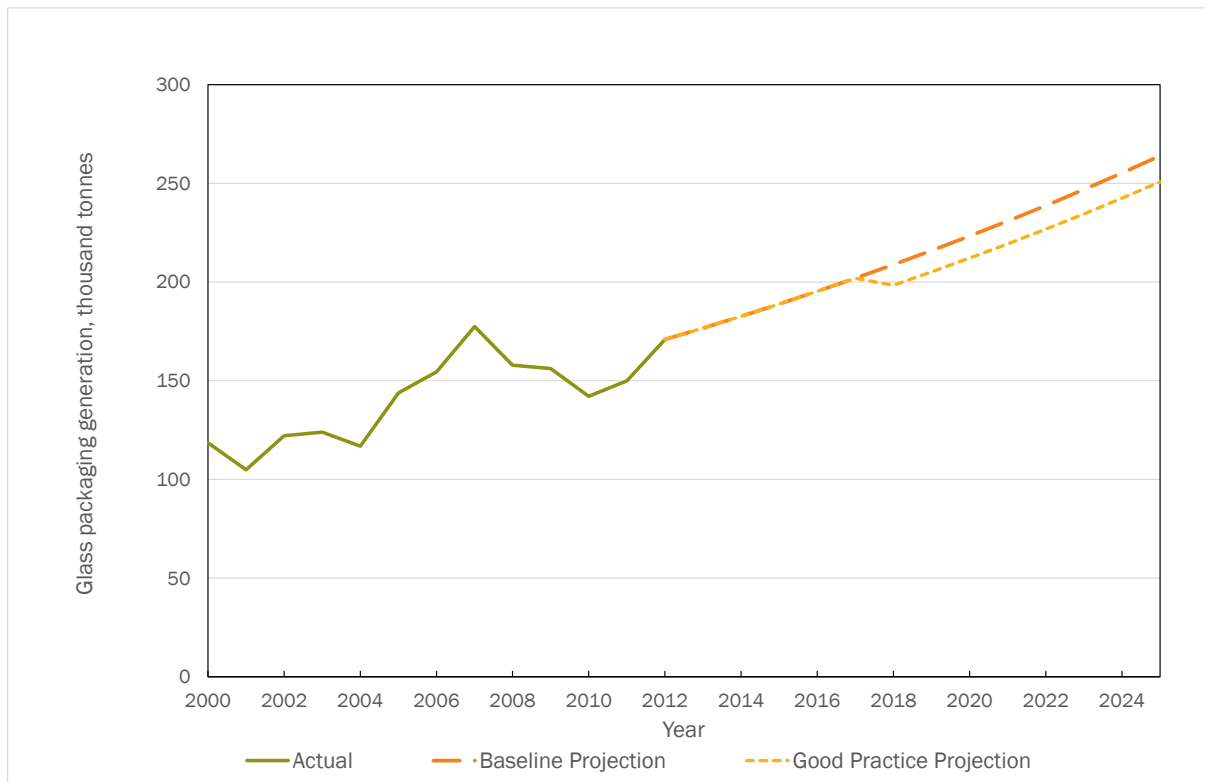
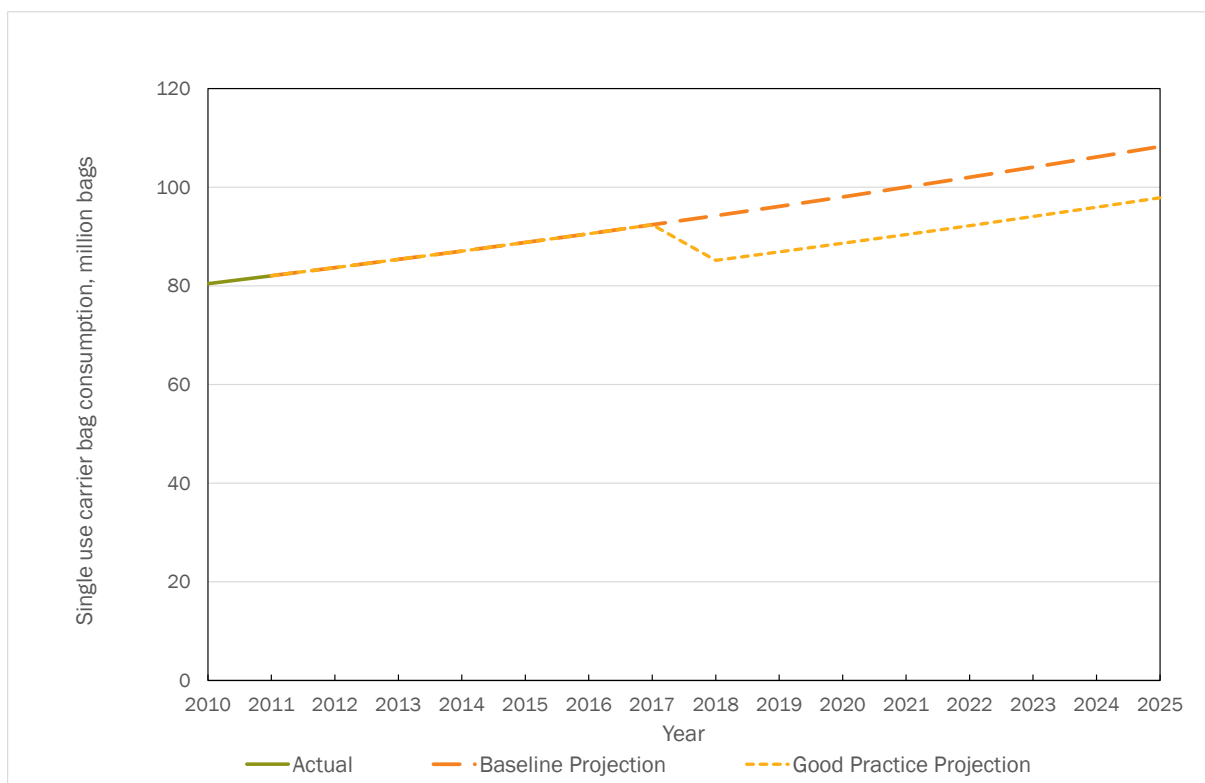


Figure 11-27: Change in Consumption of Single Use Carrier Bags, million bags



11.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 11-4: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	48	96	143	190	237	284	330	330	330
	C&I / Heating	0	0	20	39	58	77	96	115	134	134	134
	Electricity	6	6	6	6	6	6	6	6	6	6	6
	Sub-total Energy, million EUR	6	6	73	140	207	273	339	405	470	470	470
	Sub-total Energy, % GDP	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	123	247	370	494	617	618	618	618	618
	Passenger Aviation Tax	0	0	335	653	653	654	654	655	656	658	659
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Transport, million EUR	0	0	459	899	1,023	1,147	1,272	1,273	1,274	1,276	1,277
	Sub-total Transport, % GDP	0.0%	0.0%	0.3%	0.5%	0.6%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	7	15	24	25	27	27	28	28	29	29

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
	Air Pollution Tax	0	6	11	14	17	18	16	15	14	13	12	
	Water Abstraction Tax	0	19	38	55	72	88	86	86	86	86	85	
	Waste Water Tax	0	8	15	22	21	21	21	21	21	21	21	
	Pesticides Tax	0	0	28	57	58	60	63	65	68	71	73	
	Aggregates Tax	0	0	30	25	20	15	14	13	13	12	11	
	Packaging Tax	0	0	31	30	30	30	30	31	31	31	31	
	Single Use Bag Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	40	168	227	243	260	258	259	260	262	264	
	Sub-total Pollution & Resource, % GDP	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%
Total Revenue Stream	Total, million EUR	6	46	701	1,267	1,473	1,680	1,869	1,936	2,004	2,007	2,010	
	Total, % GDP	0.0%	0.0%	0.4%	0.7%	0.8%	1.0%	1.1%	1.1%	1.1%	1.1%	1.2%	

12.0 Latvia

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

12.1 Energy Taxes

There are two types of energy taxes in Latvia: excise duties, as applied to energy products, natural gas and coal, and a new tax (the 'subsidised electricity tax'), aimed at generating revenue to reduce the impact of higher energy costs on low income consumers, and applied since 1st January 2014.

The following excise duties are applied to energy products in Latvia:³⁷⁵

- Petrol:
 - Leaded petrol:
 - Rate (2014): €455.32 per 1,000 litres of fuel.
 - Note that leaded petrol is no longer sold in Latvia.
 - Unleaded petrol:
 - Rate (2014): €411.21 per 1,000 litres of fuel.
 - Unleaded petrol with 70% - 85% bio-ethanol content is taxed at a reduced rate: €123.36 per 1,000 litres of fuel.
- Gas oil (diesel):
 - Gas oil used as a propellant:
 - Rate (2014): €332.95 per 1,000 litres of fuel.
 - If the fuel contains at least 30% biofuel of rape seed origin by volume, the rate is €233.35 per 1,000 litres of fuel.
 - Fuels that are 100% biofuels are exempt from excise duties.
 - Gas oil used for industrial or commercial use and both business and non-business heating:
 - Rate (2014): €56.91 per 1,000 litres of fuel.

³⁷⁵ European Commission - Taxation and Customs Union (2014) *Excise Duty Tables: Part II - Energy Products and Electricity*, July 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- Fuels that contain at least 5% biofuel of rape seed origin are taxed less: €21.34 per 1,000 litres of fuel.
 - Gas oil used for certain agricultural purposes is exempt from excise duties.³⁷⁶
- Kerosene:
- The tax rates for kerosene are identical to those for gas oil, although only one rate is applied to kerosene used as a propellant.
 - Kerosene used as a propellant:
 - Rate (2014): €332.95 per 1,000 litres of fuel.
 - Kerosene used for industrial or commercial use and both business and non-business heating:
 - Rate (2014): €56.91 per 1,000 litres of fuel.
 - Fuels that contain at least 5% biofuel of rape seed origin are taxed less: €21.34 per 1,000 litres of fuel.
- Heavy fuel oil:
- Heating, both business and non-business use:
 - Rate (2014): €15.65 per 1,000 kg of fuel.
- Liquefied Petroleum Gas (LPG):
- Propellant and industrial or commercial use:
 - Rate (2014): €161.00 per 1,000 kg of fuel.
 - LPG for heating use (business and non-business) is not taxed.
- Natural gas:
- Used as a propellant:
 - Rate (2014): €2.67 per GJ of fuel.³⁷⁷
 - All other uses (industrial or commercial and heating, both business and non-business):
 - Rate (2014): €0.46 per GJ of fuel.³⁷⁸
 - Natural gas used to heat covered agricultural land or industrial poultry houses is exempt from excise duties while natural gas used in industrial process is charged at €0.15 per GJ of fuel.^{379,380}

³⁷⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³⁷⁷ The official rate (government) is €99.60 per 1000 m³

³⁷⁸ The official rate (government) is €17.07 per 1000 m³

³⁷⁹ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Coal and Coke:
 - Heating (business and non-business use):
 - Rate (2014): €0.30 per GJ of fuel.
- Electricity:
 - Business and non-business use:
 - Rate (2014): €1.01 per MWh.
- Any fuel used for the following purposes is exempt from excise duties:
 - Aircraft, except those used for private recreation and entertainment;
 - Ships, except those used for private recreation and entertainment;
 - Generation of energy or in CHP plants; and
 - Chemical treatment processes.
- Revenue in 2012 (the latest year for which figures are available): LVL 281 million (€403 million, equivalent to 1.81% of GDP)³⁸¹

Subsidised Electricity Tax:^{382 383}

- This tax is charged on the income obtained by electricity companies from subsidised electricity generation (from renewable energy or through combined heat and power [CHP] units):
- Income from this tax is due to be used for a new Electricity Customer Support Fund, which is intended to mitigate rising electricity costs caused by the renewable energy 'Compulsory Procurement Component' which has been added to electricity bills since 2013.
- Rates are charged based on the fuel used in the production of electricity:
 - Fossil fuels used in CHP units: 15% of income;
 - Renewable energy sources: 10% of income; and
 - Fossil fuelled Combined Heat and Power with capacity (up to 4MW) and renewable energy fuelled Combined Heat and Power (all scales), where heat is delivered to district heating networks: 5% of income.
- This tax is time-limited and applies to income earned in 2014-2017.

³⁸⁰ The official rate (government) is €5.65 per 1000 m³

³⁸¹ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁸² European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³⁸³ Ecologic Institute, and eclareon (2014) *Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Latvia*, Report for European Commission - DG Clima, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/lv_2014_en.pdf, pp. 13-14

Revenue: Unknown as the tax has only been collected since 1 January 2014.

12.2 Transport Taxes (Excluding Transport Fuels)

There are three types of transport taxes imposed in Latvia: one registration tax for cars and motorcycles, and two circulation taxes, of which one is for all vehicles and one is specifically for company cars. There are no aviation taxes or charges currently collected in Latvia. Each of these taxes is described below.

- Car Registration Tax ('Car and Motorcycle Tax'):³⁸⁴
 - This is a registration tax, known until 2004 as an excise duty on vehicles, which is paid for all vehicles prior to being registered in Latvia.
 - Exemptions apply to several types of vehicles:
 - Vehicles exempt from custom duties (under EU Regulation 918/83).
 - Vehicles more than 25 years old.
 - Electric vehicles.
 - Vehicles for certain uses, such as ambulances, caravans and hearses.
 - Vehicles adapted for people with certain disabilities.
 - Sports cars and motorcycles.
 - As of 1 January 2010, for vehicles first registered in Latvia or abroad prior to 1 January 2009, rates are determined based on the age and/or the engine size of the vehicle. Vehicles registered after 1 January 2009 are charged according to their CO₂ emissions.
 - Rates for passenger cars are outlined in Table 12-1. Motorcycles registered prior to 1 January 2009 pay 25% of the rate for passenger cars. Motorcycles registered after 1 January 2009 are charged according to their engine size (€0.14 per cc).
 - Revenue in 2012 (the latest year for which figures are available): LVL 6.26 million (€8.98 million, equivalent to 0.04% of GDP)³⁸⁵
- Motor Vehicles Tax ('Vehicle Use/Operating Tax'):³⁸⁶
 - This is a circulation tax (paid annually) on all vehicles, except tractors, trailers or semi-trailers with a GVW of less than 3.5 tonnes, trams, trolleybuses, off-road vehicles, snowmobiles and mopeds.

³⁸⁴ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

³⁸⁵ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁸⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Exemptions apply for emergency vehicles, diplomatic or consular vehicles, and vehicles used by people with disabilities.
- Deductions apply for farmers (one lorry and trailer receive a 50% deduction) and people with three or more children (80% deduction on one vehicle).
- Motorcycles, motorised tricycles and quad bikes registered after 1 January 2005 are charged according to their engine capacity:³⁸⁷
 - 500 cc or below: €17.07 per annum.
 - 501 – 1,000 cc: €34.15 per annum.
 - 1,001 – 1,500 cc: €51.22 per annum.
 - 1,501 cc and above; €68.30 per annum.
- Motorcycles, motorised tricycles and quad bikes registered prior to 1 January 2005 are charged a flat-rate of €35.57 per annum.³⁸⁸
- All passenger cars are taxed according to their gross vehicle weight (GVW). Additionally those registered after 1 January 2005 are also taxed according to engine capacity and engine power, with larger vehicles charged a higher rate. Buses and lorries are taxed on their weight only. These rates are outlined in
 - Table 12-2.
 - Revenue in 2012 (the latest year for which figures are available): LVL 47.7 million (€68.4 million, equivalent to 0.31% of GDP)³⁸⁹
- Company Car Tax:³⁹⁰
 - This is a circulation tax (paid monthly), which is charged on vehicles which are used both as company and personal vehicles and which have 9 seats or fewer.
 - The tax has been collected since 1 January 2011.
 - The rate is based on the engine size and the car registration date.
 - Vehicles registered before 1 January 2005:
 - Rate: €42.69 per month.
 - Vehicles registered after 1 January 2005:

³⁸⁷ *Vehicle Operating Tax*, accessed 5 September 2014, http://www.fm.gov.lv/en/s/taxes/vehicle_operating_tax/43722-vehicle-operating-tax

³⁸⁸ Ibid.

³⁸⁹ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁹⁰ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

- Engine capacity up to 2,000 cc: €27.03 per month.
- Engine capacity from 2,001 to 2,500 cc: €42.69 per month.
- Engine capacity above 2,500 cc: €56.91 per month.
- Exemptions include emergency vehicles, taxis and certain other vehicles.
- Revenue in 2012 (the latest year for which figures are available): LVL 11.7 million (€16.9 million, equivalent to 0.08% of GDP).³⁹¹
- As part of the Natural Resources Tax, there is also a flat-rate charge of €40 per vehicle at the time of registration in Latvia.³⁹² See below for more details of the Natural Resources Tax.
- There is currently no air passenger or freight tax, but a 'passenger departure duty' was in place until the end of the 2004.³⁹³
 - The rate of the duty is unknown.
 - Revenue in 2004 (the latest year the tax was in existence): LVL 3.59 million (€5.40 million, equivalent to 0.024% of GDP).³⁹⁴

In addition to the taxes above, a road toll system (Euro Vignette) has been in place in Latvia on many stretches of main state roads since 1 July 2014. Rates depend on the type and size of the vehicle used and the vehicle's emissions rating (Euro class). Daily rates range from €8 – €11 per vehicle, while annual rates range from €400 – €925 per vehicle.³⁹⁵

³⁹¹ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁹² Valsts Ieņēmumu Dienests (State Revenue Service) (2014) *Natural Resources Tax*, accessed 5 September 2014, <https://www.vid.gov.lv/default.aspx?tabid=8&id=6681&hl=2>

³⁹³ Valsts Valodas Centrs (State Language Centre) (2010) *Transport Development Guidelines 2007-2013 (Informative Part) (English Translation)*, March 2010, http://www.vvc.gov.lv/export/sites/default/docs/LRTA/Citi/Transport_Development_Guidelines_x2007-2013x.doc#, p.11

³⁹⁴ Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

³⁹⁵ Rates and information about the Vignette are available in English: <https://www.lvignette.eu/#middle:lng=en>

Table 12-1: Car Registration Tax ('Car and Motorcycle Tax') (Latvia, 2014)³⁹⁶

Passenger cars registered before 1 January 2009		
Engine Size (cc)	Age of the Vehicle (From First Registration Date, in Years)	Tax Rate
Up to and including 3,000	2	€213.43
	3	€177.86
	4	€142.29
	5 - 7	€106.75
	8	€113.83
	9	€120.94
	10	€128.06
	11	€142.29
	12	€156.52
	13	€184.97
	14	€213.43
	15	€241.89
	16	€270.35
	17	€298.80
	18	€327.26
	19 - 25	€355.72
3,001 - 3,500	N/A	€426.86
3,501 - 4,000	N/A	€569.15
4,001 - 4,500	N/A	€711.44
4,501 and above	N/A	€853.72
Passenger cars registered after 1 January 2009		
CO ₂ emissions (g/km)	Annual Tax	

³⁹⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

0 – 120	€0.43 per g CO ₂
121 – 170	€1.42 per g CO ₂
171 – 220	€2.13 per g CO ₂
221 – 250	€3.56 per g CO ₂
251 – 300	€4.27 per g CO ₂
301 – 350	€5.69 per g CO ₂
351 and above	€7.11 per g CO ₂

Table 12-2: Motor Vehicles Tax ('Vehicle Use Tax') (Latvia, 2014)³⁹⁷

Passenger cars registered after 1 January 2005							
Gross Vehicle Weight (kg)	Annual Tax Rate (1)		Engine Capacity (cc)	Annual Tax Rate (2)		Engine Maximum Power (kW)	Annual Tax Rate (3)
1,500 or below	€14.23	+	1,500 or below	€8.54	+	55 or below	€8.54
1,501 – 1,800	€29.88		1,501 – 2,000	€21.34		56 – 92	€21.34
1,801 – 2,100	€51.22		2,001 – 2,500	€34.15		93 – 129	€34.15
2,101 – 2,600	€65.45		2,501 – 3,000	€51.22		130 – 166	€51.22
2,601 – 3,000	€78.26		3,001 – 3,500	€85.37		167 – 203	€85.37
3,001 – 3,500	€91.06		3,501 – 4,000	€149.40		204 – 240	€149.40
3,501 and above	€102.45		4,001 – 5,000	€213.43		241 – 300	€213.43
			5,001 and above	€277.46		301 and above	€277.46
Passenger cars registered before 1 January 2005 and all other vehicles (all registration dates)							
Gross Vehicle Weight (kg)	Annual Tax Rate for Passenger Cars		Annual Tax Rate for Buses		Annual Tax Rate for Lorries		
1,500 or below	€35.57		€17.07		€17.07		
1,501 – 1,800	€75.41		€34.15		€34.15		

³⁹⁷ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

1,801 - 2,100	€128.06	€64.03	€64.03
2,101 - 2,600	€162.21	€76.84	€76.84
2,601 - 3,000	€196.36	€102.45	€102.45
3,001 - 3,500	€226.24		
3,501 - 12,000	€256.12	€110.98	€145.13
12,001 and above	N/A	€145.13	Rate based on number of axles and the type of suspension. ³⁹⁸

12.3 Pollution and Resource Taxes

In Latvia, one all-encompassing Natural Resources Tax includes taxation on most of the types of activities covered by individual taxes in many other Member States. This includes an aggregates tax, water abstraction tax, landfill tax, water pollution tax, tax on various goods that are harmful to the environment, tax on materials used for packaging, tax on radioactive materials, air pollution tax (including CO₂), tax on the use of coal, coke and lignite and, finally, a tax on the pumping of natural gas or greenhouse gases into geological structures.^{399 400}

For the sake of comparison with other EU member states in this report, the Natural Resources Tax is here described under headings related to the environmental aspects that the tax is targeting.

Natural Resources Tax: ⁴⁰¹

- Total Revenue for Natural Resources Tax: in 2012 (the latest year for which figures are available) LVL 12.3 million (€17.6 million, equivalent to 0.079% of GDP). No revenue figures have been found that break down the total into its constituent parts.⁴⁰²

³⁹⁸ Valsts Ieņēmumu Dienests (State Revenue Service) (2014) *Law on the Vehicle Operation Tax and Company Car Tax*, accessed 5 September 2014, <https://www.vid.gov.lv/default.aspx?tabid=8&id=6689&hl=2>

³⁹⁹ European Commission (2014) *Taxes in Europe Database*, Accessed 3 September, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

⁴⁰⁰ Valsts Ieņēmumu Dienests (State Revenue Service) (2014) *Natural Resources Tax*, accessed 5 September 2014, <https://www.vid.gov.lv/default.aspx?tabid=8&id=6681&hl=2>

⁴⁰¹ In addition to the sources listed above, a full English translation of the Natural Resources Law is available online: Valsts Valodas Centrs (State Language Centre) (no date) *Natural Resources Tax Law (English Translation)*, no date, http://www.vvc.gov.lv/export/sites/default/docs/LRTA/Likumi/Natural_Resources_Tax_Law.doc#

⁴⁰² Eurostat (2014) *Revenue Data by Individual Tax (National Tax List)*, accessed 4 August 2014, http://ec.europa.eu/taxation_customs/taxation/gen_info/economic_analysis/tax_structures/article_5985_en.htm

➤ Waste Disposal Tax (Landfill Tax):

- A tax on waste disposal (landfill tax) has been imposed in Latvia since 1991 and has been amended twice, both in 1996 and 2006, though rates have been increased multiple times since its introduction, most recently in January 2014.^{403,404} The rate depends on the type of waste disposed and is charged on a per tonne basis:
 - Municipal waste: €12.00 per tonne (increased in several increments from €1.07 per tonne in 2007).
 - Construction & Demolition (C&D) waste: €21.34 per tonne.
 - Asbestos: €35.57 per tonne.
 - Hazardous waste: €35.57 per tonne.
 - Industrial waste: €21.34 per tonne.

➤ Water Abstraction Tax:

- Extraction of water is taxed depending on the type and quality of water extracted. Consumers who use more than 10 cubic metres of water in any 24-hour period must pay the following tax. Rates are set according to the 'polluter pays' principles and the principle that water management costs and any damage caused must be covered.⁴⁰⁵
- Anyone wishing to abstract water must have a permit. The fee for issuing a water permit was €79 in 2011. If no permit is issued, the water abstraction tax rates are ten times the rates shown below.⁴⁰⁶
- The rate for surface water abstraction was increased between 2007 and 2010; rates for other types and uses of water have remained steady since 2007:⁴⁰⁷
 - Surface water: €0.009 per m³.
 - Ground water used in water supply, high value: €0.04 per m³.
 - Ground water used in water supply, medium value: €0.03 per m³.
 - Ground water used in water supply, low value: €0.014 per m³.
 - Medicinal mineral water: €0.14 per m³.
 - Ground water sold on, high value: €1.42 per m³.

⁴⁰³ European Topic Centre on Sustainable Consumption and Production (2012) *Overview of the Use of Landfill Taxes in Europe*, Report for European Environment Agency, April 2012, http://scp.eionet.europa.eu/publications/WP2012_1/wp/WP2012_1, p. 55

⁴⁰⁴ European Commission (2014) *Commission Staff Working Document: Assessment of the 2014 National Reform Programme and Stability Programme for Latvia*, June 2014, http://ec.europa.eu/europe2020/pdf/csr2014/swd2014_latvia_en.pdf, p. 26

⁴⁰⁵ IEEP (2013) *Steps to Greening Country Report: Latvia*, Report for the European Commission, p. 12

⁴⁰⁶ Ibid, pp. 12-13

⁴⁰⁷ Ibid., p. 12

- Ground water sold on, medium value: €0.85 per m³.
- Ground water sold on, low value: €0.43 per m³.

➤ **Aggregates Tax:**

- The extraction of natural materials is taxed on a per weight or volume basis:
 - Soil: €0.43 per m³.
 - Sandy/clay loam, sedimentary rock: €0.14 per m³.
 - Quartz sand: €0.45 per m³.
 - Sand: €0.21 per m³.
 - Sand-gravel (fragments > 2-5 mm for more than 15% of the content): €0.36 per m³.
 - Clay: €0.21 per m³.
 - Dolomite for decoration: €0.36 per m³.
 - Dolomite: €0.21 per m³.
 - Limestone: €0.28 per m³.
 - Freshwater limestone: €0.14 per m³.
 - Travertine: €1.42 per m³.
 - Gypsum: €0.54 per m³ (due to be increased to €0.60 per m³ by 2016).
 - Field stones: €0.57 per m³.
 - Pigmentary soil: €0.14 per m³.
 - Peat (moisture – 40%): €0.55 per tonne.
 - Organogenic sapropel (algal and zoogenic-algal) and organogenic lime with ash content less than 30% (moisture – 60%): €0.71 per tonne.
 - Other sapropel rock (moisture – 60%): €0.14 per tonne.
 - All types of medicinal mud: €0.71 per tonne.

➤ **Air Pollution Tax:**

- Any emission of air pollutants (including CO₂) which is outside of transferred allowances is taxed. A number of these rates are due to be further increased in 2015, having increased steadily since 2007:⁴⁰⁸
 - CO₂ from stationary technological installations (except those covered by exemptions outlined in the Law on Pollution⁴⁰⁹): 2014 rate: €2.85 per tonne; 2015 rate: €3.50 per tonne.

⁴⁰⁸ IEEP (2013) *Steps to Greening Country Report: Latvia*, Report for the European Commission, p. 30

- PM₁₀ (not containing heavy metals): 2014 rate: €51.22 per tonne; 2015 rate: €75.00 per tonne.
 - Carbon Monoxide: Rate (not changing in 2015): €7.83 per tonne.
 - Ammonia and other non-organic compounds: Rate (not changing in 2015): €18.50 per tonne.
 - Sulphur dioxide, nitrogen oxides, VOCs and other hydrocarbons: Rate (not changing in 2015): €85.37 per tonne.
 - Heavy metals and compounds thereof: Rate (not changing in 2015): €1,138.30 per tonne.
 - PM₁₀ for bulk handling at open terminals or other open areas: 2014 rate: €1,024.40 per tonne; 2015 rate: €1,500.00 per tonne.
- Water Pollution Tax:
- A tax is levied on pollution discharged into water ways. The level of the tax is set according to how hazardous the material is and is paid per tonne of material released:
 - Non-hazardous substances: €5.50 per tonne
 - Suspended (non-hazardous) substances: €14.23 per tonne
 - Moderately-hazardous substances: €42.69 per tonne
 - Hazardous substances: €11,382.97 per tonne
 - Especially hazardous substances: €71,143.59 per tonne
 - Phosphorus (total content): €270.00 per tonne
- Packaging Tax (and tax on disposable tableware and accessories):
- The sale of materials used for packaging as well as the use of disposal tableware is taxed on a per kg basis. This also includes plastic bags:
 - Glass-source materials: €0.44 per kg.
 - Plastic-source materials, except 'bioplastic' and oxy-degradable plastic source materials: €1.22 per kg.
 - Metal-source materials: €1.10 per kg.
 - Wood-, paper-, cardboard- and other natural fibre- and bioplastic-source materials: €0.24 per kg.
 - Oxy-degradable plastic-source materials: €0.70 per kg.
 - Polystyrene-source materials: €1.56 per kg.
 - Plastic bag (weight per bag is less than 0.003 kg): €3.70 per kg.
 - Plastic bag (weight per bag is more than 0.003 kg): €1.14 per kg.

⁴⁰⁹ This includes energy generation from renewable energy and peat. [Source: IEEP (2013) *Steps to Greening Country Report: Latvia*, Report for the European Commission, p.10]

- Tax on goods harmful to the environment:
 - The sale of goods harmful to the environment is taxed, either according to the weight of material or per item:
 - Lubricating oils: €0.17 per kg.
 - Electric batteries and galvanic sources of electricity: €0.74 – €17.03 per kg, depending on the type of battery.
 - Substances depleting the ozone layer: €2.22 per kg of ozone depletion potential.
 - Tyres: €0.33 per kg.
 - Oil filters: €0.33 per kg.
 - Electrical and electronic equipment (in accordance with Section 20.1, §1 of the Waste Management Law): €1.44 – €3.01 per kg, though gas discharge light bulbs are taxed on a per item basis: €8.58 per item.
 - The use of radioactive substances (resulting in radioactive waste) is also taxed:
 - The rate ranges from €711.44 per m³ of waste for the first radionuclide group from a closed radiation source to €14,228.72 per m³ of waste for the seventh radionuclide group from an ionising radiation source.
 - Vehicles are also taxed under the Natural Resources Tax, in addition to being subject to registration taxes. This is paid by the person who imports or sells the vehicles in Latvia.
 - The rate is €40 per vehicle.
- Additional tax on the sale of coal, coke and lignite:
 - Rate:
 - Coal, coke and lignite with known thermal input: €0.30 per GJ.
 - Coal, coke and lignite without known thermal input: €8.54 per tonne.
- Tax on the pumping of natural gas and greenhouse gases into geological structures:
 - The tax depends on the particular gas pumped:
 - Natural gas: €0.0143 per m³
 - Methane: €0.0143 per m³
 - Carbon dioxide: €0.07 m³
 - Other greenhouse gases: €0.14 per m³

- It has been reported that advertisement paper was due to be taxed under the Natural Resources Tax from August 2013 at a rate of €1.28 per kg, but this does not appear to be the case.⁴¹⁰
- In addition to the Natural Resources Tax, Latvia was recently considered a mandatory deposit refund system for beverage containers, to be enforced from 1st January 2015.⁴¹¹ The legal framework needed to implement this has not been adopted and the idea has now been put on hold.⁴¹²
- Water Charging:
 - Water charging in Latvia takes the form of the water abstraction tax, which is part of the Natural Resources Tax, as described above. This includes a flat volumetric-based rate which varies according to the type and quality of the water extracted, with surface water charged at a rate more than four times lower than the rate for groundwater. The tax is only collected if water usage is greater than 10 m³ in a given 24-hour period.
 - A permit must be issued before water can be abstracted and users that do not have a permit but abstract water nonetheless (or who extract more than is permitted) are taxed at ten times the normal rate.
 - An Arcadis report from 2010 states that the Daugava, Lielupe, Gauja, and Venta rivers have 100% cost recovery of financial costs related to water for agriculture.⁴¹³
 - A report from the European Environment Agency in 2013 also notes that a water supply user charge, a sewage charge, a water effluent charge and water pollution non-compliance fees are also implemented in Latvia, though no further information has been found on any of these charges.⁴¹⁴

12.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

⁴¹⁰ Ecologic Institute, and eclareon (2014) *Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Latvia*, Report for European Commission - DG Clima, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/lv_2014_en.pdf, p.12

⁴¹¹ Ecologic Institute, and eclareon (2014) *Assessment of Climate Change Policies in the Context of the European Semester - Country Report: Latvia*, Report for European Commission - DG Clima, January 2014, http://ec.europa.eu/clima/policies/g-gas/progress/docs/lv_2014_en.pdf, p.15

⁴¹² Personal communication with Silvija Aile of DG Environment at the European Commission, 3rd October 2013.

⁴¹³ See the annexes of ARCADIS, InterSus, Fresh Thoughts Consulting, Eco Logic, and TYP SA (2012) *The Role of Water Pricing and Water Allocation in Agriculture in Delivering Sustainable Water Use in Europe*, Report for European Commission Directorate-General for the Environment, February 2012, www.enorasis.eu/uploads/files/Water%20Governance/role_water_pricing.pdf, p. 18

⁴¹⁴ European Environment Agency (2013) *Assessment of Cost Recovery Through Water Pricing*, September 2013, www.eea.europa.eu/publications/assessment-of-full-cost-recovery, p. 115

Table 12-3: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	853	835	-18
Petrol	million litres	252	252	0
Kerosene	million litres	121	121	0
LPG	thousand tonnes	35	31	-4
Heavy Fuel Oil	thousand tonnes	4	4	0
Natural Gas	TJ (GCV)	14,422	13,997	-425
Coal	thousand tonnes	2,231	2,221	-11
Electricity	GWh	5,862	5,862	0

Figure 12-1: Change in Internal Passenger Flights, flights per year

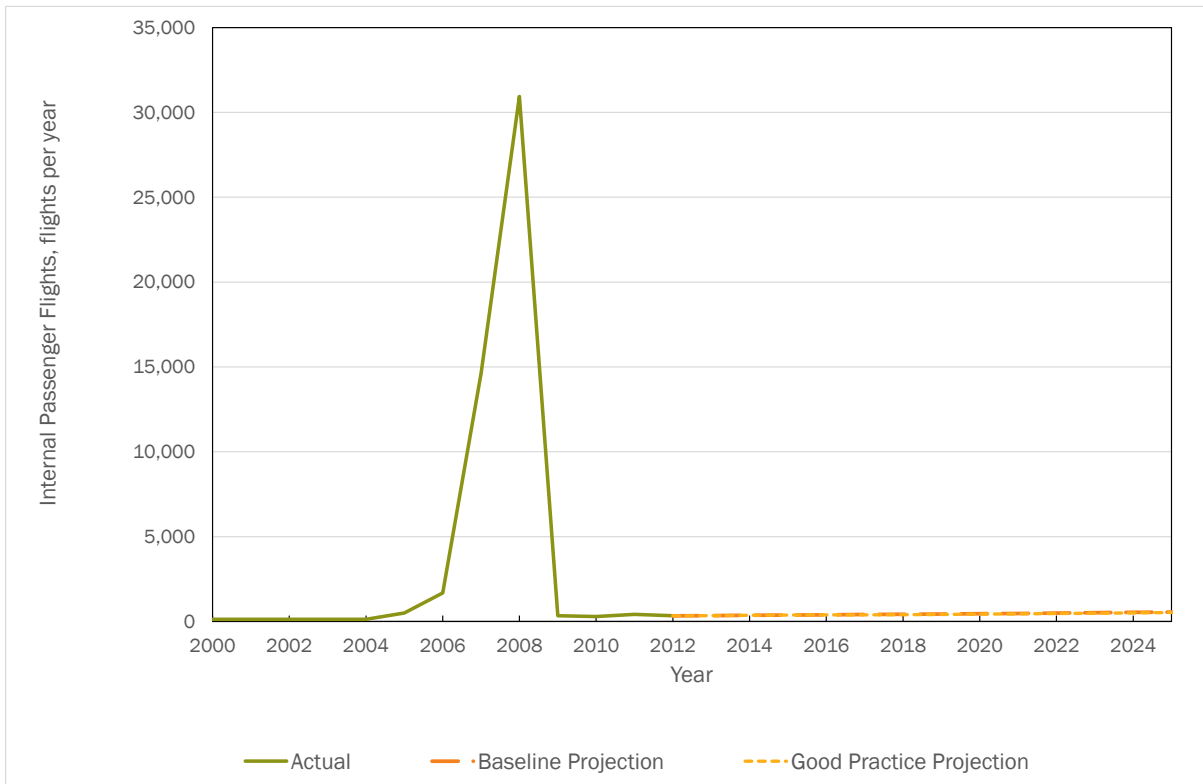


Figure 12-2: Change in Intra-EU Passenger Flights, flights per year

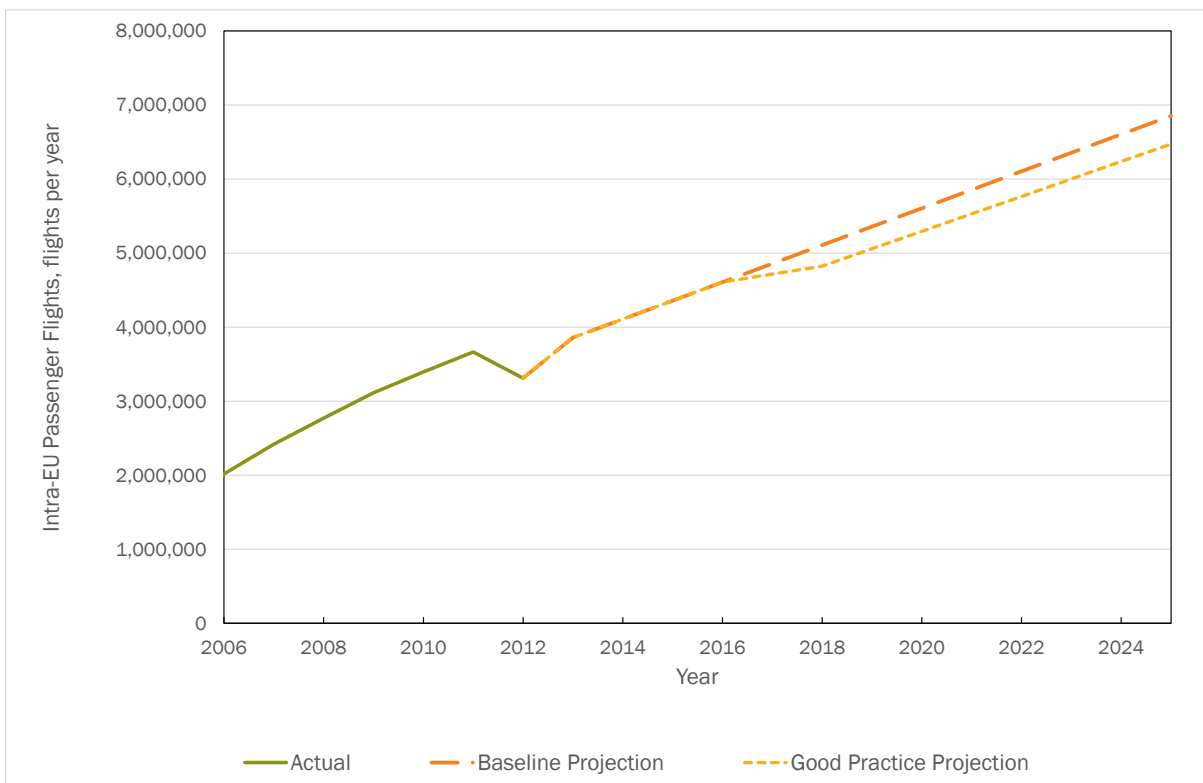


Figure 12-3: Change in Extra-EU Passenger Flights, flights per year

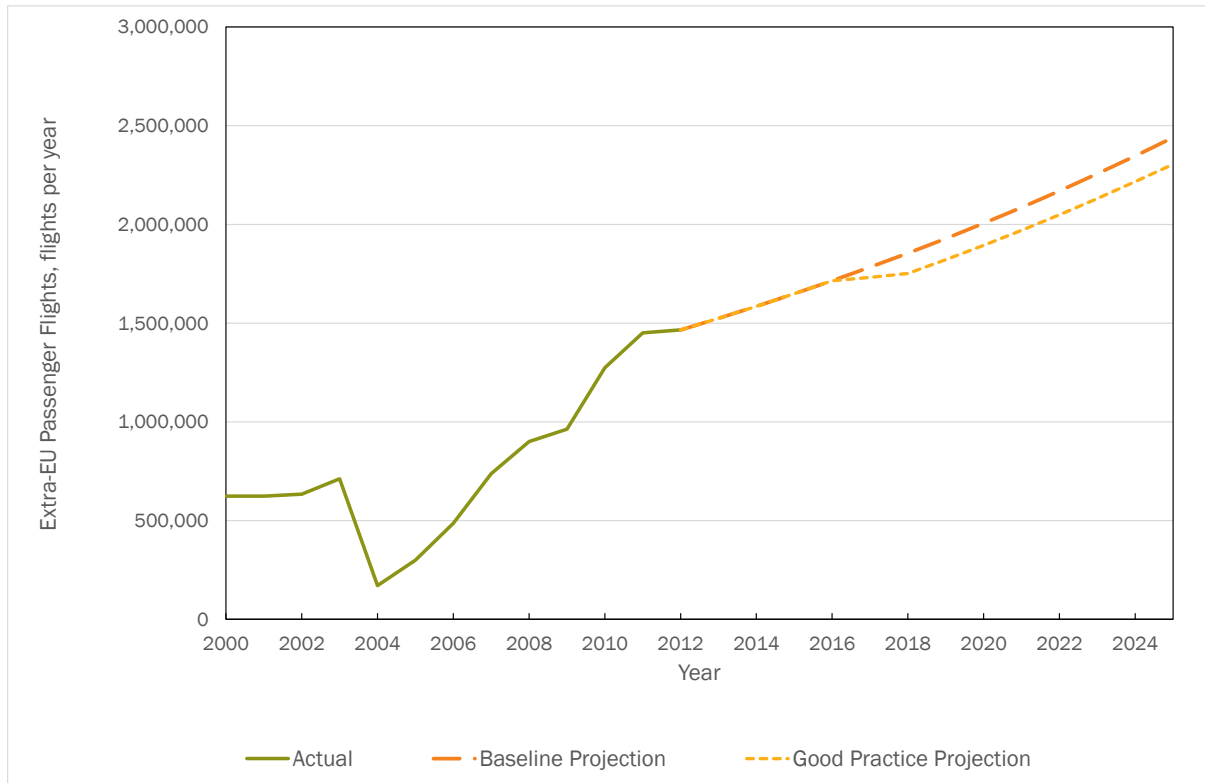


Figure 12-4: Change in Internal Air-freight, tonnes

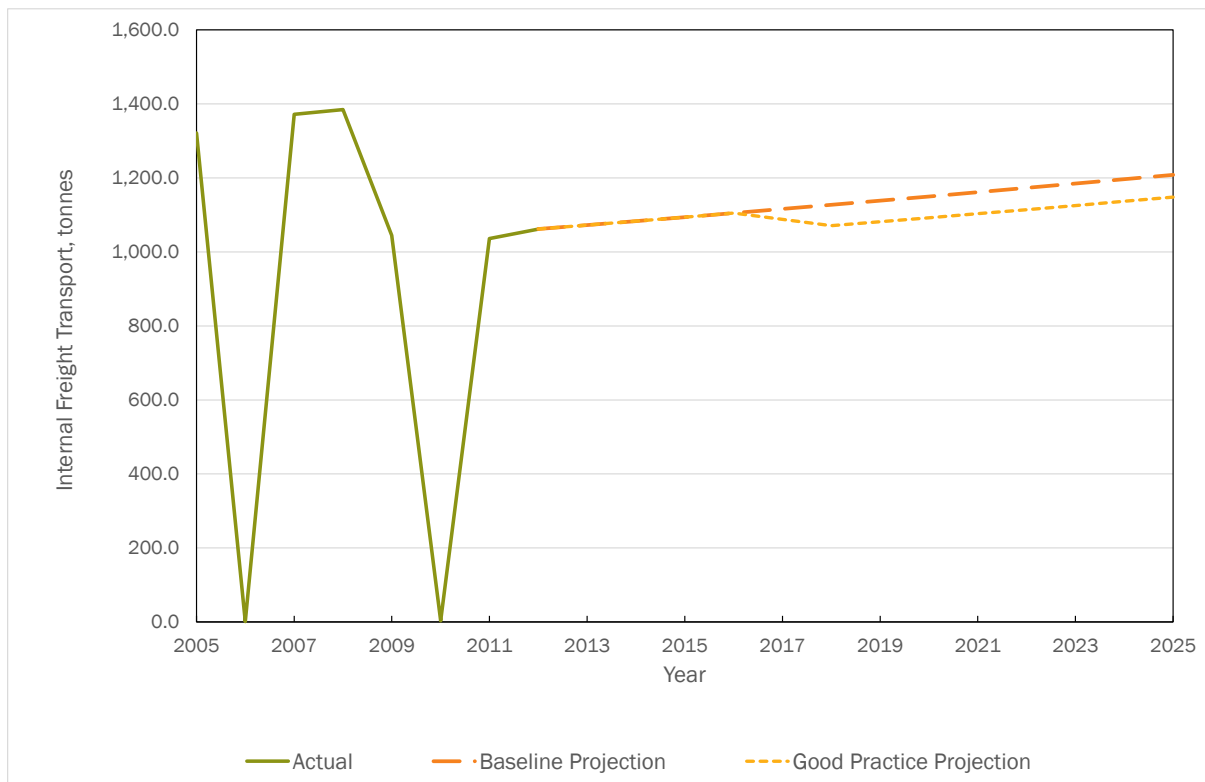


Figure 12-5: Change in Intra-EU Air-freight, tonnes

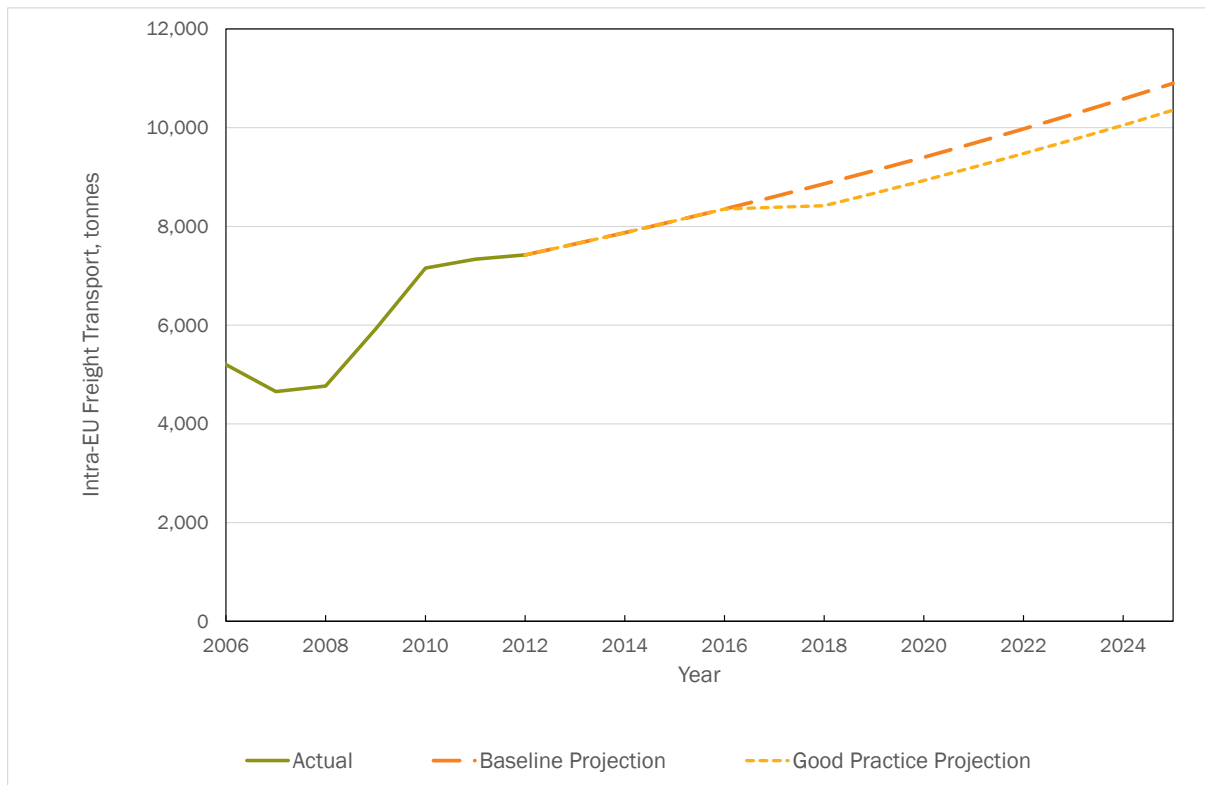


Figure 12-6: Change in Extra-EU Air-freight, tonnes

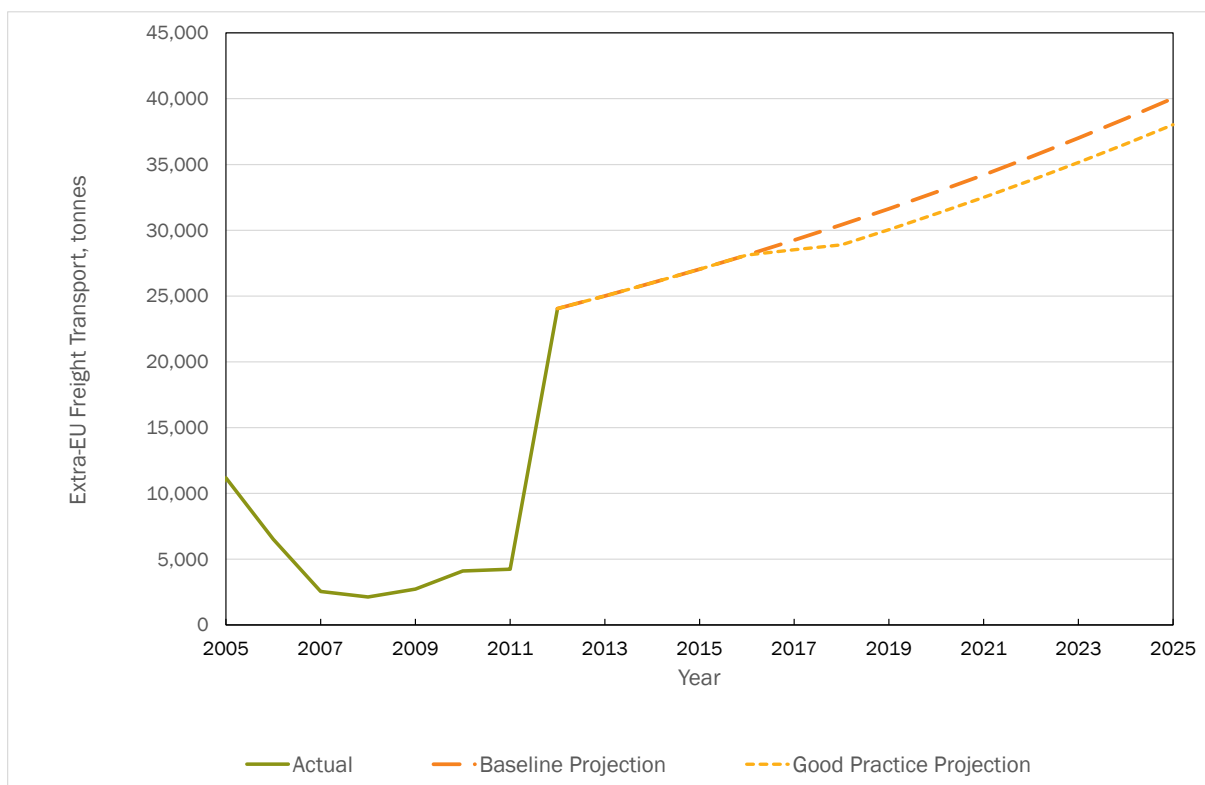


Figure 12-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

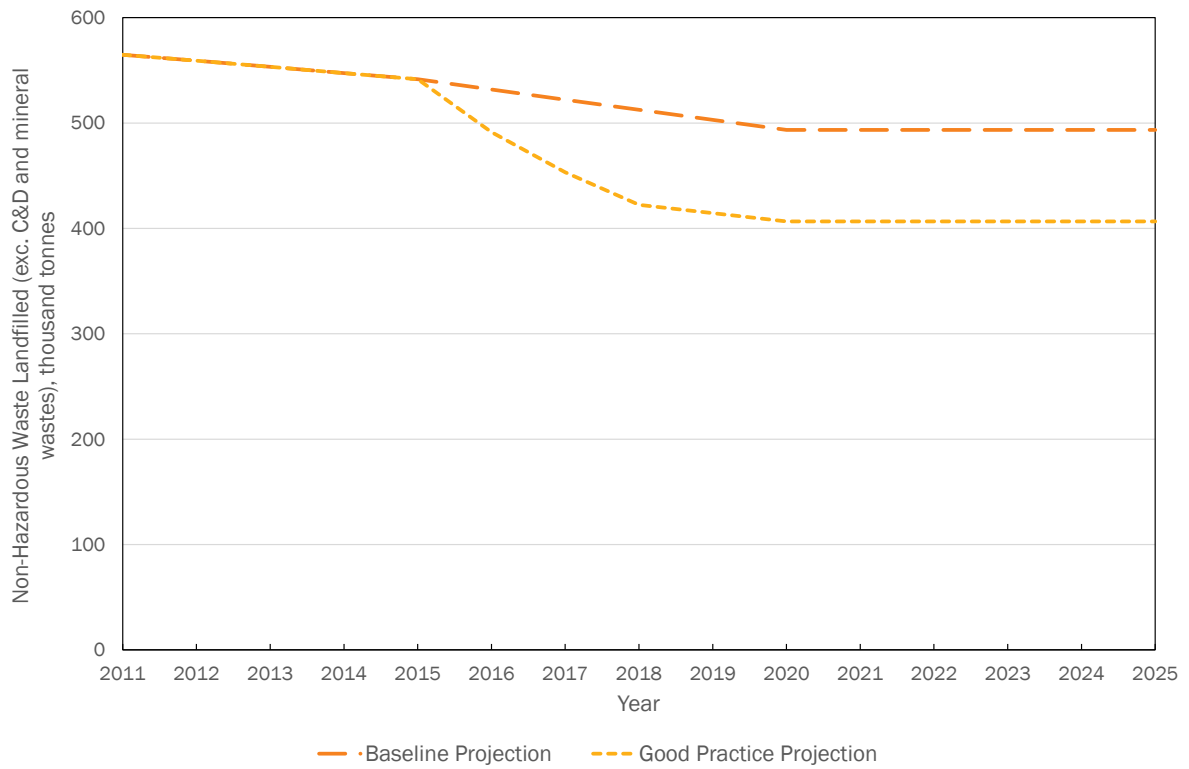


Figure 12-8: Change in MBT/ Incineration, thousand tonnes

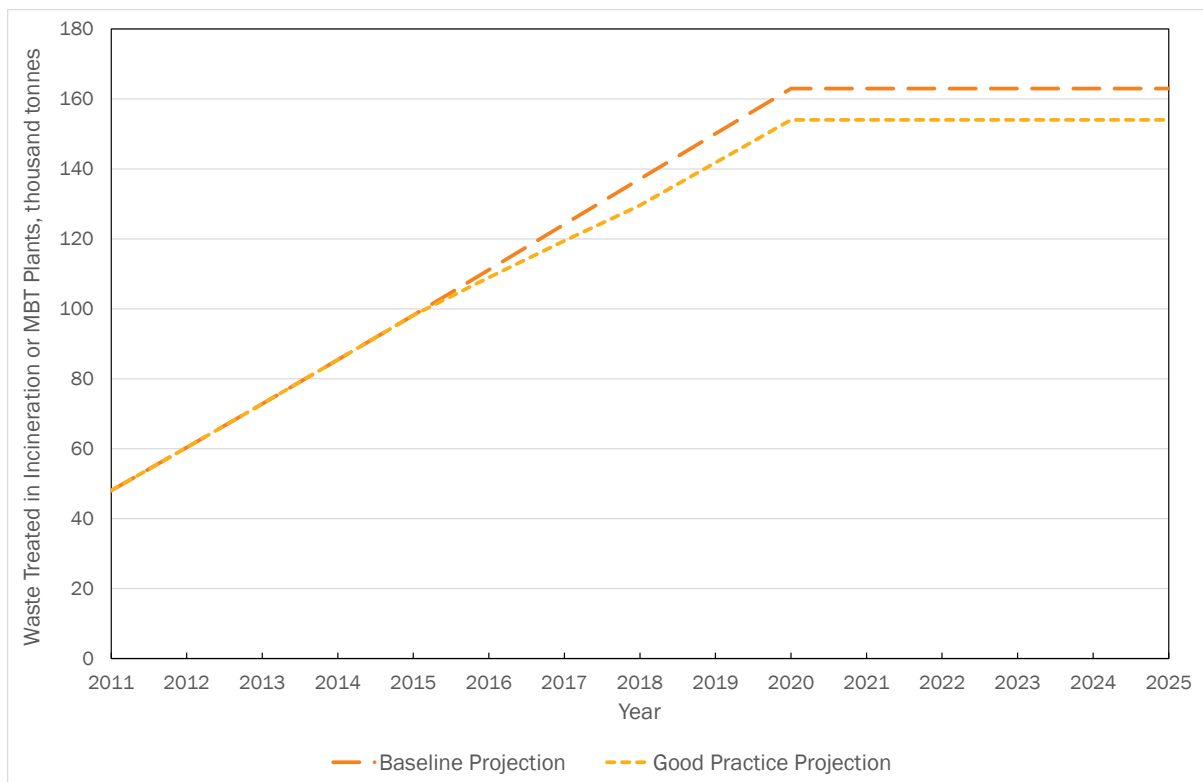


Figure 12-9: Change in SOx Emissions, tonnes

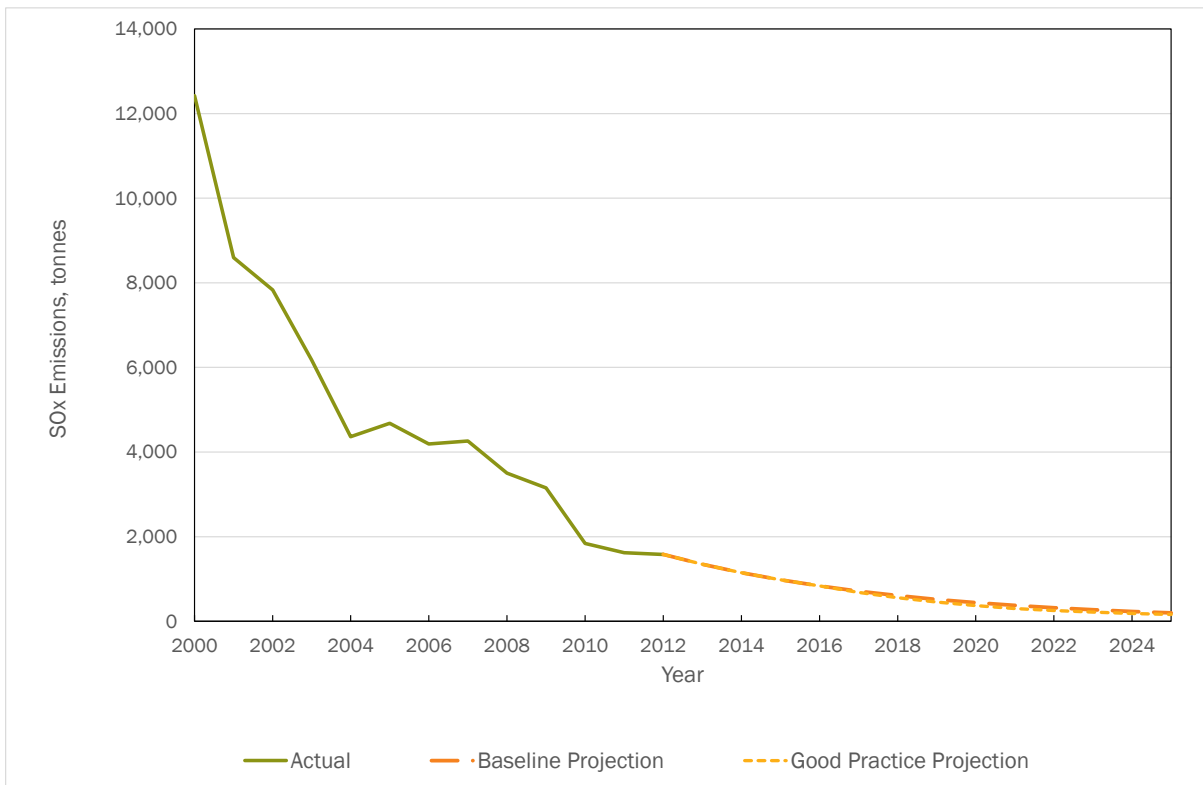


Figure 12-10: Change in NOx Emissions, tonnes

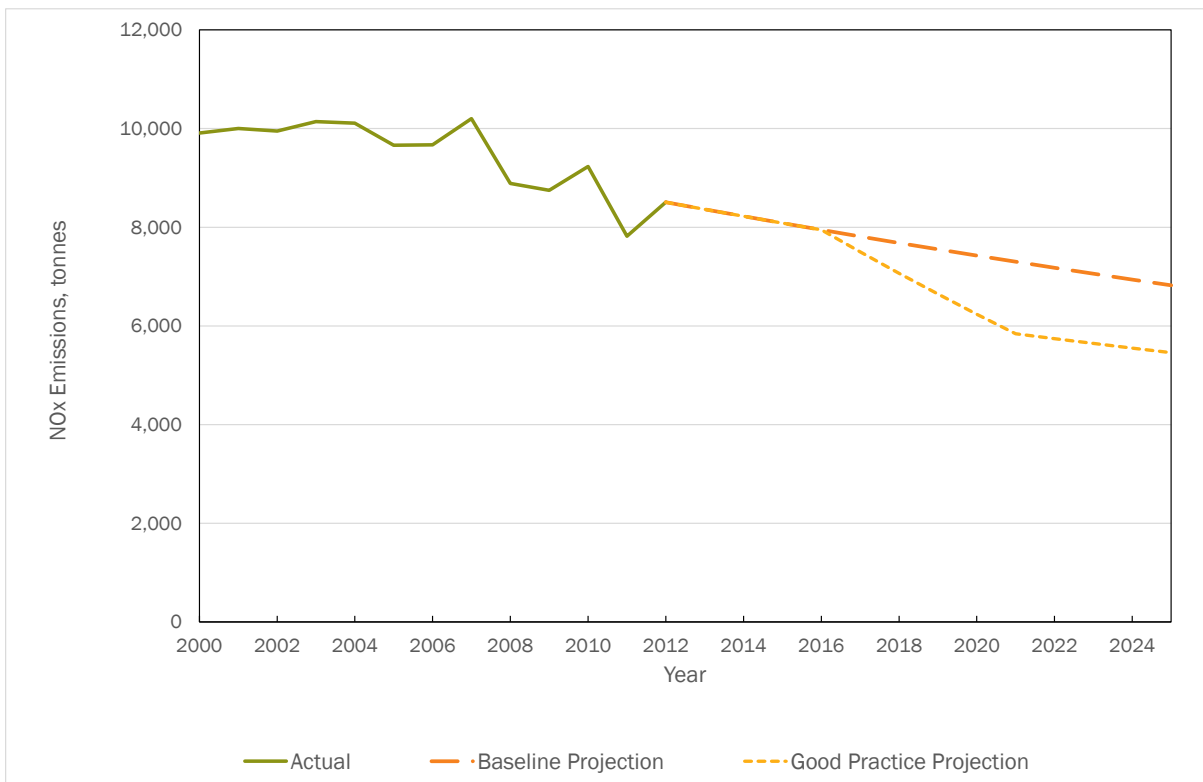


Figure 12-11: Change in PM₁₀ Emissions, tonnes

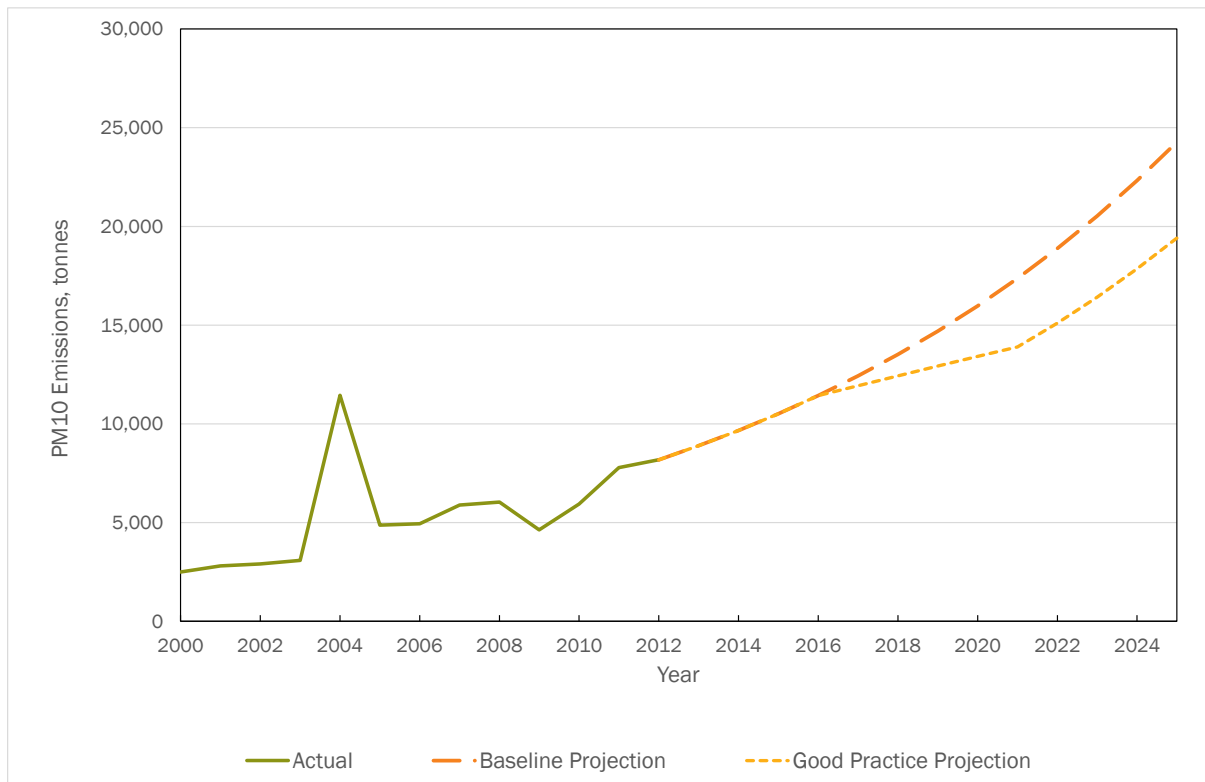


Figure 12-12: Change in Groundwater Abstraction – Public Supply, million cubic metres



Figure 12-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

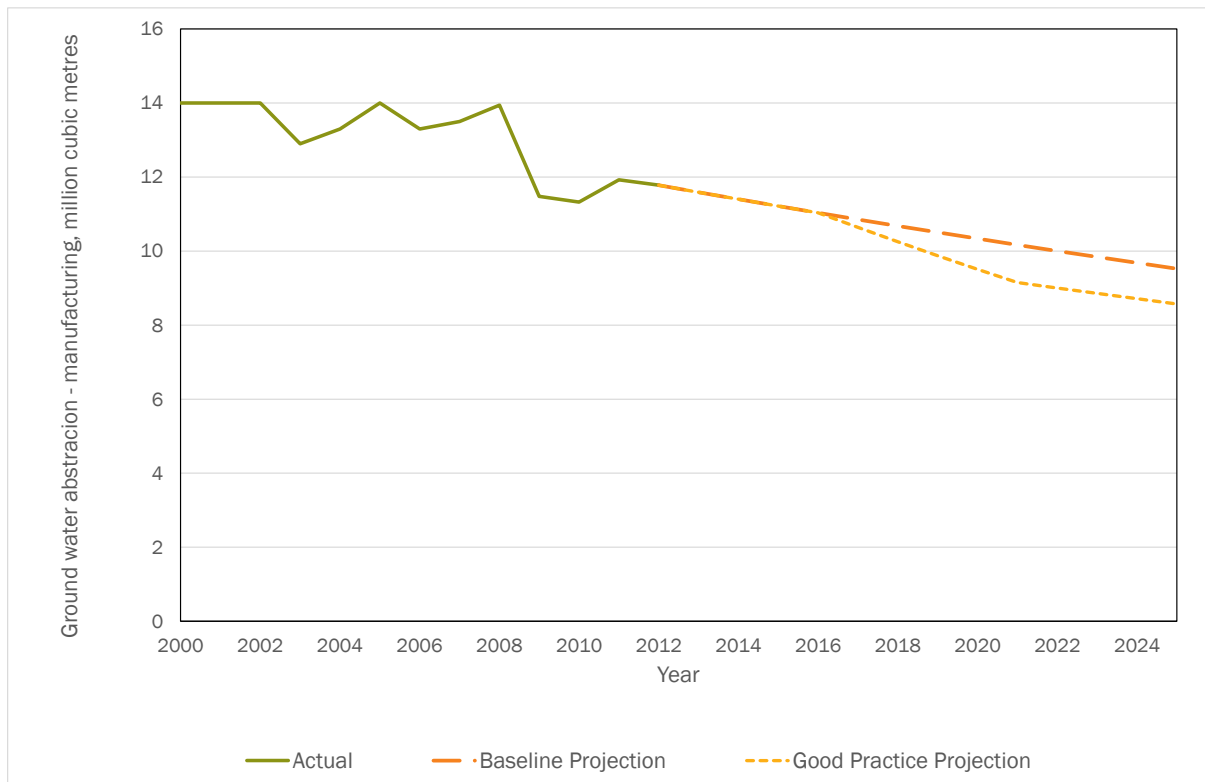


Figure 12-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

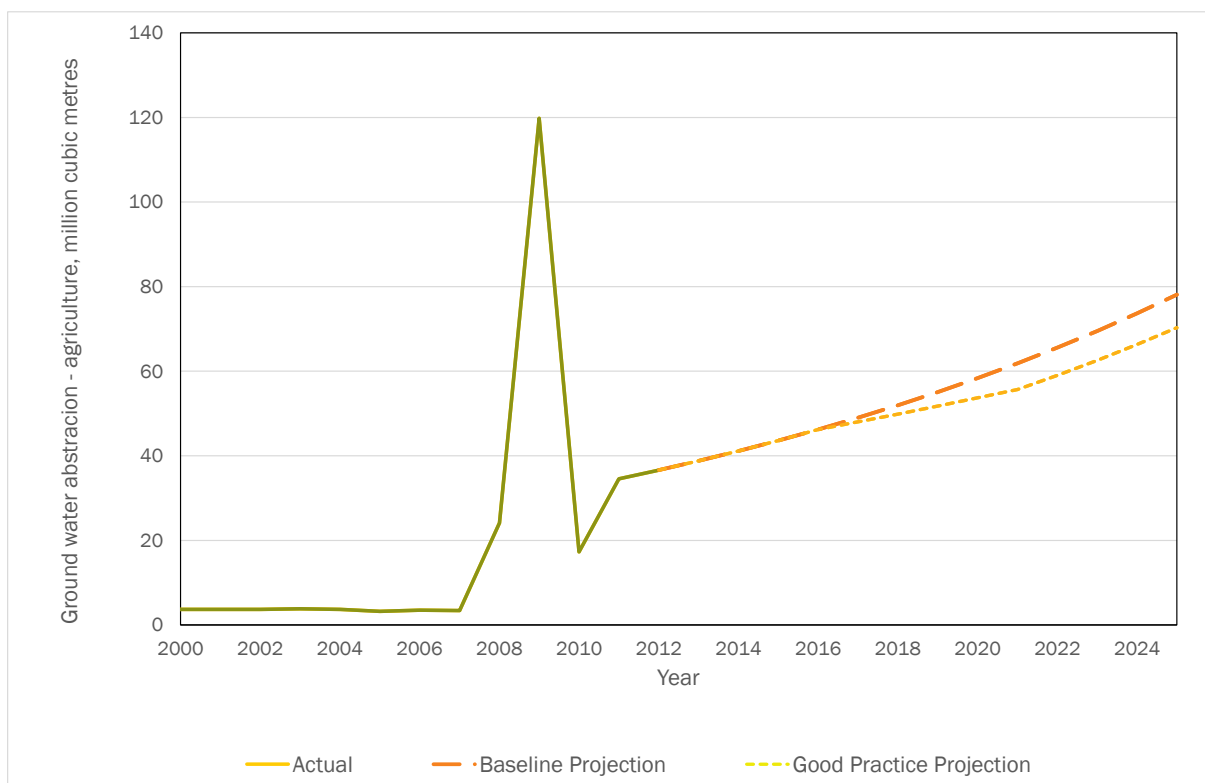


Figure 12-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

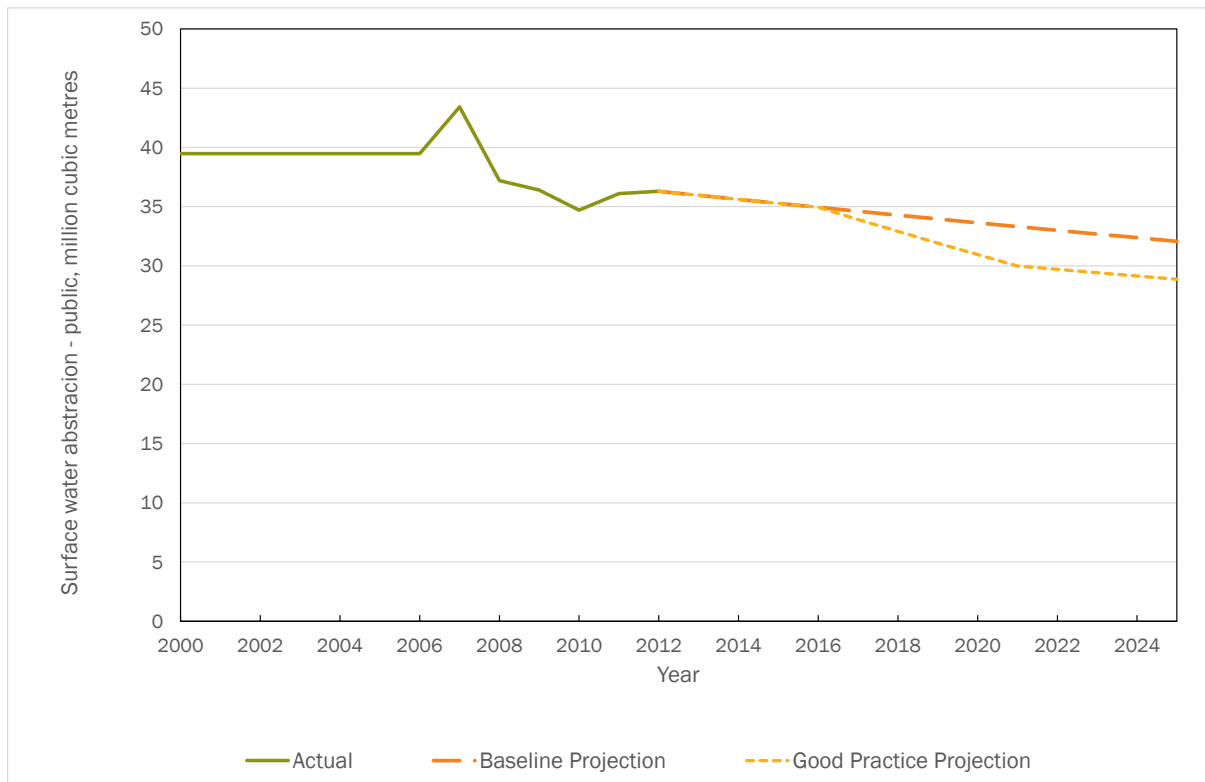


Figure 12-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres



Figure 12-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

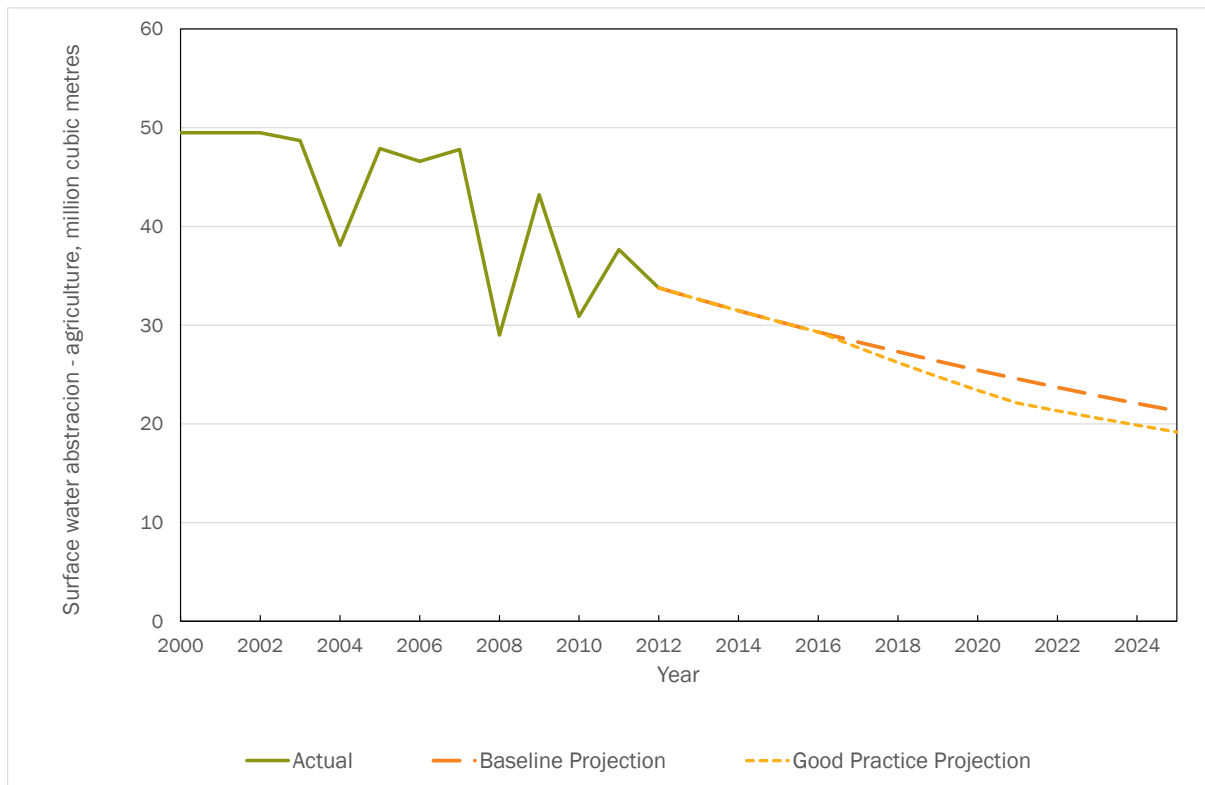


Figure 12-18: Change in Active Ingredients in Pesticides, tonnes

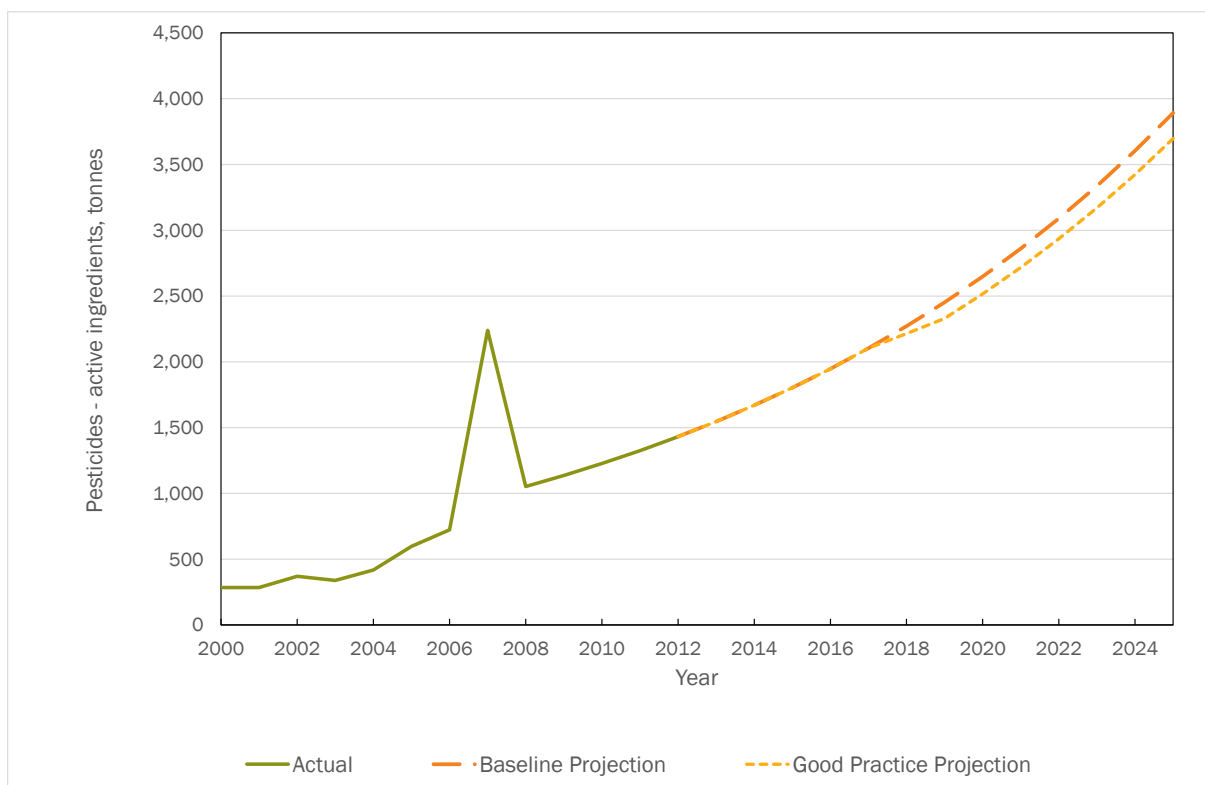


Figure 12-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes



Figure 12-20: Change in Aggregates Extraction, thousand tonnes

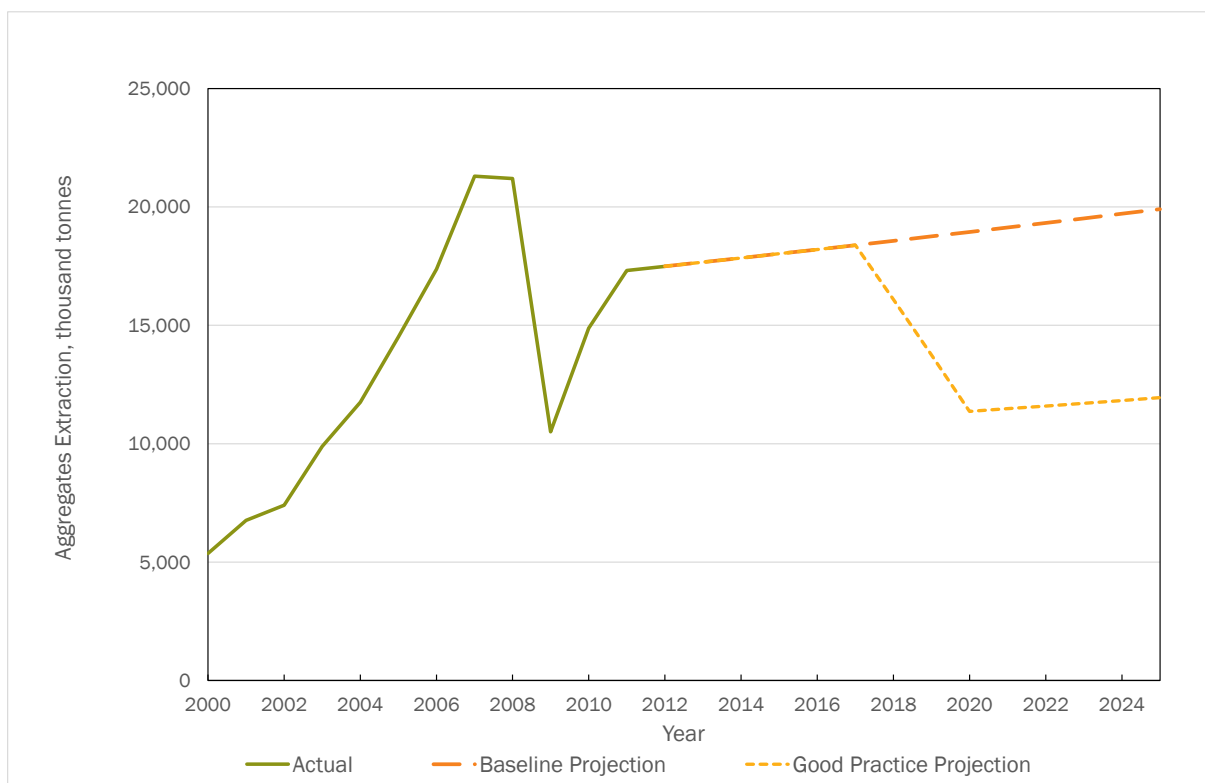


Figure 12-21: Change in Paper & Card Packaging Generation, thousand tonnes



Figure 12-22: Change in Plastic Packaging Generation, thousand tonnes

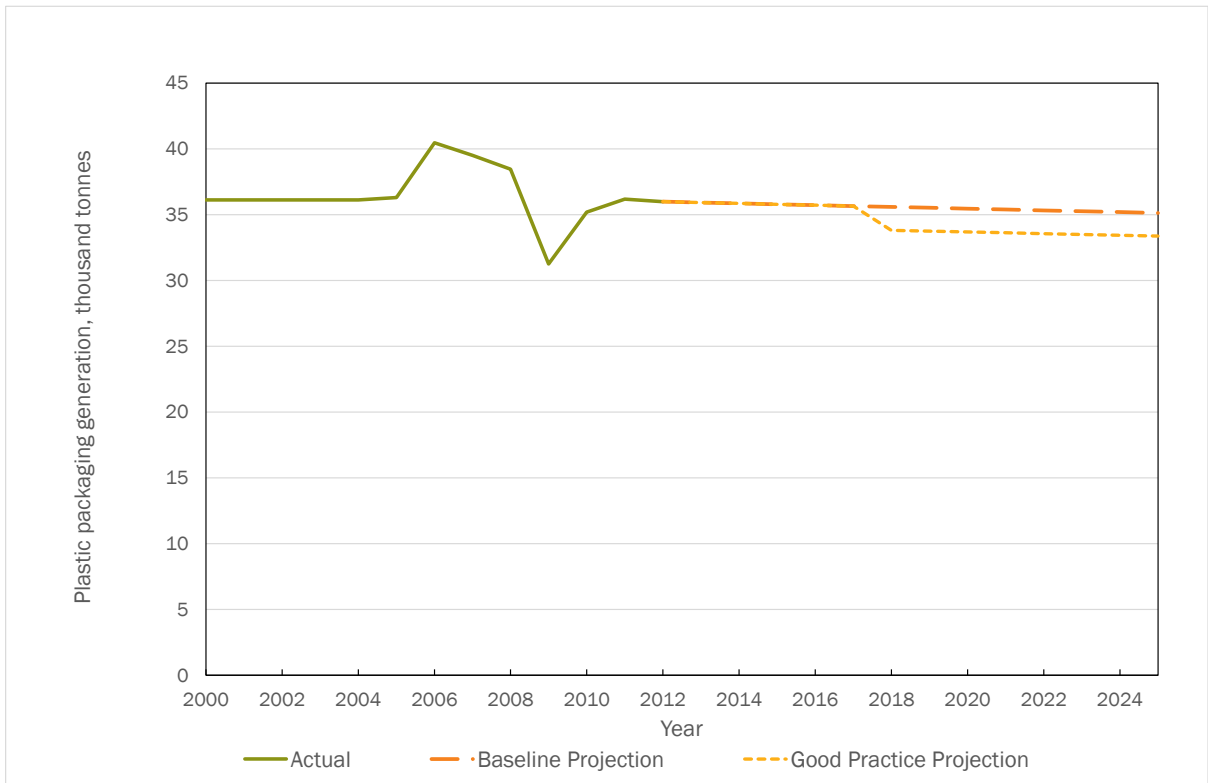


Figure 12-23: Change in Wood Packaging Generation, thousand tonnes

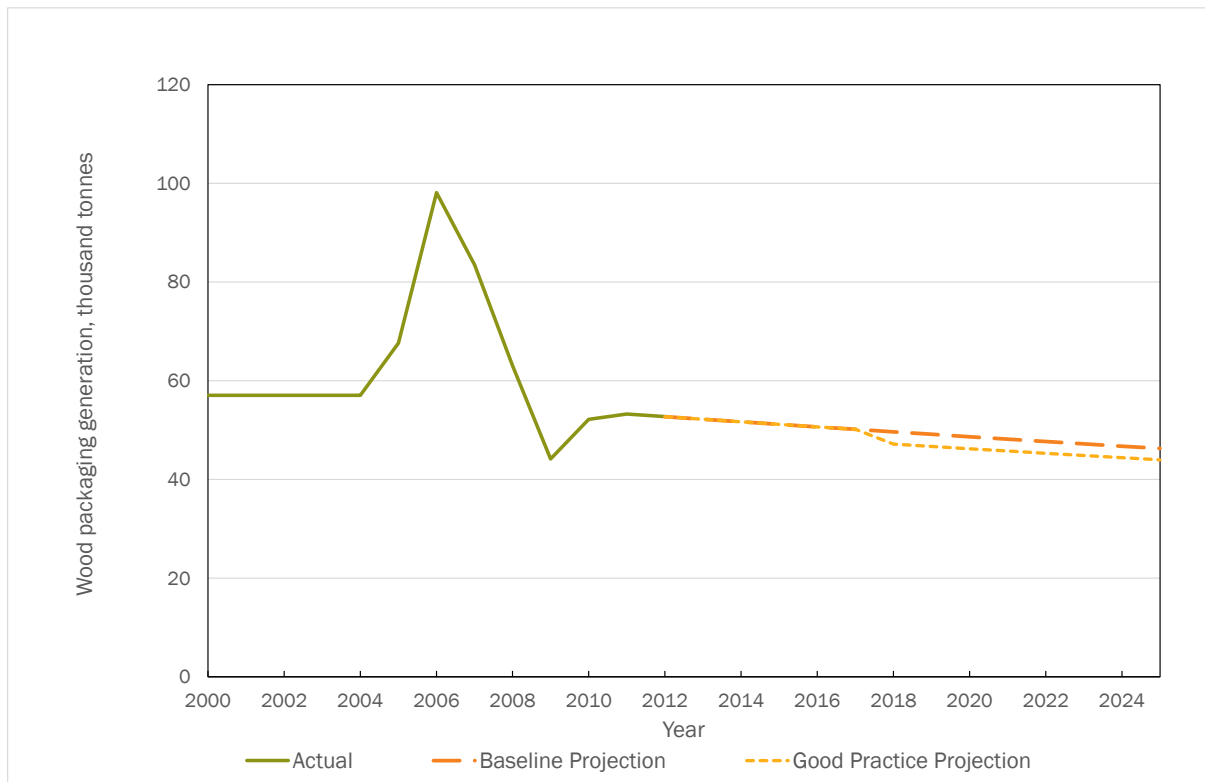


Figure 12-24: Change in Metal Packaging Generation, thousand tonnes

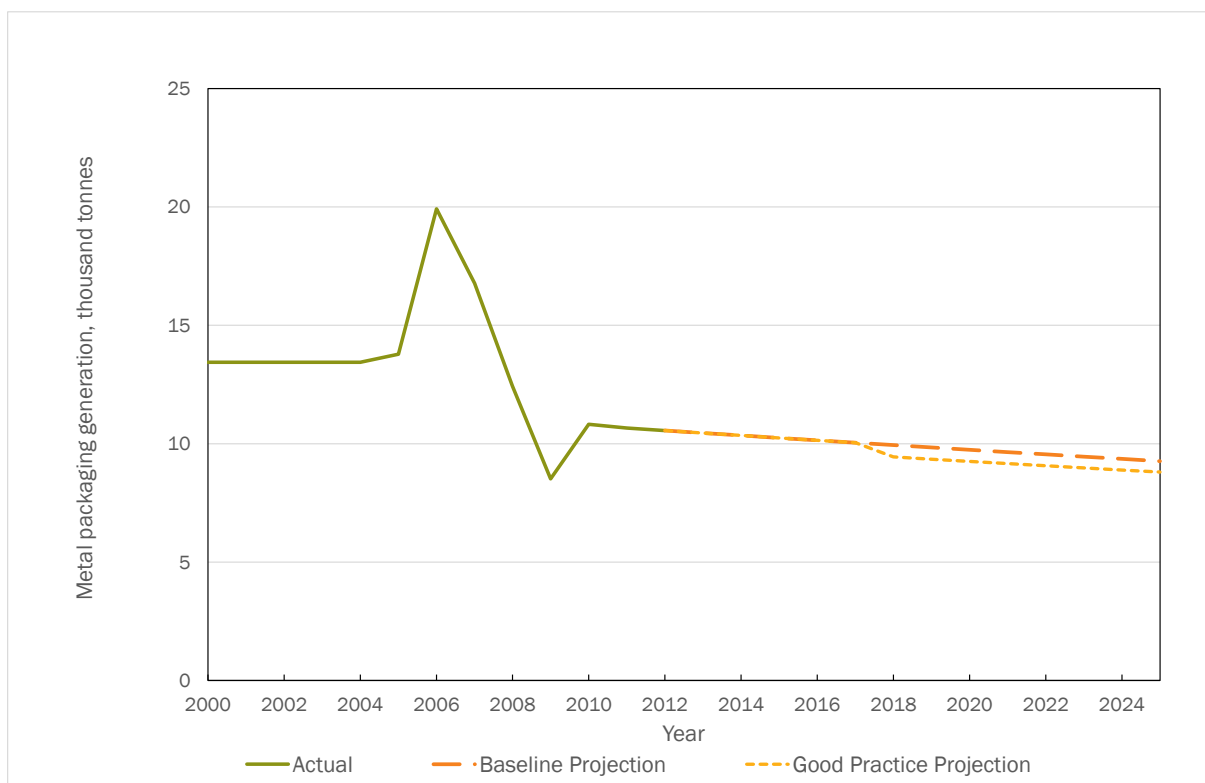
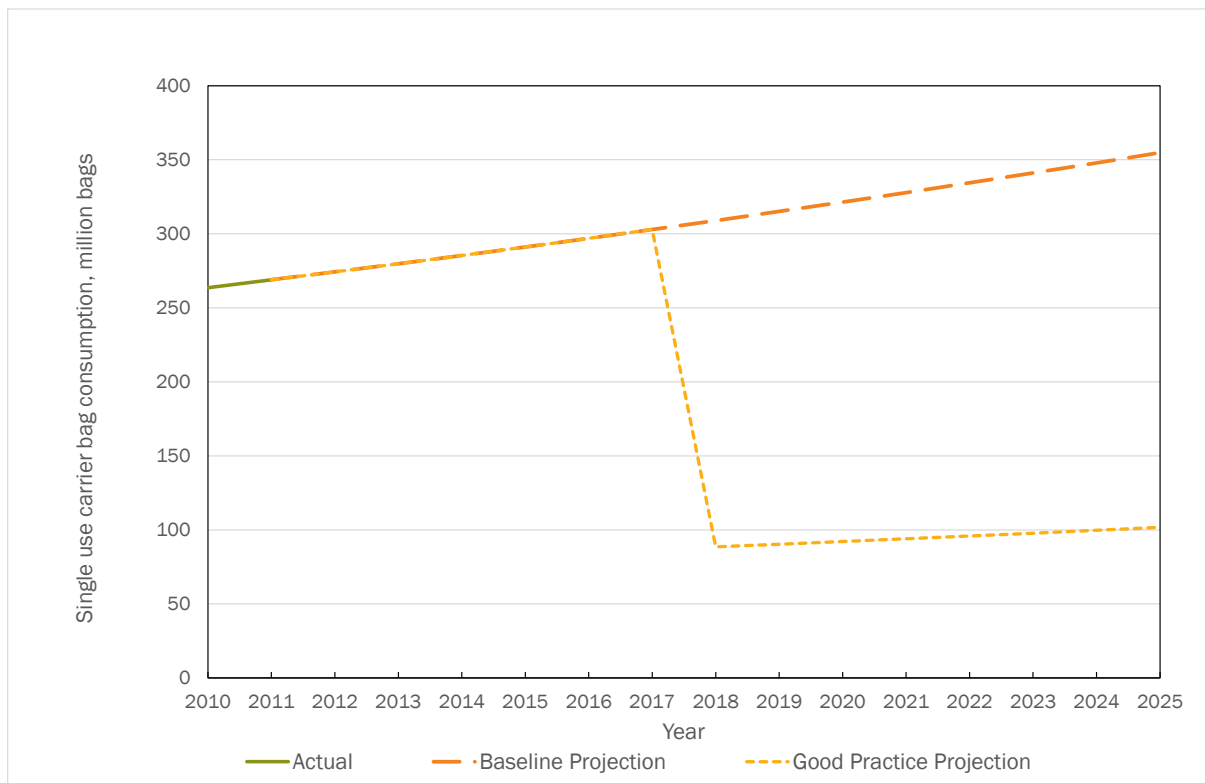


Figure 12-25: Change in Glass Packaging Generation, thousand tonnes



Figure 12-26: Change in Consumption of Single Use Carrier Bags, million bags



12.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 12-4: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	13	26	39	52	64	77	89	89	89
	C&I / Heating	0	0	17	33	50	66	83	99	116	116	116
	Electricity	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Energy, million EUR</i>	0	0	30	59	89	118	147	176	205	205	205
	<i>Sub-total Energy, % GDP</i>	0.0%	0.0%	0.1%	0.2%	0.3%	0.5%	0.6%	0.7%	0.8%	0.8%	0.8%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	4	7	11	15	19	19	19	19	19
	Passenger Aviation Tax	0	0	102	208	218	227	237	247	257	267	277
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Transport, million EUR</i>	0	0	106	216	229	242	255	265	275	285	296
	<i>Sub-total Transport, % GDP</i>	0.0%	0.0%	0.4%	0.8%	0.9%	0.9%	1.0%	1.0%	1.1%	1.1%	1.1%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	3	6	8	10	12	14	14	14	14	14
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	0	1	1	1	2	2	2	2	2	2

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
	Air Pollution Tax	0	6	12	18	25	32	32	34	37	39	42	
	Water Abstraction Tax	0	6	11	16	21	25	24	24	24	24	24	
	Waste Water Tax	0	4	8	12	11	11	11	11	11	11	11	
	Pesticides Tax	0	0	3	6	6	6	7	7	8	9	9	
	Aggregates Tax	0	0	42	36	31	25	25	25	26	26	26	
	Packaging Tax	0	0	6	6	6	6	6	6	6	6	6	
	Single Use Bag Tax	0	25	26	5	5	5	5	6	6	6	6	
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	44	114	108	116	125	128	131	134	137	141	
	Sub-total Pollution & Resource, % GDP	0.0%	0.2%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	
Total Revenue Stream	Total, million EUR	0	44	250	383	434	485	530	572	614	628	642	
	Total, % GDP	0.0%	0.2%	1.0%	1.5%	1.7%	1.9%	2.0%	2.2%	2.4%	2.4%	2.5%	

13.0 Malta

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

13.1 Energy Taxes

➤ Excise duties on energy products:

- Malta applies differentiated excise rates on petroleum products and other energy products. Excise rates are set by the Central Authority and revenues collected go directly to the Central Administration.
- The legal basis is provided by three legislative acts:
 - The Bunkering (Fuel) Tax Act (Chapter 381 of the Laws of Malta), which regulate taxes on fuels supplied for bunkering and also regulate the distribution of licences to bunker operators;⁴¹⁵
 - The Electricity Supply Regulations (Chapter 423 of the Laws of Malta);⁴¹⁶
 - The Excise Duty Act (Chapter 382 of the Laws of Malta), which makes provisions for the imposition of excise duty on goods;⁴¹⁷
- Under the Excise Duty Act (Chapter 382 of the Laws of Malta),⁴¹⁸ an exemption from the excise duty is granted to fuels used for:^{419,420}
 - Electricity generation;
 - International aircrafts travelling outside the EU;

⁴¹⁵ Government of Malta (2014), Bunkering (Fuels) Tax Act (Chapter 381), Accessed 11th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8848>

⁴¹⁶ Government of Mala (2014), Electricity Supply Regulations (Chapter 423.01), Accessed 11th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667>

⁴¹⁷ Government of Malta (2014), Excise Duty Act (Chapter 382), Accessed 11th August 2014, <http://justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8849>

⁴¹⁸ Government of Malta (2014), Excise Duty Act (Chapter 382), Accessed 11th August 2014, <http://justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8849>

⁴¹⁹ IVM (2013), *Budgetary support and tax expenditures for fossil fuels: An inventory for six non-OECD EU countries*, Final Report for the European Commission, January 2013, http://ec.europa.eu/environment/enveco/taxation/pdf/fossil_fuels.pdf

⁴²⁰ European Commission (2014), Taxes in Europe Database, Accessed 8th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=870/1391413804&taxType=Energy+prod+ucts+and+electricity

- Inshore fishing;
- Fuelling and provision of fishing, industrial, commercial and rescue vessels;
- Private and pleasure sea craft with direct voyages outside the EU;
- Biomass content in biodiesel.
- Reduced excise rates are in place for gas oil/diesel used for the following maritime commercial activities:⁴²¹
- Bunkering operations, conveyance of passengers and goods between shore and ocean-going vessels, dredging operations, harbour cruises, inland navigation between Malta and Gozo by vessels of a tonnage less than 3,500 tons, sea farming activities, tugging activities and navigation for commercial purposes within Maltese territorial waters (reduced rate of €142.09 per 1,000 litres is applied).
- Inland Navigation between Malta and Gozo by vessels of a tonnage of 3,500 tons or more (reduced rate of €21.20 per 1,000 litres is applied).
- The Maltese government also applies different tax rates for bunkering of ships outside territorial waters:⁴²²
 - Gas oil is taxed at €1.28 per 1,000 litres;
 - Fuel oil is taxed at €0.82 per 1,000 kg;
 - In 2012, revenues from the “Bunkering Tax” amounted to €455,311 and to €726,813 in 2013 (equivalent, respectively, to 0.006% and to 0.010% of Maltese GDP).⁴²³
- Prices for Liquefied Petroleum Gas and Propane cylinders (in force since the 1st May 2014) are listed in the table below. Please also note that retail prices of LPG cylinders are set by the Malta Resource Authority.

Table 13-1: Retail Prices for LPG and Propane Cylinders as Set by the Malta Resource Authority (Rate as of 1st October 2014)

Type of Fuel	Weight of Cylinders	Rate Applied (€)
LPG	10 kg cylinders	15.00
	12 kg cylinders	18.00

⁴²¹ Government of Malta (2014), Bunkering (Fuels) Tax Act (Chapter 381), Accessed 11th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8848>

⁴²² Government of Malta (2014), Bunkering (Fuels) Tax Act (Chapter 381), Accessed 11th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8848>

⁴²³ Government of Malta (2014), Financial Report 2013, Floriana: The Treasury, p. 6.

Type of Fuel	Weight of Cylinders	Rate Applied (€)
	15 kg cylinders	22.50
	25 kg cylinders	37.50
	Loose/kg (other sizes)	1.70
Propane	10 kg cylinders	15.10
	15 kg cylinders	22.65
	25 kg cylinders	37.75
	Loose/kg (other sizes)	1.80

Source: Malta Resource Authority (2014) *Regulated Tariffs*, Accessed 29th September 2014, <http://mra.org.mt/news/regulated-tariffs-for-liquified-petroleum-gas-lpg-and-propane-1-october-2014/>

- In 2012, the annual total tax revenues for energy taxes amounted to €108.35 million, accounting for 1.58% of Maltese GDP and 4.70% of total tax revenues.⁴²⁴
- A report published in February 2014 pointed out that although the biofuel substitution obligation is not a tax in itself, it is expected to increase the price of fuel in Malta and lead to a decrease in Government revenue equivalent to €4.5 million per year⁴²⁵ as excise taxes do not apply to the biomass content in biodiesel.⁴²⁶

➤ **Electricity:**

- Tariffs applied for the consumption of electricity are regulated through the *Electricity Supply regulations (Subsidiary legislation 423.01)*⁴²⁷ and are differentiated between Residential, Domestic and Non-Residential (industry) users. Residential users are Maltese citizens regularly resident in a house. Electricity consumption for unhabitated premises intended for residential use (or second houses) are charged at rates set out for

⁴²⁴ European Commission (2014), *Taxes in Europe Database*, Accessed 11th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=870/1391413804&taxType=Energy+products+and+electricity

⁴²⁵ Malta Resource and Planning Authority (2014), *Report on the present state of Biofuels in Malta and measures for their promotion (an update)*, Final Report, February 2014, <http://mra.org.mt/wp-content/uploads/2012/07/216/state-of-biodiesel-in-malta-20141.pdf>

⁴²⁶ ECOFYS et al. (2011), *RENEWABLE ENERGY POLICY COUNTRY PROFILES*, 2011 version, http://www.reshaping-res-policy.eu/downloads/RE-SHAPING_Renewable-Energy-Policy-Country-profiles-2011_FINAL_1.pdf, Accessed 04/12/12

⁴²⁷ Government of Malta (2014) *Subsidiary Legislation 423.01. (Electricity Supply Regulations)*, 29th September 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667>

domestic purposes. Non-residential users (industrial and commercial consumers) are also taxed differently from domestic and residential users.

- Residential users exceeding 60 Amps per phase are also subject to a Maximum Demand Tariff at the annual rate of €21.05 per kW of the Maximum Demand.
- According to the *Electricity Supply regulations (Subsidiary legislation 423.01)*,⁴²⁸ a reduced tariff (*ECO-Reduction*) is applied when only one individual is registered in a Residential Premise (provided as a primary residence of an individual). A reduction of 25% of the entire amount for consumption of electricity for the billing period in question (if the consumption does not exceed the pro rata equivalent consumption of 2.000 kWh per annum).
- For a household of two or more persons, if annual consumption does not exceed 1.750 kWh per person, a 25% discount on the first 1000 kWh is applied (per person, per year). For the remaining 750 kWh annually consumed (per person a year), a 15% discount is applied.
- The approved electricity consumption tariffs (applicable from 31st March 2014) for residential consumers are shown in Table 13-2.

Table 13-2: Electricity Tariffs Applied for Residential Users in Malta

Bands	Cumulative consumption per annum range (kWh)	Consumption Tariffs VAT Included (€)
Service Charge – for a Single-Phase	-	65
Service Charge – for a Three-Phase	-	195
Band 1	0 – 2,000	0.1047
Band 2	2,001 – 6,000	0.1298
Band 3	6,001 – 1,0000	0.1607
Band 4	10,001 – 20,000	0.3420
Band 5	>20,000 (for every kWh of the remaining consumption)	0.6076

Source: Government of Malta (2014) *Subsidiary Legislation 423.01. (Electricity Supply Regulations)*, 29th September 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667>

⁴²⁸ Government of Malta (2014) *Subsidiary Legislation 423.01. (Electricity Supply Regulations)*, 29th September 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667>

- Domestic users exceeding 60 Amps per phase are also subject to a Maximum Demand Tariff at the annual rate of €21.05 per kW of the Maximum Demand.
- The approved electricity tariffs (applicable from 31st March 2014) for domestic users can be found in Table 13-3.

Table 13-3: Electricity Tariffs Applied for Domestic Users in Malta

Bands	Cumulative consumption per annum range (kWh)	Consumption Tariffs VAT Included (€)
Service Charge – for a Single-Phase	-	65
Service Charge – for a Three-Phase	-	195
Band 1	0 – 2,000	0.1365
Band 2	2,001 – 6,000	0.1673
Band 3	6,001 – 1,0000	0.2023
Band 4	10,001 – 20,000	0.4180
Band 5	>20,000 (for every kWh of the remaining consumption)	0.6860

Source: Government of Malta (2014) *Subsidiary Legislation 423.01. (Electricity Supply Regulations)*, 29th September 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667>

- Non-residential users (e.g. industrial and commercial consumers) rates are shown in Table 13-4.

Table 13-4: Electricity Tariffs Applied for Non-domestic Users in Malta

Bands	Cumulative consumption per annum range (kWh)	Consumption Tariff VAT Included (€)
Service Charge – for a Single-Phase	-	120
Service Charge – for a Three-Phase	-	360
Band 1	0 – 2,000	0.162
Band 2	2,001 – 6,000	0.170
Band 3	6,001 – 10,000	0.183
Band 4	10,001 – 20,000	0.198

Bands	Cumulative consumption per annum range (kWh)	Consumption Tariff VAT Included (€)
Band 5	20,001 – 60,000	0.215
Band 6	60,001 – 100,000	0.200
Band 7	100,001 – 1,000,000	0.187
Band 8	1,000,001 – 5,000,000	0.170
Band 9	>5,000,000	0.144

Source: Government of Malta (2014) *Subsidiary Legislation 423.01. (Electricity Supply Regulations)*, 29th September 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667>

- According to *Electricity Supply regulations (Subsidiary legislation 423.01)*⁴²⁹, consumers registered under a non-residential Service with a consumption exceeding 5,000,000 kWh may apply to be billed at day and night kWh rates at the tariffs shown in Table 13-5.

⁴²⁹ Government of Malta (2014), *Subsidiary Legislation 423.01. (Electricity Supply Regulations)*, 29th September 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667>

Table 13-5: Electricity Tariffs Applied for Non-domestic Users Exceeding 5,000,000 kWh (Day and Night)

Bands	Cumulative consumption per annum range (kWh)	Consumption Tariff VAT Included (€)
Day consumption		
Band 1	0 – 2,000	0.164
Band 2	2,001 – 6,000	0.172
Band 3	6,001 – 10,000	0.185
Band 4	10,001 – 20,000	0.200
Band 5	20,001 – 60,000	0.217
Band 6	60,001 – 100,000	0.202
Band 7	100,001 – 1,000,000	0.189
Band 8	1,000,001 – 5,000,000	0.172
Band 9	>5,000,000	0.146
Night consumption		
Band 1	0 – 2,000	0.127
Band 2	2,001 – 6,000	0.135
Band 3	6,001 – 10,000	0.148
Band 4	10,001 – 20,000	0.163
Band 5	20,001 – 60,000	0.180
Band 6	60,001 – 100,000	0.165
Band 7	100,001 – 1,000,000	0.152
Band 8	1,000,001 – 5,000,000	0.135
Band 9	>5,000,000	0.109

Source: Government of Malta (2014) *Subsidiary Legislation 423.01. (Electricity Supply Regulations)*, 29th September 2014, www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667

- The registered consumer on a Non-Residential Premises Service that is rated above 100 Amps per phase may apply to be metered and billed in kVAh at the tariffs shown in Table 13-6. As per Subsidiary Legislation

423.01, the registered consumer on a non-residential premises service that is rated above 100 Amps per phase may apply to be metered and billed in kVAh at €0.156 for every kVAh of the next 4,000,000 kVAh.

Table 13-6: Electricity Tariffs Applied for Non-domestic Users Rated Above 100 Amps per Phase

Bands	Cumulative Consumption (kVAh)	Consumption Tariff VAT Included (€)
Band 1	0 – 2,000	0.149
Band 2	2,001 – 6,000	0.156
Band 3	6,001 – 10,000	0.168
Band 4	10,001 – 20,000	0.182
Band 5	20,001 – 60,000	0.198
Band 6	60,001 – 100,000	0.184
Band 7	100,001 – 1,000,000	0.172
Band 8	1,000,001 – 5,000,000	0.156
Band 9	>5,000,000	0.132

Source: Government of Malta (2014), *Subsidiary Legislation 423.01. (Electricity Supply Regulations)*, 29th September 2014, www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667

- The registered consumer on a Non-Residential Premises Service that is rated above 100 Amps per phase and has a consumption exceeding 5,500,000 kVAh may apply to be billed at day and night kVAh rates shown in Table 13-7.

Table 13-7: Electricity Tariffs Applied for Non-domestic Users Exceeding 5,000,000 kWh (Day and Night)

Bands	Cumulative Consumption (kVAh)	Consumption Tariff VAT Included (€)
Day consumption		
Band 1	0 – 2,000	0.151
Band 2	2,001 – 6,000	0.158
Band 3	6,001 – 10,000	0.170
Band 4	10,001 – 20,000	0.184
Band 5	20,001 – 60,000	0.200

Bands	Cumulative Consumption (kVAh)	Consumption Tariff VAT Included (€)
Band 6	60,001 – 100,000	0.186
Band 7	100,001 – 1,000,000	0.174
Band 8	1,000,001 – 5,000,000	0.158
Band 9	>5,000,000	0.134
Night consumption		
Band 1	0 – 2,000	0.114
Band 2	2,001 – 6,000	0.121
Band 3	6,001 – 10,000	0.133
Band 4	10,001 – 20,000	0.147
Band 5	20,001 – 60,000	0.163
Band 6	60,001 – 100,000	0.149
Band 7	100,001 – 1,000,000	0.137
Band 8	1,000,001 – 5,000,000	0.121
Band 9	>5,000,000	0.097

Source: Government of Malta (2014), Subsidiary Legislation 423.01. (Electricity Supply Regulations), 29th September 2014, www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667

- Finally, for Non-residential premises, the Three Phase Service exceeding 60 Amps per phase shall also be subject to a Maximum Demand Tariff set at the rates shown in Table 13-8.

Table 13-8: Maximum Demand Tariff rates for Non-Residential Consumers

Level of Consumption	Rate applied (€)
≤ 5,000,000 kW	20.50 per kW
≤ 5,500,000 kVA	19.20 per kVA
> 5,000,000 kW	17.20 per kW
> 5,500,000 kVA	17.20 per kVA

Source: Government of Malta (2014), Subsidiary Legislation 423.01. (Electricity Supply Regulations), 29th September 2014, www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10667

- It is also important to note that final retail prices of electricity are directly controlled by the Malta Resource Authority (mainly due to the quasi-monopolistic position on the national market). Electricity is charged on a financial cost recovery basis and the reduction in tariffs followed reflects lower costs and better emissions performance from the decommissioning of ageing plants and their replacement through LNG fuelled facilities, as well as the interconnection with the European grid which are all expected to occur in 2015 and 2016.
- The electricity generation sector in Malta is included in the EU's Emissions Trading Scheme.
- In addition, Malta applies a reduced VAT rate of 5% on the supply of electricity (instead of the normal rate of 18%) as allowed for under Article 102 of Council Directive 2006/112/EC.^{430,431}

13.2 Transport Taxes (Excluding Transport Fuels)

➤ Aviation Taxes:

- Passenger Aviation Tax (Dritt ta' Hlas ta' l'Ajruport ghal Servizz lill-Passiggieri):
 - An Airport (Passenger Service Charge) was in place in Malta between 1997 and 2008.⁴³² The tax was applied on passengers travelling from Malta to a destination outside the country and on travellers that do not return to Malta on the same day of departure.
 - The tax was repealed from 1 November 2008. At the end of the fiscal year 2008, total revenues from the tax amounted to € 7.06 million, equivalent to 0.11% of Maltese GDP.⁴³³

➤ Shipping Taxes:

- Vessel registration for small ships:
 - The *Small Ship Regulations (Subsidiary Legislation 499.52)*⁴³⁴ regulates recreational activities in internal and territorial waters. Under the Regulations small ships (vessels under twenty-four metres in length) are to be registered with the Authority for

⁴³⁰ European Commission (2014), Taxes in Europe Database, Accessed 11th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=434/1388754868&taxType=VAT

⁴³¹ Government of Malta (2014), Excise Duty Act (Chapter 382), Accessed 8th August 2014, <http://justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8849>

⁴³² OECD/EEA (2013) OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management, Accessed 4th August 2014, www2.oecd.org/econst/queries/index.htm

⁴³³ Government of Malta (2009), Financial Report 2008, Floriana: The Treasury, p. xvi.

⁴³⁴ Government of Malta (2014), Small Ships Regulations (Subsidiary Legislation 499.52), Accessed 13rd August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=11374&l=1>

Transport in Malta and are required to pay a once-off registration fee and an annual renewal fee.⁴³⁵

- The registration fee for a small ship with an engine is €50. Small ships with no engine and less than 3.65 metres in length do not have to pay an annual renewal fee. Small ships without an engine that exceed 3.65 metres in length have to pay a registration fee of €10 every five years.⁴³⁶
- The annual renewal fee for small ships with engines is differentiated according to the engine horse power (HP):
 - Between 9.9 and 25 HP €20.00
 - Between 25 and 50 HP: €30.00
 - Between 50 and 75 HP: €80.00
 - Between 75 and 150 HP: €100.00
 - Above 150 HP: €140.00
- Small ships without an engine are not subject to the annual fee, but are required to pay a €10 fee every 5 years. This also applies to small ships with engines not exceeding 9.9 H.P.
- To operate mechanically-powered small ships⁴³⁷, it is necessary to obtain an additional nautical licence at the cost of €23.29.
- Fishing boats registered with the Fisheries Department are exempt from the tax.
- Information on revenues from this tax could not be found.

➤ **Vehicle Taxes:**

- Motor Vehicle Registration Tax (Taxxa tar-Registrazzjoni fuq il-Vetturi):⁴³⁸
 - The tax was introduced with the approval of the *Motor Vehicle Registration and Licensing Act* (Chapter 368) and came into force on 1st January 1994. The stated objective is to charge a levy “on the registration of every motor vehicle imported [...] into Malta and

⁴³⁵ OECD/EEA (2013) OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management, Accessed 13th August 2014, www2.oecd.org/econstat/queries/index.htm

⁴³⁶ Details of this are prescribed in SL 499.52 Small Ships Regulations, in the First Schedule (relating to Regulation 12) www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=11374&l=1

⁴³⁷ “Mechanically driven small ship” means any mechanically driven small ship having an engine or engines with a combined power of 10 H.P. or more.

⁴³⁸ European Commission (2014), Taxes in Europe Database, Accessed 4th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=16/1357119635&taxType=Other+indirect+tax

of every motor vehicle manufactured in Malta". The tax directly targets importers of vehicles.⁴³⁹

- The value of the tax is calculated according to the engine power, EURO emissions standards, particulate matter (for diesel engines only) and CO₂ emissions.^{440,441}
- Vehicles which have been brought from abroad for temporary use (for a period not exceeding seven months), that are already registered with another EU Member State, are exempt from the registration tax.
- Vehicles of people residing for less than 185 days per year and students who reside in Malta are also exempt from the tax.⁴⁴² Electric cars and special purpose vehicles (battery driven electric and petrol/diesel electric hybrid with a maximum mass up to 12 tonnes) are exempt from the registration tax.
- Exemptions also apply to special purpose vehicles (such as ambulances) and to vehicles brought into Malta with the intention of being re-exported or exported.⁴⁴³
- From April 2013, hybrid cars (M1 vehicles) are subject to the registration tax, but the CO₂ value included in the Certificate of Conformity is lowered by 30%.⁴⁴⁴
- Since 2011, registration taxes for commercial vehicles with emissions standards lower than EURO 3 were increased to encourage purchase of newer and less polluting vehicles. In January 2012, this measure was extended to non-commercial vehicles.⁴⁴⁵

⁴³⁹ Government of Malta (2014), Motor Vehicle Registration Act (Chapter 368), Accessed 5th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8837>

⁴⁴⁰ Transport Malta (November 2013). POL 02 - Registering & Licensing of New & Used Motor Vehicles, Accessed 4th August 2014, [www.transport.gov.mt/admin/uploads/media-library/files/POL%2002%20-%20Registration%20and%20Licensing%20of%20Vehicles%20\(Versions%2026%20-%205th%20November%202013\).pdf_20131108070800.pdf](http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2002%20-%20Registration%20and%20Licensing%20of%20Vehicles%20(Versions%2026%20-%205th%20November%202013).pdf_20131108070800.pdf)

⁴⁴¹ Government of Malta (2014), Act No. XII of 2014 (An Act to implement measures for the financial year 2014 and other administrative measures), Accessed 7 August 2014 <http://justiceservices.gov.mt/DownloadDocument.aspx?app=lp&itemid=26033&l=1>

⁴⁴² Government of Malta (2014), Motor Vehicle Registration Act (Chapter 368), Accessed 5th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8837>

⁴⁴³ Transport Malta (1st January 2014), POL 33 – Annual circulation licence fees, Accessed 7th August 2014 <http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2033.pdf>,

⁴⁴⁴ Transport Malta (November 2013), POL 02 - Registering & Licensing of New & Used Motor Vehicles, [http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2002%20-%20Registration%20and%20Licensing%20of%20Vehicles%20\(Versions%2026%20-%205th%20November%202013\).pdf_20131108070800.pdf](http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2002%20-%20Registration%20and%20Licensing%20of%20Vehicles%20(Versions%2026%20-%205th%20November%202013).pdf_20131108070800.pdf), Accessed 7th August 2014.

⁴⁴⁵ IEEP et al. (2013), Steps towards greening in the EU: Monitoring Member States' achievements in selected environmental policy areas; EU summary report, Final Report - July 2013, http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/Greening.pdf

- In 2013, revenues for this tax were equivalent to €35.55 million, representing 0.52% of Maltese GDP and equivalent to 1.54% of total tax revenue.^{446,447}
- In addition, in February 2014 the government introduced a grant scheme (*Għotja mill-Gvern fuq Xiri ta' Vetturi li Jaħdmu bl-Elettriku*) to incentivise the purchase of electric vehicles and reduce the number of old motor vehicles. Citizens that register an electric car are eligible for a grant equivalent to €4,000 (€1500 if it is an electric quadricycle) or €5,000 for de-registering a vehicle with an internal combustion propeller which is at least 10 years old. The Government allocated €300,000 for the scheme.⁴⁴⁸
- Circulation Licence Fee (Licenzja ta' Cirkolazzjoni):⁴⁴⁹
 - Since 1950, vehicles registered with the Authority for Transport in Malta are subject to an annual circulation licence fee. The fee varies according to the age of the car and related CO₂ emissions.⁴⁵⁰ It provides economic incentives for the purchase of efficient vehicles.
 - For private petrol vehicles this fee ranges between €100 for a new petrol-powered vehicle with between 0-100g per km CO₂ emissions to €1,110 for a vehicle 14 years old or more with over 250g per km CO₂ emissions. For private diesel vehicles, the fee ranges between €100 for a new car with 0-100g per km CO₂ emissions and with particulate matter emissions up to 0.005g per km, to €1,210 for an old vehicle older than 14 years which emits more than 250g per km with particulate matter emissions exceeding 0.035g per km.⁴⁵¹
 - These rates have declined over the years. In 2012, the fee on petrol vehicles older than 14 years with over 250g per km CO₂ emissions was €1,474, while the fee on diesel vehicles older than 14 years,

⁴⁴⁶ European Commission (2014) Taxes in Europe Database, Accessed 4th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=1901/1388754867&taxType=Other+indirect+tax

⁴⁴⁷ Data provided by the Ministry of Treasury differs slightly from the figures given by the Eurostat. According to the latest Financial report released, the 'Motor Vehicle Registration Tax' yielded €37.025.558 in 2012 and €32.003.369 in 2013. Please refer to Government of Malta (2014), Financial Report 2013, Floriana: The Treasury, p. 6.

⁴⁴⁸ Government of Malta (2014), Government Grant on the Purchase of Electric Vehicles in *The Malta Government Gazette*, No. 19209, p. 1344.

⁴⁴⁹ European Commission (2014) Taxes in Europe Database, Accessed 12th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=425/1388754867&taxType=Other+indirect+tax

⁴⁵⁰ Transport Malta (1st January 2014), POL 33 – Annual circulation licence fees, <http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2033.pdf>, Accessed 7th August 2014

⁴⁵¹ Government of Malta (2014), Motor Vehicle Registration Act (Chapter 368), Accessed 5th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8837>

with 250g per km CO₂ emissions and PM emissions higher than 0.036g per km was €1,706.⁴⁵²

- Vehicles for disabled persons, vehicles owned by the State or vehicles which belong to official diplomatic staff are exempt from the fee.⁴⁵³
- The annual circulation licence fee also applies to electric and hybrid electric motor vehicles.⁴⁵⁴
- Revenues raised from the fee are allocated to the general budget.⁴⁵⁵
- In 2012, revenues from the fee were equivalent to €48.59 million, which amounted to 0.71% of GDP and 2.11 % of total tax revenues collected.^{456,457}

13.3 Pollution and Resource Taxes

➤ Aggregates:

- Malta has an annual quarrying operating license fee of €699 for operators that quarry and/or sell soft stone or hard stone derivatives.⁴⁵⁸ The fee is regulated through subsidiary legislation 128.01 of the *Police Licences Regulations*.⁴⁵⁹
- Apart from the quarrying operating license, there is no tax or fee applied to stones and aggregates extracted from quarries.⁴⁶⁰

⁴⁵² Transport Malta (January 2012). Registering & Licensing of New & Used Motor Vehicles, <https://secure2.gov.mt/vehicleregistration/file.aspx?f=392>, Accessed 7th August 2014

⁴⁵³ European Commission (2014) Taxes in Europe Database, Accessed 4th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=425/1388754867&taxType=Other+indirect+tax

⁴⁵⁴ Transport Malta (1st January 2014), POL 33 – Annual circulation licence fees, Accessed 7th August 2014 <http://www.transport.gov.mt/admin/uploads/media-library/files/POL%2033.pdf>

⁴⁵⁵ European Commission (2014) Taxes in Europe Database, Accessed 11th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

⁴⁵⁶ European Commission (2014) Taxes in Europe Database, Accessed 4th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxSearch.html

⁴⁵⁷ In this case data provided by Eurostat is in line with the figures the figures given by the Ministry of Treasury. According to the latest Financial report released, the 'Annual Circulation Licence Fee' yielded €48.588.334 in 2012 and €49.866.874 in 2013. Please refer to Government of Malta (2014), Financial Report 2013, Floriana: The Treasury, p. 6.

⁴⁵⁸ OECD/EEA (2013) OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management, Accessed 13th August 2014, www2.oecd.org/econinst/queries/index.htm

⁴⁵⁹ Government of Malta (2013), Police Licences Regulations – Subsidiary Legislation 128.01, Accessed 13th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=9422>

⁴⁶⁰ IEEP et al. (2013), Study supporting the phasing out of environmentally harmful subsidies: Annexes to final report, October 2012, Accessed 11th August 2014, http://ec.europa.eu/environment/enveco/taxation/pdf/annexes_phasing_out_env_harmful_subsidies.pdf

- Total revenues obtained from the fee are not available. However, according to data provided by the Malta Environment & Planning Authority (MEPA)⁴⁶¹ there are currently 23 operational hardstone and softstone quarries in Malta.⁴⁶²

➤ **Gate fees for MSW and C&D waste:**

- There is currently no landfill tax in Malta; however, gate fees are applied at authorized waste-management facilities.⁴⁶³ The fees are regulated through the *Deposit of Waste and Rubble (Fees) Regulations (Subsidiary Legislation 435.08)*⁴⁶⁴ and are paid by the municipalities. These fees are out of scope of this work, but included here for additional context.
- The gate fee for mixed municipal waste disposal and for Construction and Demolition (C&D) waste was introduced in 1991. The fee was set at €0.77 per tonne^{465,466} and provided little incentive for waste prevention or recycling. From 1 October 2009, gate fees for MSW were increased to €20 per tonne for mixed waste and waste deposited for biological treatment. A reduced fee of €0.50 per tonne was also introduced for any type of dry waste separated at source, suitable for recycling and/or recovery.⁴⁶⁷
- The owners of vehicles used to transport any kind of waste (MSW, rubble or hazardous waste) are subject to a registration tax of €23.29 for the registration of the vehicle.
- A C&D waste fee of €3.21 (excluding VAT) for every metric tonne of rubble discharged in any public waste deposit site has been in place since 2010.⁴⁶⁸
- C&D waste from households in “small quantities” may be disposed free of charge in appointed sites.⁴⁶⁹

⁴⁶¹ Malta Environment and Planning Authority (2014), *Environmental Permitting (Quarries)*, Accessed 15th August 2014, <http://www.mepa.org.mt/quarries-envpermitting>

⁴⁶² This would equal to €16072.63 revenue per year, equivalent to 0.0002% of Maltese GDP.

⁴⁶³ Maltese ministry for Sustainable Development, the Environment and Climate Change (2014), *Waste Management Plan for the Maltese Islands: A Resource Management Approach 2014 - 2020*, Final document, January 2014, p.42, <http://msdec.gov.mt/en/Document%20Repository/Waste%20Management%20Plan%202014%20-%202020%20-%20Final%20Document.pdf>

⁴⁶⁴ Government of Malta (2010), *Deposit of Waste and Rubble (Fees) Regulation*, Accessed 13rd August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10855>

⁴⁶⁵ Government of Malta (1997), *L.N. 128 of 1997 – ENVIRONMENT PROTECTION ACT OF 1991 (ACT V OF 1991) FEES ORDINANCE (CAP. 35)*, Accessed 9th September 2014, <http://www.mepa.org.mt/LpDocumentDetails?syskey=432>

⁴⁶⁶ Parliamentary Secretariat for Tourism, the Environment and Culture (2010), *Management Strategy for the Maltese Islands – First Update*, December 2010, p. 16

⁴⁶⁷ Government of Malta (2010), *Deposit of Waste and Rubble (Fees) Regulation*, Accessed 13rd August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10855>

⁴⁶⁸ Government of Malta (2010), *Deposit of Waste and Rubble (Fees) Regulation*, Accessed 13rd August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=10855>

- There are no charges applied on the collection of municipal waste in Malta.
- **Cement tax:**
 - Following the approval of Act N. IV of 2011, Malta introduced an excise tax on Portland cement excluding white cement (grey Portland cement).⁴⁷⁰
 - The tax was initially set at €9 per 1000kg, it increased over the years and in March 2014 it was at €27.00 per 1000kg (grey Portland cement remains exempted).⁴⁷¹
 - In 2012, revenues from the excise tax on cement amounted to € 3.20 million and to €4.11 million in 2013 (respectively, 0.045% and 0.057% of Maltese GDP).⁴⁷² This tax amounted to 0.13% of total tax revenues in 2012 and to 0.15% in 2013.
- **ECO-contribution scheme (Att dwar l-Eko-Kontribuzzjoni):**
 - The Eco-contribution scheme aims to encourage producers (who manufacture or brings goods into the country) to take responsibility for waste and operate waste recovery schemes.⁴⁷³
 - The scheme applies to producers of selected products (listed in the First Schedule of the ECO Contribution Act - Chapter 473 of the Laws of Malta) and is based on the number of products present on the market. Different rates are applied to different products – see Table 13-9.⁴⁷⁴
 - Producers who “take-back” waste products on which they have already paid an eco-contribution could have their future eco-contribution payments reduced totally or partially, according to the value of the eco-contribution paid on recovered waste products.⁴⁷⁵ Under the eco-contribution scheme, the following charges are applied per plastic bag:⁴⁷⁶

⁴⁶⁹ WasteServ Malta Limited (2014), Waste Management – Construction Waste, Accessed 12th August 2014, <https://www.wasteservmalta.com/wastemanagement.aspx?id=110>

⁴⁷⁰ Government of Malta (2011), *Act No. IV of 2011 entitled the Budget Measures Implementation Act*, 2011, Accessed 9th August 2014, <http://www.doi-archived.gov.mt/en/parliamentacts/2011/Act%20IV%20of%202011.pdf>

⁴⁷¹ Government of Malta (2014), *An act to implement Budget measures for the financial year 2014 and other administrative measures*, Accessed 8th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lp&itemid=25742&l=1>

⁴⁷² Government of Malta (2014), *Financial Report 2013*, Floriana: The Treasury, p. 6.

⁴⁷³ OECD/EEA (2013) OECD/EEA Database on Instruments used for Environmental Policy and Natural Resources Management, Accessed 4th August 2014, www2.oecd.org/econst/queries/index.htm

⁴⁷⁴ Government of Malta (2014), *Eco-Contribution Act (Chap. 473)*, Accessed 8th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8939&l=1>

⁴⁷⁵ Government of Malta (2014), *Eco-Contribution Act (Chap. 473)*, Accessed 8th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8939&l=1>

⁴⁷⁶ Government of Malta (2014), *Eco-Contribution Act (Chap. 473)*, pg. 16 <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8939&l=1>, Accessed 15th October 2014

- €0.14 on plastic bags excluding: i) bags for the conveyance of goods; ii) sacks and cones; iii) bags, without any handles, loops, slots or any other feature that facilitates the use of the bag for the conveyance of goods; iv) bio-degradable bags v) plastic packaging, without handles, used as part of a production process vi) plastic bags designed for re-use. A charge of €0.14 per piece.
 - €0.02 on bags of degradable plastic, excluding bags for the conveyance of goods and bags without any handles, loops, slots or any other feature that facilitates the use of the bag for the conveyance of goods, and without any gussets, not exceeding 26 cm in width and 40 cm in length.
 - €0.15 on bags of plastics, for the conveyance of goods, with a handle, loop, slot or any other feature that facilitates the use of the bag for the conveyance of goods, excluding bags which constitute or form an integral part of the packaging in which goods are sealed prior to retail sale or transfer.
- The measure was introduced as a way to discourage the use of plastic bags⁴⁷⁷ and has reportedly contributed to a decrease of 5 million plastic bags in the first five months of 2005 as well as improved traceability and monitoring of the production of plastic bags in the country.⁴⁷⁸
 - In 2012, annual revenues from the scheme were equivalent to €6.9 million, which represented the 0.10% of Maltese GDP and was equivalent to 0.29% of total tax revenue.⁴⁷⁹

Table 13-9: Eco-Contribution Tariff Applied on Different Products

Type of Product	Tariff Applied
Bottles/containers made of plastic, metal or glass for water and beer	€0.02 per item
Bottles/containers made of plastic, metal or glass for wine or liqueurs	€0.12 per item
Cans of aluminium (for beverages)	€0.02 per item
Bottles and containers of shampoo and dental hygiene	€0.05 per item

⁴⁷⁷ The Times of Malta (2009), *Eco tax on plastic bags from March*, Accessed 13rd October 2014, <http://www.timesofmalta.com/articles/view/20090129/local/eco-tax-on-plastic-bags-from-march-1.242668>

⁴⁷⁸ Lyons, L., (2013) *Dynamix Policy Mix Evaluation – Reducing Plastic Bag Use in the UK and Ireland*, http://dynamix-project.eu/sites/default/files/Plastic%20bags_Ireland%20and%20UK.pdf

⁴⁷⁹ Data provided by the Ministry of Treasury differs slightly from the figures given by the Eurostat. According to the latest financial report released, the 'Eco-contribution' yielded €6,908,470 in 2012 and €6,457,162 in 2013. Please refer to Government of Malta (2014) Financial Report 2013, Floriana: The Treasury, p. 7.

Type of Product	Tariff Applied
Bottles and containers of creams and shaving	€0.12 per item
Packaging of plastics	€0.12 per item
Tableware and kitchenware of plastics	€0.02 per item
Mattresses and articles of bedding	€6.99-€2.33 per item
Biodegradable and plastic bags	€0,14 per plastic bag €0.02 per degradable plastic bag €0.15 per plastic bag for the conveyance of goods,
Tyres	€4.66 per item
Batteries and accumulators (various types)	€0.06-1.63 per item
Petroleum oils and lubricants	€0.23 per litre
Oil filters	€0.12 per item
Water heaters	€6.99 per item
White goods and electronic equipment (various types)	€27.29-69.88 per item
Monitors and TV equipment	€11.65-34.94 per item
Appliances for washing and cooking	€23.29-6.99 per item
Telecommunication equipment	€5.82 per item
Electronic equipment (various)	€1.16-€69.88per item
Incandescent/halogen lamps	€0.25-0.50 per lamp/per tube

Type of Product	Tariff Applied
Chewing gum	€0.01 per 2g

Sources: IEEP et al. (2013) *Steps to Greening Country Report: Malta, Report for the European Commission*, p. 8; and Government of Malta (2014) *Eco-Contribution Act (Chap. 473)*, Accessed 8th August 2014, www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8939&l=1

➤ **Waste water charges:**

- Wastewater management costs are covered by water tariffs⁴⁸⁰ which seek to cover the full costs of provision – see section on water tariffs below.

➤ **Water metering and abstraction fees:**

- Regulations on the registration and use of groundwater resources have been in place in Malta since 1948.⁴⁸¹ Rules for water metering are regulated through the “*Groundwater Abstraction Metering Regulations*” (Subsidiary Legislation 423.40) which requires metering for:
 - All groundwater sources in use since 1955.
 - Registered or notified groundwater sources.
 - Sources which were in use prior to the entry into force of the Malta Resource Authority Act (in February 2001).⁴⁸²
 - Water resources used by the Water Services Corporation (which is responsible for the distribution and production of water).
- Exemptions on metering are granted:⁴⁸³
 - If no mechanical pump or device is used to abstract groundwater.
 - If a user proves that it is a cultural property (as defined under the *Cultural Heritage Act*).⁴⁸⁴
 - If the source is used for domestic purposes only, abstraction yield does not surpass 1m³ per day and the source abstracts groundwater from the perched aquifer.
- In 2009, 20,465 households were exempt from paying rent on water meters in Malta.⁴⁸⁵

⁴⁸⁰ Malta Resource Authority (2014), Decision on Proposed Water Tariffs March 2014 – Summary of Review Process and Conclusions, Accessed 18th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Minister-MECW-Approval-of-new-tariffs-for-supply-of-water-27.03.14.pdf>

⁴⁸¹ Government of Malta (2014), Subsidiary Legislation 423.03 – Water Supply Regulations, Accessed 11th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Water-Supply-Regulations.pdf>

⁴⁸² Government of Malta (2014), Malta Resources Authority Act (Chapter 423 of the Laws of Malta) Accessed 14th August 2014, <http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=8889>

⁴⁸³ IEEP et al. (2013), *Steps to greening country report: Malta, Report for the European Commission*, p. 9.

⁴⁸⁴ Government of Malta (2014), *Cultural Heritage Act (Chapter 445)*, Accessed 11th August 2014, [http://www.culturalheritage.gov.mt/filebank/chapt445\[1\]Latest%20copy%20as%20at%20September%202010.pdf](http://www.culturalheritage.gov.mt/filebank/chapt445[1]Latest%20copy%20as%20at%20September%202010.pdf)

- The Schedule of the *Groundwater Abstraction (Metering) Regulations*⁴⁸⁶ sets out charges for the installation of meters, annual metering fees, metering regulations and inspections – see Table 13-10.

Table 13-10: Water Metering Fees

Type	Fee (€)
Meter installation fee for each groundwater source	765
Annual metering fee for each groundwater source metered under the regulations	143 (per annum)
Application to Water Service Corporation for testing a meter	50
Application to Water Service Corporation for temporary suspension of metering	100
Application to Malta Resource Authority for closure, sealing and decommissioning of a groundwater source	50

Source: Government of Malta (2014), *Subsidiary Legislation 423.40 – Groundwater Abstraction (Metering) Regulations*, Accessed 11th August 2014, <http://mra.org.mt/wp-content/uploads/2012/08/40.Groundwater-Abstraction-Metering-Regulations.pdf>

- Water used for agricultural purposes is exempt from water abstraction fees and the costs of water are limited to the private on-farm costs.⁴⁸⁷ Moreover a “flat” volumetric tariff of €0.093 per m³ is in place for the supply of non-potable water to both agricultural and industrial consumers.⁴⁸⁸ Further information on abstraction fees (i.e. charges per m³ of water abstracted) could not be found.
- Water scarcity is a particular challenge in Malta given its environmental status and reliance on costly and energy intensive reverse osmosis plants for potable water. The need to introduce and enforce tariffs for water abstraction has received particular attention in recent years including from the European Commission which has pressed Malta to fully implement the

⁴⁸⁵ IEEP et al. (2013), Steps to greening country report: Malta, Report for the European Commission, p. 10.

⁴⁸⁶ Government of Malta (2014), *Subsidiary Legislation 423.40 – Groundwater Abstraction (Metering) Regulations*, Accessed 11th August 2014, <http://mra.org.mt/wp-content/uploads/2012/08/40.Groundwater-Abstraction-Metering-Regulations.pdf>

⁴⁸⁷ European Commission (2012), *The role of water pricing and water allocation in agriculture in delivering sustainable water use in Europe – FINAL REPORT*, February 2012, http://ec.europa.eu/environment/water/quantity/pdf/agriculture_report.pdf

⁴⁸⁸ Government of Malta (2014), *Subsidiary Legislation 423.03 – Water Supply Regulations*, Accessed 11th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Water-Supply-Regulations.pdf>

Water Framework Directive (especially Art. 9).⁴⁸⁹ According to an article published in 2013, the Water Service Corporation currently extracts 13 million m³ a year at the price of €0.10 per m³, however, the Maltese water service company obtains 60% of its water from reverse osmosis, with an estimated cost of €0.60 per m³.⁴⁹⁰

- Recent estimates have pointed out that the agricultural water demand in the country is equivalent to 28 million m³ a year. The majority of the water comes from groundwater, and extraction levels are beyond natural replenishment rates, i.e. not currently sustainable.⁴⁹¹

➤ **Water tariffs:**

- Water tariffs are regulated through the *Water Supply Regulations* (Subsidiary Legislation 423.03).⁴⁹²
- Water charges for households were increased between 2008 and 2010; however, in 2014 (following approval of LN 109 of 2014) water fees for households decreased from €1.47 to €1.40 (for annual consumption between 0 and 33 m³) and from €5.41 to €5.14 (for annual consumption above 33 m³).
- The supply of water services by a public authority is exempt from VAT.⁴⁹³ Table 13-11 sets out the tariffs applied to residential, non-residential and domestic consumers since 31st March 2014 (according to the latest revision of the Water Supply Regulation).⁴⁹⁴

Table 13-11: Water Tariffs Applied to Different Consumers

Type of Consumer	Annual Quantity	Charge Applied (€ per m ³)
Residential	Up to 33 m ³ per person	1.3965
	Over 33 m ³ per person	5.1395

⁴⁸⁹ Malta Today (2013), *Higher water prices – a reality Malta must face*, Accessed 1st October 2014, http://www.maltatoday.com.mt/business/business_comment/23819/marco-cremona-higher-water-prices-a-reality-malta-must-face-20130109#.VCwJU00cR9A

⁴⁹⁰ Malta Today (2013), *Higher water prices – a reality Malta must face*, Accessed 1st October 2014, http://www.maltatoday.com.mt/business/business_comment/23819/marco-cremona-higher-water-prices-a-reality-malta-must-face-20130109#.VCwJU00cR9A

⁴⁹¹ Malta Water Association (2012) *Towards Integrated Water Management in Malta – Recommendation to Political Parties*, Final report, July 2012, <http://www.maltastar.com/userfiles/file/mwa.pdf>

⁴⁹² Government of Malta (2014), *Water Supply Regulations* (Subsidiary Legislation 423.03), Accessed 6th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Water-Supply-Regulations.pdf>

⁴⁹³ European Commission (2014) *Taxes in Europe Database*, Accessed 11th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=434/1388754868&taxType=VATc

⁴⁹⁴ Government of Malta (2014), *Subsidiary Legislation 423.03 – Water Supply Regulations*, Accessed 11th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Water-Supply-Regulations.pdf>

Type of Consumer	Annual Quantity	Charge Applied (€ per m ³)
Non-Residential (including Industrial)	Up to 168 m ³ per person	2.1
	Between 168 and 40,000 m ³ per person	2.5
	Over 40,000 m ³ per person	1.75
Domestic	Up to 33 m ³ per person	2.185
	Over 33 m ³ per person	5.1395

Source: Government of Malta (2014) *Subsidiary Legislation 423.03 – Water Supply Regulations*, Accessed 11th August 2014, <http://mra.org.mt/wp-content/uploads/2014/03/5480/Water-Supply-Regulations.pdf>

13.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 13-12: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	71	69	-2
Petrol	million litres	62	62	0
Kerosene	million litres	75	75	0
LPG	thousand tonnes	14	14	0
Heavy Fuel Oil	thousand tonnes	0	0	0
Natural Gas	TJ (GCV)	0	0	0
Coal	thousand tonnes	1,635	1,627	-8
Electricity	GWh	1,181	1,181	0

Figure 13-1: Change in Internal Passenger Flights, flights per year

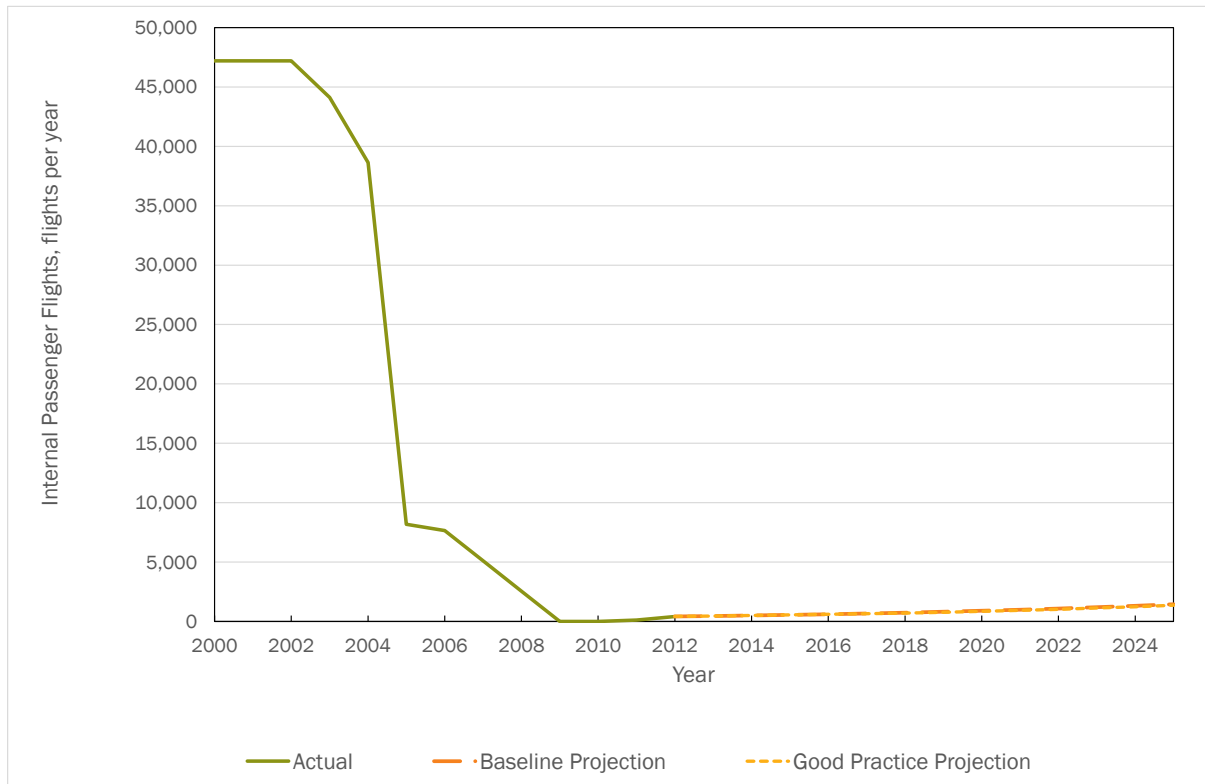


Figure 13-2: Change in Intra-EU Passenger Flights, flights per year

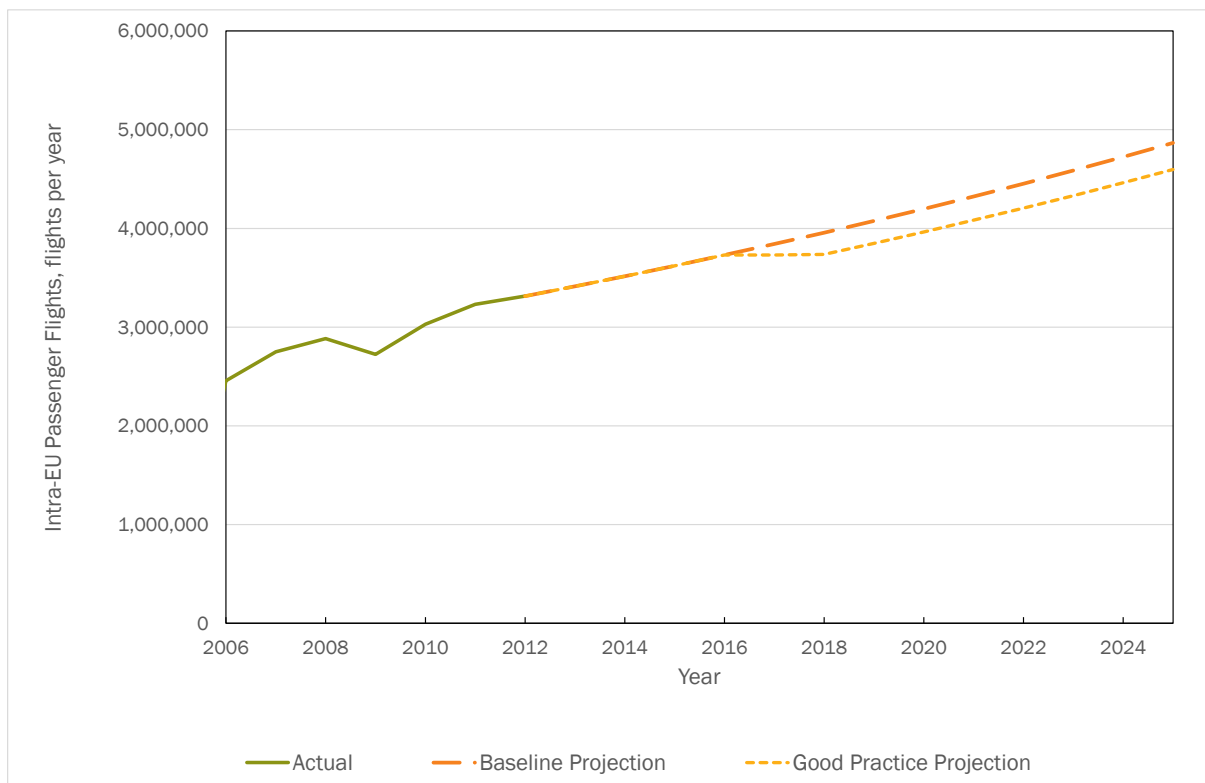


Figure 13-3: Change in Extra-EU Passenger Flights, flights per year

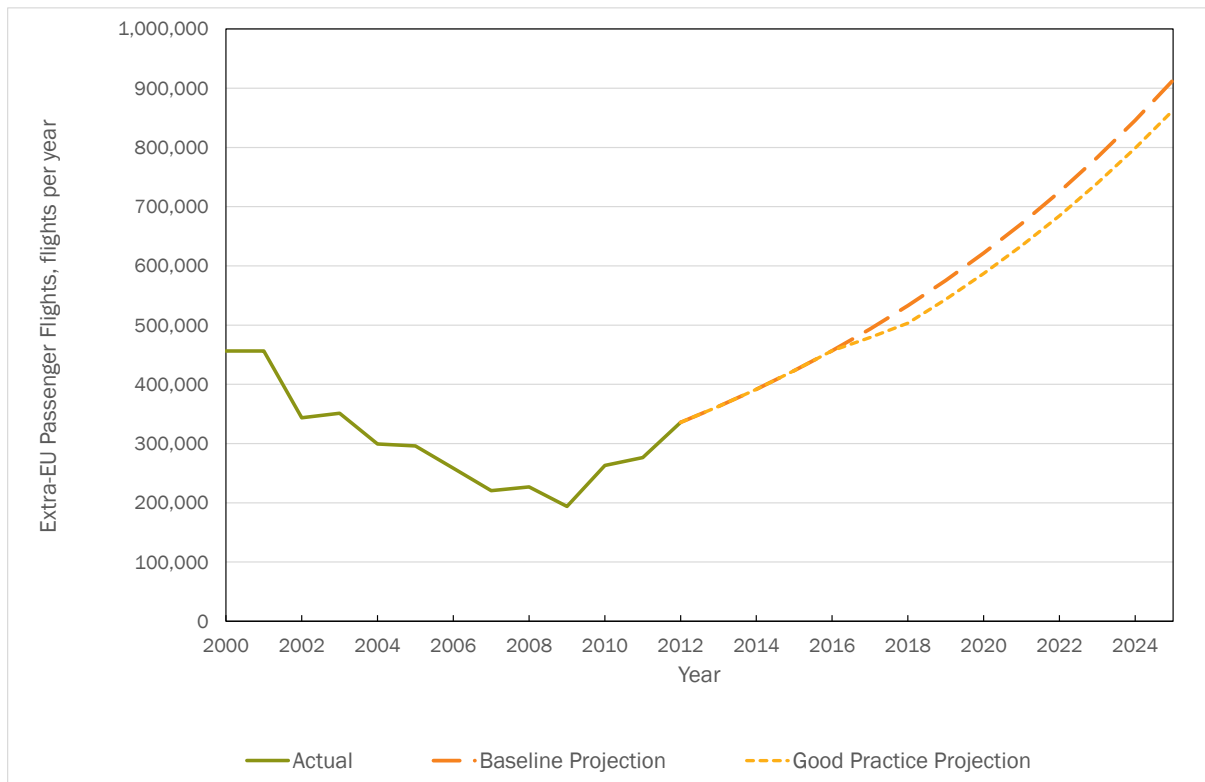


Figure 13-4: Change in Internal Air-freight, tonnes

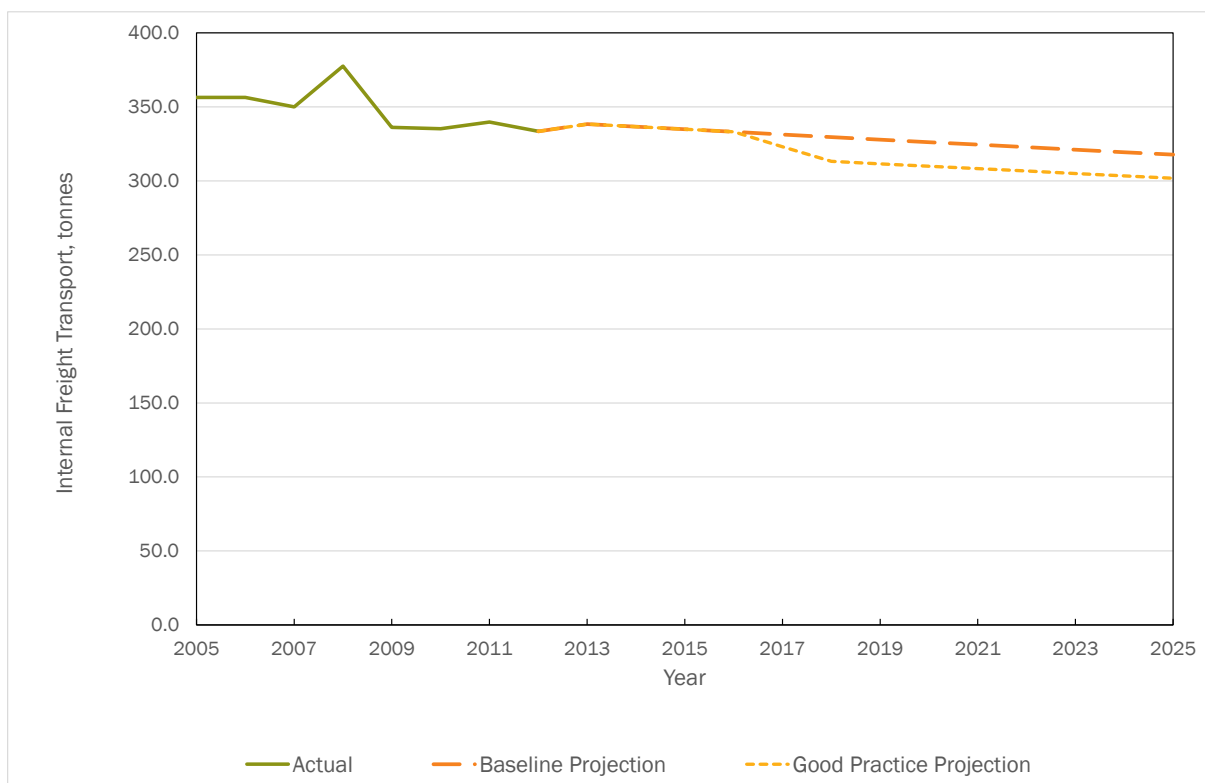


Figure 13-5: Change in Intra-EU Air-freight, tonnes

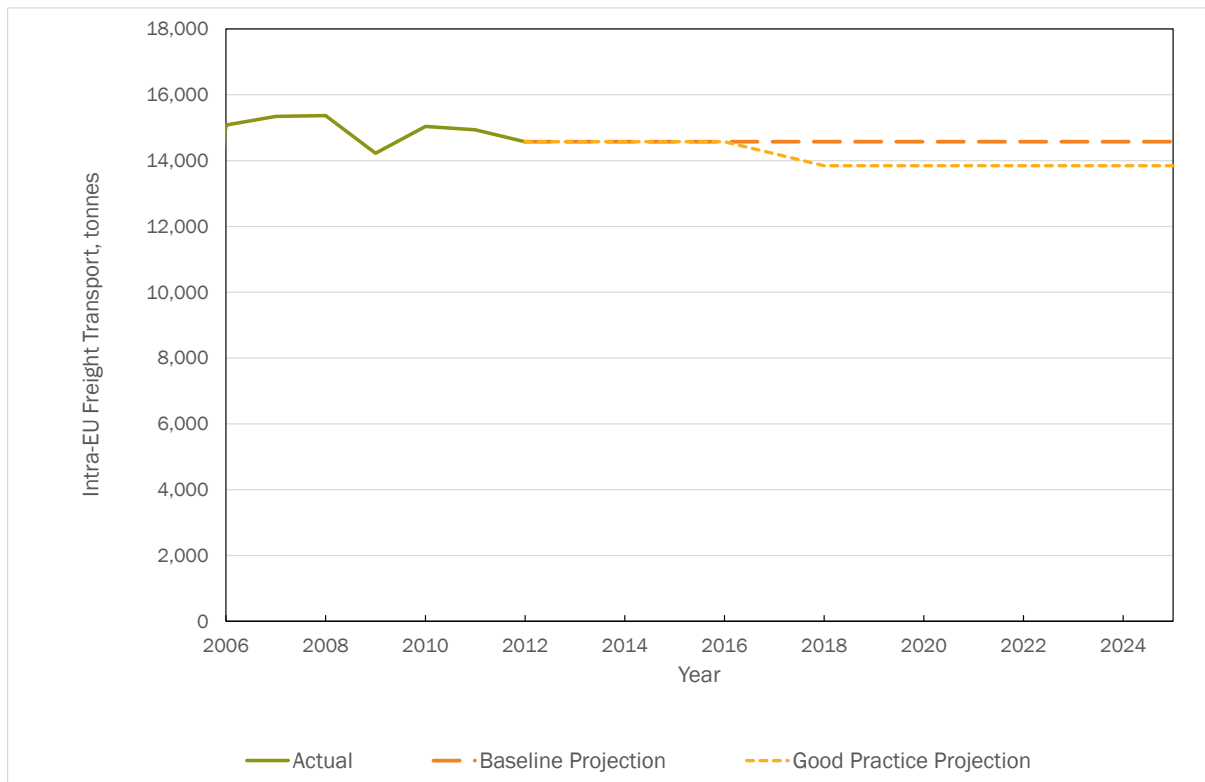


Figure 13-6: Change in Extra-EU Air-freight, tonnes

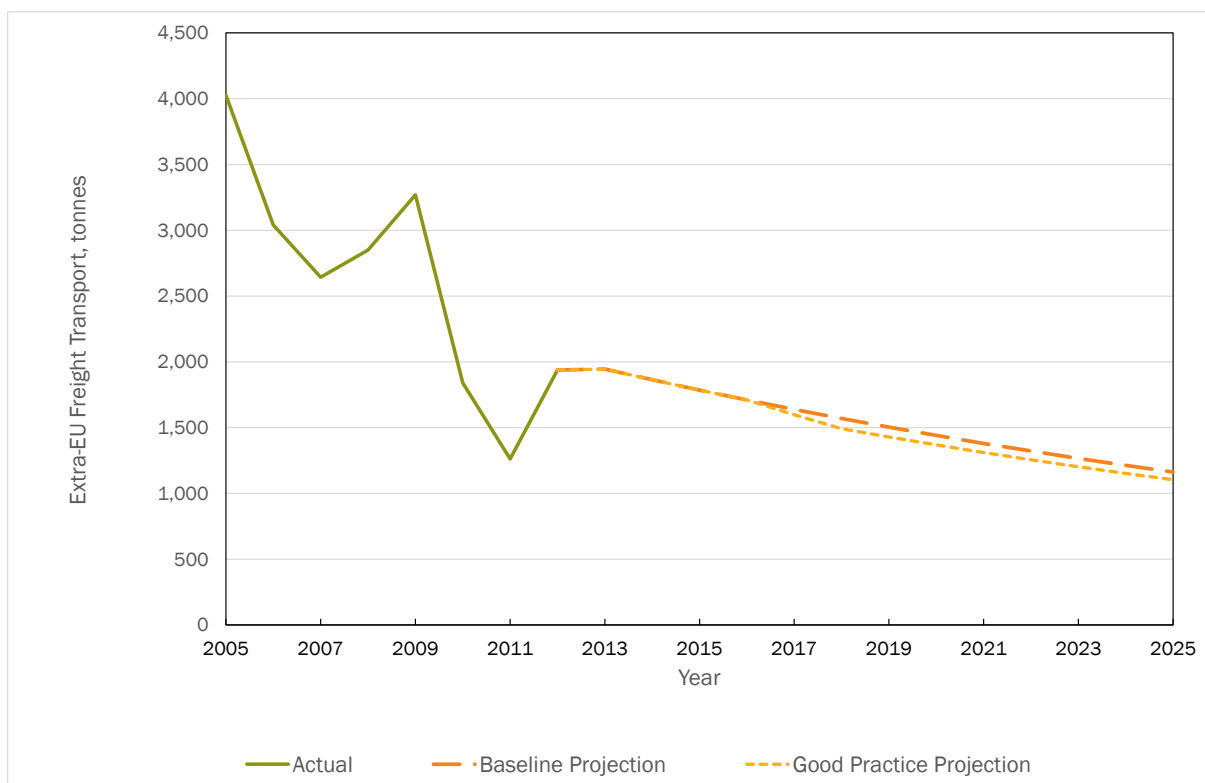


Figure 13-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

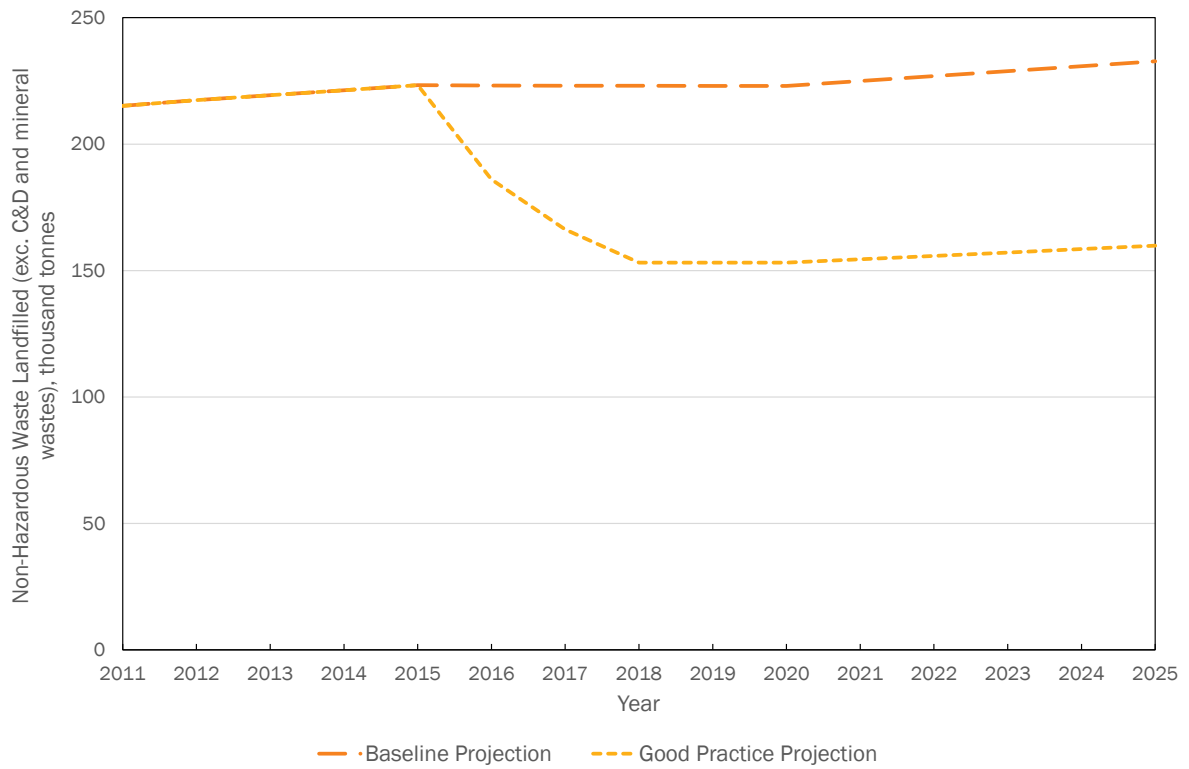


Figure 13-8: Change in MBT/ Incineration, thousand tonnes

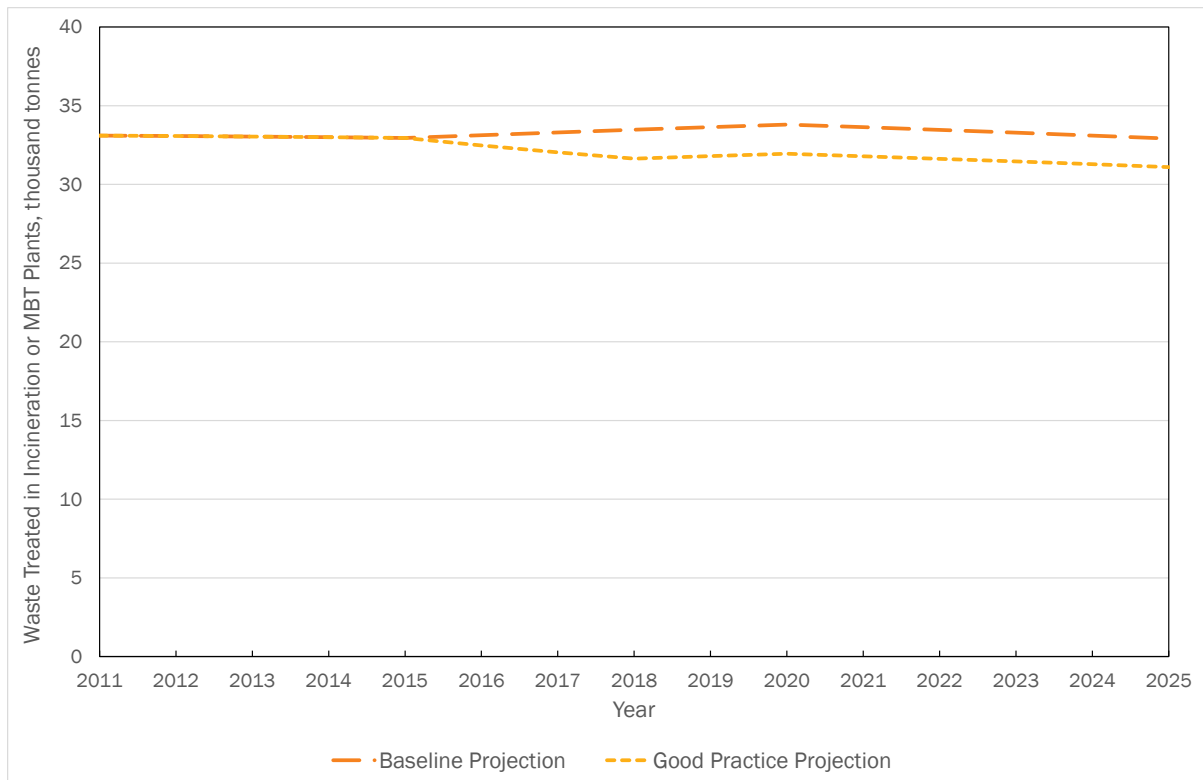


Figure 13-9: Change in SOx Emissions, tonnes

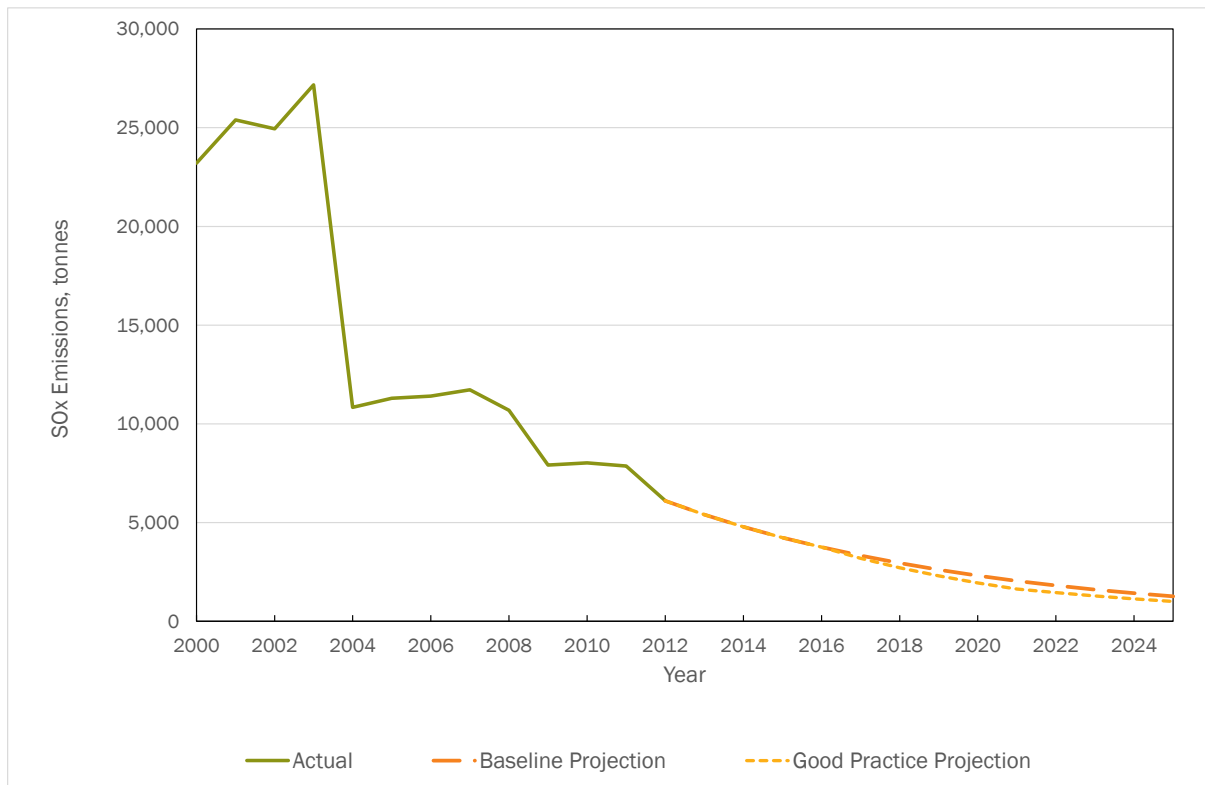


Figure 13-10: Change in NOx Emissions, tonnes

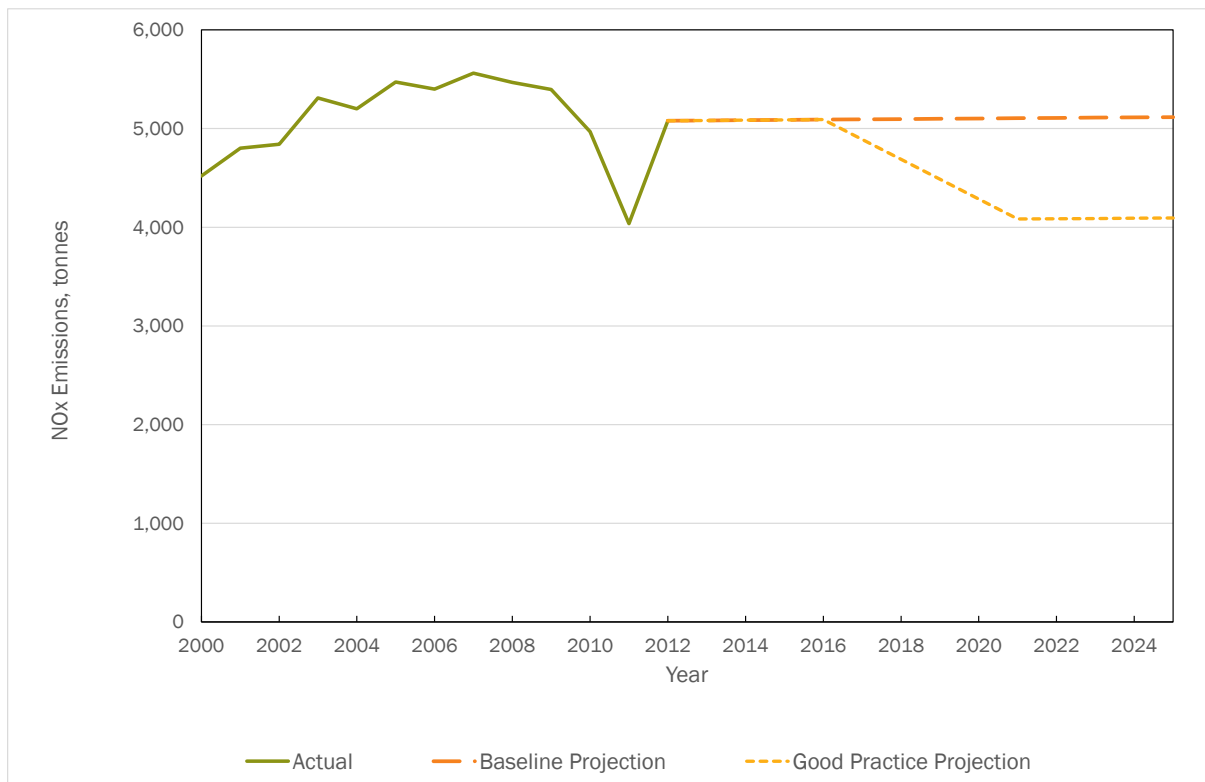


Figure 13-11: Change in PM₁₀ Emissions, tonnes

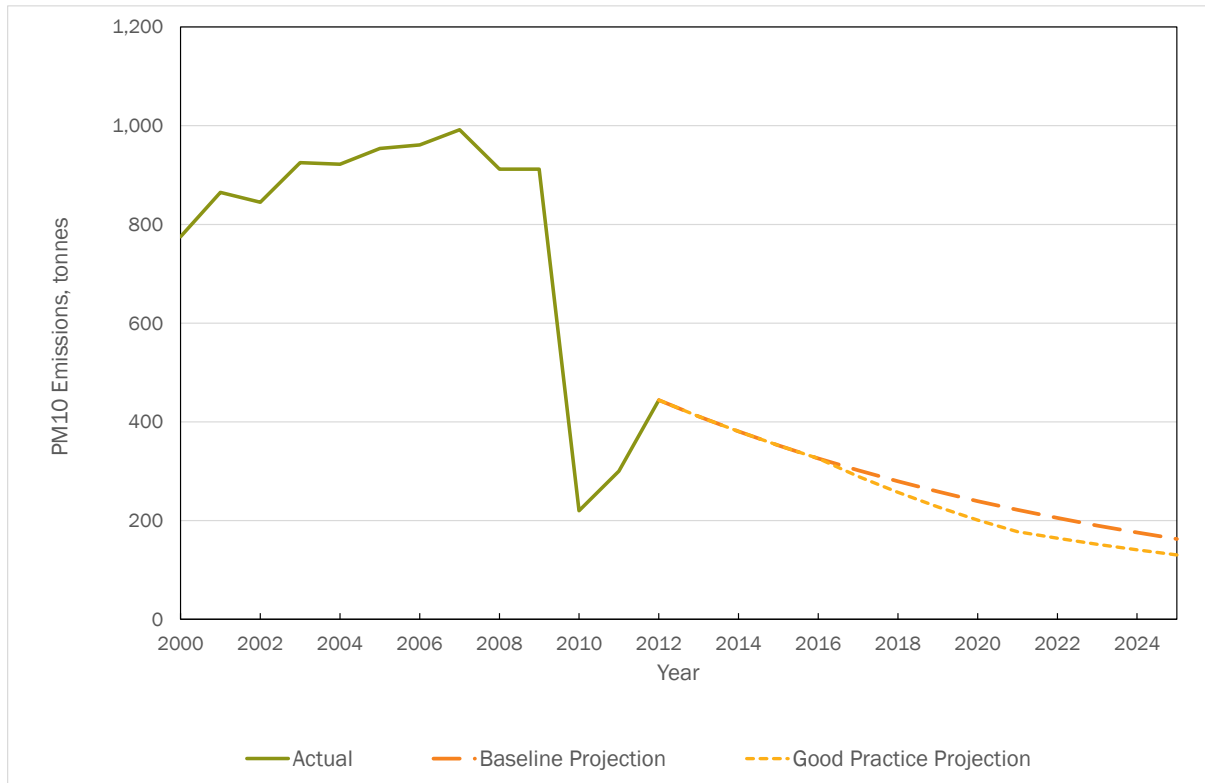


Figure 13-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

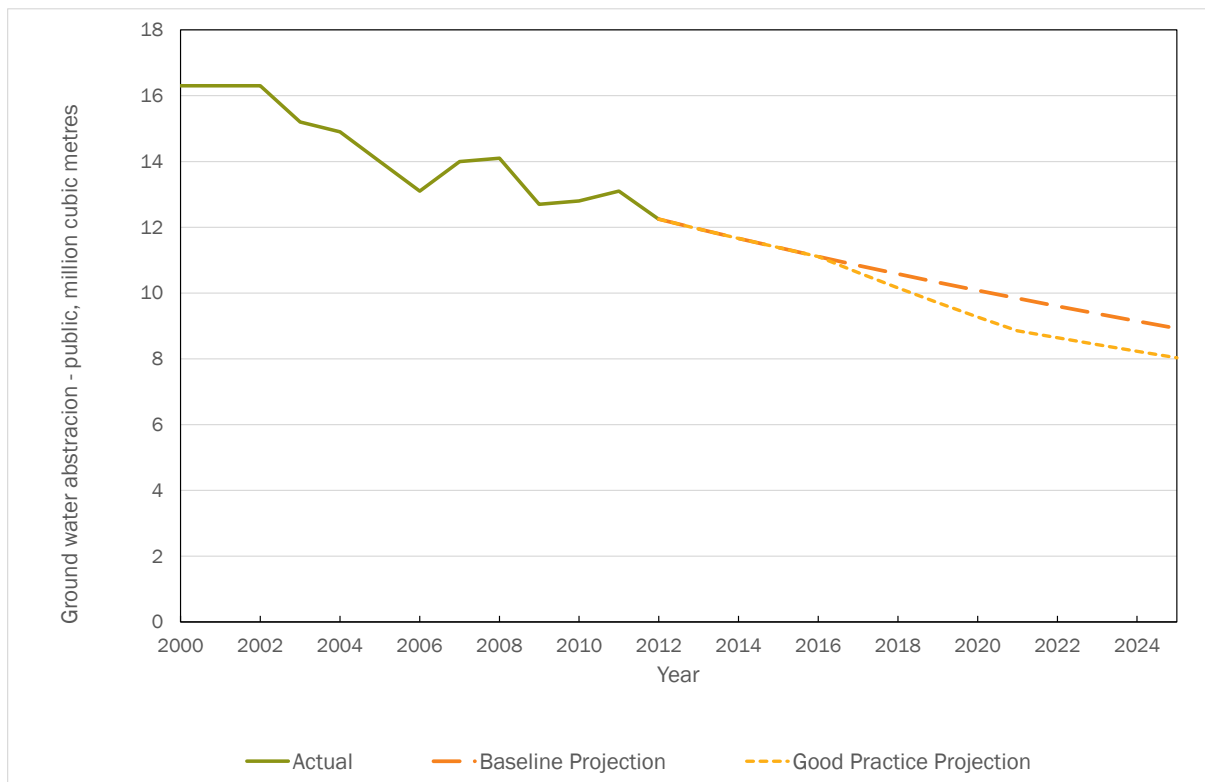


Figure 13-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

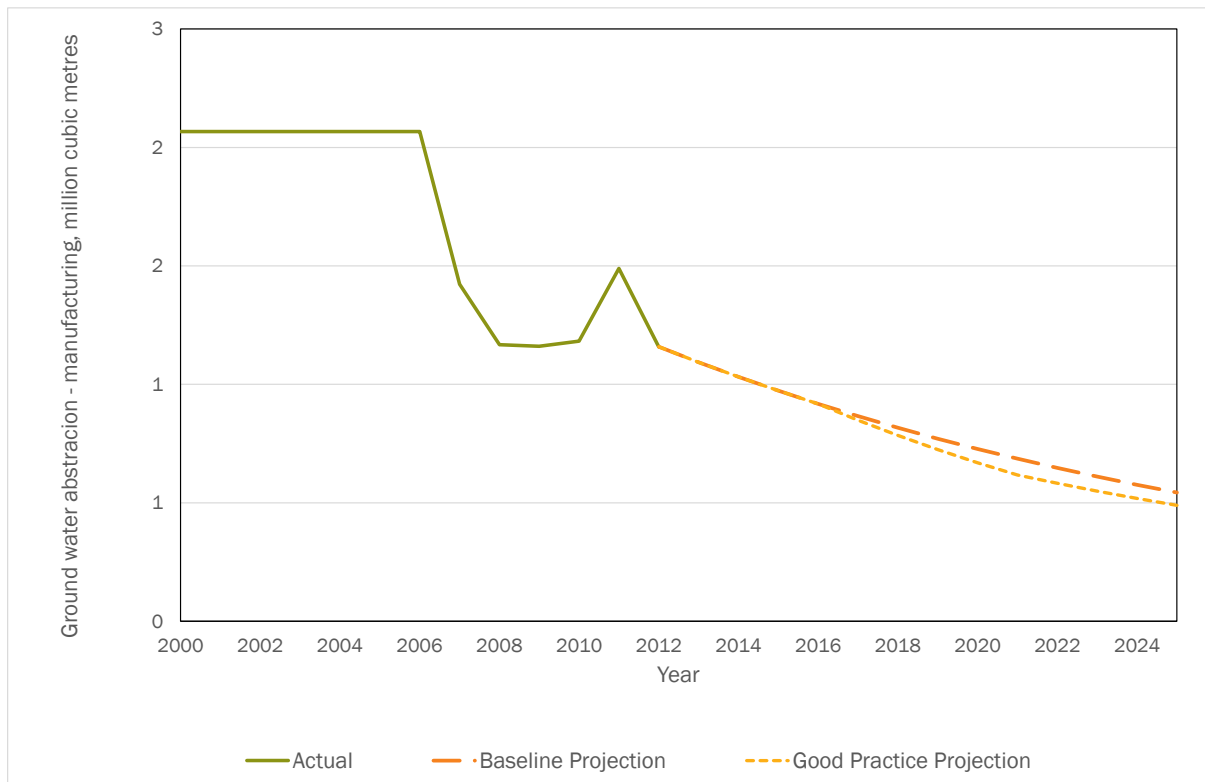


Figure 13-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

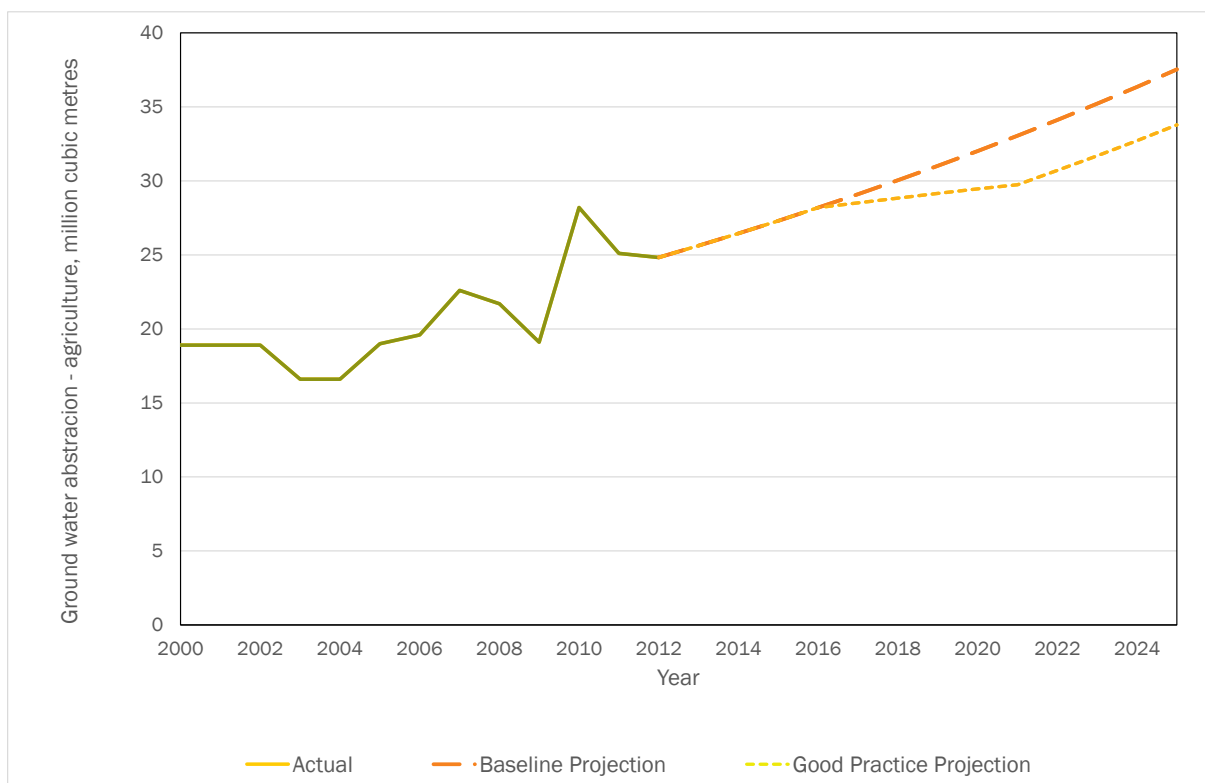


Figure 13-15: Change in Surface Water Abstraction – Public Supply, million cubic metres



Figure 13-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres

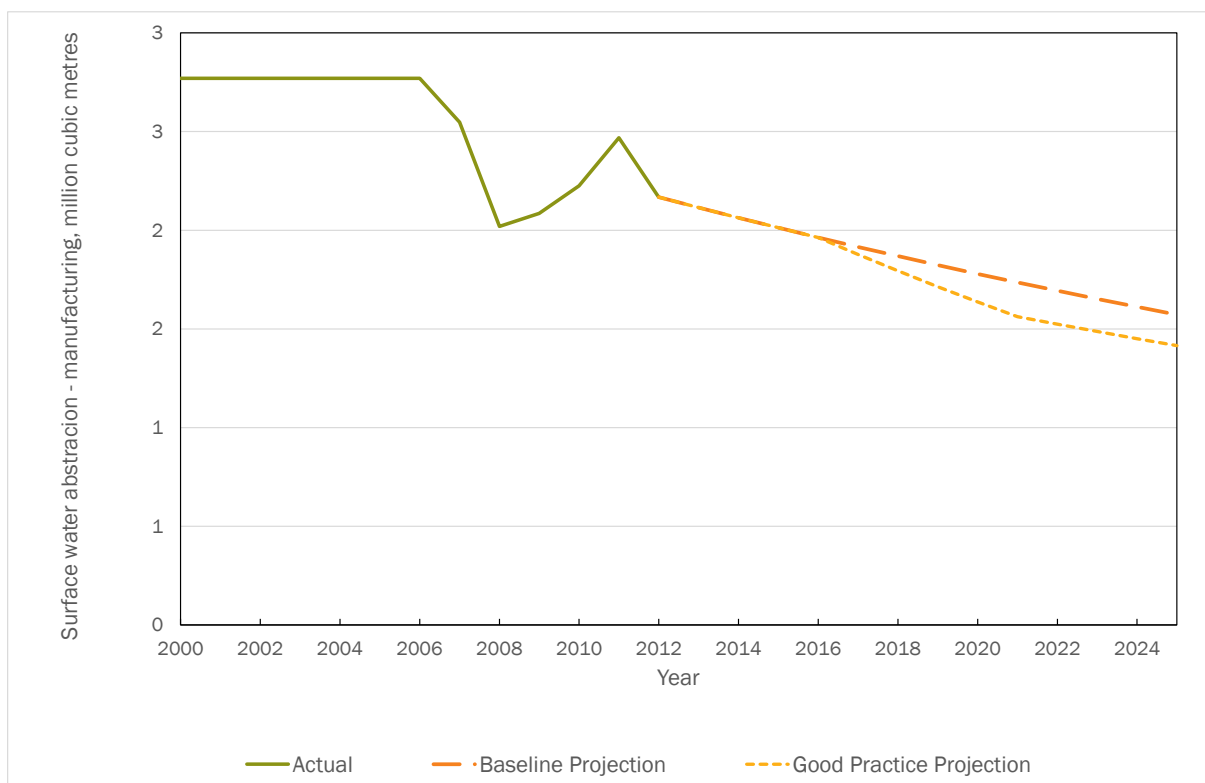


Figure 13-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

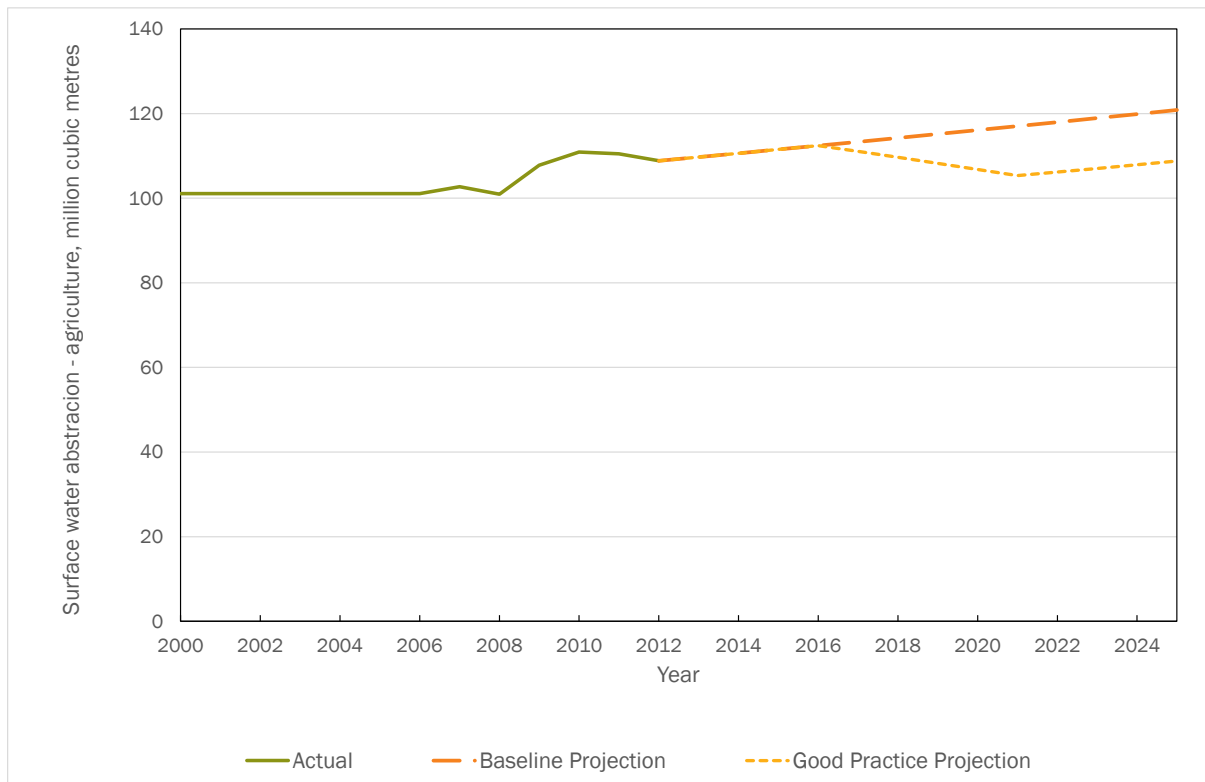


Figure 13-18: Change in Active Ingredients in Pesticides, tonnes

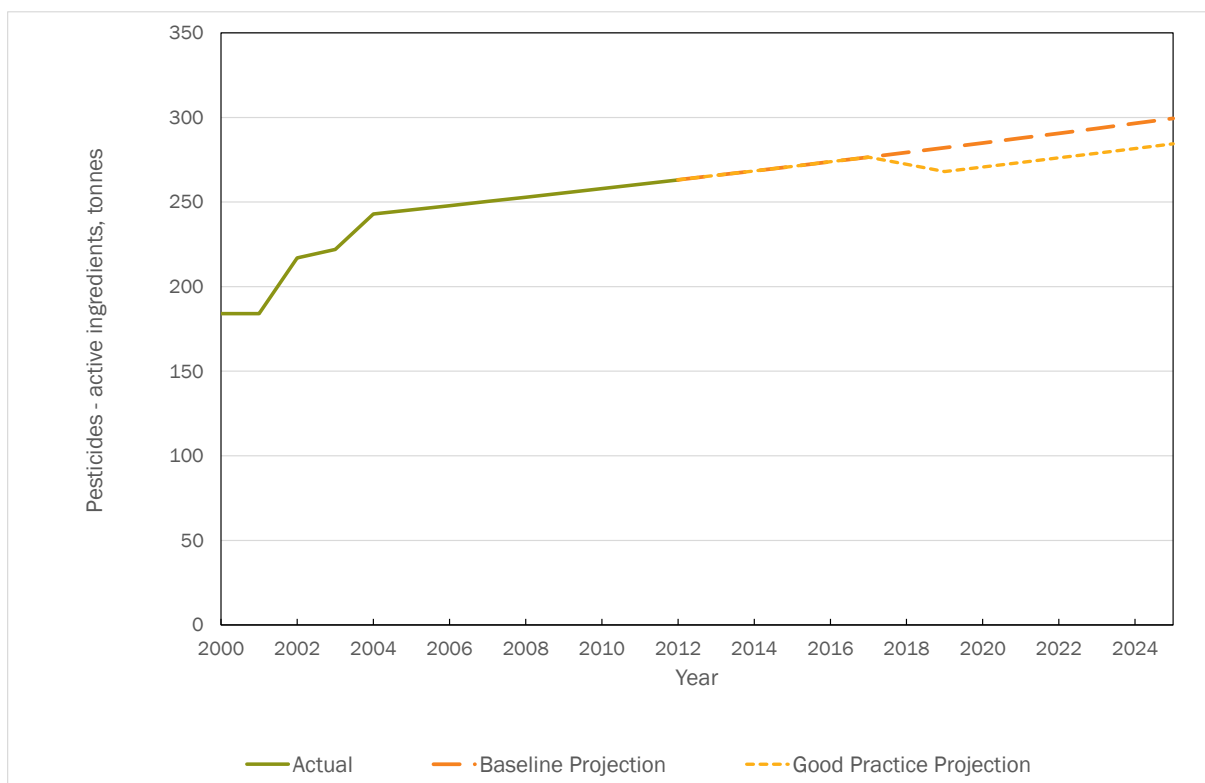


Figure 13-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

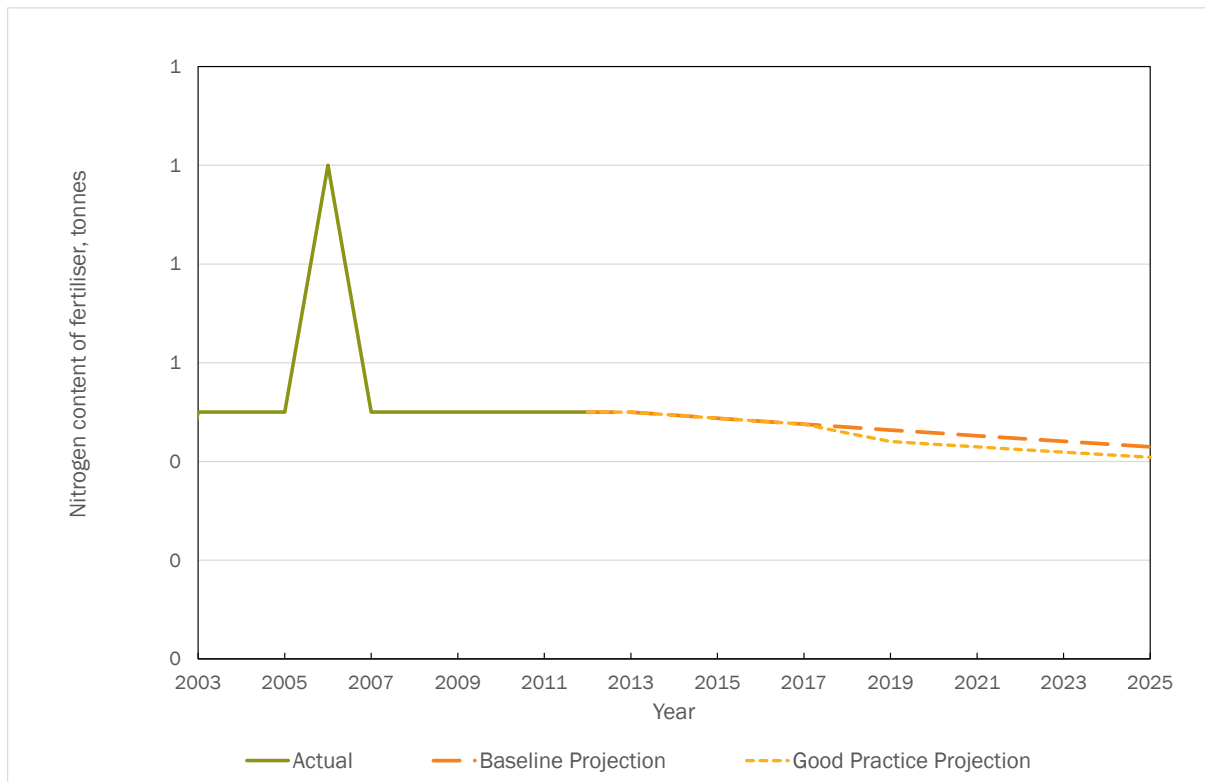


Figure 13-20: Change in Aggregates Extraction, thousand tonnes

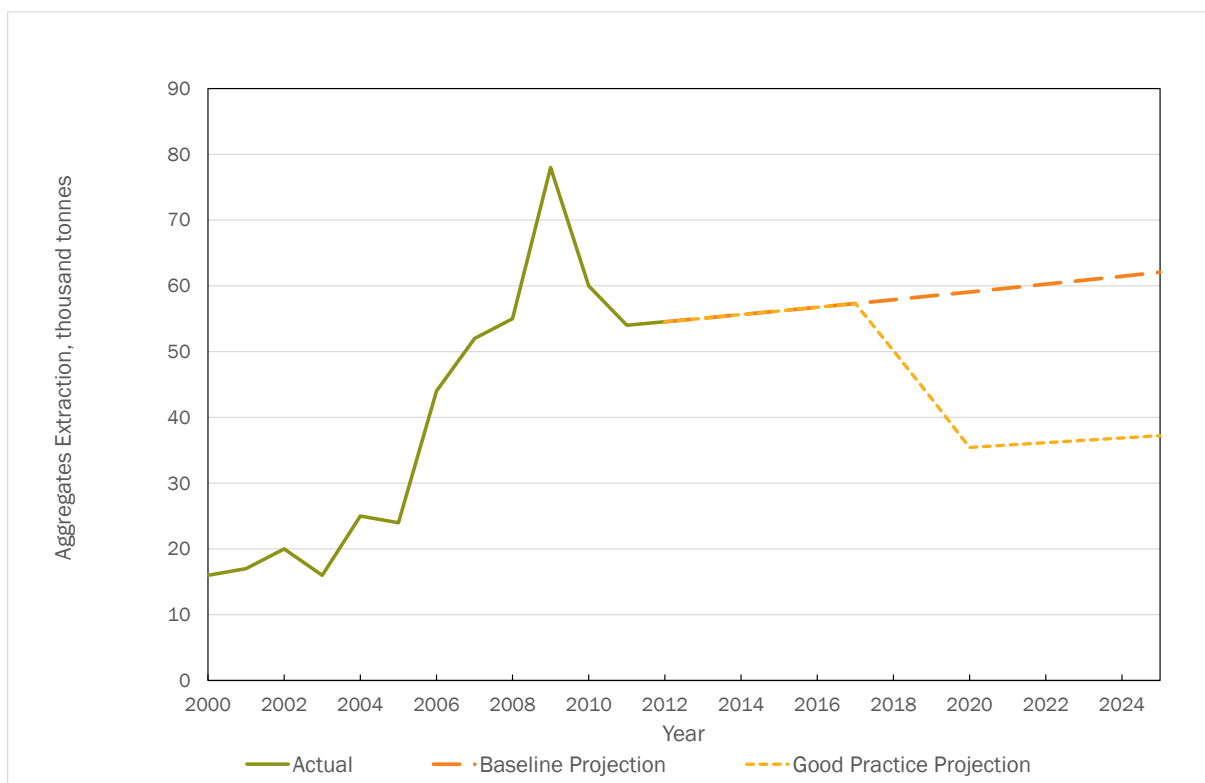


Figure 13-21: Change in Paper & Card Packaging Generation, thousand tonnes

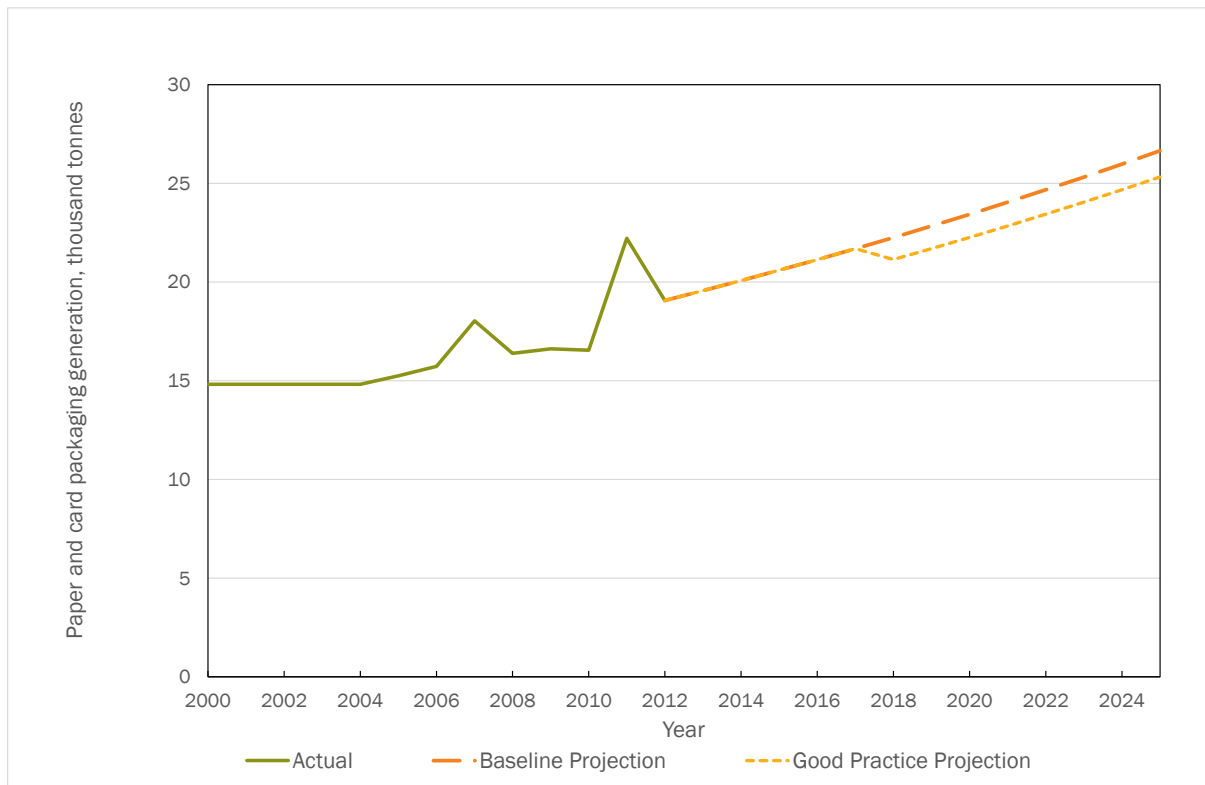


Figure 13-22: Change in Plastic Packaging Generation, thousand tonnes

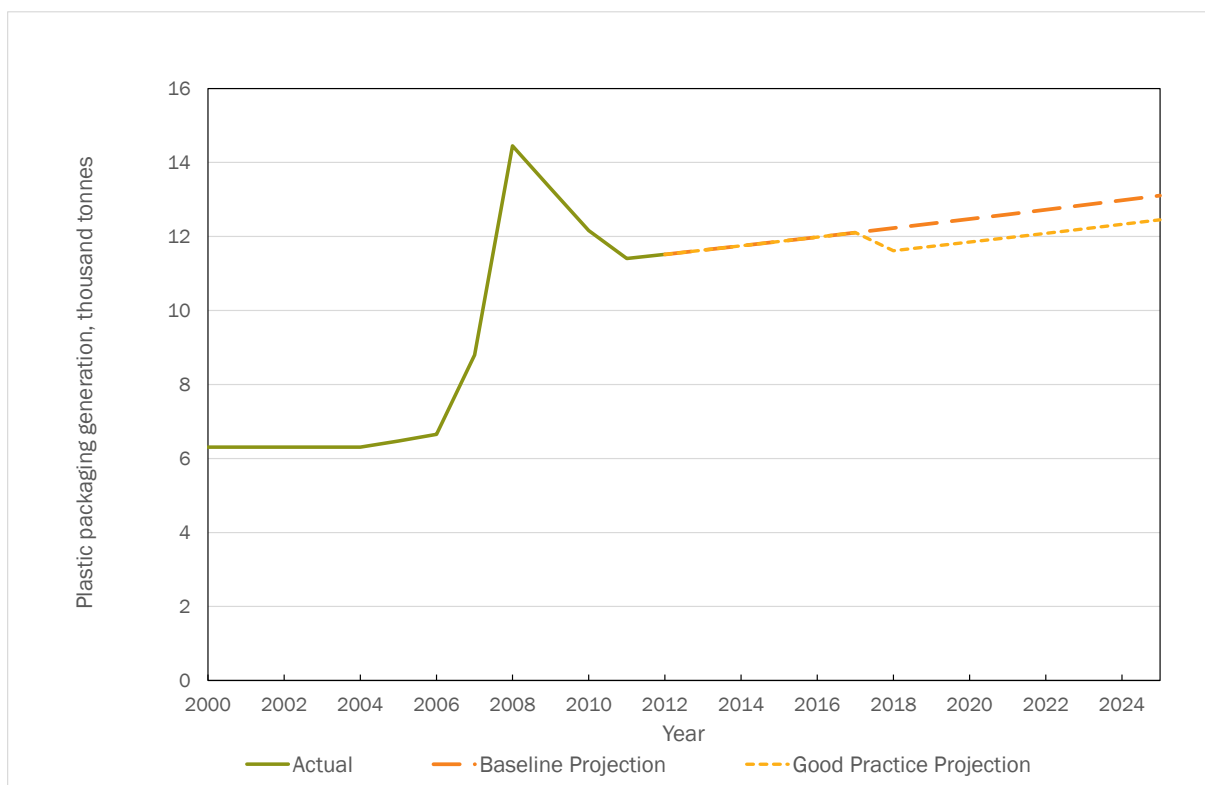


Figure 13-23: Change in Wood Packaging Generation, thousand tonnes

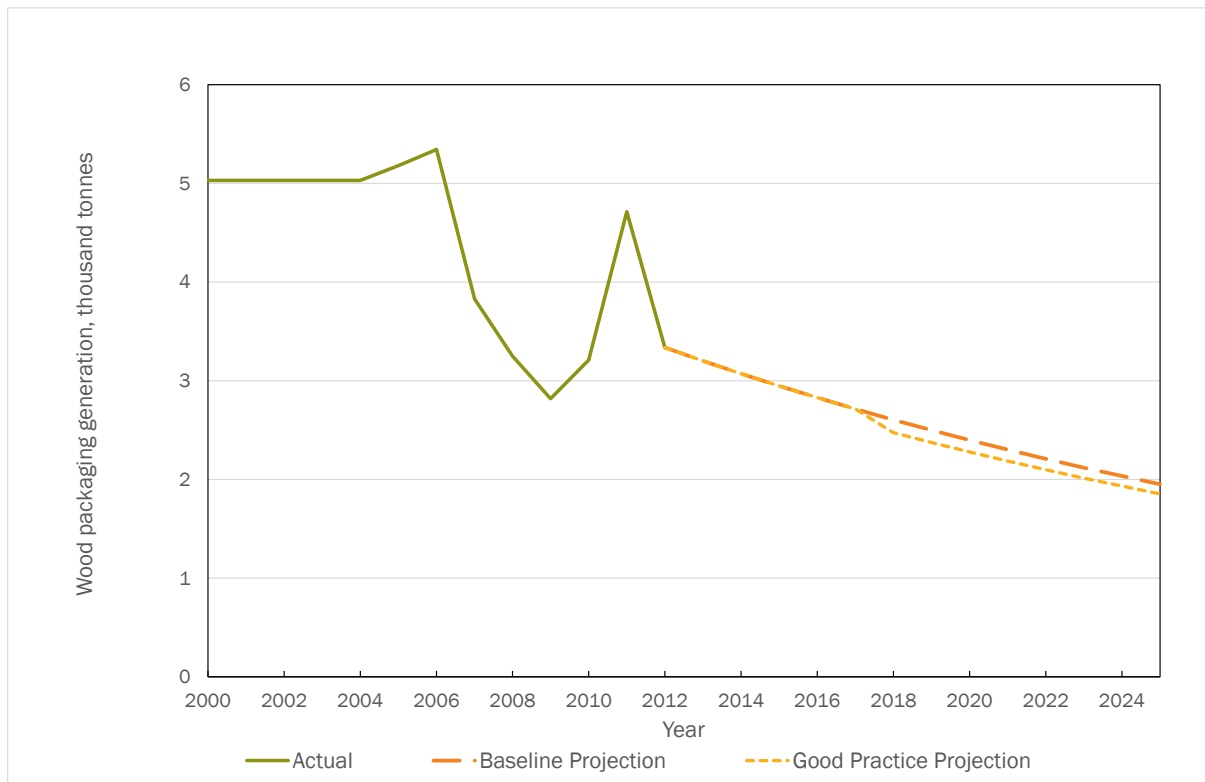


Figure 13-24: Change in Metal Packaging Generation, thousand tonnes

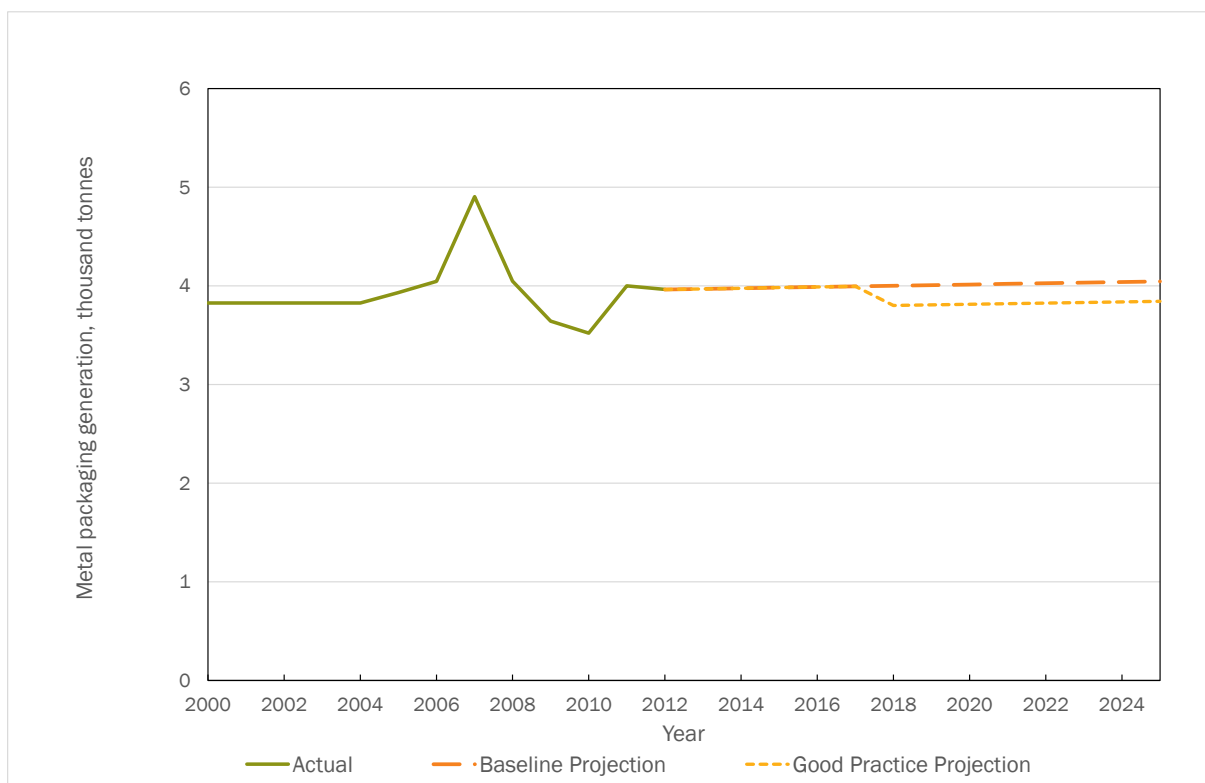


Figure 13-25: Change in Glass Packaging Generation, thousand tonnes

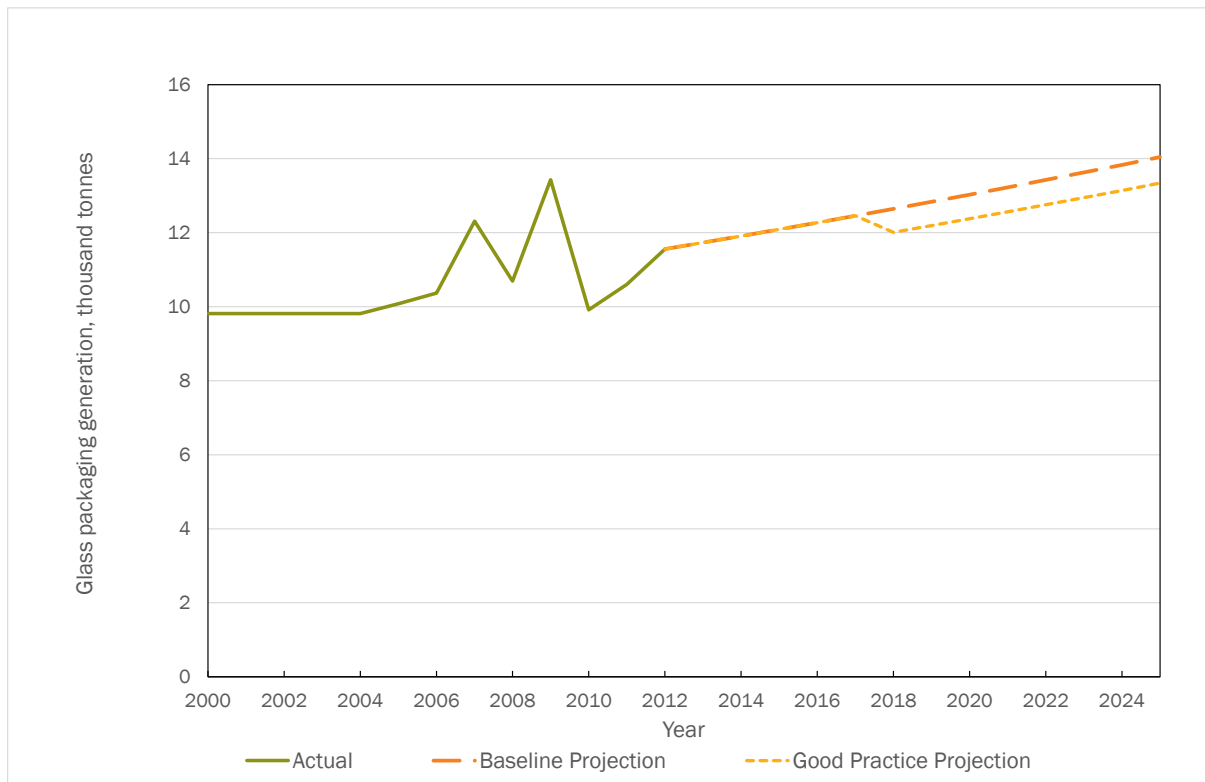
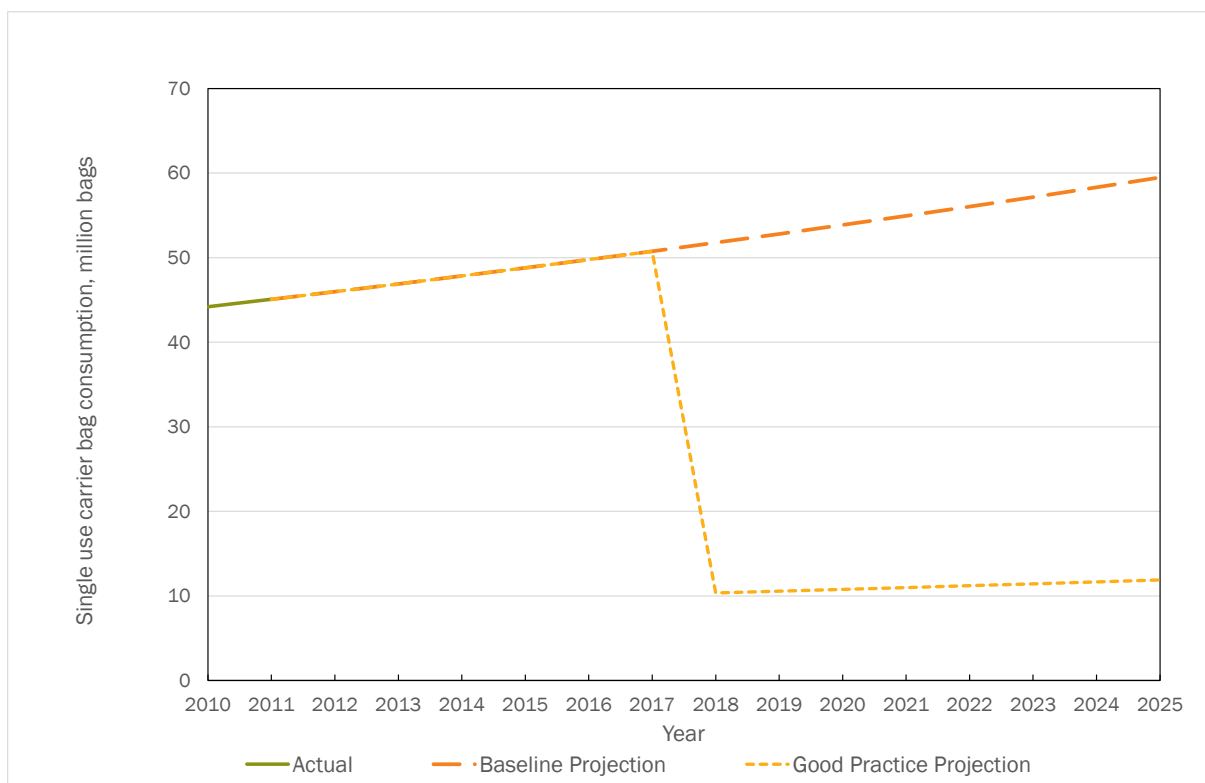


Figure 13-26: Change in Consumption of Single Use Carrier Bags, million bags



13.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 13-13: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	3	5	8	10	13	15	18	18	18
	C&I / Heating	0	0	11	21	32	42	52	63	73	73	73
	Electricity	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Energy, million EUR</i>	0	0	13	26	39	52	65	78	91	91	91
	<i>Sub-total Energy, % GDP</i>	0.0%	0.0%	0.2%	0.3%	0.5%	0.7%	0.9%	1.0%	1.2%	1.2%	1.2%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	0	0	0	0	0	0	0	0	0
	Passenger Aviation Tax	0	0	59	119	123	128	134	139	145	152	158
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Transport, million EUR</i>	0	0	59	119	123	129	134	139	145	152	158
	<i>Sub-total Transport, % GDP</i>	0.0%	0.0%	0.8%	1.6%	1.6%	1.7%	1.8%	1.8%	1.9%	2.0%	2.1%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	2	4	6	8	8	8	8	8	8	8
	Landfill Tax - Inerts (C&D)	0	0	1	1	1	1	1	1	1	1	1
	Incineration /MBT Tax	0	0	0	0	0	0	0	0	0	0	0

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
	Air Pollution Tax	0	2	3	5	6	7	6	6	6	6	5	
	Water Abstraction Tax	0	2	3	5	6	8	7	7	7	7	7	
	Waste Water Tax	0	1	1	1	1	1	1	1	1	1	1	
	Pesticides Tax	0	0	2	4	4	4	4	4	4	4	4	
	Aggregates Tax	0	0	0	0	0	0	0	0	0	0	0	
	Packaging Tax	0	0	2	2	2	2	2	2	2	2	2	
	Single Use Bag Tax	0	4	4	1	1	1	1	1	1	1	1	
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	
	Sub-total Pollution & Resource, million EUR	0	11	21	25	30	32	31	31	31	31	31	30
	Sub-total Pollution & Resource, % GDP	0.0%	0.1%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Total Revenue Stream	Total, million EUR	0	11	93	170	192	212	230	248	267	273	280	
	Total, % GDP	0.0%	0.1%	1.2%	2.2%	2.5%	2.8%	3.0%	3.3%	3.5%	3.6%	3.7%	

14.0 Netherlands

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

14.1 Energy Taxes

➤ **Excise duty on mineral oils (“Accijns van minerale oliën”):⁴⁹⁵**

- The excise duty is applied on light oils (petrols), medium oils (kerosene/petroleum), gas oils (diesel), heavy fuel oil, liquefied petroleum gas (LPG) and other energy products like biofuels used as fuel.
- The excise duty is paid by the authorized warehouse keeper from where mineral oil is released for consumption or the importer of mineral oil.
- A tax reduction might apply for LPG in vehicles used in public functions, like buses.
- Exemptions provided for kerosene used for propelling airplanes (other than pleasure craft);
- Refund of excise duty for mineral oils (not kerosene) used for propelling airplanes (other than pleasure craft);
- Excise duty on exports is remitted or refunded.
- Rates applied are outlined in the main report.
- Rates are generally considerably higher than the ETD minimum and the EU-28 average. Only the rates for heavy fuel oil are considerably lower than the EU-28 average, but still higher than the ETD minimum.
- In 2012, revenue from the excise duty on mineral oils, the energy tax and the tax on coal together amounted to: €11,480 million (equivalent to 1.92 % of GDP and to 4.91% of total tax revenue). It should be noted that leaded petrol is not available in the Netherlands. Therefore the excise duty on leaded petrol does not generate any revenue.

⁴⁹⁵ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=873/1395149523&taxType=Energy+products+and+electricity

➤ **Energy tax (“Energiebelasting”):**⁴⁹⁶

- The Energy tax is levied on delivery of electricity and natural gas.
- The tax is paid by the distributor of electricity or natural gas.
- Tax credits:
 - An annual tax credit/reduction applies per connection to the electricity grid with a capacity of more than 1 x 6 Amperes. For connections to real estate for working or dwelling, the credit is €318.62. For other connections, the credit is €119.62.
 - A tax reduction applies for the use of natural gas in the horticulture sector (greenhouse heating).
- Exemptions:
 - Natural gas and electricity used as fuel to generate electricity in either an installation with an electrical return of at least 30% or an installation that exclusively uses renewable energy and electricity to generate electricity.
 - Electricity used for chemical reduction and in electrolytic and metallurgical processes.
 - Natural gas used other than as fuel and natural gas used as an additive or filler in products that directly or indirectly are intended to be used, offered for sale or used as natural gas.
- Refunds:
 - Business use of electricity above 10 million kWh per year per electricity connection on condition that it is an energy-intensive business and has obligations to improve energy efficiency under a covenant with the government. The refund is limited: beneficiaries pay at least the minimum EU tax level on electricity.
 - When the tax has been levied while an exemption was applicable.
 - On certain conditions a refund of 50% is given when natural gas or electricity is used in a property that is mainly used by non-profit institutions or for public worship or philosophical reflections.
- Rates are outlined in Table 16-2.

Table 14-1: Standard Rates of Excise Duties on Fuels and Electricity in the Netherlands

Excise Duty	Unit	Rate Applied in the Netherlands	Existing ETD Minimum	EU-28 Average	EU-28 Median

⁴⁹⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=873/1395149523&taxType=Energy+products+and+electricity

Excise Duty	Unit	Rate Applied in the Netherlands	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol ¹	€ per 1000 litres	€845.51	€421	€585	€583
Unleaded Petrol	€ per 1000 litres	€759.24	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€477.76	€330	€427	€405
Kerosene	€ per 1000 litres	€477.76	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€322.17	€125	€209	€180
Natural Gas ^{2,3}	€ per GJ	€5.39 (0 - 170,000m ³) €1.27 (170,000 - 1 million m ³) €0.46 (1 million -10 million m ³) €0.33 (>10 million m ³)	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use					
Gas Oil (Diesel)	€ per 1000 litres	€477.76	€21	€221	€163
Kerosene	€ per 1000 litres	€477.76	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€322.17	€41	€126	€125
Natural Gas	€ per GJ	€5.39 (0 - 170,000m ³) €1.27 (170,000 - 1 million m ³) €0.46 (1 million - 10 million m ³) €0.33 (>10 million m ³)	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€477.76	€21	€221	€163
Kerosene	€ per 1000 litres	€477.76	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€35.83	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€322.17	€0.00	€82	€40
Natural Gas	€ per GJ	€5.39 (0 - 170,000m ³)	€0.15	€1.36	€0.46

Excise Duty	Unit	Rate Applied in the Netherlands	Existing ETD Minimum	EU-28 Average	EU-28 Median
		€1.27 (170,000 - 1 million m ³) €0.46 (1 million - 10 million m ³) €0.33 (>10 million m ³)			
Coal and Coke ⁴	€ per GJ	€0.53	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel)	€ per 1000 litres	€477.76	€21	€179	€125
Kerosene	€ per 1000 litres	€477.76	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€35.83	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€322.17	€0.00	€111	€42
Natural Gas ⁵	€ per GJ	€5.39 (0 - 170,000m ³) €1.27 (170,000 - 1 million m ³) €0.46 (1 million - 10 million m ³) €0.33 (>10 million m ³)	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€0.53	€0.30	€1.77	€0.32
Electricity⁶					
Business Use	€ per MWh	€118.5 (0 – 10,000 kWh) €43.1 (10,000-50,000 kWh) €11.5 (50,000-10,000,000 kWh) €0.50 (>10,000,000 kWh)	€0.50	€8.42	€1.03

Excise Duty	Unit	Rate Applied in the Netherlands	Existing ETD Minimum	EU-28 Average	EU-28 Median
Non-Business Use	€ per MWh	€118.5 (0-10,000 kWh) ⁷ €43.1 (10,000-50,000 kWh) €11.5 (50,000-10,000,000 kWh) €1.00 (>10,000,000 kWh)	€1.00	€14.53	€2.06

Notes:

1. Leaded petrol is not sold any longer.
2. These rates are approximate because the national tax rate is based on m³. Tariffs per m³ are: € 0.1894 (0 – 170,000 m³); €0.0446 (170,000 – 1 million m³); € 0.0163 (1 million – 10 million m³); 0.0117 (over 10 million m³). For propellant use, natural gas used in installations for the production of CNG (compressed natural gas) is taxed at a generic rate of € 0.128 per m³ (€ 3.64 per GJ).
3. There is a surcharge on this tax in order to finance the subsidy scheme on renewable energy since 1st January 2013. Tariffs are € 4.60, €1.70, €0.50 and €0.40, respectively for the four brackets. This also holds for the other uses of natural gas. No distinction is made between business and non-business use.
4. The coal tax is calculated based on weight: €14.27 per 1,000 kg.
5. As noted above, a surplus is applied for financing the development of renewable energy sources. Tariffs applied are as follows: € 4.60, €1.70, €0.50, and €0.40, respectively for the four brackets, no distinction is made between business/non-business use.
6. The rates in the table are given per MWh, whereas national rates are given per kWh. Since 1st January 2013 a surcharge on this energy tax is in place in order to finance the subsidy scheme on renewable energy. The rate of this surcharge is expected to increase. No distinction is made between business and non-business use.
7. As of 1st January 2014 a tax reduction of 7.7 cent per kWh applies for locally produced sustainable electricity in the first tax bracket (0-10.000 kWh).

Source: DG TAXUD (2014) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2014, http://ec.europa.eu/taxation_customs/index_en.htm#

- The rates applied for electricity for deliveries up to 50,000 kWh are much higher than the EU-28 average of €8.42 per MWh. The rates for deliveries between 50,000 and 10 million kWh are closer to the EU-28 average for both business and non-business use, but still considerably higher than the ETD minimum of €0.50. The rate for deliveries above 10 million kWh is equal to the ETD minimum.
- The rates for natural gas respect the ETD minimum for all uses except for transport fuel. In the latter case the rates applied for deliveries of more than 170,000 m³ are below the ETD minimum of €2.60 per GJ and below the EU-28 average. The rates for deliveries of less than 170,000 m³ are for all types of use significantly higher than the EU-28 averages.

- In 2012, revenue from the excise duty on mineral oils, the energy tax and the tax on coal together amounted to: €11,480 million (equivalent to 1.92 % of GDP and to 4.91% of total tax revenue).

➤ **Tax on coal (“Kolenbelasting”):**⁴⁹⁷

- The tax is levied on coal or coal products when imported or released from the coal establishment.
- The tax is paid by the licensee of a coal establishment or the one who has coal or coal products on hand that have not yet been taxed.
- Exemptions:
 - Coal or coal products not used as a fuel.
 - Coal or coal products used for dual purposes: coal or coal products used as heating fuel and for other purposes other than as motor or heating fuel.
- Tax refunds:
 - When coal tax has been levied while an exemption was applicable.
 - Coal that has been taken abroad.
- Rates are outlined in the main report.
- The rate (€0.53 per GJ) is higher than the ETD minimum; both for business and non-business use (heating), but lower than the EU-28 average.
- The tax on coal will be terminated by 2016 (i.e. the exemption for electricity production will be introduced again) in exchange for the closing down of five older power plants. This was agreed in the 2013 Energy Agreement for Sustainable Growth (“Energieakkoord voor Duurzame Groei”).
- Revenue in 2012 from the mineral oil excise duties, energy tax and the tax on coal together amounted to €11,480 million (equivalent to 1.92% of GDP and to 4.91% of total tax revenue).

14.2 Transport Taxes (Excluding Transport Fuels)

➤ **Tax on passenger cars and motorcycles (“Belasting van personenauto’s en motorrijwielen – BPM”):**⁴⁹⁸

- This one-off registration tax is paid by Dutch residents, individuals or companies, registering a passenger car, motorcycle or van not for use by a

⁴⁹⁷ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=873/1395149523&taxType=Energy+products+and+electricity

⁴⁹⁸ European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=443/1388754879&taxType=Other+indirect+tax

company for the first time, or, in the case of a vehicle registered outside the Netherlands, first use of the vehicle on Dutch roads. Temporary use for less than two weeks is not taxed.

- The tax on passenger cars is based on fuel type and CO₂ emissions. The lower the CO₂ emissions, the less tax is paid.
- The tax on motorcycles or vans is levied on the net catalogue price.
- Exemptions:
 - Vans are exempt under certain conditions (meet requirements to guarantee the vehicle could not easily be used as a replacement for a passenger car, registered in the name of an entrepreneur and used for business purposes for at least 10% of the time).
 - New vehicles seating more than eight passengers.
 - Ambulances and animal ambulances.
 - Special vehicles for the transport of prisoners.
 - Police vehicles, military vehicles and fire engines.
 - Zero emission vehicles (e.g. electric cars), i.e. motor vehicles that do not emit CO₂.
 - Taxis.
- Refund: for vans used by disabled persons.
- Rates:
 - For petrol cars: a fixed surcharge and an emission based amount (rate per g CO₂ per km above minimum of the bracket) (see Table 14-2).
 - For diesel cars: fixed surcharge and an emission based amount (rate per g CO₂ per km above the minimum of the bracket) (see Table 14-2).
 - For petrol vans: 37.7% of the net catalogue price, reduced by €1,283.
 - For diesel vans: 37.7% of the net catalogue price, increased by €273.
 - For motorcycles up to a net price of €2,133: 9.6% of the net catalogue price.
 - For motorcycles at a net price of more than €2,133: 19.4% of the net catalogue price less €210.
 - For used passenger cars, motorcycles and vans: the one-off registration tax is reduced in line with the reduction in value of the vehicle. Optionally, fixed percentages may be used to determine this reduction.
 - A used vehicle over 25 years old is exempt from this tax.
- Revenue in 2012 (the latest year for which figures are available): €1,500 million (equivalent to 0.25% of GDP and to 0.64% of total tax revenue)

- From 2015 onwards the CO₂ emission brackets within this tax will be sharpened in order to encourage consumers to buy increasingly more CO₂ efficient cars.. This is expected to generate additional revenue of €200 million per year. The tariffs for petrol and diesel cars are converging and will be equal from 2015.⁴⁹⁹

Table 14-2: Tax on Passenger Cars and Motor Bicycles – Rates for Petrol and Diesel Cars

	Minimum emission (g CO ₂ per km)	Maximum emission (g CO ₂ per km)	Fixed surcharge	Rate per g CO ₂ per km
Petrol Cars				
First bracket	88 ⁵⁰⁰	124	€ 0	€ 105
Second bracket	124	182	€ 3,780	€126
Third bracket	182	203	€ 11,088	€ 237
Fourth bracket	203		€ 16,065	€ 474
Diesel Cars				
First bracket	85 ⁵⁰¹	120	€ 0	€ 105
Second bracket	120	175	€ 3,675	€ 126
Third bracket	175	197	€ 10,605	€ 237
Fourth bracket	197		€15,819	€474
On top of this a surcharge of €72.93 per gram CO ₂ per km applies on emissions exceeding 70g CO ₂ per km.				

Source: European Commission (2014) *Taxes in Europe Database*, Accessed 27th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=443/1388754879&taxType=Other+indirect+tax

- Tax on heavy motor vehicles (“Belasting zware motorrijtuigen” or “Eurovignette”):⁵⁰²

⁴⁹⁹ Rijksoverheid (2014) *Belastingplan 2014*, Accessed 5 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingplan-2014>

⁵⁰⁰ Petrol cars with emissions less than 88 g CO₂ per km are not taxed.

⁵⁰¹ Diesel cars with emissions less than 85 g CO₂ per km are not taxed.

- The tax is paid by heavy goods vehicles (gross maximum weight of 12,000 kg or more) for the use of a motorway in the Netherlands.
- The tax is paid by the person in whose name the vehicle is registered, or in case of a foreign vehicle or a non-registered vehicle, the user.
- Rate:
 - Depends on total number of axles of the vehicle and Euro-classification (EURO-0, EURO-I, EURO-II or cleaner).
 - For a week or for a month, reduced rates apply. The rate for one day is €8.00, regardless of the type of vehicle.
- Exemptions:
 - Vehicles used by certain public services, vehicles used, for example, in road-making, vehicles in business-stock and vehicles commonly used for short distances.
 - Based on a treaty between the Netherlands, Belgium, Luxemburg, Sweden and Denmark, a Eurovignette purchased in one of the partner countries is valid in the Netherlands.
- Revenue in 2012 (the latest year for which figures are available): €134 million (equivalent to 0.02% of GDP and to 0.06% of total tax revenue).

Table 14-3: 2014 Rates of Tax on Heavy Motor Vehicles

Euro Class	for 1 year		for 1 month		for 1 week	
	max. 3 axles	4 axles or more	max. 3 axles	4 axles or more	max. 3 axles	4 axles or more
Euro class 0	€960	€1,550	€96	€155	€26	€41
Euro class 1	€850	€1,400	€85	€140	€23	€37
Euro class 2 or higher	€750	€1,250	€75	€125	€20	€33

Note: The tariff for 1 day is €8, regardless of the type of vehicle.

Source: Belastingdienst (2014) *Tarief Belasting Zware Motorrijtuigen*, Accessed 23rd September 2014, www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/privé/auto_en_vervoer/belasting_op_auto_en_motor/belasting_zware_motorrijtuigen/tarief_bzm

⁵⁰² European Commission (2014) *Taxes in Europe Database*, Accessed 27 August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=682/1388754879&taxType=Other+direct+tax

➤ **Motor vehicles tax (“Motorrijtuigenbelasting” (MRB)):**⁵⁰³

- This annual tax is paid by persons in whose name a passenger car, van, motorcycle or lorry is registered or in case of a foreign registered vehicle by the person/company that has the vehicle at its disposal.
- The amount of the tax for passenger cars depends on:
 - Weight.
 - Type of fuel (petrol, diesel, LPG).
 - CO₂-emissions (there is a special CO₂-regime for passenger cars emitting less than 50 g per km, up to and including 2015).
 - Province of residence of the owner. For example: 1,400kg, petrol: from €756 (province of Zeeland) to €820 (province of Zuid-Holland) per year; 1,000kg, petrol: from €396 (province of Zeeland) to €424 (province of Zuid-Holland) per year; 1,000kg, diesel: from €908 (province of Zeeland) to €940 (province of Zuid-Holland) per year; and 1,000kg, LPG 3 and natural gas: from €512 (province of Zeeland) to €540 (province of Zuid-Holland) per year.
- An additional regional surtax for passenger cars and motorcycles also exists.
- The amount of the tax for vans and busses depends on:
 - Weight.
 - Whether the van is used by an entrepreneur. For example: 1,400kg, € 340.00 per year
- The amount of the tax for lorries depends on:
 - Weight.
 - Number of axles.
 - Suspension.
 - EURO-classification.
 - For example: Lorry, up to 25,000kg, no towing-hook, no air-suspension and three axles: € 852.00 per year; and Lorry with Euro 0, 1 or 2, rates are 90%, 75% and 60% higher respectively.
- For motorcycles there is a fixed fee.
- Heavy goods vehicles such as trucks are also subject to the Tax on heavy vehicles using motorways (see above).
- Exemptions:

⁵⁰³ Rijksoverheid (2014) Belastingen op auto en motor, Accessed 4 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-op-auto-en-motor>

- Motor vehicles with limited road use (for example agriculture and forestry).
- Taxis.
- Motor vehicles used for public functions: ambulances, hearses, public defence, police, fire brigade, specific health services and road maintenance.
- Old vehicles which are 40 years or older.⁵⁰⁴
- Reductions:
 - For old vehicles between 26-40 years old (adapted tariff).^{505,506}
 - 100% tax reduction for a motor vehicle equipped and intended to be exclusively powered by: 1) an electric motor on condition that energy is delivered by a battery or fuel cell (this provision will expire in 2016); or 2) a combustion engine which runs on hydrogen.
 - 75% tax reduction for vehicles such as caravans, circus wagons and vehicles used for horse transportation
 - 50% or 75% reduction for campers.
 - For vehicles used as a shop.
- Tax refund:
 - Trucks that are part of a commercial vehicle fleet with more trucks than trailers.
- Revenue in 2012 (the latest year for which figures are available): €5,138 million (equivalent to 0.86% of GDP and to 2.20% of total tax revenue).
- The government initially agreed in its coalition agreement to decrease the rates of the tax. However in its 2014 tax plan, it has decided not to implement this decision.⁵⁰⁷

➤ **Aviation noise tax:**⁵⁰⁸

⁵⁰⁴ Rijksoverheid, Belastingen op auto en motor, Accessed 4 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-op-auto-en-motor/vraag-en-antwoord/wat-is-de-overheid-van-plan-met-de-motorrijtuigenbelasting-mrb-voor-oldtimers.html>

⁵⁰⁵ Rijksoverheid, Belastingen op auto en motor, Accessed 4 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-op-auto-en-motor/vraag-en-antwoord/wat-is-de-overheid-van-plan-met-de-motorrijtuigenbelasting-mrb-voor-oldtimers.html>

⁵⁰⁶ In 2014 a new arrangement was introduced: the age of old timers for exemption is increased to 40 years. A transition arrangement applies for cars exclusively using petrol: the tariff is a quarter of the regular tariff with a maximum of € 120 per year provided that the car is not being used in the January, February and December.

⁵⁰⁷ Rijksoverheid (2014) Belastingplan 2014, Accessed 5 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingplan-2014>

- The tax applies to airports where soundproofing projects around the airport have not been completed.
 - The tax is paid by owners or holders of an aircraft as part of the airport charge.
 - There are three different arrangements:
 - Schiphol airport; the rate is €180.50 per noise-production unit in 2014 (this rate will increase annually by €1.25).
 - Airports of national significance (e.g. Lelystad): rate in 2014 is € 37 per noise-production unit (rate will increase annually by €1 per noise reduction unit).
 - Airports of regional significance: to be arranged by Provinces.
 - Exemptions: all aircraft with a maximum tax-off weight less than 390 kg; propeller driven aircraft with maximum tax-off weight less than 6,000 kg; and landings at airports where soundproofing projects around the airport have been completed.
 - Revenue in 2012 (the latest year for which figures are available): €46 million.
- **Air passenger duty (now abolished):**
- On 1st July 2008 an air passenger duty was introduced.
 - The duty was set to zero as of 1st July 2009 and then ultimately abolished as of 1st January 2010.⁵⁰⁹

14.3 Pollution and Resource Taxes

- **Waste tax (“Afvalstoffenbelasting”) or landfill tax:**^{510,511}
- The tax was abolished on 1 January 2012 and was reinstated on 1 April 2014.
 - This tax is levied on the weight of waste landfilled by a waste handling company.

⁵⁰⁸ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/eoicnst/queries/AllInformation_Result.aspx?Key=f08e343c-a619-4c83-9286-226b1dc20acc&Keys=1773c438-e42c-476c-aede-a7cdada3f820&Ctry=19

⁵⁰⁹ PWC (2013) The economic impact of Air Passenger Duty, Accessed 16 April 2014, <http://www.pwc.com/gx/en/psrc/united-kingdom/helping-economic-take-off-devolving-air-passenger-duty.jhtml>

⁵¹⁰ European Commission (2014) Taxes in Europe Database, Accessed 2 September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=874/1388754878&taxType=Other+indirect+tax

⁵¹¹ Belastingdienst (2014) Afvalstoffenbelasting, Accessed 3 September 2014, http://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/afvalstoffenbelasting/

- Exemptions: the disposal of dredging's.
 - Tax refunds: Waste which originates from an offender towards whom administrative force is applied in accordance with the Environmental Act ("Wet Milieubeheer").
 - Tax rate: €17 per 1,000kg that is landfilled (rate as of 1 April 2014).
 - Revenue in 2011 (the latest year for which figures are available): €17 million (equivalent to 0.00% of GDP and to 0.01% of total tax revenue). The expected revenue for 2014 is € 25 million.
 - The 2015 Fiscal Plan foresees to extend the scope of the tax to waste incinerated by waste incineration plants. The rate for both landfilled and incinerated waste is expected to be €13 per 1,000 kg from 2015.⁵¹²
- **Municipal waste charge:**⁵¹³
- Levied to cover the costs of collection and treatment of household waste.
 - The charge only applies to households.
 - Rate:
 - Rates are decided by local authorities.
 - Some local authorities differentiate the rate according to the volume of waste collected or the number of times waste is offered to the collection service; others differentiate the rate according to the number of household members.
 - The average annual rate per household is €185.
 - Revenue in 2010 (the latest year for which figures are available): € 1,277 million.
- **Packaging tax ("Verpakkingenbelasting") (now abolished):**⁵¹⁴
- The tax was abolished and has not been levied since 1st January 2013.⁵¹⁵ Replaced by packaging waste management tax – see below.
 - The tax rate per kilogram distinguished between eight materials:
 - Glass € 0.0718.
 - Aluminium € 0.9506.

⁵¹² Rijksoverheid (2014) Belastingplan 2015, Accessed 23 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingplan-2015>

⁵¹³ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

⁵¹⁴ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

⁵¹⁵ Afvalfonds verpakking (2014) Afvalfonds verpakking, Accessed 3 September 2014, www.afvalfondsverpakkingen.nl

- Other metals € 0.1585.
 - Plastics € 0.4705.
 - Bio-plastics € 0.0795.
 - Paper and paperboard € 0.0795.
 - Wood € 0.0210.
 - Other materials € 0.1755.
 - Part of the revenue of the packaging tax went to the Treasury.
 - Exemptions:
 - Packaging less than 50,000kg.
 - Logistical aid.
 - Products that meet the definition of packaging, but whose main function is not packaging.
 - Refund provided to companies that export packaged products on which the packaging tax has been paid earlier in the chain. There is a threshold of 50,000kg.
 - Revenue in 2010 (the latest year for which figures are available): €299 million.
- **Packaging waste management charge (“Afvalbeheersbijdrage Verpakkingen”):⁵¹⁶**
- Replaced the packaging tax since 1st January 2013.
 - The charge is paid by companies which bring 50,000kg or more of packaging waste on the market annually.
 - Revenues are allocated to the packaging waste fund (“Afvalfonds Verpakkingen”) for collection and recycling of packaging waste.
 - Rate applied distinguishes between eight materials – these are shown in Table 14-4.

Table 14-4: 2013-2015 Rates of the Packaging Waste Management Charge (Excluding VAT)

Material Type	Tariff 2015 (€ per kg)	Tariff 2013/2014 (€ per kg)
Glass	0.0595	0.0595
Paper/paperboard	0.0233	0.0233
Plastics	0.3876	0.3876

⁵¹⁶ Afvalfonds verpakking (2014) Afvalfonds verpakking, Accessed 3 September 2014, www.afvalfondsverpakkingen.nl

Bio plastics	0.0212	0.0212
Aluminium	0.0212	0.0212
Other metals	0.0212	0.0212
Wood	0.0212	0.0212
Other materials	0.0212	0.0212
General tariff	0.4700	0.4700
Beverage cartons	0.1740	-
Deposit bottles	0.2012	0.0212

Source: *Afvalfonds verpakking (2014) Afvalfonds Verpakking*, Accessed 3rd September 2014, www.afvalfondsverpakkingen.nl

➤ **Tap water tax (“Belasting op leidingwater”):**⁵¹⁷

- The tax is levied on the supply of tap water to consumers through a fixed connection to the water mains.
- Tap water is taxed to a maximum quantity of 300 m³ per connection per year. This implies that the most ‘luxurious’ water consumption, such as private swimming pools and excessive garden watering, are not subject to a price incentive from the tax.⁵¹⁸
- Tax rate⁵¹⁹: € 0.330 per m³ (2014), increased from €0.165 per m³ in 2013, whilst a maximum taxable quantity was introduced.⁵²⁰
- Exemptions: tap water delivered through emergency provisions such as fireplugs and sprinkler installations (only under special circumstances).
- Revenue in 2010 (the latest year for which figures are available): €126 million (equivalent to 0.02% of GDP).

➤ **Water system charge (“watersysteemheffing”):**⁵²¹

⁵¹⁷ OECD (2014) Database on instruments used for environmental policy, Accessed on 3 September 2014, http://www2.oecd.org/eoicinst/queries/All_Information.aspx

⁵¹⁸ Ecologic, IEEP, IVM, BIO (2013) Steps towards greening in the EU - Monitoring Member States achievements in selected environmental policy areas, Country Report on the Netherlands, Study under DG Environment’s Framework contract for economic analysis ENV.F.1/FRA/2010/0044 , Brussels, 2013.

⁵¹⁹ Belastingdienst (2014) Tabellen tarieven milieubelastingen, Accessed 3 September 2014, http://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/overige_belastingen/belastingen_op_milieugrondslag/tarieven_milieubelastingen/tabellen_tarieven_milieubelastingen

⁵²⁰ Rijksoverheid (2014) Belasting op leidingwater, Accessed 5 September 2014, <http://www.rijksoverheid.nl/onderwerpen/belastingen-voor-ondernemers/milieubelastingen/belasting-op-leidingwater>

- This charge is levied to finance measures and programmes to prevent flooding, surplus water (after heavy rainfall) and water shortage. The tax is levied by the regional water management board (“waterschap”) with revenues earmarked for regional water management, i.e. dike management, water quality and quantity management.
- The charge consists of two parts:
 - The solidarity part which has to be paid by each inhabitant of the concerned river basin.
 - The profit part which has to be paid by land owners and owners of buildings.
- Rate for solidarity part:
 - fixed amount per household
 - determined by dividing the budgeted costs by the number of households within the water board area
- Rate for the profit part: based on the value of the property or the land.
- The cost recovery rate is deemed to be 100%.⁵²²
- **Wastewater treatment charge (zuiveringsheffing):**^{523,524}
 - The charge is levied on the amount and the qualification of indirect discharges, i.e. discharges into the sewerage system or into wastewater treatment plants in one year.
 - The charge is meant to recover the costs of transport and treatment of wastewater.
 - Tax rate:
 - Based on pollution load of substances discharged in one calendar year, whereby pollution load is expressed in pollution units.

⁵²¹ Kenniscentrum InfoMil (2014) Handboek water, Accessed 5 September 2014, <http://www.infomil.nl/onderwerpen/klimaat-lucht/handboek-water/wetgeving/waterschapswet-0/inhoud/watersysteemheffing/>

⁵²² European Commission (2012) Commission Staff Working Document. Member State: the Netherlands. Accompanying the document: Report from the Commission on the implementation of the Water Framework Directive (2000/60) River Basin Management Plans, Brussels, 14.11.2012, SWD (2012)379.

⁵²³ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/ecoinst/queries/AllInformation_Result.aspx?Key=d3cbd6fe-8f05-4ce7-b055-ed4c48549de8&Keys=d7e349c0-8f0b-4d64-8d57-7d0c43328b76&Ctry=19 http://www2.oecd.org/ecoinst/queries/All_Information.aspx

⁵²⁴ Kenniscentrum InfoMil (2014) Handboek water, Accessed 5 September 2014, <http://www.infomil.nl/onderwerpen/klimaat-lucht/handboek-water/wetgeving/waterschapswet-0/inhoud/zuiveringsheffing/>

- Lump charge applied to households: each household is levied on the basis of a fixed number of pollution units (up to 3). A single-person household is levied on the basis of one pollution unit.
- Water boards are free to base the pollution load for a household on its tap water use.
- Revenue in 2010 (the latest year for which figures are available): €1128 million (equivalent of 0.19% of GDP).
- The cost recovery rate is deemed to be 100%.⁵²⁵
- **Water pollution charge (“Zuiveringsheffing”):**
 - The charge is levied on the amount and the qualification of direct discharges, i.e. discharges into surface water systems.
 - The calculation of the charge is identical to that of the waste water treatment charge.
- **Municipal sewerage charge:**⁵²⁶
 - Local authorities charge households for the costs of the local sewerage system, i.e. for collecting and discharging rain and wastewater.
 - Charges are waived for households with less than minimum income.
 - Rates are determined by local authorities per household, differentiated according to the number of household members.
 - Revenue is used for the collection and discharge of rain and wastewater.
 - Revenue in 2008 (the latest year for which figures are available): €1143 million (equivalent to 0.19% of GDP).
 - The cost recovery rate is 95%.⁵²⁷
- **Tax on groundwater extraction (now abolished):**⁵²⁸

⁵²⁵ European Commission (2012) Commission Staff Working Document. Member State: the Netherlands. Accompanying the document: Report from the Commission on the implementation of the Water Framework Directive (2000/60) River Basin Management Plans, Brussels, 14.11.2012, SWD (2012)379.

⁵²⁶ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/eoicst/queries/All_Information.aspx
http://www2.oecd.org/eoicst/queries/AllInformation_Result.aspx?Key=faa3c4b5-a97d-47bb-934e-0cb9965898ad&Keys=bf122d93-fa70-40d0-942a-f044e849c8bf&Ctry=19

⁵²⁷ European Commission (2012) Commission Staff Working Document. Member State: the Netherlands. Accompanying the document: Report from the Commission on the implementation of the Water Framework Directive (2000/60) River Basin Management Plans, Brussels, 14.11.2012, SWD(2012)379

⁵²⁸ OECD (2014) Database on instruments used for environmental policy, Accessed on 2 September 2014, http://www2.oecd.org/eoicst/queries/All_Information.aspx

- The tax was abolished in 2011 by the first Rutte cabinet. It has not been levied since 1st January 2012.
- Tax rate: € 0.1951 per cubic meters groundwater extracted.
- Exemptions on extraction for:
 - A building excavation (not more than 50,000 m³ and which takes no longer than four consecutive months to complete).
 - Tests (not more than 50,000 m³ and which takes no longer than four consecutive months to complete).
 - Emergency provisions.
 - Decontamination of groundwater.
 - Country skating rinks.
 - Sprinkling and irrigation purposes.
 - By an establishment with a capacity of max 10 cubic meters per hour.
- Refund: refund of €0.1604 per cubic metre for infiltrated water according to a permit.
- Revenue in 2010 (the latest year for which figures are available): €179 million (equivalent to 0.03% of GDP).

14.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 14-5: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	6,166	5,845	-321
Petrol	million litres	3,671	3,671	0
Kerosene	million litres	2,882	2,882	0
LPG	thousand tonnes	264	238	-26
Heavy Fuel Oil	thousand tonnes	49	43	-6
Natural Gas	TJ (GCV)	563,001	499,796	-63,204
Coal	thousand tonnes	1,024	1,005	-19
Electricity	GWh	74,169	74,137	-32

Figure 14-1: Change in Internal Passenger Flights, flights per year

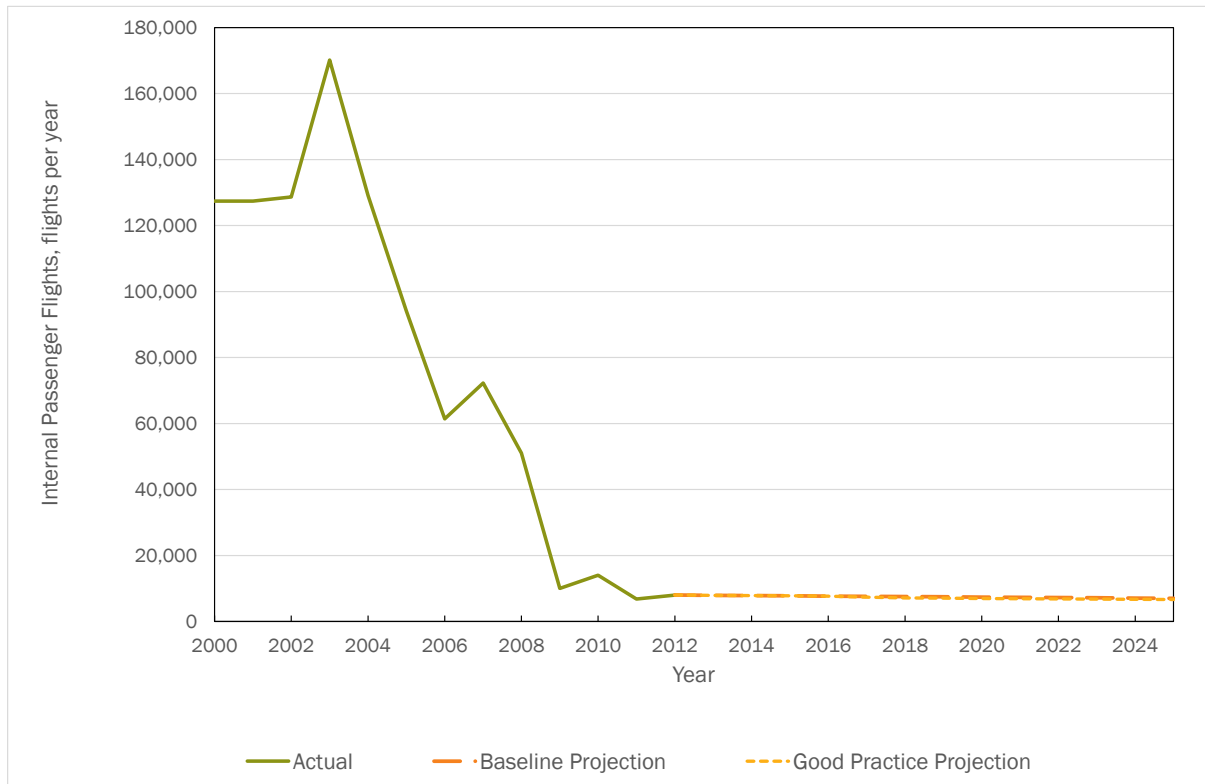


Figure 14-2: Change in Intra-EU Passenger Flights, flights per year

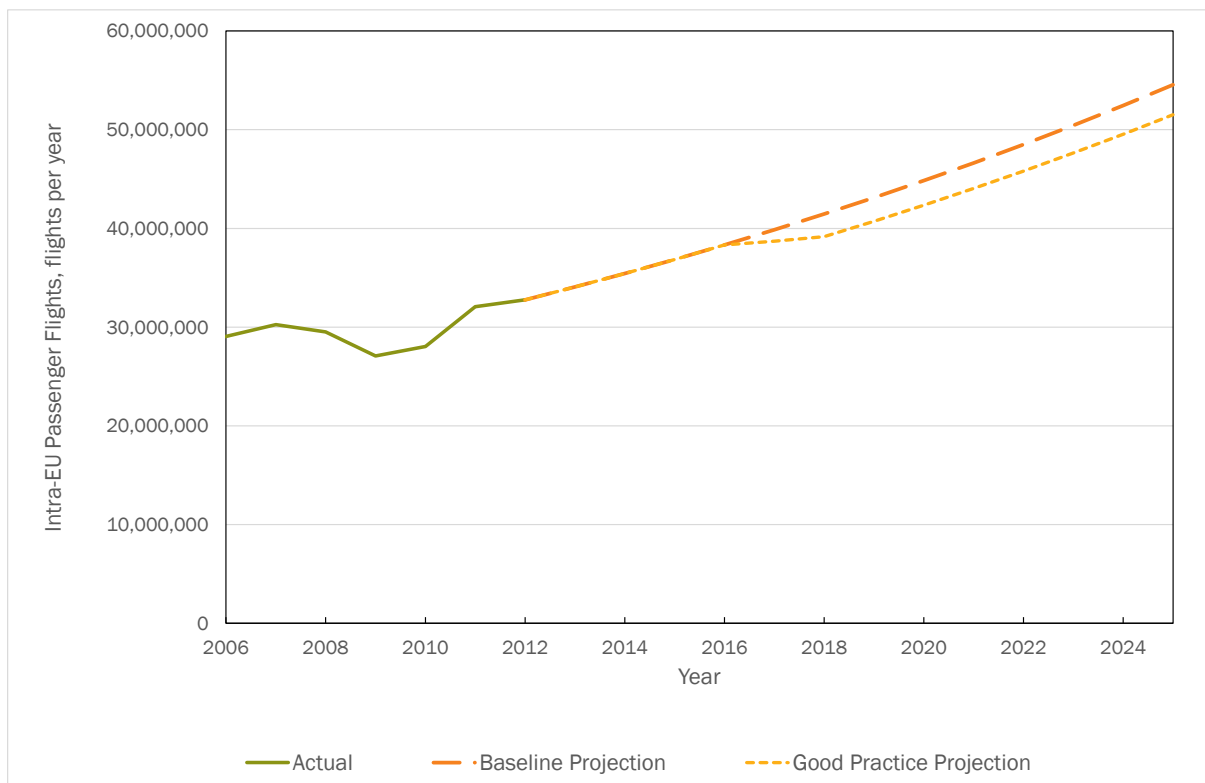


Figure 14-3: Change in Extra-EU Passenger Flights, flights per year

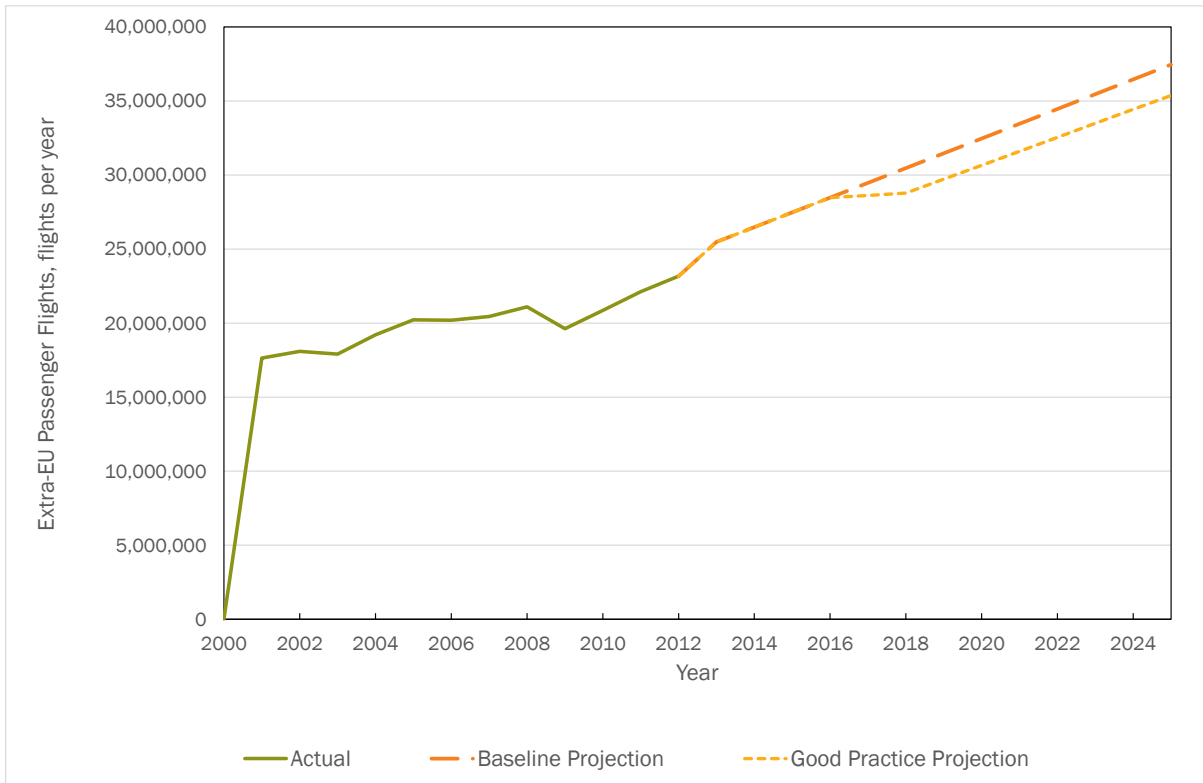


Figure 14-4: Change in Internal Air-freight, tonnes

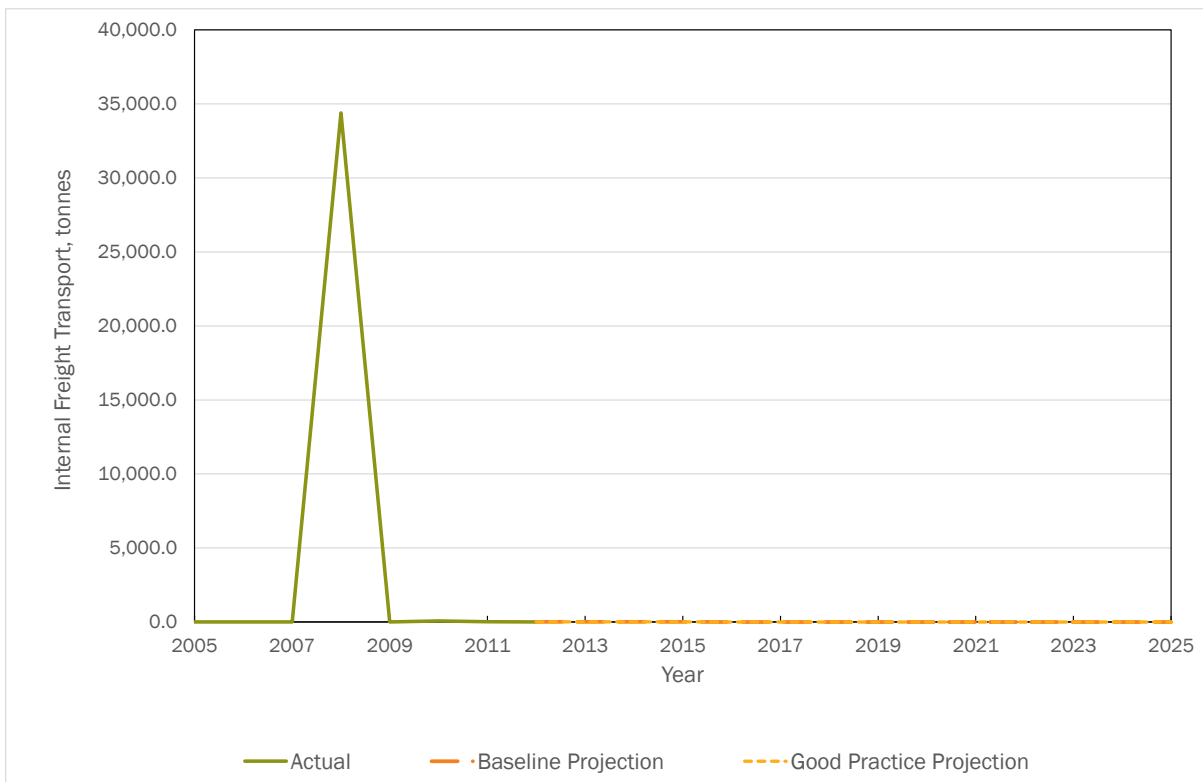


Figure 14-5: Change in Intra-EU Air-freight, tonnes

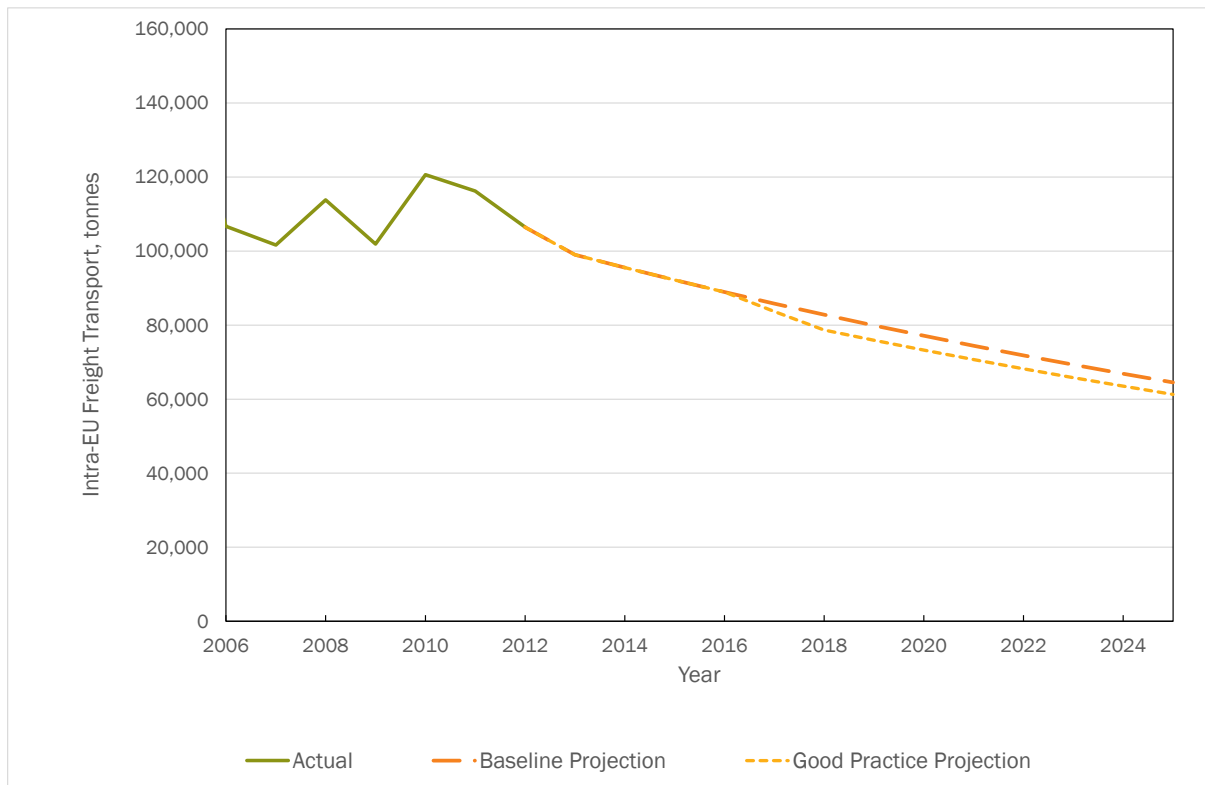


Figure 14-6: Change in Extra-EU Air-freight, tonnes

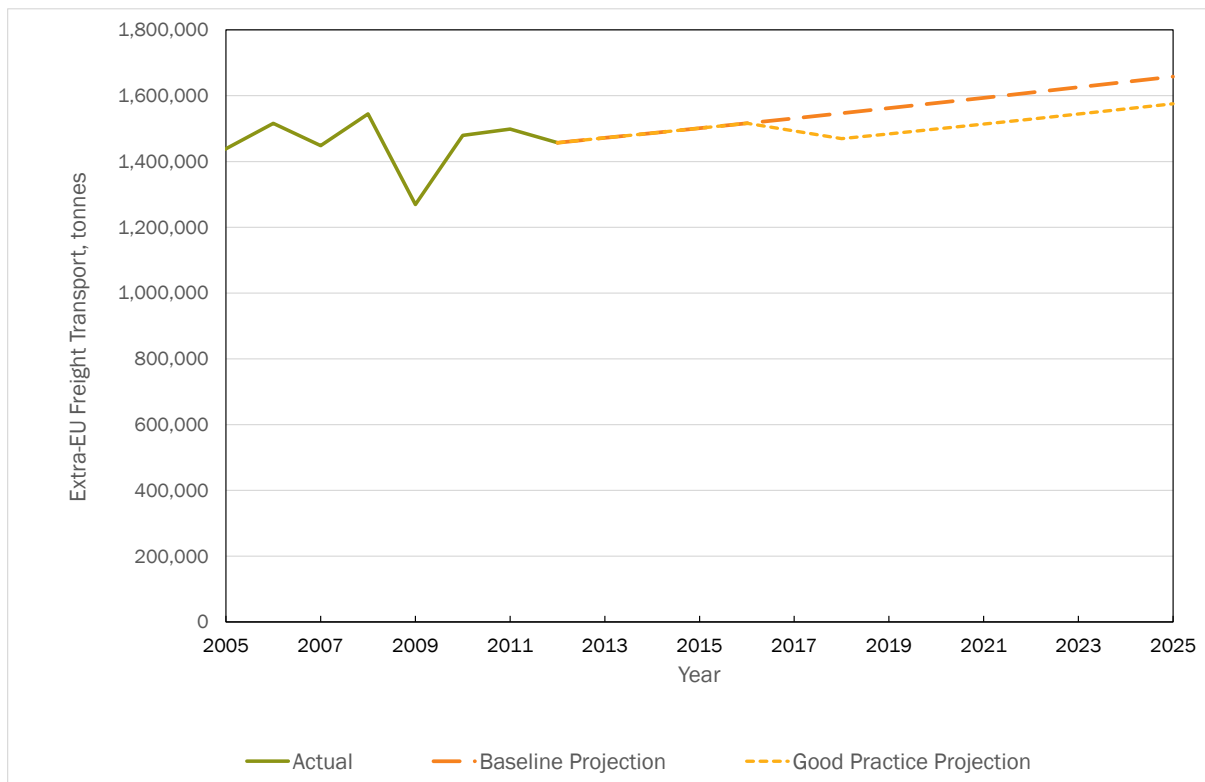


Figure 14-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

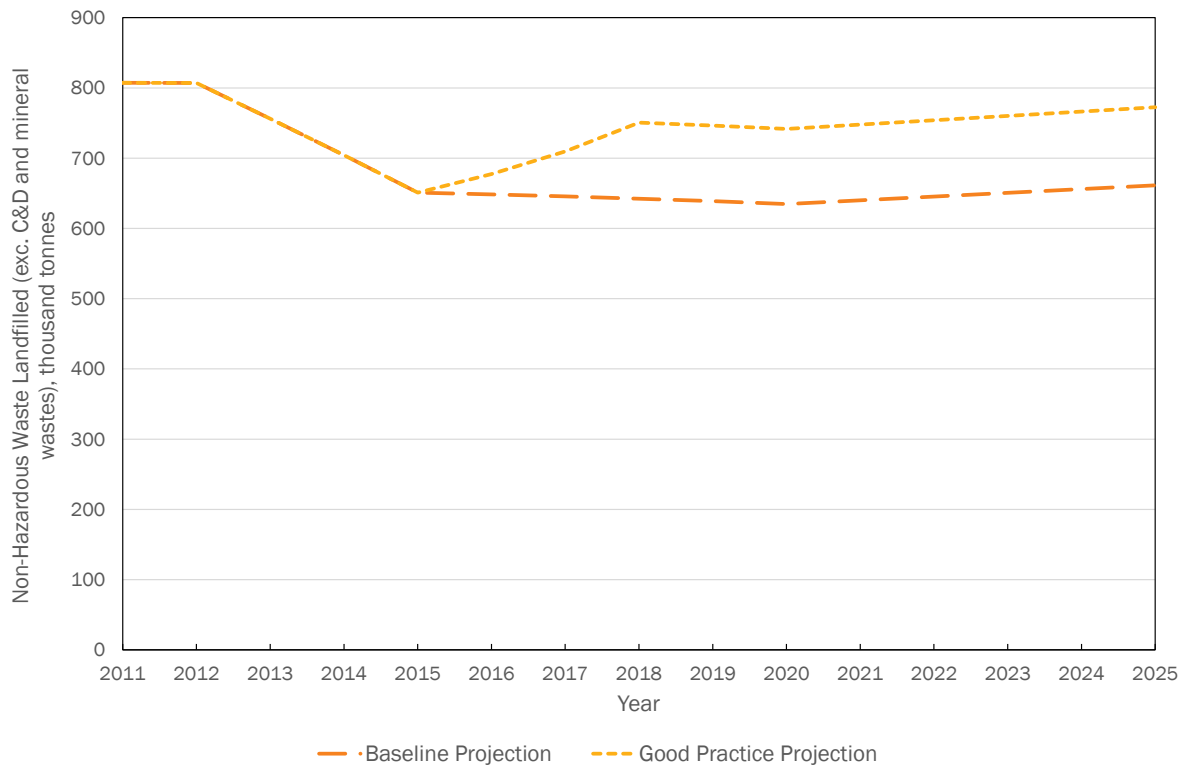


Figure 14-8: Change in MBT/ Incineration, thousand tonnes

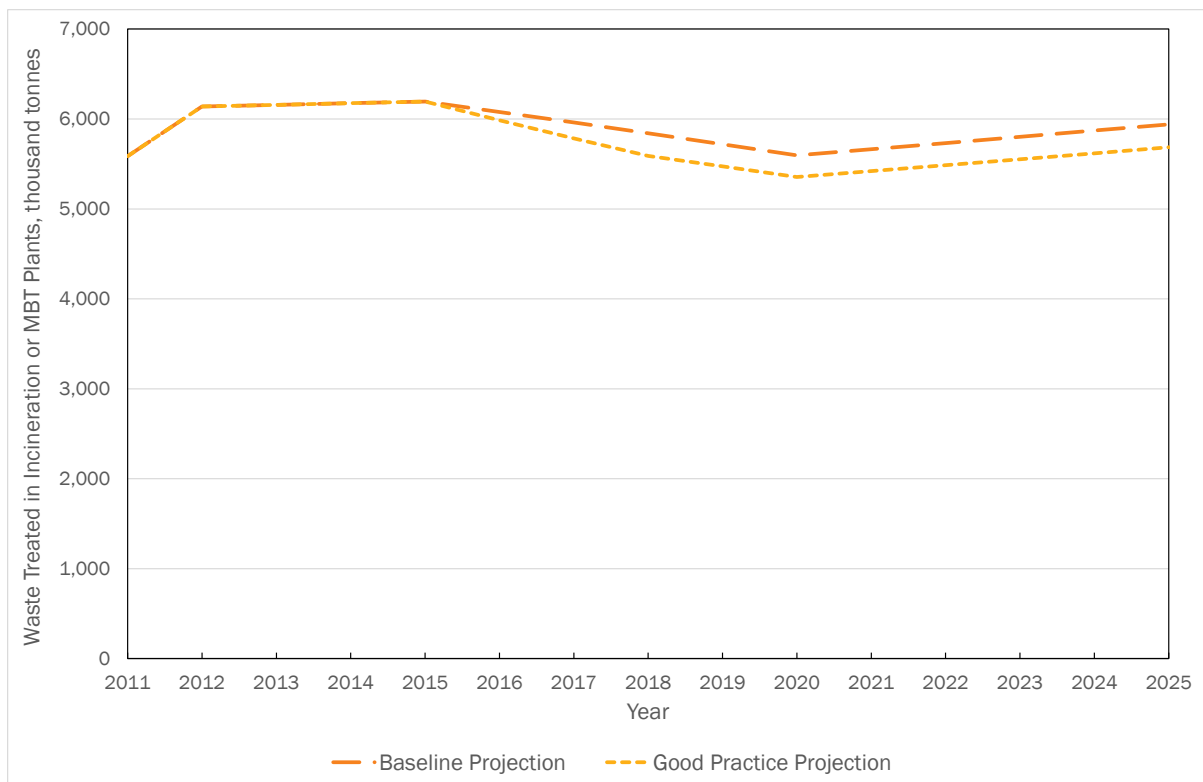


Figure 14-9: Change in SOx Emissions, tonnes

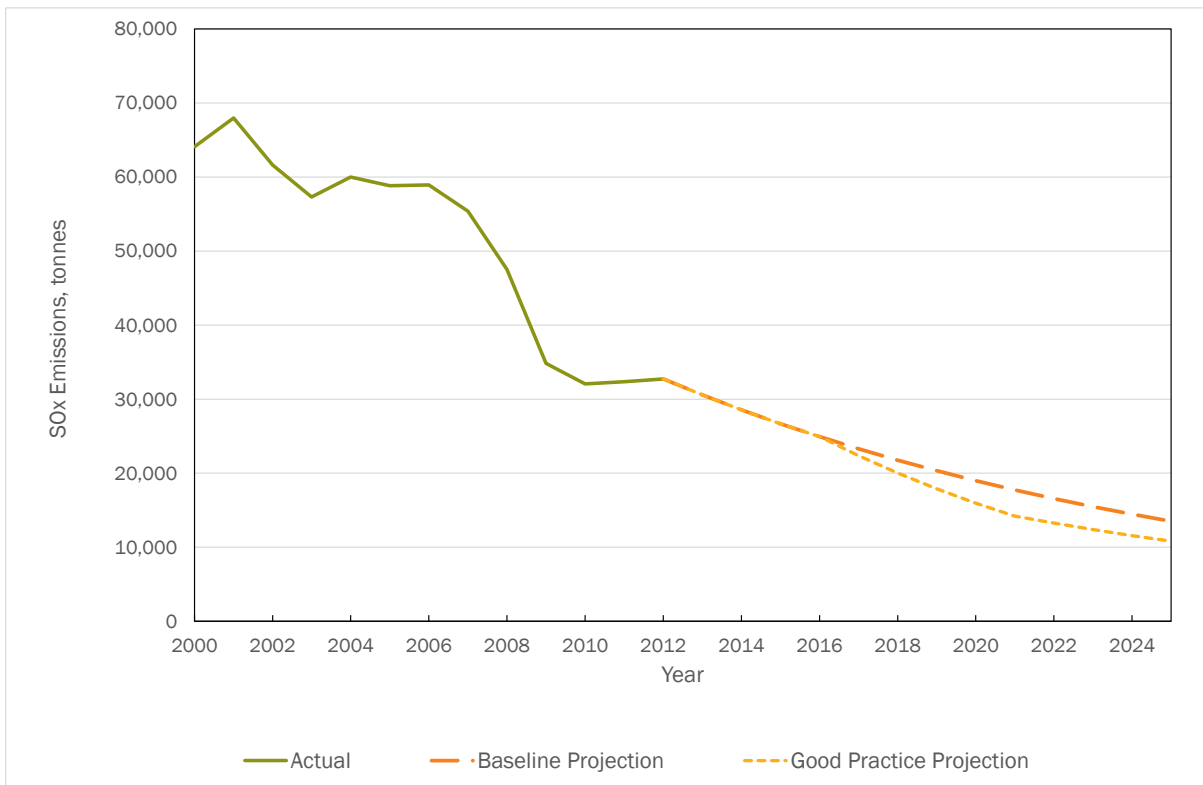


Figure 14-10: Change in NOx Emissions, tonnes

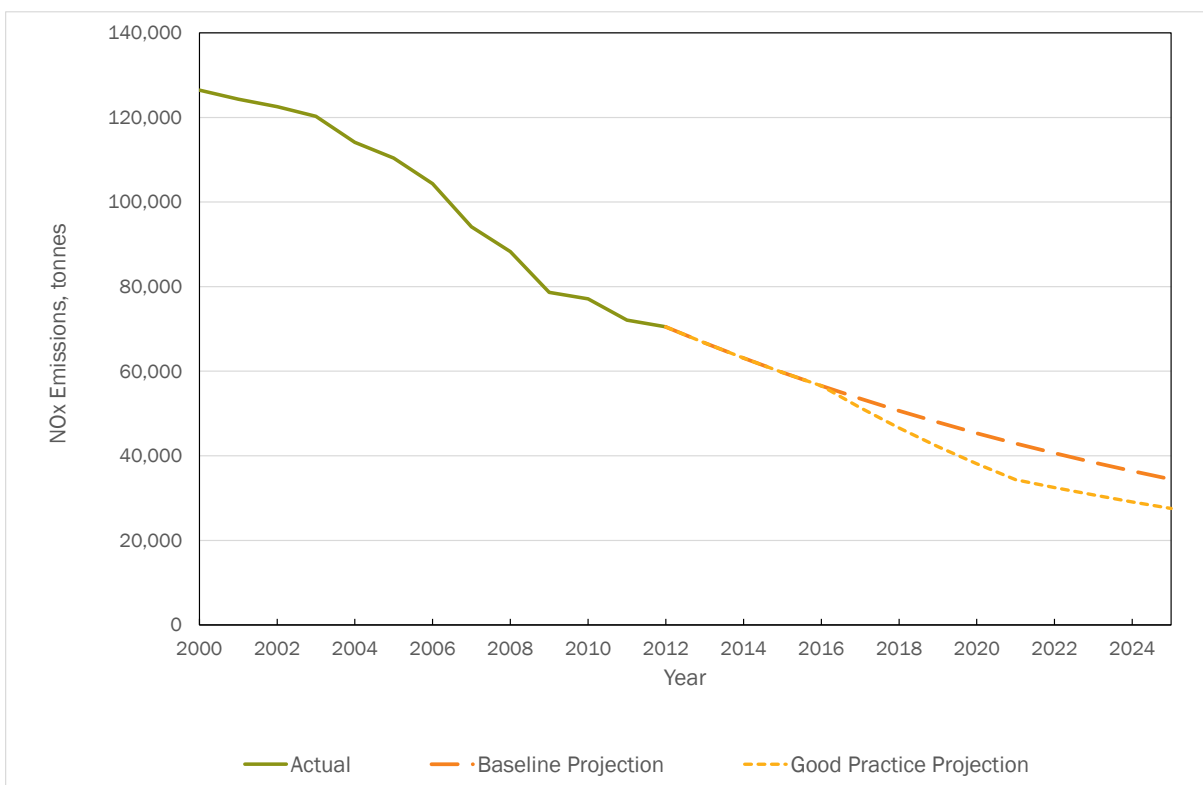


Figure 14-11: Change in PM₁₀ Emissions, tonnes

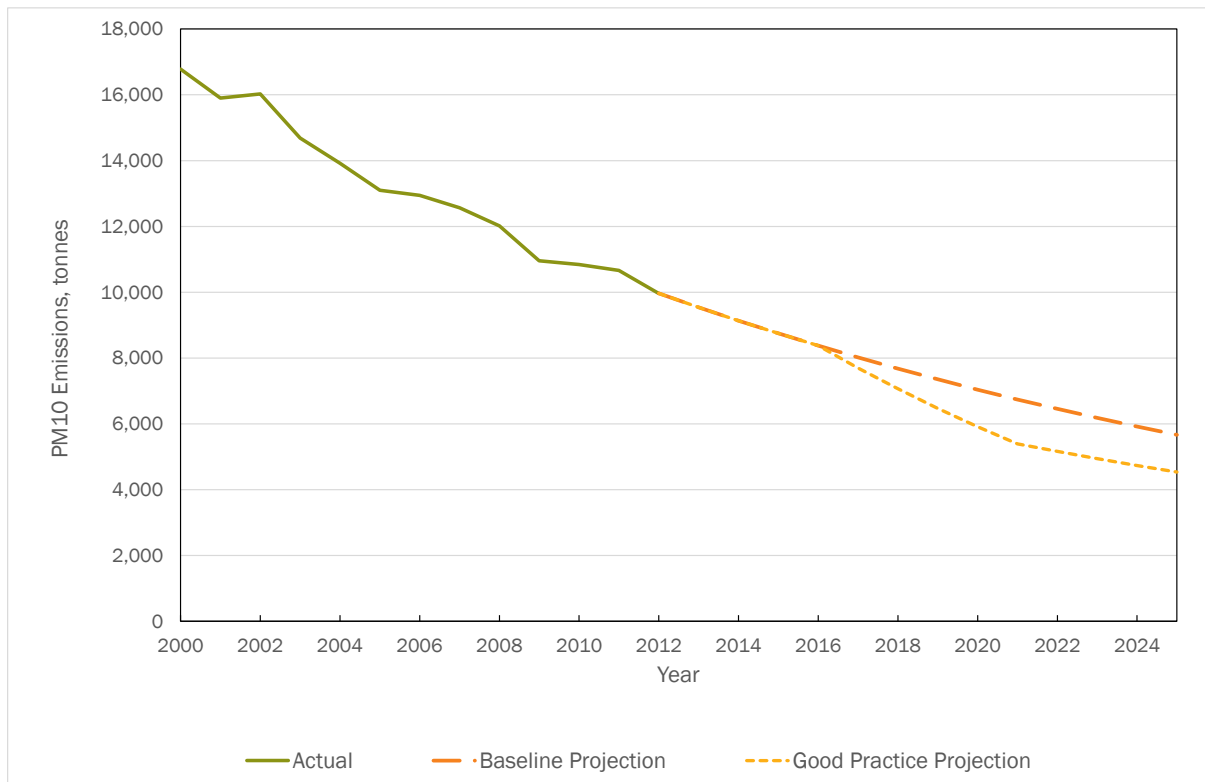


Figure 14-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

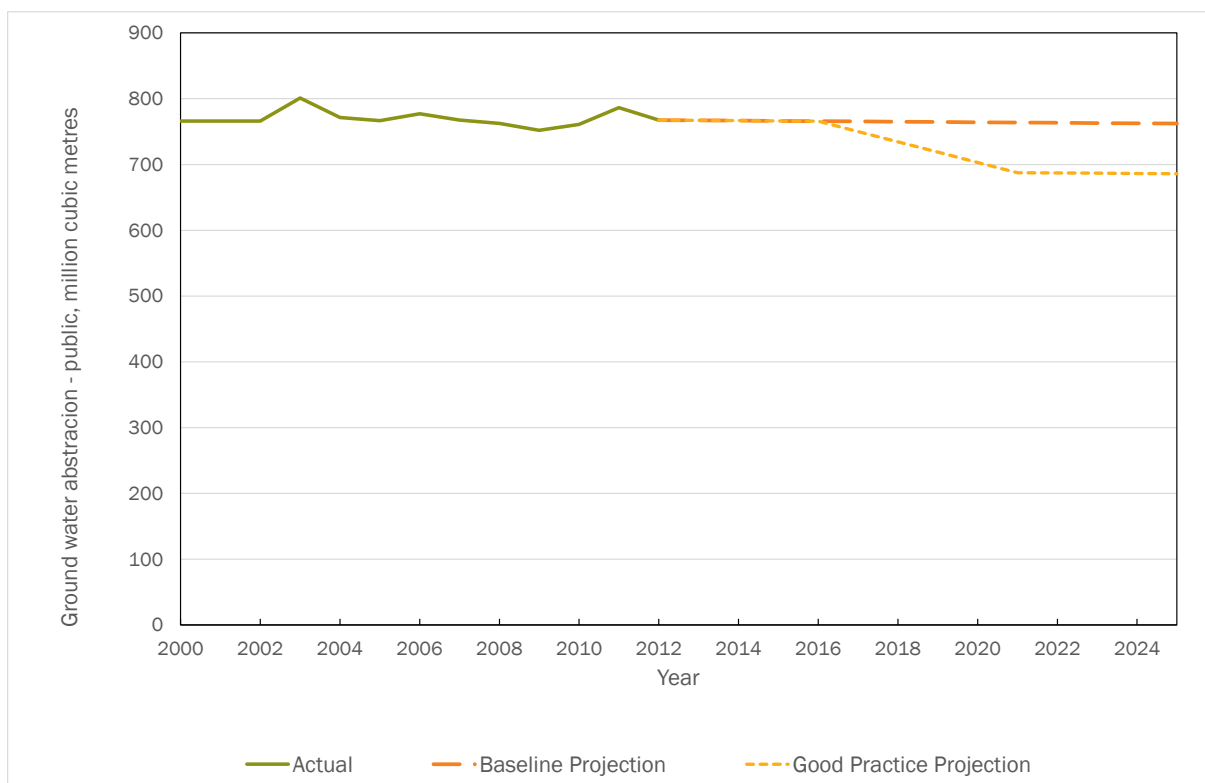


Figure 14-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

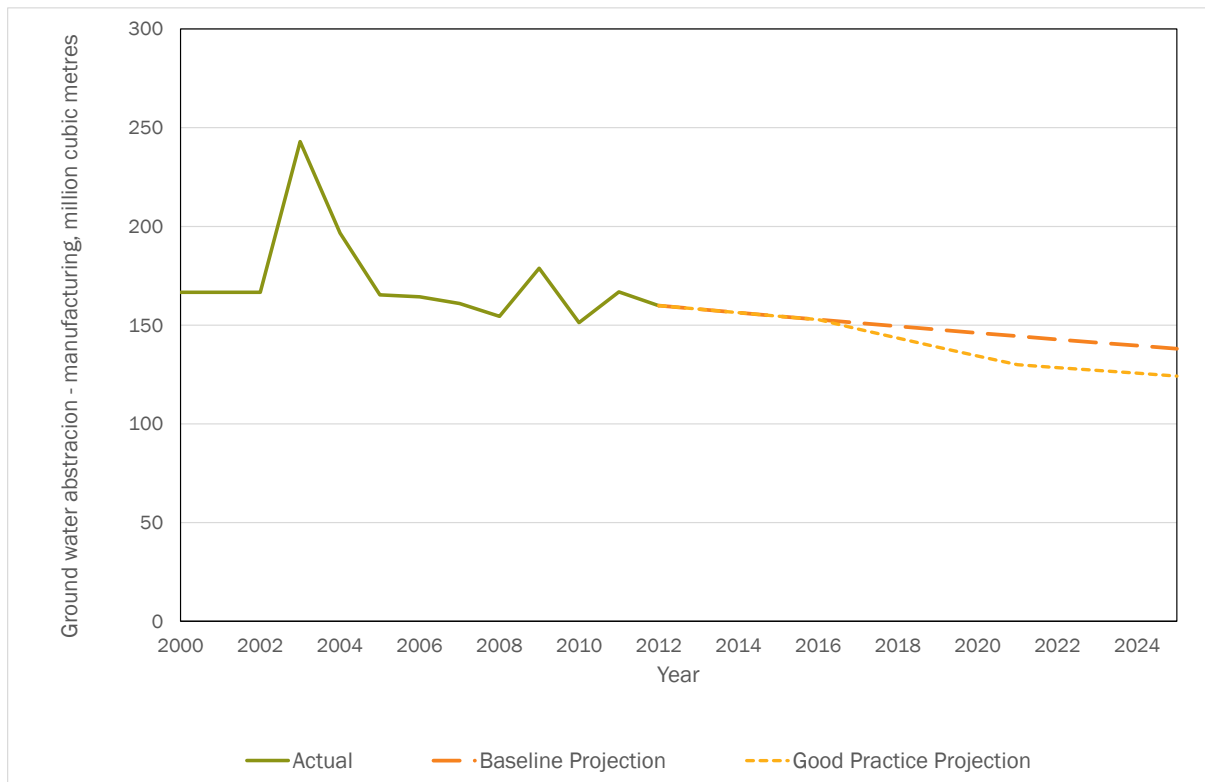


Figure 14-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

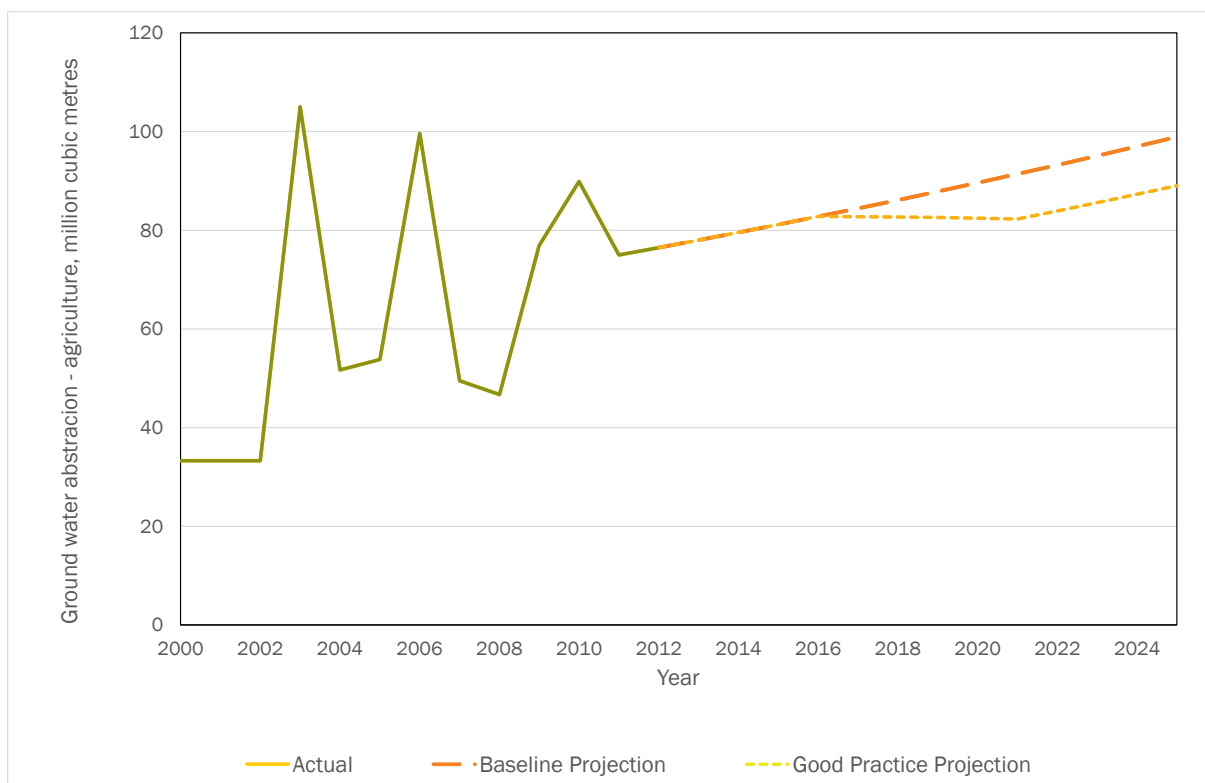


Figure 14-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

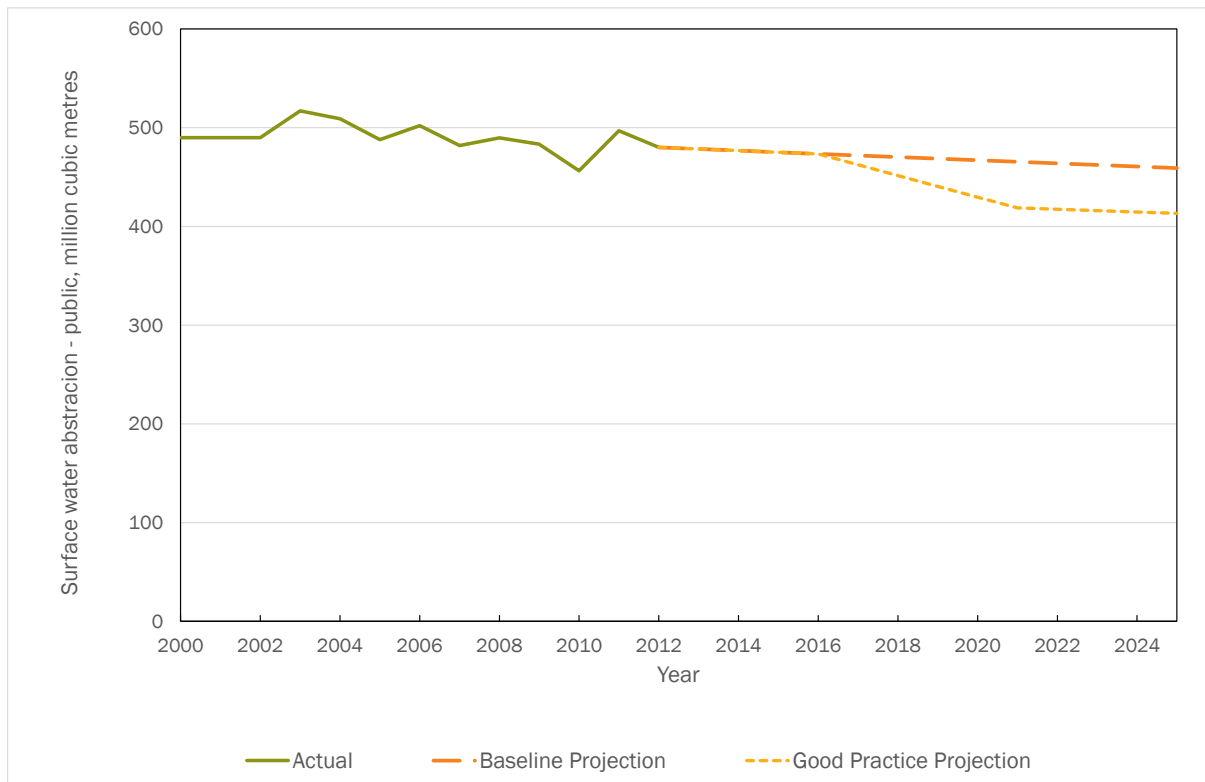


Figure 14-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres

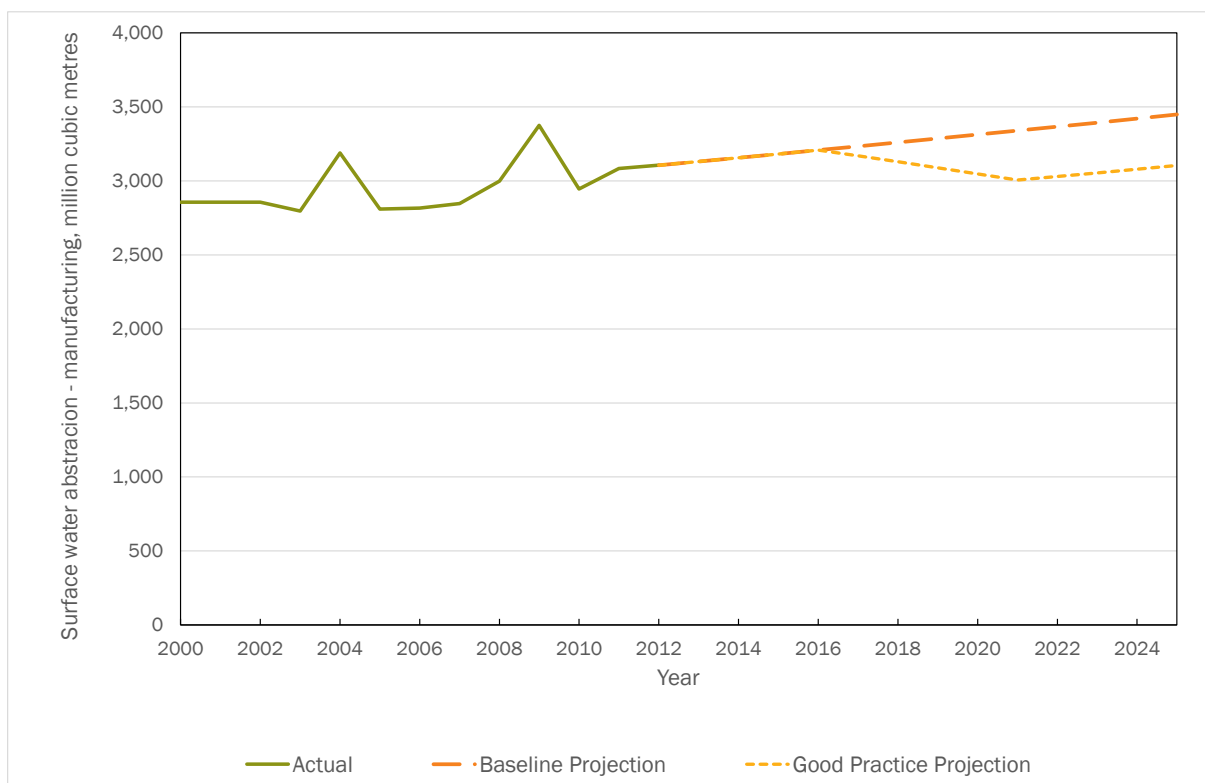


Figure 14-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

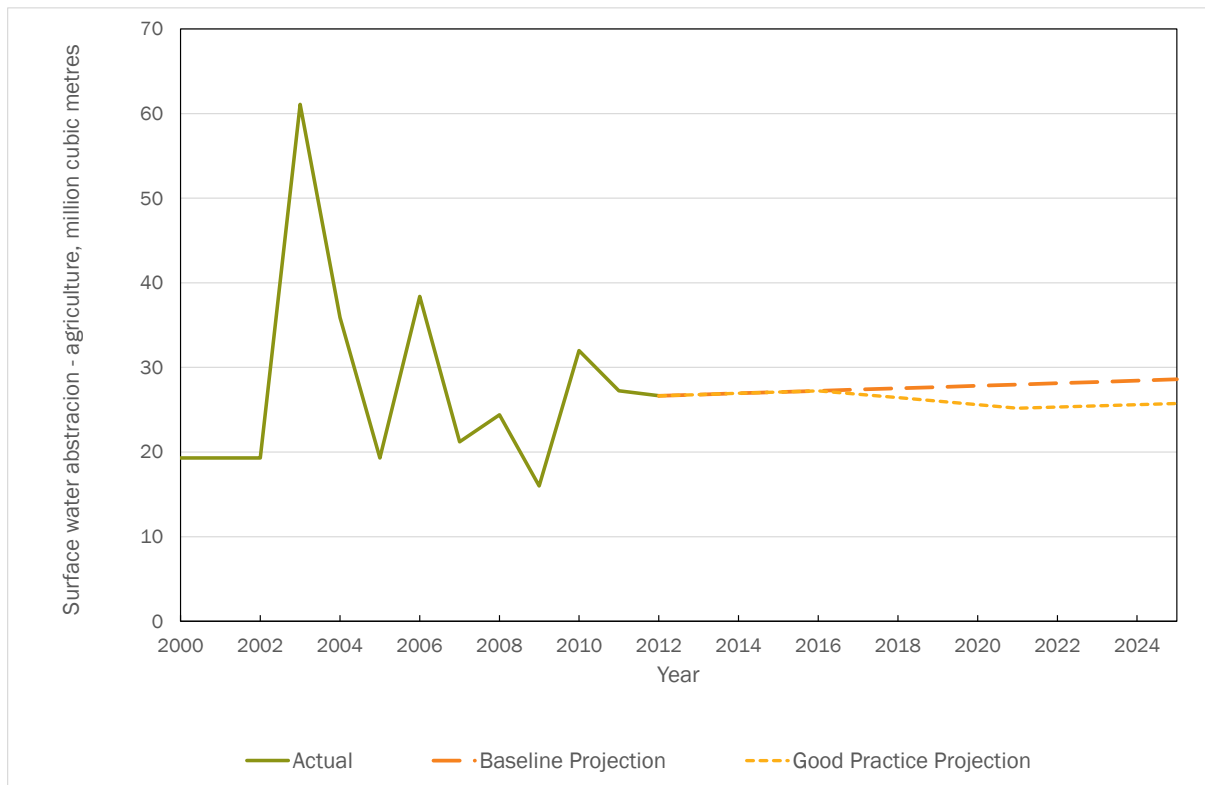


Figure 14-18: Change in Active Ingredients in Pesticides, tonnes

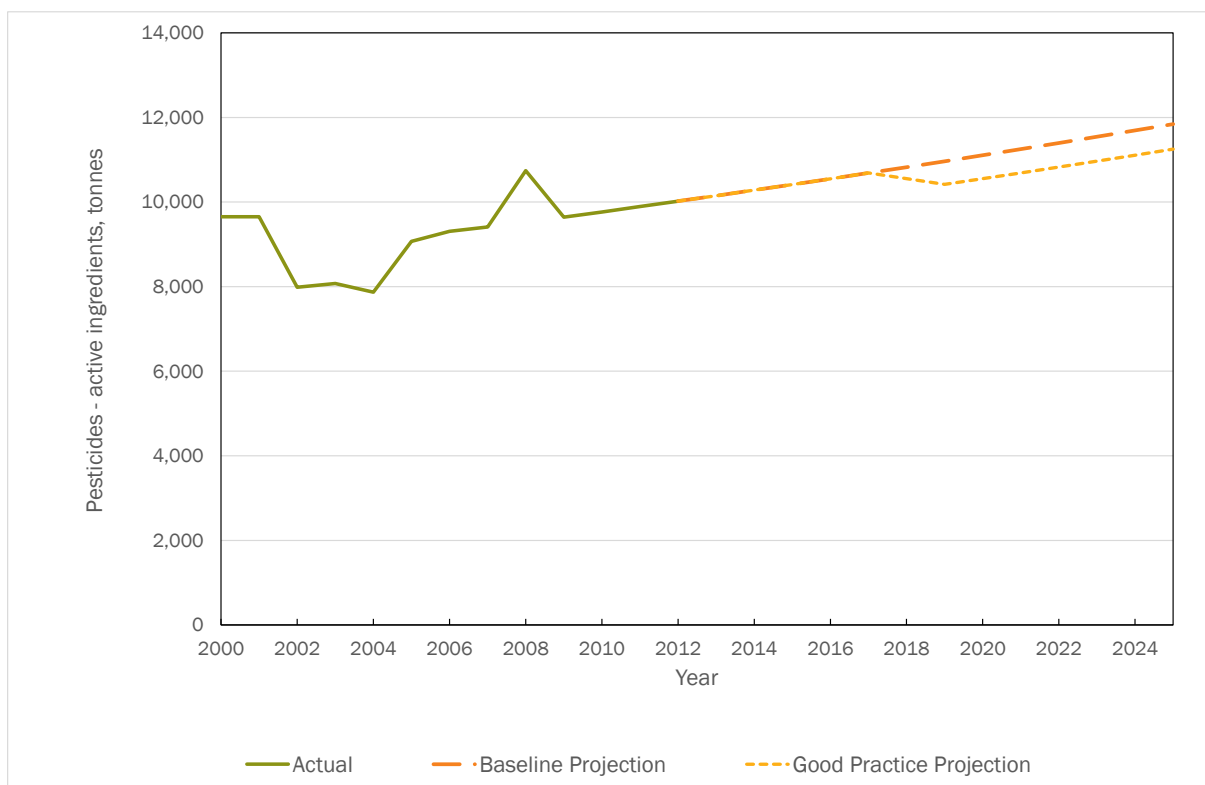


Figure 14-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

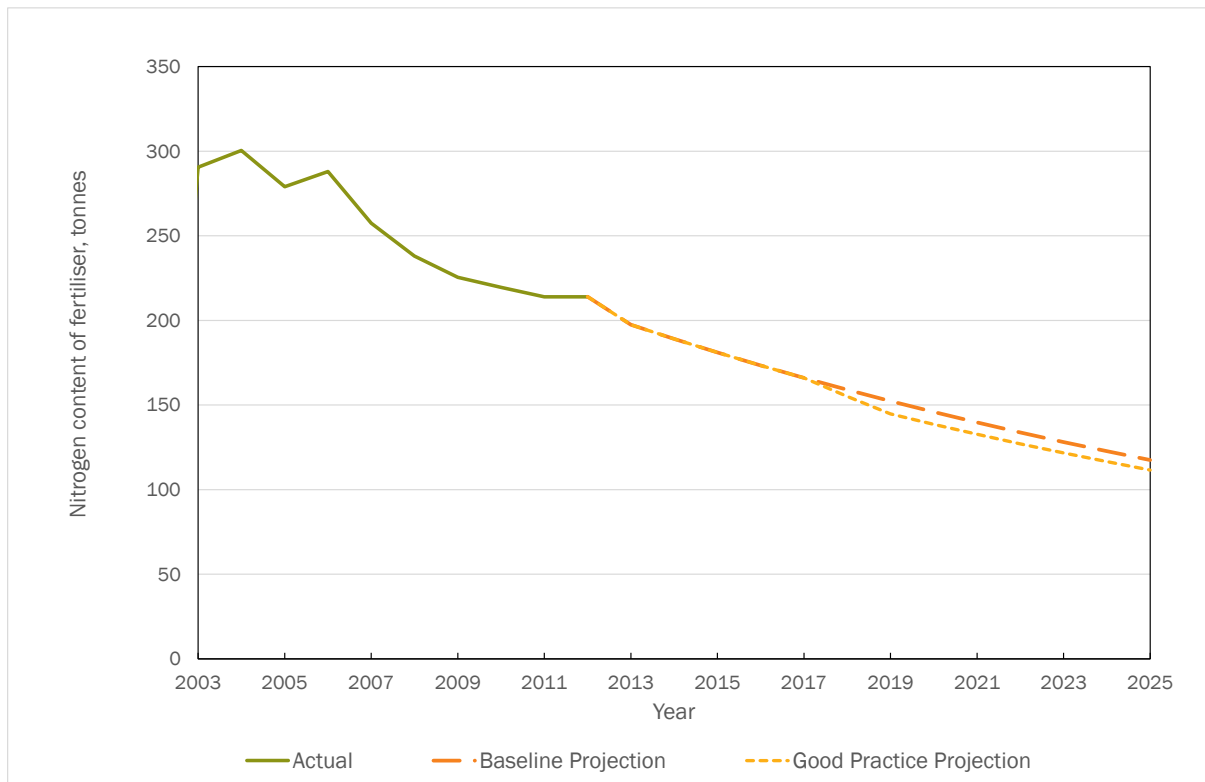


Figure 14-20: Change in Aggregates Extraction, thousand tonnes

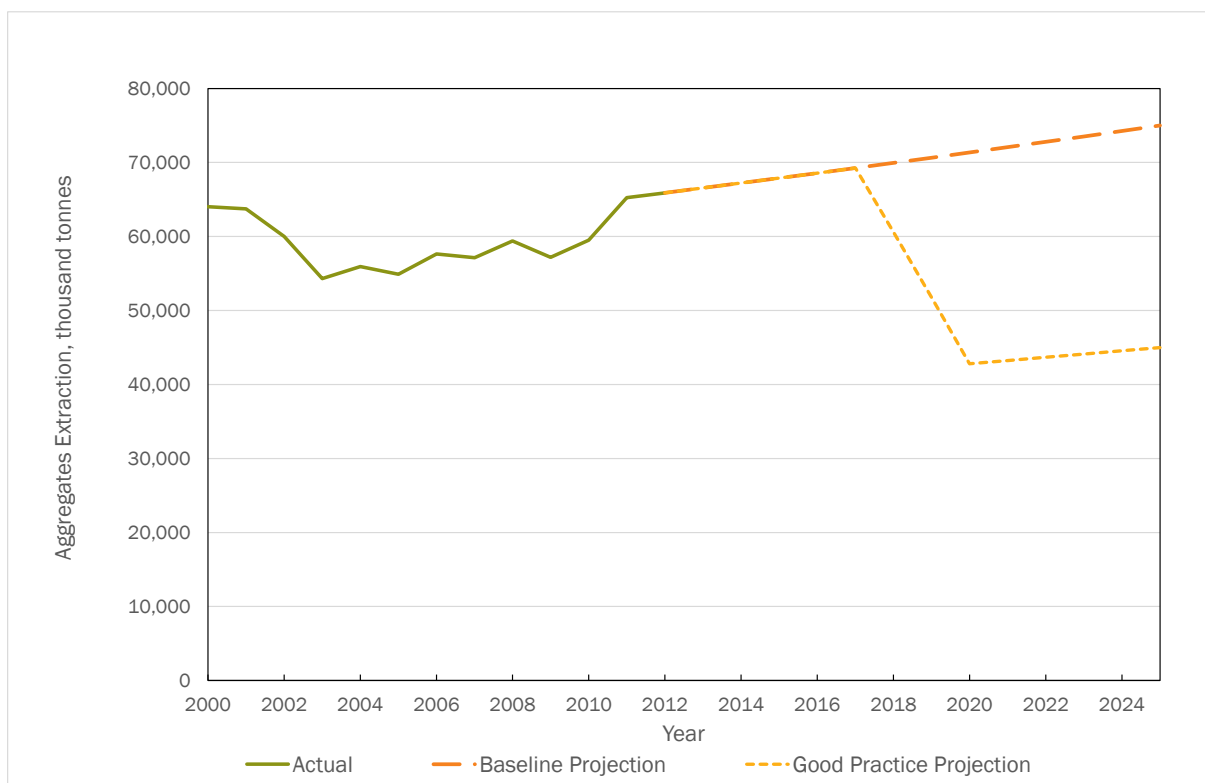


Figure 14-21: Change in Paper & Card Packaging Generation, thousand tonnes

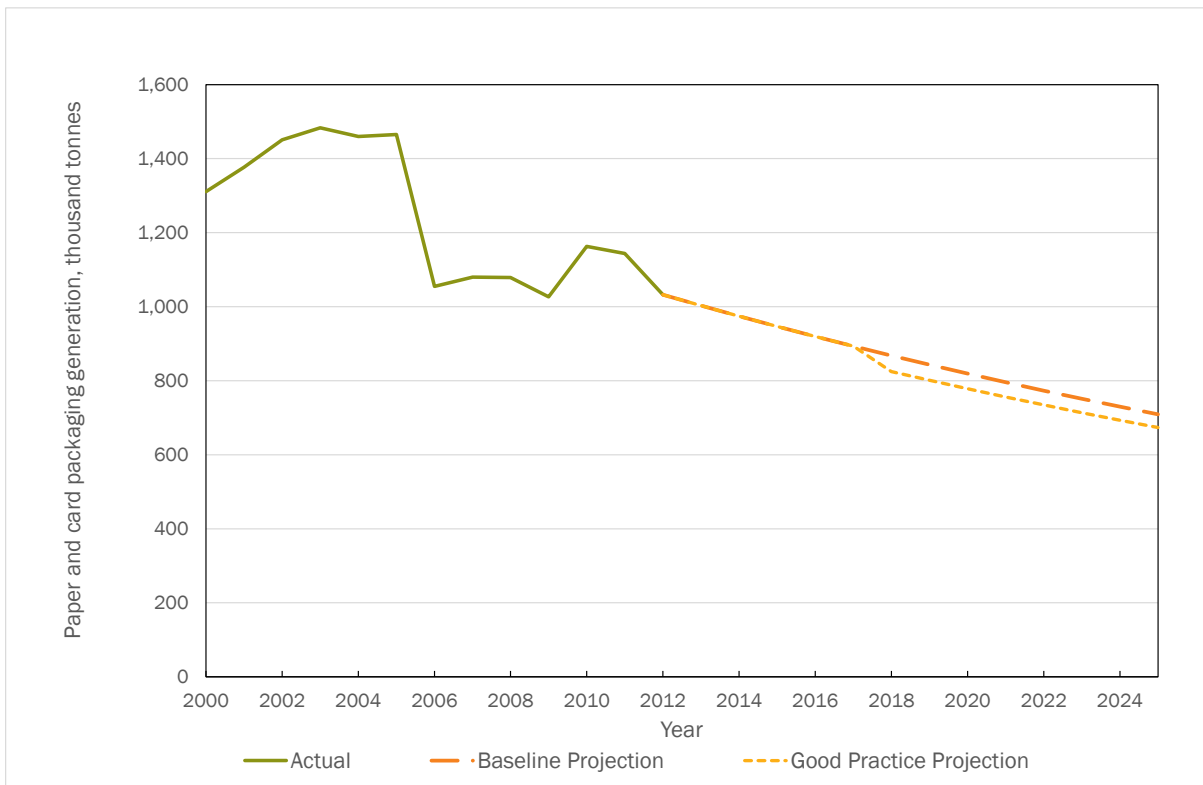


Figure 14-22: Change in Plastic Packaging Generation, thousand tonnes

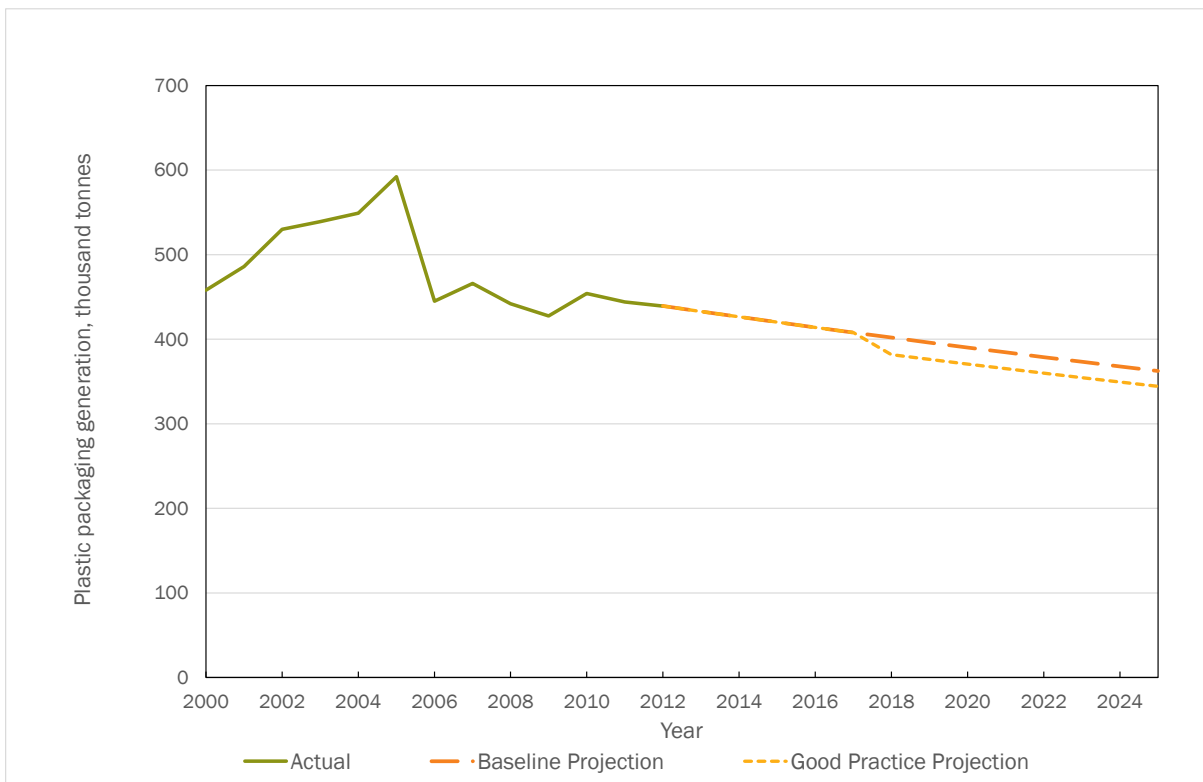


Figure 14-23: Change in Wood Packaging Generation, thousand tonnes

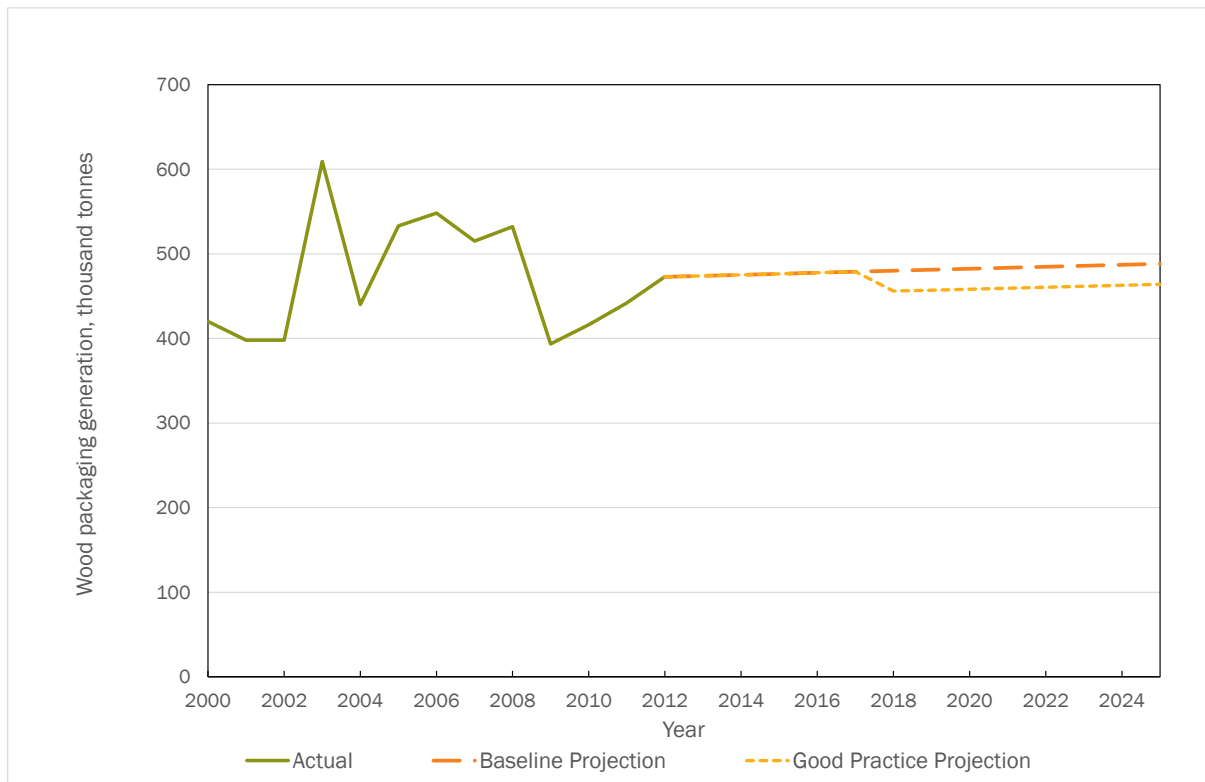


Figure 14-24: Change in Metal Packaging Generation, thousand tonnes

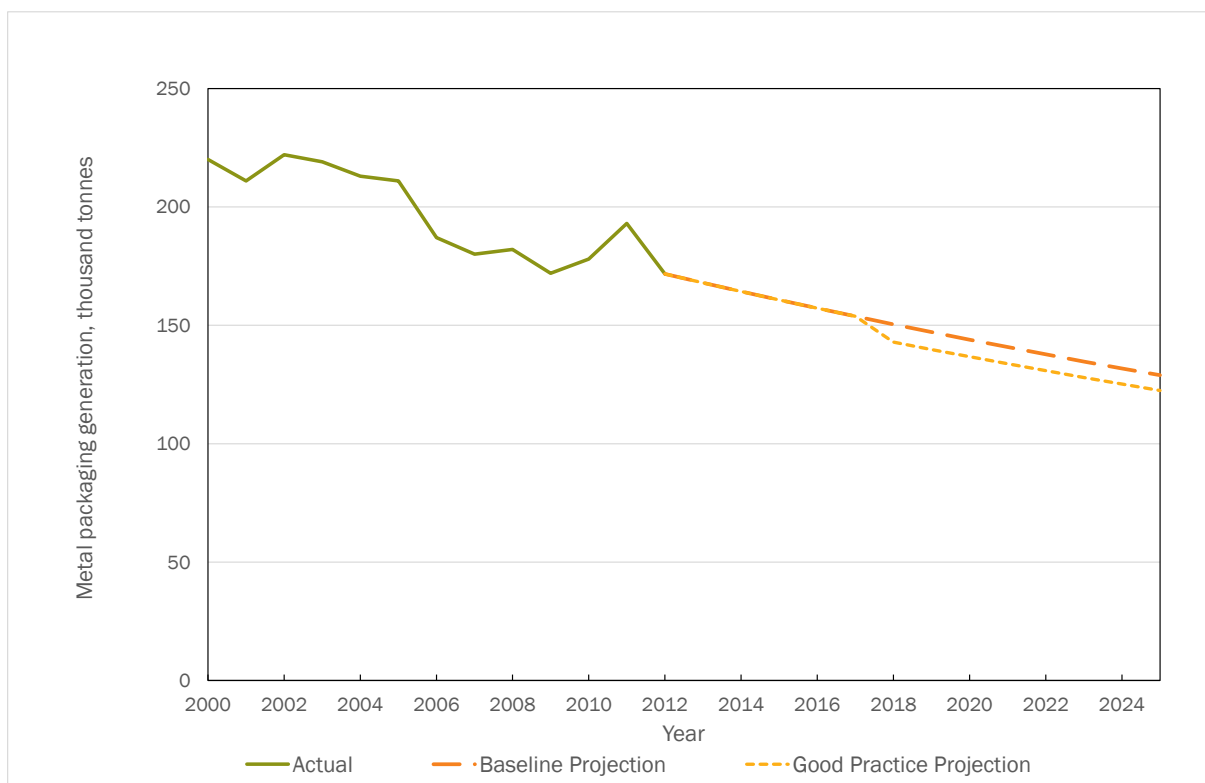


Figure 14-25: Change in Glass Packaging Generation, thousand tonnes

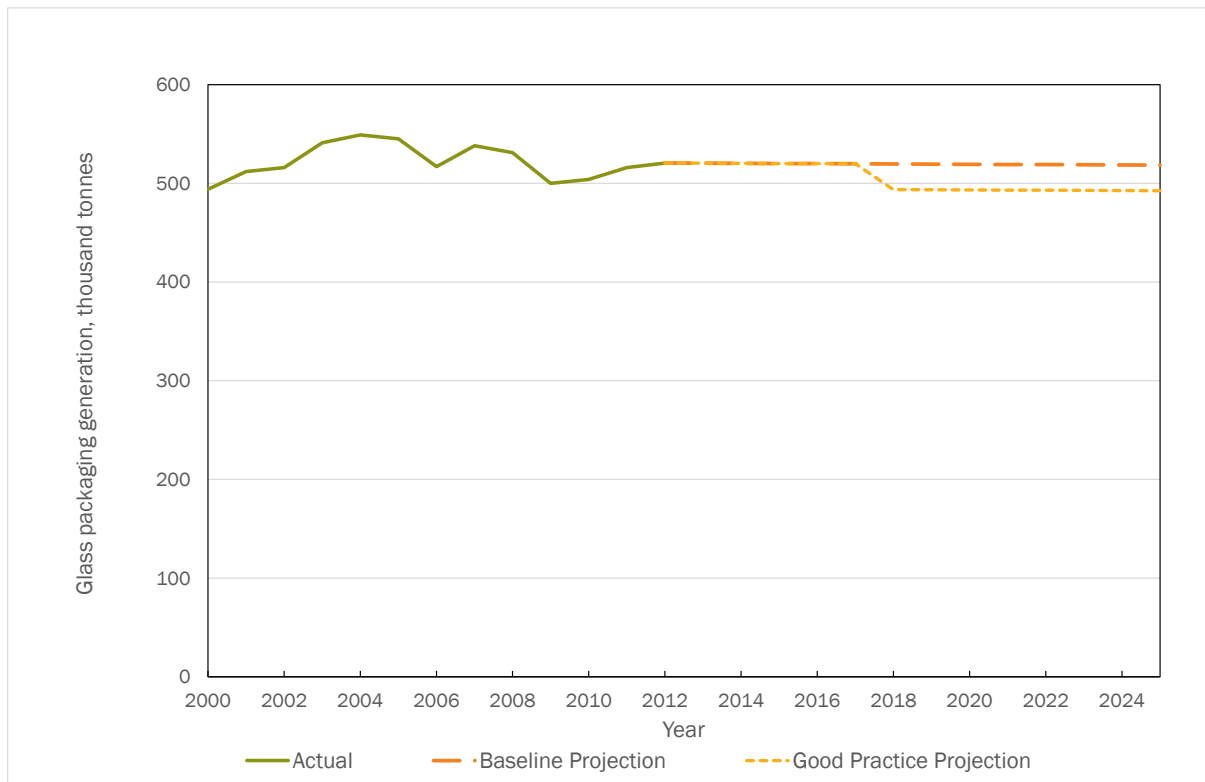
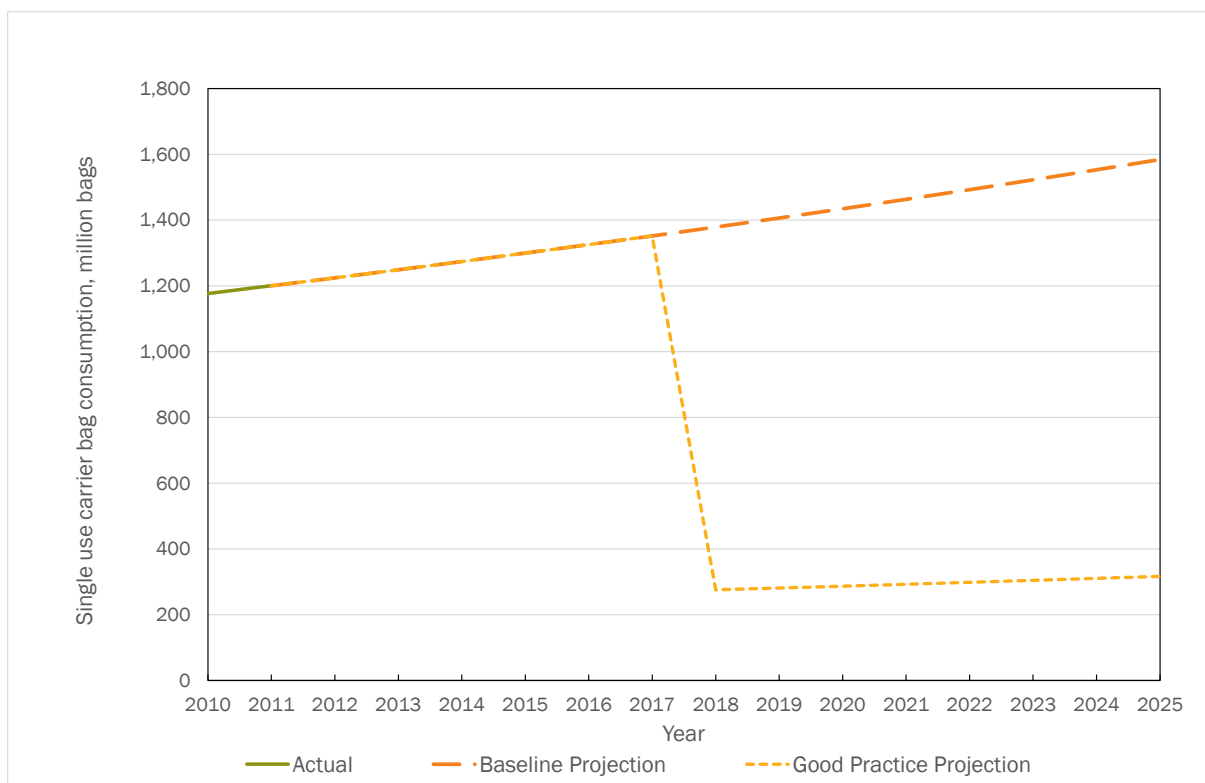


Figure 14-26: Change in Consumption of Single Use Carrier Bags, million bags



14.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 14-6: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	391	777	1,159	1,537	1,911	2,282	2,649	2,649	2,649
	C&I / Heating	0	0	403	792	1,169	1,536	1,891	2,237	2,574	2,574	2,574
	Electricity	6	6	6	6	6	6	6	6	6	6	6
	<i>Sub-total Energy, million EUR</i>	6	6	800	1,575	2,335	3,079	3,808	4,525	5,229	5,229	5,229
	<i>Sub-total Energy, % GDP</i>	0.0%	0.0%	0.1%	0.3%	0.4%	0.5%	0.6%	0.7%	0.8%	0.8%	0.8%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	0	0	0	0	0	0	0	0	0
	Passenger Aviation Tax	0	0	1,200	2,418	2,504	2,592	2,681	2,773	2,865	2,960	3,057
	Freight Aviation Tax	0	0	1	2	2	2	2	2	2	2	2
	<i>Sub-total Transport, million EUR</i>	0	0	1,201	2,420	2,506	2,594	2,683	2,775	2,868	2,962	3,059
	<i>Sub-total Transport, % GDP</i>	0.0%	0.0%	0.2%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	30	58	84	82	80	81	82	83	84	85

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	20	36	48	58	66	59	56	53	50	47
	Water Abstraction Tax	0	122	240	355	467	575	567	571	575	580	584
	Waste Water Tax	0	0	0	0	0	0	0	0	0	0	0
	Pesticides Tax	0	0	94	185	182	185	187	189	192	194	197
	Aggregates Tax	0	0	166	145	124	103	104	105	106	107	108
	Packaging Tax	0	0	73	68	67	66	65	64	63	62	61
	Single Use Bag Tax	0	146	149	30	31	32	32	33	33	34	35
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	317	814	916	1,012	1,106	1,095	1,100	1,106	1,111	1,117
	Sub-total Pollution & Resource, % GDP	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Total Revenue Stream	Total, million EUR	6	323	2,815	4,911	5,853	6,779	7,587	8,400	9,203	9,303	9,405
	Total, % GDP	0.0%	0.1%	0.5%	0.8%	0.9%	1.1%	1.2%	1.4%	1.5%	1.5%	1.5%

15.0 Slovenia

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

15.1 Energy Taxes

➤ Excise duties on energy products:

- Tax rates for 2014 are shown in Table 15-1.⁵²⁹
- Note that a number of special rates and reductions apply, for example for gas oil used for agriculture and railways.
- In 2012, revenues from energy excise duties amounted to €1.07 billion, equivalent to 3.02% of GDP.⁵³⁰
 - €1.03 billion of tax revenue was raised from excise duties on mineral oils and gas.⁵³¹
 - €33 million of tax revenue was raised from excise duties on electricity and coal.

Table 15-1: Standard Rates of Excise Duties on Fuels and Electricity in Slovenia (2014)

Excise Duty	Unit	Rate Applied in Slovenia
Transport Fuels		
Leaded Petrol ¹	€ per 1000 litres	€421.61
Unleaded Petrol	€ per 1000 litres	€549.51 ²
Gas Oil (Diesel)	€ per 1000 litres	€450.36 ³
Kerosene	€ per 1000 litres	€330

⁵²⁹ European Commission (2014) *Excise Duty Tables*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf, pp.8-64.

⁵³⁰ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=534/1389189783&taxType=Energy+products+and+electricity

⁵³¹ Eurostat (2014) *National Tax Lists*, 28th May 2014, http://epp.eurostat.ec.europa.eu/statistics_explained/images/c/c4/National_tax_lists_20140528.xls

Excise Duty	Unit	Rate Applied in Slovenia
Liquid Petroleum Gas	€ per 1000 kg	€127.50
Natural Gas	€ per GJ	€3.51 ⁷
Motor Fuels – Industry / Commercial Use		
Gas Oil (Diesel)	€ per 1000 litres	€43.90 ³
Kerosene	€ per 1000 litres	€165
Liquid Petroleum Gas	€ per 1000 kg	€63.75
Natural Gas	€ per GJ	€3.51 ⁷
Heating – Business Use		
Gas Oil (Diesel)	€ per 1000 litres	€133.09 ³
Kerosene	€ per 1000 litres	€55.56 ⁴
Heavy Fuel Oil	€ per 1000 kg	€61.10 ⁵
Liquid Petroleum Gas	€ per 1000 kg	€41.76 ⁶
Natural Gas	€ per GJ	€1.35 ⁷
Coal and Coke	€ per GJ	€1.47 ⁸
		€1.60 ⁹
		€1.83 ¹⁰
Heating – Non-Business Use		
Gas Oil (Diesel)	€ per 1000 litres	€133.09 ³
Kerosene	€ per 1000 litres	€55.56 ⁴
Heavy Fuel Oil	€ per 1000 kg	€61.10 ⁵
Liquid Petroleum Gas	€ per 1000 kg	€41.76 ⁶
Natural Gas	€ per GJ	€1.35 ⁷
Coal and Coke	€ per GJ	€1.47 ⁸
		€1.60 ⁹
		€1.83 ¹⁰
Electricity		
Business Use	€ per MWh	€3.05
Non-Business Use	€ per MWh	€3.05

Excise Duty	Unit	Rate Applied in Slovenia
Notes:		
<ol style="list-style-type: none"> 1. <i>Leaded petrol is forbidden for sale in Slovenia.</i> 2. <i>Includes CO₂-tax in the amount of €34.56 per 1000 litres.</i> 3. <i>Includes CO₂-tax in the amount of €37.44 per 1000 litres.</i> 4. <i>Includes CO₂-tax in the amount of €34.56 per 1000 litres.</i> 5. <i>Includes CO₂-tax in the amount of €46.08 per 1000 kg.</i> 6. <i>Excise duty for LPG used for heating (business and non-business use) is €0, this figure shows only the CO₂-tax.</i> 7. <i>Includes CO₂-tax in the amount of €0.8047 per GJ.</i> 8. <i>[CN 2701]; Includes CO₂-tax in the amount of €1.1829 per GJ, energy value used: 1000 kg = 28 GJ.</i> 9. <i>[CN 2702]; Includes CO₂-tax in the amount of €1.3091 per GJ, energy value used: 1000 kg = 16.5 GJ.</i> 10. <i>[CN 2704]. Includes CO₂-tax in the amount of €1.5393 per GJ, energy value used: 1000 kg = 29 GJ.</i> 		

Source: DG TAXUD (2014) *Excise Duty Tables (Part II – Energy products and Electricity)*, Situation as at 1 July 2014, http://ec.europa.eu/taxation_customs/index_en.htm#

- A tax on CO₂ came into force in 1997 into Slovenia.⁵³² This was the first instance of a CO₂ tax being implemented by a Central and Eastern Europe country:
 - The tax is levied on all CO₂ emissions from the combustion of fuel and from the incineration of combustible organic substances.
 - The tax is payable by either the importer (customs debtor), or, in the case of fuel production or purchase in the Republic of Slovenia, the producer of the fuel.
 - A tax rate of €14.4 per tonne of CO₂ is charged on all fuels, with specific tax rates calculated according to the carbon content of each fuel; these are listed in the notes in Table 15-1.
 - A number of exemptions exist, including on:⁵³³
 - Biomass for heating, fuel extracted from biomass and biogas, fuel used in chemical reactions, electrolytic and metallurgical processes;
 - Fuel exported to the EU area;
 - Kerosene used in aviation; and
 - Fuel used by companies that participate in the EU ETS.
 - Tax revenues in 2012 totalled €55 million, equivalent to 0.16% of GDP.

⁵³² European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=714/1388754940&taxType=Other+indirect+tax

⁵³³ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

- Since 2010, energy suppliers are required to collect an energy efficiency tax from final customers:⁵³⁴
 - The revenues from this tax are fully earmarked for energy efficiency programmes.
 - Tax rates are provided in Table 15-2.

Table 15-2: Energy Efficiency Tax Rates in Slovenia (2014)

Tax base	Tax rate
Automotive diesel oil	€0.002 per litre
District heating	€0.0005 per kWh
Domestic heating gasoil	€0.05 per litre
Electricity	€0.0005 per kWh
Industrial residual fuel	€0.05 per kg
LPG motor fuel	€0.004 per litre
Unleaded petrol motor fuel	€0.004 per litre
Natural gas	€0.005 per m ³

OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_4.aspx?Key=4b855ee6-5e38-4ba5-a0cd-e310aa5779d5&QryCtx=3&QryFlag=3

15.2 Transport Taxes (Excluding Transport Fuels)

- Motor vehicles tax (“Davek na motorna vozila”):⁵³⁵
 - This tax is paid on a one-off basis at the time of purchase, or first time registration, of a passenger motor vehicle in Slovenia (or at the time of registration of a vehicle imported into Slovenia).
 - The tax is payable on the net purchasing price of the vehicle, excluding VAT.

⁵³⁴ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁵³⁵ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=537/1388754941&taxType=Other+indirect+tax

- For passenger cars, the tax rate is determined by the CO₂ emissions and fuel type of the vehicle. Motorcycle and camper vans are taxed according to the power of the engine. An additional premium is charged for motor vehicles with large engine capacities. These rates are outlined in Table 15-3.
- Main exemptions: Exported vehicles, vehicles used by families with three or more children, vehicles for carrying disabled people.
- Revenue in 2012: €34.8 million (equivalent to 0.10% of GDP).

Table 15-3: Motor Vehicle Tax Rates (Slovenia, 2014)

General tax base	Specific tax base (I)	Tax Rate (% of pre-VAT price of the vehicle)
Basic Tax		
Passenger cars – petrol or LPG	0 – 110 g per km CO ₂	0.5%
	110 – 120 g per km CO ₂	1%
	120 – 130 g per km CO ₂	1.5%
	130 – 150 g per km CO ₂	3%
	150 – 170 g per km CO ₂	6%
	170 – 190 g per km CO ₂	9%
	190 – 210 g per km CO ₂	13%
	210 – 230 g per km CO ₂	18%
	230 – 250 g per km CO ₂	23%
	Above 250 g per km CO ₂	28%
Passenger cars - diesel	0 – 110 g per km CO ₂	1%
	110 – 120 g per km CO ₂	2%
	120 – 130 g per km CO ₂	3%
	130 – 150 g per km CO ₂	Not listed
	150 – 170 g per km CO ₂	11%
	170 – 190 g per km CO ₂	16%
	190 – 210 g per km CO ₂	18%
	210 – 230 g per km CO ₂	22%

General tax base	Specific tax base (I)	Tax Rate (% of pre-VAT price of the vehicle)
	230 – 250 g per km CO ₂	26%
	Above 250 g per km CO ₂	31%
Camping vans	Up to 60 kW	6%
	60 – 90 kW	9%
	90 – 120 kW	13%
	Above 120 kW	18%
Motorcycles	Up to 25 kW	1.5%
	25 – 50 kW	2%
	50 – 75 kW	3%
	Above 75 kW	5%
Additional Premium		
All types of new vehicles except for motorcycles	Engine capacity between 2500 and 2999 cm ³	8%
	Engine capacity between 3000 and 3499 cm ³	10%
	Engine capacity between 3500 and 3999 cm ³	13%
	Engine capacity between above 4000 cm ³	16%
Motorcycles	Engine capacity above 1000 cm ³	5%

Source: OECD (2014) Database on Instruments Used for Environmental Policy, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_4.aspx?Key=311407f7-153f-4771-afbf-194e42f9b838&OryCtx=3&OryFlag=3

➤ Circulation Taxes:

- The annual fee on the use of motor vehicles “Letna dajatev za uporabo vozil v cestnem prometu” is paid annually by the owners of all registered motor vehicles and trailers.⁵³⁶
- The tax rate is calculated on the basis of a number of different features, as follows:
 - Motorcycle and passenger vehicles (related to engine capacity);
 - Buses (per passenger seat);
 - Trucks and trailers (related to maximum permissible weight); and
 - Traction vehicles (related to engine capacity, to maximum permissible weight, or to maximum permissible weight of vehicle group).
- The tax rate also varies by a fixed percentage depending on vehicle emissions (measured by EURO standards).
- These rates are outlined in Table 15-4 and Table 15-5.
- Main exemptions: Electric vehicles, tractors and tractor trailers, motorcycles, three-wheeled small capacity cycles, light four wheeled cycles, light trailers, public service vehicles, vehicles for disabled persons.
- Revenue in 2012: €109 million (equivalent to 0.31% of GDP).

Table 15-4: Annual Fee on the Use of Motor Vehicles Tax Rates (Slovenia, 2014)

General tax base	Specific tax base (I)	Annual Fee
Motorbikes	Engine capacity up to 125 cc	€13
	Engine capacity between 125 and 500 cc	€21
	Engine capacity between 500 and 1000 cc	€29
	Engine capacity above 1000 cc	€33
Personal Cars	Engine capacity up to 1350 cc	€62
	Engine capacity between 1350 and 1800 cc	€96
	Engine capacity between 1800 and 2500 cc	€153
	Engine capacity between 2500 and 3000 cc	€282
	Engine capacity between 3000 and 4000 cc	€452

⁵³⁶ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=812/1388754940&taxType=Other+direct+tax

General tax base	Specific tax base (I)	Annual Fee
	Engine capacity above 4500 cc	€565
Buses	Number of seats	€3.16 per seat
Trucks	Up to 4 tonnes (max. allowed weight)	€101.94
	Above 4 tonnes (max. allowed weight)	€22.86 per tonne
Trucks with trailer	Up to 190 kW	€5.37 per kW
	Above 190 kW	€1019.37 per truck
Trailers	Up to 2 tonnes	€38.22
	Above 2 tonnes	€19.11

Source: European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=812/1388754940&taxType=Other+direct+tax

Table 15-5: Emissions Related Adjustment to Motor Vehicles Tax Rates (Slovenia, 2014)

Emissions Standard	Percentage Adjustment to Annual Fee
EURO VI and higher	35% reduction
EURO V	25% reduction
EURO III	10% increase
EURO II	20% increase
EURO I	30% increase
EURO 0 or lower	40% increase

Source: European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=812/1388754940&taxType=Other+direct+tax

- Other transport taxes:
 - End-of-life vehicles tax:⁵³⁷

⁵³⁷ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/ecoinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

- An end-of-life vehicles tax is payable on all new vehicles in Slovenia, with a tax rate of €0.0063 per kg of vehicle.
- The tax is returned if the vehicle is exported
- Revenue in 2012: €0.5 million, equivalent to 0.001% of GDP.
- Road toll:⁵³⁸
 - Slovenia has a toll system in place for most motorways and expressways, implemented on the 1 July 2008. This is split into two distinct systems, as follows:
 - **Vignettes** are required for all motorcycles, private cars and vans whose maximum permitted weight does not exceed 3.5 tonnes. Vignettes are sold on a yearly, half-yearly, monthly, or weekly basis.
 - **Open and closed tolling systems** for vehicles weighing over 3.5 tonnes. The amount payable is determined by the distance covered, and can be linked to an electronic tag in the vehicle.
 - Rates: see Table 15-6 for details of the Vignette rates. The rates for vehicles exceeding 3.5 tonnes depend on:
 - The class of vehicle: R3 (motor vehicles and groups of motor vehicles with two or three axles), R4 (motor vehicles with more than three vehicles);
 - The emissions (as represented through EURO class); and
 - The particular toll road (or section of toll road)

Table 15-6: Vignette Road Toll Prices (Slovenia, 2014)

Vehicle Category	Vignette Price (including VAT)		
	Yearly	Half-year	Weekly
1 (motorcycle)	€55	€30	€7.50
2A (caravans and two-track motor vehicles with vehicle height above front axis up to 1.30 m)	€110	€30	€15
2B (two-track motor vehicles with vehicle height above front axis 1.30 m or more)	€220	€80	€40

Source: DARS (2014) Toll Price List, Accessed 14th August 2014, www.dars.si/Dokumenti/Toll/Toll_price_303.aspx

⁵³⁸ DARS (2014) Tolling System and Roads, Accessed 14th August 2014, http://www.dars.si/Dokumenti/Toll/Tolling_system_and_roads_298.aspx

15.3 Pollution and Resource Taxes

- Landfilling of waste in Slovenia has been subject to a landfill tax since 2001.
 - The tax is payable by all landfill operators.
 - The tax basis is the number of units of waste, multiplied by a set number of “soil load units” and “air pollution units”, reduced for the recalculated amount of burned or captured landfill gas. Different numbers of load units are assigned to each category of inert, non-hazardous and hazardous waste (units of 1, 5 and 10, respectively).⁵³⁹
 - Tax rates of €0.0022 per unit of soil load, and €0.0125 per unit of air pollution apply.⁵⁴⁰ The overall tax rates are therefore: €5.5 per tonne for inert waste, €11 per tonne for non-hazardous waste, and €22 per tonne for hazardous waste.
 - Revenue in 2012: €4.6 million (equivalent to 0.013% of GDP).
- Electronic and electrical equipment (EEE), pneumatic tyres, and packaging waste placed on the market are taxed in Slovenia:⁵⁴¹
 - The tax is payable by all legal entities placing these products on the market in Slovenia.
 - The tax basis is the mass of EEE, pneumatic tyres, or packaging waste, multiplied by a “unit of environmental load”. The unit of environmental load measure aims to account for the environmental impacts of disposal of WEEE, end-of-life tyres, and packaging waste. A different unit of environmental load applies to each type of EEE.
 - According to TAXUD a yearly reimbursement of €33.38 is provided for keeping a register of producers and suppliers.
 - The following tax rates apply:
 - WEEE: €0.0083 per unit of environmental load.
 - End-of-life tyres: €0.0054 per unit of environmental load.
 - Packaging waste: €0.0017 per unit of environmental load.
 - Revenues in 2012:
 - Tax on WEEE: €0.4 million (equivalent to 0.001% of GDP)

⁵³⁹ Source: European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=814/1388754940&taxType=Other+indirect+tax

⁵⁴⁰ OECD (2012), *OECD Environmental Performance Review: Slovenia 2012*, <http://dx.doi.org/10.1787/9789264169265-en>

⁵⁴¹ Source: European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=814/1388754940&taxType=Other+indirect+tax

- Tax on end-of-life tyres: €0.1 million (equivalent to 0.0003% of GDP)
- Tax on packaging waste: €1.0 million (equivalent to 0.002% of GDP)
- A mineral extraction tax was implemented in 2012 in Slovenia:⁵⁴²
 - The tax is applied on the extraction of all mineral resources in Slovenia.
 - The tax rate is calculated by multiplying a fixed value per point by a 'number of points', which varies according to the type of material and extraction type. This rate is then multiplied by the quantity extracted in previous years (in m³) to obtain the final tax rate
 - The current value of one point is €0.009
- As part of the same package of taxes as the mineral extraction tax, Slovenia implemented a tax on land used for mining in 2012:⁵⁴³
 - The tax is applied on the extraction of all mineral resources in Slovenia.
 - The tax rate is calculated by multiplying a fixed value per point by a 'number of points', which varies according to the type of material and extraction type. This rate is then multiplied by the area of land used for mining (ha) to obtain the final tax rate.
 - The current value of one point is €0.009.
- Slovenia has a tax on lubricating oils and fluids:⁵⁴⁴
 - A tax rate of €0.1586 per kg applies. The full tax rate is applied to lubricating oils used in vehicles, while industrial lubricating oils are subject to a 50% tax rate.
 - Revenue in 2012: €2.5 million (equivalent to 0.007% of GDP)
- Volatile organic compounds are subject to a tax in Slovenia:⁵⁴⁵
 - A tax rate of €0.001 per unit load applies.
 - Revenue in 2012: €0.1 million (equivalent to 0.0003% of GDP).
- Slovenia has a tax on fluorinated greenhouse gases.⁵⁴⁶

⁵⁴² Personal communication with Andrej Udovč, Professor of Environmental Economics, University of Ljubljana

⁵⁴³ Personal communication with Andrej Udovč, Professor of Environmental Economics, University of Ljubljana

⁵⁴⁴ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁵⁴⁵ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

- A tax applies to the disposal of waste water in Slovenia:⁵⁴⁷
 - The tax is payable by all legal entities using water in their industrial processes, and the owner or manager of a building where municipal waste water arises.
 - The tax basis is the number of waste water load units in the taxation period.
 - A tax rate of €26.40 per unit of waste water load applies.
 - Revenue in 2012: €29.8 million (equivalent to 0.084% of GDP).⁵⁴⁸
- Slovenia has a “payment for water rights” charge which applies to a number of activities requiring access to (or use of) water. Table 15-7 provides a list of chargeable activities and fees.

Table 15-7: Payment for Water Rights Charges (Slovenia, 2014)

Activity	Charge
Hydroelectric power production up to 10MW	The water right is paid as a percentage of the average sell value of heat sold in the previous year. An example fee rate from a previous year is €0.0842 per kWh
Usage of marine farm organisms: clams	€0.75 per kg of clams
Usage of marine farm organisms: native marine fish	€5.79 per kg of fish
Usage of marine farm organisms: salmonid fish	€3.03 per kg of fish
Mineral water extraction	€1.754 per 1000 litres
Use of thermal underground waters	€0.0248 per 1000 kJ of heat

OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicinst/queries/QueryResult_4.aspx?Key=4b855ee6-5e38-4ba5-a0cd-e310aa5779d5&QryCtx=3&QryFlag=3

⁵⁴⁶ Statistical Office of the Republic of Slovenia (2013) *Improvement and Upgrading of the Existing Environmental Accounts (Environmentally Related Taxes)*, January 2013, <http://www.cbd.int/financial/fiscalenviron/slovenia-environcount.pdf>

⁵⁴⁷ European Commission (2014) *Taxes in Europe Database*, Accessed 13th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=814/1388754940&taxType=Other+indirect+tax

⁵⁴⁸ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

- Wastewater collection and treatment is subject to a charge in Slovenia:⁵⁴⁹
 - Two pricing structures are used for households and industry:⁵⁵⁰
 - Mixed rate: fixed rate per connection plus variable rate per cubic metre.
 - Simple variable rate: variable rate per cubic metre.
 - Charges vary across municipalities depending on a number of factors (e.g. the level of service provided, service costs, population distribution and density, etc.).
 - Rates vary between €0.089 and €2.405 per m³ for households, and between €0.129 and €2.436 per m³ for industry.
 - Revenue in 2012: €30 million (equivalent to 0.085% of GDP).⁵⁵¹
- A water abstraction tax is levied in Slovenia:⁵⁵²
 - Rates vary according to the use to which the abstracted water is applied (see Table 15-8).
 - Revenue in 2012: €26 million (equivalent to 0.074% of GDP).⁵⁵³

Table 15-8: Water Abstraction Taxes (Slovenia, 2014)

Water Abstraction Type	Rate
Abstractions for bottling, public swimming pools and natural spas	€0.0666 per m ³
Abstractions for drinking water supply	€0.0555 per m ³
Abstractions for electricity production in hydropower plants above 10 MW	€1.50 per MWh
Abstractions for electricity production in hydropower plants below 10 MW	€0.1863 per MWh

⁵⁴⁹ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁵⁵⁰ European Environment Agency (2013) *Assessment of Cost Recovery Through Water Pricing*, <http://www.eea.europa.eu/publications/assessment-of-full-cost-recovery>

⁵⁵¹ Eurostat (2014) *National Tax Lists*, 28th May 2014, http://epp.eurostat.ec.europa.eu/statistics_explained/images/c/c4/National_tax_lists_20140528.xls

⁵⁵² OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁵⁵³ Eurostat (2014) *National Tax Lists*, 28th May 2014, http://epp.eurostat.ec.europa.eu/statistics_explained/images/c/c4/National_tax_lists_20140528.xls

Water Abstraction Type	Rate
Abstractions for irrigation of agricultural land	€0.0008 per m ³
Abstractions for irrigation of non-agricultural land	€0.0555 per m ³
Abstractions for technological purposes and cooling in thermal power plants	€0.0041 per m ³
For breeding cyprinid fish species	€0.0008 per m ³
For breeding salmonid fish species	€0.0029 per 100 m ³
Power water mills, saws or similar devices	€0.1694 per MWh
The use of sand	€2.46 per m ³
The use of water land for the operation of anchoring vessels	€0.0111 per m ² of water surface area
The use of water land for the operation of ports to vessels	€0.2086 per m ² of water surface area
The use of water land for the operation of swimming	€0.8346 per m ² of water surface area
Water used for commercial fish farms in ponds	€0.0160 per m ³
Water used for heat production	€0.8470 per MWh
Water used for shellfish farms	€0.0041 per m ² of sea used for shellfish farms

OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicinst/queries/QueryResult_4.aspx?Key=4b855ee6-5e38-4ba5-a0cd-e310aa5779d5&QryCtx=3&QryFlag=3

- Water consumption is subject to a charge in Slovenia:⁵⁵⁴
 - Two pricing structures are used for households and industry:⁵⁵⁵

⁵⁵⁴ OECD (2014) *Database on Instruments Used for Environmental Policy*, Accessed 13th August 2014, http://www2.oecd.org/eoicinst/queries/QueryResult_2.aspx?Key=3a15a4ab-7d0c-4b07-b7c6-9f10dbc06b6e&QryCtx=1&QryFlag=3

⁵⁵⁵ European Environment Agency (2013) *Assessment of Cost Recovery Through Water Pricing*, <http://www.eea.europa.eu/publications/assessment-of-full-cost-recovery>

- Mixed rate: fixed rate per connection plus variable rate per cubic metre.
- Simple variable rate: variable rate per cubic metre.
- Charges vary across municipalities depending on a number of factors (e.g. the level of service provided, service costs, population distribution and density, etc.).
- Rates vary between €0.19 and €1.48 per m³ of drinking water.

15.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 15-9: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	1,771	1,729	-42
Petrol	million litres	586	586	0
Kerosene	million litres	25	25	0
LPG	thousand tonnes	73	71	-2
Heavy Fuel Oil	thousand tonnes	7	7	0
Natural Gas	TJ (GCV)	20,077	20,073	-4
Coal	thousand tonnes	416	415	-1
Electricity	GWh	10,995	10,995	0

Figure 15-1: Change in Internal Passenger Flights, flights per year

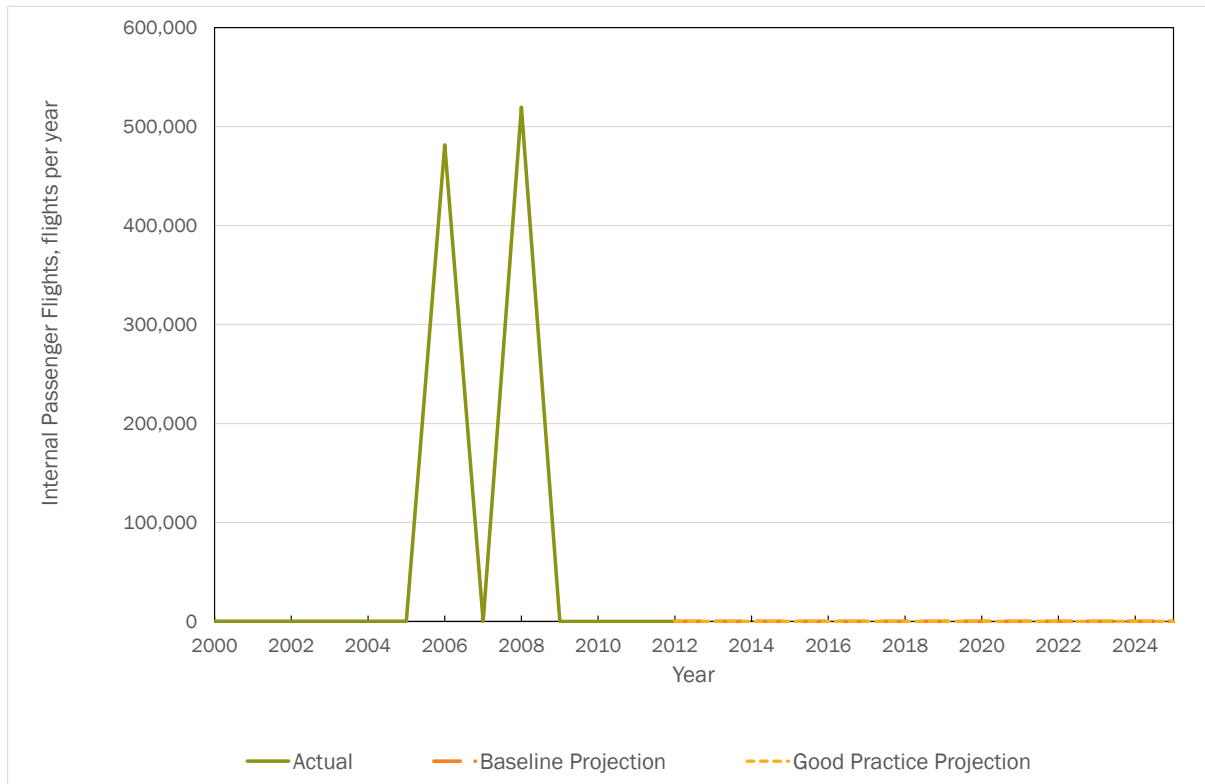


Figure 15-2: Change in Intra-EU Passenger Flights, flights per year

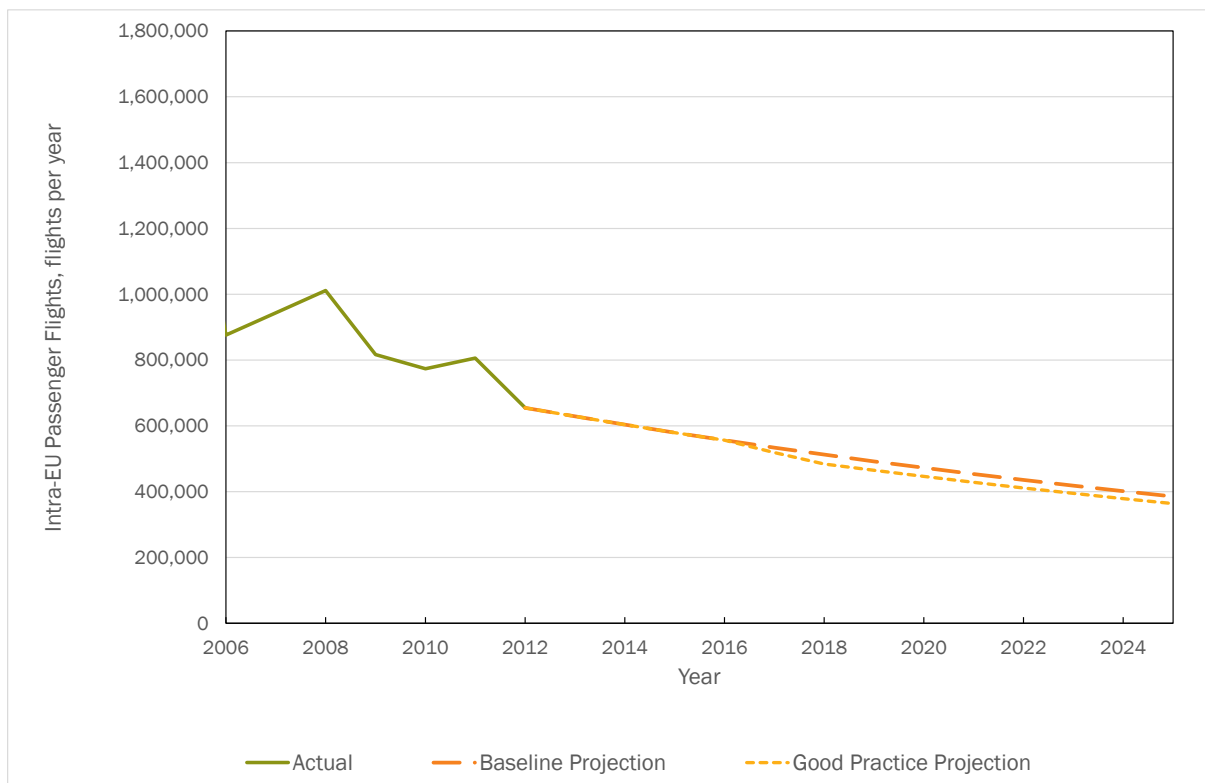


Figure 15-3: Change in Extra-EU Passenger Flights, flights per year

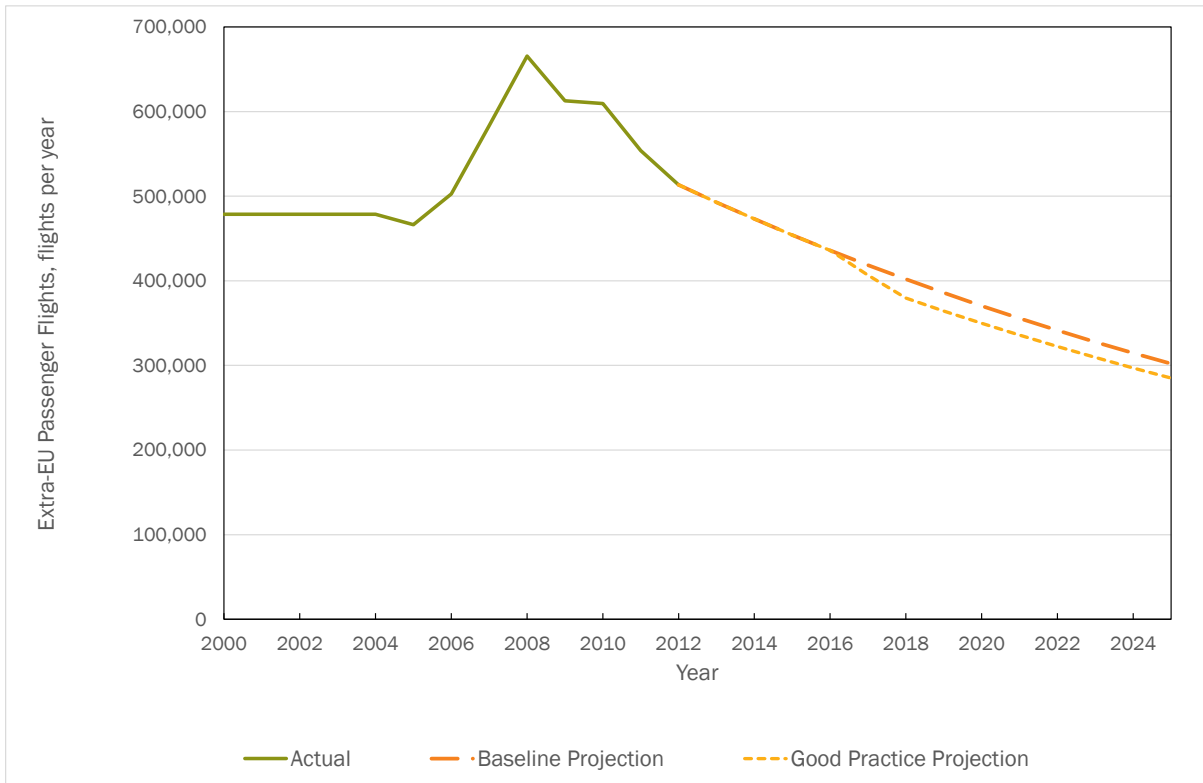


Figure 15-4: Change in Internal Air-freight, tonnes



Figure 15-5: Change in Intra-EU Air-freight, tonnes

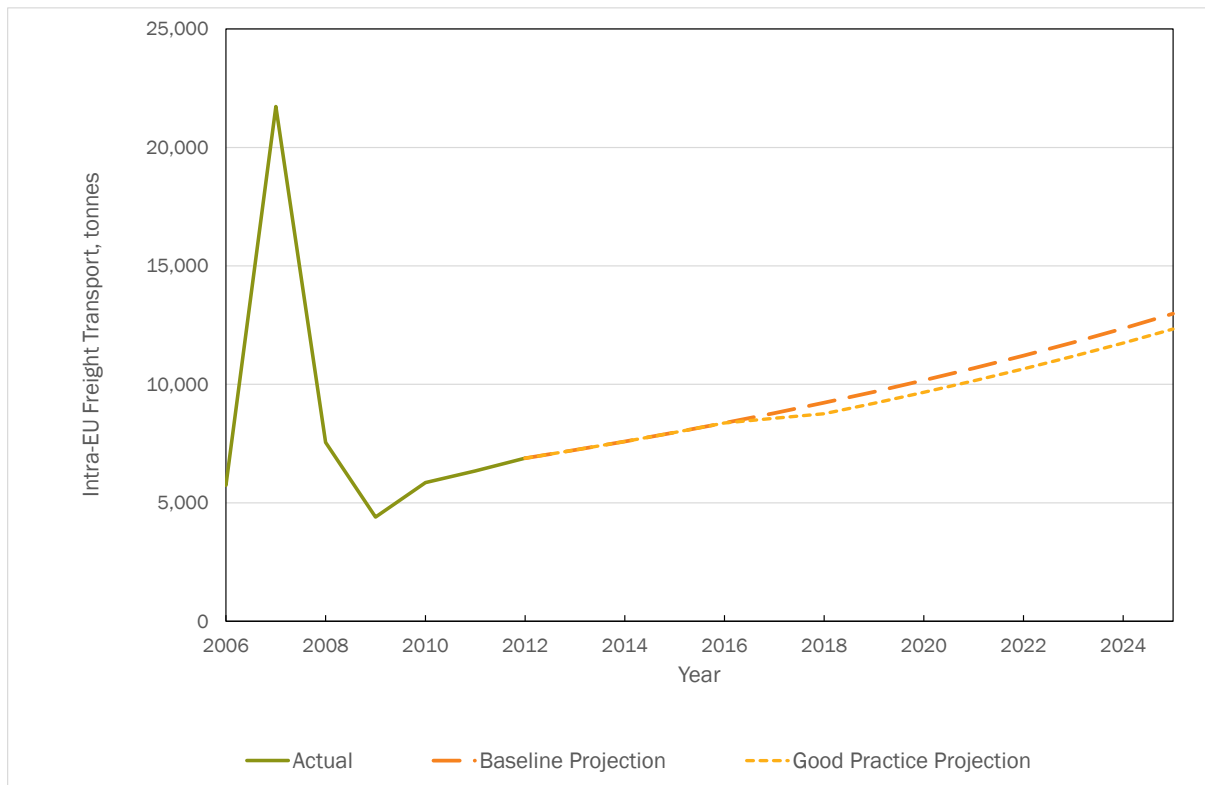


Figure 15-6: Change in Extra-EU Air-freight, tonnes

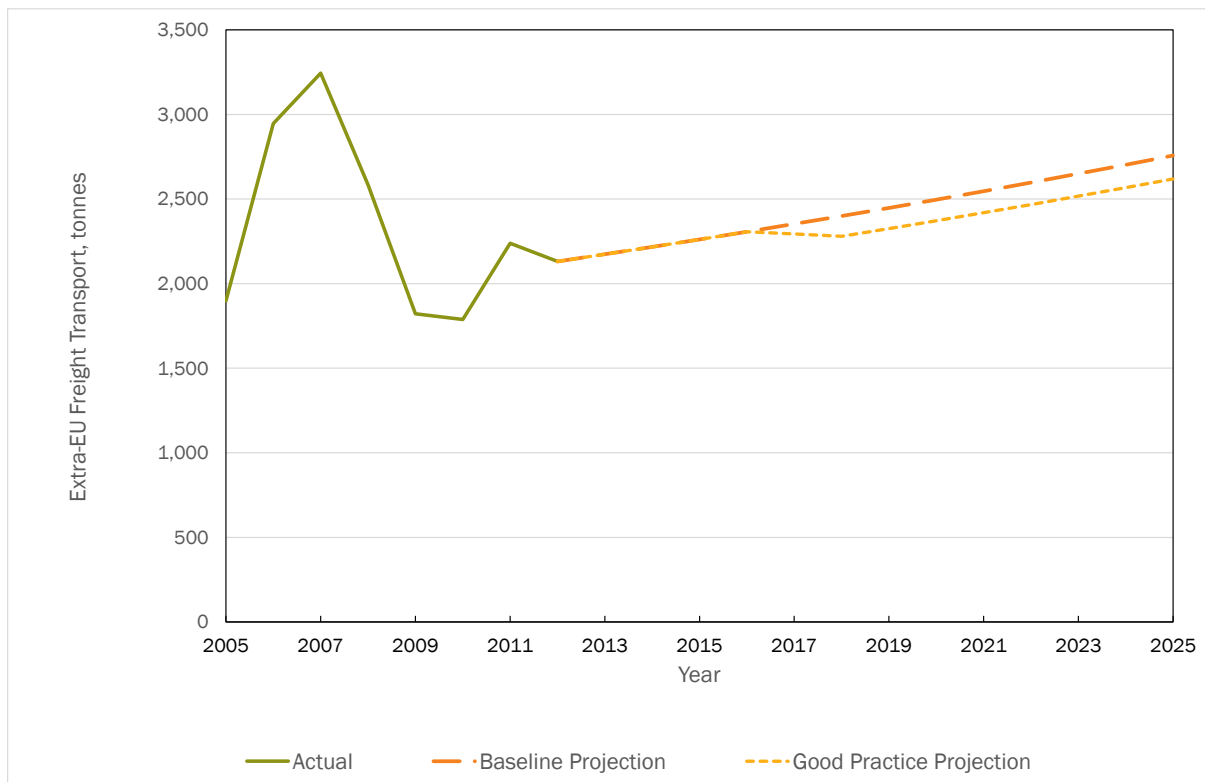


Figure 15-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

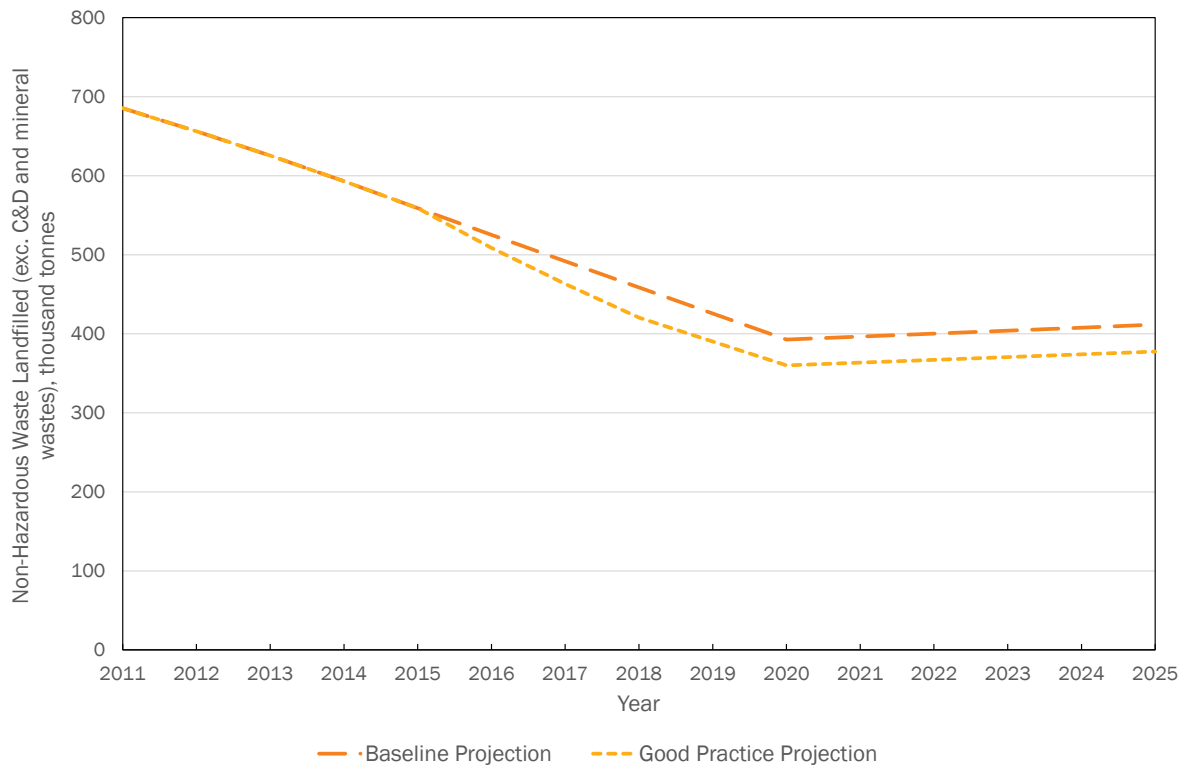


Figure 15-8: Change in MBT/ Incineration, thousand tonnes

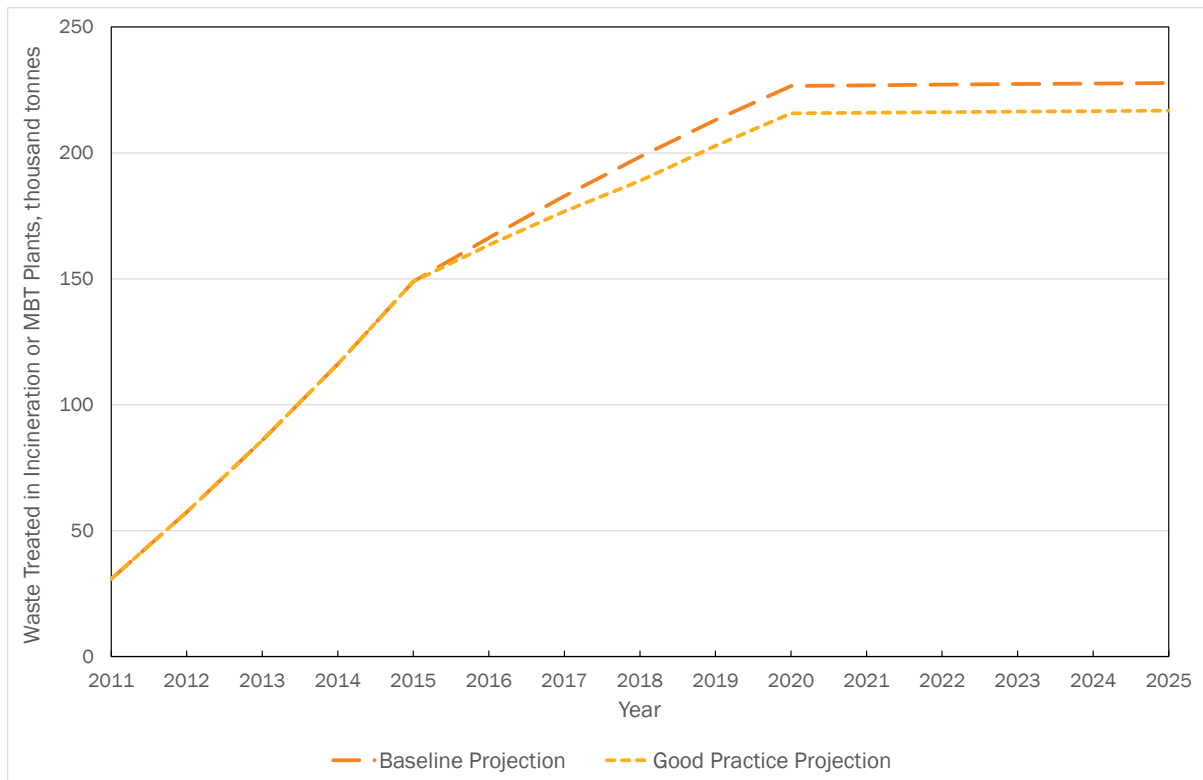


Figure 15-9: Change in SOx Emissions, tonnes

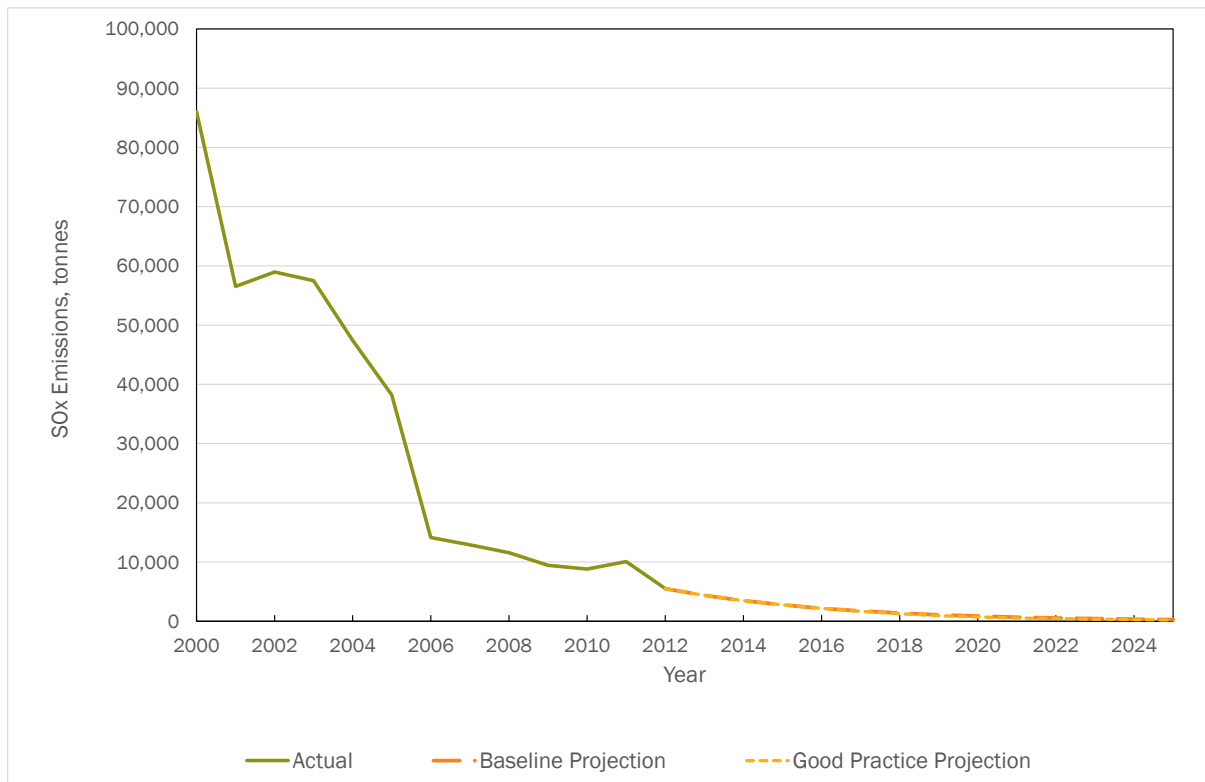


Figure 15-10: Change in NOx Emissions, tonnes

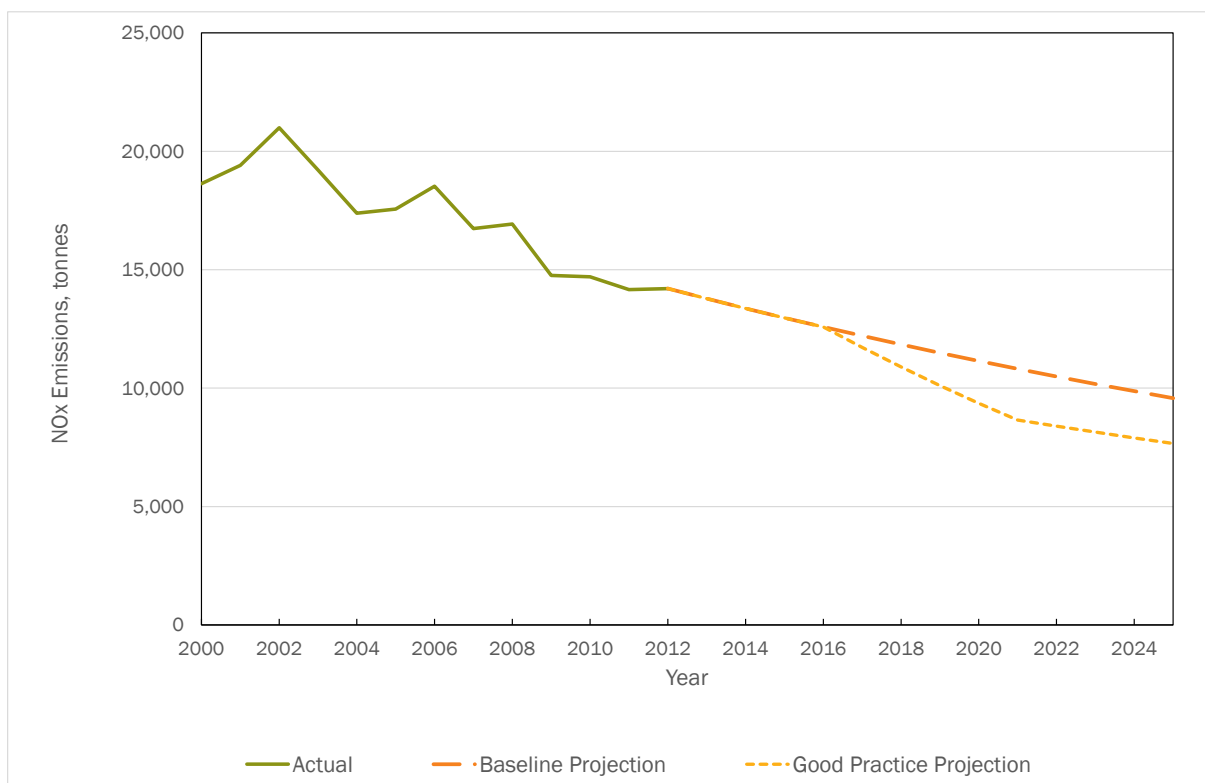


Figure 15-11: Change in PM₁₀ Emissions, tonnes

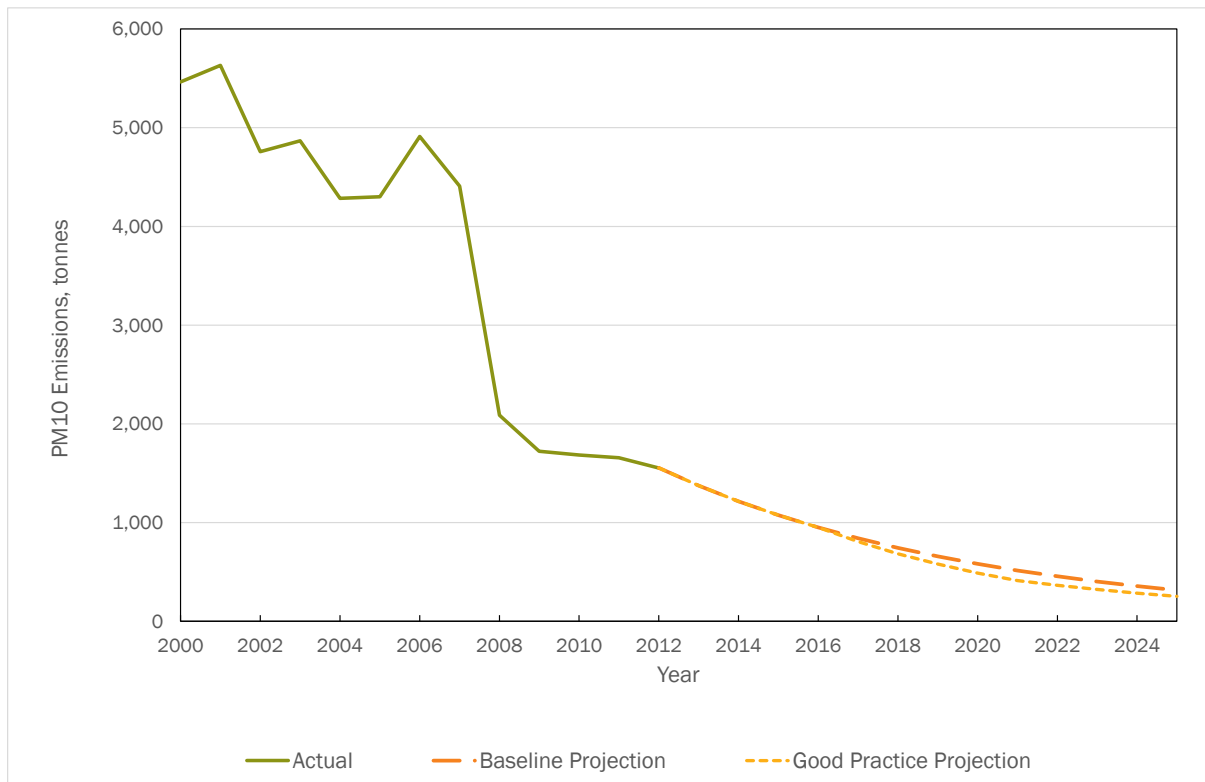


Figure 15-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

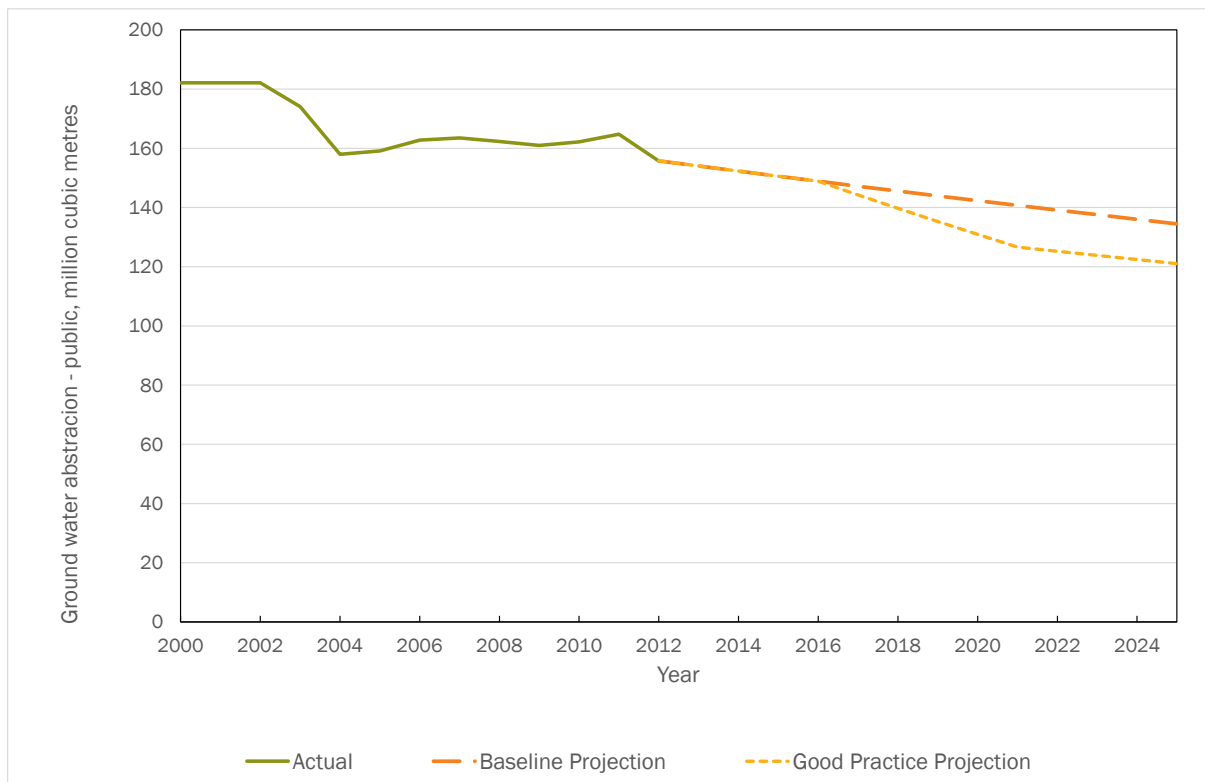


Figure 15-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

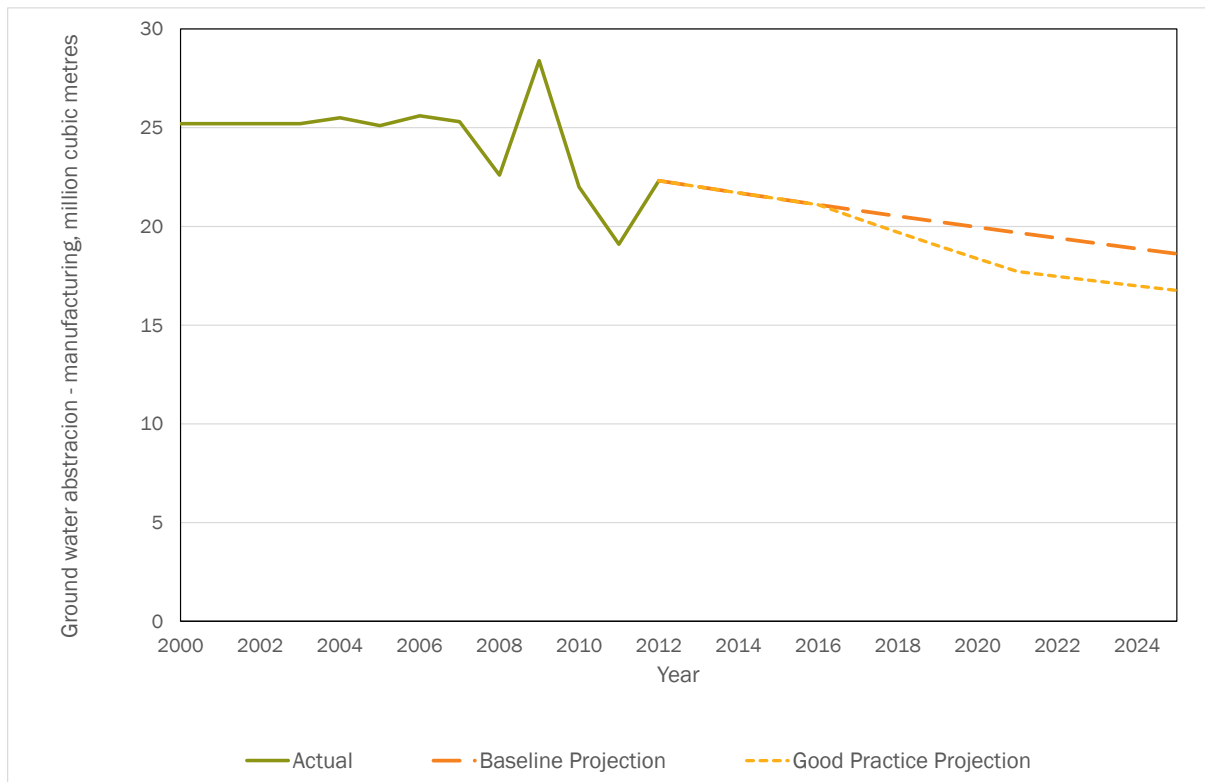


Figure 15-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

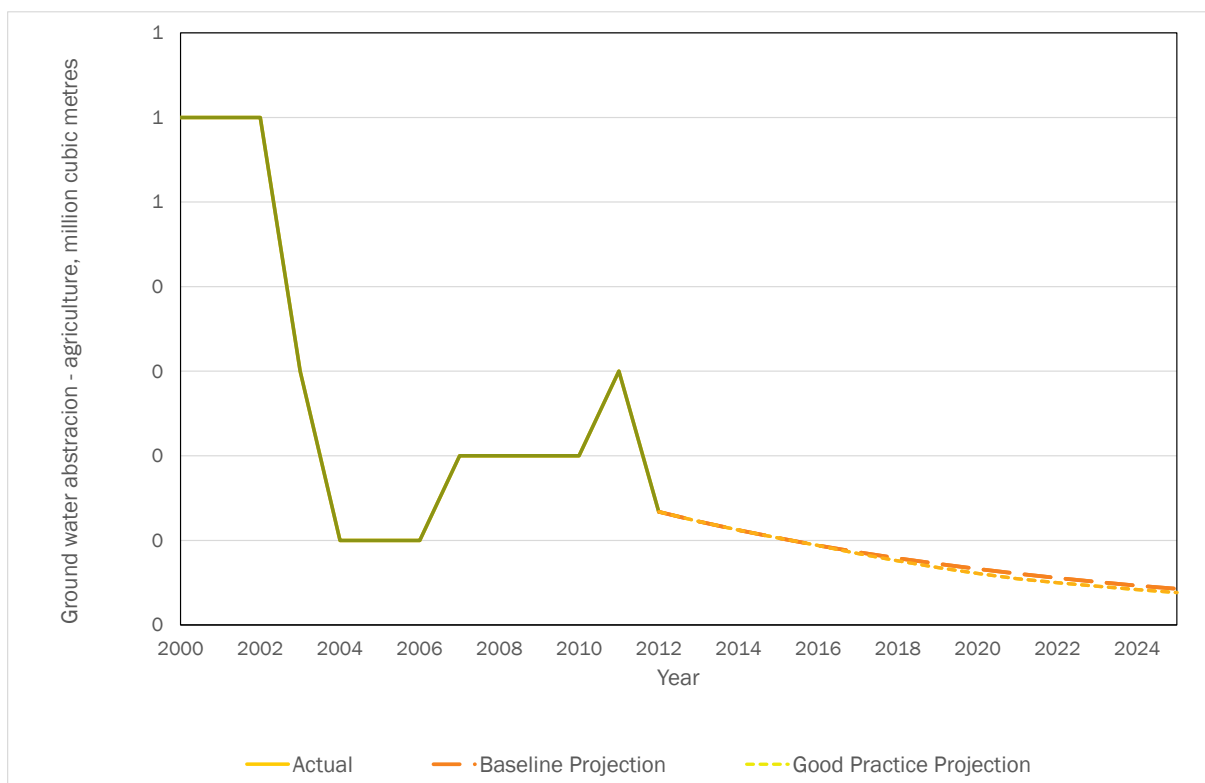


Figure 15-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

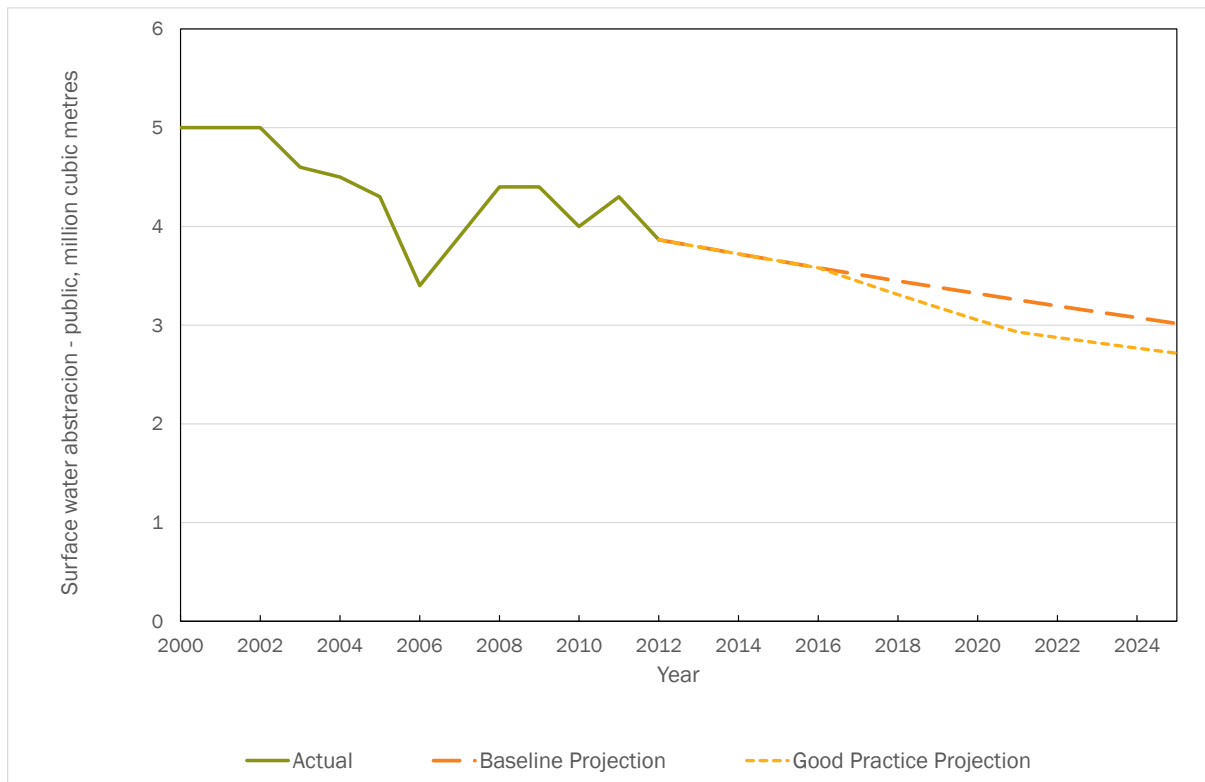


Figure 15-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres



Figure 15-17: Change in Surface Water Abstraction – Agriculture, million cubic metres



Figure 15-18: Change in Active Ingredients in Pesticides, tonnes

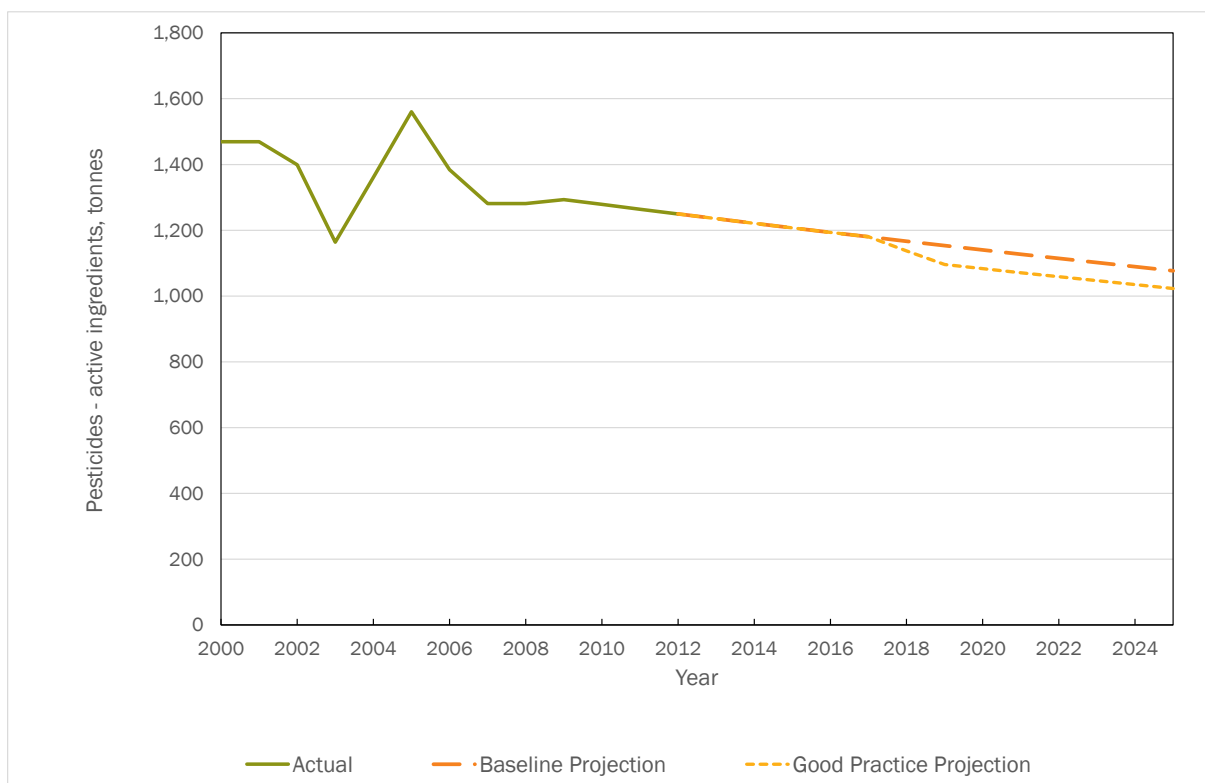


Figure 15-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

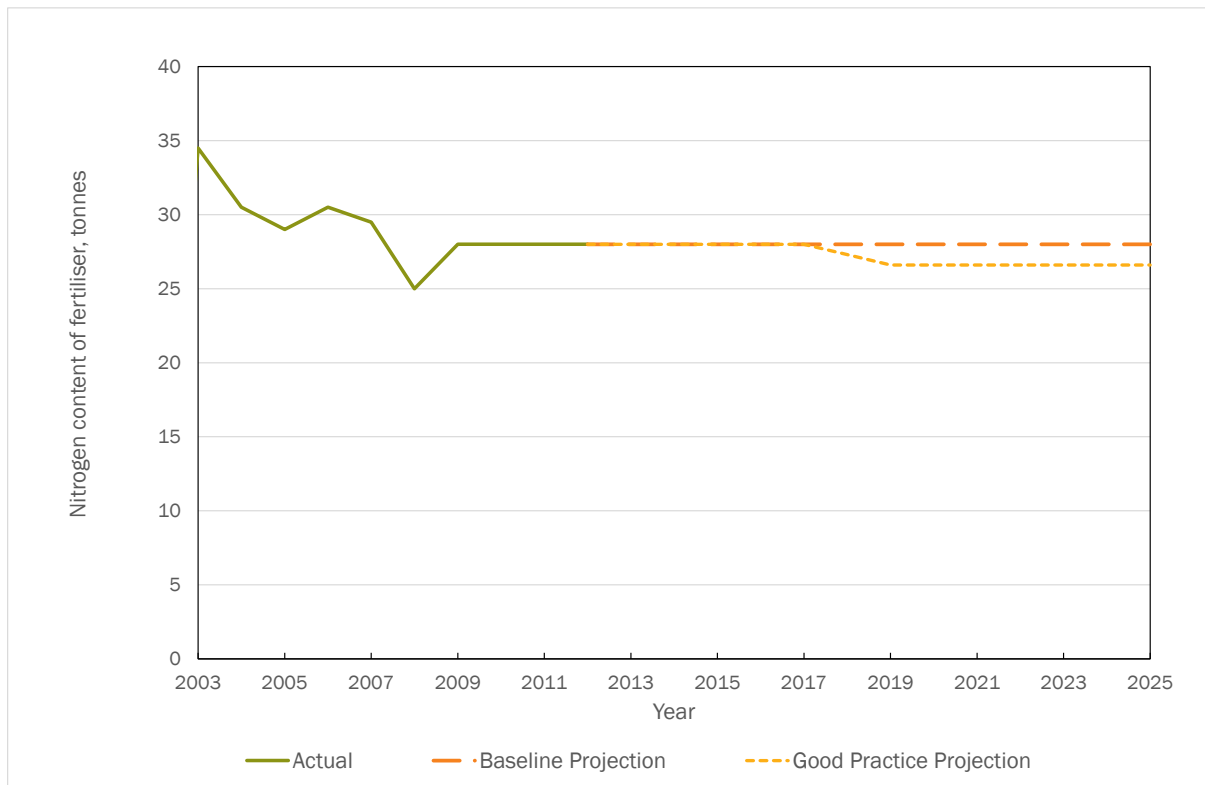


Figure 15-20: Change in Aggregates Extraction, thousand tonnes



Figure 15-21: Change in Paper & Card Packaging Generation, thousand tonnes

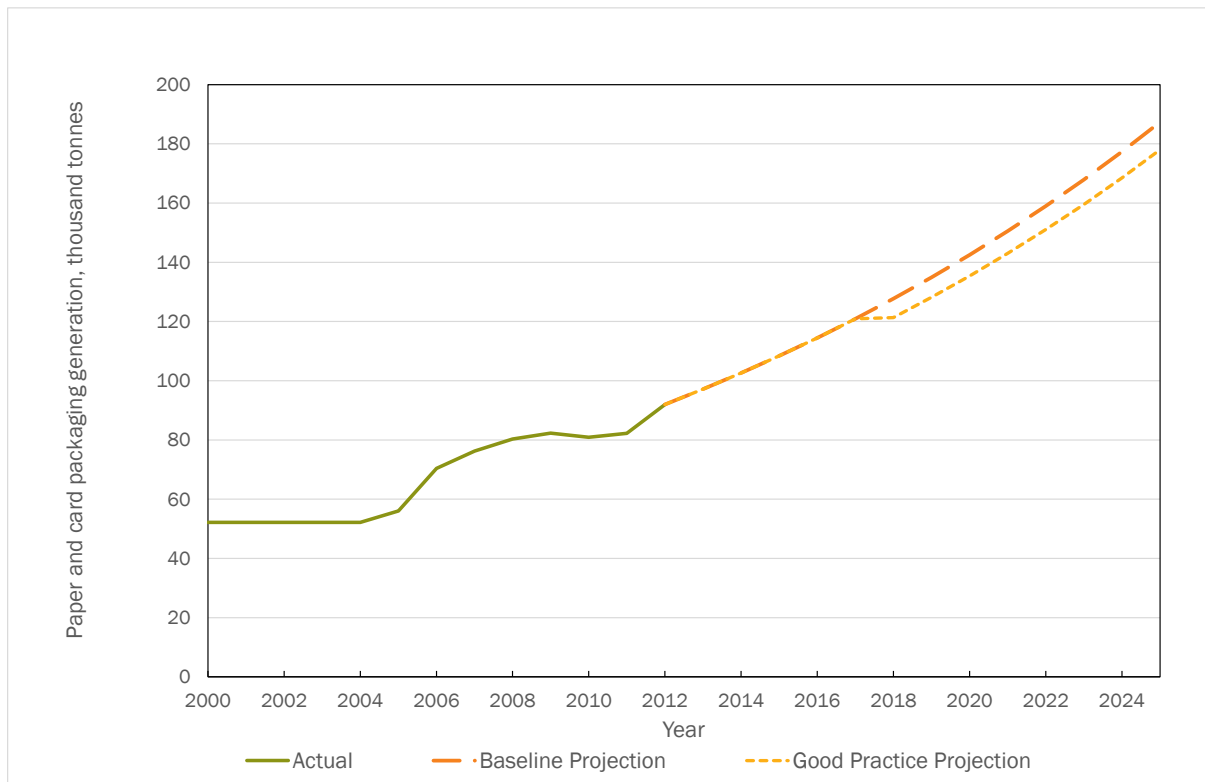


Figure 15-22: Change in Plastic Packaging Generation, thousand tonnes

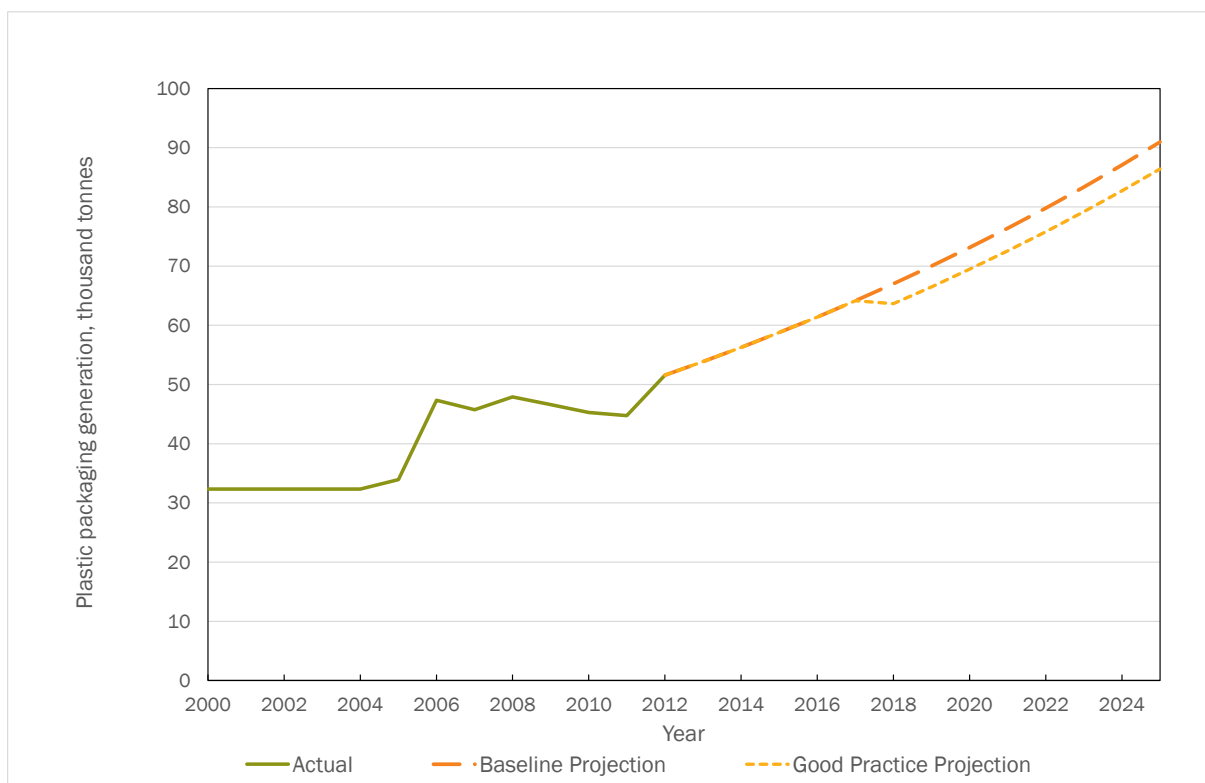


Figure 15-23: Change in Wood Packaging Generation, thousand tonnes



Figure 15-24: Change in Metal Packaging Generation, thousand tonnes

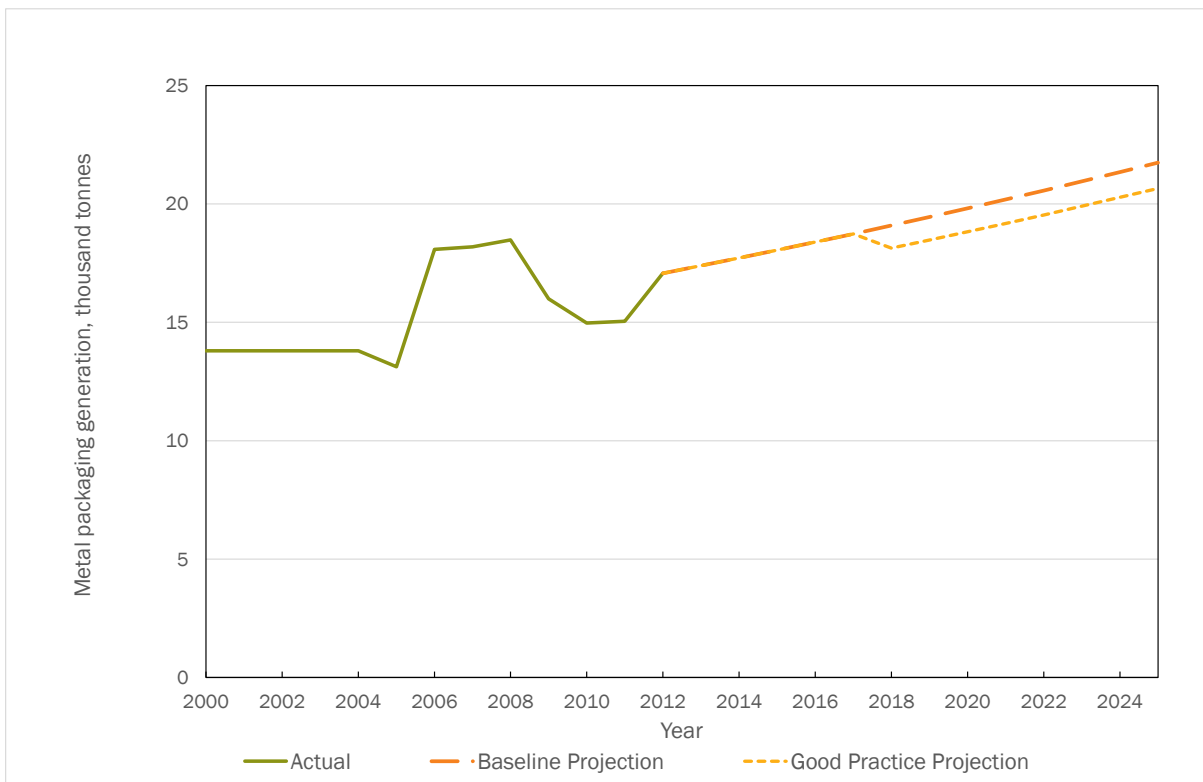


Figure 15-25: Change in Glass Packaging Generation, thousand tonnes

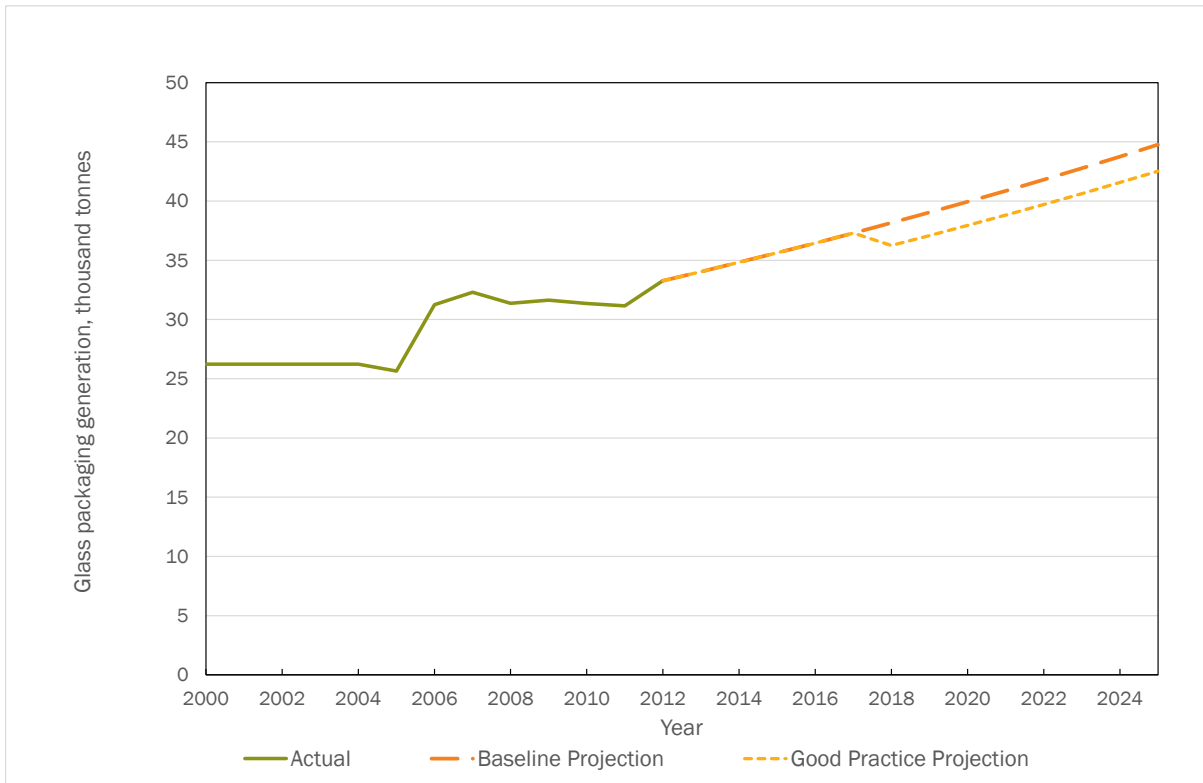
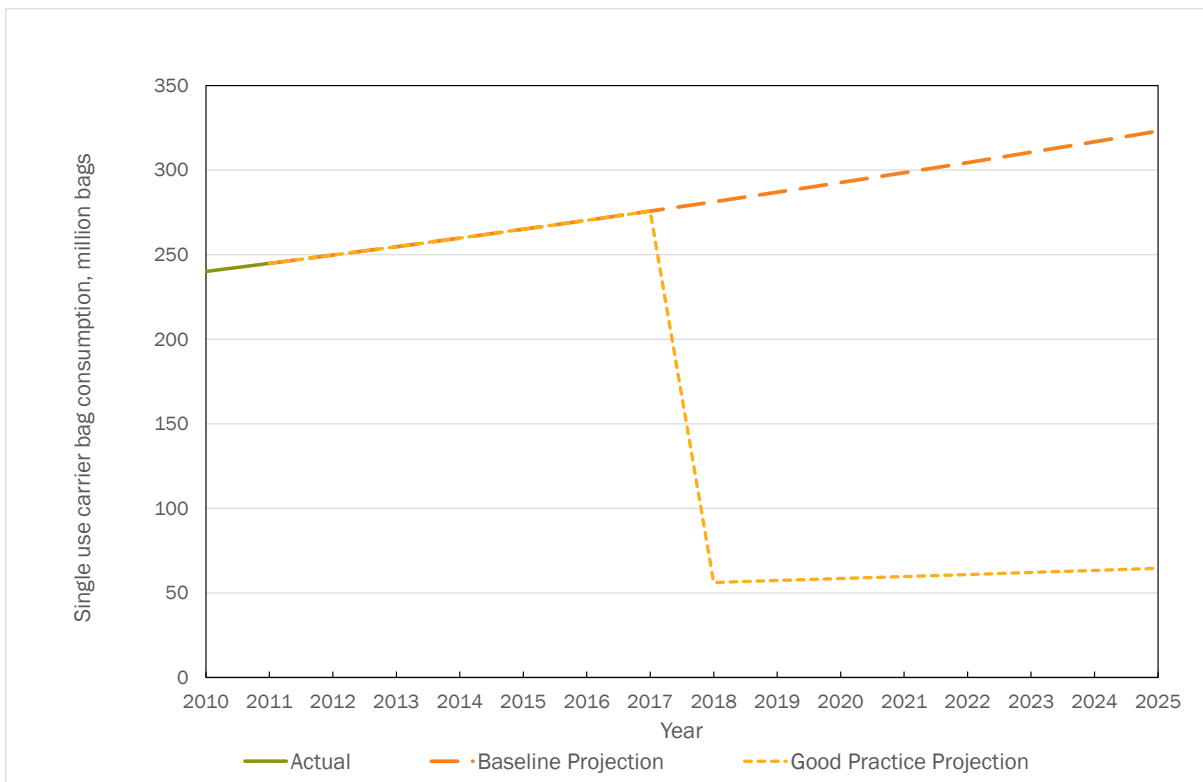


Figure 15-26: Change in Consumption of Single Use Carrier Bags, million bags



15.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 15-10: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	26	52	78	103	129	154	179	179	179
	C&I / Heating	0	0	2	4	6	8	10	12	14	14	14
	Electricity	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Energy, million EUR</i>	0	0	28	56	84	111	139	166	193	193	193
	<i>Sub-total Energy, % GDP</i>	0.0%	0.0%	0.1%	0.2%	0.2%	0.3%	0.4%	0.5%	0.5%	0.5%	0.5%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	0	0	0	0	0	0	0	0	0
	Passenger Aviation Tax	0	0	17	31	30	29	27	26	25	24	23
	Freight Aviation Tax	0	0	0	0	0	0	0	0	0	0	0
	<i>Sub-total Transport, million EUR</i>	0	0	17	31	30	29	28	26	25	24	23
	<i>Sub-total Transport, % GDP</i>	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	5	9	12	15	14	14	14	14	14	14
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	1	1	2	3	3	3	3	3	3	3

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
	Air Pollution Tax	0	3	6	8	10	11	10	10	9	9	8	
	Water Abstraction Tax	0	4	7	11	14	17	16	16	16	15	15	
	Waste Water Tax	0	3	6	8	8	8	8	8	8	8	8	
	Pesticides Tax	0	0	6	11	11	11	11	11	10	10	10	
	Aggregates Tax	0	0	22	18	14	10	9	9	8	7	7	
	Packaging Tax	0	0	9	9	10	10	10	11	11	12	12	
	Single Use Bag Tax	0	22	22	5	5	5	5	5	5	5	5	
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	37	89	84	88	88	86	85	85	84	83	
	Sub-total Pollution & Resource, % GDP	0.0%	0.1%	0.3%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	
Total Revenue Stream	Total, million EUR	0	37	134	171	202	228	252	278	303	301	299	
	Total, % GDP	0.0%	0.1%	0.4%	0.5%	0.6%	0.6%	0.7%	0.8%	0.9%	0.9%	0.8%	

16.0 Spain

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

16.1 Energy Taxes

➤ Motor fuels (refund, full and partial exemptions):

- Energy excise rates for motor fuels are regulated through the Art. 50 of the *Ley 38/1992, de 28 de diciembre, de Impuestos Especiales* (Law 38/1992),⁵⁵⁶ and rates are published by the *Dirección General de Tributos*, which part of the Ministry of Economy⁵⁵⁷. These rates are summarised in Table 16-1.

Table 16-1: Standard Rates of Excise Duties on Fuels and Electricity in Spain

Excise Duty	Unit	Rate Applied in Spain	Existing ETD Minimum	EU-28 Average	EU-28 Median
Transport Fuels					
Leaded Petrol	€ per 1000 litres	€457.79	€421	€585	€583
Unleaded Petrol ¹	€ per 1000 litres	€424.69	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	€331.00	€330	€427	€405
Kerosene	€ per 1000 litres	€330.00	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	€57.47	€125	€209	€180
Natural Gas	€ per GJ	€1.66	€2.60	€3.03	€2.66
Motor Fuels - Industry / Commercial Use					
Gas Oil (Diesel) ²	€ per 1000 litres	€84.71	€21	€221	€163

⁵⁵⁶ Government of Spain (2013), *Ley 38/1992, de 28 de diciembre, de Impuestos Especiales*, Accessed 9th September 2014

⁵⁵⁷ Values found in the Law 38/1992 are slightly different than the values given by DG TAUXUD

Excise Duty	Unit	Rate Applied in Spain	Existing ETD Minimum	EU-28 Average	EU-28 Median
Kerosene	€ per 1000 litres	€330.00	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	€57.47	€41	€126	€125
Natural Gas	€ per GJ	€1.15 – €0.65 ³	€0.30	€1.76	€1.50
Heating – Business Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€84.71	€21	€221	€163
Kerosene	€ per 1000 litres	€78.71	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	€12.00 – €15.00 ⁴	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	€15.00	€0.00	€82	€40
Natural Gas	€ per GJ	€0.65 – €0.15 ⁵	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	€0.65 ⁶	€0.15	€1.27	€0.31
Heating – Non-Business Use					
Gas Oil (Diesel) ¹	€ per 1000 litres	€84.71	€21	€179	€125
Kerosene	€ per 1000 litres	€78.71	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	€15.00	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	€15.00	€0.00	€111	€42
Natural Gas	€ per GJ	€0.65	€0.30	€2.04	€0.94
Coal and Coke	€ per GJ	€0.65	€0.30	€1.77	€0.32
Electricity					
Business Use	€ per MWh	€0.50 ⁷	€0.50	€8.42	€1.03
Non-Business Use	€ per MWh	€1 ⁷	€1.00	€14.53	€2.06
<p>Notes:</p> <ol style="list-style-type: none"> 1. The rate shown is for <98 octane I.O. 2. Diesel intended for electric power production and/or cogeneration of electricity and heat costs €29.15. 3. €0.64 excise rate is applied on natural gas used for stationary motors. 4. €12 excise rate is applied on heavy fuel oil used for electric power production and/or cogeneration of electricity and heat costs (See Council Directive 2003/96/EC). 5. The rate for natural gas and biogas applicable for industrial users is €0.15. 6. The rate for coal used for “professional uses” is €0.15 (following approval of Real Decreto-Ley 9/2013) 7. The rates applied for electricity used for business and non-business use are minimum tax rates. The actual electricity rates applied are higher, for example in the case of electricity used for non-business purposes, tax rates around €9 per MWh are common. 					

Source: DG TAXUD (2014) *Excise Duty Tables (Part II – Energy products and Electricity)*, Situation as at 1st July 2014,
http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- Exemptions from excise duties on motor fuels are applied to:
 - Diplomats and international organisations.
 - Deliveries to foreign armies.
 - Domestic and international navigation fuels (gas oil/diesel and heavy fuel oil) not for leisure activity.
 - Rail fuel (Gas oil/diesel).
 - International and domestic aviation (not for leisure activity).
 - The manufacture and import of coal gas, water gas, producer gas and similar gases (other than petroleum gases and other gaseous hydrocarbons) used for the production of electricity in power plants, power generation and cogeneration of electricity and heat in combined power plants or their own consumption on the premises where it was generated.⁵⁵⁸
- According to estimates from the OECD, the above tax exemptions corresponded to consumer support of €394 million in 2011.⁵⁵⁹
- Since 1996, a reduced excise rate for petroleum products has been applied to LPG, heavy fuel oil and gas oil/diesel used in the agriculture and mining sectors.
- Gas oil/diesel used for farming purposes is taxed at the lower rate of €78.71 per 1,000 litres. Since 2006, a partial refund scheme for gas oil/diesel used in agriculture and livestock is also in place.^{560,561} This action was taken to partially offset the economic effects of increased oil prices on the agricultural sector. According to estimates from the OECD, this support was equivalent to €170 million in 2011.⁵⁶²
- Between 2007 and 2008, fuel tax exemptions were granted to the fisheries sector in order to protect it from rising energy prices. These

⁵⁵⁸ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014,
http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁵⁵⁹ OECD (2013), *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*, OECD Publishing, p. 329.

⁵⁶⁰ OECD (2013), *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*, OECD Publishing, p. 327.

⁵⁶¹ Government of Spain (1992), *Ley 38/1992, de 28 de diciembre, de Impuestos Especiales*, Accessed 9th September 2014, <http://www.boe.es/buscar/act.php?id=BOE-A-2008-20744>

⁵⁶² OECD (2013), *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*, OECD Publishing, p. 327-9.

exemptions are regulated through *Real Decreto 1517/2007* (Royal Decree 785/01) (aids granted to undertakings with fuel consumption in the period 1/11/2004 – 31/10/2005) and temporary measures in 2008.⁵⁶³ Moreover, according to Art. 51, of *Ley 38/1992*, diesel fuel used for fishing purposes continues to be exempt from the excise duties.

- All fuels used for industrial, heating or propellant purposes are subject to the standard VAT rate of 21% (with the exception of the Canary Islands where a differentiated VAT rate is applied).⁵⁶⁴
- According to *Ley 22/2005* (Law 22/2005)⁵⁶⁵, a special rate of €0 per 1,000 litre was applied on biofuels between November 2005 and 1st January 2013. The rate was applied to the volume of biofuels and blends with other products. Since June 2007, *Ley 34/1998* established that fuel suppliers in the country must include certain biofuels and renewable fuels in their overall sales.⁵⁶⁶
- Part of the excise tax on gas oil/diesel and the regional tax is refunded on professional transport sector.⁵⁶⁷
- In 2012, total revenues from electricity, coal and hydrocarbons excise duties (*Impuesto sobre Hidrocarburos, Impuesto sobre la Electricidad and Impuesto sobre el Carbón*) amounted to €11.087 million.⁵⁶⁸ This accounted for 1.08% of Spanish GDP and 3.31% of total tax revenues. The *Impuesto sobre Hidrocarburos* (excise duty on hydrocarbons) alone yielded €9.4 billion in 2012 (equivalent to 0.91% of the GDP).⁵⁶⁹

➤ **Tax on Hydrocarbons (Impuesto sobre Hidrocarburos):**

⁵⁶³ Martini, R. (2012), “Fuel Tax Concessions in the Fisheries Sector” in *OECD Food, Agriculture and Fisheries Papers*, No. 56, OECD Publishing, p. 27.

⁵⁶⁴ OECD/IEA (2014), *Energy Prices and Taxes: Quarterly Statistics (Second Quarter 2014)*, OECD Publishing, p. 250.

⁵⁶⁵ Government of Spain (1992), *Ley 22/2005, de 18 de noviembre, por la que se incorporan al ordenamiento jurídico español diversas directivas comunitarias en materia de fiscalidad de productos energéticos y electricidad y del régimen fiscal común aplicable a las sociedades matrices y filiales de estados miembros diferentes, y se regula el régimen fiscal de las aportaciones transfronterizas a fondos de pensiones en el ámbito de la Unión Europea.*, Accessed 9th September 2014, https://www.boe.es/diario_boe/txt.php?id=BOE-A-2005-19003

⁵⁶⁶ Antón, A.A. (2012), Promotion of biofuels and EU State aid rules: the case of Spain, in Kreiser, L. et al. (ed.) *Green Taxation and Environmental Sustainability*, Northampton: Edward Elgar Publishing Ltd, pp.43-55.

⁵⁶⁷ OECD/IEA (2014), *Energy Prices and Taxes: Quarterly Statistics (Second Quarter 2014)*, OECD Publishing, p. 250.

⁵⁶⁸ European Commission (2014), Taxes in Europe Database, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁵⁶⁹ Agencia Tributaria (2013), 4. Hidrocarburos, p. 23, Accessed 5th September 2014, http://www.agenciatributaria.es/static_files/AEAT/Aduanas/Contenidos_Privados/Impuestos_especiales/Estudio_relativo_2012/4HIDROCARBUROS.docx

- A Tax on hydrocarbons (*Impuesto sobre Hidrocarburos*) is applied in Spain. This tax comprises of rates applied by the state (*Tipo Estatal*) and rates applied by the autonomous communities (*Tipo autonómico*). In total, 58% of revenues obtained from the *Tipo Estatal* are distributed to the autonomous communities, while all the revenues obtained through the *Tipo autonómico* are retained by the autonomous communities.⁵⁷⁰
- The state tax comprises of two different types of rates (the *tipo general* and *tipo especial*). The *Tipo especial*, originally named Tax on the retail sale of certain mineral oils (*Impuesto sobre ventas minoristas de determinados hidrocarburos*) was introduced with the *Ley 24/2001* (Law 24/2001) and has been in place since 2002.⁵⁷¹ Initially, the tax proposed to raise revenues for healthcare services provided by the autonomous communities and for environmental objectives. Following the approval of the *Ley 2/2012* of 29th June, the tax was integrated within the *Impuesto sobre Hidrocarburos* in 2013, under the *Tipo especial*. The 2013 national rates for the *Tipo Especial* are shown in Table 16-2.

Table 16-2: Special Excise Duty as Part of the Hydrocarbon Tax (2013)

Type of Fuel	Rate Applied (€)	Unit
Petrol	24	per 1,000 litres
Gas oil/diesel	24	per 1,000 litres
Gas oil/diesel (special uses)	6	per 1,000 litres
Fuel oil	1	per 1,000 Kg
Kerosene	24	per 1,000 litres

Source: Government of Spain (2014), *Ley 38/1992, de 28 de diciembre, de Impuestos Especiales*, Accessed 9th September 2014, <https://www.boe.es/buscar/act.php?id=BOE-A-1992-28741>

- Within the legislative framework set by *Ley 38/1992*, autonomous communities can choose to put an additional regional excise rate in addition to those set at a national levels. This is done through the *Tipo autonómico* tax. Initially, the *Tipo Autonómico* was called *Impuesto sobre Ventas Minoristas de Determinados Hidrocarburos* (tax on the retail sale of certain hydrocarbons) and it was a separate tax from the *Impuestos sobre los Hidrocarburos* until 2013 when it was inserted into the *Impuesta sobre Hidrocarburos*.

⁵⁷⁰ Economics for Energy (2013), *Impuestos energético-ambientales en España [Informe 2013]*, Accessed URL: http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

⁵⁷¹ Government of Spain (2001), *Ley 24/2001, de 27 de diciembre, de Medidas Fiscales, Administrativas y del Orden Social*, Accessed 3rd September 2014, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2001-24965

- The autonomous communities are allowed to impose maximum rates for petrol (up to €48 per 1,000l), diesel (up to €48 per 1000l), fuel oil (up to €12 per 1,000l); kerosene (up to €48 per 1,000l) and biodiesel used as transportation fuel (€48 per 1,000l) or combustion (up to €12 per 1,000l). Table 16-3 shows tax rates applied by the autonomous communities (rates as of January 2014).⁵⁷²
- The Regions of Aragon, Navarra, La Rioja and Basque countries do not apply the *Tipo autonómico* tax, while Madrid and Cantabria have introduced rather low rates. Most of the rates were increased between 2012 and 2014, with exceptions being Cantabria, Andalusia and Navarra.^{573,574}

Table 16-3: Tax Rates on Hydrocarbons Applied by the Autonomous Communities (*Tipo Autonómico*)(2014)

Type of Fuel	Autonomous Community	Rate Applied (€)	Unit	Range
Petrol	Andalusia	48	1,000 litres	0-48 € per 1000litres
	Aragon	0		
	Asturias	48		
	Balearic Islands	48		
	Cantabria	24		
	Castilla and Leon	48		
	Castilla-La Mancha	48		
	Catalonia	48		
	Extremadura	48		
	Galicia	48		
	Madrid	17		
	Murcia	48		
	Navarra	0		
	Basque Countries	0		
La Rioja	0			
Valencian Community	48			

⁵⁷² Agencia Tributaria (2014), 10. ANEXOS, Accessed 3rd September 2014, http://www.agenciatributaria.es/static_files/AEAT/Aduanas/Contenidos_Privados/Impuestos_especiales/Estudio_relativo_2012/10ANEXOS.docx

⁵⁷³ Agencia Tributaria (2014), 10. ANEXOS, Accessed 3rd September 2014, http://www.agenciatributaria.es/static_files/AEAT/Aduanas/Contenidos_Privados/Impuestos_especiales/Estudio_relativo_2012/10ANEXOS.docx

⁵⁷⁴ Please also note that the autonomous community of Navarra has not decided to remove the supplementary tax rate and just leave the national charge.

Type of Fuel	Autonomous Community	Rate Applied (€)	Unit	Range
Diesel (Transportation)	Andalusia	48	1,000 litres	0-48 € per 1000litres
	Aragon	0		
	Asturias	40		
	Balearic Islands	48		
	Cantabria	24		
	Castilla and Leon	48		
	Castilla-La Mancha	48		
	Catalonia	48		
	Extremadura	48		
	Galicia	48		
	Madrid	17		
	Murcia	48		
	Navarra	0		
	Basque Countries	0		
	La Rioja	0		
Valencian Community	48			
Diesel (Non transportation)	Andalusia	48	1,000 litres	0-48 € per 1,000litres
	Aragon	0		
	Asturias	40		
	Balearic Islands	48		
	Cantabria	24		
	Castilla and Leon	48		
	Castilla-La Mancha	48		
	Catalonia	48		
	Extremadura	48		
	Galicia	48		
	Madrid	17		
	Murcia	48		
	Navarra	0		
	Basque Countries	0		
	La Rioja	0		
Valencian Community	48			
Diesel (Special Purposes)	Andalusia	0	1,000 litres	0-12 € per 1,000litres
	Aragon	0		
	Asturias	6		
	Balearic Islands	12		
	Cantabria	0		
	Castilla and Leon	0		
	Castilla-La Mancha	4		
	Catalonia	6		
	Extremadura	0		
	Galicia	0		
	Madrid	4,25		
	Murcia	6		
	Navarra	0		
	Basque Countries	0		
	La Rioja	0		
Valencian Community	0			

Type of Fuel	Autonomous Community	Rate Applied (€)	Unit	Range
Fuel oil	Andalusia	2	1,000 kg	0-2 € per 1,000 kg
	Aragon	0		
	Asturias	2		
	Balearic Islands	2		
	Cantabria	1		
	Castilla and Leon	2		
	Castilla-La Mancha	2		
	Catalonia	2		
	Extremadura	2		
	Galicia	2		
	Madrid	0,7		
	Murcia	2		
	Navarra	0		
	Basque Countries	0		
La Rioja	0			
Valencian Community	2			
Kerosene	Andalusia	48	1,000 litres	0-48 € per 1,000litres
	Aragon	0		
	Asturias	48		
	Balearic Islands	48		
	Cantabria	24		
	Castilla and Leon	48		
	Castilla-La Mancha	48		
	Catalonia	48		
	Extremadura	48		
	Galicia	48		
	Madrid	17		
	Murcia	48		
	Navarra	0		
	Basque Countries	0		
La Rioja	0			
Valencian Community	48			
Biodiesel, Biomethane and Biodiesel (Fuel)	Andalusia	48	1,000 litres	0-48 € per 1,000litres
	Aragon	0		
	Asturias	48		
	Balearic Islands	48		
	Cantabria	24		
	Castilla and Leon	0		
	Castilla-La Mancha	48		
	Catalonia	48		
	Extremadura	48		
	Galicia	48		
	Madrid	17		
	Murcia	48		
	Navarra	0		
	Basque Countries	0		
La Rioja	0			
Valencian Community	48			

Type of Fuel	Autonomous Community	Rate Applied (€)	Unit	Range
Biodiesel, Biomethane and Biodiesel (Other uses)	Andalusia	0	1,000 litres	0-12 € per 1,000litres
	Aragon	0		
	Asturias	6		
	Balearic Islands	12		
	Cantabria	0		
	Castilla and Leon	0		
	Castilla-La Mancha	4		
	Catalonia	6		
	Extremadura	0		
	Galicia	0		
	Madrid	4,25		
	Murcia	6		
	Navarra	0		
	Basque Countries	0		
La Rioja	0			
Valencian Community	0			

Sources: Agencia Tributaria (2013), *Impuestos especiales - Estudio relativo al año 2012 - ANEXOS*, Accessed 4th September 2014, www.agenciatributaria.es/static_files/AEAT/Aduanas/Contenidos_Privados/Impuestos_especiales/Estudio_relativo_2012/10ANEXOS.docx; and Economics for Energy (2013), *Impuestos energético-ambientales en España [Informe 2013]*, Accessed URL: http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

- Exemptions are granted for fuels used in the production of electricity, co-generation and heat and for the construction and maintenance of aircraft or vessels. Moreover, fuels used for international aviation and navigation (not for leisure) and within the framework of diplomatic relationships are also exempt.⁵⁷⁵
- The Canary Islands, Ceuta and Melilla are exempt from the tax, however the local governments of Ceuta and Melilla apply a local tax on the same products as the national tax.⁵⁷⁶
- The *Impuesto sobre Hidrocarburos* yielded €9.933 million (equivalent to 0.96% of GDP) in 2013.⁵⁷⁷

➤ Electricity:

- A fee on the use of continental waters for the production of electricity (*Canon por utilización de las aguas continentales para la producción de energía eléctrica*) was introduced in Spain in 2013. Following the approval

⁵⁷⁵ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁵⁷⁶ OECD and EEA (2014), *Database on instruments used for environmental policy*, Accessed 3rd September 2014, http://www2.oecd.org/eoicinst/queries/All_Information.aspx

⁵⁷⁷ Agencia Tributaria (2013), 9. *Impuesto sobre las ventas minoristas de determinados hidrocarburos*, p. 13, Accessed 3rd September 2014, http://www.agenciatributaria.es/static_files/AEAT/Aduanas/Contenidos_Privados/Impuestos_especiales/Estudio_relativo_2012/9VENTASMINORISTAS.docx

of Ley 15/2012 de 27 de Diciembre (Law 15/2012 of 27 December),⁵⁷⁸ a levy equivalent to 22% on the value of electricity generated by hydroelectric plants is applied on the value on the use of inland waters. Revenues from this tax are invested to protect and reinforce water infrastructure in Spain.

- According to Art. 112 bis of Ley 15/2012, hydroelectric installations with power output equal or less than 50MW enjoy a reduction of 90% on this tax.⁵⁷⁹
- Expected revenues for this tax in 2013 were estimated to be €298 million, equivalent to 0.02% of GDP.^{580,581}
- An *Impuesto especial sobre la electricidad* (Special Tax on Electricity) has been levied following approval of the Ley 66/1997 (Law 66/1997)⁵⁸² and it is regulated through the Ley 38/1992 of 28th December.
- The tax was originally introduced to “compensate” fiscal transfers to coal mines and is now applied to the production or import of electricity. The tax has been revised over the years and is currently calculated based on the following formula:⁵⁸³

$$4,864 \times (\text{contracted power} + \text{power consumed}) \times 1,05113$$

- Exemptions are granted for electricity delivered in the framework of diplomatic relations or international organisations; for consumption in third countries in the framework of international agreements, international aviation and navigation.⁵⁸⁴

⁵⁷⁸ Government of Spain (2012), *Ley 15/2012, de 27 de diciembre, de medidas fiscales para la sostenibilidad energética*, Accessed 19th September 2014, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2012-15649

⁵⁷⁹ Government of Spain (2012), *Ley 15/2012, de 27 de diciembre, de medidas fiscales para la sostenibilidad energética*, Accessed 19th September 2014, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2012-15649

⁵⁸⁰ Economics for Energy (2013), *Impuestos energético-ambientales en España* [Informe 2013], Accessed 23rd September 2014, http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

⁵⁸¹ Agencia Tributaria (2014), *Informe Anual de Recaudacion Tributaria: AÑO 2013*, Accessed 24th September 2014, http://www.agenciatributaria.es/static_files/AEAT/Estudios/Estadisticas/Informes_Estadisticos/Informes_Anuales_de_Recaudacion_Tributaria/Ejercicio_2013/IART_13.pdf

⁵⁸² Government of Spain (1997), *Ley 66/1997, de 30 de diciembre, de Medidas Fiscales, Administrativas y del Orden Social* (Law 66/1997), Accessed 3rd September 2014, https://www.boe.es/diario_boe/txt.php?id=BOE-A-1997-28053

⁵⁸³ Agencia Tributaria (2013), 6. *IMPUESTO SOBRE LA ELECTRICIDAD*, p. 18, Accessed 3rd September 2014, http://www.agenciatributaria.es/static_files/AEAT/Aduanas/Contenidos_Privados/Impuestos_especiales/Estudio_relativo_2012/6ELECTRICIDAD.docx

⁵⁸⁴ European Commission (2014), *Taxes in Europe Database*, Accessed 9th September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

- In 2012, the tax generated revenues of €1.6 billion, equivalent to 0.15% of Spanish GDP.⁵⁸⁵
- Since 2013, Spain has implemented taxes on the production of electric energy, the production of radioactive fuel and on the storage of radioactive waste. These taxes are regulated under *Ley 15/2012* (Law 15/2012)⁵⁸⁶:
- A 7% charge on the value of production of electric energy has been applied to power generators since January 2013. No data was found on the revenues generated from this charge. Exemptions are granted to facilities producing electricity for self-consumption, manufacturers and imports of electricity for self-consumption, manufacture, imports or intra-EU acquisition of electricity for use in chemical reduction and electrolytic processes, mineralogical and metallurgical processes.⁵⁸⁷
- A tax on the production of radioactive waste (*producción combustible nuclear gastado*) is levied on the production of used nuclear fuel and radioactive waste from nuclear power generation. The tax rate for nuclear fuel is calculated according to the kilograms of heavy metal content (uranium and plutonium) in the nuclear fuel produced in a given tax year and according to the amount of nuclear fuel extracted from the reactor. The tax rate on radioactive waste is calculated on the cubic meters of intermediate, low and very low radioactive level waste temporarily stored in the power plant.⁵⁸⁸ The rates are shown in Table 16-4. No data was found on revenues from this tax.

Table 16-4: Tax Rates Applied on Production of Radioactive Waste

Type of Waste	Tax rate (€)	Unit
Uranium and Plutonium	2.190	kg
Low – Intermediate waste	6.000	m ³
Low	1.000	m ³

Source: Agencia Tributaria (2013), 6. *Impuesto Sobre La Electricidad*, Accessed 3rd September 2014, www.agenciatributaria.es/AEAT.internet/Inicio_es_ES/La_Agencia_Tributaria/Memorias_y_estadisticas_tr

⁵⁸⁵ Agencia Tributaria (2013), 6. *IMPUESTO SOBRE LA ELECTRICIDAD*, p. 18, Accessed 3rd September 2014, http://www.agenciatributaria.es/static_files/AEAT/Aduanas/Contenidos_Privados/Impuestos_especiales/Estudio_relativo_2012/6ELECTRICIDAD.docx

⁵⁸⁶ Government of Spain (2012), *Ley 15/2012, de 27 de diciembre, de medidas fiscales para la sostenibilidad energética* (Law 15/2012), Accessed 3rd September 2014, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2012-15649

⁵⁸⁷ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁵⁸⁸ Government of Spain (2012), *Ley 15/2012, de 27 de diciembre, de medidas fiscales para la sostenibilidad energética* (Law 15/2012), Accessed 3rd September 2014, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2012-15649

- The tax on the storage of radioactive waste (*almacenamiento combustible nuclear gastado*) is in place to address the cost linked to the centralized warehousing of radioactive waste. The tax is calculated according to the difference in weight of heavy metal content in nuclear fuel stored between the beginning and the end of a tax year and on the volume of radioactive waste produced. The rates are shown in Table 16-5. No data was found on revenues from this specific tax.

Table 16-5: Tax Rates Applies on Storage of Radioactive Waste

Type of Waste	Tax Rate (€)	Unit
Heavy metal content	70	kg
High radioactive level waste	30,000	m ³
Low – Intermediate radioactive level waste	10,000	m ³
Very low radioactive level waste	2,000	m ³

Source: European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

- The above three taxes yielded €1.570 million in 2013, equivalent to 0.15% of Spanish GDP.⁵⁸⁹
- **Coal and coke:**
- A special excise duty on coal (*Impuesto especial sobre el carbon*) has been in place in Spain since 2005, following the introduction of the *Ley 22/2005* of 18th November).⁵⁹⁰ The excise duty was introduced following the transposition of the EU Energy Taxation Directive (2003/96/EC) and aims to tax the extraction, production and consumption of coal in Spain. The tax is calculated on the energetic value of the product (GJ).⁵⁹¹

⁵⁸⁹ Agencia Tributaria (2014), *Informe Anual de Recaudacion Tributaria: AÑO 2013*, Accessed 24th September 2014, http://www.agenciatributaria.es/static_files/AEAT/Estudios/Estadisticas/Informes_Estadisticos/Informes_Anuales_de_Recaudacion_Tributaria/Ejercicio_2013/IART_13.pdf

⁵⁹⁰ Government of Spain (2005), *Ley 22/2005, de 18 de noviembre, por la que se incorporan al ordenamiento jurídico español diversas directivas comunitarias en materia de fiscalidad de productos energéticos y electricidad y del régimen fiscal común aplicable a las sociedades matrices y filiales de estados miembros diferentes, y se regula el régimen fiscal de las aportaciones transfronterizas a fondos de pensiones en el ámbito de la Unión Europea*, Accessed 19th September 2014, <http://www.boe.es/buscar/doc.php?id=BOE-A-2005-19003>

⁵⁹¹ Economics for Energy (2013), *Impuestos energético-ambientales en España [Informe 2013]*, Accessed URL: http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

- For professional uses (exception made for electricity production and cogeneration) the rate is €0.15 per GJ, while coal consumed for other uses is taxed at €0.65 per GJ.
- Coal and Coke used for power generation and cogeneration of electricity and heat, for electrolytic and metallurgical processes, mineralogical processes and as a fuel for domestic consumption and any other use that does not involve combustion are exempt from this excise duty.⁵⁹²
- According to data provided by the *Agencia Tributaria*, the tax on carbon yielded €148 million in 2013, equivalent to 0.014% of Spanish GDP.⁵⁹³

16.2 Transport Taxes (Excluding Transport Fuels)

➤ Vehicle registration tax (Impuesto Especial sobre Determinados Medios de Transporte):⁵⁹⁴

- A tax on certain means of transport has been in place since January 1993, following approval of *Ley 38/1992* (Law 34/1992) and *Real Decreto 1165/1995* (Royal Decree No 1165/1995 on the regulation of excise duties).⁵⁹⁵
- The tax covers the registration of small vessels and boats for pleasure and or water sports (with a total length of seven and half meters), mechanically powered aircrafts and self-propelled vehicles powered by an engine.
- The amount of the tax varies according to different criteria. In case of a used product, the tax is calculated according to the market value and CO₂ emissions per kilometre. For motorcycles and quads, the tax is also differentiated to take into account overall engine power.⁵⁹⁶
- A full exemption is granted for cars and vehicles registered for use by handicapped people and a 50% reduction for cars used by large families.

⁵⁹² European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁵⁹³ Agencia Tributaria (2014), *Informe Anual de Recaudacion Tributaria: AÑO 2013*, Accessed 24 September 2014, http://www.agenciatributaria.es/static_files/AEAT/Estudios/Estadisticas/Informes_Estadisticos/Informes_Anuales_de_Recaudacion_Tributaria/Ejercicio_2013/IART_13.pdf

⁵⁹⁴ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁵⁹⁵ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁵⁹⁶ Agencia Tributaria (2014), *Impuesto especial sobre determinados medios de transporte*, Accessed 2nd September 2014, http://www.agenciatributaria.es/AEAT/Contenidos_Comunes/La_Agencia_Tributaria/Modelos_y_formularios/Declaraciones/Modelos_500_al_599/576/Instrucciones/instr_mod576.pdf

- General tax rates applied at the national level on different categories of vehicles are shown Table 16-6.⁵⁹⁷ Please also note that different rates are applied to motorcycles. Motorcycles with engine power equal or above 74 kW (100 cv) are subject to rates calculated according to CO₂ emissions.

Table 16-6: Special Vehicle Tax Rates Applied at the National Level

Category (Epigraph)	Type of Vehicle	CO ₂ Emissions (g per km)	Special Tax Rate Applied
1a	All vehicles (except quads and motorcycles)	≤ 120	0%
1b	Single engine without internal combustion (except quads)	0	
6	Motorcycles (with engine power ≥ 74 kW)	≤ 100	
2	All vehicles (except quads and motorcycles)	between 120 - 160	4,75%
7	Motorcycles (with engine power ≥ 74 kW)	between 100 - 120	
3	All vehicles (except quads and motorcycles)	between 160 - 200	9,75%
8	Motorcycles (with engine power ≥ 74 kW)	between 120 - 140	
4a	All vehicles (except quads and motorcycles)	≥ 200	14,75%
4b	All vehicles (except quads and motorcycles)	when no data is available	
4c	Motor homes	n/a	
4d	Quads		
4e	Jet Skis		
9a	Motorcycles (with engine power ≥ 74 kW)	≥ 140	
9c	Motorcycles (with engine power ≥ 74 kW)	when no data is available	

⁵⁹⁷ Agencia Tributaria (2013), *Impuestos especiales - Estudio relativo al año 2012*, Accessed 3rd September 2014,

http://www.agenciatributaria.es/AEAT.internet/Inicio_es_ES/La_Agencia_Tributaria/Memorias_y_estadisticas_tributarias/Estadisticas/Estadisticas_por_impuesto/Impuestos_especiales/Estudio_relativo_al_ano_2012/Estudio_relativo_al_ano_2012.shtml

Category (Epigraph)	Type of Vehicle	CO ₂ Emissions (g per km)	Special Tax Rate Applied
5b	Vessels and Leisure/Sport boats	n/a	12%
5c	Airplanes		
5a	Other (Not listed above)		

Sources: Government of Spain (2013), *Ley 38/1992, de 28 de diciembre, de Impuestos Especiales*, Accessed 9th September 2014, http://noticias.juridicas.com/base_datos/Fiscal/I38-1992.html; and Economics for Energy (2013), *Impuestos energético-ambientales en España [Informe 2013]*, Accessed 9th September 2014, http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

- The rates mentioned above are generally applied “by default” at national level if the autonomous communities do not take any action to increase them. However, autonomous communities are entitled to set local rates up to 15% higher than the national ones under the provisions laid down by Art. 51 of *Ley 22/2009 (Law 22/2009)*.⁵⁹⁸
- According to Art. 70 (par. b and c) of *Ley 38/1992*, Canary Island and Ceuta y Melilla (in particular the cities of Ceuta and Melilla⁵⁹⁹ are entitled to apply different tax rates than the rest of the regions.⁶⁰⁰
- Table 16-7 shows the rates applied for the autonomous communities which apply different tax rates for certain types of vehicles: Andalusia, Asturias, Balearic Islands, Canary Islands, Cantabria, Catalonia, Ceuta y Melilla and Extremadura:

Table 16-7: Special vehicle tax rates applied in the autonomous communities

Category (Epigraph)	Autonomous Community	Type of Vehicle	CO ₂ Emissions (g per km)	Special Tax Rate
4a	Andalucía	All vehicles (except quads and motorcycles)	≥ 200	16,90%

⁵⁹⁸ Government of Spain (2009), *Ley 22/2009, de 18 de diciembre, por la que se regula el sistema de financiación de las Comunidades Autónomas de régimen común y Ciudades con Estatuto de Autonomía y se modifican determinadas normas tributarias*, Accessed 22nd September 2014, http://noticias.juridicas.com/base_datos/Fiscal/I22-2009.t3.html#a51

⁵⁹⁹ Agencia Tributaria (2014), *Impuesto especial sobre determinados medios de transporte*, Accessed 2nd September 2014, http://www.agenciatributaria.es/AEAT/Contenidos_Comunes/La_Agencia_Tributaria/Modelos_y_formularios/Declaraciones/Modelos_500_al_599/576/Instrucciones/instr_mod576.pdf

⁶⁰⁰ Government of Spain (2013), *Ley 38/1992, de 28 de diciembre, de Impuestos Especiales*, Accessed 9th September 2014: http://noticias.juridicas.com/base_datos/Fiscal/I38-1992.html

Category (Epigraphe)	Autonomous Community	Type of Vehicle	CO2 Emissions (g per km)	Special Tax Rate	
4b		All vehicles (except quads and motorcycles)	when no data is available		
4c		Motor homes	n/a		
4d		Quads			
4e		Jet Skis			
9a		Motorcycles (with engine power ≥ 74 kW)	≥ 140		
9c		Motorcycles (with engine power ≥ 74 kW)	when no data is available		
5b		Vessels and Leisure/Sport boats	n/a		13,80%
5c		Airplanes			
5a		Other (Not listed above)			
4a	Asturias	All vehicles (except quads and motorcycles)	≥ 200	16%	
4b		All vehicles (except quads and motorcycles)	when no data is available		
4c		Motor homes	n/a		
4d		Quads			
4e		Jet Skis			
9a		Motorcycles (with engine power ≥ 74 kW)	≥ 140		
9c		Motorcycles (with engine power ≥ 74 kW)	when no data is available		
4a	Balearic Islands	All vehicles (except quads and motorcycles)	≥ 200	16%	
4b		All vehicles (except quads and motorcycles)	when no data is available		
4c		Motor homes	n/a		
4d		Quads			
4e		Jet Skis			

Category (Epigraphe)	Autonomous Community	Type of Vehicle	CO2 Emissions (g per km)	Special Tax Rate
1a	Canary Islands	All vehicles (except quads and motorcycles)	≤ 120	0%
1b		Single engine without internal combustion (except quads)	0	
6		Motorcycles (with engine power ≥ 74 kW)	≤ 100	
2		All vehicles (except quads and motorcycles)	between 120 - 160	3,75%
7		Motorcycles (with engine power ≥ 74 kW)	between 100 - 120	
3		All vehicles (except quads and motorcycles)	between 160 - 200	8,75%
8		Motorcycles (with engine power ≥ 74 kW)	between 120 - 140	
4a		All vehicles (except quads and motorcycles)	≥ 200	13,75%
4b		All vehicles (except quads and motorcycles)	when no data is available	
4c		Motor homes		
4d		Quads	n/a	
4e		Jet Skis		
9a		Motorcycles (with engine power ≥ 74 kW)	≥ 140	
9c		Motorcycles (with engine power ≥ 74 kW)	when no data is available	
5b		Vessels and Leisure/Sport boats	n/a	11%
5c		Airplanes		
5a	Other (Not listed above)			
3	Cantabria	All vehicles (except quads and motorcycles)	between 160 - 200	11%
4a		All vehicles (except quads and motorcycles)	≥ 200	16%

Category (Epigraphe)	Autonomous Community	Type of Vehicle	CO2 Emissions (g per km)	Special Tax Rate	
4b		All vehicles (except quads and motorcycles)	when no data is available		
4c		Motor homes	n/a		
4d		Quads			
4e		Jet Skis			
9a		Motorcycles (with engine power ≥ 74 kW)			≥ 140
9c		Motorcycles (with engine power ≥ 74 kW)	when no data is available		
5b		Vessels and Leisure/Sport boats	n/a		13%
5c		Airplanes			
5a		Other (Not listed above)			
4a	Catalonia	All vehicles (except quads and motorcycles)	≥ 200	16%	
4b		All vehicles (except quads and motorcycles)	when no data is available		
4c		Motor homes	n/a		
4d		Quads			
4e		Jet Skis			
9a		Motorcycles (with engine power ≥ 74 kW)	≥ 140		
9c		Motorcycles (with engine power ≥ 74 kW)	when no data is available		
1a	Ceuta y Melilla	All vehicles (except quads and motorcycles)	≤ 120	0%	
1b		Single engine without internal combustion (except quads)	0		
6		Motorcycles (with engine power ≥ 74 kW)	≤ 100		
2		All vehicles (except quads and motorcycles)	between 120 - 160		

Category (Epigraphe)	Autonomous Community	Type of Vehicle	CO2 Emissions (g per km)	Special Tax Rate		
7		Motorcycles (with engine power ≥ 74 kW)	between 100 - 120			
3		All vehicles (except quads and motorcycles)	between 160 - 200			
8		Motorcycles (with engine power ≥ 74 kW)	between 120 - 140			
4a		All vehicles (except quads and motorcycles)	≥ 200			
4b		All vehicles (except quads and motorcycles)	when no data is available			
4c		Motor homes				
4d		Quads	n/a			
4e		Jet Skis				
9a		Motorcycles (with engine power ≥ 74 kW)	≥ 140			
9c		Motorcycles (with engine power ≥ 74 kW)	when no data is available			
5b		Vessels and Leisure/Sport boats				
5c		Airplanes	n/a			
5a		Other (Not listed above)				
2		Extremadura	All vehicles (except quads and motorcycles)		between 120 - 160	5,20%
7			Motorcycles (with engine power ≥ 74 kW)		between 100 - 120	
3	All vehicles (except quads and motorcycles)		between 160 - 200	11%		
8	Motorcycles (with engine power ≥ 74 kW)		between 120 - 140			
4a	All vehicles (except quads and motorcycles)		≥ 200	16%		
4b	All vehicles (except quads and motorcycles)		when no data is available			

Category (Epigraphe)	Autonomous Community	Type of Vehicle	CO2 Emissions (g per km)	Special Tax Rate
4c		Motor homes	n/a	
4d		Quads		
4e		Jet Skis		
9a		Motorcycles (with engine power ≥ 74 kW)	≥ 140	
9c		Motorcycles (with engine power ≥ 74 kW)	when no data is available	
5b		Vessels and Leisure/Sport boats	n/a	
5c		Airplanes		
5a		Other (Not listed above)		

Source: Agencia Tributaria (2013), *Impuestos especiales - Estudio relativo al año 2012 - ANEXOS*, Accessed 4th September 2014, www.agenciatributaria.es/static_files/AEAT/Aduanas/Contenidos_Privados/Impuestos_especial/es/Estudio_relativo_2012/10ANEXOS.docx

- In 2012, total revenues from the tax amounted to €339million, equivalent to 0.32% of GDP.⁶⁰¹ The tax is collected by the *Agencia Tributaria* (Spanish State Tax Agency).

➤ **Vehicle circulation tax (Impuesto sobre los Vehículos de Tracción Mecánica):**

- A tax on “mechanically powered vehicles” has been in place since November 1988, initially under the Municipal Road Tax (*Impuesto municipal sobre circulación de vehículos*) and now under Royal Legislative Decree No 2/2004 of 5 March.⁶⁰²
- The tax applies to the whole Spanish territory and is aimed at all vehicle owners. The tax is municipal but it is regulated at national level. All classes and categories of mechanically powered vehicles which are suitable for use on public highways or roads are subject to the tax. The tax lasts for one year and it is paid each first day of the year.

⁶⁰¹ Economics for Energy (2013), *Impuestos energético-ambientales en España [Informe 2013]*, Accessed 9th September 2014, http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

⁶⁰² European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

- Exemptions are provided for vehicles used by disabled people, diplomatic vehicles, tractors, agricultural machines, buses and coaches used for public transportation. Moreover, according to Art. 95 of the *Real Decreto 2/2004* (Royal Decree 2/2004) local governments may provide an exemption from the tax of 75% for low-polluting cars or a full exemption for vehicles older than 25 years.⁶⁰³
- The tax rate is calculated according to the engine rating, type of vehicle and weight (for certain vehicles). National Rates are set through Art. 95 of the *Real Decreto Legislativo 2/2004*⁶⁰⁴ (see Table 16-8) and the autonomous communities are entitled a coefficient between 1 and 2 to these taxes.

Table 16-8: Vehicle Circulation Tax Rates (2014)

Type of Vehicle		Tax Rate €
Cars	less than 8 taxable horsepower	12.62
	between 8 - 11,99 taxable horsepower	34.08
	between 12 - 15,99 taxable horsepower	71.94
	between 16 - 19,99 taxable horsepower	89.61
	more than 20 taxable horsepower	112
Buses	less than 22 seats	83.3
	between 21 - 50 seats	118.64
	more than 50 seats	148.3
Trucks	less than 1000 kgs payload	42.28
	between 1000 - 2999 kgs payload	83.3
	between 2999 - 9999 kgs payload	118.64
	more than 9999 kgs payload	148.3
Tractors	less than 16 taxable horsepower	17.67

⁶⁰³ Government of Spain (2004), *Real Decreto Legislativo 2/2004, de 5 de marzo, por el que se aprueba el texto refundido de la Ley Reguladora de las Haciendas Locales.*, Accessed 9th September 2014, <http://www.boe.es/buscar/act.php?id=BOE-A-2004-4214>

⁶⁰⁴ Government of Spain (2014), *Real Decreto Legislativo 2/2004, de 5 de marzo, por el que se aprueba el texto refundido de la Ley Reguladora de las Haciendas Locales (Vigente hasta el 15 de Julio de 2015)*, Accessed 22nd September, 2014, http://noticias.juridicas.com/base_datos/Admin/rdleg2-2004.t2.html#c2s3ss4

Type of Vehicle		Tax Rate €
	between 16 - 25 taxable horsepower	27.77
	more than 25 taxable horsepower	83.3
Trailers pulled by motor vehicles	between 750 - 1000 kgs	17.67
	between 1000 - 2999 kgs payload	27.77
	more than 2999 kgs payload	83.3
Motorcycles	up to 125 Cm3	4.42
	between 125 - 250 cm3	7.57
	between 250 - 500 cm3	15.15
	between 500 to 1000 cm3	30.29
	more than 1000 cm3	60.58

- In 2012, total revenue from the tax amounted to €2,243 million, equivalent to 0.22 % of GDP and 0.67% of total tax revenue.⁶⁰⁵

➤ **Company car treatment:**

- Spain has a specific tax benefit on company cars. The taxable benefit is calculated as a percentage of the cost price and is equivalent to 20% of the acquisition cost.⁶⁰⁶ According to Art. 43 of *Ley 35/2006* (Law 35/2006), when an employee uses the car of its employer, the annual benefit would be equal to 20% of the market value of the car.^{607,608}

⁶⁰⁵ European Commission (2014), Taxes in Europe Database, Accessed 22nd August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁶⁰⁶ Harding, M. (2014), "Personal Tax Treatment of Company Cars and Commuting Expenses: Estimating the Fiscal and Environmental Costs", *OECD Taxation Working Papers*, No. 20, OECD Publishing, pp. 53.

⁶⁰⁷ Government of Spain (2014), *Ley 35/2006*, de 28 de noviembre, del Impuesto sobre la Renta de las Personas Físicas y de modificación parcial de las leyes de los Impuestos sobre Sociedades, sobre la Renta de no Residentes y sobre el Patrimonio. Accessed 22 september 2014, http://noticias.juridicas.com/base_datos/Fiscal/l35-2006.t3.html#a42

⁶⁰⁸ PWC (2014), International Assignment Services : taxation of International Assignees Country – Spain, Accessed 22nd September 2014, <http://www.pwc.com/us/en/hr-international-assignment-services/assets/spain-folio.pdf>

- Commuting expenses are not deductible in Spain for company cars, reimbursement for public transport costs is exempt from taxation to a maximum level.⁶⁰⁹
- According to Art. 65 of *Ley 38/1992*, there are exemptions currently in place for certain vehicles used only for commercial, industrial and scientific activities.

16.3 Pollution and Resource Taxes

➤ Landfill and incineration taxes:

- No national landfill or incineration tax exists in Spain, although Article 16 of the Spanish Waste Act (*Ley 22/2011, de 28 de julio, de residuos y suelos contaminados*) gives the possibility for waste authorities to introduce economic and fiscal measures in order to promote waste prevention and separate collection including landfill and incineration taxes on municipal waste.⁶¹⁰ The same law gives autonomous communities (i.e. the Spanish Regions) the possibility to impose regional taxes on waste (art. 16.1), such as the Catalanian landfill and waste incineration tax, or Murcia's landfill tax.
- Nine autonomous communities have introduced fiscal instruments on waste:
 - Catalonia introduced taxes on municipal waste, either through incineration or landfill.
 - Cantabria introduced a landfill tax on industrial non-hazardous waste.
 - Andalusia introduced a landfill tax on hazardous waste and on radioactive waste.
 - Valencia, Murcia, Madrid and la Rioja introduced a general tax on waste management except for the municipal waste. All of them except La Rioja included also a landfill tax on construction waste.
 - Castile and Leon and Extremadura introduced a tax on the landfill of any type of waste (on municipal, industrial, hazardous and construction waste)

⁶⁰⁹ Harding, M. (2014), "Personal Tax Treatment of Company Cars and Commuting Expenses: Estimating the Fiscal and Environmental Costs", *OECD Taxation Working Papers*, No. 20, OECD Publishing, pp. 36-44.

⁶¹⁰ Ignasi Puig Ventosa, I. (2011) *Landfill and Waste incinerated taxes – the Spanish case*, [http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20\(2\).pdf](http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20(2).pdf)

- In 2010, revenues from all waste related taxes in Spain amounted to about €315 million⁶¹¹, representing 0.03% of its GDP (based on Eurostat data on GDP measures).
- *Tax on municipal waste in Catalonia*: A landfill tax was introduced in Catalonia in 2004.^{612,613} The tax rate has been modified several times. As of 2014 the tax rate applied is €15.80 per tonne for sorted municipal waste and €25.40 per tonne of controlled municipal waste from local authorities that do not operate a separate collection of organic waste yet, according to the development project approved by the Waste Agency of Catalonia. Incineration has been charged since 2011. As of 2014 the tax rate is €7.40 per tonne for incinerated municipal waste and €18.60 per tonne for incinerated municipal waste from local authorities that don't do a separate collection of organic waste, according to the development project approved by the Waste Agency of Catalonia (Article 15 of *Ley 8/2008 de 10 de julio de financiación de las infraestructuras de gestión de los residuos y de los cánones sobre la disposición del desperdicio de los residuos*).^{614,615}
- Landfill managers collect the money from municipalities and other customers and pass it on to a special fund (*Fons de Gestió de Residus*) created by the regional government.⁶¹⁶ In 2011, revenues generated accounted for €24.4 million.⁶¹⁷ At least 50% of these revenues are 'devoted to the treatment of organic waste, including treatments that reduce the quantity or improve the quality of waste for disposal, especially regarding the reduction of the organic fraction contained in the residual fraction' (Law 8/2008). The remaining part is used for 'the separate collection of organic matter, to the collection and recycling of other waste fractions, to other forms of material recovery and to promote awareness

⁶¹¹ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, September 2012, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

⁶¹² ADEME (2008), *Taxes sur l'élimination des déchets en Europe: quel enseignement pour la France?*, Novembre 2008, <http://www.ademe-et-vous.ademe.fr/sites/default/files/strategie-etudes/16/ademe-strategie-et-etudesn16.pdf>

⁶¹³ ENDS Europe (2003) *Catalonia introduces Spain's first landfill tax*, Accessed 12th August 2014, <http://www.endseurope.com/8305>

⁶¹⁴ Ignasi Puig Ventosa, I. (2011) *Landfill and Waste incinerated taxes – the Spanish case*, [http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20\(2\).pdf](http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20(2).pdf)

⁶¹⁵ Government of Spain (2014), *Ley 8/2008, de 10 de julio, de financiación de las infraestructuras de gestión de los residuos y de los cánones sobre la disposición del desperdicio de los residuos (Vigente hasta el 31 de Enero de 2014)*, Accessed 24th September 2014, http://noticias.juridicas.com/base_datos/Anterior/r3-ca-l8-2008.html

⁶¹⁶ Puig Ventosa, I., (2004), *Green Budget News*, no. 8-6/2004, Accessed 12th August 2014, <http://files.foes.de/de/downloads/GreenBudgetNews/GBN8.pdf>

⁶¹⁷ OECD and EEA (2014) *Database on instruments used for environmental policy*, Accessed 12th August 2014, http://www2.oecd.org/eoicst/queries/All_Information.aspx

campaigns and environmental education' (Law 8/2008)⁶¹⁸. Between 85-90% of these funds are therefore redistributed to local municipalities responsible for waste collection, transportation and treatment (based on a per tonne basis, in some cases varying with the level of contamination of the waste) to improve the efficiency of their activities, in particular the collection and treatment of organic waste. Funds from the tax are a powerful incentive for change in management of waste practices, and were recently responsible for an increase in the development of bio-waste recycling in Catalonia⁶¹⁹. Data from 2010 shows that almost 40% of waste collected was sorted in Catalonia.⁶²⁰

➤ **Other regional waste management taxes:**

- Other regional waste management taxes are payable by users of public and private landfills for hazardous waste from industrial, construction and demolition activities, as well as for municipal waste in Cantabria, Castile and Leon and Extremadura. Table 16-9 sets out the various charges in seven autonomous communities.

Table 16-9: Regional Waste Management Taxes

Autonomous Community	Introduction Date [Last Revision Date]	Type of Waste Subject to the Tax	Rate (in € per tonne)	Revenues Generated in 2011 (in million €)
Andalusia	2004	Hazardous	From 15 to 35	0.4 (2011) 0.17 (2012)
Cantabria	2010 [2011]	Industrial	7	No data available
Castile and Leon	2012 [2012]	All type of waste (Municipal, industrial, hazardous, construction)	From 3 to 35	No data available
Extremadura	2012	All type of waste (Municipal, industrial, hazardous, construction)	From 3 to 15	No data available

⁶¹⁸ Puig Ventosa, I., Gonzales, A.C., Jofra Sora, M., (2012) Landfill and waste incineration taxes in Catalonia, Spain, in Kreiser, L., Yabar, A., Herrera, P., Milne, J.E., Aishabor, H. (Eds) *Green Taxation and Environmental Sustainability. Critical Issues in Environmental Taxation*, Vol. XII, p. 244-257

⁶¹⁹ Francesc Giro (2011) *Strategies and experiences in Bio-waste management in Catalonia*, Accessed 4th September 2014, <http://www.ecotech.cat/grecia/ARC.pdf>

⁶²⁰ Puig Ventosa, I., et al. (2012) Landfill and Waste Incineration Taxes in Catalonia (Spain), in *Critical Issues in Environmental Taxation*, Volume XI

Autonomous Community	Introduction Date [Last Revision Date]	Type of Waste Subject to the Tax	Rate (in € per tonne)	Revenues Generated in 2011 (in million €)
La Rioja	2013	Industrial and hazardous	From 4 to 21	No data available
Madrid	2003 [2012]	Industrial, hazardous and construction	From 5 to 8, 1 per m ³ for construction and demolition waste	3.0
Murcia	2006 [2006]	Industrial, hazardous and construction	From 3 to 15	1.5
Valencian Community	2013	Industrial, hazardous and construction	From 0.5 to 10	No data available

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- Rates vary according to whether the waste is recoverable or not and hazardous or not, while in Castille and León a further distinction is made - whether the landfills are managed locally or not. In Andalusia, tax revenues served environmental policies in those regions. In Extremadura, revenues are also used for environmental actions, while in La Rioja, Cantabria and Castile and Leon, revenues are dedicated to finance programmes for the protection of the environment. Revenues generated in Madrid (€3 million in 2011) were not used for specific policies.⁶²¹ In the Valencian Community, revenues are used for regional government expenditures in planning, monitoring, management and disposal of waste.
- Radioactive waste is subject to a special tax in Andalusia since 2004, of €2,000 to €10,000 per m³, which accounted to €5 million in revenue in 2011.⁶²²

⁶²¹ Ignasi Puig Ventosa, I. (2011) *Landfill and Waste incinerated taxes – the Spanish case*, Accessed 4th September 2014, [http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20\(2\).pdf](http://ec.europa.eu/environment/waste/pdf/strategy/5.%20Landfill%20and%20incineration%20taxes%20in%20Spain%20Ignasi%20Puig%20(2).pdf)

⁶²² OECD and EEA (2014) *Database on instruments used for environmental policy*, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

➤ **Air Pollution Tax:**

- No tax is collected at federal or state level, but several regional or autonomous community taxes are in place. For SO₂ emissions, rates range from €33 to €94 per tonne, while for NO₂, rates vary from €50 to €140 per tonne emitted. The rates are however low compared to Nordic countries such as Denmark and Sweden. Moreover, revenues from these taxes have dropped from €28 million in 2005 to €7 million in 2010; while in Denmark, sulphur and nitrogen taxes raised €10 million in 2010⁶²³.
- In Andalusia, a tax on air pollution was introduced in 2004 to finance environmental expenditure programmes and relief operations in case of environmental disasters. Exemptions are in place for landfills receiving more than 10 tonnes daily, the intensive breeding of poultry and pigs, as well as from combustions of biofuels, while deductions apply for investments in infrastructure and other equipment for tackling pollution.⁶²⁴ Article 31 of the Ley 18/2003 (*Ley 18/2003 de 29 de diciembre, por la que se aprueban medidas fiscales y administrativas*) also fixes a minimum exempt limit of 3 polluting units that a taxpayer can reduce from the tax base. In 2012, revenues from the tax amounted to €5.1 million.
- The Murcia region introduced the same type of scheme in 2006, for financing the following environmental programmes: waste management, repairing environmental damages, rising environmental awareness, monitoring emission level, water sanitation and improving costal water quality. The same minimum exempt limit of 3 polluting units that a taxpayer can reduce from the tax base also applies (as laid down by article 47 of Ley 9/2005, de 29 de diciembre, de Medidas Tributarias en materia de Tributos Cedidos y Tributos Propios año 2006).⁶²⁵ In 2011, revenues from the tax amounted to €0.4 million. The tax base and rate in both communities is set out in Table 16-10.

⁶²³ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, Accessed 4th September 2014, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

⁶²⁴ Junta de Andalucía (2003), LEY 18/2003, de 29 de diciembre, por la que se aprueban medidas fiscales y administrativas, Accessed 24th September 2014, <http://www.juntadeandalucia.es/boja/2003/251/6>

⁶²⁵ Presidencia de la region de Murcia (2006), Ley 9/2005, de 29 de diciembre, de Medidas Tributarias en materia de Tributos Cedidos y Tributos Propios año 200, Accessed 24th September 2014, http://noticias.juridicas.com/base_datos/CCAA/mu-19-2005.html

Table 16-10: Air Pollution Taxes in Andalusia and Murcia

Tax base	Rate in €
Variable rate per emissions (emissions below 10 pollution units per year). 1 pollution unit = SO _x emissions /150 = NO _x emissions / 100 = VOC emissions / 100 = NH ₃ emissions / 10. (All emissions in t)	5,000
Variable rate per emissions (emissions between 10 and 20 pollution units per year)	8,000
Variable rate per emissions (emissions between 20 and 30 pollution units per year)	10,000
Variable rate per emissions (emissions between 30 and 50 pollution units per year)	12,000
Variable rate per emissions (emissions above 50 pollution units per year)	14,000

Source: OECD and EEA (2014) Database on Instruments Used for Environmental Policy, Accessed 12th August 2014, www2.oecd.org/ecoinst/queries/All_Information.aspx

- In Aragon an air pollution tax was introduced in 2006 to finance restoration activities in environmental areas degraded by hazardous activities such as natural resource depletion, landscape and territorial degradation. Deductions and exemptions for this tax apply (for the same activities as in Andalusia). Additionally, CO₂ emissions from installations covered by the Emissions Trading System (article 23.b of Ley 13/2005 de 30 de diciembre, de Medidas Fiscales y Administrativa en materia de Tributos Cedidos y Tributos Propios de la Comunidad Autónoma de Aragón), and emission quantities below certain thresholds (according to Article 26 of Ley 13/2005) are exempt from the payment of the tax.⁶²⁶ The reduction to the pollution units is of 150 tons per annum for SO_x emissions, 100 tons per annum for NO_x emissions and 100 kilotons per annum for CO₂ emissions. In 2012, tax revenues were equivalent to €5.4 million, and different tax rates were set according to the quantity of nitrogen oxide, carbon dioxide and sulphur dioxide emitted - as shown in Table 16-11.

Table 16-11: Air Pollution Taxes in Aragon

Tax Base	Rate in €
CO ₂ emissions	0.2000 per tonne
NO _x emissions	50 per tonne

⁶²⁶ Parlamento Andalucía (2003), *Ley de Medidas para la Vivienda Protegida y el Suelo*, Accessed 24th September 2014, <http://www.parlamentodeandalucia.es/webdinamica/portal-web-parlamento/pdf.do?tipodoc=coleccion&id=14455&cley=13>

Tax Base	Rate in €
SO ₂ emissions	50 per tonne

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- In Galicia, a similar tax was introduced since 1996, but there are no exemptions or deductions in place. Tax revenues are used to finance extraordinary damages and emergency situations following environmental disasters. Revenues from this tax represented around €3 million in 2011. The different tax rates are shown in Table 16-12.

Table 16-12: Air Pollution Taxes in Galicia

Tax Base	Rate in €
Variable rate for NO _x and SO _x emissions (emissions below 101 tonnes per year)	0
Variable rate for NO _x and SO _x emissions (emissions between 101 and 1000 tonnes per year)	36
Variable rate for NO _x and SO _x emissions (emissions between 1001 and 3000 tonnes per year)	50
Variable rate for NO _x and SO _x emissions (emissions between 3001 and 7000 tonnes per year)	70
Variable rate for NO _x and SO _x emissions (emissions between 7001 and 15000 tonnes per year)	95
Variable rate for NO _x and SO _x emissions (emissions between 15001 and 40000 tonnes per year)	120
Variable rate for NO _x and SO _x emissions (emissions between 40001 and 80000 tonnes per year)	150
Variable rate for NO _x and SO _x emissions (emissions above 80000 tonnes per year)	200

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- In Valencia, since 2003, harmful air emissions are integrated into a broader tax system on activities that cause environmental harm, along with electricity production. Exemptions to the payment of the tax are allowed for emissions below certain thresholds: up to 150 tons of NO_x and up to 150 tons of SO₂ emissions (article 154.7.1 of the Ley 10/2012 de

21 de diciembre, de Medidas Fiscales, de Gestión Administrativa y Financiera, y de Organización de la Generalitat).⁶²⁷ Collected revenues serve a more general purpose of conservation and improvement of the environment. Tax rates on air pollution increase accordingly to the amount of SO_x and NO_x emitted into the atmosphere annually and are shown in Table 16-13.

Table 16-13: Air Pollution Taxes in Valencia

Tax base	Rate in €
Variable rate for NO _x and SO ₂ emissions (the rates refer to emissions below 1000 tonnes per year)	9
Variable rate for NO _x and SO ₂ emissions (the rates refer to emissions between 1000 and 3000 tonnes per year)	12
Variable rate for NO _x and SO ₂ emissions (the rates refer to emissions between 3000 and 7000 tonnes per year)	18
Variable rate for NO _x and SO ₂ emissions (the rates refer to emissions between 7000 and 15000 tonnes per year)	24
Variable rate for NO _x and SO ₂ emissions (the rates refer to emissions between 15000 and 40000 tonnes per year)	30
Variable rate for NO _x and SO ₂ emissions (the rates refer to emissions between 40000 and 80000 tonnes per year)	38
Variable rate for NO _x and SO ₂ emissions (the rates refer to emissions above 80000 tonnes per year)	50

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/eoicst/queries/All_Information.aspx

➤ Pesticides Tax

- No pesticides tax exists in Spain. However, Spanish pesticides' consumption is one of the highest among the EU-28 Member States.⁶²⁸ Data released in 2010 by FAO, demonstrated that total pesticides

627

Diari Oficial de la Comunitat Valenciana (2012), Ley 10/2012, de 21 de diciembre, de Medidas Fiscales, de Gestión Administrativa y Financiera, y de Organización de la Generalitat, Accessed 24th September 2014, http://www.docv.gva.es/portal/ficha_disposicion.jsp?id=26&sig=011715/2012&L=1&url_lista=

628 Eurostat (2014) Agri-environmental indicator - consumption of pesticides, Accessed 19th August 2014, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Agri-environmental_indicator_-_consumption_of_pesticides

consumption in Spain equals 39,043 tonnes.⁶²⁹ These values are changed little over the years since 2001, when 35,700 tonnes were sold.

➤ **Tax on fluorinated greenhouse gases**

- The tax was introduced in Law 16/2013 of 29 October 2013 and is being phased in gradually from 2014. It will not be fully applicable until 2016.⁶³⁰
- The tax applies to the consumption of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and preparations containing such substances (including regenerated and recycled). The taxable base is structured according to the weight (in kg), impact in terms of global-warming potential and type of gas, while gases with a global warming potential of less than or equal to 150 are exempted. The gases could be taxed up to a maximum value of €100 per kg according to the Law 16/2013, as described in Table 16-14.

Table 16-14: Tax on Fluorinated Greenhouse Gases

Tax Base	Rate in €
Sulphur hexafluoride	100 per kg
HFC-23	100 per kg
HFC-32	11 per kg
HFC-43-10mee	30 per kg
HFC-125	68 per kg
HFC-134	22 per kg
HFC-134a	26 per kg
HFC-143	6.6 per kg
HFC-143a	86 per kg
HFC-227ea	70 per kg
HFC-236cb	26 per kg
HFC-236ea	24 per kg

⁶²⁹ FAO (2014), *Statistics Database*, Accessed 19th August 2014, <http://faostat3.fao.org/faostat-gateway/go/to/home/E>

⁶³⁰ Government of Spain (2013), *Ley 16/2013, de 29 de octubre, por la que se establecen determinadas medidas en materia de fiscalidad medioambiental y se adoptan otras medidas tributarias y financieras*, Accessed 5th September 2014, <http://www.boe.es/boe/dias/2013/10/30/pdfs/BOE-A-2013-11331.pdf>

Tax Base	Rate in €
HFC-236fa	100 per kg
HFC-245ca	12.8 per kg
HFC-245fa	19 per kg
HFC-365mfc	17.8 per kg
Perfluoromethane	100 per kg
Perfluoroethane	100 per kg
Perfluoropropane	100 per kg
Perfluorobutane	100 per kg
Perfluoropentane	100 per kg
Perfluorohexane	100 per kg
Perfluorocyclobutane	100 per kg
Preparations	0.020 x global warming potential
Gases regenerated and recycled	0.85 x Tax rate of the gas in question
Ready regenerated and recycled	0.85 x Tax rate preparation

Source: Government of Spain (2013) Ley 16/2013, de 29 de octubre, por la que se establecen determinadas medidas en materia de fiscalidad medioambiental y se adoptan otras medidas tributarias y financieras, Accessed 5th September 2014, <http://www.boe.es/boe/dias/2013/10/30/pdfs/BOE-A-2013-11331.pdf>

- No data is available on the revenue from this tax, as it was recently introduced. Data provided by the Spanish authorities estimate that the tax could yield €400 million in 2014 (equivalent to 0.039% of Spanish GDP),⁶³¹ while amendments to the final bill could make revenues drop to €113 million.⁶³²

➤ **Aggregates tax:**

⁶³¹ European Commission (2014), Assessment of the 2014 national reform programme and stability programme for SPAIN Accompanying the document Recommendation for a COUNCIL RECOMMENDATION on Spain's 2014 national reform programme and delivering a Council opinion on Spain's 2014 stability programme, June 2014, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0410&from=fr>

⁶³² Economics for Energy (2013) *Impuestos energetico-ambientales en Espana*, http://eforenergy.org/docpublicaciones/informes/Informe_Completo_EfE_2013.pdf

- No tax on extracted materials currently exists at national or regional level in Spain.⁶³³ According to the European Aggregates Association⁶³⁴ however, approximately 175 million tonnes of aggregates were produced in Spain in 2011, and the vast majority was composed of crushed rocks, sand and gravel. Recycled aggregates represented less than 1% of the total output produced.

➤ **Other pollution taxes:**

- Other environmental taxes have been introduced in *Aragon, Andalusia, Asturias, La Rioja, Extremadura, Castile and Leon, Valencia, Castile La Mancha, Galicia and the Canary Islands*:
- A disposable *plastic bag tax* has been in place in *Andalusia* since 2011. It has generated revenues of around €0.7 million which are not earmarked for any particular use. From 2014 onwards, the tax rate is fixed at €0.10 per unit of plastic bag.
- In *Aragon* soil pollution taxes have been applied since 2006 on the construction of large department stores. The tax is used for preventive, corrective and restoration activities caused by construction and installation activities. In 2012 tax revenues amounted to €7.2 million. Tax rates vary according to the area covered by the department store and ranges from €12 per m² (for stores between 2000 and 3000 m²) to €19 per m² for stores larger than 10000 m². Surfaces under 2000 m² are exempted from the tax.
- Activities causing environmental harm are taxed in the autonomous regions of *Asturias, Canary Islands, La Rioja, Extremadura and Castile and Leon*. These activities concern communication networks and electricity supply networks, as well as underground or submarine electricity supply networks for the *Canary Islands* – see table below:

Table 16-15: Taxes on Activities Causing Environmental Harm in Asturias, Canary Islands and La Rioja

Tax base	Rate in € (Asturias)	Rate in € (Canary Islands)	Rate in € (La Rioja)
Communication networks	700 per post or antenna or heritage element or facility	500 per post or antenna	175 per post or antenna
Electricity supply	700 per km of	600-750 per km of	175 per km of

⁶³³ Withana, S., ten Brink, P., Illes, A., Nanni, S., Watkins, E. (2014) *Environmental tax reform in Europe: Opportunities for the future*, Final Report for the Netherlands Ministry of Infrastructure and the Environment, May 2014, http://www.ieep.eu/assets/1397/ETR_in_Europe_-_Final_report_of_IEEP_study_-_30_May_2014.pdf

⁶³⁴ European Aggregates Association (2013) *Annual Review 2012-2013*, http://www.uepg.eu/uploads/Modules/Publications/uepg-ar2012-2013_en_inter_v14_pbp_small.pdf

Tax base	Rate in € (Asturias)	Rate in € (Canary Islands)	Rate in € (La Rioja)
network	transmission line	transmission line, depending on the voltage	transmission line
Underground or submarine electricity supply networks	-	0	-

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- In the Valencian Community, the tax on activities causing environmental harms applies to the production of electricity by hydroelectric power plants (€0.0004 per kWh), by thermonuclear plants (€0.0018 per kWh) and all other sources of energy (€0.0008 per kWh).
- In Aragón a tax on the environmental damage caused by the installation of cable transport (e.g. skiing facilities);
- In Castile and Leon a tax on environmental damage caused by some uses of water from reservoirs (refers to production of electricity in hydropower plants and depends on the capacity of the reservoir and the height of the dam) and by high voltage transportation of electricity (€ 700 per km of line);
- In Castile La Mancha a tax on certain activities that cause environmental harm (including a tax on production of electricity from nuclear plants of €2.1 per MWh and radioactive waste disposal of €7 per kg), in Extremadura a tax on production and distribution of electricity (ranging from €0.0010 per kWh to €661.1100 per km of line)
- In Extremadura a tax on production and distribution of electricity (ranging from €0.0010 per kWh to €661.1100 per km of line)
- In Galicia a tax on environmental damage caused by some uses of water from reservoirs (€800 per hm³ and depending on the jump of the reservoir and the raw power).

➤ **Water abstraction, wastewater and water pollution taxes:**

- At national level, a *fee on wastewater discharges* has been applied to tackle water pollution since 1986 (*Ley 29/1985, de 2 de Agosto, de Aguas*,⁶³⁵ modified by *Ley 46/1999, de 13 de Diciembre*⁶³⁶). Latest

⁶³⁵ Government of Spain (1985), *Ley 29/1985, de 2 de agosto, de Aguas*, Accessed 24th September 2014, http://noticias.juridicas.com/base_datos/Derogadas/r2-l29-1985.html

estimates from the OECD date back to 2001 and account for €32.6 million of tax revenues.⁶³⁷ This fee is composed of a fixed rate of €0.0120 per m³ for municipal wastewater discharges and a fixed rate of €0.03 per m³ for industrial wastewater discharges. These rates increase progressively depending on the level of pollution.

- Regional taxes on wastewater and discharges were also introduced in several autonomous communities – see Table 16-16 and details below:⁶³⁸

Table 16-16: Taxes on Wastewater and Discharges by Industrial Users in the Autonomous Communities

Autonomous Community	Date Approved [reformed]	Tax Rate (in €)
Andalusia	2010 [2011]	Fixed: 1/month per taxpayer Variable: 0.25 per m ³ per month
Aragon	1997 [2014]	Fixed: 19.162 per month per taxpayer for industrial use Variable: depending on the type of pollution load
Asturias	1993 [1994]	Fixed: 5-1280 per month per taxpayer Variable: 0.599 per m ³
Balearic Islands ⁶³⁹	1991 [2014]	Fixed: 7.5-899.8 depending on metre calibre Variable: 0.2947 per m ³
Cantabria	2002 [2013]	Fixed: 14.88 per year per taxpayer Variable: 0.3638 per m ³ or depending on the pollution load
Catalonia	1981 [2003]	Variable: 0.0927 per m ³ + 0.3633 per m ³ until September (0.1454 per m ³ + 0.5702 per m ³ from October) and depending on the pollution

⁶³⁶ Government of Spain (2014), Ley 46/1999 de 13 de diciembre, de modificación de la Ley 29/1985, de 2 de agosto, de Aguas, Accessed 24th September 2014, http://noticias.juridicas.com/base_datos/Admin/I46-1999.html

⁶³⁷ OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 5th September 2014, <http://www2.oecd.org/ecoinst/queries/>

⁶³⁸ Vales-Gimenez, J., Zarate-Marco, A. (2013) Environmental taxation and industrial water use in Spain, in *Investigaciones Regionales*, No. 25, pp.133-62.

⁶³⁹ Agencia Tributaria Illes Balears (2014) *Canon de Saneamiento de Aguas*, Accessed 23rd September 2014, <http://www.atib.es/TA/contenido.aspx?id=9858&lang=es>

Autonomous Community	Date Approved [reformed]	Tax Rate (in €)
Canary Islands	1990 [1994]	Variable: Depends on pollution load and volume of wastewater
Castile-La Mancha	2002	Variable: 0.42 per m ³ x factor depending on pollution load
Galicia	1993 [2011]	Fixed: 2.5 per month per taxpayer Variable: 0.421 per m ³ or depending on the pollution load
La Rioja	1994 [2000]	Variable: 0.34 per m ³ x factor depending on the pollution load (Ley 6/2009 de 15 de Diciembre de Medidas Fiscales y Administrativas para el año 2010)
Madrid	1984 [2003]	Fixed: 0.0209 twice-monthly x factor depending on meter calibre Variable: €0.2927-€0.5104 twice-monthly depending on both consumption and the pollution load
Murcia	2000 [2002]	Fixed: 35 per year per source of supply Variable: 0.37 per m ³ x factor depending on pollution load
Valencia	1992 [1993]	Fixed: 84.54-2,957.1 per year depending on meter calibre. Dependant on pollution load Variable: 0.414 per m ³ , dependant on pollution load
Navarre	1988	Variable: 0.619 per m ³ x factor depending on the pollution load
Basque Country	2008	Variable: 0.06 per m ³

- In Andalusia, a tax on coastal wastewater discharge has been in place since 2004. It now funds environmental expenditure programmes and environmental catastrophes relief programmes. In 2012, €3.5 million was collected through a flat rate of €10 per pollution unit was applied to the amount of pollution discharged to coastal waters.
- In Murcia, a tax on coastal wastewater discharge has been in place since 2006. Revenues are used to finance regional environmental protection programmes and actions. Revenues totalling €0.4 million were collected in 2011, mainly based on the quantity of polluting units (i.e. suspended material plus oxidizable matter).

- In Catalonia, the tax on water and water pollution was introduced in 2000 –although this was based on already existing taxes– through water regulation (*Ley 6/1999, modified by Decreto Legislativo 3/2003, de 4 de noviembre, por el que se aprueba el Texto refundido de la legislación en materia de aguas de Cataluña*)⁶⁴⁰. In 2011, the charge generated revenues of €356.7 million. Revenues are earmarked for pollution prevention at source, recovery and maintenance of ecological flows in rivers, financing investments and exploitation costs of water works, and to finance other costs of the Catalan Water Agency. The charge is a hybrid between a water consumption and water pollution tax
- In Aragon, water pollution is linked to water extraction in a broader ecological tax created by Law 6/2001 and updated by Ley 1/2014, *Ley de presupuestos de la comunidad autonoma de Aragon para el ejercicio 2014*.⁶⁴¹ The tax introduced in 2002 and which accounted for €33.7 million of tax revenues in 2011, is used, according to Ley 6/2001 (Law 6/2001), to finance installations' maintenance and water purification carried out by the Region.
- Combined water pollution and water abstraction taxes are also found in *Cantabria*, where a tax on water and water pollution provides tax rates for the management of water resources. The tax, first introduced in 2006 and revised in 2013, is used to finance investments and expenses in the construction, management and maintenance of local wastewater treatment facilities. In 2009, (the latest available information from the OECD⁶⁴²), the tax generated €11.3 million in revenue.
- In Galicia, a water tax was introduced in 2011. Revenues from the tax are used to reduce pollution at source, restore ecological flows in rivers, finance investments, exploitation and management costs of water works of the Community. In 2011, €35.1 million were raised through the tax. Tax rates of the hybrid water pollution and water abstraction in Aragon, Cantabria, Catalonia and Galicia are listed in Table 16-17.

Table 16-17: Taxes on Water Pollution and Extraction in Aragon, Cantabria, Catalonia and Galicia

Tax Base	Rate in € (Aragon)	Rate in € (Cantabria)	Rate in € (Catalonia)	Rate in € (Galicia)
Pollution charge on	0.6510 per kg	0.5032 per kg	0.8812 per kg	0.4930 per kg

⁶⁴⁰ Presidencia de la generalidad de Catalonia (2003), *Decreto Legislativo 3/2003, de 4 de noviembre, por el que se aprueba el Texto refundido de la legislación en materia de aguas de Cataluña*, Accessed 24th September 2014, http://noticias.juridicas.com/base_datos/CCAA/ca-dleg3-2003.html

⁶⁴¹ Presidencia del Gobierno de Aragon (2014), *Ley 1/2014, de 23 de enero, de Presupuestos de la Comunidad Autónoma de Aragón para el ejercicio 2014*, Accessed 24th September 2014, <http://www.boa.aragon.es/cgi-bin/EBOA/BRSCGI?CMD=VEROBJ&MLKOB=772781623030>

⁶⁴² OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, <http://www2.oecd.org/ecoinst/queries/>

Tax Base	Rate in € (Aragon)	Rate in € (Cantabria)	Rate in € (Catalonia)	Rate in € (Galicia)
chemical oxygen demand				
Pollution charge on heavy metals	6.3870 per equimetal	-	-	11.1130 per kg of equimetal
Pollution charge on inhibiting matters	15.1820 per kiloequitox	8.6237 per kiloequitox	10.4515 per equitox	0.0520 per equitox
Pollution charge on organic and ammoniac nitrogen	1.2770 per kg	0.5494 per kg (any type of nitrogen)	0.6690 per kg	0.3690 per kg
Pollution charge on soluble salts	5.2580 per Siemens per cm and m ³	6.8851 per Siemens per cm and m ³	7.0502 per Siemens per cm and m ³	3.9550 per Siemens per cm and m ³
Pollution charge on suspended matters	0.4680 per kg	0.4345 per kg	0.4405 per kg	-
Pollution charge on phosphorus	-	1.0997 per kg	1.3382 per kg	0.7400 per kg
Pollution charge on increase of water temperature by more than 3 °C	-	0.0001 per °C	-	-
Domestic water consumption - fixed rate	5.02 per month per household	25.8800 per annum	-	1.5 per person and per month
Industrial water consumption - fixed rate	18.8790 per month per activity	25.8800 per annum	-	2.5 per person and per month
Volume of domestic water consumption	0.6050 per m ³	0.4874 per m ³	0.4469, 1.0294, 2.5735 or 4.1176 per m ³ depending on the consumption	0, 0.2800, 0.3600 or 0.4100 per m ³ depending on the consumption
Volume of Industrial water consumption	-	0.6332 per m ³	0.5702 per m ³	0.4210 per m ³
Real or estimated water consumption - industrial use	-	-	0.0927 per m ³	-
Social tax rate	-	-	0.3990 per m ³	-

Tax Base	Rate in € (Aragon)	Rate in € (Cantabria)	Rate in € (Catalonia)	Rate in € (Galicia)
Other specific uses	-	-	-	Fixed rate of 2.5 per month and activity plus a variable rate depending on the use

Sources: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx; and Government of Spain (2014), Ley 1/2014. Ley de presupuestos de la comunidad autonoma de Aragon para el ejercicio 2014, Accessed 23rd September 2014, <http://www.boa.aragon.es/cgi-bin/EBOA/BRSCGI?CMD=VEROBJ&MLKOB=772781623030>

- In Castile-La Mancha, a tax on water treatment has been in place since 2003. Revenues are used to finance management costs and investments in infrastructure for the *Master Plan for Water Supply* which aims to provide high-quality water resources under any circumstances. The fixed rate is €0.42 per m³, a pollution coefficient is applied if the pollution level is higher than the domestic standard established by Law 12/2002 (30 grams of suspended matter, 60 grams of oxidizable materials, 9 grams of nitrogen, 2 grams of phosphorus).
- In Madrid, water pollution taxes have been in place since 1985 for financing water quality related works. In 2010, €1.8 million in revenue was collected from the tax. See Table 16-18 below for calculation of tax rates.

Table 16-18: Water Pollution Taxes in Madrid

Tax base	Rate in €
Adduction service fee for all users and an adduction variable rate	Dependant on the diameter and the number of dwellings or commercial activities, type of user, water consumption, seasonality etc.
Distribution service fee for all users and a distribution variable fees	Dependant on the diameter and the number of dwellings or commercial activity, on the type of user ad on water consumption
Sewage system fee and a sewage system variable rate	Dependant on the number of dwellings or activities, and on the type of user and volume of water consumption
Wastewater treatment service fee and a waste water treatment variable rate	Dependant on the number of dwelling or commercial activities, the volume of consumer water, etc.

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- In Navarra, a general charge on water (pollution and consumption) has been in place since 2001. Revenues are used to finance the construction of wastewater treatment plants in the region, collection and management operations of treatment and purification services. Tax bases and rates for water pollution are listed in Table 16-19.

Table 16-19: Water Taxes in Navarra

Tax Base	Rate in €
Fixed rate for mud coming from private wastewater treatment installations (volume inferior to 5 m ³)	40
Fixed rate for mud coming from private wastewater treatment installations (volume between 5 m ³ and 10 m ³)	80
Variable rate for mud coming from private wastewater treatment installations (volume above 10 m ³)	8 per m ³

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

➤ **Water abstraction charges:**

- There are no water abstraction charges at national level.⁶⁴³ Instead, many autonomous communities have *regional taxes for water extraction* (which in some cases combine water pollution charges and therefore these are presented in the wastewater and water pollution taxes section). Overall, these regional taxes are considered inefficient, as noted by the EEA,⁶⁴⁴ with Spanish water tariffs amongst the lowest in OECD/EU countries⁶⁴⁵. Large differences in design and tariff rates between regions suggest significant revenue raising potential from the introduction of a general tax for all utilities abstracting water as well as gains from further efforts to tackle losses in non-domestic uses of water.⁶⁴⁶

⁶⁴³ IEEP (2013), Steps to Greening Country Report: Spain, Final report for the European Commission, p. 7.

⁶⁴⁴ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, Accessed 2nd September 2014, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

⁶⁴⁵ See EC study, http://ec.europa.eu/europe2020/pdf/nd/swd2012_spain_en.pdf

⁶⁴⁶ European Environment Agency (2012), *Environmental Fiscal Reform – Illustrative Potential in Spain*, EEA Staff Position Note, Accessed 2nd September 2014, http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs/EEABriefingNoteforETRWorkshop_Madrid.pdf

- According to *Ley 20/1991* (Law 20/1991)⁶⁴⁷ and Article 98 of the Directive 2006/112/EC the production and distribution of water in the *Canary Islands* is subject to a reduced VAT rate of 0%.⁶⁴⁸
- In Andalusia, the *water extraction tax* is used to finance the maintenance of water treatment infrastructures. Introduced in 2011 by the *Ley 9/2010* (Law 9/2010), the tax generated €55 million in revenue in 2012.⁶⁴⁹ Tax rates are set according to the consumption of water – see Table 16-20.

Table 16-20: Water Extraction Tax in Andalusia

Tax Base	Rate in €
Flat rate for domestic use	1 per household per month
Rate for losses in the non-domestic water supply network	0.25 per m ³
Rate for non-domestic uses	0.25 per m ³
Domestic water consumption between 10 and 18 m ³ per household per month	0.2 per m ³
Domestic water consumption between 2 and 10 m ³ per household per month	0.1 per m ³
Domestic water consumption higher than 18 m ³ per household per month	0.6 per m ³

Source: OECD and EEA (2014) *Database on instruments used for environmental policy*, Accessed 12th August 2014,

http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- Following the approval of *Ley 1/1994* (Law 1/1994), *Asturias* introduced a *tax on water consumption* in 2000. The tax is used to finance investments and expenses for the construction, management, maintenance and operation of the necessary works and facilities for waste water treatment. In 2011, revenues from the tax were €35 million. Tax rates are calculated according to different formula – see Table 16-21.

⁶⁴⁷ Government of Spain (2014), *Ley 20/1991, de 7 de junio, de modificación de los aspectos fiscales del Régimen Económico Fiscal de Canarias* (Law 20/1991), Accessed 2nd September 2014, <https://www.boe.es/buscar/act.php?id=BOE-A-1991-14463>

⁶⁴⁸ European Commission (2014), *Taxes in Europe Database*, Accessed 2nd September 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetails.html

⁶⁴⁹ OECD and EEA (2014) *Database on instruments used for environmental policy*, Accessed 12th August 2014, <http://www2.oecd.org/ecoinst/queries/>

Table 16-21: Taxes on Water Consumption in Asturias

Tax Base	Rate in €
Domestic water consumption – fixed rate	3 per month
Industrial water consumption per company (the fixed rates refer to a consumption below 200 m ³ , between 200 m ³ and 500 m ³ , 500 m ³ and 1000 m ³ , 1000 m ³ and 5000 m ³ , 5000 m ³ and 22000 m ³ , 22000 m ³ and 100000 m ³ , 100000 m ³ and 500000 m ³ , 500000 m ³ and 1000000 m ³ and up to 1000000 m ³ per year)	5, 10, 20, 40, 80, 160, 320, 640 and 1280 per month depending on the consumption
Volume and characteristics of industrial wastewater	Determined by a formula in the annex of the law
Volume of domestic water consumption (rates for below 15 m ³ , between 15 m ³ and 25 m ³ , and over 25 m ³ per month)	0.3993, 0.4754, 0.5590 per m ³ depending on the consumption
Volume of industrial water consumption	0.5990 per m ³
Volume of industrial water consumption in special cases	0.0001 per m ³

Source: OECD and EEA (2014) *Database on instruments used for environmental policy*, Accessed 12th August 2014, http://www2.oecd.org/econst/queries/All_Information.aspx

- The tax on water, introduced in 1992 in the *Balearic Islands* through the *Ley 9/1991* (Law 9/1991), finances works within the hydraulic and water-related policy. It aims to reduce water consumption, improve efficiency and avoid deterioration in the quality of water resources.⁶⁵⁰ In 2011, the tax generated revenue of €52.6 million in 2011. The tax is composed of variable and fixed rates as shown in Table 16-22.

Table 16-22: Tax on Water in the Balearic Islands

Tax Base	Rate in €
Variable rate for domestic and industrial water consumption (the rates refer to a consumption below 6 m ³ , between 6 m ³ and 10 m ³ , 10 m ³ and 20 m ³ , 20 m ³ and 40 m ³ , and more than 40 m ³ per month)	0.2779, 0.4167, 0.5557, 1.1115 and 1.6662 per m ³ per month depending on the consumption

⁶⁵⁰ MEDIS (2005) *Institutional analysis of water management practices*, Majorca Case Study, Delivery for Project No EVK1-CT-2001-0009, March 2005, http://www.uni-muenster.de/Umweltforschung/medis/restricted/d12_complete.pdf

Domestic water consumption – fixed rate	3.8861 per month
Industrial water consumption – fixed rate	Varies according to the type of the company, per month
Volume of domestic and industrial water consumption – variable rate	0.2865 per m ³

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- In Castile-La Mancha, the tax on water purification was first introduced in 2003 through 12/2002 Law. It finances the construction of infrastructure projects (as established in the *Master Plan for Water Supply* as laid down in Article 13 of Law 12/2002). Tax rates vary according to the local municipality – see Table 16-23.

Table 16-23: Tax on Water Purification in Castile-La Mancha

Tax Base	Rate in €
Volume of provision of water services in the municipalities of the Supply System of Picadas	0.2805 per m ³
Volume of provision of water services in the municipalities of the Supply System of the Mancomunidad de Aguas del Alto Bornova	0.2941 per m ³
Volume of provision of water services in the municipalities of the Supply System of the Mancomunidad de Almodovar-Mondejar	0.3415 per m ³
Volume of provision of water services in the municipalities of the Supply System of the Mancomunidad de Girasol and Mancomunidad of Rio Algodor	0.4883 per m ³
Volume of provision of water services in the municipalities of the Supply System of the Mancomunidad de la Campina Baja and the Muela	0.4552 per m ³
Volume of provision of water services in the municipalities of the Supply System of the Rio Gevalo	0.4389 per m ³
Volume of provision of water services in the other municipalities of Castile-La Mancha	0.4200 per m ³

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- In the autonomous community of *Extremadura*, the charge on water was

introduced in 2012. It has been used to finance regional spending programmes on the maintenance of the local infrastructure network. The rates are shown in Table 16-24.

Table 16-24: Water Charges in Extremadura

Tax Base	Rate in €
Flat rate for domestic uses	2 per user per month
Flat rate for domestic uses located in secondary neighbourhood areas	4 per household per month
Tax rate for losses in the non-domestic water supply network	0.2500 per m ³
Variable tax rate for non-domestic uses	0.2500 per m ³
Variable rate for domestic water consumption (the rates refer to a household's consumption lower than 10 m ³ , between 10 m ³ and 18 m ³ , and above 18 m ³ per month)	0.1000, 0.2000 and 0.6000 per m ³ depending on the consumption

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/econstat/queries/All_Information.aspx

- In *La Rioja*, a water abstraction tax was introduced by *Ley 5/2000* (Law 5/2000) in 2001. Revenues are used to finance operations of “general interest” such as water collection and treatment, sanitation and maintenance of wastewater treatment plants. Tax revenues amounted to €7.7 million in 2011. The tax rates vary according to the type of consumption (industrial or domestic consumption) – see Table 16-25.

Table 16-25: Water Taxes in La Rioja

Tax Base	Rate in €
Variable rate for domestic water consumption	0.4800 per m ³
Variable rate for industrial water consumption	0.4800 per m ³ and per pollution unit (formula determined through the Law 5/2000 ⁶⁵¹)

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/econstat/queries/All_Information.aspx

- In *Murcia*, a water abstraction tax was introduced in 2001 and revised in 2011 by *Ley 3/2010* (Law 3/2010 of 27 December). Revenues are used

⁶⁵¹ Article 40 of *Ley 5/2000*, de saneamiento y depuración de aguas residuales de *La Rioja*, of 25 October, http://noticias.juridicas.com/base_datos/CCAA/Lr-15-2000.html

to finance the management and conservation of public drainage, purification installations and in some cases investments related to their construction. In 2011, revenues raised from the tax amounted to €0.3 million. The tax rates are listed in Table 16-26.

Table 16-26: Water Taxes in Murcia

Tax Base	Rate in €
Fixed domestic water consumption rate	30 per year and per household
Variable domestic water consumption rate	0.2500 per m ³
Fixed non-domestic water consumption rate	30 per year and activity
Variable non-domestic water consumption rate	0.3400 per m ³

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- The region of Navarra introduced the tax on water extraction in 2001, through the *Ley Foral 10/1988*. Its revenues are used to finance the construction of wastewater treatment plants and general collectors and the management and operation of treatment and purification services. In 2008, the revenues amounted to €24.8 according to the OECD/EEA environmental taxes database. The various rates applied are presented in Table 16-27.

Table 16-27: Water Extraction Taxes in Navarra

Tax Base	Rate in €
Variable domestic water consumption rate	0.5200 per m ³
Variable non-domestic water consumption rate	0.6500 per m ³ if connected to public drainage system, and 0.0800 per m ³ otherwise

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

- Finally, in Valencia, a regional tax on water was introduced in 1993 with a regional law (*Ley Valenciana 2/1992*). Revenues are used to finance the construction, management and operation of wastewater facilities for disposal, treatment and purification of water. According to data provided by the OECD, revenues amounted to €210.3 million in 2011. The various rates are outlined in Table 16-28.

Table 16-28: Water Taxes in Valencia

Tax Base	Rate in €
Fixed rate for domestic and industrial water consumption for municipalities with a consumption inferior to 3000 m ³ (the rates vary for municipalities with less than 3000, between 3001 and 10000, 10001 and 100000 and more than 100.000 inhabitants)	28.6300, 35.0800, 38.6600, 39.5600 per year per household or activity according to the size of the municipality
Variable rate for domestic and industrial water consumption for municipalities with a consumption inferior to 3000 m ³ (the rates vary for municipalities with less than 3000, between 3001 and 10000, 10001 and 100000 and more than 100.000 inhabitants)	0.2840, 0.3320, 0.3640 and 0.3890 per m ³ respectively according to the size of the municipality
Fixed rate for industrial water consumption exceeding 3000 m ³	102.73 – 3593.55 per year per activity depending on the calibre of the water meter
Variable rate for industrial water consumption exceeding 3000 m ³	0.5030 per m ³

Source: OECD and EEA (2014) Database on instruments used for environmental policy, Accessed 12th August 2014, http://www2.oecd.org/ecoinst/queries/All_Information.aspx

16.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 16-29: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	24,271	23,638	-633
Petrol	million litres	4,849	4,849	0
Kerosene	million litres	5,112	5,112	0
LPG	thousand tonnes	1,267	1,224	-43
Heavy Fuel Oil	thousand tonnes	522	507	-15
Natural Gas	TJ (GCV)	489,602	479,337	-10,265
Coal	thousand tonnes	1,095	1,091	-4
Electricity	GWh	191,981	191,756	-225

Figure 16-1: Change in Internal Passenger Flights, flights per year

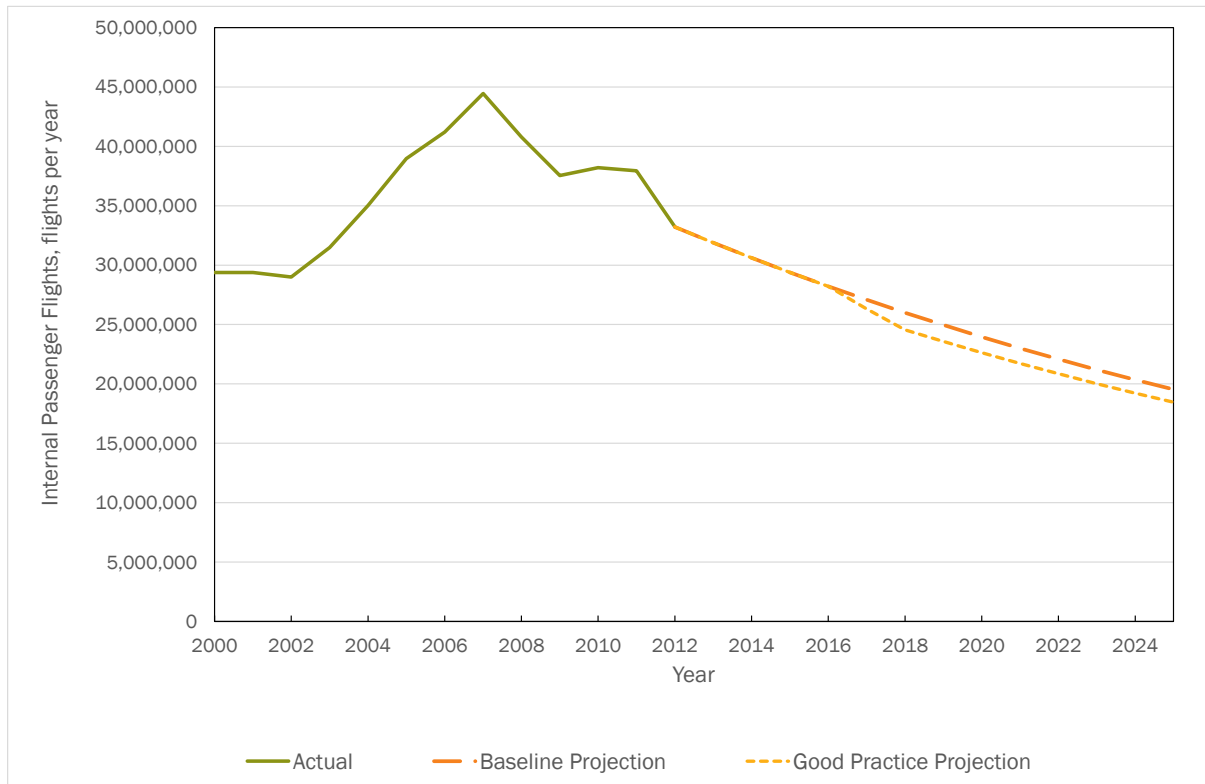


Figure 16-2: Change in Intra-EU Passenger Flights, flights per year

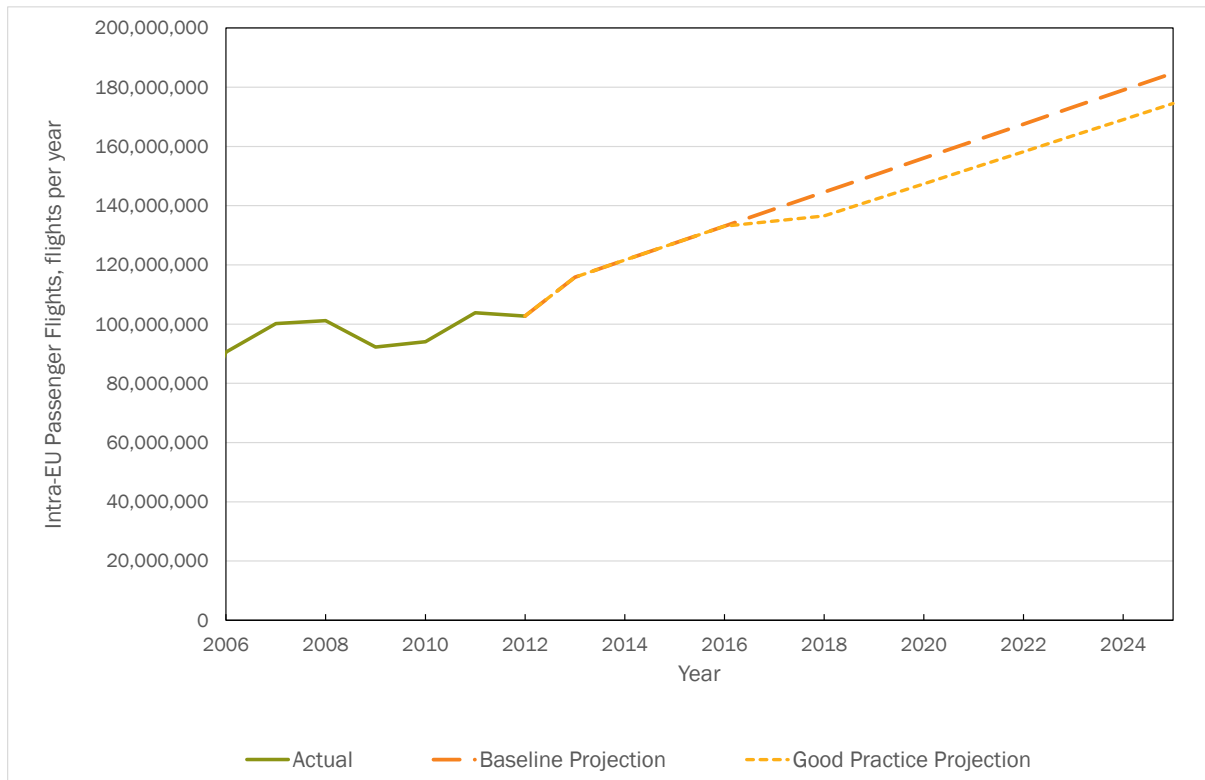


Figure 16-3: Change in Extra-EU Passenger Flights, flights per year

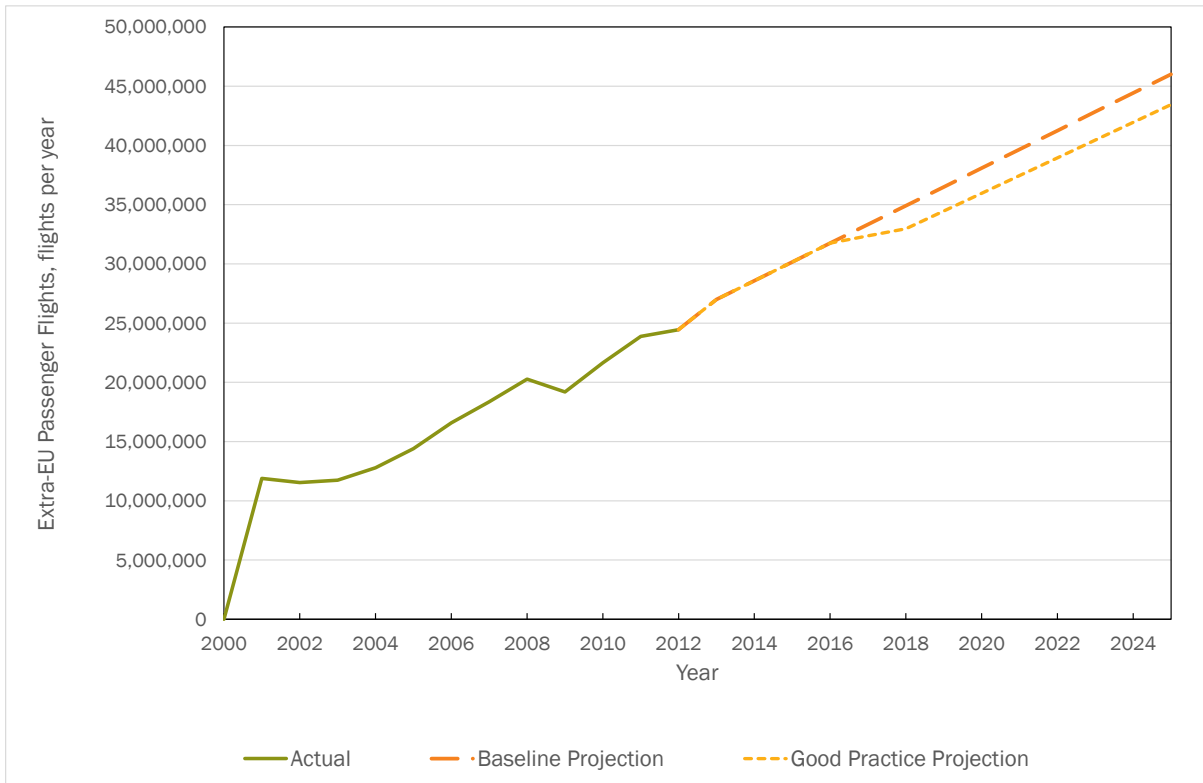


Figure 16-4: Change in Internal Air-freight, tonnes

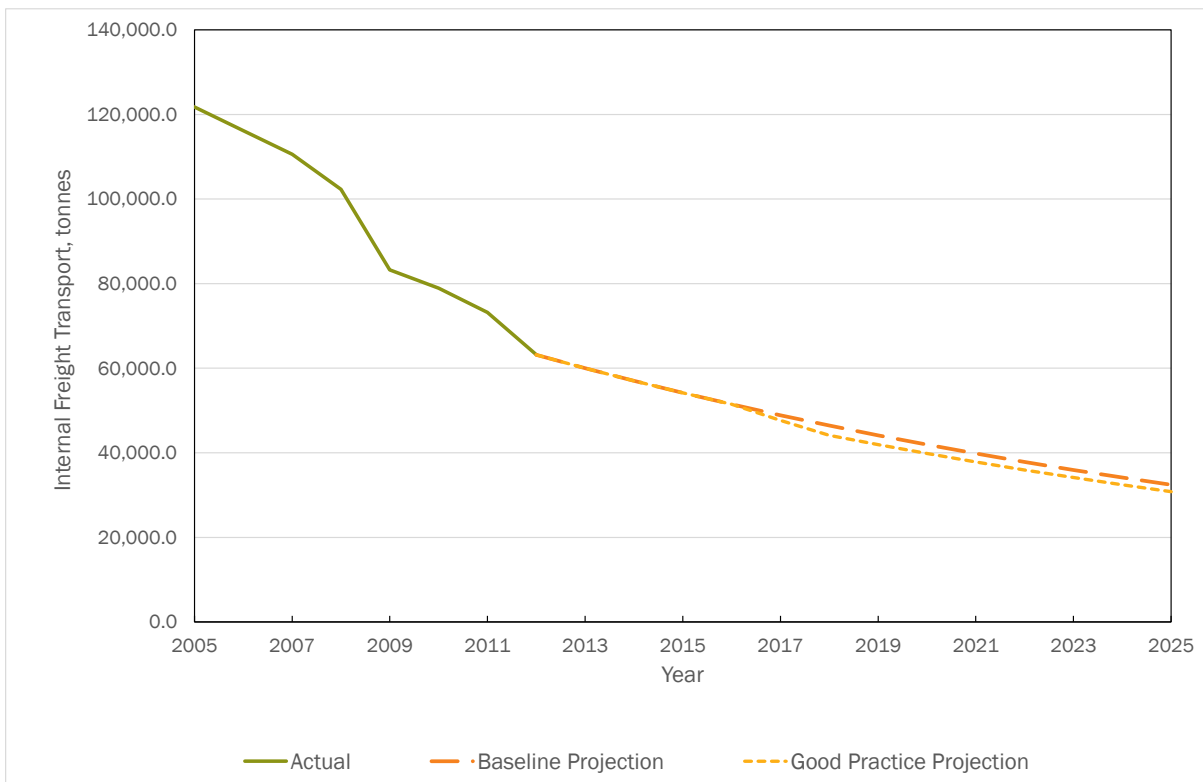


Figure 16-5: Change in Intra-EU Air-freight, tonnes

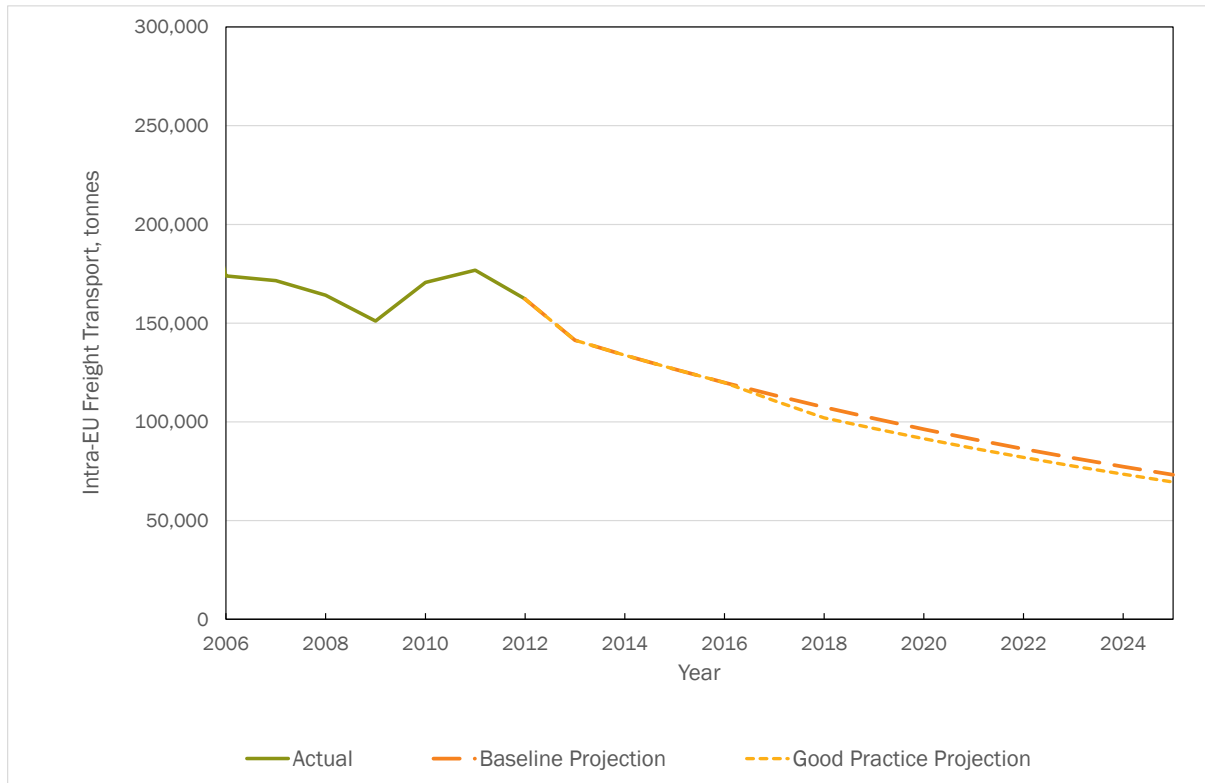


Figure 16-6: Change in Extra-EU Air-freight, tonnes

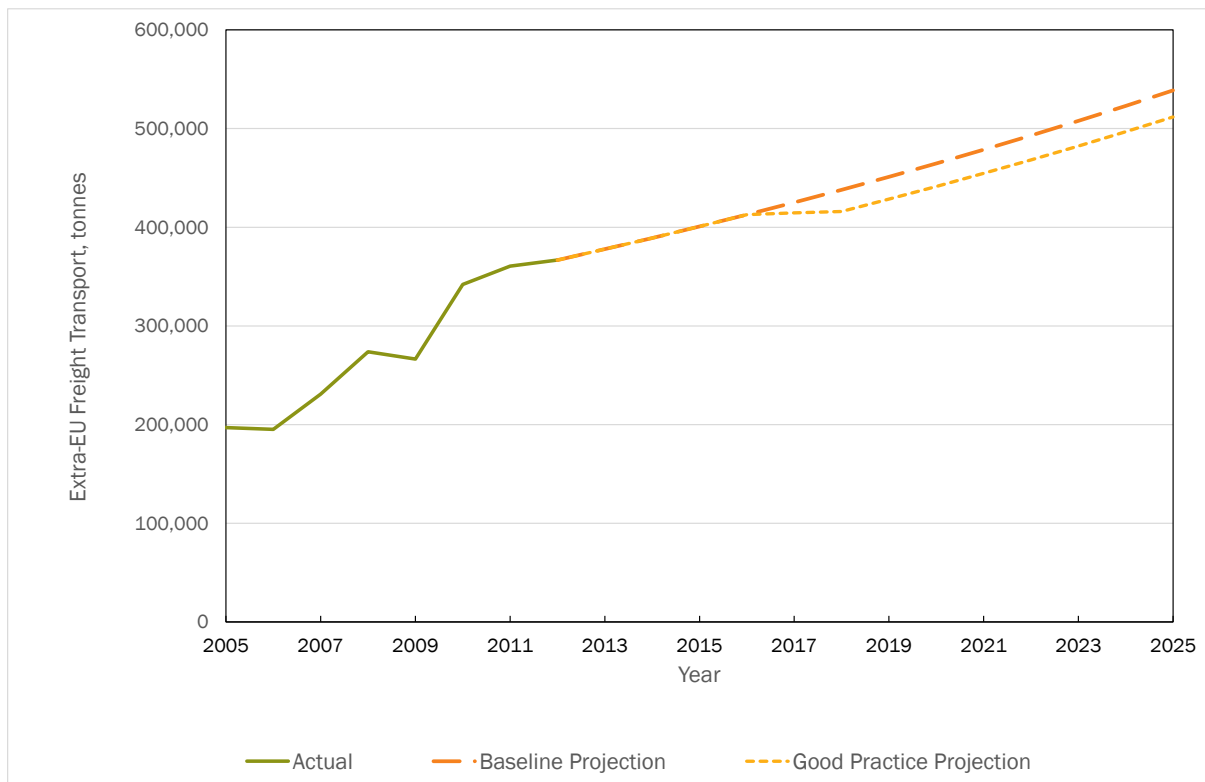


Figure 16-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

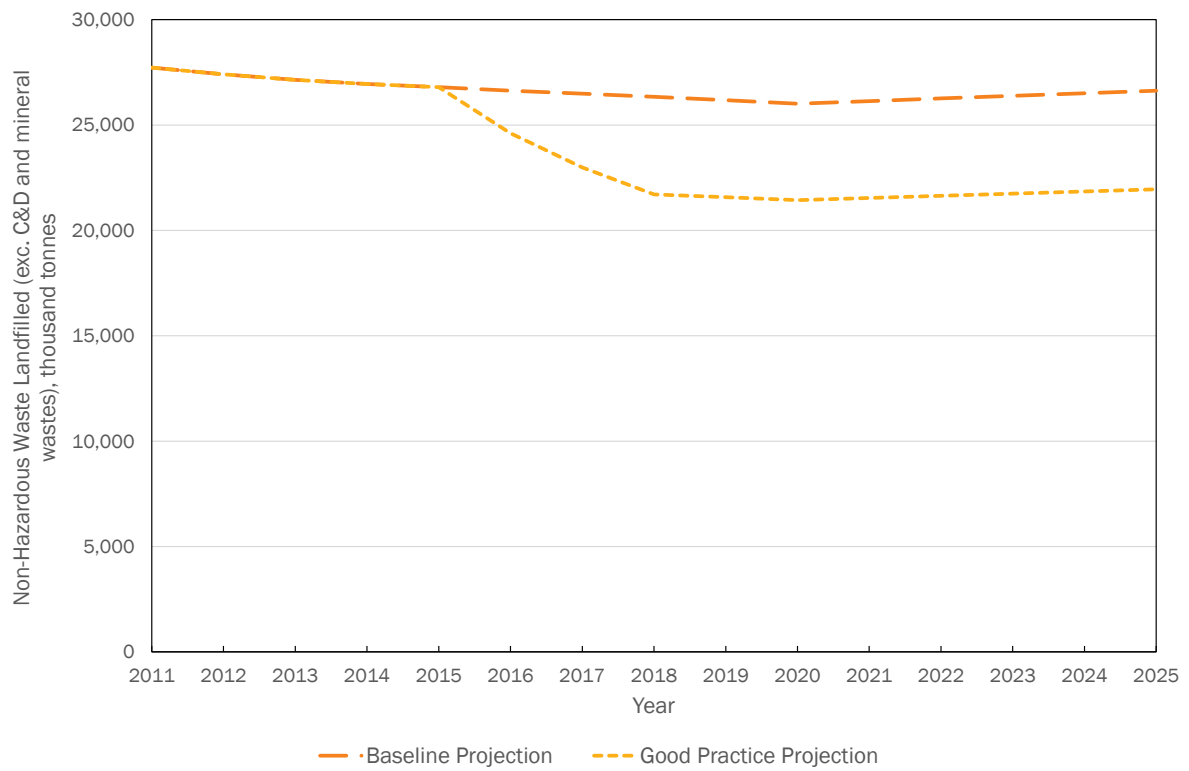


Figure 16-8: Change in MBT/ Incineration, thousand tonnes

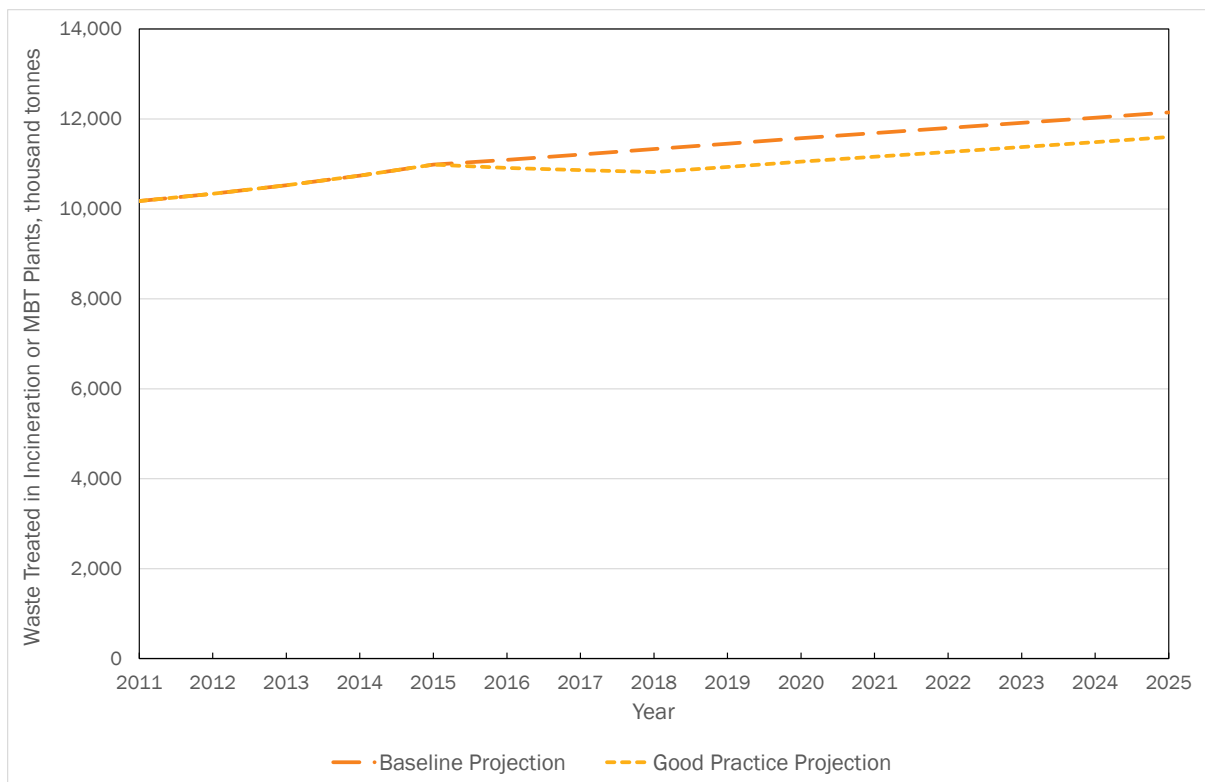


Figure 16-9: Change in SOx Emissions, tonnes

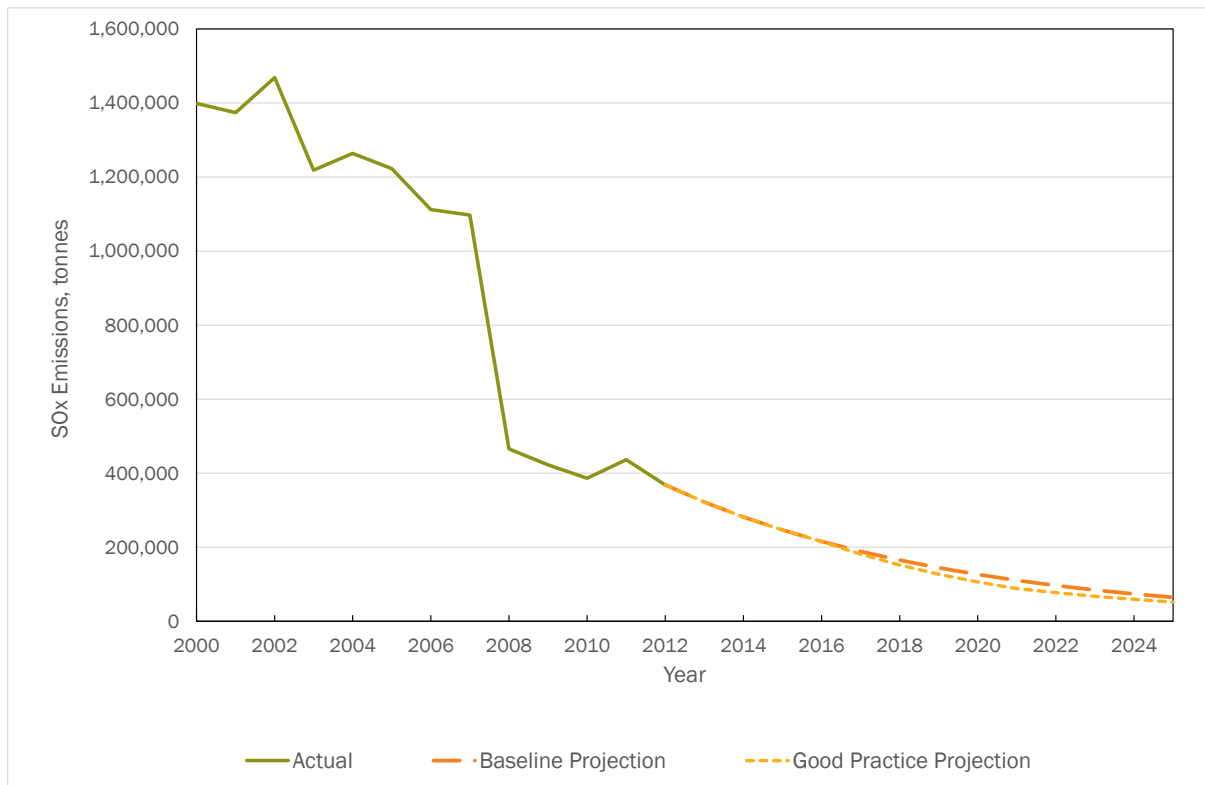


Figure 16-10: Change in NOx Emissions, tonnes

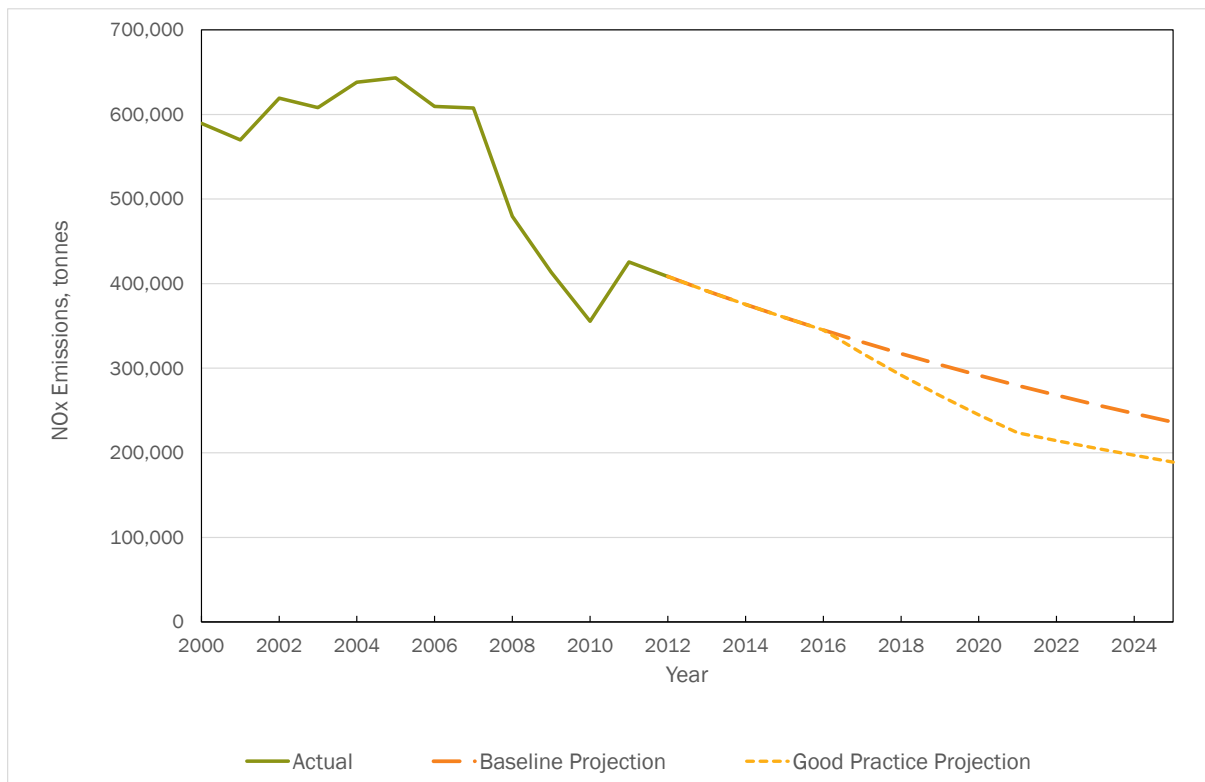


Figure 16-11: Change in PM₁₀ Emissions, tonnes

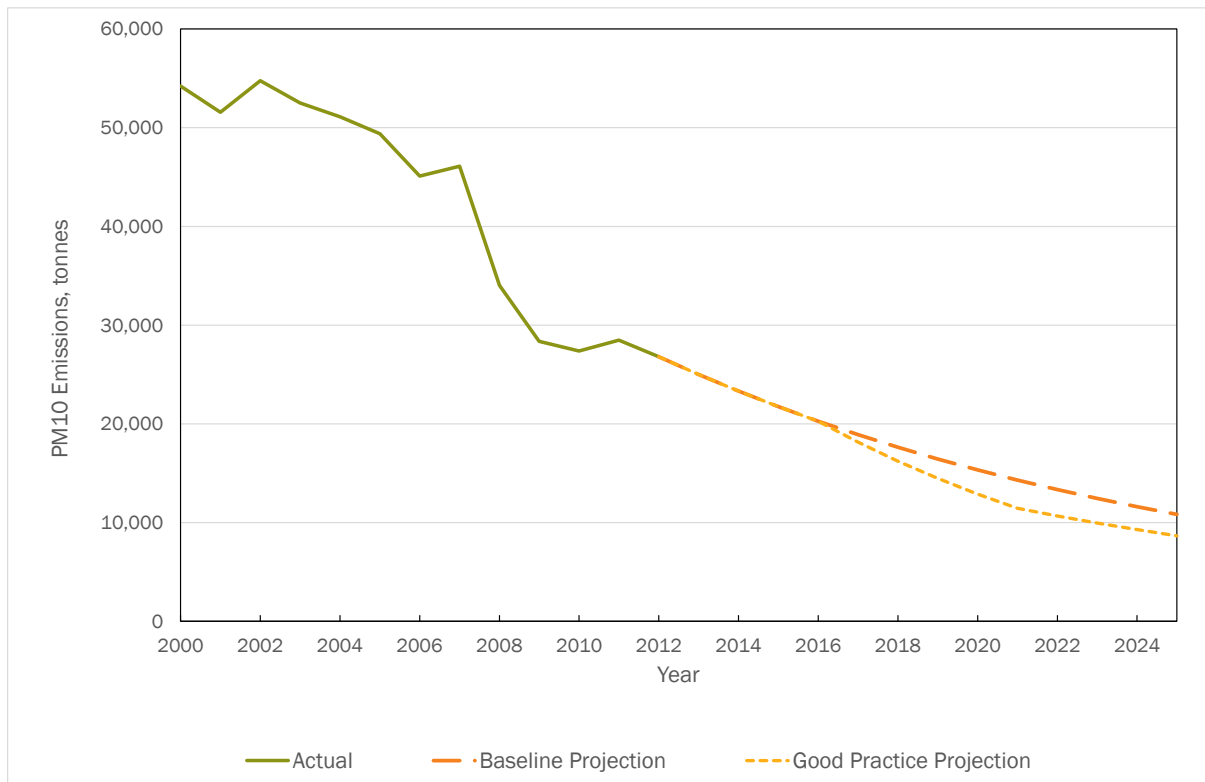


Figure 16-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

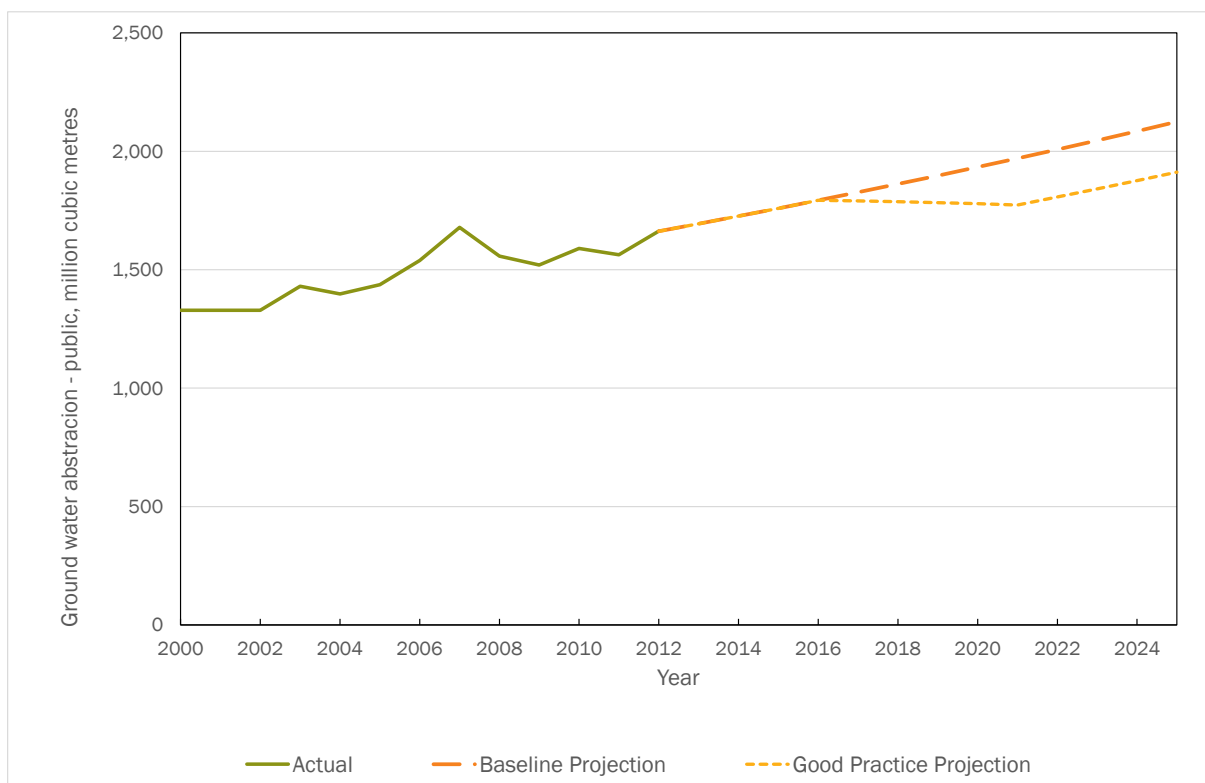


Figure 16-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

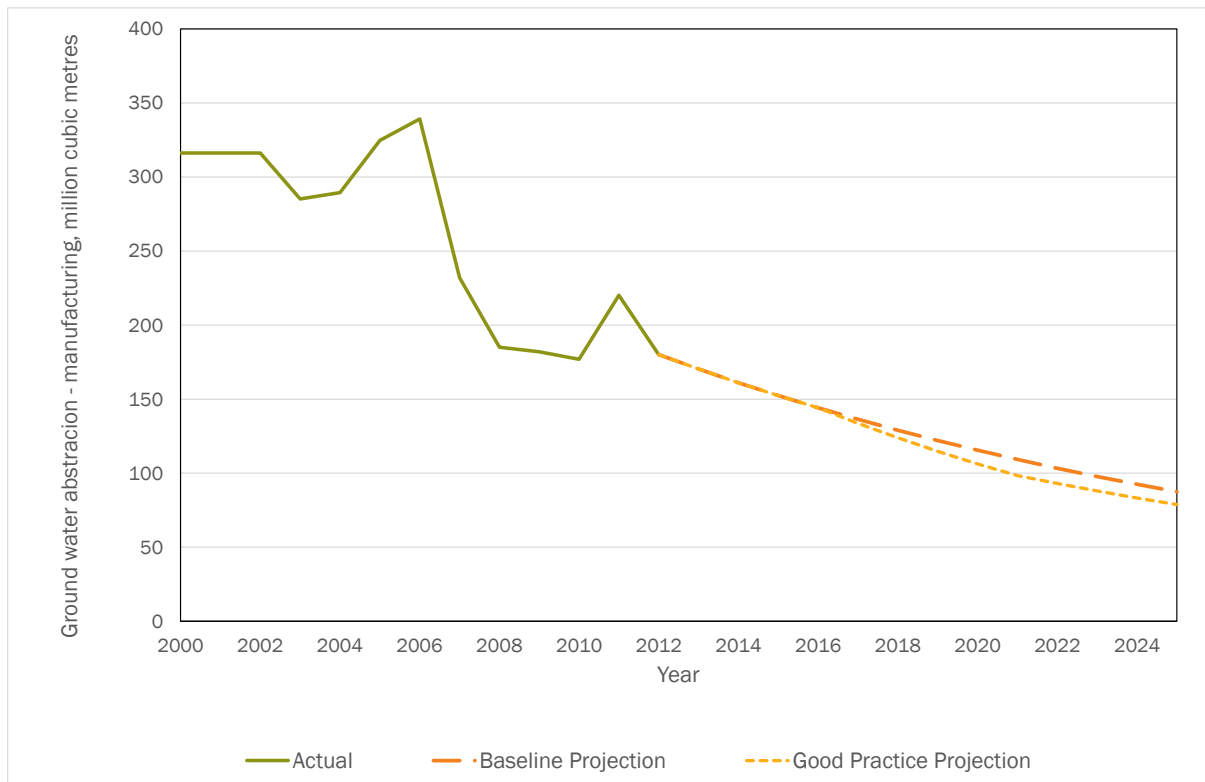


Figure 16-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

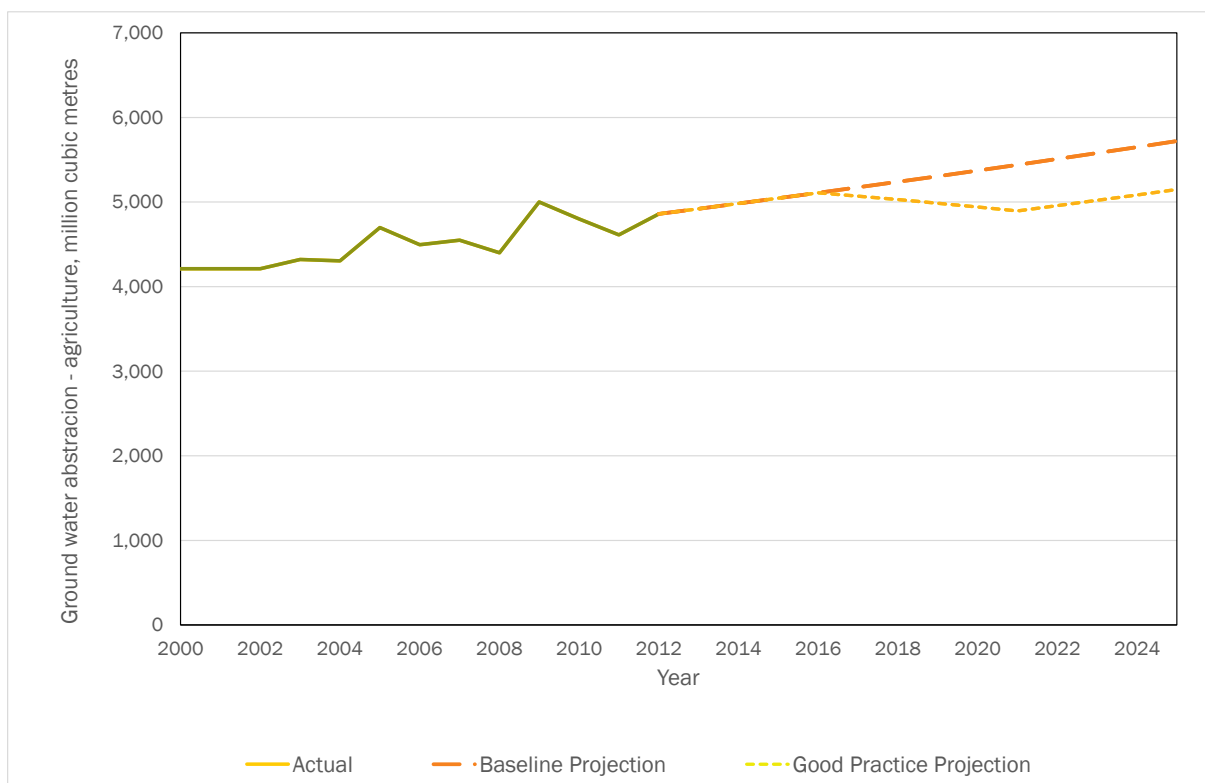


Figure 16-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

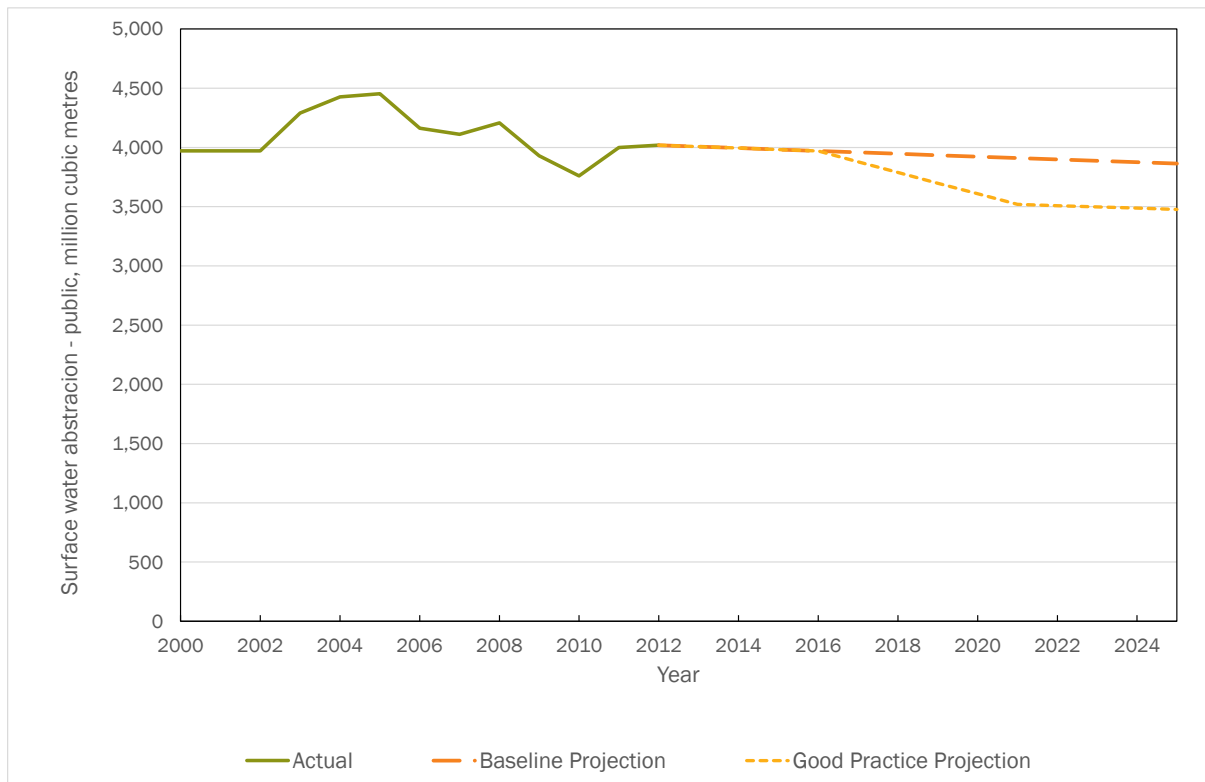


Figure 16-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres



Figure 16-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

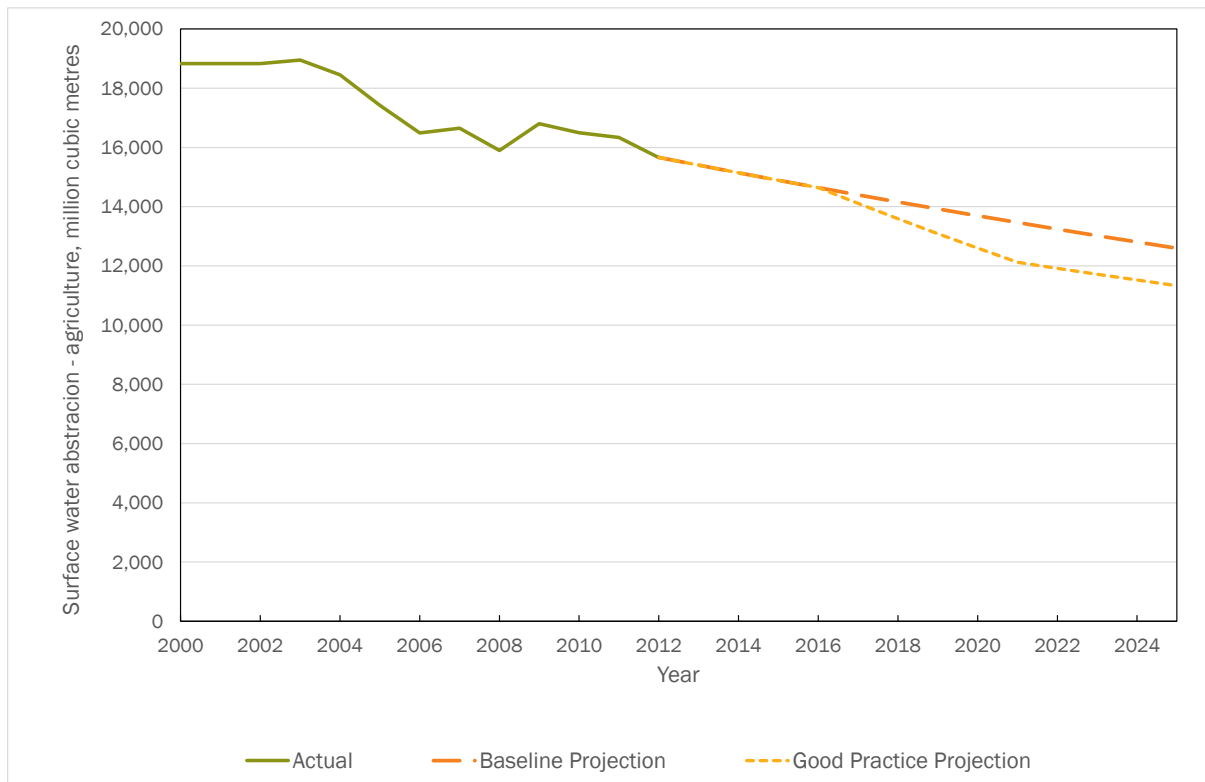


Figure 16-18: Change in Active Ingredients in Pesticides, tonnes

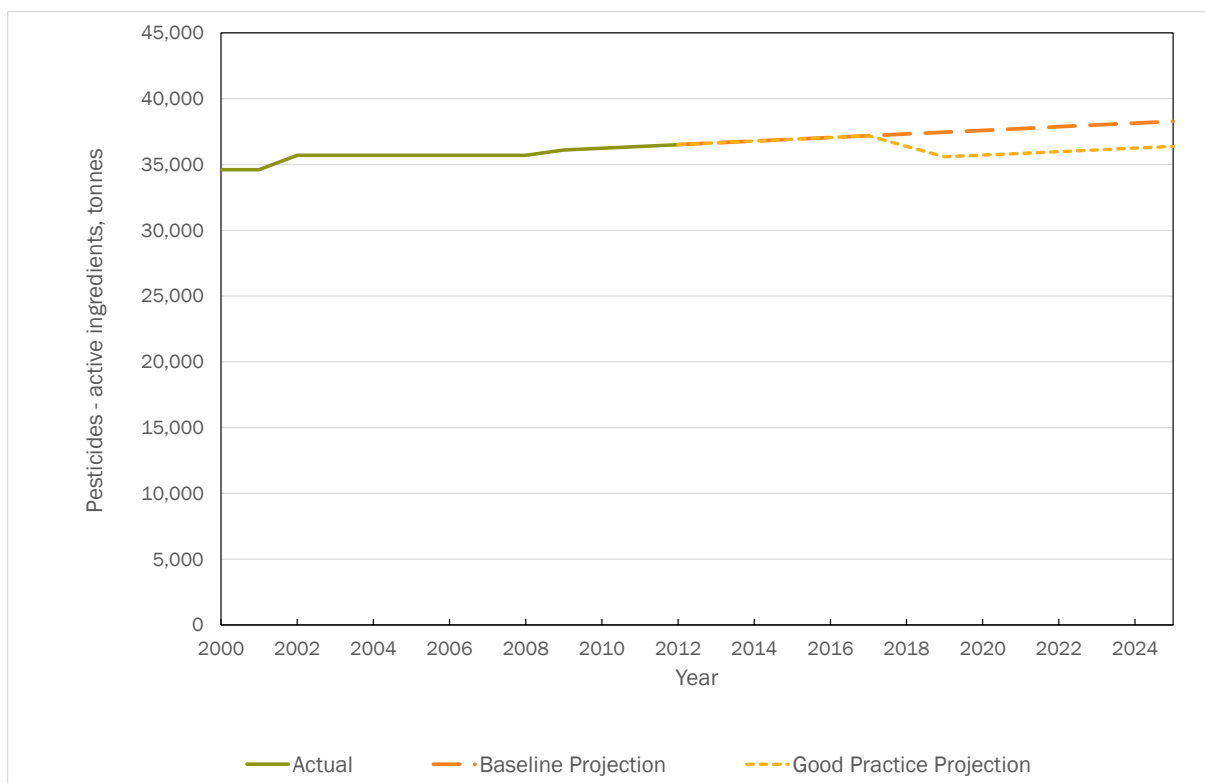


Figure 16-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

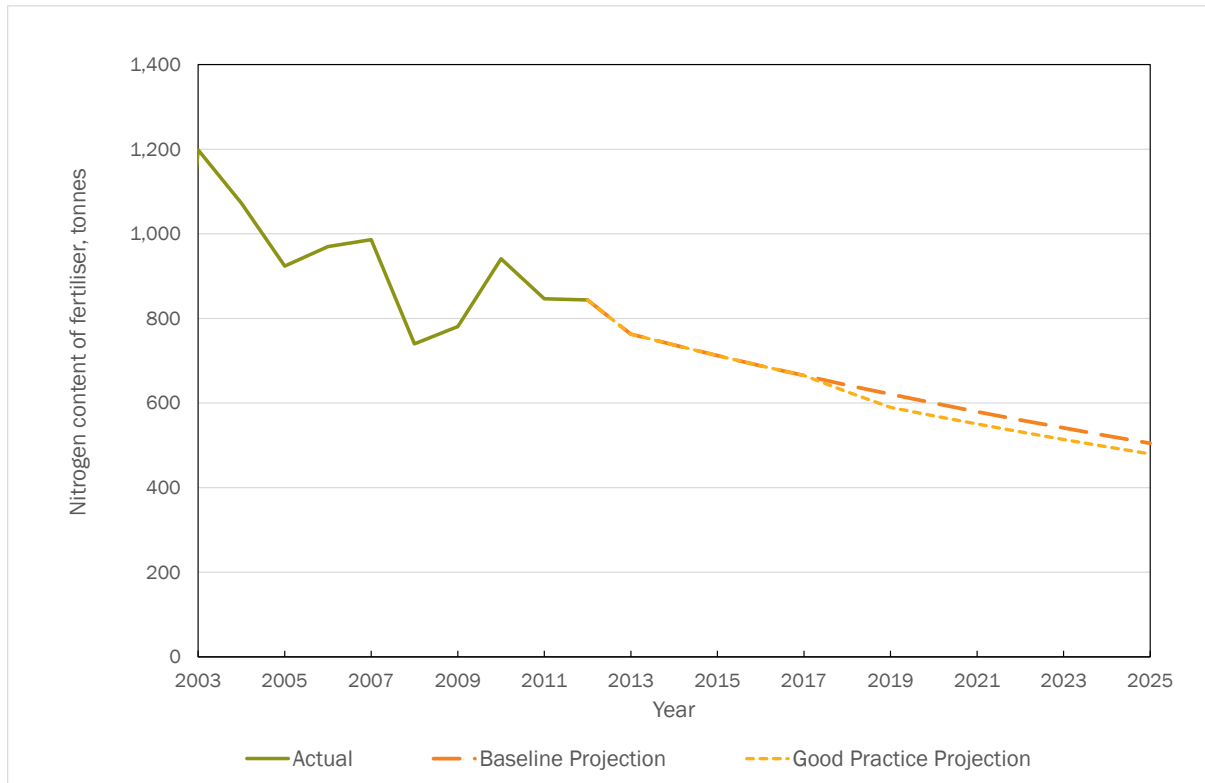


Figure 16-20: Change in Aggregates Extraction, thousand tonnes

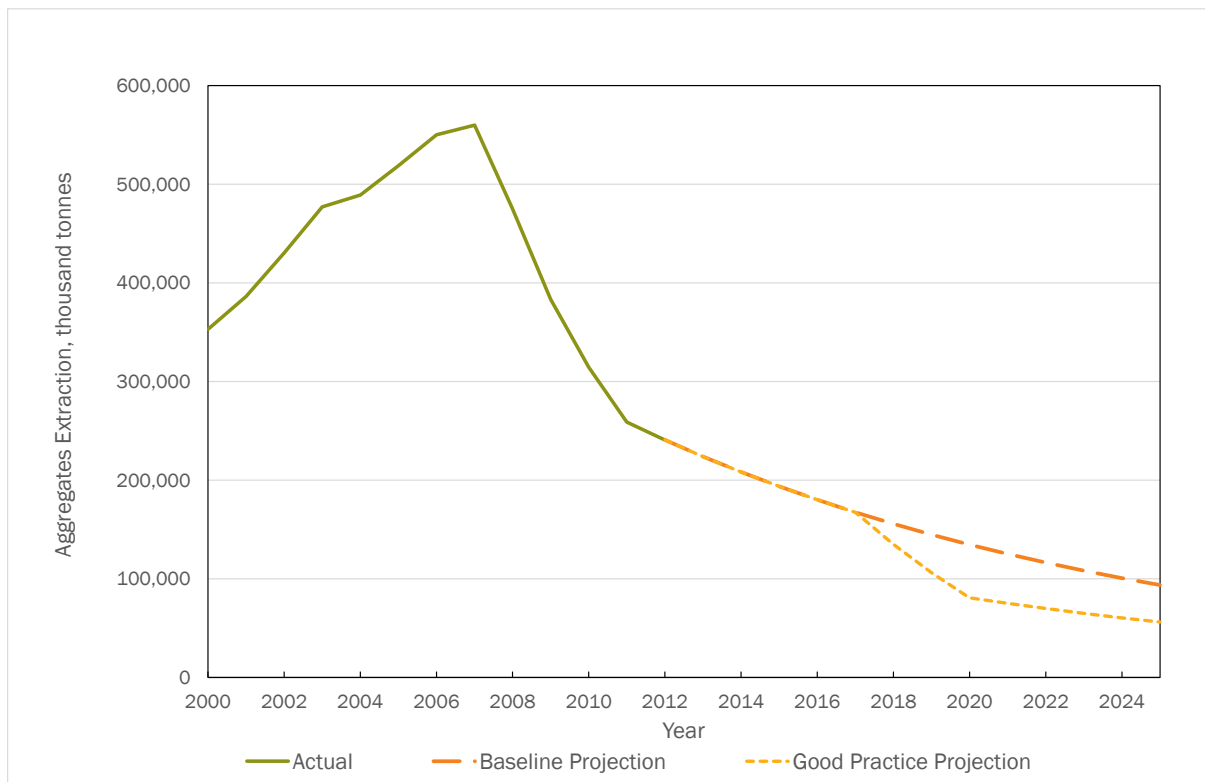


Figure 16-21: Change in Paper & Card Packaging Generation, thousand tonnes

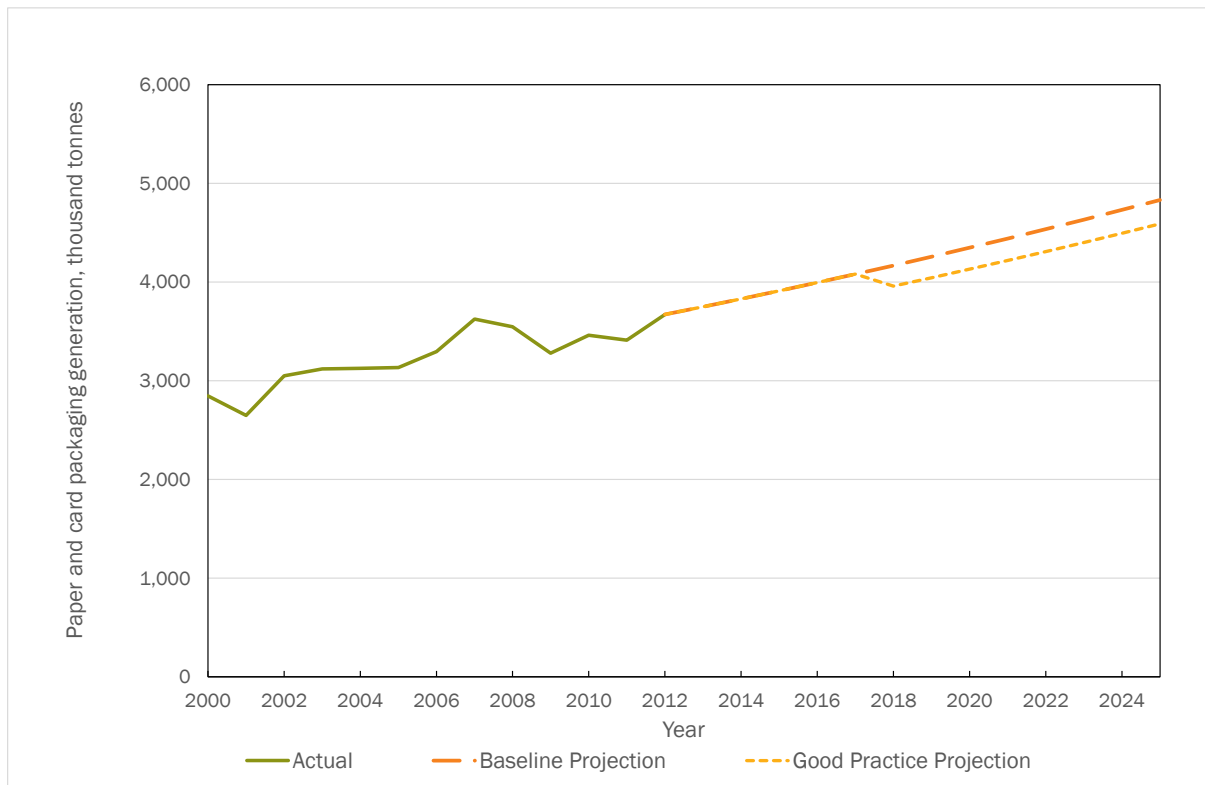


Figure 16-22: Change in Plastic Packaging Generation, thousand tonnes

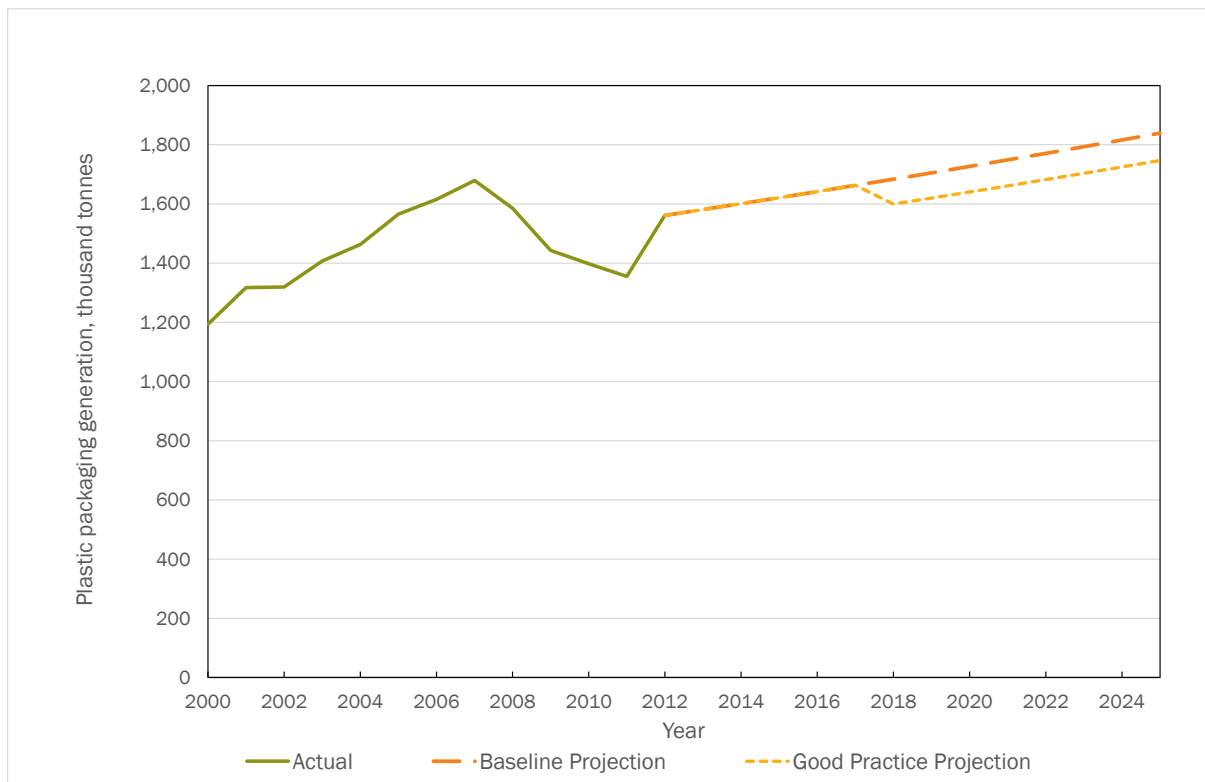


Figure 16-23: Change in Wood Packaging Generation, thousand tonnes



Figure 16-24: Change in Metal Packaging Generation, thousand tonnes

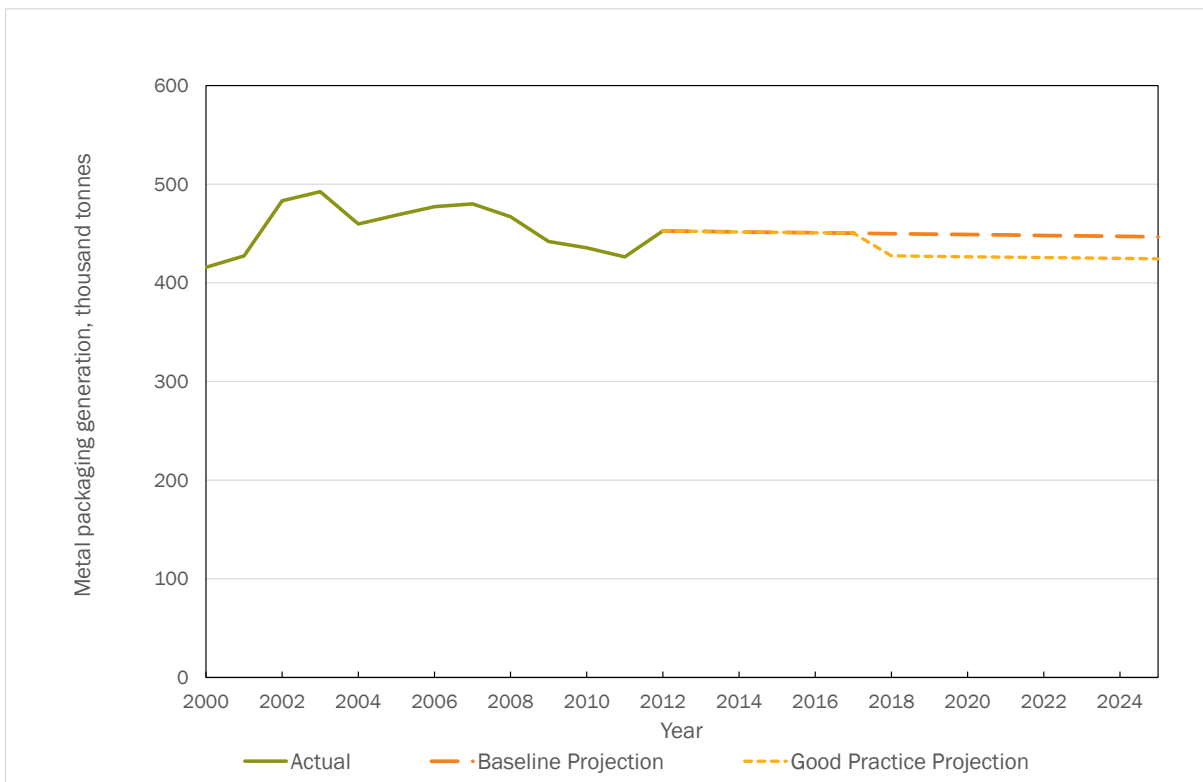


Figure 16-25: Change in Glass Packaging Generation, thousand tonnes

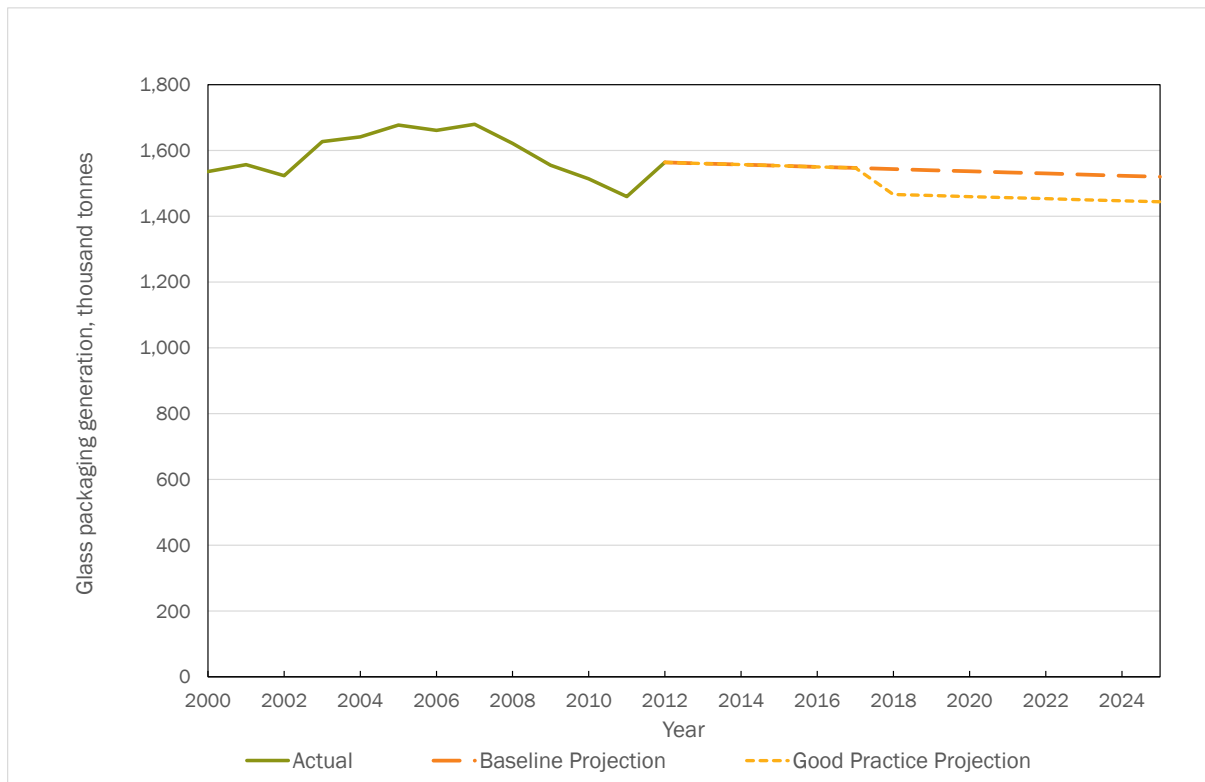
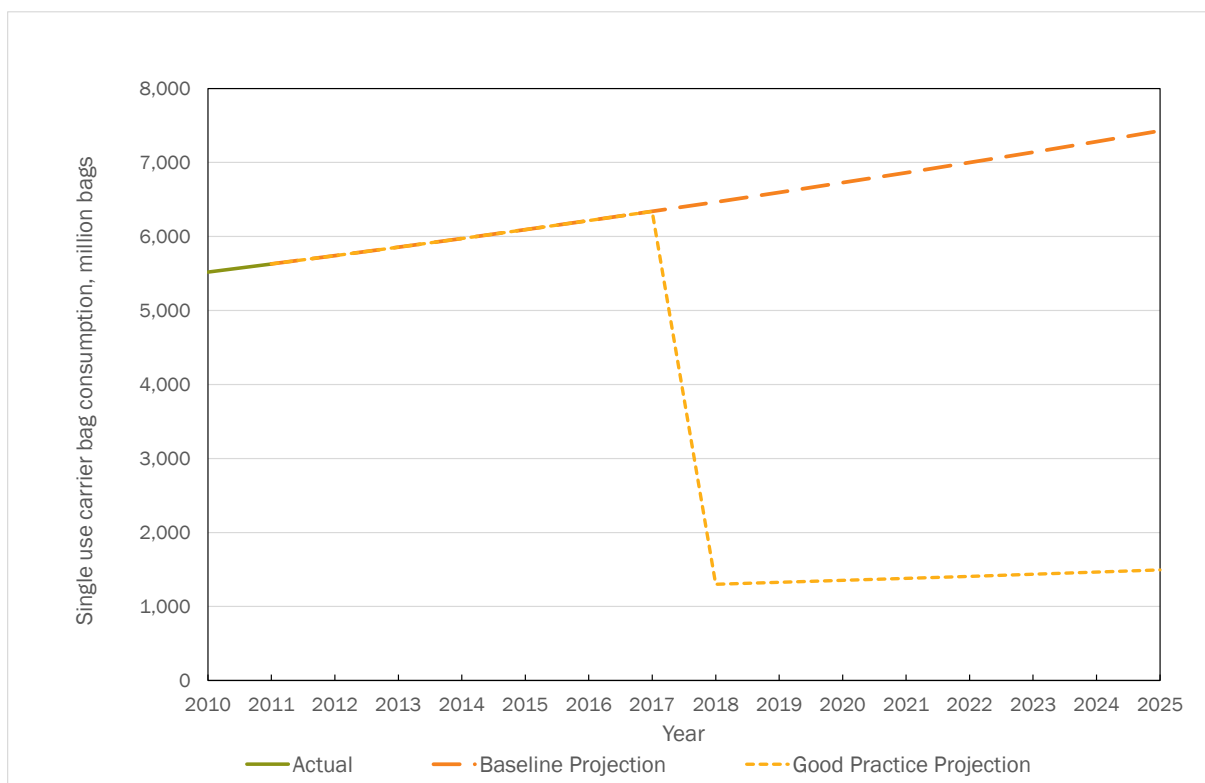


Figure 16-26: Change in Consumption of Single Use Carrier Bags, million bags



16.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 16-30: Revenue Outturns from Model, million EUR (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	379	755	1,130	1,502	1,872	2,241	2,607	2,972	2,972
	C&I / Heating	0	0	166	329	489	513	536	558	580	602	602
	Electricity	0	66	66	66	66	66	66	66	66	66	66
	Sub-total Energy, million EUR	0	66	610	1,150	1,684	2,080	2,474	2,865	3,253	3,639	3,639
	Sub-total Energy, % GDP	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	2,458	4,917	7,376	9,836	12,300	12,302	12,304	12,306	12,308
	Passenger Aviation Tax	0	0	2,692	5,431	5,626	5,823	6,019	6,217	6,415	6,613	6,812
	Freight Aviation Tax	0	0	0	1	1	1	1	1	1	1	1
	Sub-total Transport, million EUR	0	0	5,151	10,348	13,003	15,659	18,320	18,519	18,719	18,920	19,121
	Sub-total Transport, % GDP	0.0%	0.0%	0.5%	1.0%	1.2%	1.5%	1.7%	1.8%	1.8%	1.8%	1.8%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	301	565	804	799	794	798	802	805	809	813
	Landfill Tax - Inerts (C&D)	0	2	4	4	3	2	2	2	2	2	2
	Incineration /MBT Tax	0	41	83	123	125	126	127	128	130	131	132

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	119	212	283	335	372	331	309	289	271	255
	Water Abstraction Tax	0	729	1,427	2,095	2,734	3,345	3,272	3,274	3,276	3,279	3,283
	Waste Water Tax	0	122	237	343	330	330	330	330	330	330	330
	Pesticides Tax	0	0	139	273	267	268	269	270	271	272	273
	Aggregates Tax	0	0	402	324	255	194	180	168	156	145	135
	Packaging Tax	0	0	262	251	254	257	260	263	266	269	272
	Single Use Bag Tax	0	565	576	117	120	122	125	127	130	132	135
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million EUR	0	1,879	3,906	4,618	5,222	5,810	5,694	5,673	5,655	5,641	5,630
	Sub-total Pollution & Resource, % GDP	0.0%	0.2%	0.4%	0.4%	0.5%	0.6%	0.5%	0.5%	0.5%	0.5%	0.5%
Total Revenue Stream	Total, million EUR	0	1,945	9,667	16,116	19,910	23,550	26,488	27,057	27,628	28,200	28,390
	Total, % GDP	0.0%	0.2%	0.9%	1.5%	1.9%	2.2%	2.5%	2.6%	2.6%	2.7%	2.7%

17.0 Sweden

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

17.1 Energy Taxes

➤ Energy Taxes:

- The Sweden excise duties on fuels and electricity are shown in Table 17-1 alongside minimum rates in the existing ETD and the EU-28 average and median rates.

Table 17-1: Standard Rates of Excise Duties on Fuels and Electricity in Sweden

Excise Duty	Unit	Rate Applied in Sweden ^{652 653} (1€=9.0914SEK ⁶⁵⁴)	Existing ETD Minimum	EU-28 Average	EU-28 Median
Motor Fuels – propellant					
Unleaded Petrol	€ per 1000 litres	SEK 5,658 (€622.31) ¹	€359	€519	€509
Gas Oil (Diesel)	€ per 1000 litres	SEK 4,847 (€533.14) ²	€330	€427	€405
Kerosene	€ per 1000 litres	SEK 4,847 (€533.13)	€330	€440	€405
Liquid Petroleum Gas	€ per 1000 kg	SEK 3,249 (€357.35)	€125	€209	€180
Natural Gas	€ per GJ	SEK 58 (€6.36)	€2.60	€3.03	€2.66
Motor Fuels – Industry / Commercial Use – Manufacturing business					
Gas Oil (Diesel)	€ per 1000 litres	SEK 1,971 (€228.37) ³	€21	€221	€163

⁶⁵² These tax rates exclude the sulphur tax and the nitrogen charge; see separate sections for these.

⁶⁵³ Rate increases, many of which are significant, will take effect from 2015 for propellants LPG and gas; and for all industry/business fuels, except coal and heavy fuel.

⁶⁵⁴ Note as the proposed rates for 2015 are used they are converted to EUR using the estimated exchange rate published by Eurostat for 2015.

Excise Duty	Unit	Rate Applied in Sweden ^{652 653} (1€=9.0914SEK ⁶⁵⁴)	Existing ETD Minimum	EU-28 Average	EU-28 Median
		SEK 245 (€26.93) ³			
Kerosene	€ per 1000 litres	SEK 1,971 (€228.37) ³ SEK 245 (€26.93) ³	€21	€283	€330
Liquid Petroleum Gas	€ per 1000 kg	SEK 1,611 (€177.24) ³ SEK 314 (€34.58) ³	€41	€126	€125
Natural Gas	€ per GJ	SEK 30 (€3.31)	€0.30	€1.76	€1.50
Heating – Manufacturing Business Use –					
Gas Oil (Diesel)	€ per 1000 litres	SEK 1,971 (€228.37) ³ SEK 245 (€26.93) ³	€21	€221	€163
Kerosene	€ per 1000 litres	SEK 1,971 (€228.37) ³ SEK 245 (€26.93) ³	€0.00	€270	€330
Heavy Fuel Oil	€ per 1000 kg	SEK 4,110 (€452.02) ³ SEK 258 (€28.34) ³	€15	€70	€25
Liquid Petroleum Gas	€ per 1000 kg	SEK 1,611 (€177.24) ³ SEK 314 (€34.58) ³	€0.00	€82	€40
Natural Gas	€ per GJ	SEK 30 (€3.31) ³ SEK 6.7 (€0.74) ³	€0.15	€1.36	€0.46
Coal and Coke	€ per GJ	SEK 35 (€3.85) ³ SEK 6.6 (€0.72) ³	€0.15	€1.27	€0.31
Heating⁴ – Non-Business Use (incl. non-manufacturing business use)					
Gas Oil (Diesel)	€ per 1000 litres	SEK 3,904 (€429.41)	€21	€179	€125
Kerosene	€ per 1000 litres	SEK 3,904 (€429.41)	€0.00	€279	€330
Heavy Fuel Oil	€ per 1000 kg	SEK 4,110 (€452.02)	€15	€85	€26
Liquid Petroleum Gas	€ per 1000 kg	SEK 4,297 (€472.65)	€0	€111	€42

Excise Duty	Unit	Rate Applied in Sweden ^{652 653} (1€=9.0914SEK ⁶⁵⁴)	Existing ETD Minimum	EU-28 Average	EU-28 Median
Natural Gas	€ per GJ	SEK 80 (€8.84)	€0.3	€2.04	€0.94
Coal and Coke	€ per GJ	SEK 116 (€12.81)	€0.3	€1.77	€0.32
Electricity					
Business Use - manufacturing	€ per MWh	SEK 5 (€0.55)	€0.5	€8.42	€1.03
Non-Business Use - and non-manufacturing business	€ per MWh	SEK 293 (€32.23)	€1.0	€14.53	€2.06
<p>Notes:</p> <ol style="list-style-type: none"> 1. This rate is for Class 2 petrol. Class 1b has a rate of €619.27. 2. This rate is for Class 1 diesel. Class 2 has a rate of 562.73 and Class 3 a rate of €578.24. Reduced rate for agricultural motor fuel is €346.16 3. Different rates for non-ETS and ETS installations (the latter are exempt from the CO₂-tax). 4. For CHP within ETS the CO₂-tax is reduced with 93 per cent; other heating has a reduction of 6 per cent. 					

Source: DG TAXUD (2013) Excise Duty Tables (Part II – Energy products and Electricity), Situation as at 1 July 2013, http://ec.europa.eu/taxation_customs/index_en.htm#

- Overall most of the carbon and energy tax burden falls on the residential, commercial and public service sectors, while energy-intensive industries under ETS accounting for 1/3 of Sweden's carbon emissions are taxed at rates close to the obligatory minimum rates.
- With the large share of hydropower and nuclear power the treatment of biofuels implies that almost of half of Sweden's energy use is not subject to any energy tax.
- There is an exemption from energy tax and CO₂ tax for FAME, ethanol and biofuels when these are based on biomass of sustainable origin.
- FAME (fatty acid methyl esters) is produced from vegetable or animal oils, such as rape-seed oil, for admixture into vehicle fuels.
- Ethanol used as low admixture in petrol is exempt from tax up to admixture for 6.5 per cent by volume.
- Biofuels used as low admixture in diesel oil is exempt from tax up to admixture for 5 per cent by volume.

- The exemptions in most cases seem to be 100%, with some exceptions: For ethanol etc. the energy tax reduction is 89% and for FAME it is 84%.⁶⁵⁵
- The carbon tax is not applied to peat, a highly carbon-intensive fuel, used mainly in ETS-covered installations, notably heat and power plants. The foregone revenues amount to annually about €220 million.⁶⁵⁶
- The carbon and energy taxes are not applied to domestic aviation. The foregone revenues amount to annually about €220 million.⁶⁵⁷
- The carbon and energy taxes are not applied to domestic shipping. The foregone revenues amount to annually about €130 million.⁶⁵⁸
- There is a reduced carbon tax rate for use of diesel in agriculture and forestry. The foregone revenues amount to annually about €150 million.⁶⁵⁹

17.2 Transport Taxes (Excluding Transport Fuels)

➤ Circulation Tax:

- Green vehicles (classified Euro 5, Euro 6, Electric and hybrid) are since 2010 fully exempted from the circulation tax during the first 5 years after registration.
- There is a tax reduction for cars registered in certain communities in the countryside (glesbygd⁶⁶⁰) by SEK 384 per vehicle and year.
- Since 2010 the CO₂-based circulation tax applies also to light-duty vehicles.⁶⁶¹ Light duty vehicles registered for the first time before 2010 are subject to a weight-based tax scale (see Table 17-2 for the tax rates).
- The circulation tax on heavy goods vehicles is relatively lower than the tax on passenger cars, and it depends on various factors, including type of fuel used, axes, weight and EU environmental classification.
- The following vehicles are exempt from circulation tax⁶⁶²: vintage vehicles older than 30 years, trailers less than 750 kg, emergency vehicles, certain

⁶⁵⁵

<https://www.skatteverket.se/foretagorganisationer/skatter/punktskatter/energiskatter/energiskatterpabranslen/skattebefrielseforbi drivmedel.4.2b543913a42158acf800021393.html>

⁶⁵⁶ OECD; in press.

⁶⁵⁷ OECD; 2013, Inventory of estimate budgetary support and tax expenditures for fossil fuels 2013.

⁶⁵⁸ OECD; 2013, Inventory of estimate budgetary support and tax expenditures for fossil fuels 2013.

⁶⁵⁹ OECD; 2013, Inventory of estimate budgetary support and tax expenditures for fossil fuels 2013.

⁶⁶⁰ <http://www4.skatteverket.se/rattsligvagledning/edition/2014.1/1848.html#h-Glesbygdsavdrag>

⁶⁶¹ <http://www4.skatteverket.se/rattsligvagledning/edition/2014.1/1848.html#h-Berakning-enligt-det-koldioxidbaserade-skattesystemet>

⁶⁶²

<http://www.skatteverket.se/privat/skatter/biltrafik/fordonsskatt.4.18e1b10334ebe8bc80003864.html>

tractors, heavy terrain vehicles not used on the entire road network, motorised equipment less than 2 tonnes, trailers > 3 tonnes when hauled by diesel fuelled vehicles.

Table 17-2: Circulation Tax for Light-Duty Vehicles < 2010 (Source: Swedish Tax Authority,2014)⁶⁶³

Weight	Light Trucks, Buses and Class-II Passenger Vehicles	
	Non-diesel (SEK)	Diesel (SEK)
0 - 1300	780	2247
1301-1400	963	2399
1401-1500	1127	2458
1501-1600	1291	2517
1601-1700	1456	2577
1701-1800	1585	2755
1801-1900	1714	2933
1901-2000	1843	3111
2001-2100	1972	3289
2101-2200	2101	3467
2201-2300	2230	3645
2301-2400	2359	3823
2401-2500	2488	4001
2501-2600	2617	4179
2601-2700	2746	4357
2701-2800	2875	4535
2801-2900	3004	4713
2901-3000	3133	4891
3001-	3257	5078

- Since 1998 heavy-goods vehicles above 12 tonnes, both Swedish and foreign, are levied a road user charge in accordance with the Eurovignette directive. Charges depend on the exhaust class of the vehicle and the number of axles.⁶⁶⁴ Charges for 2013 are summarised in Table 17-3.
- There are exemptions for 'vintage' vehicles older than 30 years, vehicles of the armed forces, the police, the state, the municipality, or if used for emergency services. Road maintenance vehicles are also exempt.

⁶⁶³

<http://www.skatteverket.se/download/18.2b543913a42158acf800024151/1363260045853/Fordonsskatttabeller+20130101.pdf>

⁶⁶⁴ <http://www4.skatteverket.se/rattsligvagledning/edition/2014.1/1848.html#h-Tung-lastbil-och-tung-buss>

Table 17-3: Road Charge for Heavy-duty Vehicles (Source: NMR, 2014)⁶⁶⁵

Number of Axels	Exhaust Class	Annual Road Charge (2013) SEK
Two or three	Euro 0	8,134
Two or three	Euro 1	7,202
Two or three	Euro 2 or cleaner	6,354
Four or more	Euro 0	13,133
Four or more	Euro 1	11,862
Four or more	Euro 2 or cleaner	10,591

17.3 Pollution and Resource Taxes

➤ Sulphur Tax:⁶⁶⁶

- The sulphur tax is due on the input side, not on actual emissions, but there is a deduction available for the effects of desulphurisation with flue gas equipment or where sulphur is embedded in a resulting product. Although it applies to the same fuels as the energy and CO₂ taxes, the same reductions or refunds do not apply. Sulphur tax also applies to peat, but not crude oil.
- The rate of the sulphur tax is 30 SEK per kg. sulphur in solid fuels and gas. For fluids the tax rate is for each decedentile weight per cent at SEK 27 per m³ of sulphur.
- For low-sulphur gasoil with 0.10% sulphur the tax amounts to SEK 0.027 per litre or about 0.3 eurocent.
- The sulphur tax does not apply where the contents of sulphur are below 0.05% of the fuel weight, which implies that no motor fuels are subject to sulphur tax in Sweden.
- Certain industrial processes, such as in non-metal mineral industries (cement, tile, ceramics, mineral insulation etc.) are exempt from sulphur tax. A deduction is possible where fuels have been used to produce taxable electricity or in CHP, as well as for purposes related to aviation, shipping and railways. Agriculture and forestry may deduct the sulphur tax for non-motor fuels.

➤ Waste Tax:

⁶⁶⁵ Nordic Council of Ministers, 2014, The use of economic instruments in Nordic environmental policy, Copenhagen.

⁶⁶⁶ Swedish Tax Authority, 2013, Handledning för punktskatter, Stockholm.

- Landfills and other sites where waste (>50 tonnes per year) is deposited for more than 3 years are liable. Deductions can be made for waste that is removed again from the site, e.g. for reuse.
- The waste tax does not apply for sites that only store soil, gravel, clay, stones or mine residuals etc. including certain residuals from cement production. Tile and concrete is not subject to exemption. Waste from metallurgical processes is exempt as well as several other wastes with toxic or hazardous components.
- Where waste material is applied as an alternative material for construction of harbours, for skiing hills or for noise walls etc. it is regarded as reuse and the site is not tax liable.
- The tax is weightbased, while there is also a detailed table for converting volumes of certain materials into weight.
- The tax on waste for incineration was abolished in 2010, but the tax applies to any residuals from incineration (slags and cinders etc).

17.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 17-4: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	402	392	-10
Petrol	million litres	264	265	1
Kerosene	million litres	77	77	0
LPG	thousand tonnes	22	19	-3
Heavy Fuel Oil	thousand tonnes	37	34	-3
Natural Gas	TJ (GCV)	1,862	1,648	-213
Coal	thousand tonnes	15	15	0
Electricity	GWh	9,523	8,683	-840

Figure 17-1: Change in Internal Passenger Flights, flights per year

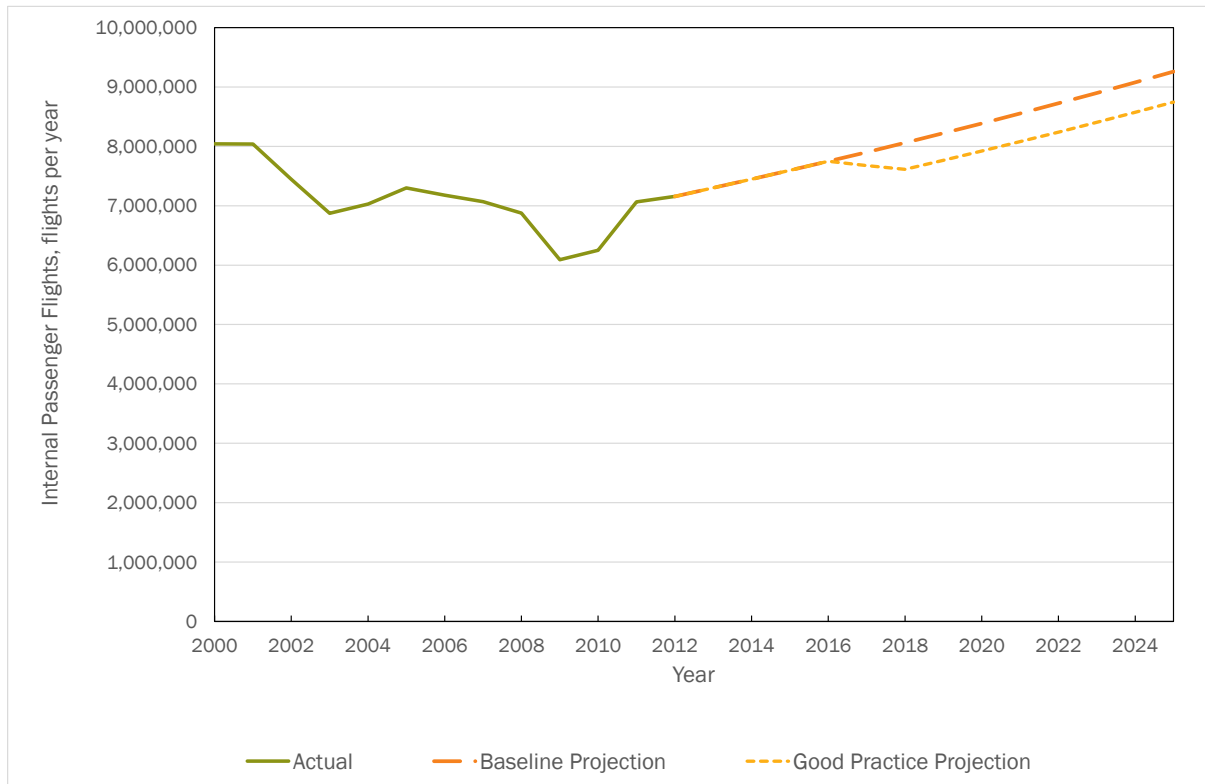


Figure 17-2: Change in Intra-EU Passenger Flights, flights per year

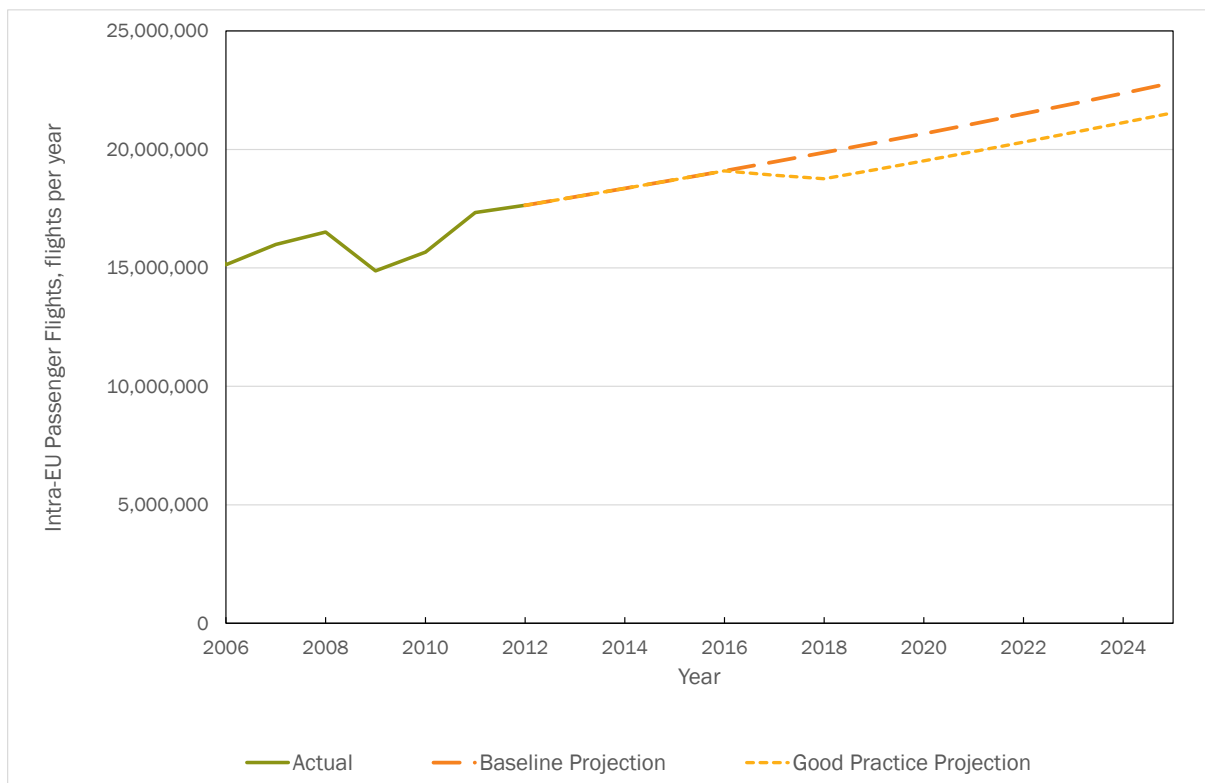


Figure 17-3: Change in Extra-EU Passenger Flights, flights per year

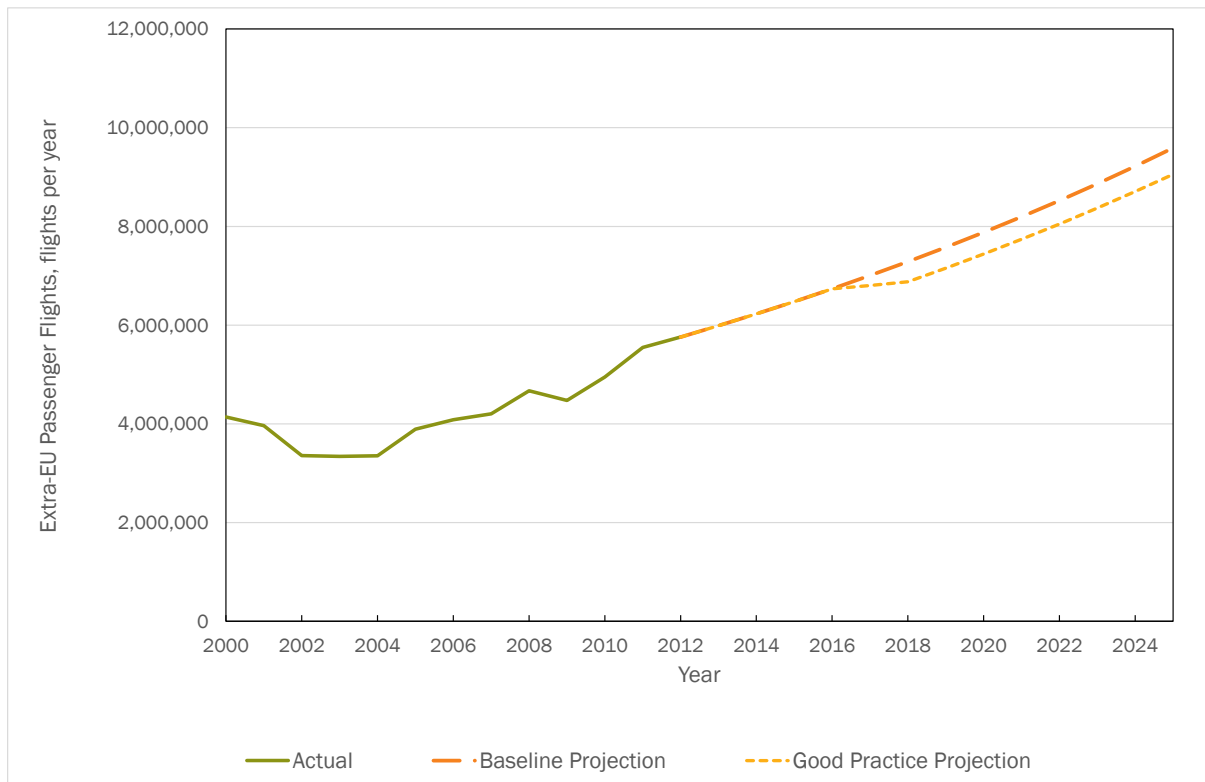


Figure 17-4: Change in Internal Air-freight, tonnes

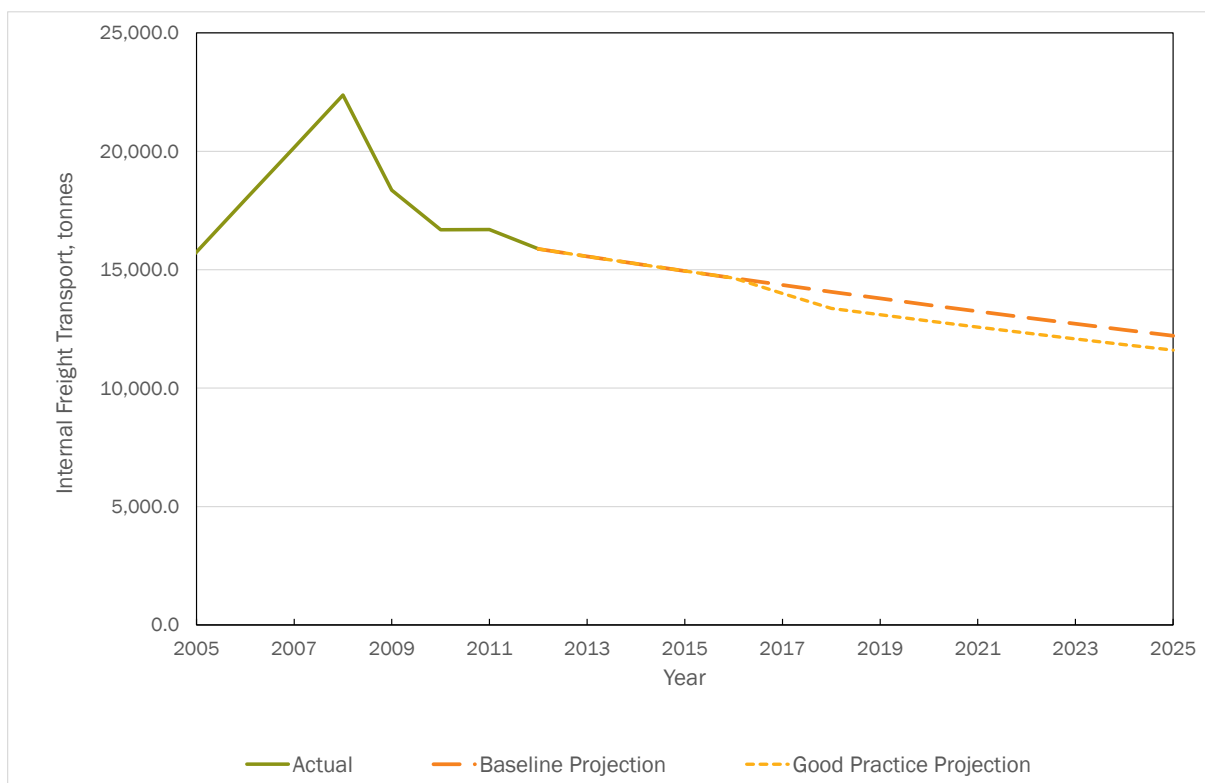


Figure 17-5: Change in Intra-EU Air-freight, tonnes

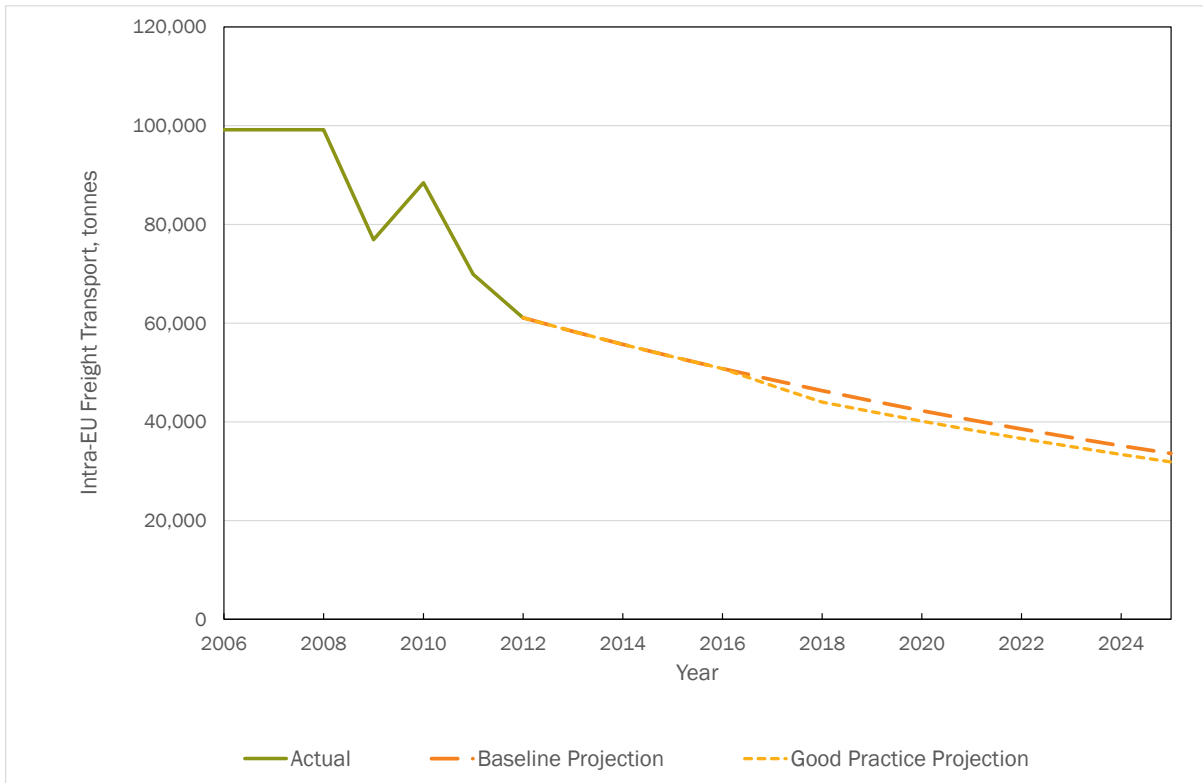


Figure 17-6: Change in Extra-EU Air-freight, tonnes

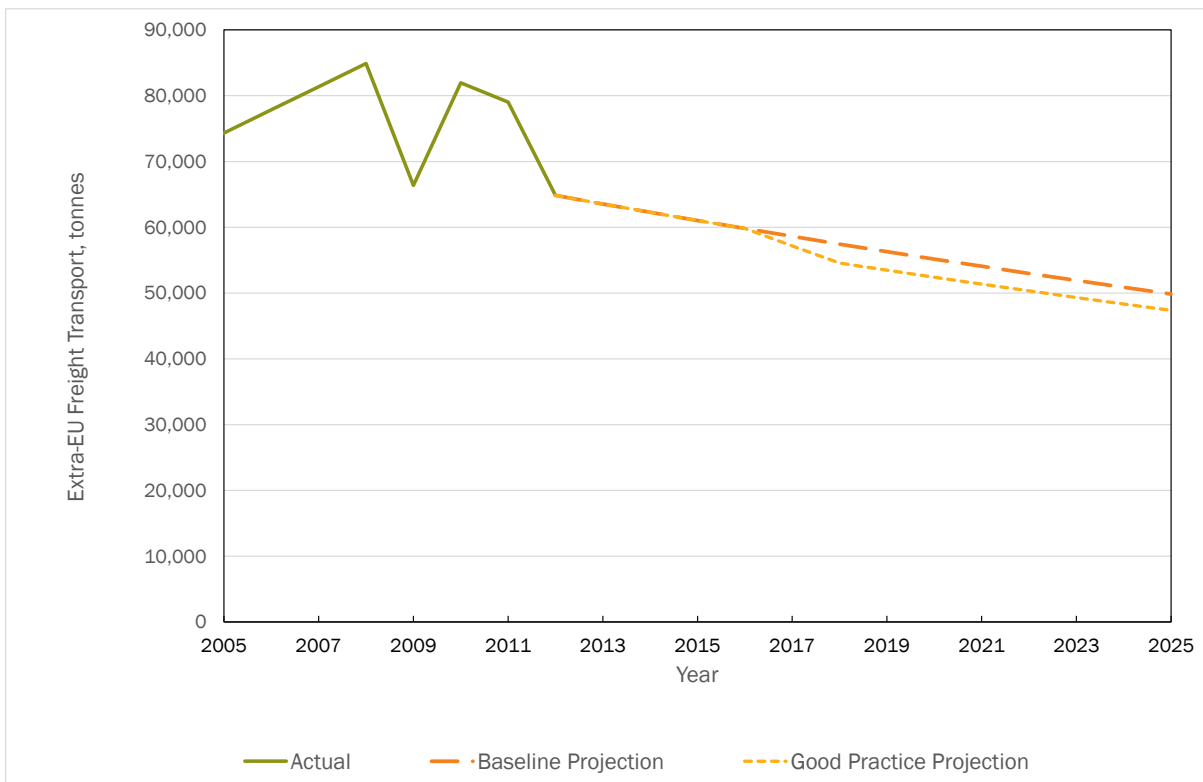


Figure 17-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

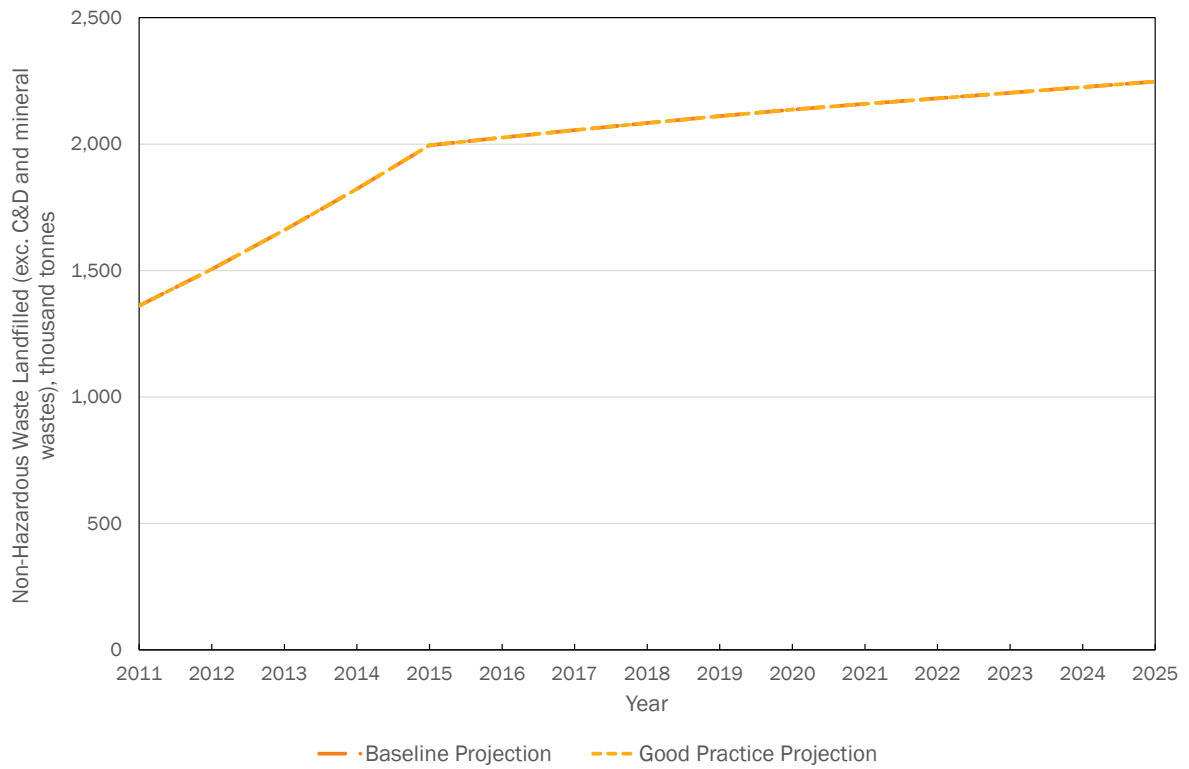


Figure 17-8: Change in MBT/ Incineration, thousand tonnes

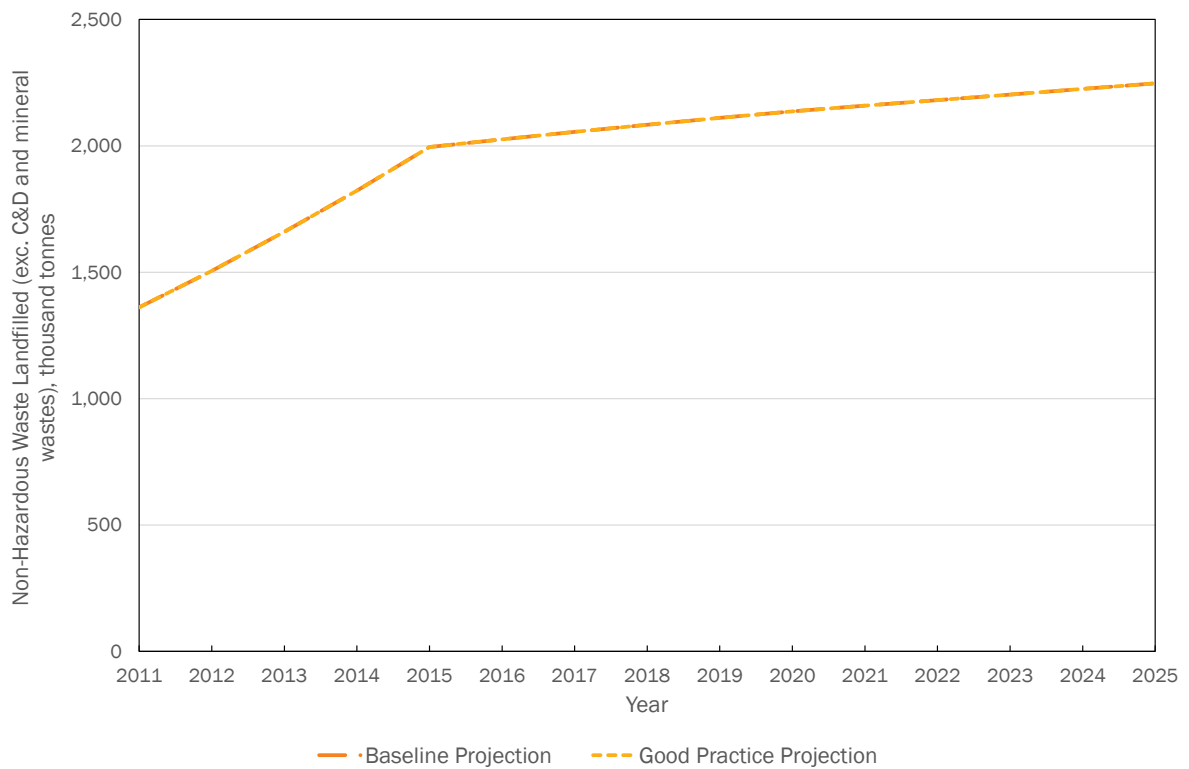


Figure 17-9: Change in SOx Emissions, tonnes



Figure 17-10: Change in NOx Emissions, tonnes

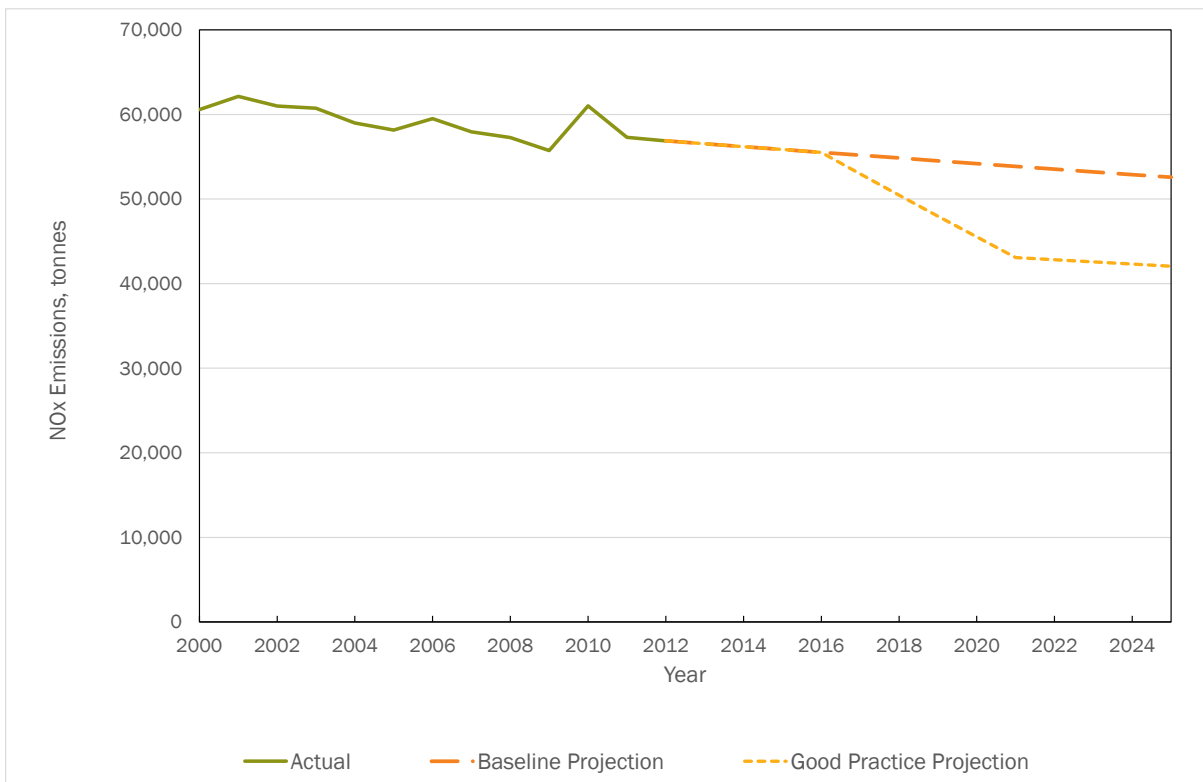


Figure 17-11: Change in PM₁₀ Emissions, tonnes

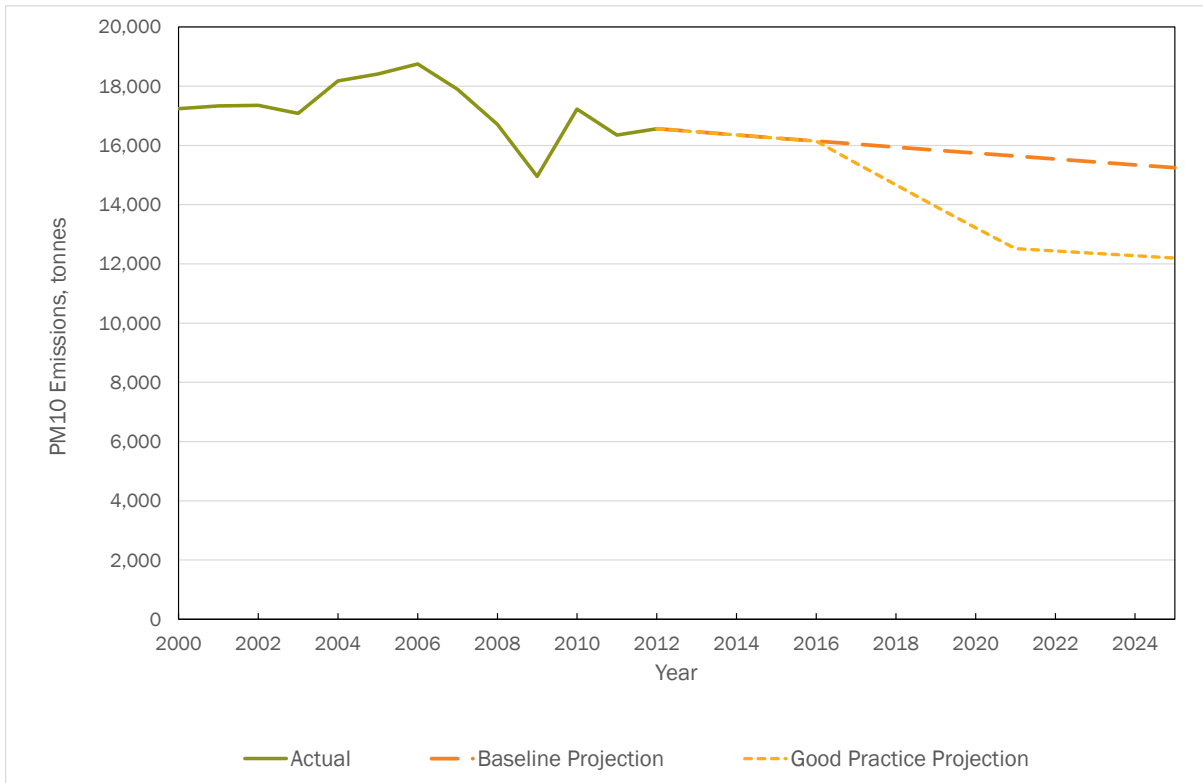


Figure 17-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

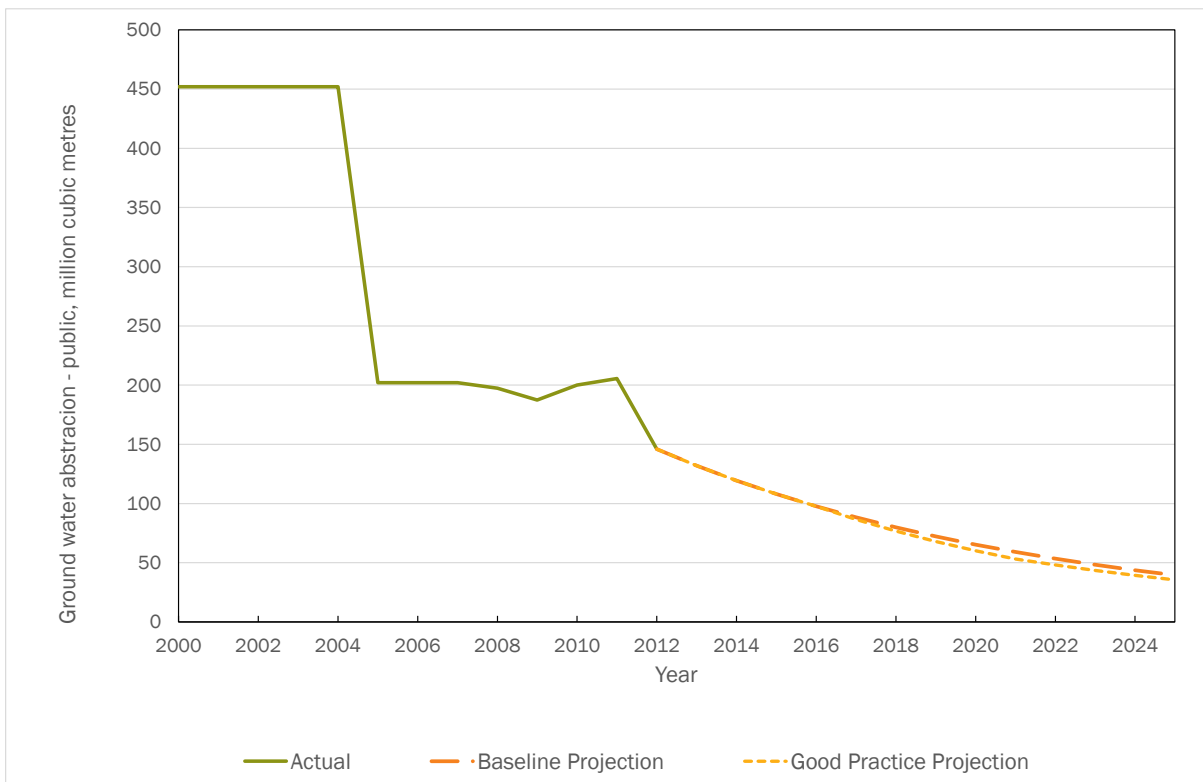


Figure 17-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

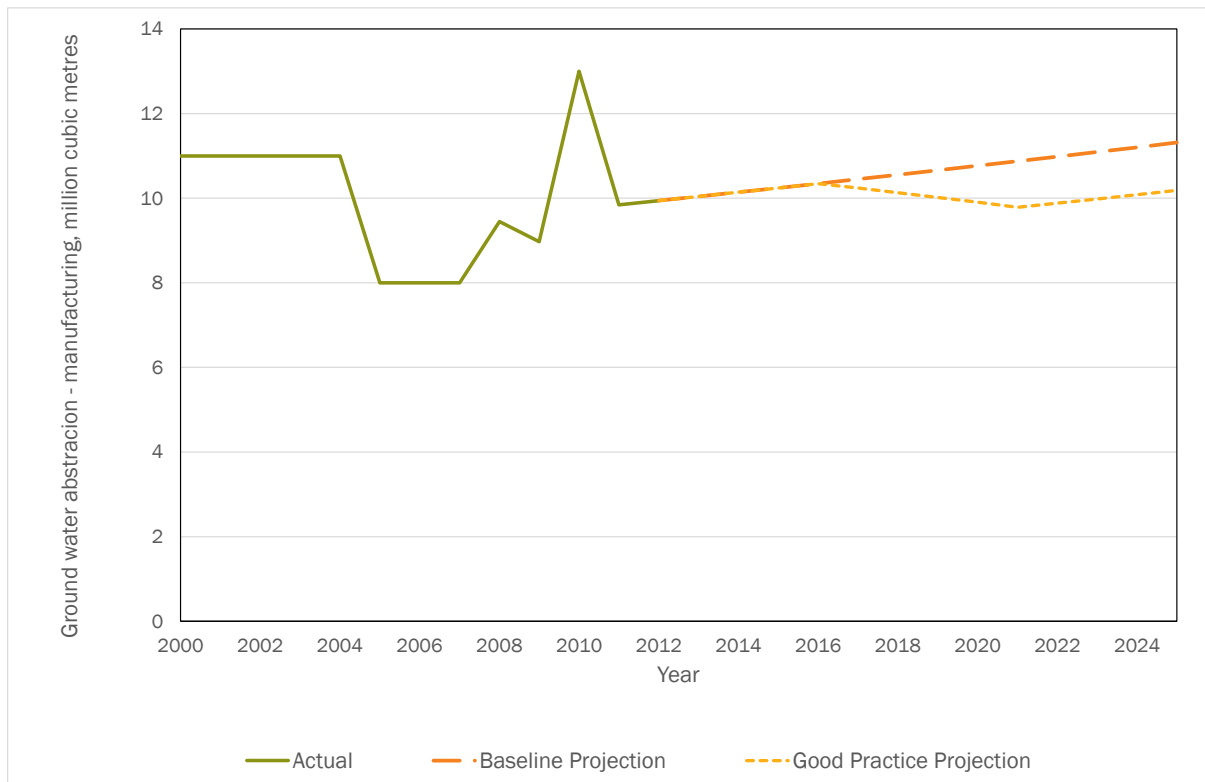


Figure 17-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

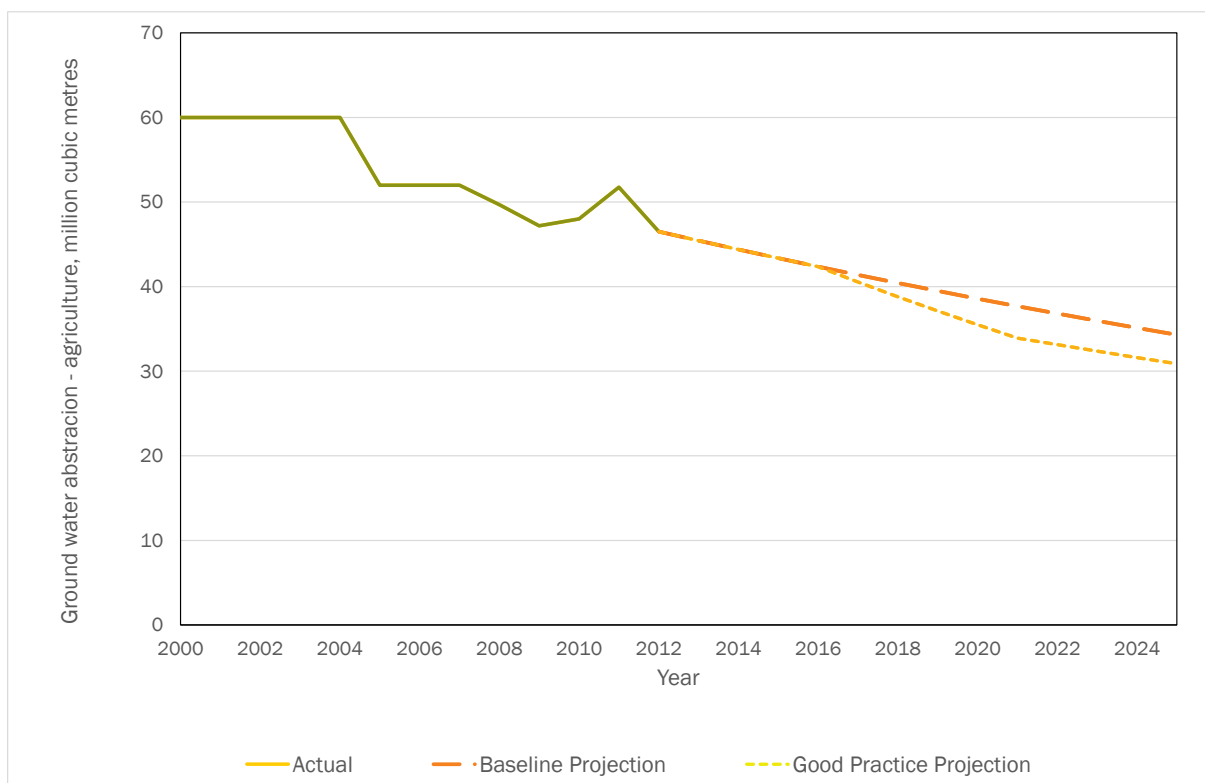


Figure 17-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

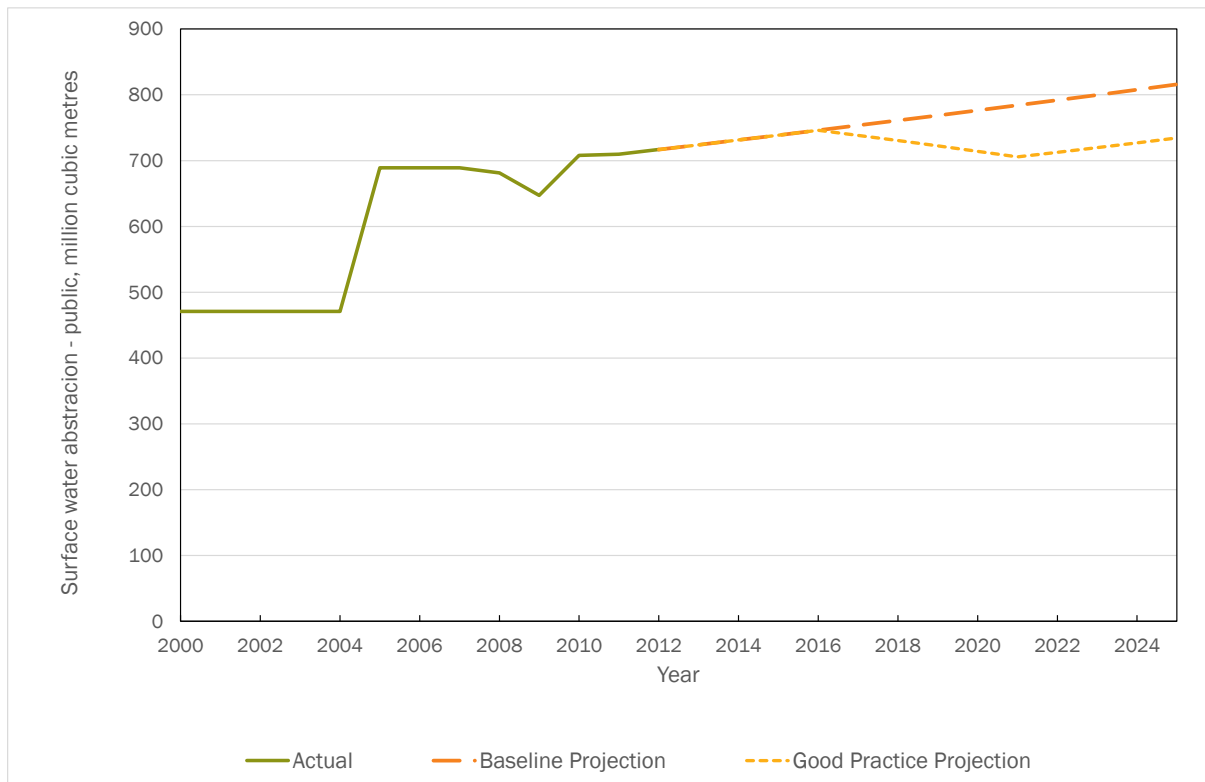


Figure 17-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres



Figure 17-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

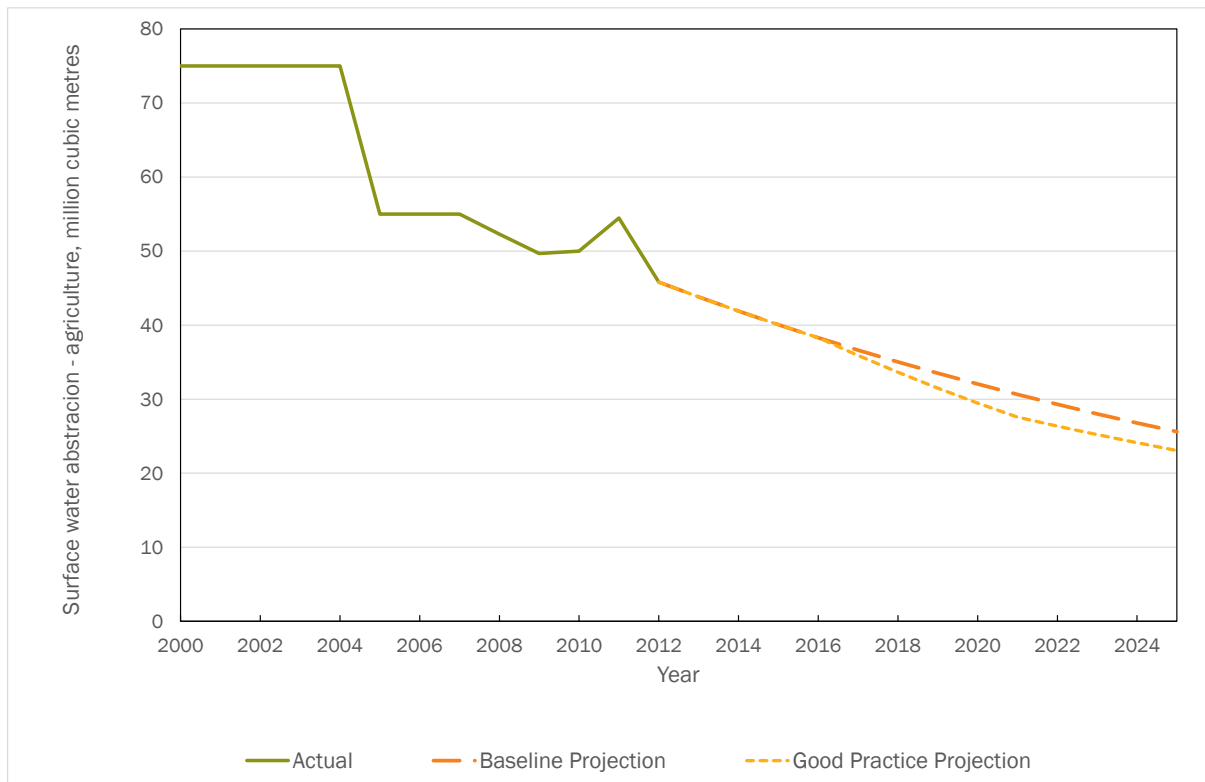


Figure 17-18: Change in Active Ingredients in Pesticides, tonnes

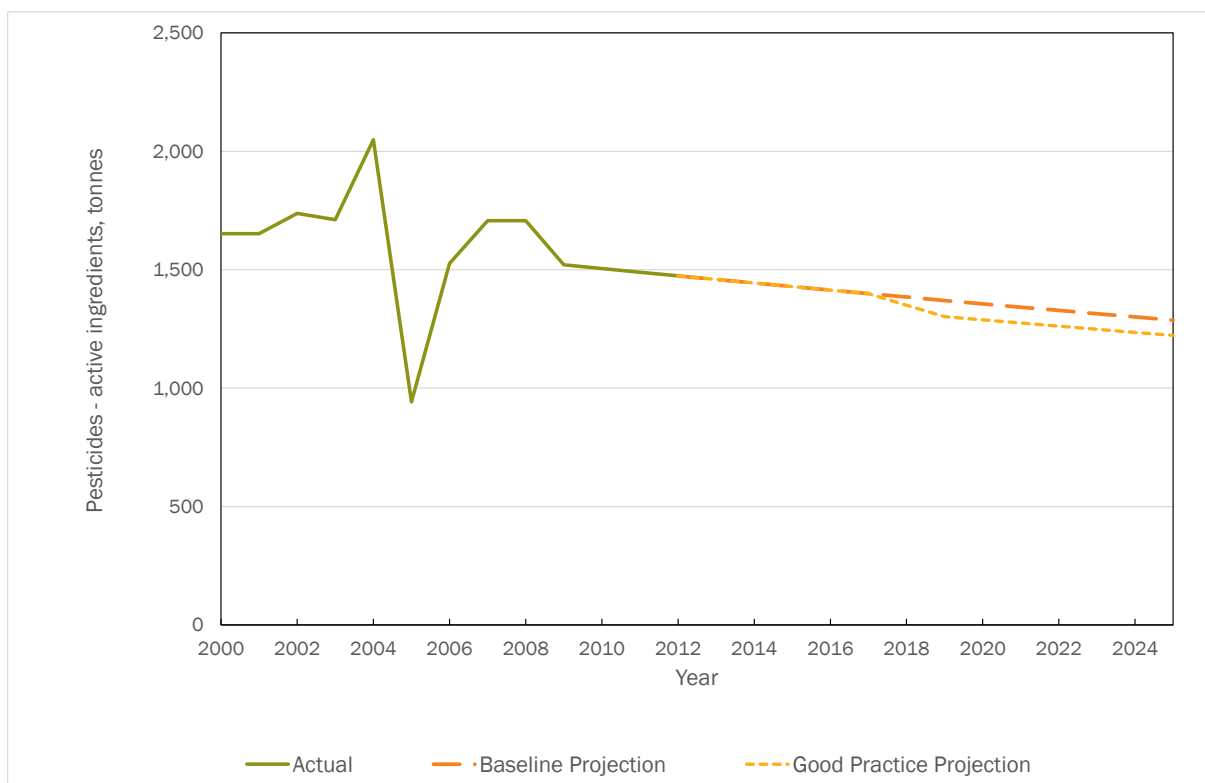


Figure 17-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

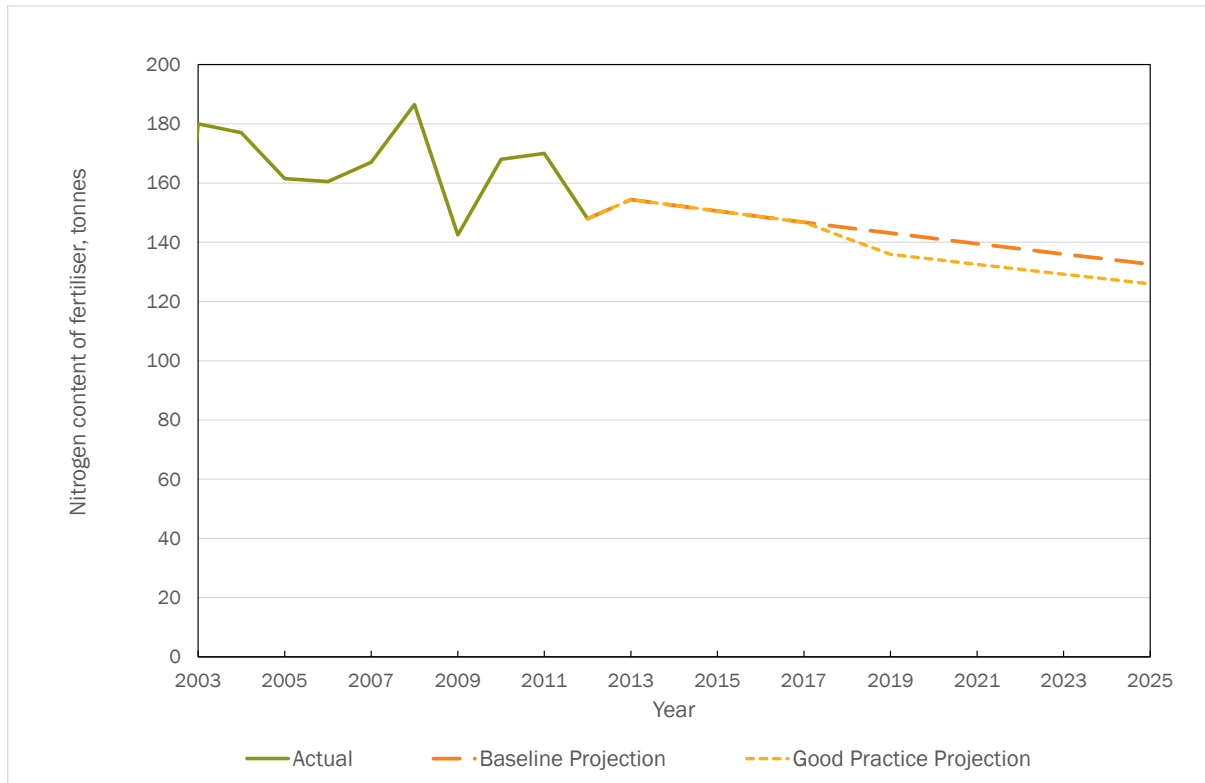


Figure 17-20: Change in Aggregates Extraction, thousand tonnes

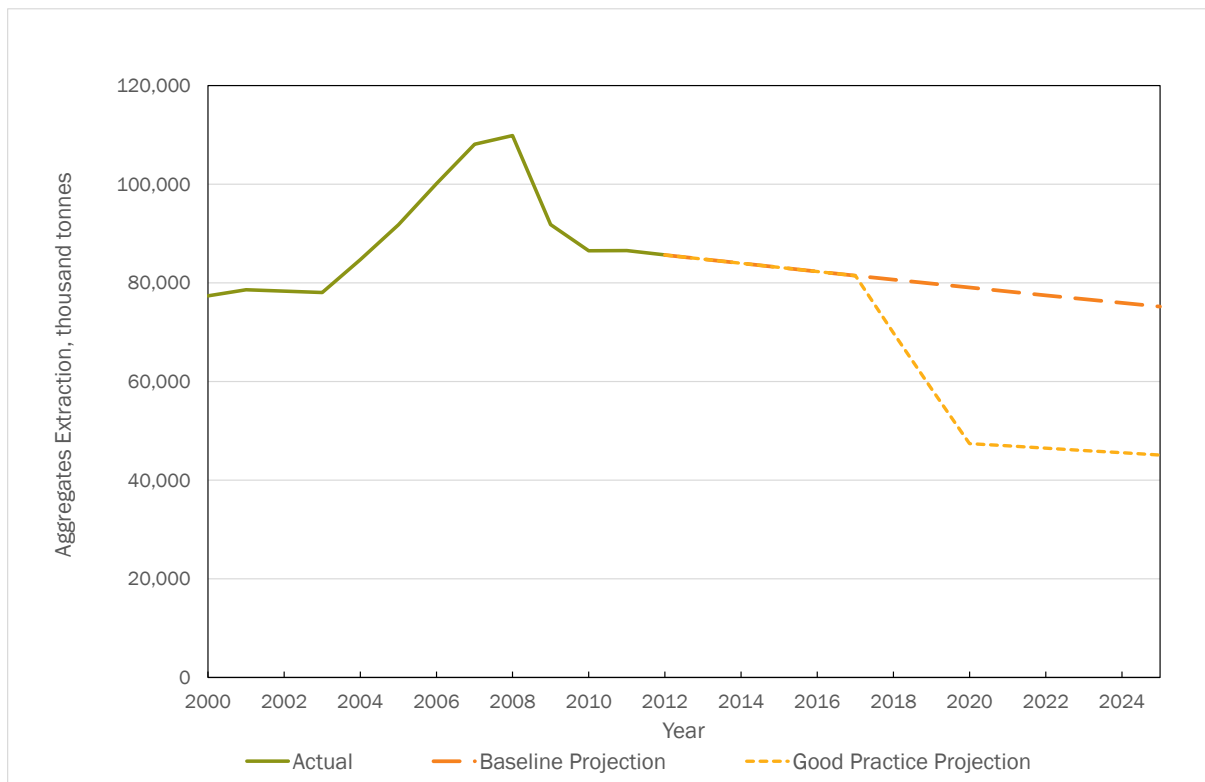


Figure 17-21: Change in Paper & Card Packaging Generation, thousand tonnes

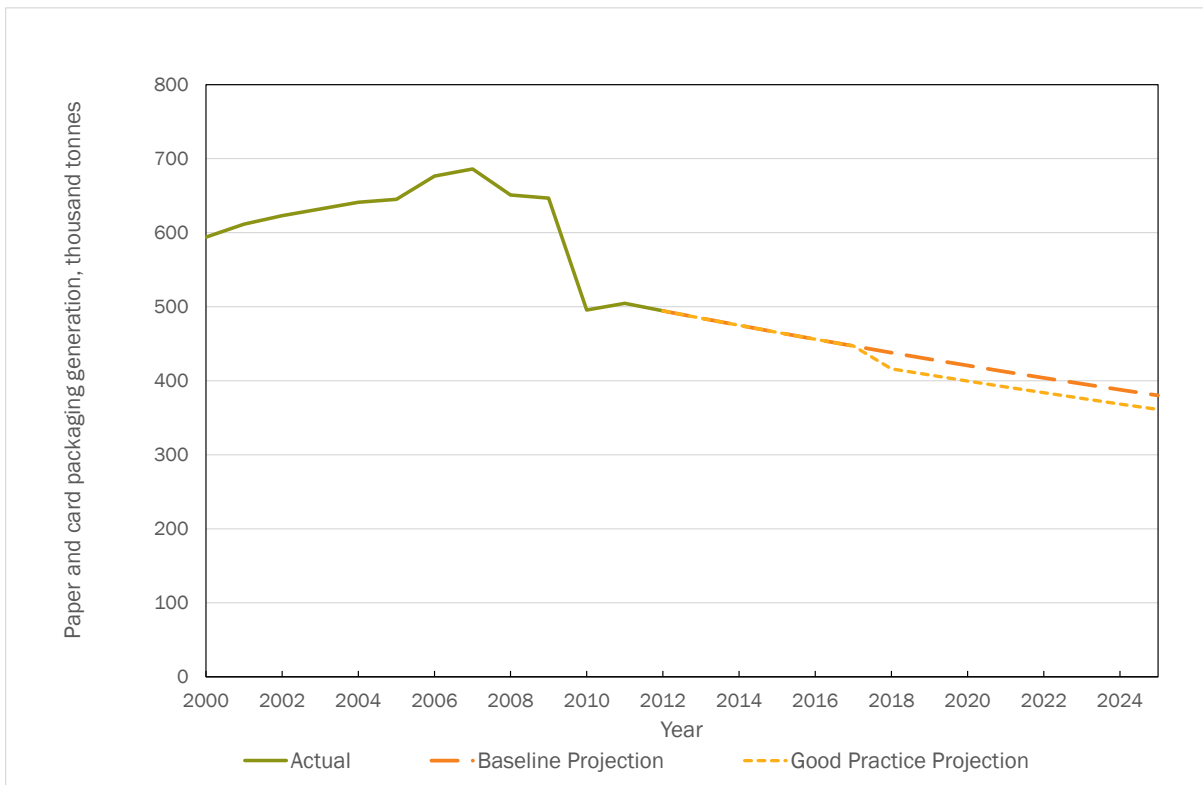


Figure 17-22: Change in Plastic Packaging Generation, thousand tonnes

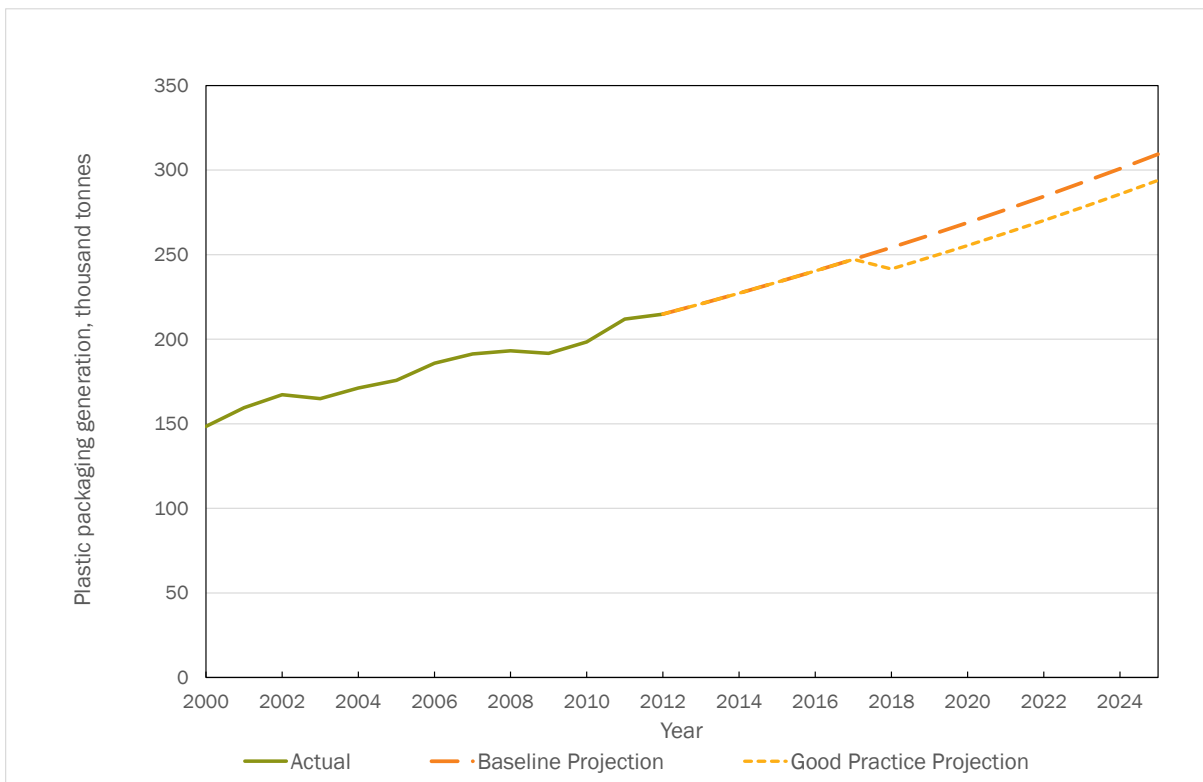


Figure 17-23: Change in Wood Packaging Generation, thousand tonnes

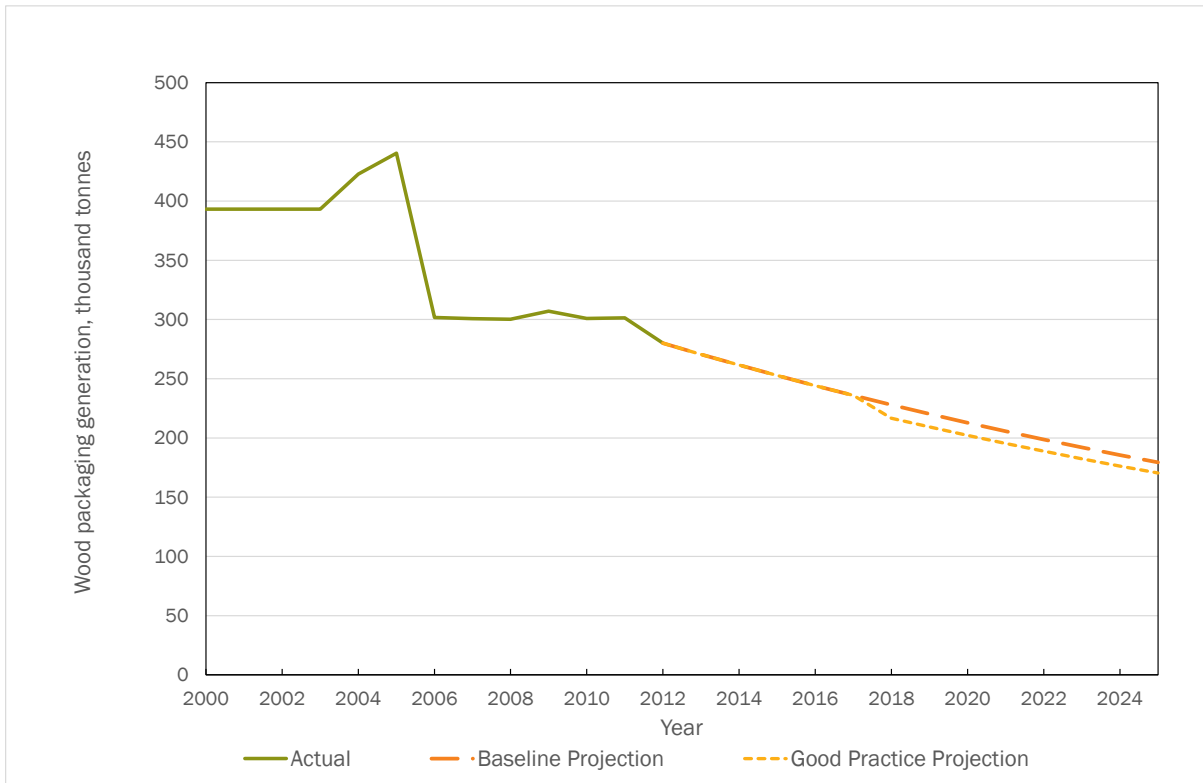


Figure 17-24: Change in Metal Packaging Generation, thousand tonnes

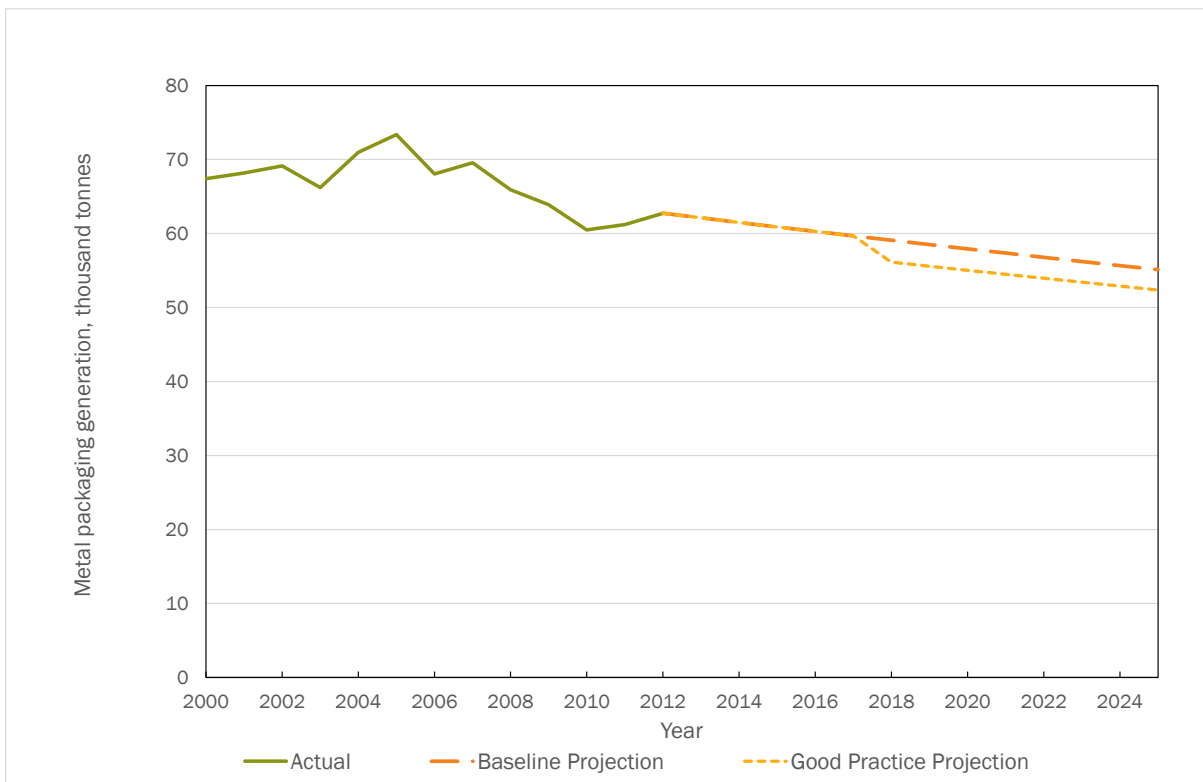


Figure 17-25: Change in Glass Packaging Generation, thousand tonnes

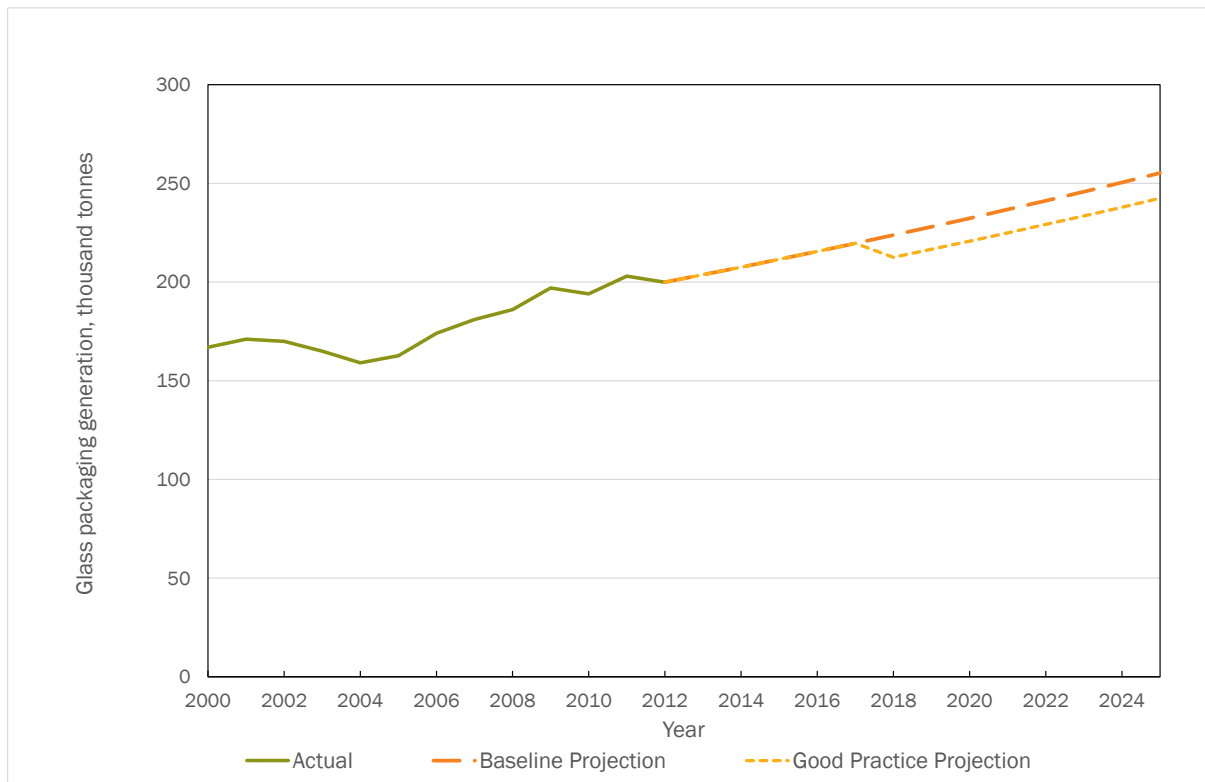
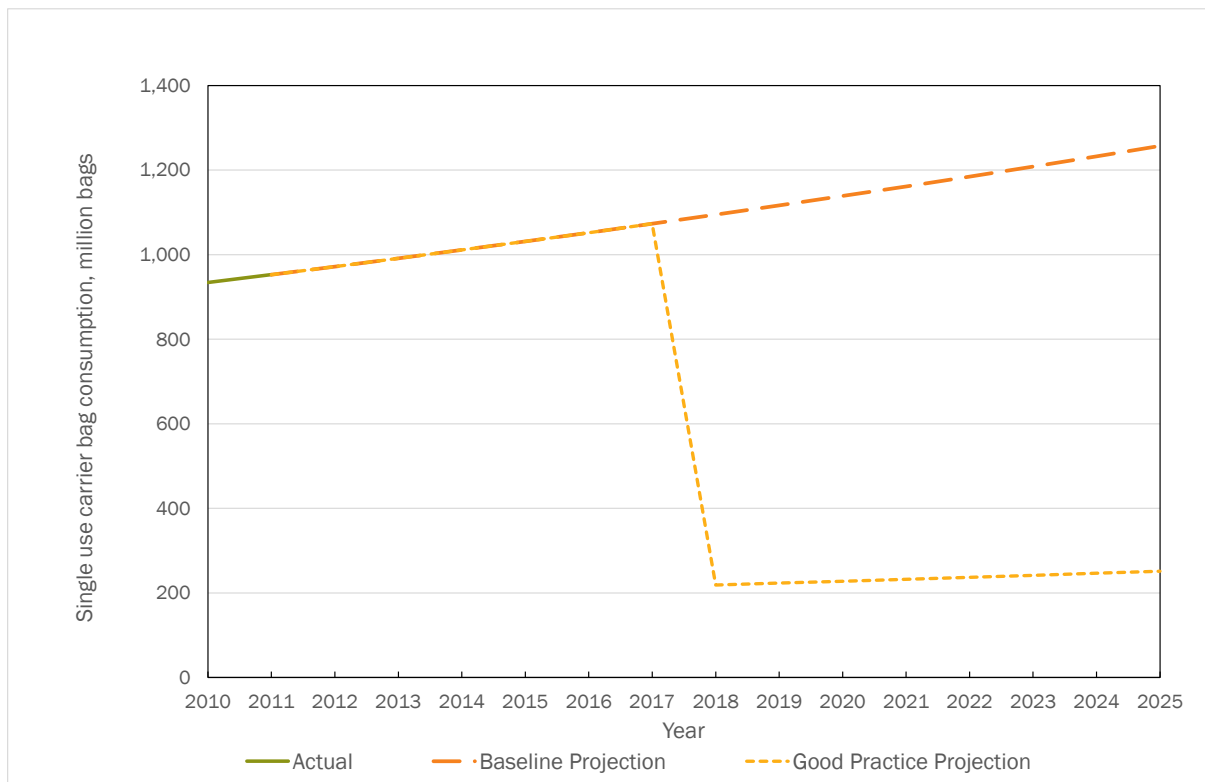


Figure 17-26: Change in Consumption of Single Use Carrier Bags, million bags



17.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 17-5: Revenue Outturns from Model, million SEK (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	52	103	154	205	255	305	355	355	355
	C&I / Heating	0	0	54	106	157	207	255	302	349	349	349
	Electricity	1,548	1,548	1,548	1,548	1,548	1,548	1,548	1,548	1,548	1,548	1,548
	Sub-total Energy, million SEK	1,548	1,548	1,653	1,757	1,859	1,959	2,058	2,155	2,251	2,251	2,251
	Sub-total Energy, % GDP	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	8,618	17,239	25,864	34,491	43,152	43,167	43,182	43,197	43,212
	Passenger Aviation Tax	0	0	4,219	8,430	8,661	8,900	9,145	9,399	9,660	9,929	10,207
	Freight Aviation Tax	0	0	1	1	1	1	1	1	1	1	1
	Sub-total Transport, million SEK	0	0	12,838	25,671	34,526	43,392	52,298	52,567	52,843	53,127	53,420
	Sub-total Transport, % GDP	0.0%	0.0%	0.3%	0.6%	0.9%	1.1%	1.3%	1.3%	1.3%	1.3%	1.3%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0
	Landfill Tax - Inerts (C&D)	0	1	3	3	3	2	2	2	2	2	2
	Incineration /MBT Tax	0	61	99	128	123	117	119	120	121	122	124

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	101	191	270	339	399	375	370	364	359	354
	Water Abstraction Tax	0	561	1,099	1,614	2,108	2,580	2,527	2,531	2,536	2,541	2,548
	Waste Water Tax	0	167	322	467	450	450	450	450	450	450	450
	Pesticides Tax	0	0	43	81	77	76	76	75	74	73	73
	Aggregates Tax	0	0	0	0	0	0	0	0	0	0	0
	Packaging Tax	0	0	335	320	321	323	325	328	330	333	336
	Single Use Bag Tax	0	1,283	1,309	267	272	278	283	289	295	301	307
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million SEK	0	2,175	3,400	3,150	3,694	4,228	4,158	4,165	4,174	4,183	4,194
	Sub-total Pollution & Resource, % GDP	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Total Revenue Stream	Total, million SEK	1,548	3,723	17,891	30,578	40,080	49,579	58,514	58,887	59,268	59,562	59,865
	Total, % GDP	0.0%	0.1%	0.4%	0.8%	1.0%	1.2%	1.5%	1.5%	1.5%	1.5%	1.5%

18.0 United Kingdom

During the course of the study the latest data available from official sources was sought, namely the TAXUD Taxes in Europe database, energy excise duty tables and the OECD database on environmental taxes and charges. This was supplemented by national data sources where possible. Due to the number of taxes and countries involved, the central case for energy excise duties has been the rates published by TAXUD giving the position as of 1st July 2014. Planned future increases may not be fully captured in this analysis and therefore, the projected increase in revenues would effectively incorporate any revenue from increased rates in early 2015 or shortly thereafter.

18.1 Energy Taxes

➤ Hydrocarbon Oil Duty:

- Duties on hydrocarbons are payable at varying rates depending on the type of fuel and its use. Most rates of duty are calculated per thousand litres of fuel, with some exceptions that are calculated per thousand kilograms or per gigajoule.
- Rates: see Table 18-1 for details of rates.
- The main exemptions to the duty include: ⁶⁶⁷
 - Oil used in marine craft (except private pleasure craft);
 - Oil used as refinery fuel;
 - Oil used in blast furnaces;
 - Heavy oil used for such horticultural purposes as heating greenhouses; and
 - Heavy oil used in electricity generation.
- Other exemptions include: ⁶⁶⁸
 - The industrial and commercial use of tied oils;
 - LPG and natural gas used for off-road vehicles;
 - LPG when used as in agriculture, horticulture, pisciculture and forestry;
 - Reduced rates are applied for kerosene when used as motor fuel for agricultural purposes and for marked gas oil; and
 - A £0.05 (€0.06) reduction in duty applies on some more remote islands, a measure for which the United Kingdom obtained approval

⁶⁶⁷ European Commission (2013) *Taxes in Europe Database*, Accessed 19th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=895/1388754990&taxType=Energy+products+and+electricity

⁶⁶⁸ European Commission (2013) *Excise Duty Tables*, Accessed 19th August 2014, pp. 8-73, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/ra/tes/excise_duties-part_ii_energy_products_en.pdf

from the European Commission. The United Kingdom Government has applied to extend this to 17 of the most rural parts of the mainland.

- Coal, coke, electricity and non-propellant uses of natural gas all fall outside of the remit of the Hydrocarbon Oil Duty. Business use of these products is charged under the Climate Change Levy.
- Note that from April 2015, the government will apply a reduced rate of fuel duty to methanol. The rate will be set at £0.0932 (€0.1097) per litre. The size of the duty differential between the main rate and methanol will be maintained until March 2024. The government will review the impact of this incentive alongside the duty incentives for road fuel gases at Budget 2018. (Finance Bill 2015).⁶⁶⁹
- Tax revenue (2013): £26.7 (€31.4) billion, equivalent to 1.65% of GDP.⁶⁷⁰

Table 18-1: Details of Hydrocarbon Oil Duty (United Kingdom, 2014)⁶⁷¹

General Tax Base	Specific Tax Base	Tax Rate	
		GBP	€
Petrol (per 1,000 litres)	Leaded	676.70	796.81
	Unleaded	579.50	682.36
	Aviation gasoline	377.00	443.92
Gas oil (per 1,000 litres)	Propellant use	579.50	682.36
	Industrial/Commercial use	111.40	131.17
	Heating - Business use	111.40	131.17
	Heating - Non-business use	111.40	131.17
Kerosene (per 1,000 litres)	Propellant use	579.50	682.36
	Industrial/Commercial use	111.40	131.17
Heavy fuel oil (per 1,000 kg)	Heating - Business use	107.00	125.99
	Heating - Non-business use	107.00	125.99

⁶⁶⁹ United Kingdom Government Website (2014) *Guidance: HMRC overview*, Paragraph 5.4, Accessed 24th September 2014 <https://www.gov.uk/government/publications/budget-2014-hm-revenue-customs-overview/hmrc-overview>

⁶⁷⁰ Table 2 in HMRC (2014) *Hydrocarbon Oils Bulletin June 2014*, 22 July 2014, Accessed 19th August 2014, <https://www.uktradeinfo.com/Statistics/Pages/TaxAndDutyBulletins.aspx>

⁶⁷¹ European Commission (2013) *Excise Duty Tables*, Accessed 19th August 2014, pp. 8-73, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/ra-tes/excise_duties-part_ii_energy_products_en.pdf

General Tax Base	Specific Tax Base	Tax Rate	
		GBP	€
Liquid Petroleum Gas (LPG) (per 1,000 kg)	Propellant use	316.10	372.21
Natural Gas (per gigajoule)	Propellant use	5.67	6.68

Source: European Commission (2013) *Excise Duty Tables*, Accessed 19th August, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

➤ **United Kingdom Climate Change Levy:**

- The Climate Change Levy (CCL) is chargeable on the industrial and commercial supply of certain fuels. It is made up of 2 rates: the main rates and the carbon price support (CPS) rates (see below for more detail on the CPS).
- Fuels liable to the main rates of CCL are:
 - Electricity;
 - Natural gas;
 - LPG; and
 - Solid fuels – such as coal, lignite and coke.
- The main rates are presented in Table 18-2.

Table 18-2: Main Rates of CCL (United Kingdom, 2014) ⁶⁷²

Commodity	Main Rate	
	GBP	EUR
Electricity (per kWh)	0.00541	0.006370
Natural gas (per kWh)	0.00188	0.002214
LPG (per kg)	0.01210	0.014248
Solid fuel (per kg)	0.01476	0.017380

Source: European Commission (2013) *Excise Duty Tables*, Accessed 19th August, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

⁶⁷²European Commission (2013) *Excise Duty Tables*, Accessed 19th August 2014, pp. 8-73, http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/energy_products/rates/excise_duties-part_ii_energy_products_en.pdf

- Electricity, gas and solid fuel are normally exempt from the main rates of CCL if:
 - They are not being used in the United Kingdom;
 - They are supplied to or from certain combined heat and power (CHP) schemes registered under the CHP quality assurance (CHPQA) programme;
 - The electricity is generated from renewable sources;
 - They are used to produce electricity in a generating station which has a capacity of 2MW or greater;
 - They will not be used as fuel; or
 - They are used in particular types of transport. ⁶⁷³
- Businesses can get a reduction on the main rates of CCL if they are an energy intensive business and have entered into a climate change agreement (CCA) with the Environment Agency. Energy intensive businesses can get a 90% reduction for electricity and a 65% reduction for gas, LPG, coal and other solid fuel. ⁶⁷⁴
- The CPS rates are applied to businesses and organisations using fossil fuels to generate electricity, to encourage the use of low carbon technology. This is known as the Carbon Price Floor (CPF). These are paid by owners of electricity generating stations and operators of combined heat and power (CHP) stations.
- Fuels liable to the CPS rates of CCL are:
 - Natural gas;
 - LPG; and
 - Solid fuels – such as coal, lignite and coke. ⁶⁷⁵
- The CPS rates are presented in Table 18-3.
- The CCL and CPS generated revenue of £1.06 billion (€1.25 billion) in 2013, equivalent to 0.07% of GDP. ⁶⁷⁶

⁶⁷³ United Kingdom Government (2014) *Green Taxes, Reliefs and Schemes for Businesses*, Accessed 19th August 2014, <https://www.gov.uk/green-taxes-and-reliefs/climate-change-levy>

⁶⁷⁴ United Kingdom Government (2014) *Green Taxes, Reliefs and Schemes for Businesses*, Accessed 19th August 2014, <https://www.gov.uk/green-taxes-and-reliefs/climate-change-levy>

⁶⁷⁵ United Kingdom Government (2014) *Green Taxes, Reliefs and Schemes for Businesses*, Accessed 19th August 2014, <https://www.gov.uk/green-taxes-and-reliefs/climate-change-levy>

⁶⁷⁶ Table 2 in HMRC (2014) *Climate Change Levy and Carbon Price Floor Bulletin April 2014*, 28th May 2014, Accessed 19 August 2014, <https://www.uktradeinfo.com/Statistics/Pages/TaxAndDutyBulletins.aspx>

Table 18-3: Carbon Price Support Rates of CCL (United Kingdom, 2014) ⁶⁷⁷

Commodity	Main Rate	
	GBP	EUR
Natural gas (per kWh)	0.00175	0.002061
LPG (per kg)	0.02822	0.033229
Solid fuels (per GJ on gross calorific value)	0.81906	0.964440

Source: HMRC (2014) *Climate Change Levy Rates*, Accessed 19th August 2014, http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?_nfpb=true&_pageLabel=pageExcise_ShowContent&id=HMCE_PROD1_031183&propertyType=document

➤ **CRC Energy Efficiency scheme:**

- A mandatory carbon reporting and pricing scheme operating in the United Kingdom. The scheme is currently in phase 2, which runs from 2014 to 2019.⁶⁷⁸
- All organisations consuming over 6,000 MWh of qualifying electricity through settled half-hourly meters during the qualification year (2012/13) must comply with the scheme.
- Participants are required to monitor their energy use, and report their electricity and natural gas supplies annually. Participants must buy and surrender allowances for each tonne of CO₂ emitted from these energy sources. These can be bought either at the beginning of the reporting year (forecast sale), or after reporting (buy to comply).
- The cost of CRC allowances for 2014/15 are as follows:
 - Forecast sale: £15.60(€18.37) per tCO₂
 - Buy to comply sale: £16.40(€19.31) per tCO₂

18.2 Transport Taxes (Excluding Transport Fuels)

➤ **Registration Taxes:**

- Vehicles registered for the first time on the Driver and Vehicle Licensing Agency (DVLA) records are required to pay a fee of £55 (€64.76).⁶⁷⁹

⁶⁷⁷ HMRC (2014) *Climate Change Levy Rates*, Accessed 19th August 2014, http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?_nfpb=true&_pageLabel=pageExcise_ShowContent&id=HMCE_PROD1_031183&propertyType=document

⁶⁷⁸ United Kingdom Government (2014) *CRC Energy Efficiency Scheme*, 29 July 2014, <https://www.gov.uk/government/policies/reducing-demand-for-energy-from-industry-businesses-and-the-public-sector-2/supporting-pages/crc-energy-efficiency-scheme>

⁶⁷⁹ United Kingdom Government Website: *Vehicle Registration*, Accessed 15th August, <https://www.gov.uk/vehicle-registration/new-registrations-fee>

- The fee is designed to cover the administrative costs associated with the registration of the vehicle throughout its life and thus, strictly speaking, is not an environmental tax.
- Exemptions include: ⁶⁸⁰
 - Those first registered and licensed in the disabled exempt taxation class;
 - Historic vehicles previously registered with the old local authorities (late conversions);
 - Vehicles previously registered in Northern Ireland;
 - Imported vehicles previously registered under the personal export scheme and new means of transport scheme;
 - Visiting forces vehicles;
 - Vehicles registered under the direct export scheme;
 - Vehicles registered for off-road use only; and
 - Crown exempt vehicles.

➤ **Circulation Taxes:**

- Vehicle Excise Duty (VED), also referred to as vehicle tax, is levied on most vehicle types used on public roads in the United Kingdom.
- The rate of vehicle tax for cars is based on engine size or on fuel type and CO₂ emissions, depending on when the car was registered.
- The rate of vehicle tax for cars and light goods vehicles registered before 1st March 2001 is based on engine size. This is shown in Table 18-4.

Table 18-4: VED for Private/Light Goods Cars (TC11) Registered before 1st March 2001 (United Kingdom, 2014)^{681,682}

Engine Size (cc)	12 Months Rate		6 Months Rate	
	GBP	EUR	GBP	EUR
Not over 1549	145.00	170.74	79.75	93.91
Over 1549	230.00	270.82	126.50	148.95

Source: DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-

⁶⁸⁰ United Kingdom Government Website: *Vehicle Registration*, Accessed 15th August, <https://www.gov.uk/vehicle-registration/new-registrations-fee>

⁶⁸¹ DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf

⁶⁸² United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

[15.pdf](#) and United Kingdom Government (2014) Vehicle Tax Rate Tables, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

- The rate of vehicle tax for cars registered on or after 1st March 2001 is based on fuel type and CO₂ emissions. The rates are split into bands depending on CO₂ emissions - the lower the emissions, the lower the vehicle tax. These standard rates are shown in Table 18-5 and Table 18-6.

Table 18-5: Standard VED for Petrol (TC48) and Diesel (TC49) Cars Registered on or after 1st March 2001 (United Kingdom, 2014)^{683,684}

Band	CO ₂ Emission (g/km)	12 Months Rate		6 Months Rate	
		GBP	EUR	GBP	EUR
A	Up to 100	0.00	0.00	Not available	Not available
B	101-110	20.00	23.55	Not available	Not available
C	111-120	30.00	35.32	Not available	Not available
D	121-130	110.00	129.52	60.50	71.24
E	131-140	130.00	153.07	71.50	84.19
F	141-150	145.00	170.74	79.75	93.91
G	151-165	180.00	211.95	99.00	116.57
H	166-175	205.00	241.39	112.75	132.76
I	176-185	225.00	264.94	123.75	145.72
J	186-200	265.00	312.04	145.75	171.62
K*	201-225	285.00	335.59	156.75	184.57
L	226-255	485.00	571.09	266.75	314.10
M	Over 255	500.00	588.75	275.00	323.81

Notes: *Includes cars with a CO₂ figure over 225g per km but were registered before 23 March 2006.

Source: DVLA (2014) Rates of Vehicle Tax, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf and United Kingdom Government (2014) Vehicle Tax Rate Tables, Accessed 20th August 2014,

⁶⁸³ DVLA (2014) Rates of Vehicle Tax, Accessed 20th August 2014, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf

⁶⁸⁴ United Kingdom Government (2014) Vehicle Tax Rate Tables, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

Table 18-6: Standard VED for Alternative Fuel Cars (TC59) Registered on or after 1st March 2001 (United Kingdom, 2014)^{685 686}

Band	CO ₂ Emission (g per km)	12 Months Rate		6 Months Rate	
		GBP	EUR	GBP	EUR
A	Up to 100	0.00	0.00	Not available	Not available
B	101-110	10.00	11.77	Not available	Not available
C	111-120	20.00	23.55	Not available	Not available
D	121-130	100.00	117.75	55.00	64.76
E	131-140	120.00	141.30	66.00	77.71
F	141-150	135.00	158.96	74.25	87.43
G	151-165	170.00	200.17	93.50	110.10
H	166-175	195.00	229.61	107.25	126.29
I	176-185	215.00	253.16	118.25	139.24
J	186-200	255.00	300.26	140.25	165.14
K*	201-225	275.00	323.81	151.25	178.10
L	226-255	475.00	559.31	261.25	307.62
M	Over 255	490.00	576.97	269.50	317.34

Notes: *Includes cars with a CO₂ figure over 225g per km but were registered before 23 March 2006

Source: DVLA (2014) Rates of Vehicle Tax, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf and United Kingdom Government (2014) Vehicle Tax Rate Tables, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

⁶⁸⁵ DVLA (2014) Rates of Vehicle Tax, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf

⁶⁸⁶ United Kingdom Government (2014) Vehicle Tax Rate Tables, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

- For cars registered on or after 1st April 2010, a different set of rates are applicable for a vehicle's first year. After the first year, the rates shown in Table 18-5 and Table 18-6 apply.
- The first year rates for cars registered on or after 1st April 2010 are shown in Table 18-7 and
- Table 18-8.

Table 18-7: First Year VED Rates for Petrol (TC48) and Diesel (TC49) Cars Registered on or after 1 April 2010 (United Kingdom, 2014)^{687,688}

Band	CO ₂ Emission (g/km)	12 Months Rate		6 Months Rate	
		GBP	EUR	GBP	EUR
A	Up to 100	0.00	0.00	Not available	Not available
B	101-110	0.00	0.00	Not available	Not available
C	111-120	0.00	0.00	Not available	Not available
D	121-130	0.00	0.00	Not available	Not available
E	131-140	130.00	153.07	71.50	84.19
F	141-150	145.00	170.74	79.75	93.91
G	151-165	180.00	211.95	99.00	116.57
H	166-175	290.00	341.47	Not available	Not available
I	176-185	345.00	406.24	Not available	Not available
J	186-200	485.00	571.09	Not available	Not available
K	201-225	635.00	747.71	Not available	Not available
L	226-255	860.00	1012.65	Not available	Not available
M	Over 255	1,090.00	1283.47	Not available	Not available

Source: DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf and United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

⁶⁸⁷ DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf

⁶⁸⁸ United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

Table 18-8: First Year VED Rates for Alternative Fuel Cars (TC59) Registered on or after 1 April 2010 (United Kingdom, 2014)^{689,690}

Band	CO ₂ Emission (g per km)	12 Months Rate		6 Months Rate	
		GBP	EUR	GBP	EUR
A	Up to 100	0.00	0	Not available	Not available
B	101-110	0.00	0	Not available	Not available
C	111-120	0.00	0	Not available	Not available
D	121-130	0.00	0	Not available	Not available
E	131-140	120.00	141.30	66.00	77.71
F	141-150	135.00	158.96	74.25	87.43
G	151-165	170.00	200.17	93.50	110.10
H	166-175	280.00	329.70	Not available	Not available
I	176-185	335.00	394.46	Not available	Not available
J	186-200	475.00	559.31	Not available	Not available
K	201-225	625.00	735.93	Not available	Not available
L	226-255	850.00	1000.87	Not available	Not available
M	Over 255	1,080.00	1271.70	Not available	Not available

Source: DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf and United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

- Alternate VED rates apply to other types of vehicles. These are given below (2014 rates). Note that 6 monthly rates are also available for these vehicles. ^{691,692,693}

⁶⁸⁹ DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf

⁶⁹⁰ United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

⁶⁹¹ DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf

- Light goods vehicles (TC39) registered on or after 1st March 2001 and not over 500kg revenue weight are subject to a VED of £225 (€264.94) per year.
- Euro 4 light goods vehicles (TC36) registered between 1 March 2003 and 31 December 2006, Euro 4 compliant and not over 3,500kg revenue weight are subject to a VED of £140 (€164.85) per year.
- Euro 5 light goods vehicles (TC36) registered between 1 January 2009 and 31 December 2010, Euro 5 compliant and not over 3,500kg revenue weight are also subject to a VED of £140 (€164.85) per year.
- Motorcycles (with or without sidecar) are subject to a rate of VED based on engine size. The rates are shown in Table 18-9.

Table 18-9: VED Rates for Motorcycles (TC17) (United Kingdom, 2014)^{694,695}

Engine size (cc)	12 months rate	
	GBP	EUR
Not over 150	17.00	20.02
Not over 150	17.00	20.02
401-600	58.00	68.29
Over 600	80.00	94.20

Source: DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf and United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

- Tricycles (not over 450kg unladen) (TC50) are subject to a rate of VED based on engine size. Tricycles not over 150cc are subject to a VED rate of £17.00 (€20.02) per year. All other tricycles are subject to a rate of £80.00 (€94.20).

⁶⁹² United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

⁶⁹³ European Commission (2013) *Taxes in Europe Database*, Accessed 19th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=576/1388754985&taxType=Other+indirect+tax

⁶⁹⁴ DVLA (2014) *Rates of Vehicle Tax*, Accessed 20th August 2014, pp.1-4, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/299797/V149_2014-15.pdf

⁶⁹⁵ United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

- Trade vehicles must also pay for a trade licence. These are charged at a rate of £165 (€194.29) per year for all vehicles except for bicycles and tricycles (not over 450kg), which pay a rate of £80.00 (€94.20).
- Rates of duty on heavy goods vehicles (HGVs) rise from £80 (€94.20) up to £850 (€1000.87) per year, depending on the number of axles and revenue weight of the vehicle.
- Vehicles used for carrying or drawing exceptional loads pay a rate of duty of £1,585 (€1866.33) per year.
- Rates of duty for buses are in four bands according to seating capacity, rising from £165 (€194.29) to £500 (€588.75) per year. For reduced pollution buses there is a flat rate of duty of £165 (€203.02) a year.
- Rates of duty for recovery vehicles range from £165 (€194.29) to £410 (€482.77) per year, according to revenue weight.
- There is a flat rate of duty for haulage vehicles of £350 (€412.12).
- Exemptions to the VED include:⁶⁹⁶
 - Vehicles used by a disabled person;
 - Disabled passenger vehicles;
 - Mobility scooters, historic vehicles;
 - Electric vehicles;
 - Steam vehicles; and
 - Vehicles used just for agriculture, horticulture and forestry.
- Tax revenue (2012): £5.87 (€7.24) billion, equivalent to 0.36% of GDP.⁶⁹⁷

➤ **HGV Road User Levy:**

- A road user levy for HGVs weighing 12 tonnes or more was introduced on 1st April 2014 by the HGV Road User Levy Act 2013 (Finance Bill 2014), with payments collected by the DVLA.⁶⁹⁸
- Paid alongside VED, levy amounts range from £85 (€100.09) to £1,000 (€1,177.50) per year according to the vehicle's weight, axle configuration and levy duration.⁶⁹⁹

⁶⁹⁶ United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

⁶⁹⁷ European Commission (2013) *Taxes in Europe Database*, Accessed 19th August 2014, http://ec.europa.eu/taxation_customs/tedb/taxDetail.html?id=576/1388754985&taxType=Other+indirect+tax

⁶⁹⁸ HGV Road User Levy Act 2013, Accessed 34th September 2014, <http://www.legislation.gov.uk/ukpga/2013/7/contents>

⁶⁹⁹ United Kingdom Government (2014) *Vehicle Tax Rate Tables*, Accessed 20th August 2014, <https://www.gov.uk/vehicle-tax-rate-tables>

- In line with the introduction of the Levy, VED for HGVs has been reduced. Consequentially, over 90% of HGVs will not see costs rise from the previous year.⁷⁰⁰

➤ **Other Vehicle Taxes:**

- The United Kingdom imposes user charges in some parts of the country in the form of road pricing. Examples of this include:
 - London Congestion Charge: ⁷⁰¹
 - Since 2003, Transport for London (TfL) has imposed a charge per weekday on most vehicles being used in Central London.
 - The charge for entering the zone is £11.50 (€13.54) per vehicle per day.
 - Exemptions from the charge include: motorbikes, emergency service and National Health Service vehicles and disabled persons' vehicles.
 - The Charge generated revenue of £235 (€276.71) million in 2013/14, equivalent to 0.01% of GDP. ⁷⁰²
 - Durham Road User Charge:
 - In place since 2002, the charge operates from Monday to Saturday and is applicable to most vehicles entering the designated zone.
 - The charge for entering the zone is £2.00 (€2.35) per vehicle (2014). ⁷⁰³
 - Exemptions from the charge include: motorbikes, disabled persons vehicles, any Durham County Council Vehicle and bullion vehicles.
 - M6toll road:
 - A 27 mile stretch of road in the West Midlands region, the M6toll charges users to use the road, bypassing the more congested M6 motorway.

⁷⁰⁰ United Kingdom Government Website (2014) HGV Road User Levy, Accessed 24th September 2014, <https://www.gov.uk/government/collections/hgv-road-user-levy>

⁷⁰¹ TfL (2014) *Congestion Charge*, Accessed 20th August 2014, <https://www.tfl.gov.uk/modes/driving/congestion-charge>

⁷⁰² TfL (2014) *Annual Report and Statement of Accounts*, Accessed 20th August 2014, <http://www.tfl.gov.uk/cdn/static/cms/documents/annual-report-2013-14.pdf>

⁷⁰³ Durham County Council (2014) *Durham Road User Charge Zone*, Accessed 20th August 2014, <http://www.durham.gov.uk/pages/Service.aspx?ServiceId=6370>

- Prices depend on the class of vehicle and time of day. For example, an HGV travelling in the day time will pay more than a motorbike travelling at night.
 - Prices (2014) range from £1.80 (€2.12) to £11.00 (€12.95) per vehicle, per journey.⁷⁰⁴
 - Vehicles exempt from the charge include: disabled persons' vehicles, emergency service vehicles and ministry of defence vehicles.
 - Ultra-Low Emissions Zone:
 - It is also notable that the Mayor of London has proposed an Ultra-Low Emissions Zone (ULEZ) in the capital, on top of the existing scheme, to tackle the problem of air pollution. Under the scheme, which has been proposed to come into force by 2020, almost all the vehicles running during the operating hours would be either zero or low emission. A public consultation on the ULEZ is due to take place in autumn 2014.⁷⁰⁵
- **Air Passenger Duty:**⁷⁰⁶
 - Air Passenger Duty (APD) is due on aircrafts that depart from airports in the United Kingdom and carry passengers. The amount is related to the number of chargeable passengers, the classes of travel on offer and the destination.
 - Chargeable aircraft are fixed wing aircraft with an authorised take-off weight of 5.7 tonnes or more, fuelled by Avtur (aviation turbine fuel), with the exception of any that are:
 - Emergency or public service flights;
 - Short pleasure flights that begin and end at the same place and are no longer than 60 minutes;
 - Flights departing specific airports in the Scottish Highlands and Islands subject to circumstances beyond the control of the airline; and
 - NATO flights.

⁷⁰⁴ M6toll Website (2014) *Pricing Guide*, Accessed 21st August 2014, <http://www.m6toll.co.uk/pricing/pricing-guide/>

⁷⁰⁵ TfL (2014) Ultra Low Emissions Zone, Accessed 24th September 2014, <https://www.tfl.gov.uk/modes/driving/low-emission-zone/ultra-low-emission-zone>

⁷⁰⁶ HMRC (2014) *Air Passenger Duty Bulletin June 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/Statistics/Pages/TaxAndDutyBulletins.aspx>

- The duty rates depend on the final destination of the passenger, and the class of travel (for example, economy or premium). A four-band destination band structure applies based on geographical distance from London to the capital city of the destination country. Each band is 2,000 miles wider than the previous, i.e. 0-2,000 miles, 2,000-4,000 miles, 4,000-6,000 miles and 6,000+ miles. The 2014 Budget announced the intention to simplify the banding system to two bands as of April 2015.⁷⁰⁷
- Rates are presented in Table 18-10 and Table 18-11.
- Tax revenue (2013): £2.96 (€3.49) billion, equivalent to 0.18% of GDP.⁷⁰⁸

Table 18-10: Air Passenger Duty Rates (United Kingdom, 2014)⁷⁰⁹

Destination Bands and Distance from London (miles)	Reduced Rate From (for Travel in the Lowest Class of Travel Available on the Aircraft)		Standard Rate From (for Travel in any Other Class of Travel)		Higher Rate From (for Travel in Aircraft of 20 Tonnes or more Equipped to Carry Fewer than 19 Passengers)	
	GBP	EUR	GBP	EUR	GBP	EUR
Band A (0-2,000)	13	15.31	26	30.61	52	61.23
Band B (2,001-4,000)	69	81.25	138	162.49	276	324.99
Band C (4,001-6,000)	85	100.09	170	200.17	340	400.35
Band D (over 6,000)	97	114.22	194	228.43	388	456.87

Source: HMRC (2014) *Air Passenger Duty*, Accessed 20th August 2014, <http://www.hmrc.gov.uk/rates/apd.htm>

Table 18-11: Air Passenger Duty Rates from 1 April 2015 (United Kingdom, 2015)

Bands (Distance in Miles from London)	Reduced Rate (Lowest Class of Travel)		Standard Rate ¹ (Other than the Lowest Class of Travel)		Higher Rate ²	
	GBP	EUR	GBP	EUR	GBP	EUR
Band A (0 – 2000 miles)	13	15.31	26	30.61	78	91.84

⁷⁰⁷ Deloitte (2014) *Air Passenger Duty*, Accessed 24th September 2014, <http://www.ukbudget.com/2014-measures/air-passenger-duty.aspx>

⁷⁰⁸ From Table 2 in HMRC (2014) *Air Passenger Duty Bulletin June 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/Statistics/Pages/TaxAndDutyBulletins.aspx>

⁷⁰⁹ HMRC (2014) *Air Passenger Duty*, Accessed 20th August 2014, <http://www.hmrc.gov.uk/rates/apd.htm>

Band B (over 2000 miles)	71	83.60	142	167.20	426	501.61
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Notes:

1. If any class of travel provides a seat pitch in excess of 1.016 metres (40 inches) the standard rate is the minimum rate that applies.

2. The higher rate applies to flights aboard aircraft of 20 tonnes and above with fewer than 19 seats.

Source: Deloitte (2014) Air Passenger Duty, Accessed 24th September 2014, <http://www.ukbudget.com/2014-measures/air-passenger-duty.aspx>

18.3 Pollution and Resource Taxes

➤ Landfill tax:

- Applies to all waste disposed of by way of landfill at a licensed site on or after 1 October 1996.
- The tax is charged by weight and there are two rates (2014): ⁷¹⁰
 - Standard rate: £80 (€94.20) per tonne
 - Lower rate: £2.50 (€2.94) per tonne (levied on inert waste).
- Exemptions exist for: ⁷¹¹
 - Dredging;
 - Mining and quarrying waste;
 - Pet cemeteries;
 - Material from the reclamation of contaminated land;
 - Filling of quarries; and
 - Waste from visiting forces.
- The standard rate has risen by £8 (€9.42) per year since 2008, whereas the lower rate has been constant over this period. There are no immediate plans to increase either rate.
- Tax revenue (2013): £1.1 (€1.3) billion, equivalent to 0.07% of GDP. ⁷¹²

➤ Aggregates Tax:

- Levied on the commercial exploitation in the United Kingdom of rock, sand and gravel, due from any business that quarries, dredges or imports these products that has been in place since 1 April 2002.
- Rate (2014): £2 (€2.35) per tonne of aggregate. ⁷¹³

⁷¹⁰ HMRC (2014) *Landfill Tax*, Accessed 20th August 2014, <http://www.hmrc.gov.uk/rates/landfill-tax.htm>

⁷¹¹ HMRC (2014) *Landfill Tax Bulletin April 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/statistics/pages/taxanddutybulletins.aspx>

⁷¹² Table 2 in HMRC (2014) *Landfill Tax Bulletin April 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/statistics/pages/taxanddutybulletins.aspx>

- Prior to 1st April 2014, businesses that exploited the following materials benefitted from an exemption or relief from the tax:
 - Coal, lignite, slate or shale, or the spoil from the separation of these materials from other rock;
 - Clay;
 - Certain industrial minerals, such as ball clay and china clay;
 - The spoil, waste or other by-products from the extraction or separation of the industrial minerals set out in the previous bullet from other rock; and
 - The spoil, waste or by-products from industrial combustion or the smelting or refining of metal.
- Since 1st April 2014, these exemptions and reliefs have been suspended as they are the subject of a State aid investigation by the European Commission. ⁷¹⁴
- Material that remains exempt from the tax includes soil and other organic matter. ⁷¹⁵
- In Northern Ireland, the Aggregates Levy Credit Scheme (ALCS), which allowed for an 80 per cent relief from the full rate of the levy for aggregate extracted from 1st April 2004 to 30 November 2010, has been suspended until further notice.
- Tax revenue (2013): £275 (€323.81) million, equivalent to 0.02% of GDP. ⁷¹⁶

➤ **Single Use Plastic Bag Tax:**

- From October 2015, a £0.05 (€0.06) charge on all single-use plastic carrier bags will be introduced in England.⁷¹⁷
 - Small and medium-sized (SME) businesses will be exempt from the plastic bag charge in England.

⁷¹³ Table 6 in HMRC (2014) *Aggregates Levy Bulletin April 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/statistics/pages/taxanddutybulletins.aspx>

⁷¹⁴ HMRC *Aggregates Levy: Suspension of Exemptions*, Accessed 20th August 2014, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/293915/TIIN_6081_aggregates_levy_suspension_of_exemptions.pdf

⁷¹⁵ HMRC (2014) *Aggregates Levy: Introduction*, Accessed 20th August 2014, http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?nfpb=true&pageLabel=pageLibrary&propertyType=document&id=HMCE_CL_001169

⁷¹⁶ Table 2 in HMRC (2014) *Aggregates Levy Bulletin April 2014*, Accessed 20th August 2014, <https://www.uktradeinfo.com/statistics/pages/taxanddutybulletins.aspx>

⁷¹⁷ United Kingdom Government (2014) *Reducing and managing Waste: Charging for single use plastic carrier bags*, Accessed 20 August 2014, <https://www.gov.uk/government/policies/reducing-and-managing-waste/supporting-pages/charging-for-single-use-plastic-carrier-bags>

- There is already a similar £0.05 (€0.06) charge on single-use bags in Wales, Northern Ireland and Scotland will be introducing a charge in October 2014.

➤ **Water Abstraction Charge:**

- In England, individuals or businesses that plan to abstract more than 20 cubic metres of water a day from a surface source (such as river, stream or canal) need an abstraction licence from the Environment Agency.
- Abstractions that don't need a licence include: ⁷¹⁸
 - Abstractions of 20 m³ or less a day (if the abstraction is part of a single operation);
 - Some land drainage operations (for example, flood protection);
 - Filling ships or boats with drinking or ballast water;
 - Water used for firefighting;
 - Abstractions in relation to dewatering quarries, mines and other building or engineering operations; and
 - Trickle irrigation.
- An annual charge is then determined per licence based on a number of factors including the source of water, season, and standard unit charge. The standard rates of charge for different regions in England are given in Table 18-12.

Table 18-12: Rate of Charge for the Abstraction of Water (United Kingdom, 2014) ⁷¹⁹

Regional Charging Area	Standard Unit charge (per 1,000 m ³)	
	GBP	EUR
Anglian	27.51	32.39
Midlands	14.95	17.60
Northumbria	29.64	34.90
North West	12.57	14.80
Southern	19.23	22.64
South West (incl. Wessex)	19.71	23.21

⁷¹⁸ United Kingdom Government (2014) *Water management: Abstract or impound water*, Accessed 20 August 2014, <https://www.gov.uk/water-management-abstract-or-impound-water>

⁷¹⁹ Environment Agency (2014) *Abstraction Charges Scheme 2014/15*, Accessed 20 August 2014, p.12, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304569/Abstraction_Charging_Scheme_2014-15_final_draft_140414_unsigned_version....pdf

Regional Charging Area	Standard Unit charge (per 1,000 m3)	
	GBP	EUR
Thames	13.84	16.30
Yorkshire	11.63	13.69
Dee	15.16	17.85
Wye	15.16	17.85

Note: The minimum annual charge is £25.00

Source: Environment Agency (2014) *Abstraction Charges Scheme 2014/15*, Accessed 20 August 2014, p.12, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304569/Abstraction_Charging_Scheme_2014-15_final_draft_140414_unsigned_version....pdf

- Tax revenue (2013): £118.5 (€139.53) million, equivalent to 0.01% of GDP. ⁷²⁰
- Different pricing mechanisms apply in Wales, Scotland and Northern Ireland:
 - In Wales, Natural Resources Wales is responsible for the abstraction of water. Its charging mechanism is in line with that of the Environment Agency and will be until March 2015 when it is due to be reviewed. ^{721,722}
 - In Scotland, the Scottish Environment Protection Agency (SEPA) administers the charging scheme. All industry sectors that abstract water (generally above 50m³ per day) have to pay subsistence charges as well as hold a SEPA licence. Subsistence charges are determined according to a number of factors including volume abstracted and source type. ⁷²³

⁷²⁰ Environment Agency (2014) *Annual Report and Accounts for the Financial Year 2013 and 2014*, Accessed 20th August 2014, p.75, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/326016/41276_HC_35_7_Env_Agency_ARA_accessible.pdf

⁷²¹ Natural Resources Wales (2014) *Abstraction Charges Scheme 2014/15*, Accessed 20th October 2014, <http://naturalresourceswales.gov.uk/content/docs/pdfs/how-we-regulate-you/our-charges/abstraction-charges-scheme-2014-15.pdf?lang=en>

⁷²² Natural Resources Wales, *Consultation on our Charging Scheme for 2015-16*, Accessed 20th October 2014, <http://naturalresourceswales.gov.uk/about-us/Consultations/our-own-consultations/consultation-on-our-charging-scheme-for-2015-16/?lang=en>

⁷²³ Scottish Environment Protection Agency (2014) *Water Environment Charging Scheme Guidance*, Accessed 20th October 2014, pp.20-26, http://www.sepa.org.uk/about_us/charging_schemes/current_charging_schemes.aspx

- In Northern Ireland, The Northern Ireland Environment Agency administers water abstraction. A one-off fee is payable for all applications to abstract water of more than 20 m³ per day. Unlike the schemes elsewhere in the UK, an annual charge only applies to licence holders who abstract more than 100m³ per day. ⁷²⁴

➤ **Water Discharge Activities:**⁷²⁵

- In England, water discharge activities require a specific permit dependant on the nature of the activity:
 - Standard rules permits for discharge to surface water from cooling water and heat exchangers;
 - Standard rules permits for discharge to surface water of secondary treated domestic sewage with a maximum daily volume between 5 and 20 m³ per day; or
 - Bespoke permits for any other discharge to surface water or groundwater.
- Applications are made to the Environment Agency.
- These permits are charged using a formulaic method of:
 - Volume factor;
 - Content factor;
 - Receiving water factor; and
 - Charge multiplier.
- Similar schemes operate in Wales, Scotland and Northern Ireland under their respective environmental agencies.

18.4 Modelled Changes in Tax Base

The modelled change in the tax base for each of the suggested reforms to the tax system are shown in the table and figures below.

Table 18-13: Change in Energy Tax Base

Fuel Type	Units	Baseline	After Tax Increase	Change
Gas Oil	million litres	29,594	29,167	-427

⁷²⁴ Department of the Environment (Ireland), Abstraction & Impoundment Licensing: Fees and charges, Accessed 20th October, http://www.doeni.gov.uk/niea/water-home/water_resources/abstraction/fees_and_charges-2.htm

⁷²⁵ Environment Agency (2014) *Environmental permitting Charging Scheme and Guidance*, Accessed 20th August 2014, p.65, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304565/EP_Scheme_and_Guidance_14-15_new_template_v10.pdf

Fuel Type	Units	Baseline	After Tax Increase	Change
Petrol	million litres	17,008	16,907	-101
Kerosene	million litres	14,422	14,422	0
LPG	thousand tonnes	88	77	-11
Heavy Fuel Oil	thousand tonnes	189	187	-3
Natural Gas	TJ (GCV)	0	0	0
Coal	thousand tonnes	0	0	0
Electricity	GWh	0	0	0

Figure 18-1: Change in Internal Passenger Flights, flights per year

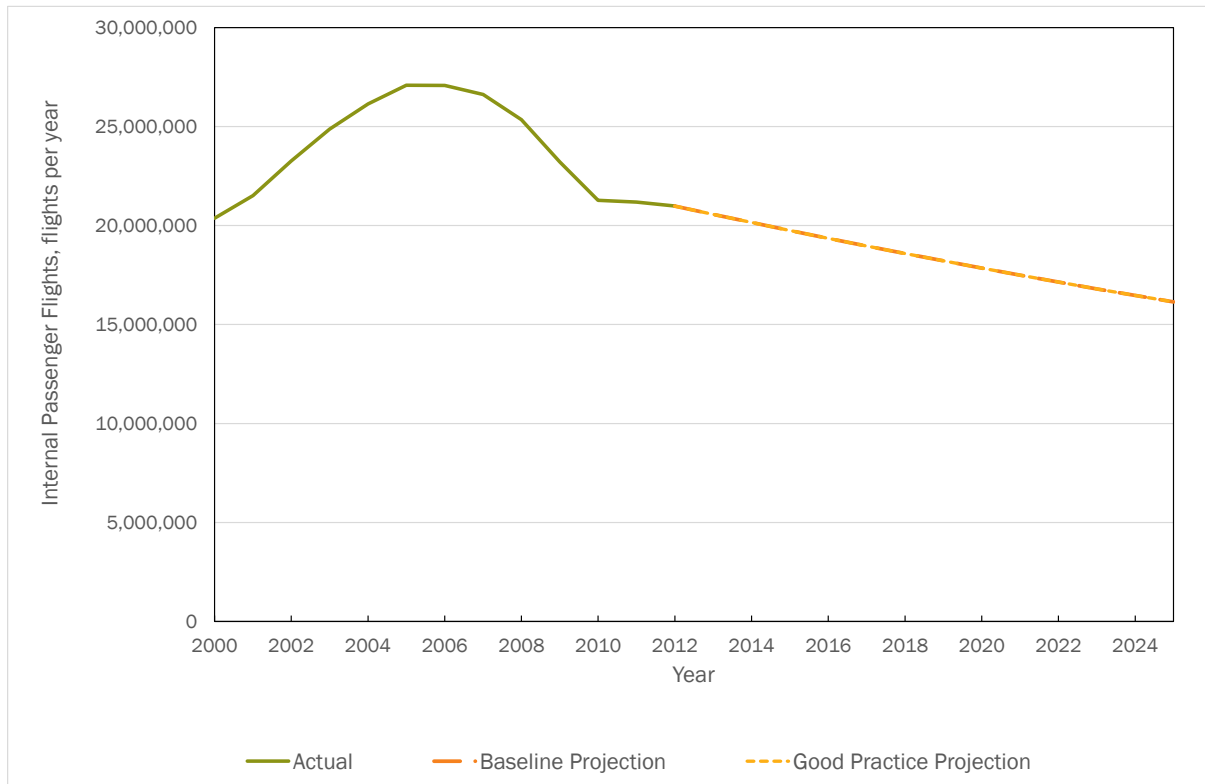


Figure 18-2: Change in Intra-EU Passenger Flights, flights per year

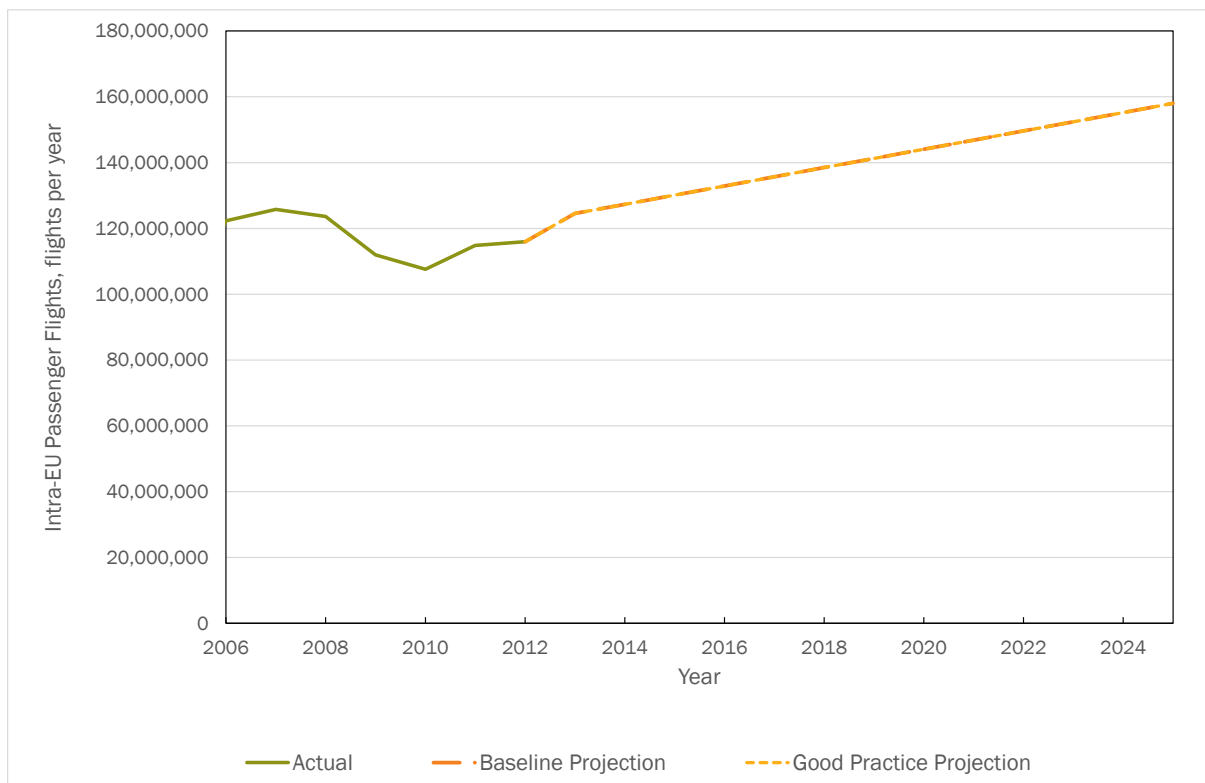


Figure 18-3: Change in Extra-EU Passenger Flights, flights per year

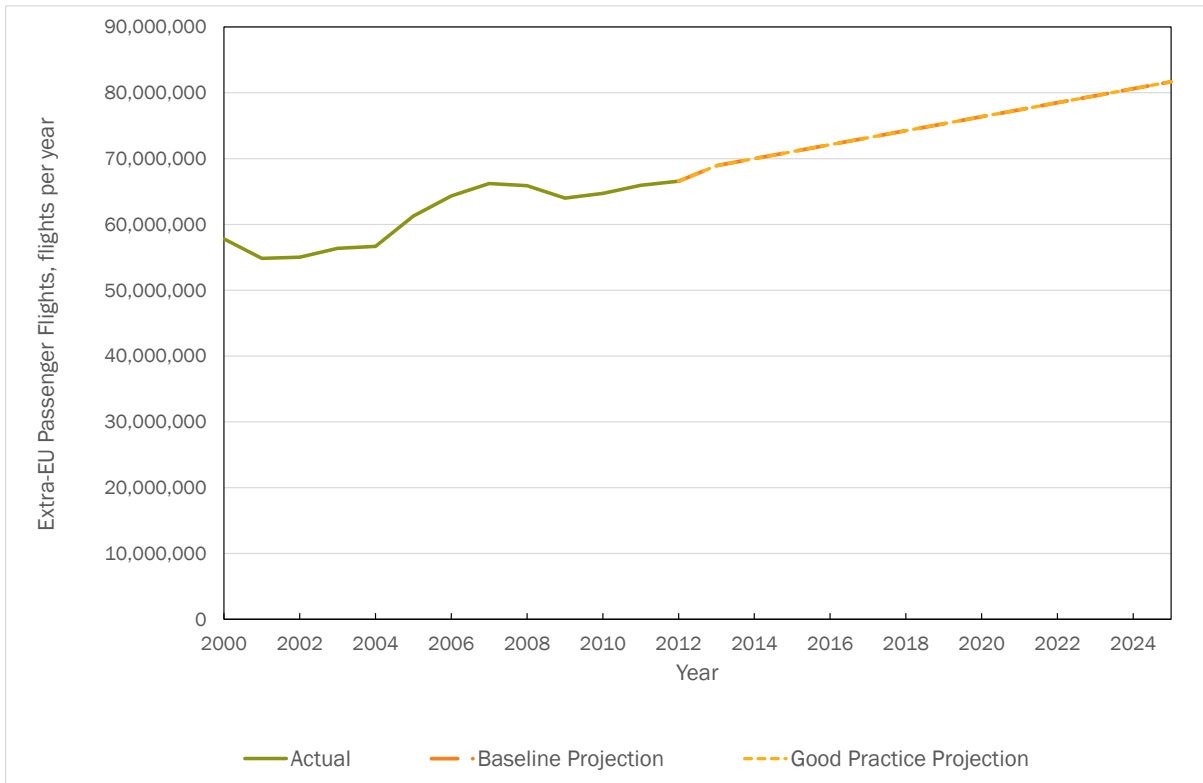


Figure 18-4: Change in Internal Air-freight, tonnes

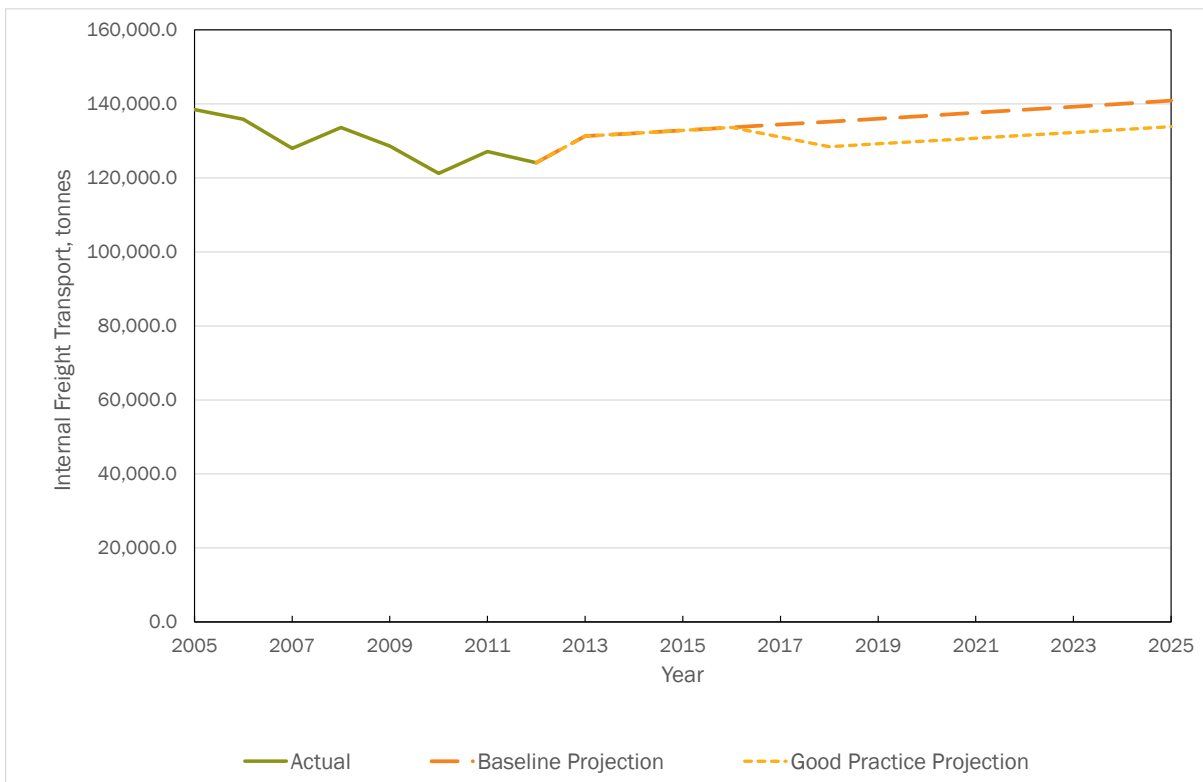


Figure 18-5: Change in Intra-EU Air-freight, tonnes

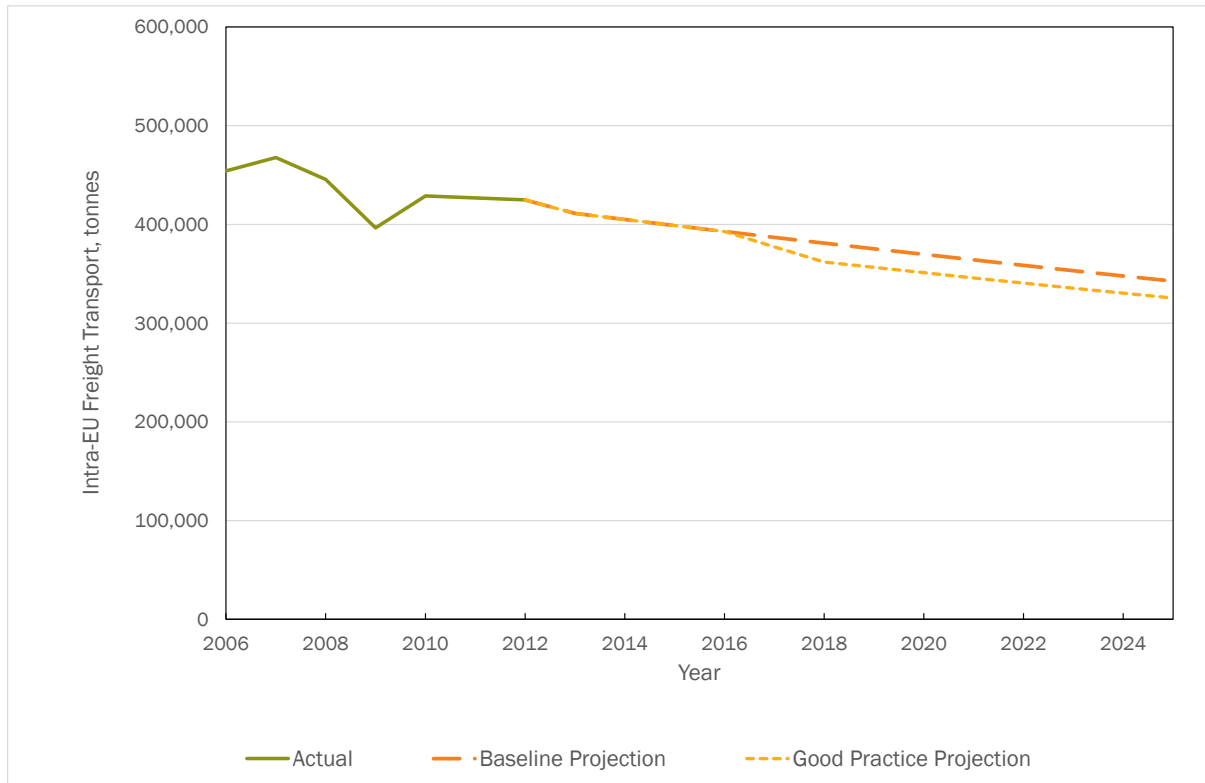


Figure 18-6: Change in Extra-EU Air-freight, tonnes

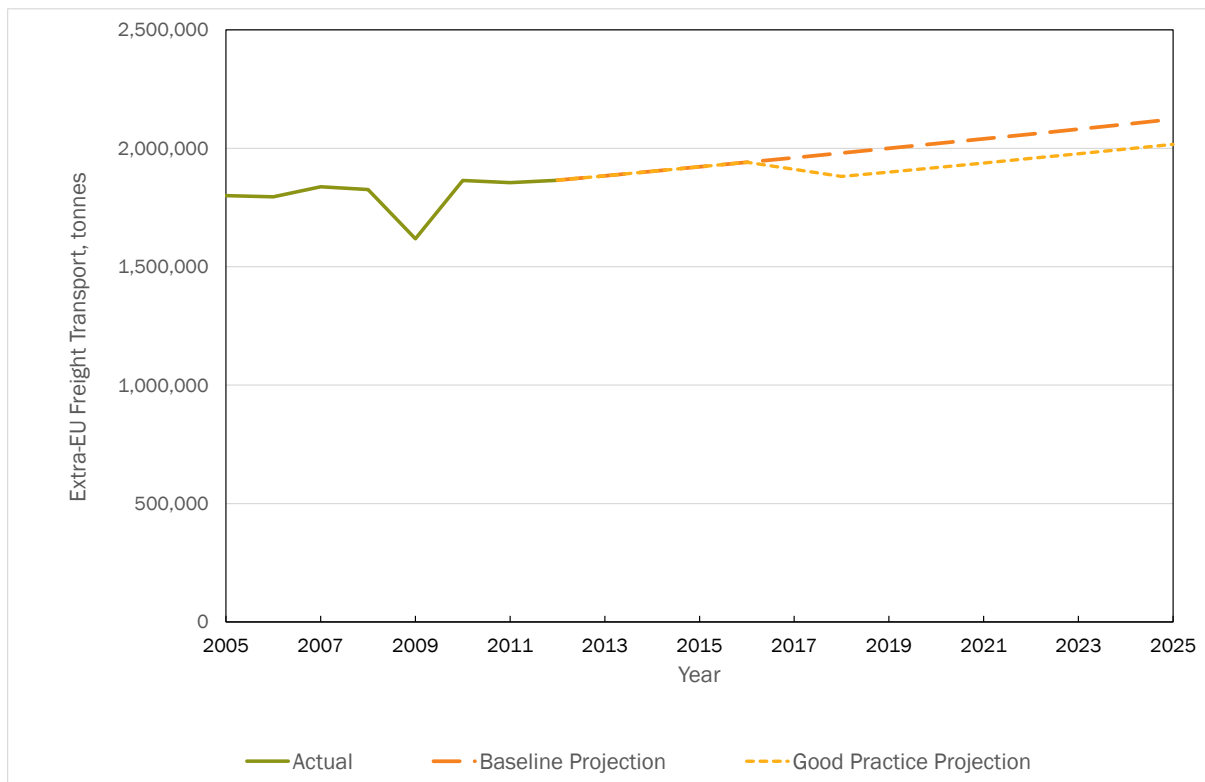


Figure 18-7: Change in Non-Hazardous Waste Landfilled, thousand tonnes

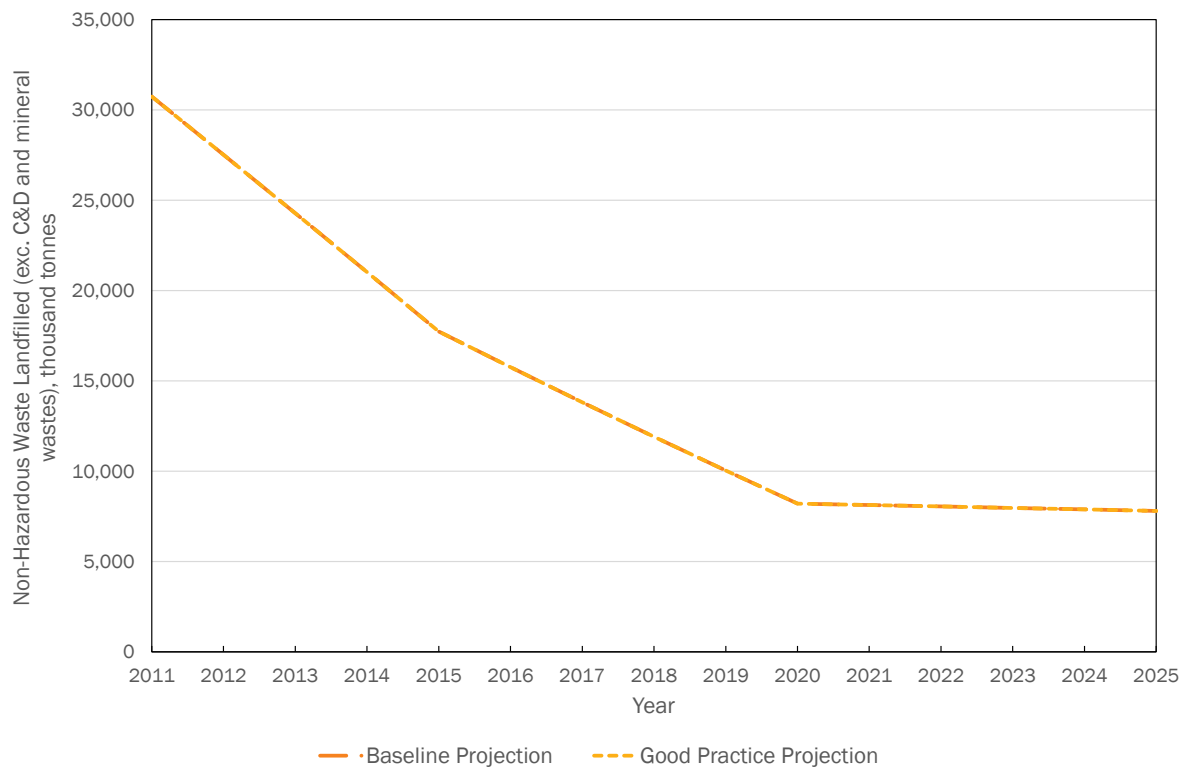


Figure 18-8: Change in MBT/ Incineration, thousand tonnes

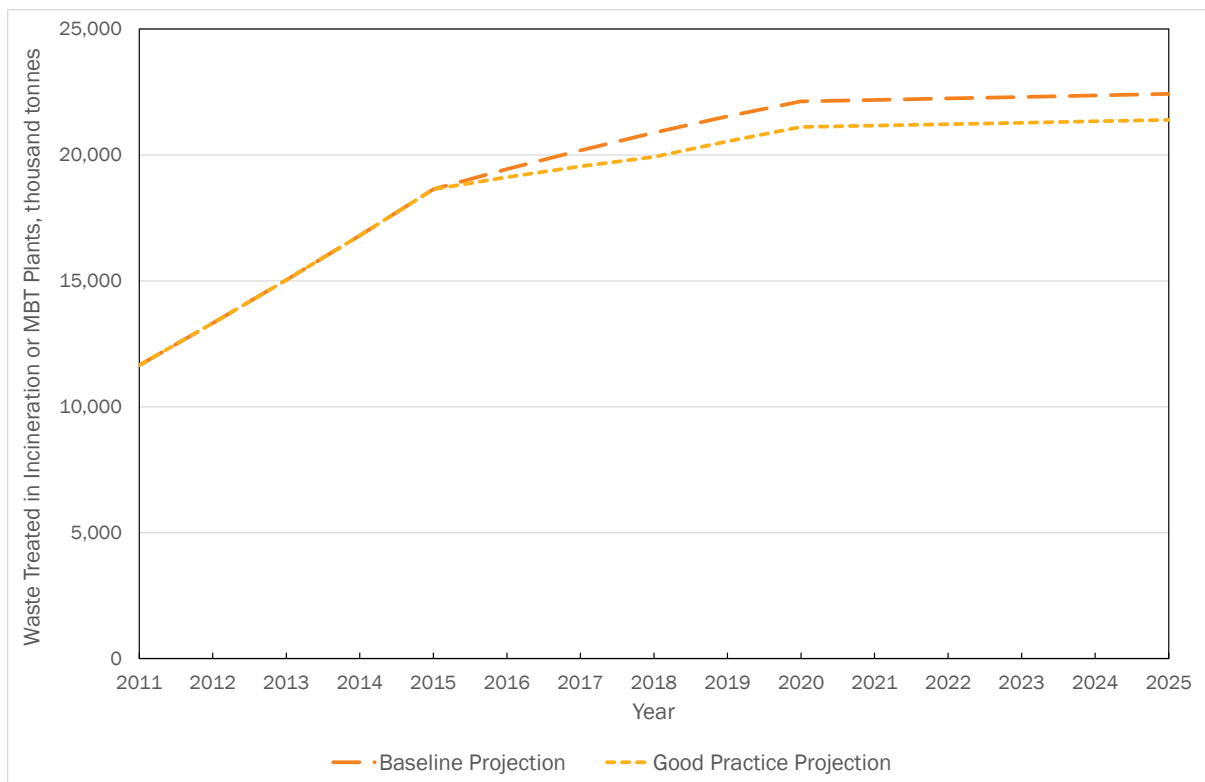


Figure 18-9: Change in SOx Emissions, tonnes

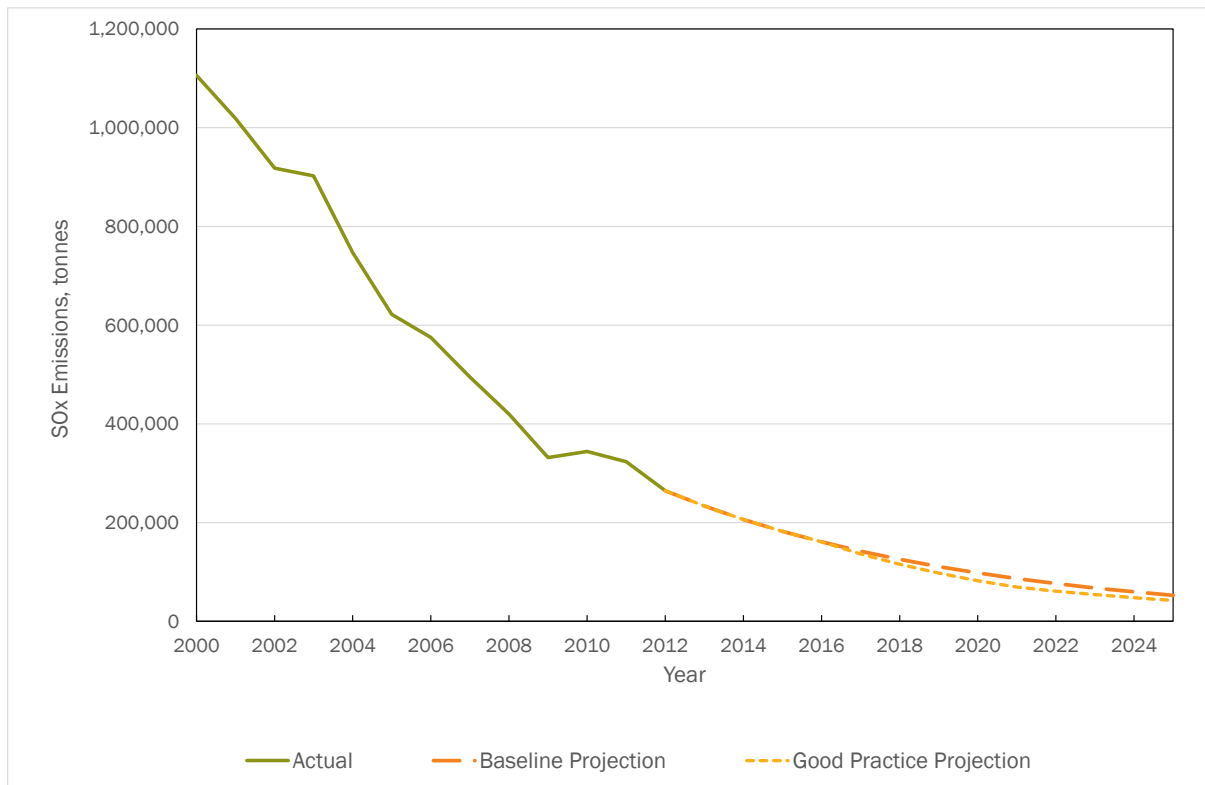


Figure 18-10: Change in NOx Emissions, tonnes

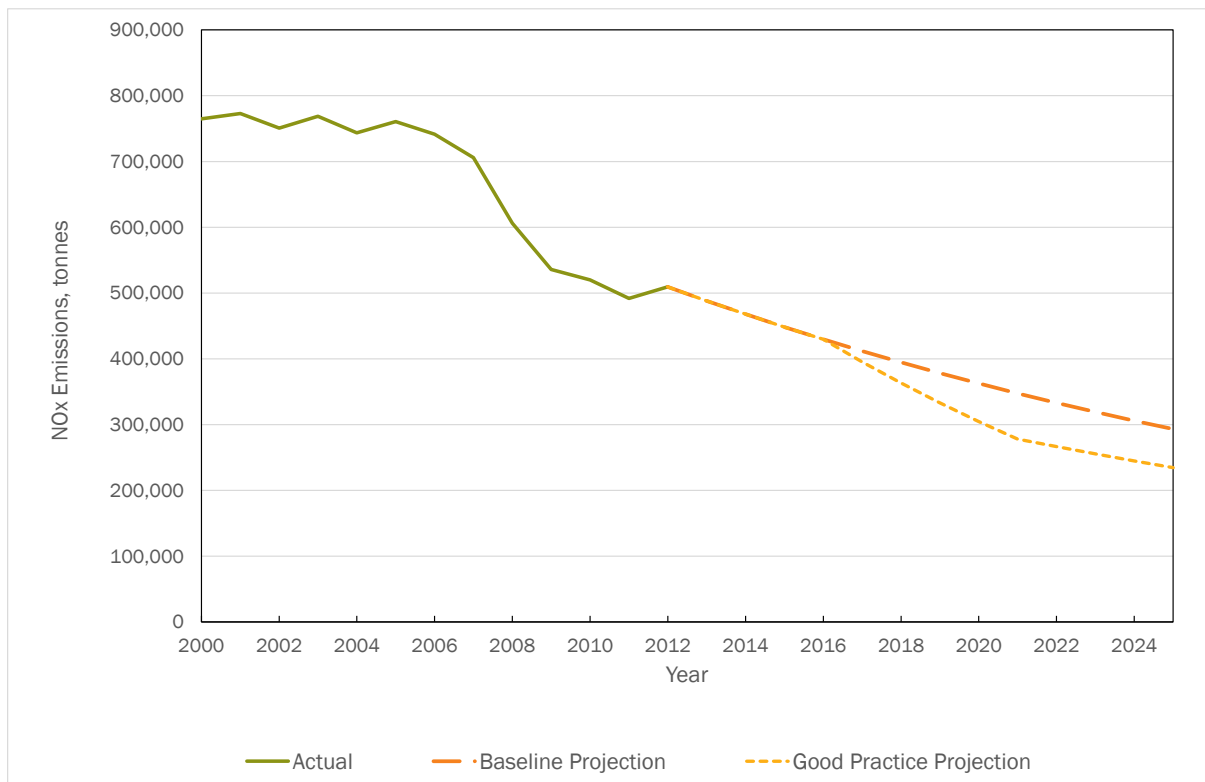


Figure 18-11: Change in PM₁₀ Emissions, tonnes

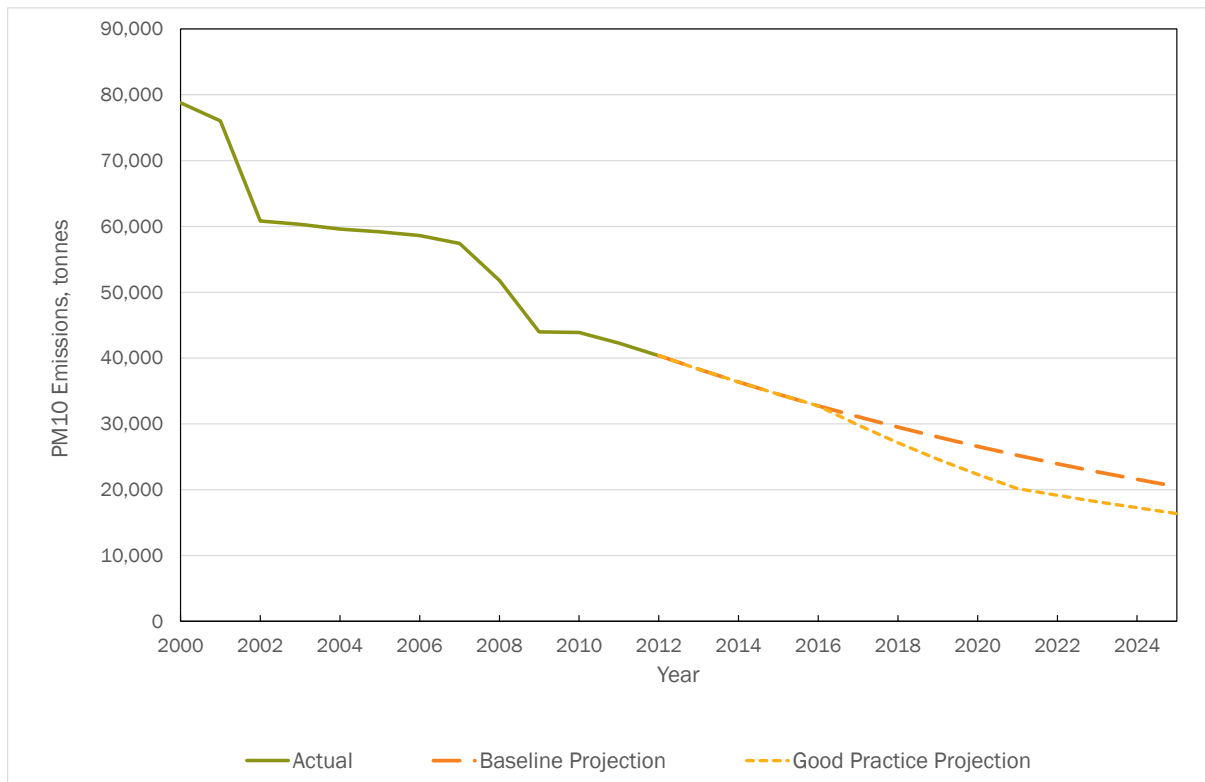


Figure 18-12: Change in Groundwater Abstraction – Public Supply, million cubic metres

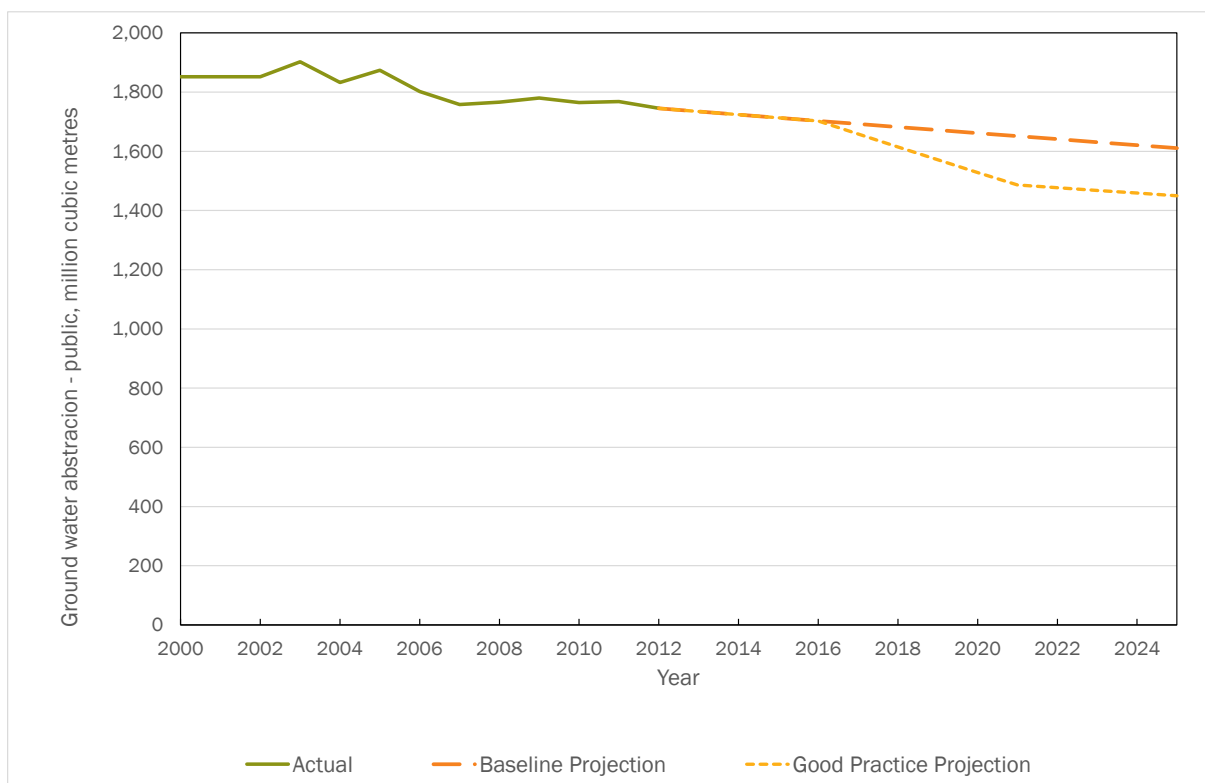


Figure 18-13: Change in Groundwater Abstraction – Manufacturing, million cubic metres

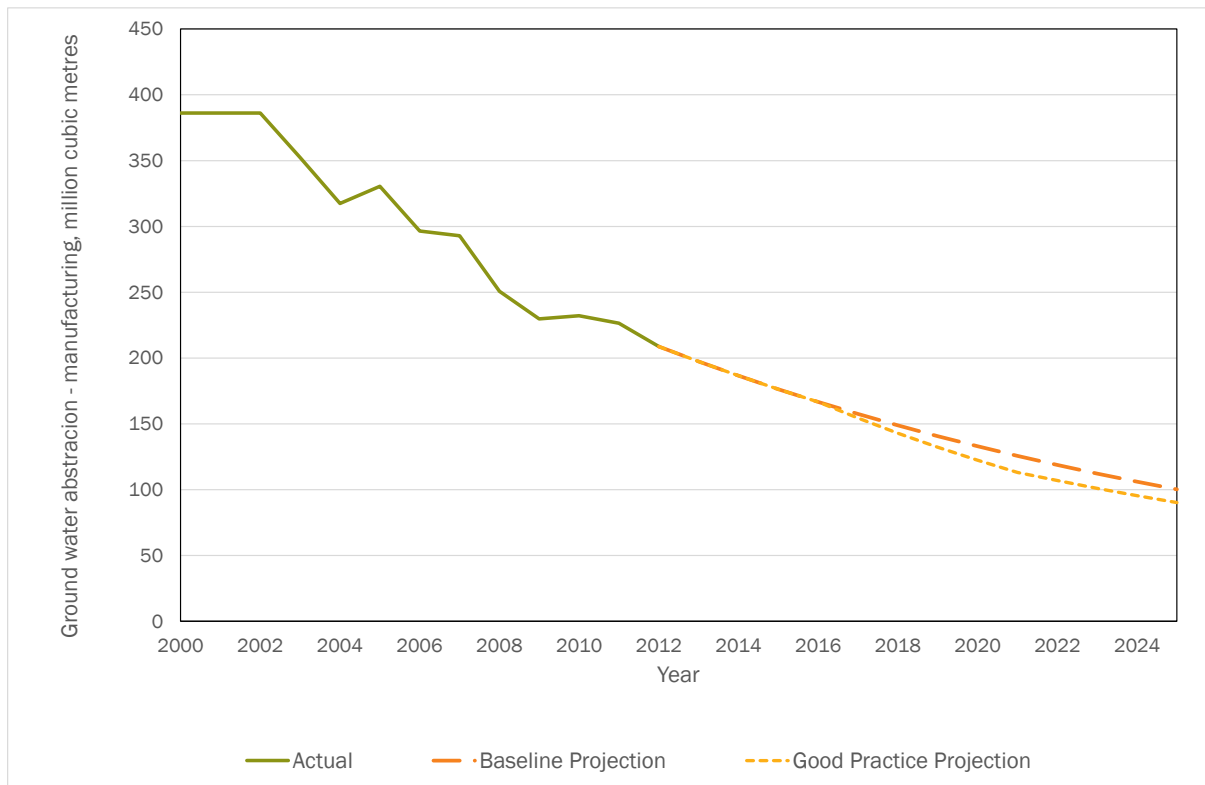


Figure 18-14: Change in Groundwater Abstraction – Agriculture, million cubic metres

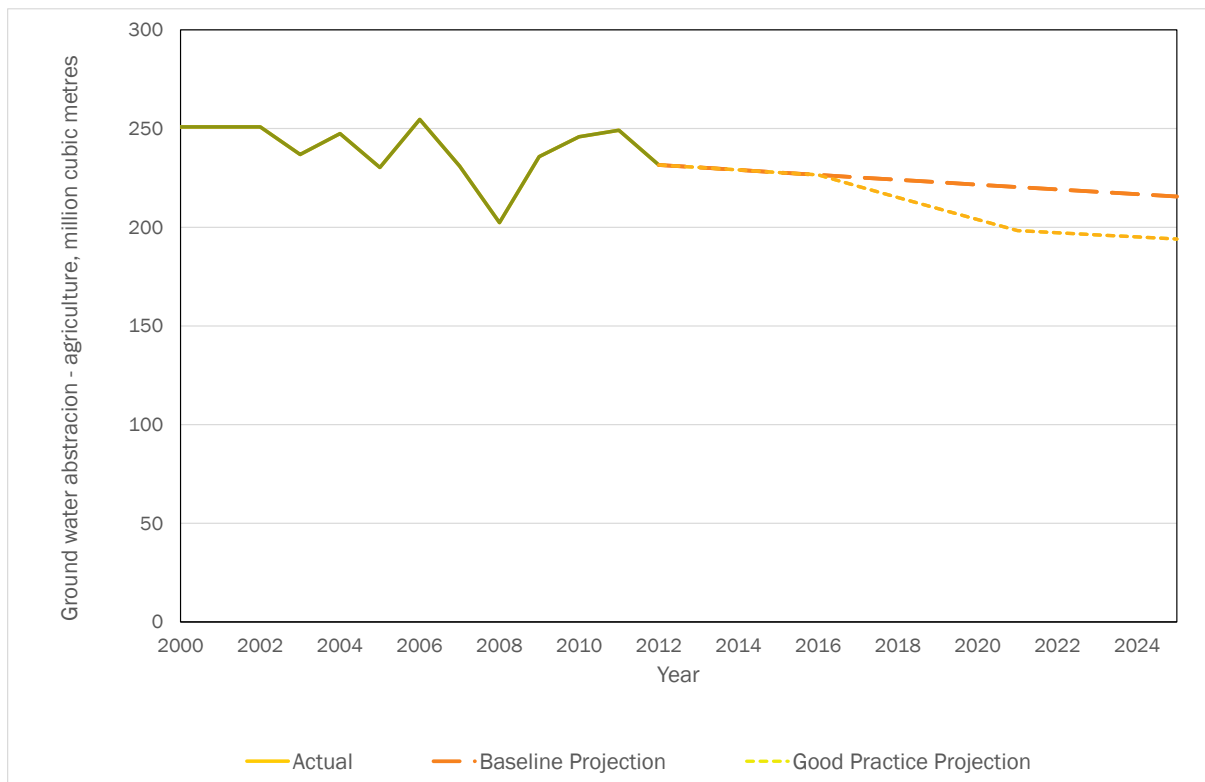


Figure 18-15: Change in Surface Water Abstraction – Public Supply, million cubic metres

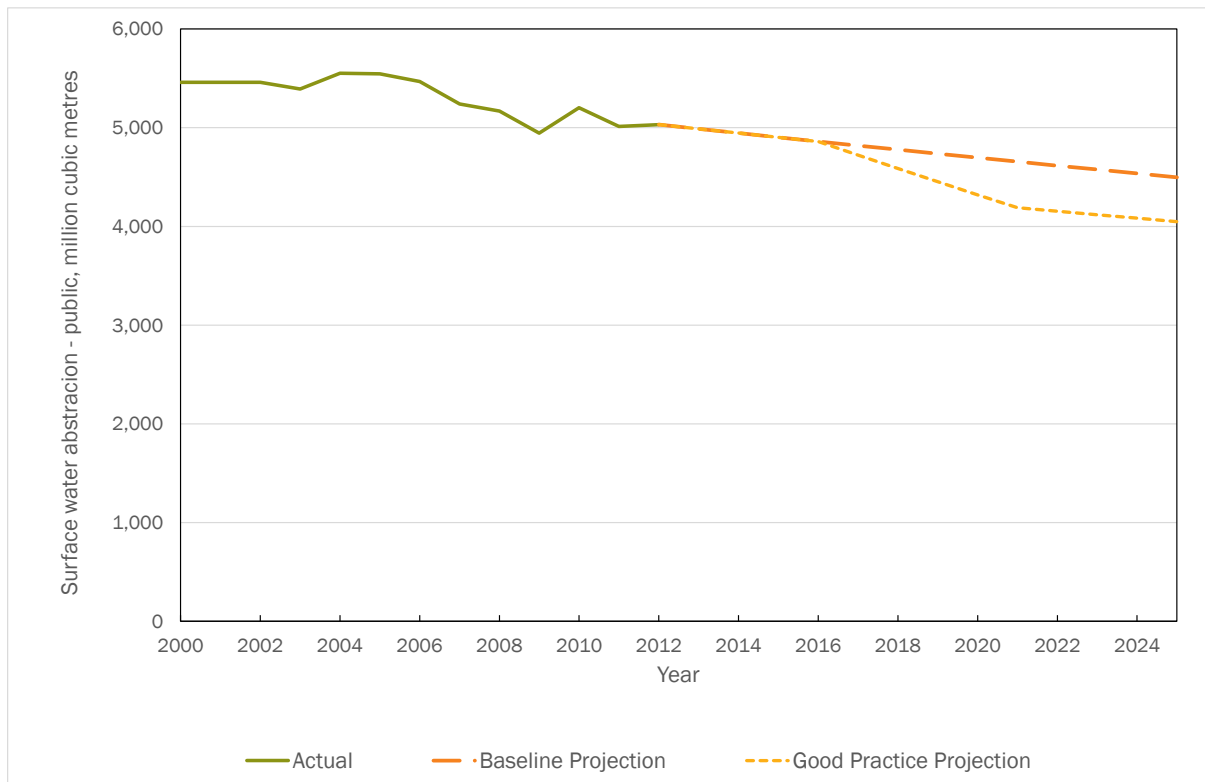


Figure 18-16: Change in Surface Water Abstraction – Manufacturing, million cubic metres



Figure 18-17: Change in Surface Water Abstraction – Agriculture, million cubic metres

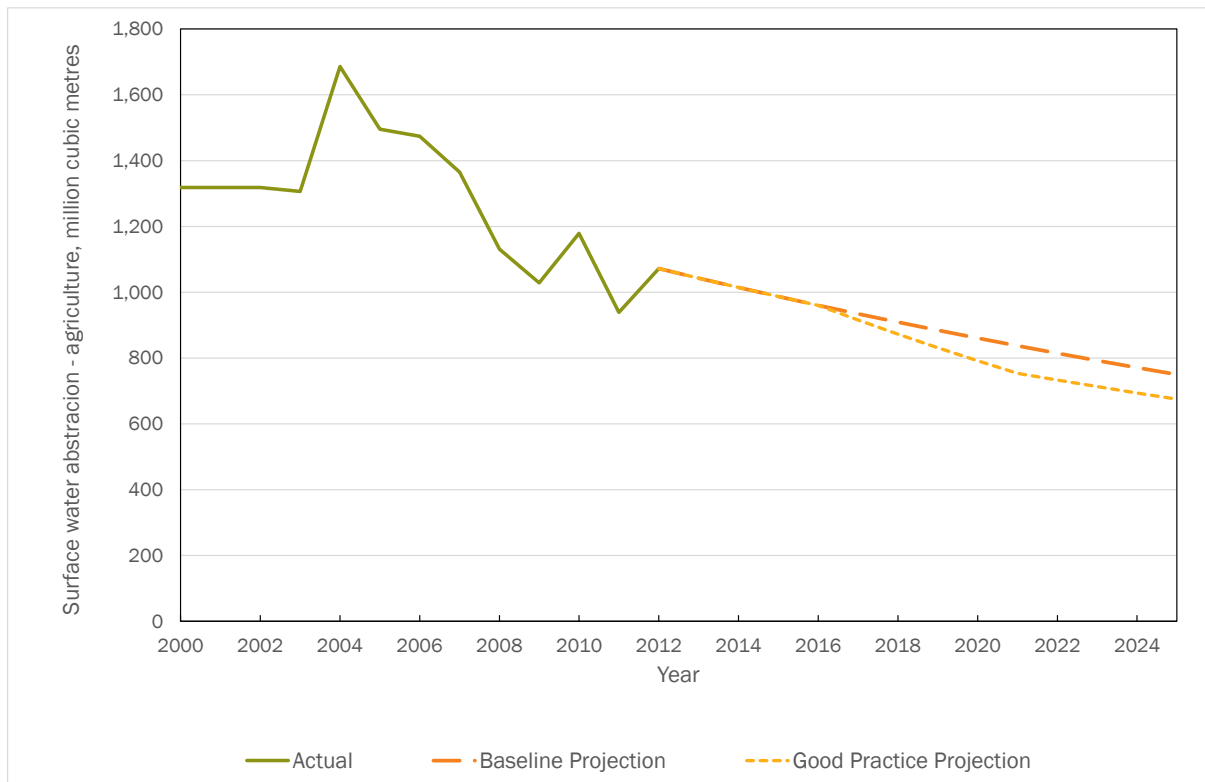


Figure 18-18: Change in Active Ingredients in Pesticides, tonnes

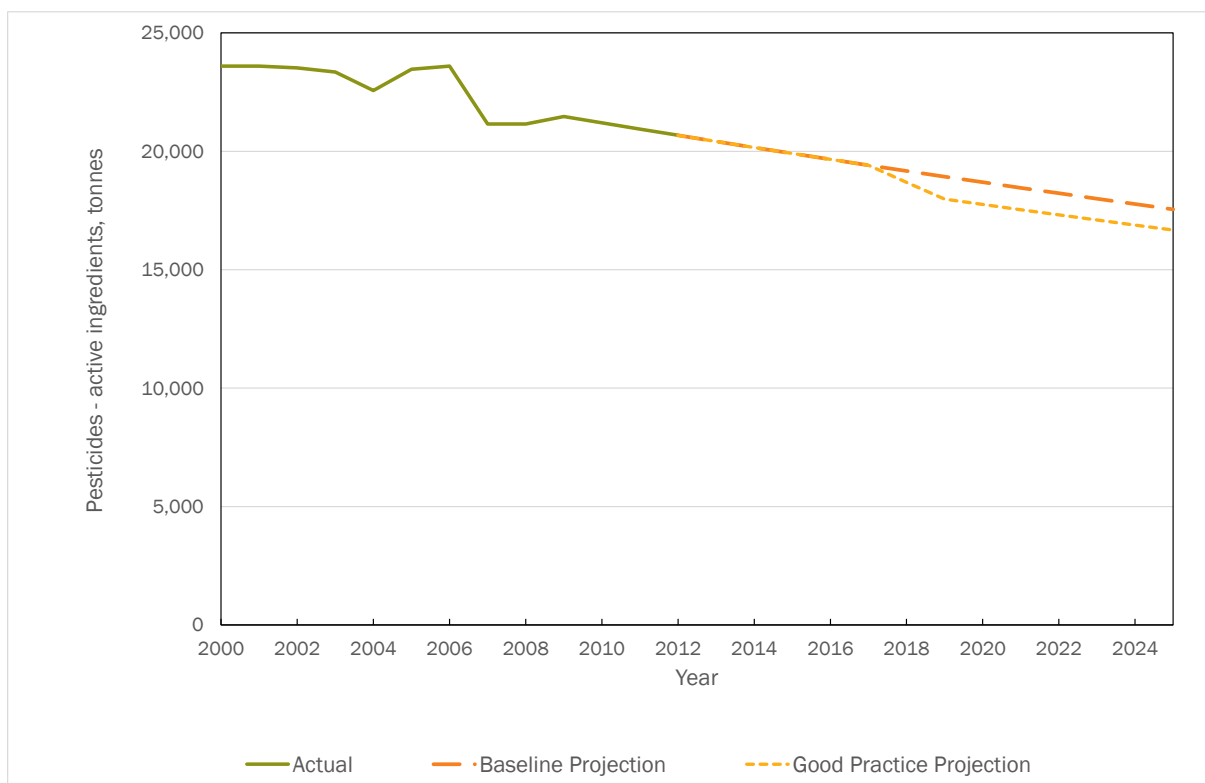


Figure 18-19: Change in Non-organic Nitrogen Sales of Fertilisers, tonnes

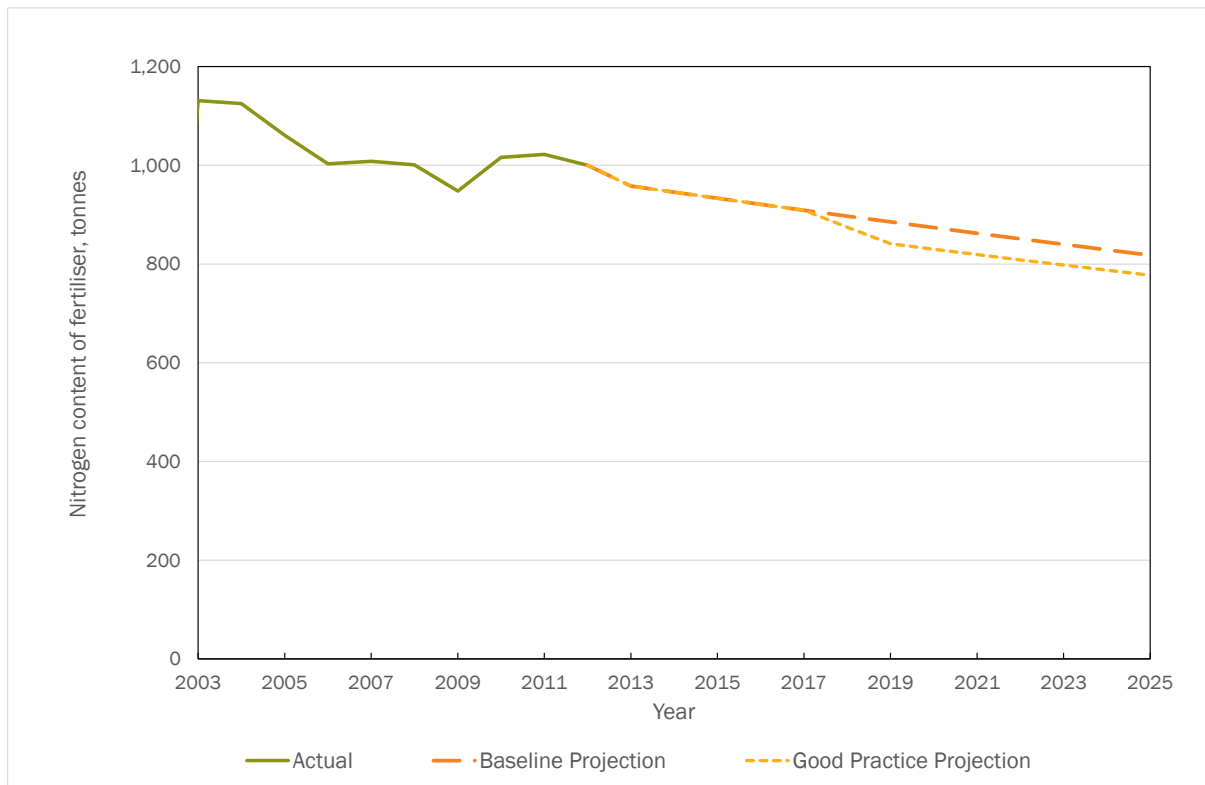


Figure 18-20: Change in Aggregates Extraction, thousand tonnes

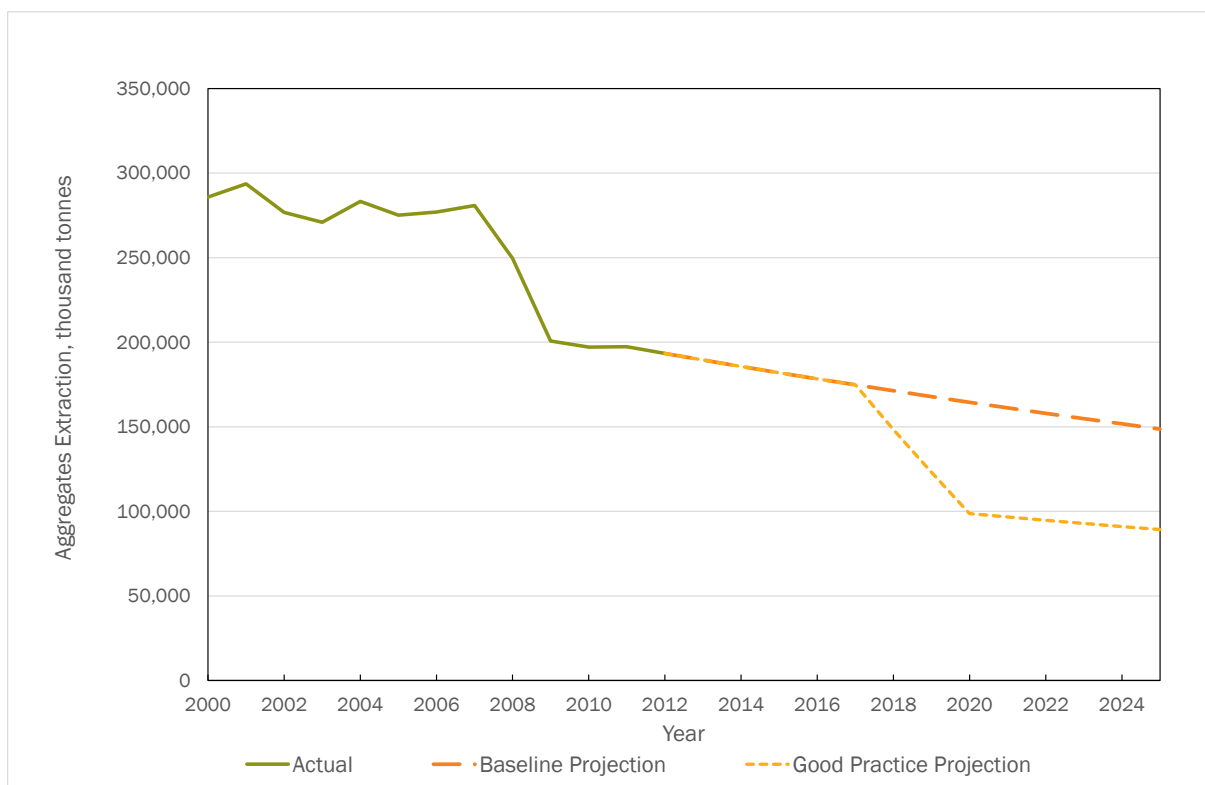


Figure 18-21: Change in Paper & Card Packaging Generation, thousand tonnes

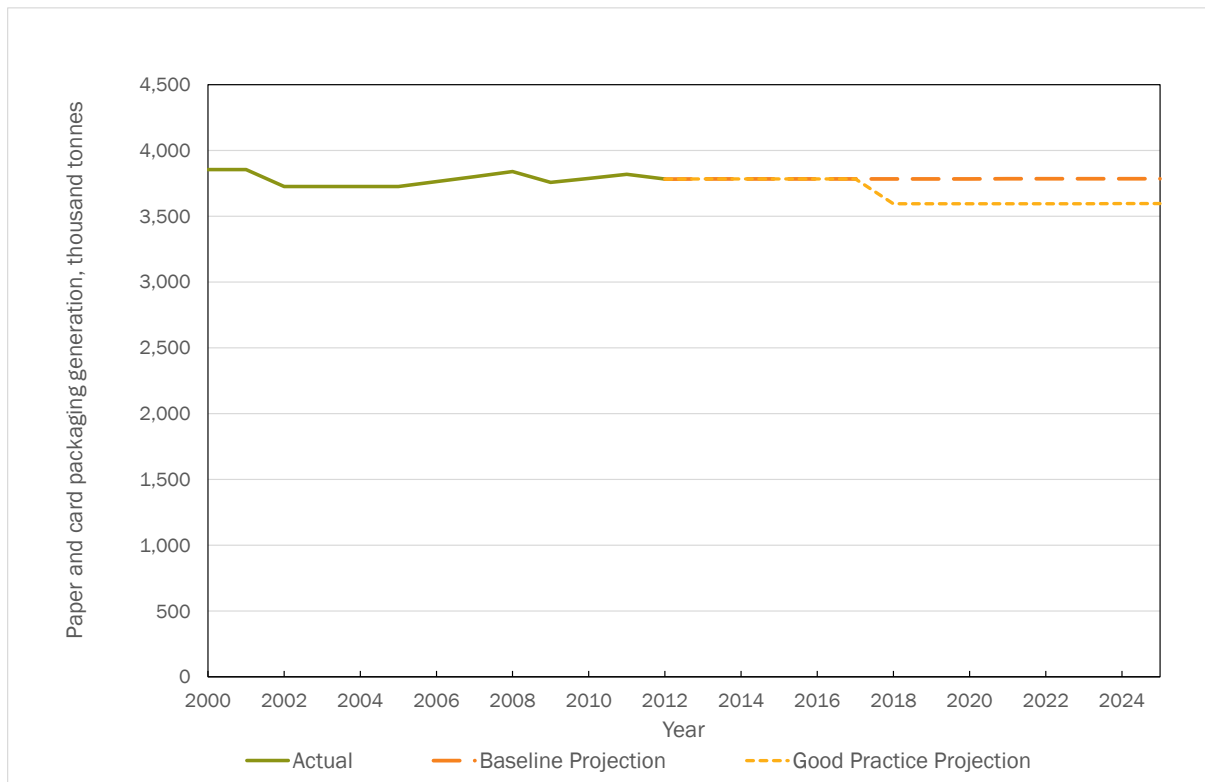


Figure 18-22: Change in Plastic Packaging Generation, thousand tonnes

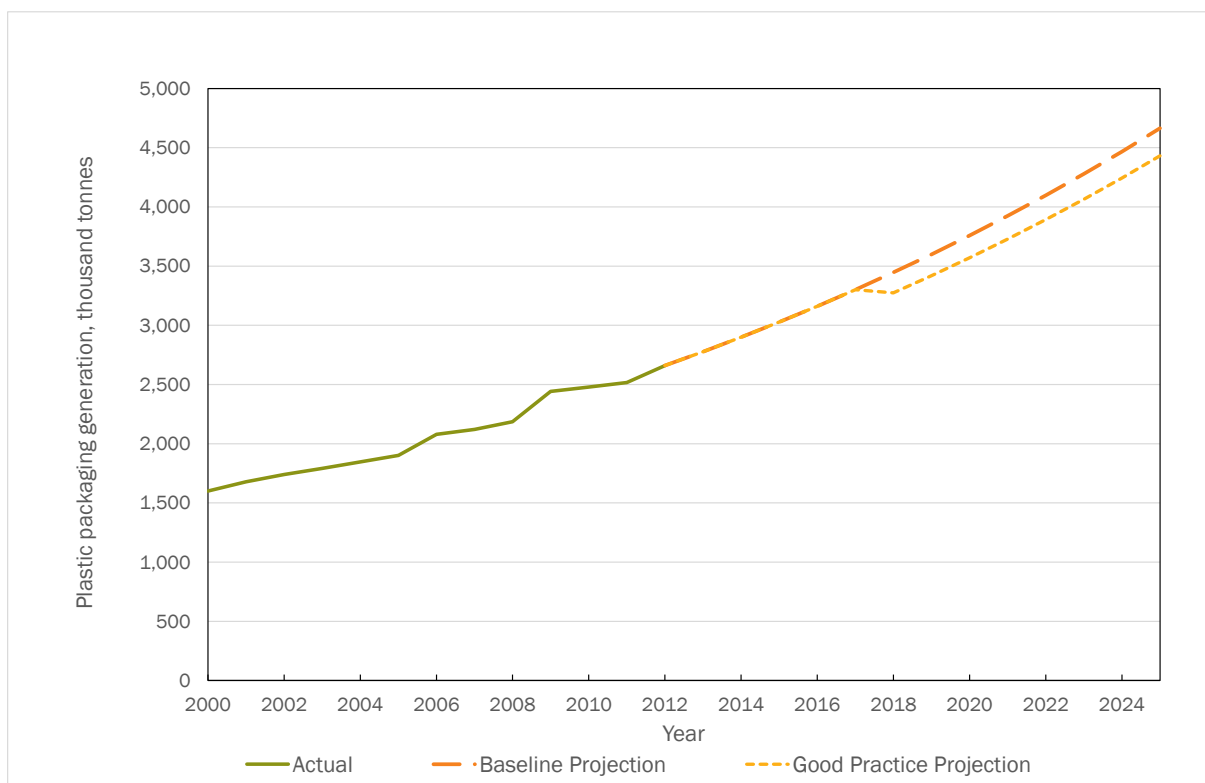


Figure 18-23: Change in Wood Packaging Generation, thousand tonnes

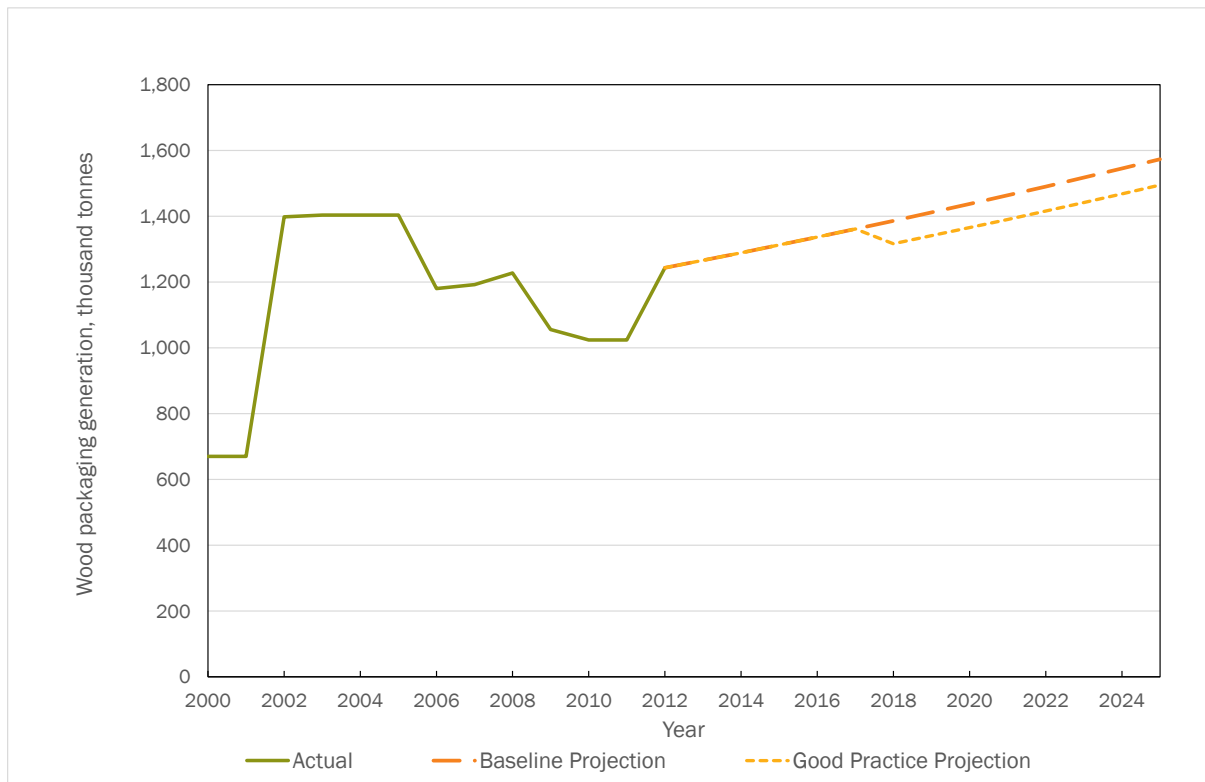


Figure 18-24: Change in Metal Packaging Generation, thousand tonnes

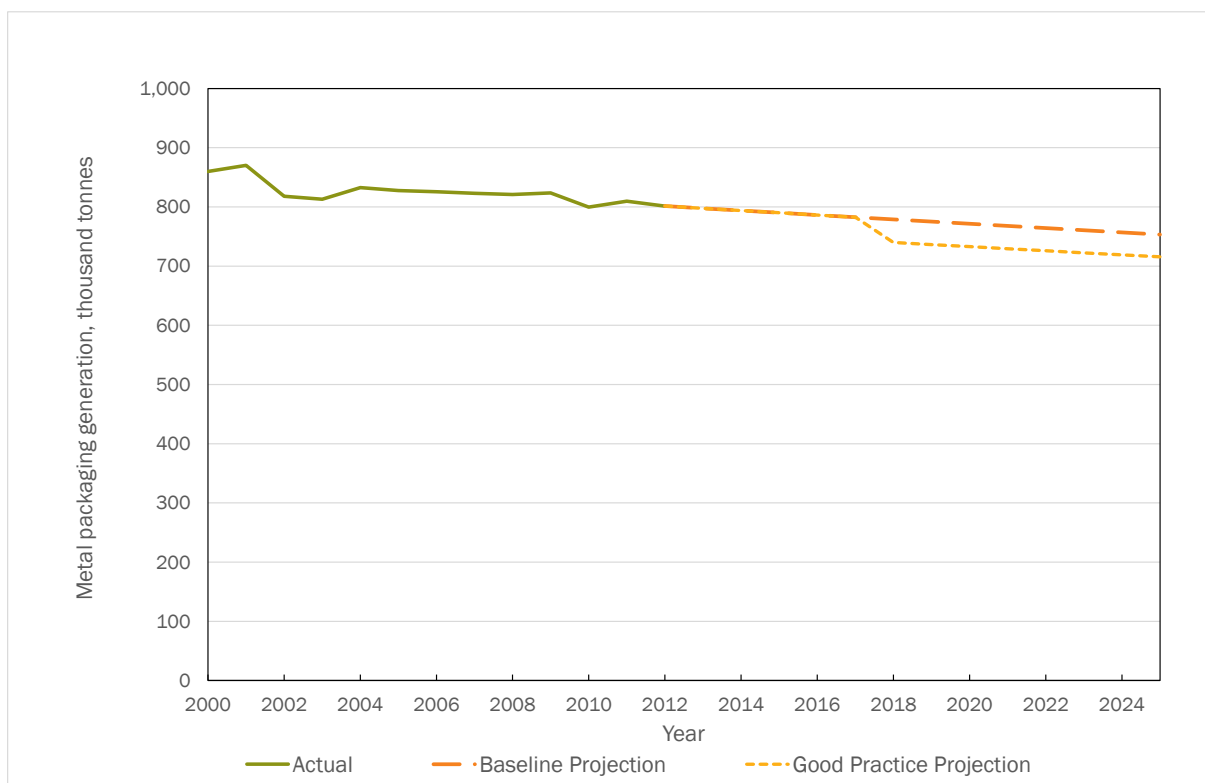


Figure 18-25: Change in Glass Packaging Generation, thousand tonnes

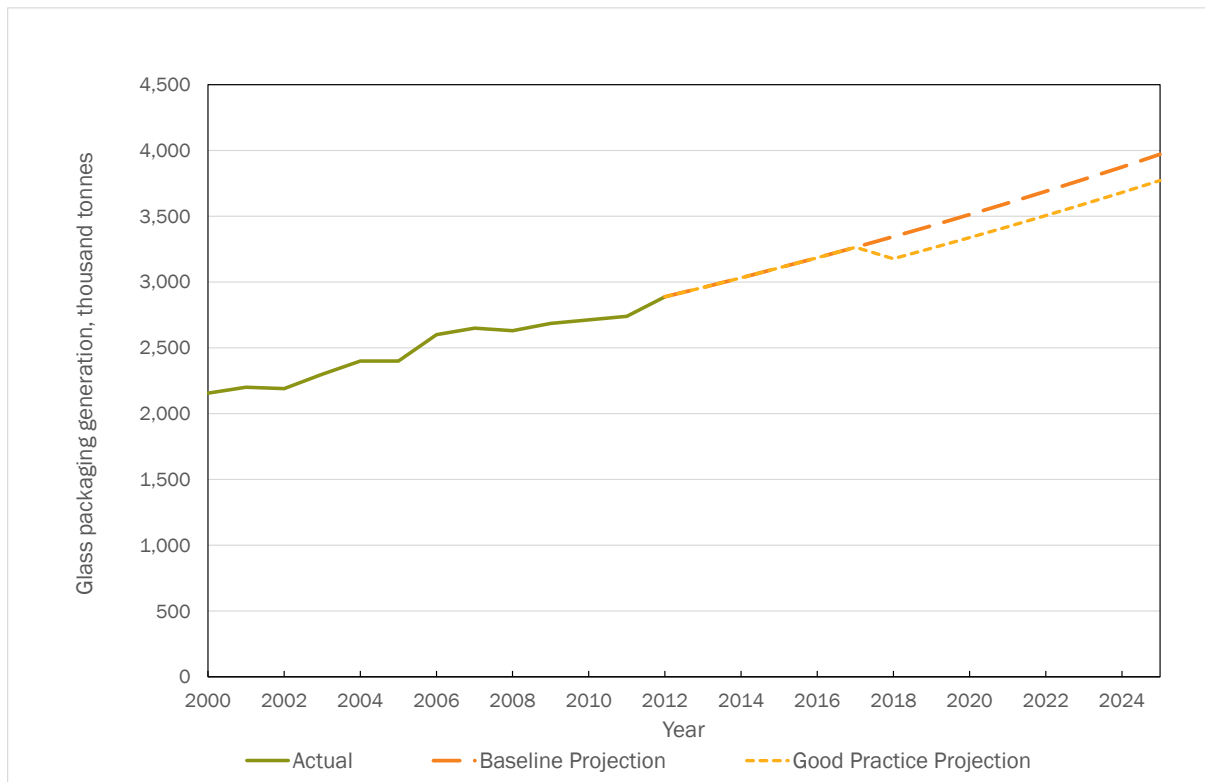
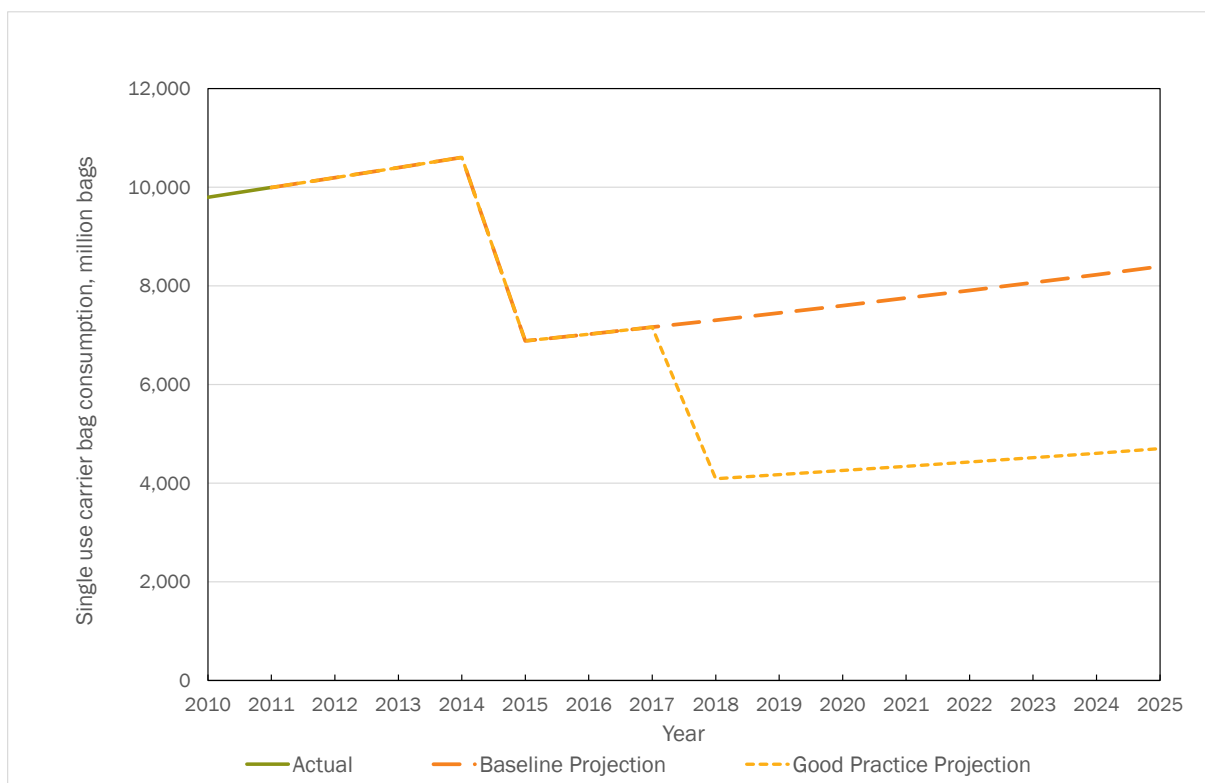


Figure 18-26: Change in Consumption of Single Use Carrier Bags, million bags



18.5 Full Revenue Outputs

A summary of the full revenue outputs for each of the suggested reforms to the tax system are presented in the table below.

Table 18-14: Revenue Outturns from Model, million GBP (real 2014 terms)

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Energy Taxes	Transport fuels	0	0	439	876	1,312	1,748	2,182	2,615	3,047	3,047	3,047
	C&I / Heating	0	0	4	9	13	17	22	26	30	30	30
	Electricity	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Energy, million GBP	0	0	443	885	1,325	1,765	2,203	2,641	3,077	3,077	3,077
	Sub-total Energy, % GDP	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%
Transport Taxes (excluding transport fuels)	Vehicle Taxes	0	0	877	1,755	2,632	3,510	4,391	4,392	4,393	4,394	4,395
	Passenger Aviation Tax	0	0	0	0	0	0	0	0	0	0	0
	Freight Aviation Tax	0	0	1	2	2	2	2	2	2	2	2
	Sub-total Transport, million GBP	0	0	878	1,757	2,635	3,513	4,393	4,394	4,395	4,396	4,397
	Sub-total Transport, % GDP	0.0%	0.0%	0.1%	0.1%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%	0.3%
Pollution and Resource Taxes	Landfill Tax - Non-haz (excl. C&D)	0	0	0	0	0	0	0	0	0	0	0
	Landfill Tax - Inerts (C&D)	0	0	0	0	0	0	0	0	0	0	0
	Incineration /MBT Tax	0	77	157	240	248	255	255	256	257	257	258

Tax Category	Type of Tax	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Air Pollution Tax	0	106	190	257	309	347	312	294	278	263	249
	Water Abstraction Tax	0	336	651	946	1,222	1,479	1,431	1,416	1,401	1,386	1,372
	Waste Water Tax	0	132	256	371	358	358	358	358	358	358	358
	Pesticides Tax	0	0	78	150	145	143	141	139	137	136	134
	Aggregates Tax	0	0	0	0	0	0	0	0	0	0	0
	Packaging Tax	0	0	344	335	344	353	362	372	382	392	403
	Single Use Bag Tax	0	264	270	-7	-7	-7	-7	-7	-7	-8	-8
	Fertiliser Tax	0	0	0	0	0	0	0	0	0	0	0
	Sub-total Pollution & Resource, million GBP	0	915	1,946	2,293	2,617	2,926	2,851	2,827	2,805	2,785	2,766
	Sub-total Pollution & Resource, % GDP	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Total Revenue Stream	Total, million GBP	0	915	3,268	4,935	6,578	8,204	9,448	9,862	10,277	10,258	10,240
	Total, % GDP	0.0%	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.6%	0.6%	0.6%	0.6%

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