ENHANCEMENT, CONVERGENCE, AND ADOPTION

Measuring Portfolio Alignment

GFANZ
Glasgow Financial Alliance for Net Zero

Acknowledgements

This draft report was developed by the GFANZ workstream on Portfolio Alignment Measurement with input from the GFANZ Principals Group, Steering Group, and Advisory Panel. The workstream was supported by the GFANZ Secretariat. Oliver Wyman provided knowledge and advisory support. Members of the workstream include representatives from:

Allianz
Bank of America
BlackRock
Bloomberg
Cambridge Associates
CDP (Advisor)
Deutsche Bank
EY
Fulcrum Asset Management
Generation IM (Workstream Chair)
HSBC
Institutional Investors Group on Climate Change (IGCC)
Lombard Odier
McKinsey (Advisor)
Mirova
Mitsubishi UFJ Financial Group, Inc.
MSCI
Ninety One
Rocky Mountain Institute (Advisor)
Shinhan Financial
Singapore Exchange Group
S&P Global
UBS
UNEP-FI (Advisor)
Wells Fargo
WTW

GFANZ would like to thank all those who have contributed to the work and development of this draft report in support of a net-zero climate transition.

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How to participate in the consultation

On behalf of the Glasgow Financial Alliance for Net Zero (GFANZ),[1] the Portfolio Alignment Measurement workstream is pleased to share our interim report for consultation:
Measuring Portfolio Alignment: Enhancement, Convergence, and Adoption.

The release of this draft report is accompanied by a five-week public consultation, running until September 12, 2022.

To provide feedback, please respond to the survey available here.

Thank you for taking the time to review this draft report and respond to the questions. GFANZ will take the responses into consideration when releasing the final recommendations and guidance in the final report for publication ahead of COP 27.

1 GFANZ is led by a Principals Group comprising chief executives from financial institutions that have joined a net-zero alliance anchored in the UN Race to Zero.

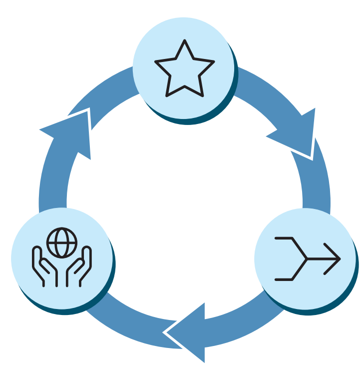
Executive Summary

To measure the alignment of their investment, lending, and underwriting activities with the goal of net zero, GFANZ members have expressed the need for sound and forward-looking portfolio alignment methods. This draft report provides guidance and lays out illustrative quantitative and practitioner case studies for financial institutions looking to develop and use portfolio alignment metrics, drawing on extensive engagement with financial experts and other key stakeholders.[2] The purpose of this consultation is to seek feedback from a broad, public audience prior to the publication of the final report ahead of COP 27.

Enhancement, convergence, and adoption

The GFANZ workstream on Portfolio Alignment Measurement builds on the work of the Portfolio Alignment Team (PAT) which published reports in 2020 and 2021 (see Exhibit 1 for more details) with the overarching objectives of enhancement, convergence, and adoption. These objectives are interconnected and reinforce each other as part of a continuous circle, with further details provided below (Figure 1).

Figure 1: The 2022 objectives of the GFANZ workstream on Portfolio Alignment Measurement reinforce each other as part of a continuous circle that drives adoption through convergence and enhancement.



2 See "Developing this draft report" section for more details on the GFANZ engagement outreach.

The enhanced guidance provided in this draft report encourages greater levels of convergence on best-practice methods for portfolio alignment measurement; increasing the transparency on the underlying assumptions employed, and fostering agreement on methodological frameworks, to be embraced by financial institutions and metric providers.

The guidance was developed in collaboration with members and advisors of the Portfolio Alignment Measurement workstream as well as net-zero financial institutions, metric providers, and NGOs. Overall, the GFANZ workstream on Portfolio Alignment Measurement engaged with and incorporated input from over 50 individual institutions.[3] The guidance provided in this draft report is underpinned by quantitative and practitioner case study examples that provide practical insights into the outcomes and implementation of different design choices. To illustrate the current use of portfolio alignment metrics, this draft report provides practical, real-world applications of portfolio alignment metrics that were identified during the engagement process. As a result, this draft report is comprehensive and certain sections contain a greater level of detail which will be useful for readers who wish to conduct deep dives on topics that are most relevant for them.

1. THE ECOSYSTEM OF PORTFOLIO ALIGNMENT METRICS

Four categories of alignment metrics are being used by financial practitioners today (see Section 1). On a spectrum of increasing complexity, they are **binary** metrics, **maturity scale alignment** metrics**,** **benchmark divergence** metrics, and **implied temperature rise (ITR)** metrics. While the **binary**, **benchmark divergence**, and **ITR** metrics had already been identified in the 2021 PAT Report, the widespread use of **maturity scale alignment** metrics became clear during GFANZ engagement outreach earlier this year[4] as a fourth category.

The **binary** approach focuses on measuring alignment based on the percentage of portfolio companies with net-zero aligned emission reduction targets. By contrast, **maturity scale** metrics bucket portfolio companies into alignment categories, for example, based on a categorical scale of “aligned”, “aligning”, “committed to aligning”, or “not aligned”. **Benchmark divergence** metrics provide the cumulative over or undershoot from a net-zero aligned benchmark, and **ITR** metrics go one step further by translating this over/undershoot into a science-based, end-of-century global warming outcome.

Portfolio alignment metrics should be simple to use, transparent, science-based, broadly applicable, aggregable, and incentive optimal.[5] For example, feedback from engagement has suggested that the binary metric is easy to use, however, the approach does not provide insights for companies without emissions reduction targets and does not currently incorporate the credibility of transition plans. By contrast, maturity scale alignment metrics might help provide a more comprehensive picture of how portfolio companies perform on a maturity scale. The drawback of these metrics is that there may be differing data sources and definitions used for the qualitative categories that are assigned to companies in a portfolio. On the other hand, benchmark-divergence metrics are complex to use and interpret. For example, the level of acceptable over or undershoot to invest or lend in a net-zero aligned fashion is not straightforward. Nevertheless, benchmark divergence metrics have merit, for example, for identifying sectoral climate

3 See “Developing this draft report” section for more details on engagement outreach.

4 See “Developing this draft report” section for more details on engagement outreach.

5 Portfolio Alignment Team, “Measuring Portfolio Alignment: Technical Considerations”, 2021.

leaders and laggards in an investment portfolio. In theory, ITR metrics may be the most intuitive and incentive-optimal metric[6] for a range of use cases. In practice, feedback from members suggests that methodological and implementation challenges continue to exist and for some financial institutions this may compromise ITR metrics' current decision-usefulness.

In the meantime, and until the remaining challenges are addressed, some financial institutions may find simpler metrics such as the binary or maturity scale approaches preferable; others find a combination of approaches provides a range of insights.

Portfolio alignment metrics and the GFANZ four key approaches

GFANZ's 2022 report "Recommendations and Guidance on Financial Institution Net-zero Transition Plans" outlines four key approaches to progress the transition to net zero in the real economy. They can be seen as relating to four types of companies: **providers of climate solutions, companies that are 1.5 degrees C-aligned, companies that are in the process of becoming 1.5 degrees C-aligned**, and **companies that need to phase out high-emitting assets before their end-of-life**.[7]

Portfolio alignment metrics are useful today to help financial institutions assess those companies that are 1.5 degrees C-aligned and those that need to transition to become 1.5 degrees C-aligned.

However, at the time of writing, the accurate representation of climate solutions, the suitability for use in broader asset classes such as private equity, and phase-out of high-emitting assets, are not yet appropriately addressed in portfolio alignment measurement tools. To start the thinking around measuring alignment for climate solutions, a number of practitioner case studies are featured in Section 3. Enabling the use of portfolio alignment metrics across more asset classes and considering the managed phaseout of high-emitting assets are areas that have been highlighted for further development.

2. ADOPTION: HOW PORTFOLIO ALIGNMENT METRICS ARE USED TODAY

Section 2 sets out use case examples from financial practitioners, including asset managers, asset owners, investment consultants, and a central bank to illuminate how alignment metrics are already being used in practice today.

Seven use cases[8] for portfolio alignment metrics have been identified across two broad dimensions: communication and decision-making (Table 1). The use of portfolio metrics for communication relates to reporting progress on net-zero targets and net zero-aligned transition planning to internal and external stakeholders. Decision-making refers to the use of portfolio alignment metrics, for example, lending decisions, manager selection, investment research, portfolio construction, and underwriting decisions.

6 If constructed in a scientifically robust way, Measuring Portfolio Alignment: Technical Considerations, Portfolio Alignment Team, [hereafter 2021 PAT Report] at p. 2.

7 GFANZ, "Recommendations and Guidance on Financial Institution Net-zero Transition Plans", 2022, p. 6.

8 Based on public sources and contributions from institutions as a result of public engagement.

Table 1: Seven use cases across two broad dimensions

USE CASE	BROAD DIMENSION	END USER TYPE(S)
Investment research and selection	Decision-making	AM/AO/B/IC
Portfolio construction		AM/AO/IC
Manager selection and monitoring		AO/IC
Disclosure of progress	Communication	AM/AO/B/IC/IU/CBG
Engagement		AM/AO/B/IC/IU
Understanding the impact of policies and conditions		AM/AO/B/IC/IU
Supervisory activity		CBG

Key:
AM = Asset managers
AO = Asset owners
B = Banks
IC = Investment consultants
IU = Insurance underwriters
CBG = Central banks and governments

Barriers to adoption

Barriers to the wider adoption of portfolio alignment metrics remain and must be addressed. For example, during GFANZ engagement outreach,[9] practitioners have raised concerns that scenarios used to construct an alignment benchmark lack sectoral and regional granularity, which might prevent appropriate alignment outcomes and result in perverse incentives for capital allocation.

Challenges also remain regarding the choice of emission unit and scope. In particular, practitioners noted the challenge of incorporating Scope 3 value-chain emissions due to a lack of high-quality disclosures.[10] Two central themes that emerged were the need to assess the credibility of transition plans and how to measure alignment for companies without transition plans. In this context, the appropriate time horizon for measuring alignment was also unclear.

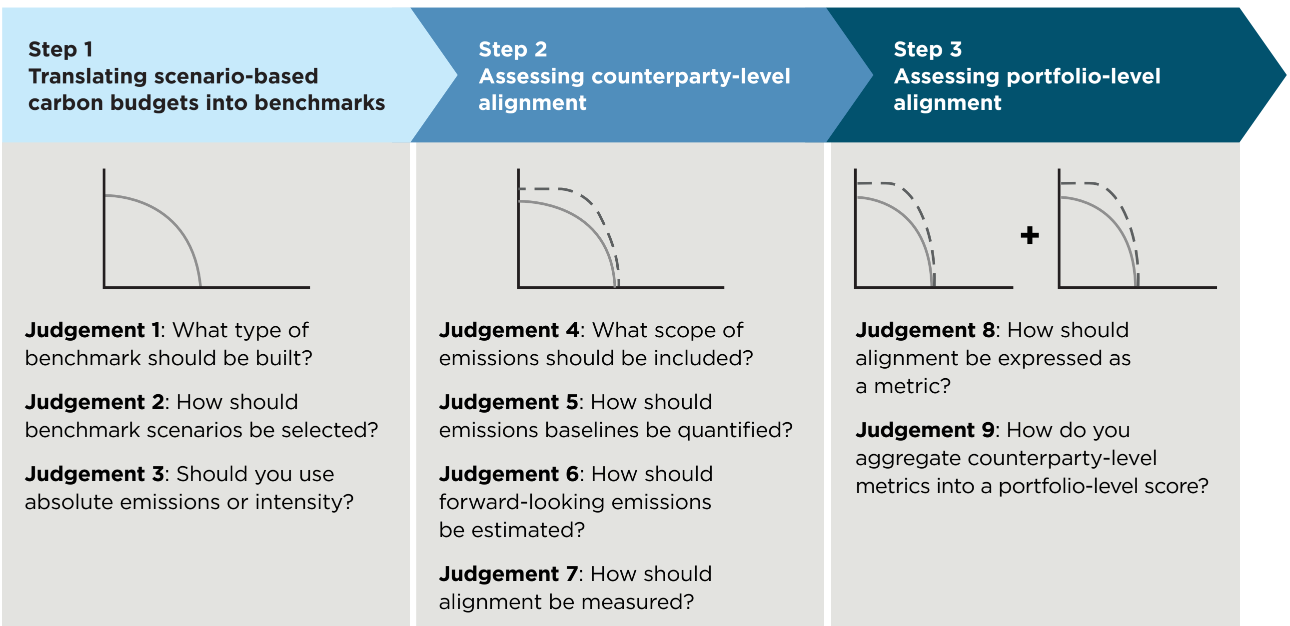
9 See "Developing this draft report" section for more details on engagement outreach.

10 Ibid.

3. ENHANCEMENT: PROGRESSING PORTFOLIO ALIGNMENT MEASUREMENT

To overcome the barriers to adoption, a core focus of this year's work on Portfolio Alignment Measurement has been enhancing and refining the practical guidance related to the PAT's 2021 report "Measuring Portfolio Alignment: Technical Considerations" Key Design Judgement Framework,[11] outlined in Section 3. The framework is composed of three conceptual steps and underpinned by nine Key Design Judgements. The three conceptual steps are 1) translating net-zero aligned, scenario-based carbon budgets into benchmarks, 2) assessing company-level alignment against this benchmark based on cumulative emissions, and 3) aggregating company-level alignment at the portfolio-level (Figure 2).

Figure 2: The Key Design Judgement Framework



This draft report provides refined guidance on design choices for **Judgements 3, 4, 6, 7, and 8**, underpinned by quantitative and practitioner case study examples.

On the choice of measurement units **(Judgement 3)**, quantitative case studies examine whether oil and gas companies should be assessed based on production units, physical or economic intensities or absolute emissions. At the time of writing, there are issues with all available unit choices because they may not properly incentivize and reflect key transition activities for oil and gas companies. For this reason, GFANZ is seeking practitioners' views on the appropriate measurement unit for oil and gas companies during public consultation. The workstream's aim is to explore the advantages and drawbacks of measurement units to develop guidance within the final report for publication ahead of COP 27, with a focus on oil and gas companies.

11 Portfolio Alignment Team, "Measuring Portfolio Alignment: Technical Considerations", 2021.

With regards to emission scopes, the draft report focuses on the materiality of Scope 3 value chain emissions in high-impact sectors **(Judgement 4)**. The analysis carried out is based on an assessment of 1,300 companies that reported at least two out of 15 upstream and downstream Scope 3 categories as outlined by the Greenhouse Gas (GHG) Protocol since 2019. The draft report features category-specific Scope 3 analysis of 10 sectors and provides guidance for Scope 3 upstream and downstream emissions categories for four high-impact sectors: oil and gas, automotive, electric utilities, and chemicals. GFANZ findings show that practitioners should aim to include in their analysis the purchase of goods and services, fuel and energy-related activities, and use phase emissions, and should verify whether, at a minimum, these emissions categories have been disclosed by companies in the four high-impact sectors.

Workstream members have highlighted the need to estimate forward-looking emissions **(Judgement 6)** as central to portfolio alignment measurement. Projecting emissions based on companies' stated emissions reduction targets does not reflect the likelihood that those targets will be met. Therefore, practitioners are looking for guidance on assessing the credibility of those targets.[12] This draft report provides an illustrative credibility framework for assessing companies' stated emissions reduction targets.[13] The framework synthesizes inputs from the GFANZ workstream on Real-economy Transition Planning which draws upon existing frameworks such as the Assessing low-Carbon Transition (ACT), the Climate Action 100+, and the Transition Pathway Initiative (TPI). When performing a credibility assessment of emissions reduction targets, GFANZ has outlined key indicators, including but not limited to: whether the company has third-party validated short- and long-term targets, whether these targets are linked to executive oversight, and whether these targets are supported by a clear funding channel and a transition plan that lays out the pathway to achieving these targets.

With regards to the appropriate time horizon for computing alignment **(Judgement 7)**, feedback from GFANZ engagement suggests that practitioners should consider computing alignment over short- and medium-term time horizons, supplemented with longer-term time horizons (e.g., 2050 and beyond). The choice of time horizon should also be informed by the practitioner's use cases as short- and medium-term time horizons may be better suited for particular use cases.

Workstream members have highlighted that some practitioners prefer a diverse range of portfolio alignment metrics **(Judgement 8)**. Four practitioner case studies outline how the portfolio alignment metrics identified in Section 1 can be used. Each metric has advantages and drawbacks that should be weighed by the end-user when considering the suitability of a metric for a specific use case. When selecting a metric, practitioners should consider the decision-usefulness as well as its broad dimensions (communication or decision-making).

Finally, this draft report provides practical implementation guidance on single-scenario benchmark construction **(Judgement 1)**, outlining the implementation of the fair share carbon budget approach, and the selection of benchmark scenarios **(Judgement 2)**, with input from the GFANZ workstream on Sectoral Pathways. No further guidance is provided on the quantification of baselines **(Judgement 5)** and on portfolio-level aggregation **(Judgement 9)**, however, the GFANZ workstream on Portfolio Alignment Measurement is endorsing the PAT's 2021 recommendations.

12 Portfolio Alignment Team, "Measuring Portfolio Alignment: Technical Considerations", 2021, p. 45.

13 Which will likely become an integral component of companies' future net-zero transition plans.

4. CONVERGENCE

At the time of writing, some initial assessments comparing the portfolio alignment scores of different metric providers indicate that the company-level results diverge substantially, with no systematic pattern for the differences found.[14] This low correlation can be explained by differences in a variety of methodological design choices (e.g., scenario choice, cumulative emissions versus point-in-time approaches and emissions projections).

More disclosure on how different providers adhere to the guidance on the nine Key Design Judgements proposed in this draft report could be helpful to achieve greater levels of convergence on methodological best-practice approaches. To drive convergence on best-practice approaches, GFANZ suggests that metric providers disclose their choices against the nine Key Design Judgements. A more detailed analysis of how portfolio alignment metric providers approach the nine Key Design Judgements is planned for inclusion in the final report for publication ahead of COP 27.

Moreover, when enabling the adoption of portfolio alignment metrics, the views of the net-zero alliances need to be considered. At the time of writing, many net-zero institutions are reluctant to limit the measurement of portfolio alignment to one single metric, and instead prefer a dashboard approach where a selection of backward- and forward-looking metrics is considered. This draft report demonstrates how the guidance provided for each of the individual nine Key Design Judgements can be used to underpin the range of metrics included in these dashboards. For example, the credibility framework developed for evaluating transition plans could be leveraged to identify aligned and aligning companies.

5. CONCLUSION

With this draft report, the GFANZ workstream on Portfolio Alignment Measurement hopes to further progress enhancement, convergence on methodological best practices, and adoption of portfolio alignment metrics. In turn, these decision-useful metrics should support financial institutions to align their capital allocation to the net-zero economy.

14 "Portfolio Climate Alignment: Understanding unwanted disincentives when using climate alignment methodologies", Draft Report, Switzerland Federal Office for the Environment (FOEN), 2022.

Introduction

BACKGROUND AND PURPOSE

Measuring portfolio alignment will provide transparency on whether the financial sector is reallocating capital flows to support the transition to a net-zero economy and builds on the implementation of sound real-economy transition plans, science-based net-zero pathways, and the articulation of said plans and pathways in financial sector transition plans

This consultation report builds on the work of Portfolio Alignment Team (PAT) as outlined in Exhibit 1 and is seeking feedback to inform the final report for publication ahead of COP 27. It has been developed by the GFANZ secretariat in collaboration with Oliver Wyman and the support of a dedicated workstream on Portfolio Alignment Measurement. The workstream is CEO-led by David Blood, Managing Partner of Generation Investment Management (Generation IM), co-chaired by Edward Mason, Director of Engagement at Generation IM, and supported by 21 GFANZ member organizations, metric providers, and NGOs.

The GFANZ workstream on Portfolio Alignment Measurement aims to further the work of the PAT to drive the enhancement of, convergence around, and adoption of best practice approaches and implementation guidelines for portfolio alignment measurement. The purpose of this draft report is to present the analysis to further these aims, cognizant of the needs of practitioners and end-users throughout.

This draft report includes three types of examples to help financial institutions interpret the guidance for their own practices:

- Examples of how financial institutions are using portfolio alignment metrics;
- Case studies that demonstrate how practitioners have approached and implemented the Key Design Judgements; and
- Quantitative analysis examples that highlight the illustrative impact of Key Design Judgements.

These examples are not intended to represent “best practices”, nor do they represent the entirety of guidance for a component.[15,16]

15 The mention of specific financial institutions or examples of net-zero transition-related activities does not imply that GFANZ has endorsed them or its members in preference to others of a similar nature that are not mentioned.

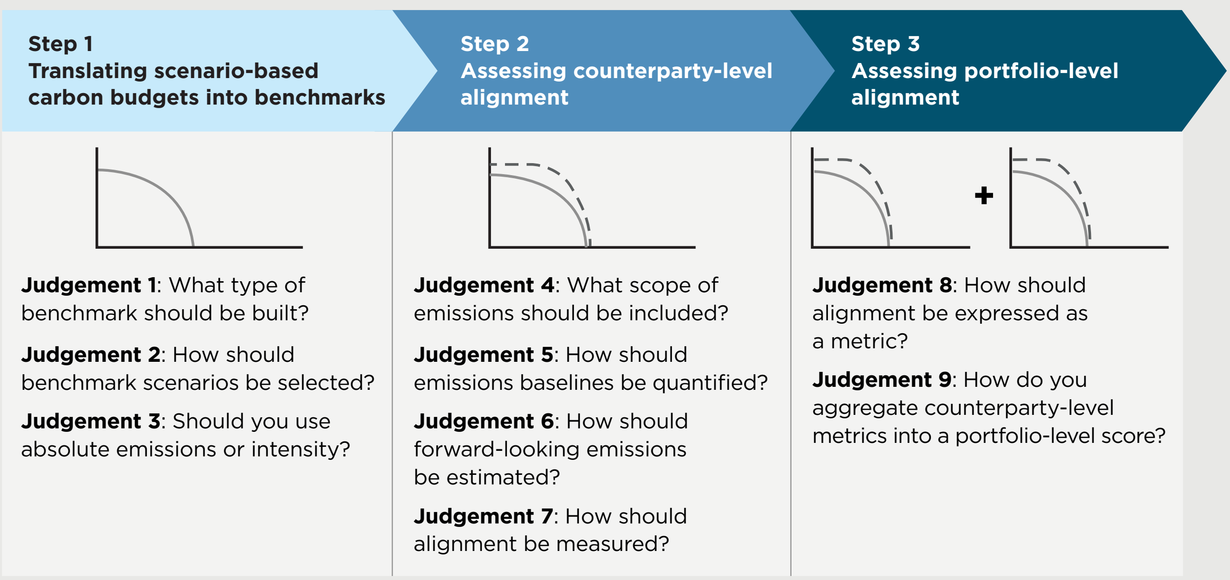
16 The GFANZ workstream on Portfolio Alignment Measurement is grateful to the Principals Group members and workstream members for providing support in developing the case studies and welcomes the suggestion of any other examples from GFANZ members and the wider sector.

EXHIBIT 1: BUILDING ON THE WORK OF THE PORTFOLIO ALIGNMENT TEAM

The GFANZ workstream on Portfolio Alignment Measurement was preceded by the work of the Portfolio Alignment Team (PAT). The PAT was set up to respond to growing investor, lender, and underwriting interest in measuring portfolio alignment against the 1.5 degrees C goal of the Paris Agreement and to advance the adoption of consistent, robust, and transparent tools that enhance financial decision-making. PAT published reports in 2020 and 2021. The 2020 PAT Report[17] developed a "Key Design Judgement" framework for helping financial institutions understand the current landscape of portfolio alignment metrics (Figure 3). The 2021 PAT Report[18] defined emerging methodological best practices in developing metrics and suggested future research priorities that GFANZ is taking on this year. David Blood, of Generation Investment Management, led the PAT throughout 2020 and 2021 and is continuing this leadership role as Principal of this workstream in 2022. Several PAT members are also working actively with the workstream.

The main output of the PAT centered on a framework composed of three conceptual steps and underpinned by nine Key Design Judgements. The three conceptual steps are 1) translating net-zero aligned, scenario-based carbon budgets into normative benchmarks, 2) assessing company (counterparty)-level alignment based on cumulative emissions against this benchmark, and 3) aggregating company-level scores into portfolio-level metrics. Differences in the design of the nine Key Design Judgements are what differentiates the outcome of different portfolio alignment metrics.

Figure 3: Conceptual Steps and the Key Design Judgement Framework

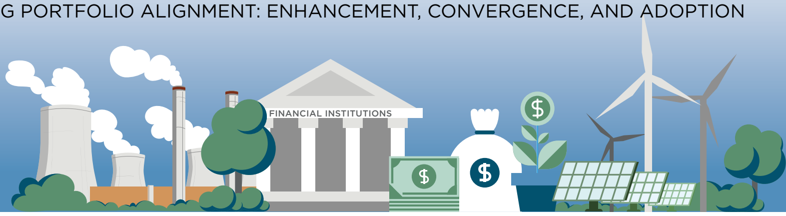


DEVELOPING THIS DRAFT REPORT

GFANZ undertook a large program of engagement in 2022 to understand the perspectives of financial institutions and portfolio alignment metric providers on portfolio alignment measurement. GFANZ has used this engagement to develop the report as summarized on the next page.

17 Portfolio Alignment Team. "Measuring Portfolio Alignment: Assessing the position of companies and portfolios on the path to net zero", 2020.

18 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021.



How we have used engagement to develop this report

The GFANZ worskstream on Portfolio Alignment Measurement engaged with **52 organizations**, including **41 financial institutions** and **11 portfolio alignment metric providers**.

The organizations that were engaged with comprise the following geographies:

The workstream was practitioner-led, supported closely by **21 member financial institutions** and **5 advisors**.

- **10** Banks
- **11** Asset Managers
- **4** Asset Owners
- **2** Private Equity Funds
- **4** Investment Consultants
- **14** Financial Service Providers
- **2** Central Banks and Governments

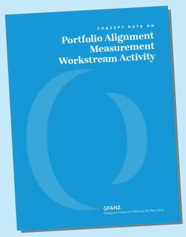
GATHERING INSIGHTS

The practitioner-led workstream has listened to the market and gathered insights by completing the following key tasks:

- **Discussed the Concept Note** with the GFANZ Advisory Panel of **23 advisors** from NGOs.
- Held **six workstream member meetings** and **eight technical focus group sessions**.
- Held **bilateral discussions** with **25+** financial institutions and portfolio alignment metric providers to **understand their latest views and thinking on portfolio alignment measurement**.
- Conducted **a review of 60+ financial institutions' latest disclosures** to assess their alignment with the nine Key Design Judgements.

WHAT HAVE WE DONE SINCE THE CONCEPT NOTE CONSULTATION

We published a Concept Note on May 4th that detailed the work plan for 2022, based on engagement in Q1 2022, and have since undertaken several actions.



- Held interviews with GFANZ members and net-zero alliances to ensure consultation feedback was correctly understood.
- Used consultation feedback to ensure that the report focuses on high priority areas for end users of portfolio alignment metrics.

APPLYING THE RECOMMENDATIONS AND GUIDANCE

The GFANZ workstream on Portfolio Alignment Measurement recommendations and guidance are voluntary and were developed to apply broadly across various types of financial institutions and jurisdictions. Regardless of jurisdiction, GFANZ hopes that its recommendations and guidance may be instructive. GFANZ recognizes that different types of financial institutions have fundamentally different business models, serve a range of clients and stakeholders, face different constraints, and interact with the real economy in different ways. However, common across the financial sector is the financial support and enablement of real-economy business activities. The recommendations and guidance are intended to be widely applicable and support consistency in development and use of portfolio alignment tools across the sector. In addition to the recommendations and guidance set out herein, GFANZ encourages financial institutions to follow targeted guidance developed by their sector-specific net-zero alliances.

HOW SPECIFIC TERMS ARE USED IN THIS DRAFT REPORT

This draft report uses the following simplified — or shortened — phrases throughout:

- "**GFANZ engagement**" or "**engagement**" refers to all engagement activities specified in the Developing this draft report sub-section
- "**Real-economy companies**" are referred to as "**companies**", unless otherwise noted
- "**GHG emissions**" are referred to as "**emissions**", unless otherwise noted
- A company's stated GHG emissions or physical GHG emissions intensity reduction targets are referred to as "**emission reduction targets**", unless otherwise noted
- "**Physical GHG emissions intensity**" is referred to as "**physical intensity**", unless otherwise noted
- "**Scenario**" and "**pathway**" are used interchangeably (i.e., a benchmark pathway is equivalent to a benchmark scenario)
- "**Trajectory**" and "**projection**" are used interchangeably in the following context: "**a company's projection based on emission reduction targets**" is equivalent to "**a company's trajectory based on emission reduction targets**".

THE FOUR CASE STUDIES TYPES PROVIDED IN THIS DRAFT REPORT

Use case

These are examples of how portfolio alignment metrics are used in practice by financial institutions and other organizations, sourced by the GFANZ workstream on Portfolio Alignment Measurement through engagement as a part of broader, public consultative work.

Implementation

These are examples of how Key Design Judgements have been implemented by financial institutions, sourced by the GFANZ workstream on Portfolio Alignment Measurement through engagement as a part of broader, public consultative work.

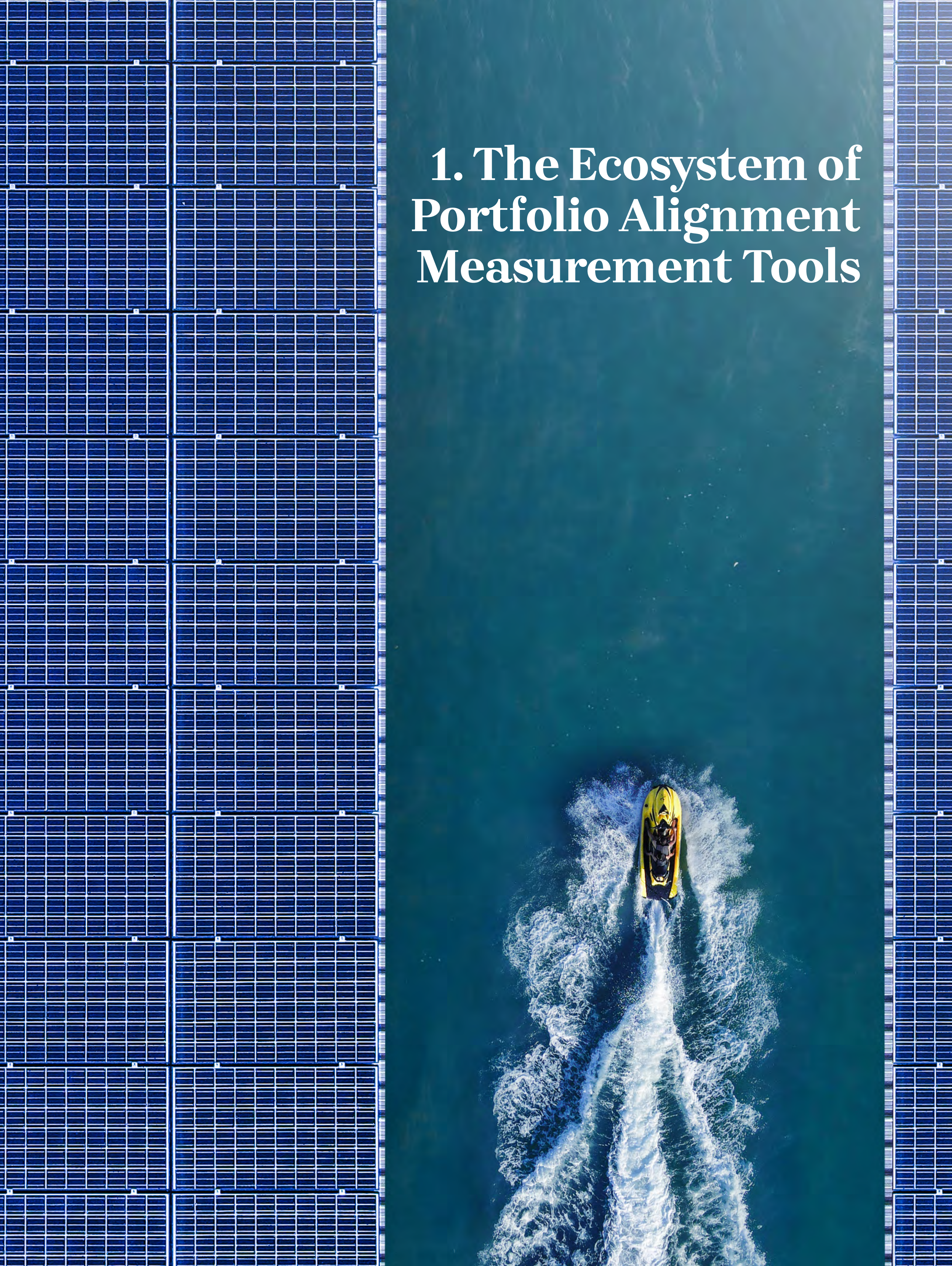
Quantitative

These are illustrative, analytical studies of companies in high-impact sectors that have been created by the GFANZ workstream on Portfolio Alignment Measurement.

Climate solutions

These are perspectives on approaches that could be leveraged to measure the alignment of climate solutions companies, sourced by the GFANZ workstream on Portfolio Alignment Measurement through engagement as a part of broader, public consultative work.

1. The Ecosystem of Portfolio Alignment Measurement Tools



Portfolio alignment tools are invaluable instruments for financial institutions to measure and track how aligned their investment, lending, and underwriting activities are with a 1.5 degrees C-aligned pathway so that they can support the transition to a net-zero economy. The Portfolio Alignment Team (PAT) has been laying the foundations for portfolio alignment metrics since 2020 and has made progress in defining emerging methodological best practices, but key challenges remain. At the time of writing, there are a number of portfolio alignment measurement approaches, each based on different underlying assumptions. A lack of convergence on methodological best practices is challenging for financial institutions and guidance can therefore help.

In this section, the GFANZ workstream on Portfolio Alignment Measurement surveys the current landscape of portfolio alignment metrics and tools. Section 1.1 examines the categories of the metrics, including a discussion on their pros and cons, as well as consideration of how financial institutions might select appropriate alignment metrics. The potential of portfolio alignment tools to drive real-economy impact is also discussed. Section 1.2 outlines the relevance of portfolio alignment measurement tools for the four key approaches of net-zero transition planning.

1.1 – CATEGORIES OF PORTFOLIO ALIGNMENT METRICS

The desire for a diverse range of alignment metrics was expressed by many practitioners GFANZ has engaged with. There does not seem to be a one-size-fits-all alignment metric, for example, different metrics may be used depending on the specific use case they apply to. That said, one of GFANZ's goals is to build on the work the PAT has done and extend the range of alignment metrics presented.

The 2021 PAT Report identified three broad categories of alignment metrics along a spectrum of complexity:[19]

1. **Binary target measurement** — these metrics mainly focus on the percentage of underlying portfolio companies with science-based, validated targets. An example of binary target measurement could be to state that 50% of portfolio companies have set net-zero validated emission reduction targets and to express alignment by setting targets for further increasing this percentage over time via engagement with portfolio companies. Example 8 in Section 2 highlights how the binary approach might be applied in practice by an investment consultant.
2. **Benchmark-divergence** — these metrics assess portfolio alignment at the individual company level by constructing a normative benchmark budget based on a chosen 1.5 degrees C-aligned scenario pathway and then comparing projected cumulative company emissions against this benchmark. The resulting metric is a percentage, indicating how far projected company emissions are over or undershooting this benchmark. Table 22 in Section 3.8 provides a case study example of how practitioners could use the benchmark-divergence approach, for example to conduct a climate alignment hotspot analysis where individual portfolio companies in a sector are ranked according to their level of overshoot.
3. **Implied Temperature Rise (ITR)** — these metrics build on the benchmark-divergence model, translating an assessment of alignment/misalignment with a benchmark into a measure of the consequences of that alignment in the form of a temperature score that describes the most likely global warming outcome if the global economy was to exhibit the same level of ambition as the company or portfolio in question. ITR most appropriately provides a measure of the consequence of misalignment and could, if constructed in a scientifically

19 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.17.

robust way, most transparently incentivize reallocation of capital to net zero-aligned or aligning companies. Examples 5 and 6 in Section 2 outlines how ITR could be used in investment selection and research as well as for portfolio construction.

During GFANZ discussions with practitioners earlier this year it became apparent that many financial market practitioners are applying a fourth type of alignment category which most closely corresponds to the approach suggested by the IIGCC's Net-Zero Investment Framework and has also been adopted, in part, by the four key approaches outlined in GFANZ "Recommendations and Guidance on Financial Institution Net-zero Transition Plans":[20]

4. **Maturity scale alignment metrics** — these metrics assign companies on a scale of alignment with a net-zero world based on a qualitative and quantitative assessment of various factors that might include, but are not limited to: stated targets, past performance, disclosure, and governance. For example, based on a categorical scale of "aligned", "aligning", "committed to aligning", or "not aligned".

The pros and cons of different portfolio alignment metrics

This section summarizes findings from the engagement undertaken by the GFANZ workstream on Portfolio Alignment Measurement in the course of the work referenced above.

Temperature metrics such as ITR might be best suited to communicating with internal and external stakeholders because they are intuitive to understand. In theory, if appropriate scenario pathways were available across sectors and company disclosures across Scope 1, 2, and 3 emissions were comprehensive, ITR could be the metric best suited to achieving capital reallocation to a 1.5 degrees C-aligned world. However, many practitioners avoid using ITR because the apparent simplicity conveyed might obscure the complexity of underlying assumptions and therefore lead to misuse, unintended consequences, and compromised decision-usefulness.

Benchmark-divergence approaches, on the other hand, lack a framing context. For example, it is not clear whether a certain percentage of misalignment corresponds to an average or significant misalignment. However, benchmark-deviation might be a suitable tool when used in a sector-specific context and to identify climate-specific hotspots. The identification of such hotspots could be used to flag potential transitional risks inherent in individual portfolio assets, to steer capital allocation decisions, or to inform lending policies. More complex benchmark divergence models can also more appropriately reflect regional and sectoral decarbonization requirements. For example, certain regions and sectors may need to decarbonize more slowly compared to the rest of the economy and more complex models could be constructed to avoid situations where an unjustly high overshoot is applied to an emerging market company. The trade-off of using such models is that added layers of complexity might not be transparent to the end users of the metric.

By contrast, the binary approach is simpler and might help to remove complexity, thus encouraging use. On the other hand, the insights gained might be limited. For example, the fact that 50% of companies in a portfolio have 1.5 degrees C science-based targets does not help one to understand the exact trajectory that the portfolio is on.

Maturity scale alignment metrics might help to provide a more comprehensive picture about the portfolio's trajectory. By employing this method, it is possible to understand the percentage of aligned and aligning portfolio companies and targets could be set to increase these percentages over time.

20 GFANZ. "Recommendations and guidance on Financial Institution Net-Zero Transition Plans", 2022.

The drawback of the method is a lack of standards. While the Portfolio Alignment Measurement framework discussed in this draft report could serve to identify aligned and aligning assets, a multitude of indicators are currently being used which makes it harder to drive convergence on methodological best practices. A case study from Willis Towers Watson (Section 4.1) illuminates the approach from an asset owner perspective.

Finally, given that there are several metrics used to assess the financial performance of an investment, and given the multifaceted nature of carbon and climate change, practitioners pointed to the usefulness of a portfolio alignment climate dashboard approach with multiple metrics.[21] Such an ensemble of alignment indicators could be made up of a range of forward- and backward-looking indicators to determine alignment. This draft report features a case study showcasing the climate dashboard approach (see Section 3.8, Judgement 8).

Selecting alignment metrics

In choosing between different alignments, GFANZ suggests that financial institutions evaluate the metrics' decision-usefulness for specific use cases and consider how well they integrate with existing decision-making processes.

The PAT considered alignment metrics "decision-useful" if they are **simple to use, transparent, science-based, aggregable, and incentive-optimal**. These criteria help to categorize the pros and cons highlighted above into a practical framework to help the end user of portfolio alignment metrics choose the one best suited to a particular use case. Ultimately, the main consideration should be whether the approach chosen is suitable to achieve the required real-economy impact. Table 2 outlines the four categories of alignment metrics across this framework.[22]

21 Institut Louis Bachelier. "The Alignment Cookbook: A Technical review of Methodologies Assessing a Portfolio's Alignment with Low-Carbon Trajectories or Temperature Goal", 2021.

22 Some insights presented in Table 3 have been taken from Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021.

Table 2: Decision usefulness selection criteria for alignment metrics

EVALUATION CRITERION	BINARY TARGET MEASUREMENT	BENCHMARK DIVERGENCE	ITR	MATURITY SCALE
Simple to use	Simple to use, no technical skills needed.	Complex to use and interpret. Can perform sector-specific hotspot analysis.	Highest levels of complexity: combines benchmark- divergence approach with inputs from physical climate science to translate the level of misalignment into an end-of century warming outcome.	Relatively simple to use. Proprietary data and methods[23] are used for bucketing assets into maturity categories.
Transparent (with regards to underlying assumptions)	Only percentage of aligned/not aligned companies based on targets is known, extent of portfolio-level alignment is unknown.	The output is hard to interpret and depends on the scenario and benchmark construction method chosen. Diverging results are possible.	Output is easy to communicate and facilitate capital reallocation to net-zero. Underlying assumptions and complexities might not be known to the end user of the metric.	Categorizes portfolio companies into aligned, aligning and non-aligned companies, obscures the level of alignment at the portfolio-level.
Science-based (underlying method implemented is based on latest peer-reviewed science)	Scientific robustness depends on the inclusion of 1.5 degrees C-aligned and 3rd party verified targets.	The model can be scientifically robust, depending on design choices.	The model can be scientifically robust, depending on design choices.	Depends on the scientific robustness of underlying data sources chosen to bucket companies into individual categories.
Aggregable (seamless aggregation at portfolio level is possible)	Restricted to aggregating portfolio companies with verified 1.5 degrees C-aligned targets.	Not meaningful to aggregate at the portfolio level.	Results can be aggregated at the portfolio level with ease.	Restricted to portfolio bands.
Incentive optimal (no unintended consequences are created when applied widely)	Currently, the approach does not consider the credibility of targets. However, SBTi are planning to release an MRV[24] framework to increase transparency and accountability of corporate targets.	Decision-usefulness is highly dependent on an appropriate level of scenario granularity by sector and geography.	ITR metrics may be incentive optimal subject to appropriate design choices.	May be incentive optimal depending on the appropriateness of the underlying data chosen.

The binary metric is easy to use, but, the approach does not provide insights for companies without emission reduction targets and does not incorporate the credibility of transition plans. On the other hand, benchmark-divergence metrics are complex to use and interpret and there are restrictions with regards to appropriate scenario data. While the complexity issue also applies to ITR, the output is easy to communicate and can help to set the right incentives for reallocating capital in line with net-zero. While the challenges are being addressed, simpler metrics, as for example the use of binary and maturity scale metrics might be helpful approaches to drive greater level of adoption.

23 Practitioners pointed to the use of CDP, TPI and SBTi data sets to bucket assets into alignment categories.

24 The Science Based Targets Initiative's Progress Framework on Measurement, reporting and verification.

THE 1.5 DEGREES C CARBON BUDGET BENCHMARK

Since large pension funds are predominantly passive investors that control about half of capital markets,[25] net-zero benchmark construction approaches, in addition to bottom-up portfolio alignment methods, are important. In this context, a benchmark aligned with a carbon budget[26] for limiting warming to 1.5 degrees C might be useful to help shift capital to the net-zero economy.

The net-zero benchmark proposal outlined here is based on an IPCC-conform 1.5 degrees C carbon budget that is updated annually and distributed to the underlying benchmark companies based on the prevailing corporate emissions in each year. A simulation[27] applying the approach to a European portfolio of $1 trillion shows that it is possible to construct a 1.5 degrees C carbon budget-adjusted benchmark that maintains a low tracking error and minimal turnover. The simulated benchmark maintains exposure to all benchmark sectors with slight over- and under-weight tilts and behaves like the parent benchmark but within the assigned 1.5 degrees C carbon budget.

In short, an index provider could have a carbon budget that is allocated among the benchmark companies based on prevailing emissions. The following year, there would be a new and decreasing carbon budget and the portfolio would be reshuffled again and so on. The sum of the yearly carbon budgets would mirror the trajectory necessary to be carbon neutral (-10% per year in volume in 2021 in order to achieve 1.5 degrees C increase with 83% probability).

The carbon budget benchmark approach highlights the importance of the carbon budget, which keeps shrinking. If an investor were to start the strategy five years from today, the required annual reductions would increase from 10% to 18%.[28]

Moreover, the carbon budget approach can be applied with a forward-looking lens. Rather than allocating a yearly budget based on the prevailing GHG emissions of the benchmark companies, a three-year carbon budget is allocated based on an estimate of corporate emissions over the next three years.[29] Every three years, the next three years of carbon budget would be determined based on the most up-to-date forward-looking emission pathways. The three-year estimates of corporate emissions could be sourced from a data provider. An even more sophisticated and forward-looking approach could be applied whereby listed companies had to provide guidance on future emissions, as is common with earnings. In both cases, data could then be used by investors to allocate the carbon budget of portfolios over a given period with the weighting of individual companies based on future emissions.

The credibility assessment for net-zero transition plans and emission reduction targets (Section 3.6, Judgement 6) could feed into the calculation of three-year emission forecasts.

25 WWF. "Pathway to Net-Zero: A New Benchmark for Universal Asset Owners", 2022.

26 300GtCO, including CO_2, excluding other GHG emissions such as methane, nitrous oxide, etc.

27 Bolton, Kacperczyk, Samama, "Net-Zero Carbon Portfolio Alignment", 2022.

28 Ibid.

29 Ibid.

Using Portfolio Alignment tools to achieve real-economy impact

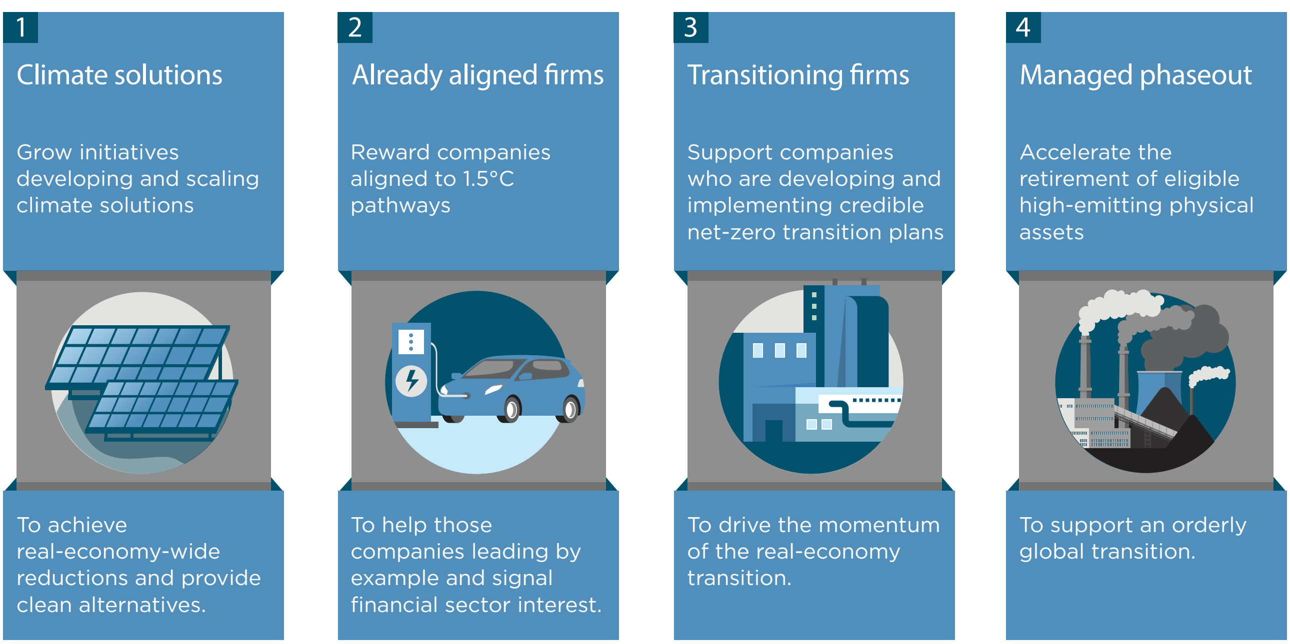
In order to enable the required business transformation compatible with a 1.5 degrees C world and achieve real-economy emission reductions, it is crucial that alignment measurement approaches be forward-looking and consider transition planning. Influencing a real-economy shift could be a double win for financial institutions who contribute to creating more favorable market conditions[30] and driving the best outcome for the real economy as net-zero investment or lending strategies and net zero-aligned economies converge.

Therefore, at the heart of the Portfolio Alignment Measurement framework discussed in this draft report is the forward-looking dimension that seeks to understand the transition-readiness of companies compared to net-zero aligned scenario pathways, thus helping financial institutions identify those portfolio companies that are actively transitioning to a net zero-aligned world. Rather than focusing on current emissions, the framework considers the rate of change based on future emissions, thus enabling financial institutions to finance those companies that are most actively pushing the transition to a net-zero economy, regardless of their current carbon intensity.

1.2 – PORTFOLIO ALIGNMENT METRICS AND THE FOUR KEY APPROACHES

GFANZ's 2022 report "Recommendations and Guidance on Financial Institution Net-zero Transition Plans" outlines four key approaches to progress the transition to net zero in the real economy. They can be seen as relating to four types of companies: providers of climate solutions, companies that are 1.5 degrees C-aligned, companies that need to transition to 1.5 degrees C-aligned, and companies that need to phase out high-emitting assets before their end-of-life (Figure 4).[31]

Figure 4: Enabling real-economy reductions with the four key approaches



30 MSCI. "Net-Zero Alignment: Objectives and Strategic Approaches for Investors", 2021.

31 GFANZ. "Recommendations and Guidance: Financial Institution Net-zero Transition Plans", 2022, p. 6.

At the time of writing, portfolio alignment metrics are already useful to help financial institutions assess aligned and transitioning companies. However, they are not yet useful for measuring alignment for providers of climate solutions and those companies that are phasing out high-emitting assets early.

Measuring alignment for climate solutions

To start the development of alignment metrics and methods that are suitable for providers of climate solutions this draft report outlines a number of case study examples, featured in Section 3.10.

Measuring alignment for net zero-aligned companies

Companies that are already aligned with 1.5 degrees C, or close to being aligned, might have undertaken actions in the past that make them aligned with net zero today. To identify these companies, one may compare a forward-looking projection of current emission levels, for example, based on absolute Scope 1, 2, and 3 emissions or an appropriate physical intensity such as CO_2/MWh to an appropriate 1.5 degrees C-aligned sectoral pathway. In Section 3.6, GFANZ has set out a framework based on current and historical emissions that helps financial institutions assess the current level of 1.5 degrees C alignment.

An example of a 1.5 degrees C-aligned company could be an electric utility that has started to transition into wind energy over the past decade by gradually dismantling its traditional fossil fuel-based coal business. As a result, the utility has become a large green energy company with one-third of offshore installed wind capacity globally. The company has announced that it will become net-zero in 2025. The company's historical and forward-looking emission trajectory is clearly aligned with the IEA's Net-Zero by 2050 scenario (Figure 5), confirming that it is aligned with 1.5 degrees C today.

Measuring alignment for companies transitioning

The third approach requires financial institutions to assess how likely companies are to transition to a net-zero economy in the future. To make this assessment, a financial institution needs to compare the ambition of the company's transition plan with an appropriate 1.5 degrees C-aligned pathway. The financial institution also needs to assess how credible and achievable the real-economy company's transition plan is. For example, a real-economy transition plan that has been verified by a third party, that contains short and long-term commitments, and that may be underpinned by relevant management oversight may well be considered credible and achievable. In Section 3.6, GFANZ has set out a framework developed that provides guidelines for assessing real-economy transition plans.

An example of a transitioning company could be an electric utility that recently announced a plan to become net-zero by 2050, with the intent to reduce emissions by 40% by 2030. In order to reach this target, the company has started a process of strategic transformation into renewable energy capacity with plans to construct large solar farms with capacities exceeding 100 MWh. As a result of the transformation, their absolute emissions already reduced by 10% between 2018 and 2020 with a commitment to investing significant capital expenditures into further building out renewable capacity.

Figure 5: Physical emissions intensity trajectories of a 1.5 degrees C-aligned company and a 1.5 degrees C transitioning company based on their stated emission reduction targets

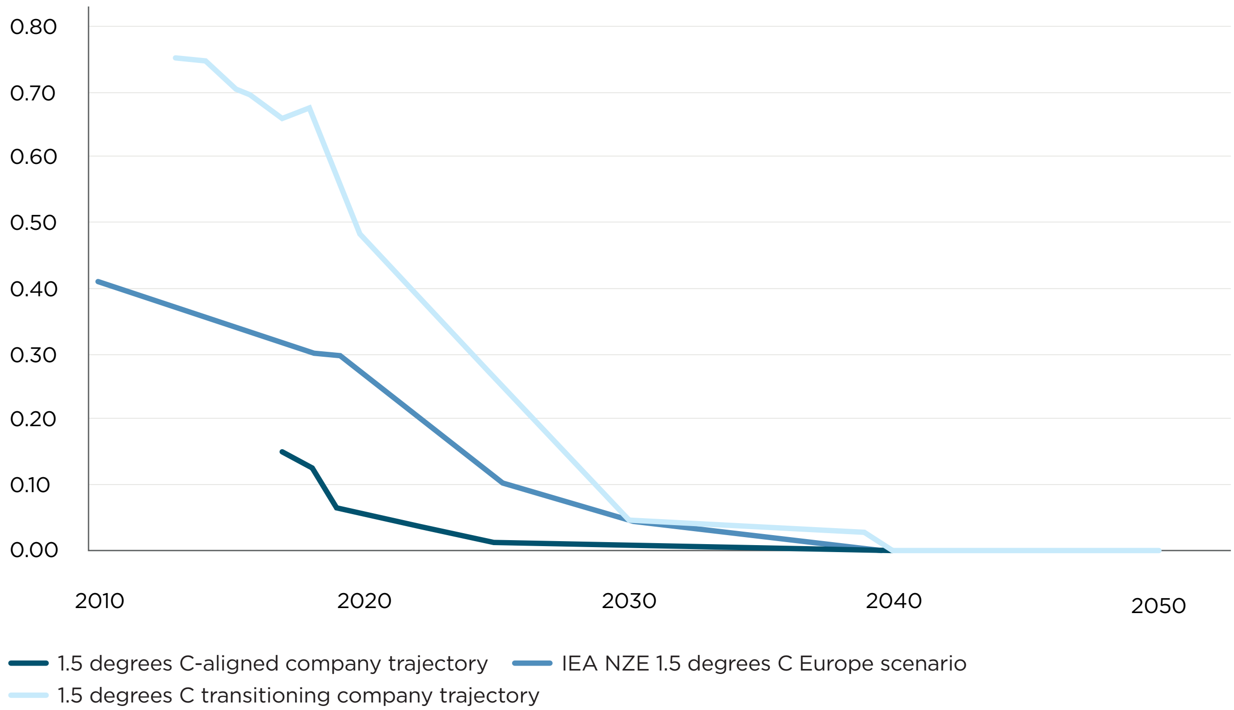


Figure 5 illustrates the trajectories for two of the four approaches: **Approach 2** or companies that are already 1.5 degrees C-aligned and **Approach 3** or companies that are 1.5 degrees C transitioning.

Measuring alignment for companies phasing out high-emitting assets

Finally, the fourth approach requires assessing the alignment of high-emitting assets in the context of a managed phaseout. The 2022 GFANZ publication on the Managed Phaseout of High-emitting Assets: How to Facilitate the Early Retirement of High-emitting Assets as Part of a Net-zero World suggests that specific metrics and targets will be needed as part of a managed phaseout plan. This is because such assets may potentially maintain levels of emissions with no downward trajectory before they stop completely emitting.

The projected cumulative emissions of an asset with and without a managed phaseout plan through its design life may be relevant, as well as a benchmark for what those emissions ought to be in a 1.5 degrees C-aligned scenario. To factor in carbon efficiency, age, and design life among other relevant factors, a benchmark may need a high level of granularity. Another key issue related to a managed phaseout will be assessing the credibility of the plan. Such a plan may be harder to demonstrate progress on because it relies on a binary event in the future, e.g., asset closure.

2. Adoption

How are portfolio alignment metrics used today and what are the barriers to further adoption?

One of the key areas explored during the engagement was different types of use cases for portfolio alignment metrics, including how these are embedded within key functions across different types of institutions in the financial sector. The findings of the engagement undertaken by the GFANZ workstream on Portfolio Alignment Measurement on this topic, along with use case examples, are captured in this section. The use cases provided in this section capture current perspectives and approaches, but do not represent the only suitable approach for the associated use case.

2.1 HIGH-LEVEL OVERVIEW OF USE CASES

Consultation question(s) for consideration:

- Which use cases for portfolio alignment metrics are used at your organization?
- Are there any other use cases that should be included?

There are a variety of potential use cases for portfolio alignment metrics, the choice of which depends on the type of end user and the user's objectives. There are two fundamental purposes to which a use case can be broadly assigned: decision-making and communication.The former applies when the metric is required to integrate net-zero alignment considerations into investment decision-making processes, whereas the latter would be considered when communicating the net-zero impact of a given company or portfolio. Table 3 provides a high-level overview of the fundamental purposes, potential use cases, the types of institutions that would typically apply them, and the examples from practitioners featured in this draft report.

Table 3: Use cases by end user type

FUNDAMENTAL PURPOSE	USE CASE TYPE	END USER TYPE(S)	EXAMPLES FROM PRACTITIONERS IN THIS DRAFT REPORT
Communication	Disclosure of progress	Asset Managers/Asset Owners/Banks/Investment Consultants/Insurance and Reinsurance Underwriters[32,33]/Central banks and governments	• Japan's Government Pension Investment Fund • Bank of England
	Engagement	Asset Managers/Asset Owners/Banks/Investment Consultants/Insurance and Reinsurance Underwriters	• Generation Investment Management
	Understanding the impact of internal policies and conditions		• AXA
	Supervisory activity	Central banks and governments	• Switzerland's State Secretariat for International Finance (SIF)
Decision-making	Investment research and selection	Asset Managers/Asset Owners/Banks/Investment Consultants	• Lombard Odier
	Portfolio construction	Asset Managers/Asset Owners/Investment Consultants	• Fulcrum Asset Management • UBS
	Manager selection and monitoring	Asset Owners/Investment Consultants	• Cambridge Associates

32 Insurance underwriters are responsible for assessing the extent of a risk, for example, as how likely it is to occur. Lloyd's of London. "How insurance works", 2017.

33 Reinsurance underwriters are insurance underwriters for insurance companies. Insurance Information Institute. "Reinsurance".

2.2 – USE CASES

2.2.1 – Disclosure of progress

Portfolio alignment metrics are particularly suited to capturing and communicating the forward-looking climate impact of a portfolio because they directly link emissions trajectories to climate outcomes. Therefore, a number of financial institutions communicate to internal and external stakeholders the alignment of their investments, lending, and underwriting activities with a 1.5 degrees C-aligned benchmark scenario for external stakeholders.

As such, portfolio alignment metrics are a useful component of climate disclosure for financial institutions. Such metrics are typically just one of a range of metrics used by stakeholders to better understand the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risk.[34] The Task Force on Climate-related Financial Disclosures (TCFD) supplemental guidance on disclosures for the financial sector details how metrics can feature in such disclosures. For example, TCFD guidance recommends that banks describe the extent to which their lending and other financial intermediary business activities, where relevant, are aligned with a below 2 degrees C-aligned benchmark scenario, using the approach or metrics best suited to their organizational context or capabilities.[35] The prevalence of climate-related disclosures is high among financial institutions, with some communicating alignment with a 1.5 degrees C-aligned benchmark scenario as part of these disclosures.

34 Financial Stability Board. "Proposal for a disclosure task force on climate-related risks", 2015.

35 Task Force on Climate-related Financial Disclosures. "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures", 2021.

Use case

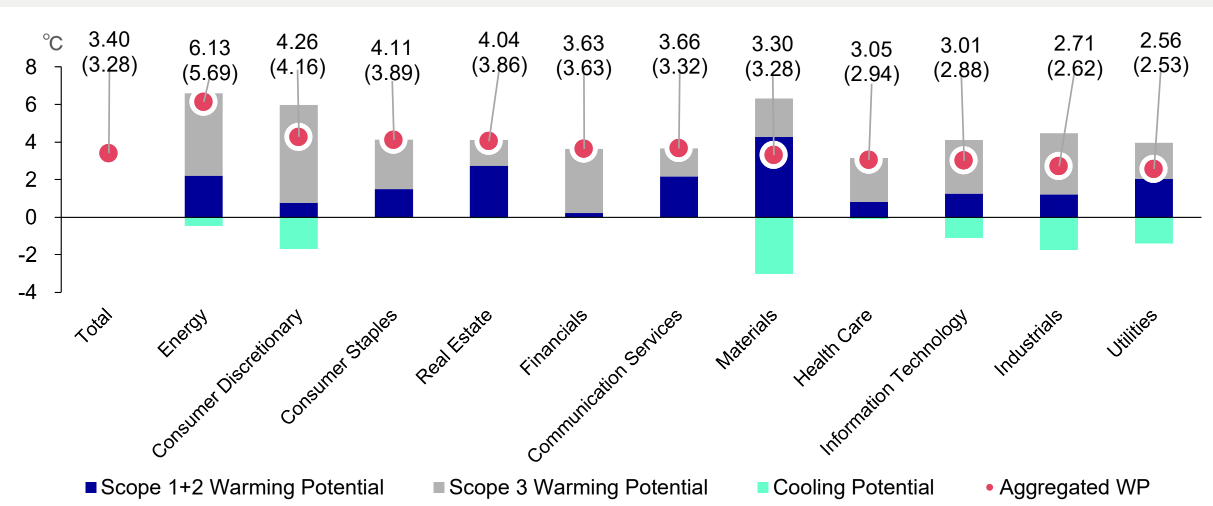
EXAMPLE 1 — CASE STUDY INSTITUTION: JAPAN'S GOVERNMENT PENSION INVESTMENT FUND (GPIF)

Sub-sector of institution: Pension Fund

The Government Pension Investment Fund (GPIF) is an incorporated administrative agency established by the Japanese government; it is the largest pool of retirement savings in the world. GPIF states that it is using portfolio alignment metrics to monitor its portfolio's warming potential. By disclosing the warming potential temperatures, as shown in Figure 6, GPIF hopes to improve both the disclosure of ESG-related information and the sustainability of the market overall.[36]

In 2020, GPIF released a supplementary guide to its ESG report titled "Analysis of Climate Change-Related Risks and Opportunities in the GPIF Portfolio", which includes the warming potential metric provided by MSCI.[37] Because of the scale of its global investments, GPIF believes the analysis detailed in its report could be a beneficial resource to multiple stakeholders, including investors, when considering climate opportunities and risks.[38]

Figure 6: The Global Warming Potential of GPIF's Domestic Equity Portfolio in 2020



Note: Global warming potential does not include reduction targets. Figures for global warming potential in consideration of reduction targets are shown in parentheses in the label.

36 GPIF. "GPIF Climate Related Portfolio Risk Assessment — Trucost Analysis supporting GPIF's disclosures in line with TCFD recommendations (Summary)", 2019.

37 GPIF. "GPIF Publishes the "FY2020 Analysis of Climate Change-Related Risks and Opportunities in the GPIF Portfolio"", 2021.

38 Ibid., 2021.

Use case

EXAMPLE 2 — CASE STUDY INSTITUTION: THE BANK OF ENGLAND (BOE)

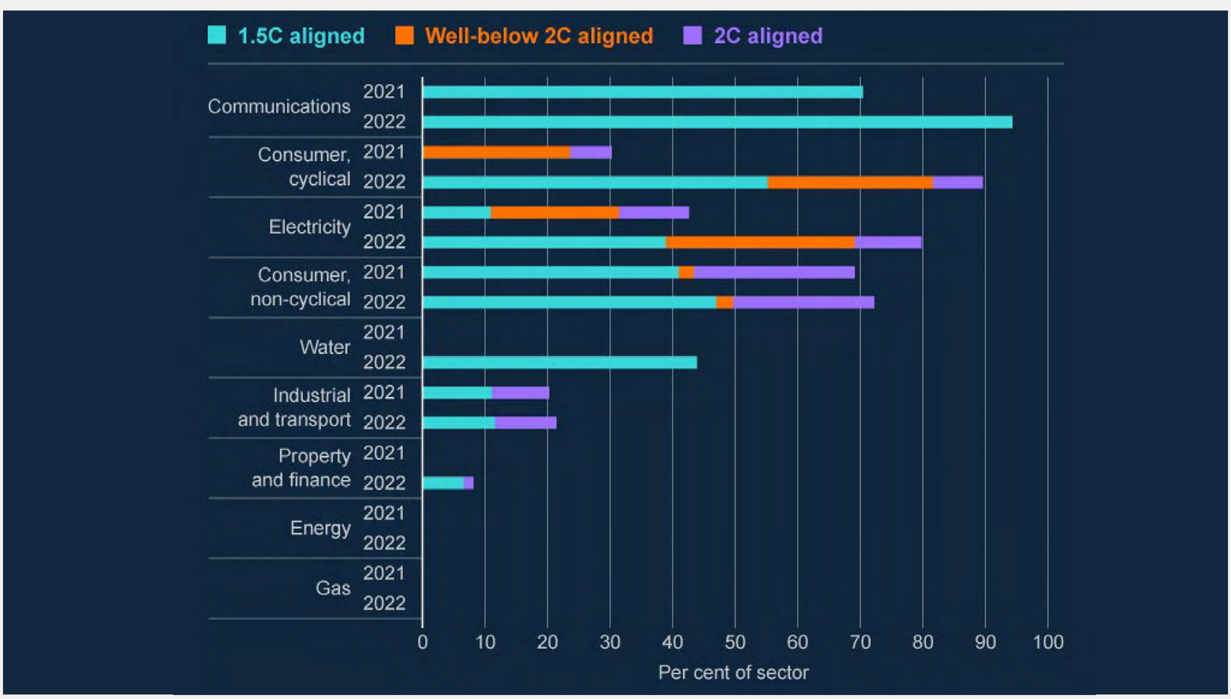
Sub-sector of institution: Central Bank
The Bank of England (The Bank) uses portfolio alignment metrics to disclose the progress of its Corporate Bond Purchase Scheme (CBPS), a monetary policy tool. In its 2022 TCFD disclosure[39] the bank reported an implied temperature rise (ITR) of 2.4 degrees C for its CBPS in 2022. The methodology used by the Bank to calculate this ITR is in line with the methodological best practices outlined in the 2021 PAT Report.

When assessing the forward-looking performance of the CBPS, the Bank supplements the ITR metric with additional measures, such as a binary target measurement metric. This evaluates how many emission reduction targets set by companies in the portfolio are subject to third party verification.

Figure highlights the proportion of companies within each sector of the CBPS that has a SBTi verified emissions reduction target, sub-divided by sector.

The Bank records that the proportion of companies whose assets are held in the CBPS with SBTi verified targets has significantly increased from 2021 to 2022 from 38% to 59%.

Figure 7: Proportion of each CBPS sector with verified science-based targets



39 Bank of England. "The Bank of England's Climate-related financial disclosure", 2022.

2.2.2 – Engagement

Portfolio alignment metrics have been identified as a useful instrument in the engagement process because they can be used to identify clients or portfolio companies that are misaligned with pre-determined climate goals. Engagement strategies can then be crafted based on what the metrics reveal. For example, misalignment is often a trigger for an asset owner to engage with the asset manager on the investment case for specific holdings in the portfolio. Similarly, the asset manager can use alignment metrics as a trigger for direct engagement with high-emitting portfolio companies.

A variety of financial institutions currently use portfolio alignment metrics as an input for identifying engagement targets. Given the uncertainties associated with portfolio alignment metrics, however, practitioners often use alignment metrics in conjunction with other measures (e.g., current carbon footprint data, target accreditation, etc.) to identify engagement targets.

Use case

EXAMPLE 3 — CASE STUDY INSTITUTION: GENERATION IM

Sub-sector of institution: Asset Management

Generation IM (Generation) is an investment manager focusing on sustainable investments. The firm uses portfolio alignment metrics (in particular, binary target measurement to track SBTi coverage) to inform the level of engagement required with the companies in its portfolios. This engagement includes where remedial action needs to be taken to resolve portfolio misalignment to both the 1.5 degrees C goal set by the Paris Agreement and Generation's goal to achieve net-zero emissions portfolios by 2040.[40] Where necessary, the engagement may include sustainability-linked requirements to secure Generation's vote for chair re-election. Two of the possible criteria for the chair of portfolio companies to secure Generation's vote for re-election include:

- A requirement that the company disclose its emissions, either in company reporting or via CDP
- The company formally commits to setting science-based targets with the SBTi (this will come into effect from 2023)

Figure 8 compares Generation's Global Equity Fund with the benchmark.[41] It shows the percentage of companies in its Global Equity Fund that participate in the SBTi.

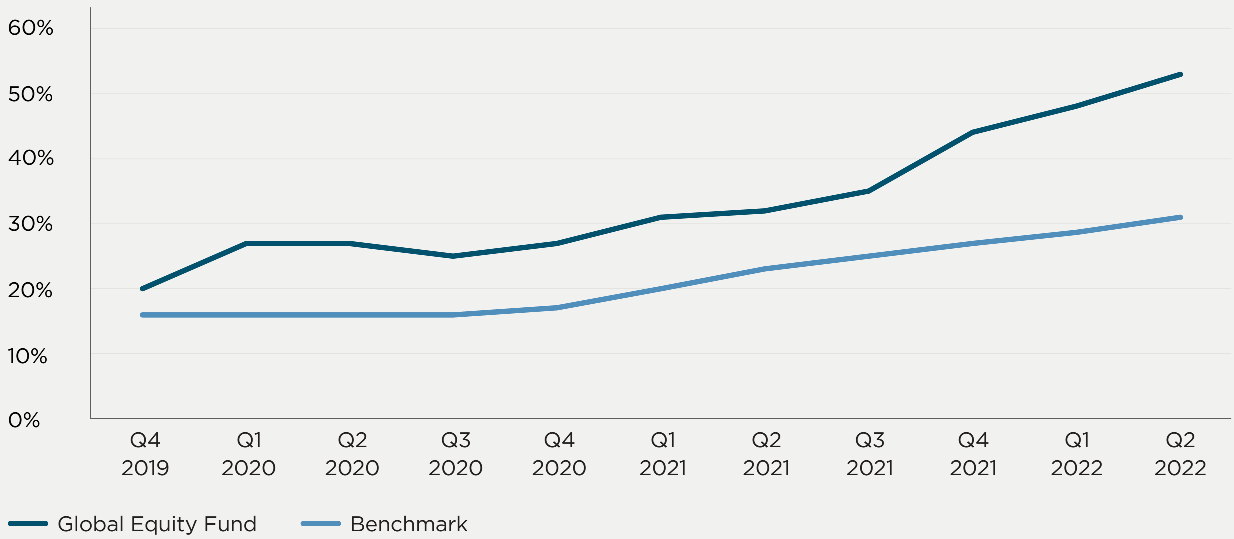
Generation has stated publicly that its engagement is an important step in its efforts to steward its Global Equity Fund to net-zero emissions by 2040.

40 Generation IM. Global Equity Q1 2022 Investor Letter, 2022.

41 Generation IM. Q1 2021 Global Equity Investor Letter, 2021.

Figure 8: Comparing the share of companies that participate in SBTi within Generation's Global Equity Fund against the benchmark

Percentage of fund/benchmark containing companies with SBTi verified emissions reduction targets



2.2.3 – Understanding the impact of internal policies and conditions

Portfolio alignment metrics can be used by financial institutions to understand the impact of climate-related policies and conditions and to guide their investments or lending. Much like corporate policies or conditions that restrict finance related to, for example, gambling or weapons, financial institutions are considering applying such exclusionary measures to high-emitting activities. In turn, portfolio alignment metrics could be used to illustrate the impact of such climate-related policies and conditions for a portfolio.

As climate-related policies and conditions are enforced more broadly by financial institutions, it is expected that this use case will become more prevalent.

Use case

EXAMPLE 4 — CASE STUDY INSTITUTION: AXA

Sub-sector of institution: Insurance

AXA is a multinational insurance company which uses portfolio alignment metrics to gauge the “warming potential” impact of their investment decisions. AXA, which aims to align its business with the Paris Agreement, launched its climate strategy in 2019.[42] It has since published three annual disclosures (2020, 2021, and 2022)[43,44,45] that includes progress against AXA’s objective to contain the “warming potential” of their investments to under 1.5 degrees C by 2050.

Acting in line with its strategy, AXA disclosed its divestment of coal assets the 2021 Climate Report, which it calculated to have a “warming potential” of 3.88 degrees C in 2020.[46] The quantification of this divestment, using this metric, will help AXA to achieve another objective in its climate strategy: containing the “warming potential” of its investments to under 1.5 degrees C by 2050. AXA has chosen to disclose this metric as part of a group of indicators it uses to:

- measure climate impact
- anticipate and manage climate-related risks in its business and stakeholders
- determine effective action plans[47]

42 AXA. “AXA & Climate Change”, 2019.
43 AXA. “2020 Climate report: renewed action in a time of crisis”, 2020.
44 AXA. “2021 Climate report: the decisive decade”, 2021.
45 AXA. “2022 Climate and Biodiversity Report: Accelerating Transition”, 2022.
46 AXA. “2021 Climate report: the decisive decade”, 2021.
47 AXA. “AXA publishes its 2021 Climate Report”, 2021.

2.2.4 – Investment research and selection

A financial institution can use portfolio alignment metrics to identify the alignment of individual real-economy companies with a 1.5 degrees C benchmark scenario. By doing so, financial institutions can perform investment research and make selection decisions based on these alignment metrics. For example, a financial institution could set a selection rule regarding having a minimum proportion of companies in its portfolio with an SBTi-accredited target or an ITR below 2 degrees C.

At present, portfolio alignment metrics for investment research and selection purposes are used by only a few financial institutions. Engagement revealed that uncertainty associated with the underlying assumptions of portfolio alignment metrics has been a key barrier to adopting these metrics for this particular use case.

The information discussed in Example 5 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken.

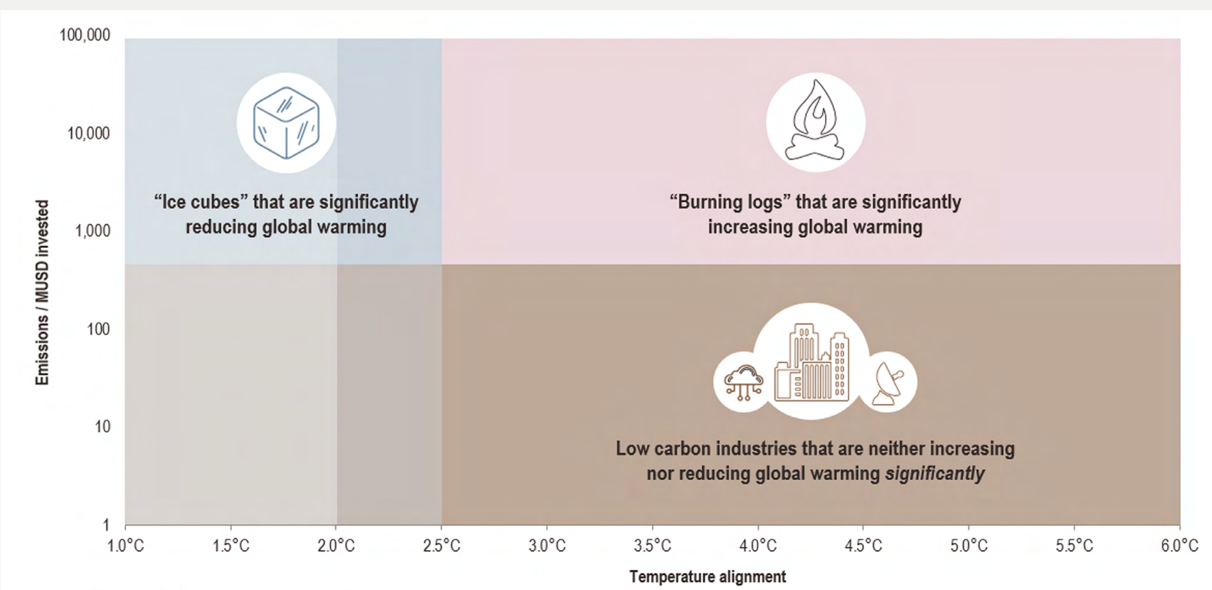
Use case

EXAMPLE 5 — CASE STUDY INSTITUTION: LOMBARD ODIER

Sub-sector of institution: Asset Management

Lombard Odier is a Swiss private bank with an asset management division. Lombard Odier offers a series of “Target Net Zero” (TNZ) funds that operate under the constraint of maintaining an ITR of no more than 2 degrees C, with the goal of progressively accelerating the rate of decarbonization of the portfolio constituents to target net-zero emissions by 2050, so as to limit global warming to 1.5 degrees C.

Figure 9: Example categorization of companies using emissions and temperature alignment for use in portfolio tilting



Its TNZ funds achieve this goal by tilting capital towards “ice cubes”, or companies in high-emitting sectors, like auto manufacturing, steel, and cement, that are rapidly decarbonizing by having implemented innovative low carbon technology or that have robust and credible transition plans. At the same time, TNZ funds tilt capital away from “burning logs”, or high-carbon companies that are misaligned on a forward-looking basis. This tilting is illustrated in Figure 9. It is Lombard Odier’s conviction that burning logs will be particularly negatively exposed to the transition to net zero.

Lombard Odier relies on portfolio alignment metrics in its TNZ funds to maintain diversification, minimize tracking errors, and ultimately reduce the temperature of its investment funds.

2.2.5 – Portfolio construction

Asset managers, asset owners, and insurers are increasingly considering climate-related impacts in their portfolio construction process because portfolio alignment metrics can serve as a useful indicator of the climate-related ambition of real-economy companies.

An asset manager (or asset owner with direct investment capabilities) might use portfolio alignment metrics as an input alongside other climate and sustainability metrics to assess the overall sustainability characteristics of its investment portfolios. This can then inform decisions within the portfolio construction process by allowing the investor to compare — and trade-off — the change in sustainability characteristics of a given portfolio against the resulting changes in other key characteristics, such as costs, liquidity, etc.

At present, because portfolio alignment metrics are relatively new, financial institutions are only beginning to incorporate these in their granular decision-making with respect to portfolio construction.

The information discussed in Example 6 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Use case

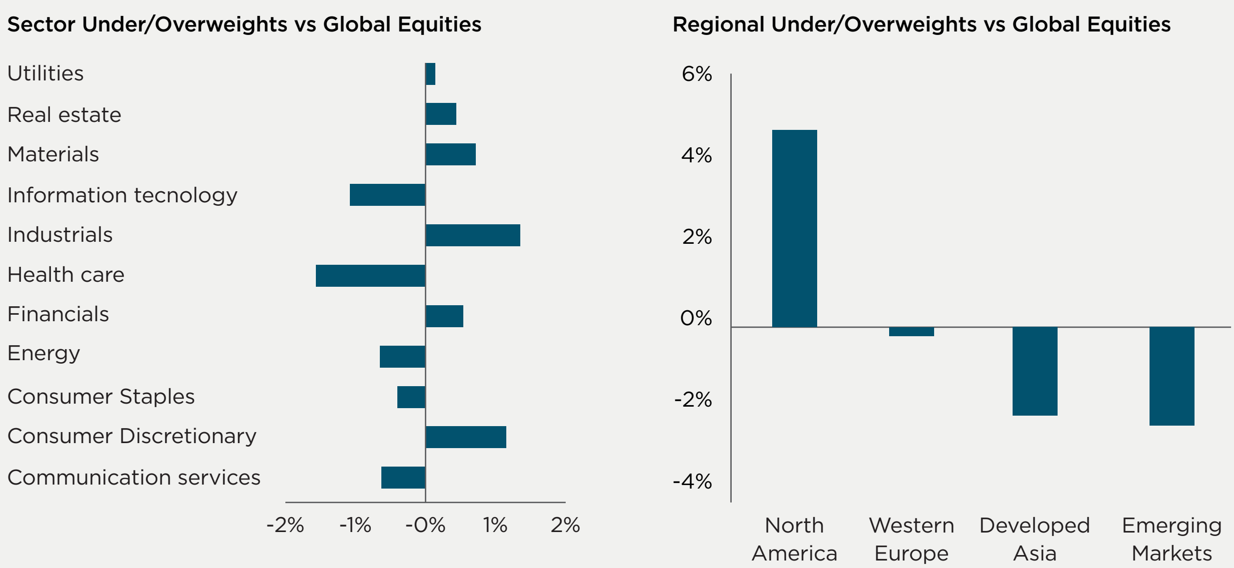
EXAMPLE 6 — CASE STUDY INSTITUTION: FULCRUM ASSET MANAGEMENT

Sub-sector of institution: Asset Management

Fulcrum Asset Management (Fulcrum) is a global asset manager. The firm has used implied temperature rise metrics to construct a highly diversified global equity portfolio that only invests in companies aligned with the below 2 degrees C goal of the Paris Agreement, i.e., companies already demonstrating higher levels of ambition, in terms of emission reductions, compared to the global economy.

Developed in partnership with Arvella Investments, the strategy places climate considerations in the portfolio construction process, whilst maintaining similar regional, sectoral and factor exposure to global listed markets.

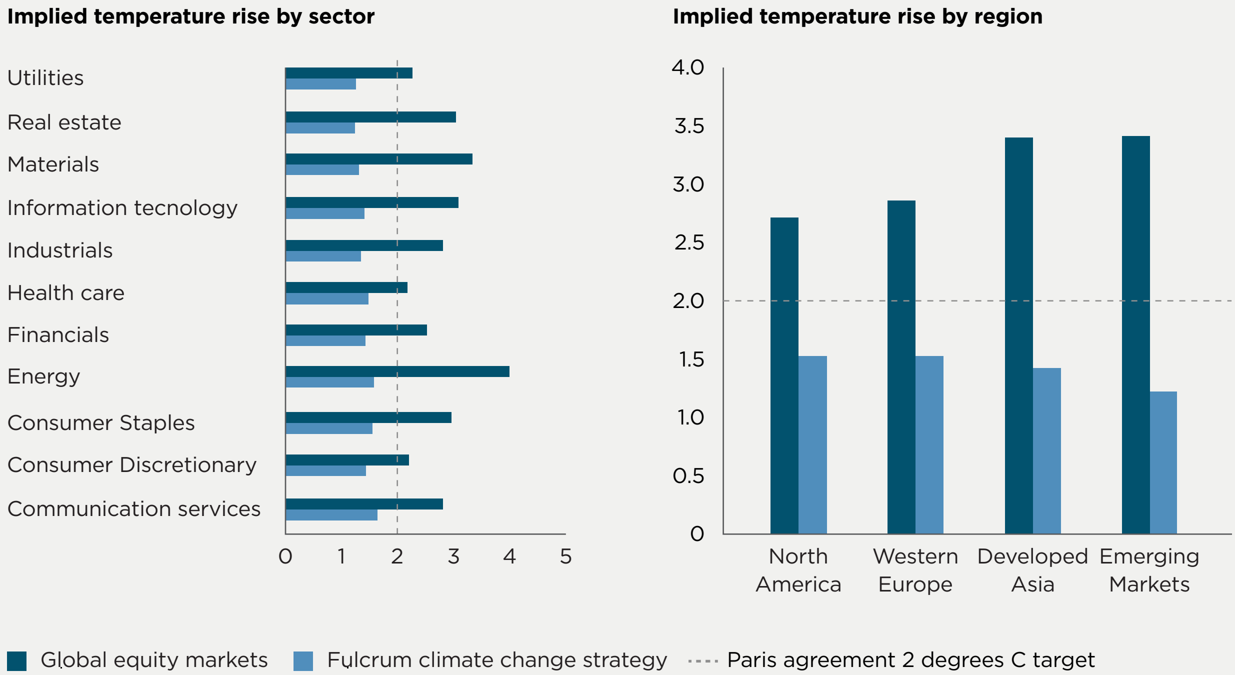
Figure 10: Sector and Regional Under/Overweights vs the MSCI All Country World Index[48]



48 The GFANZ workstream on Portfolio Alignment Measurement received this graphic from Fulcrum Asset Management LLP, who created this graphic using data from MSCI, Bloomberg LLP, S&P Global Trucost and Fulcrum Asset Management (accurate as of 30th June 2022).

Figure 11: A comparison of the Implied Temperature Rise by sector and by region of Fulcrum's Climate Change Strategy and the MSCI All Country World Index[49]

ITR (Degrees C)



The strategy is designed to serve as a core component of investors' equity allocation, helping to finance demand- and supply-side climate solutions, whilst having the potential to capture 'transition alpha' as markets begin to price in climate alignment. Fulcrum suggests that this approach addresses the challenge of aggregation (Judgement 9) by requiring all counterparties to be aligned, rather than relying on metrics at the average portfolio level. It also involves an engagement component, backed by voting sanctions, to encourage the adoption of independently verified Science Based Targets across markets.

The strategy was developed in the belief that its wide-scale adoption could significantly increase the probability of transitioning to a net-zero world.

49 Ibid., 2022

The information discussed in Example 7 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Use case

EXAMPLE 7 — CASE STUDY INSTITUTION: UBS

Sub-sector of institution: Banking and Asset Management

UBS is a multinational diversified financial services company. In 2016 UBS partnered with the United Kingdom's National Employment Savings Trust (NEST) to devise a climate strategy addressing NEST's specific goal of managing climate change risks in its passive strategies, while maintaining a risk-return profile similar to the market capitalization-based benchmark.

UBS's strategy seeks to generate positive exposures to three types of companies:

- Companies that mitigate climate change risk,
- Companies that drive the adaptation of low carbon alternatives, and
- Companies that are crucial to the transition to a low-carbon economy.

In applying these selection criteria, UBS considers four perspectives when constructing a portfolio: 1) forward-looking climate-related characteristics; 2) index-like characteristics of the portfolio to achieve close tracking of the benchmark; 3) coverage of Scope 1, 2, 3 emissions; and 4) an engagement and voting approach.

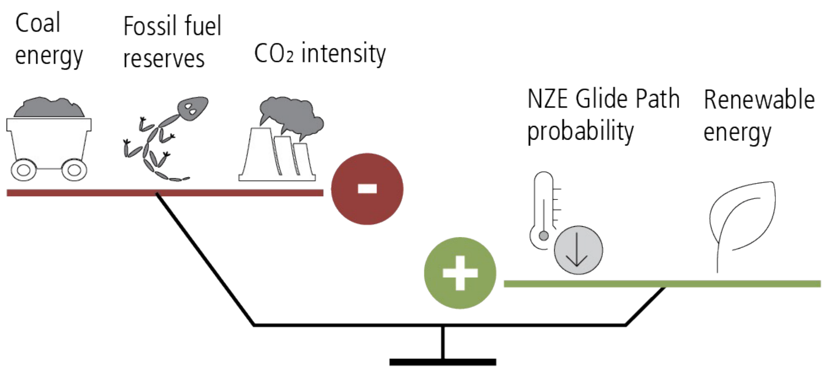
To incorporate a forward-looking dimension into the portfolio construction process, UBS uses "Net Zero Emissions (NZE) Glide Path Probability" metrics. They can be considered an example of portfolio alignment metrics as they assess the probability that a company is aligned with a net-zero emissions scenario for its sector. Specifically, the glide path tool draws on a quantitative model that considers a company's trajectory of emissions over the last seven years. It compares this profile relative to its peers, as well as the relevant sectoral pathway implied by the net-zero scenario used.

The three primary data inputs for the glide path tool are:

- Historical Scope 1, 2, and 3 emissions of the underlying portfolio companies based on
- Company emissions disclosures (as opposed to estimates from data vendors) and
- Company targets, policies, and/or initiatives to reduce the company's carbon emissions.

UBS uses companies' Glide Path Probabilities in portfolio construction to apply a "positive tilt" to companies that perform in line with globally agreed climate change goals, one of five factor tilts that UBS leverages for its Climate Aware model portfolio. Figure 12 illustrates the five factor tilts applied to the Climate Aware model portfolio.

Figure 12: Factor tilts applied to the Climate Aware model portfolio



2.2.6 – Manager selection and monitoring

Asset owners and investors can incorporate climate-related considerations in their processes for evaluating and monitoring asset managers. Portfolio alignment metrics can be used as one data point in a suite of metrics to holistically assess investment manager performance. In assessing the effectiveness of an asset manager's approach to integrating climate considerations into their investment process, asset owners and investors can consider the alignment of the manager's portfolio to a 1.5 degrees C benchmark scenario, as well as their responses to questions on the alignment of specific holdings. These factors can also be used to assess how, and to what extent, the asset manager's understanding of portfolio alignment impacts their engagement and voting approach.

Because many asset owners use several managers, the level of comparability of portfolio alignment metrics across different asset managers is a key input in the manager selection decision.

The information discussed in Example 8 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Use case

EXAMPLE 8 — CASE STUDY INSTITUTION: CAMBRIDGE ASSOCIATES

Sub-sector of institution: Investment Consultant
Cambridge Associates is a global investment consultant. As a part of its asset manager oversight process on behalf of its asset owner clients, Cambridge Associates uses a variety of metrics to assess asset managers' performance on climate considerations. The list of metrics includes the binary measurement of alignment by portfolio (assessed as the proportion of aligned versus non-aligned companies as identified by TPI and SBTi datasets), current and recent trend emissions on an absolute and intensity basis, an ITR model (at the security and portfolio level), and finally the level of exposure to climate solutions. Cambridge Associates uses the same ITR model for all asset managers, such that it provides one way of ranking asset managers on portfolio alignment in a comparable manner. At least as important as each of these quantitative inputs is discussion with the manager, and review of their individual decisions, in order to understand the extent of their understanding of each portfolio position from a climate perspective and how this knowledge is incorporated into the manager's investment process, driving buy/sell decisions as well as engagement and voting.

Cambridge Associates seeks to avoid over-quantification of alignment Judgements, especially the use of single aggregate metrics. Rather, it synthesizes the above range of inputs to build a holistic picture of an asset manager's approach and uses this as an input for conversations to understand their climate-related strategy and identify any weaknesses/areas for improvement as well as their appropriateness for different client types.

In the spirit of the NZICI commitment to driving real world change, Cambridge Associates looks for managers that focus on companies that need to transform and how, as much as those constructing a portfolio of companies already on a pathway aligned with net-zero.

2.2.7 – Supervisory activity

Central banks and governments are aware of the broad range of climate-related metrics used by financial institutions within their regulatory purview. Though adoption of climate-related metrics in supervisory activities is still relatively new, central banks and supervisors are conscious of the advantages and limitations of the use of portfolio alignment metrics. Very few regulatory bodies have explicitly noted that they are currently considering the use of portfolio alignment metrics in supervisory activities. However, the Financial Stability Board highlighted the use of ITR in its most recent interim report on supervisory and regulatory approaches to climate-related risks.[50]

50 FSB, "Supervisory and Regulatory Approaches to Climate-related Risks". Interim Report, 2022.

Use case

EXAMPLE 9 — CASE STUDY INSTITUTION: SWITZERLAND'S STATE SECRETARIAT FOR INTERNATIONAL FINANCE (SIF)

Sub-sector of institution: Government

Switzerland's State Secretariat for International Finance (SIF) is an administrative unit of the Swiss Confederation under the Federal Department of Finance. SIF is responsible for implementing the financial market policy of the Federal Council. SIF has recently introduced a Climate Score approach[51] as a basis for transparency for investment products and financial institution portfolios, where suitable. SIF notes that the main objective of the score is to drive convergence on methodological best practices, promote comparability, and create forward-looking transparency on alignment of investment products sold in Switzerland with the 1.5 degrees C goal of the Paris Agreement.

Comparability is promoted by setting concrete minimum requirements on how each of the required indicators is derived. As opposed to the EU taxonomy, the climate score creates forward-looking transparency and captures the extent to which companies are positioned for the necessary transition to net zero. The climate scoring framework is underpinned by the work of GFANZ, the net-zero alliances, and TCFD. Switzerland is working together with international bodies such as the G20, the Organisation for Economic Co-operation and Development (OECD), and the International Platform for Sustainable Finance (IPSF) to ensure that the indicators of the Swiss Climate Scores enjoy a high degree of international compatibility and offer an ideal basis for transparency with regard to climate compatibility, in accordance with the Paris Agreement.

There are six elements that make up the Swiss State Secretariat's Climate Score:

- The global warming potential of the portfolio (based on implied-temperature rise models)
- The share of portfolio companies with verified commitments to net zero and credible interim targets
- The share of portfolio companies currently actively engaged in climate initiatives, for example, membership in a climate engagement initiative
- The investment strategy of the portfolio includes a goal of reducing the carbon emissions of the underlying investments
- The share of portfolio companies with activities in coal and other fossil fuel-intensive sectors
- The portfolio's greenhouse gas emissions intensity and footprint

51 Switzerland's State Secretariat for International Finance. "Swiss Climate Scores", 2022.

2.3 – STARTING THE JOURNEY: PORTFOLIO ALIGNMENT MEASUREMENT FOR TRANSITION FINANCE IN PRIVATE EQUITY

Private Equity (PE) firms are well placed to actively drive net-zero transformations of small and medium Enterprises (SMEs) as they often sit on the boards of their SME portfolio companies and can empower them to focus on the benefits of net-zero transition planning.

When PE firms consider the acquisition of carbon-intensive companies, with the intention of achieving long-term emissions reductions, the use of forward-looking considerations and the credibility assessment of prospective portfolio company transition plans is crucial. In this way, portfolio alignment measurement will play an increasingly important role for PE firms and their transition financing activity.

Implementation

EXAMPLE 10: Brookfield Global Transition Fund

The Brookfield Global Transition Fund (BGTF) is a fund dedicated to accelerating the transition to net zero, launched by Brookfield Asset Management, a multinational investment management company.[52]

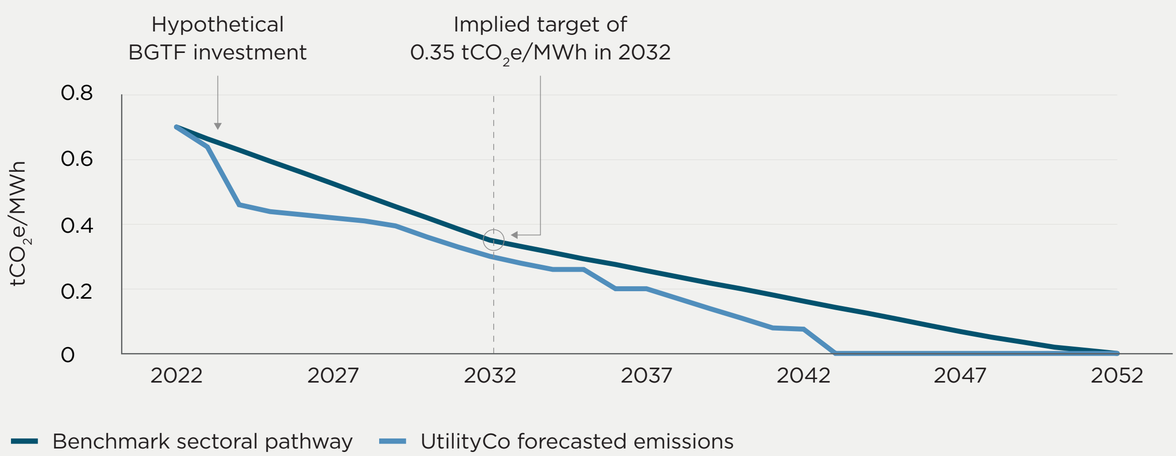
BGTF has begun making early investments within the business transformation theme. To illustrate how the process works, the following hypothetical case study has been constructed, drawing on the real-life learnings from the BGTF experience so far. This hypothetical case centers on UtilityCo, a large-scale electric utility, predominantly operating thermal power assets alongside some renewables. BGTF will fund UtilityCo's decarbonization plan by decommissioning its coal assets early and developing a significant renewable portfolio to replace it.

At the screen stage, BGTF deploys four measures to ensure the investment meets the impact criteria for the Fund. For BGTF to invest, it must be able to align the investment to a sectoral emissions pathway consistent with the goals of the Paris Agreement; the investment (either through capital or operations) must provide additionality to what would otherwise occur; there must be accountability in emissions reporting enabling BGTF to track process against the plan; and the investment must be able to avoid or mitigate other related ESG risks.

BGTF will analyze UtilityCo's emissions forecast and project their emissions intensity against a benchmark sectoral pathway to assess Paris-Alignment and set targets for the business on an interim and long-term basis. The emissions forecast is designed to take into account both the credibility and execution feasibility of the plan. These forecasts are reviewed against the relevant benchmark sectoral pathway to assess Paris-alignment on a short-, medium- and long-term basis. Emissions reduction targets are set both on an interim and a long-term basis based on what is required by the selected sector pathway, with interim targets in this hypothetical case setting a c. 50% cut in emissions intensity (tCO_2e/MWh) by 2032 from the baseline year of 2022.

52 Disclaimer: This document is being provided as a high-level overview of Brookfield's views on making "business transformation" investments and the case study discussed herein is hypothetical and for illustrative purposes only. Nothing herein should be constructed as being an offer, invitation or recommendation of any kind and this document is not to be construed as a prospectus, product disclosure statement or advertisement. This document may not be used or reproduced.

Figure 13: Forecasted UtilityCo emissions intensity trajectory after hypothetical BGTF investment



BGTF's financial underwriting is aligned to incorporate any financial investments or early retirements required for the investment to meet this clear emissions reduction target. In this case, the phase-out of emitting assets will be crucial steps along the way to meeting the interim target, and as part of the due diligence, BGTF will prepare an analysis to confirm the viability of these phase-outs, while considering factors such as "just transition" with respect to employees and stability of the power sector.

Post-acquisition, BGTF will require UtilityCo to track emissions in accordance with the GHG Protocol and will look to align with TCFD recommended disclosures. This data will be reported to investors in BGTF on a regular basis to ensure transparency and accountability for the business and Fund.

2.4 – BARRIERS TO ADOPTION

Though progress has been made with regard to the adoption of portfolio alignment metrics, as seen by the range of use cases in which they are being applied, barriers to successful implementation of these metrics remain.

Through the engagement carried out by the GFANZ workstream on Portfolio Alignment Measurement, several barriers to adoption were identified, which fall into two main categories: methodological- and implementation-based. The first category of barriers relates to the methodological steps required in the Key Design Judgement Framework that would benefit from further elaboration and clear guidance. The second category of barriers are centered on implementation challenges that limit the broader adoption of alignment metrics.

The identified barriers to adoption are summarized in Table 4. This table also summarizes how and where this draft report addresses the related challenge that each barrier introduces.

Table 4: Summary of barriers to adoption

JUDGEMENT(S)	BARRIER CATEGORY	BARRIER	CHALLENGE(S)	HOW THIS DRAFT REPORT IS ADDRESSING THE CHALLENGE
All	Methodological and Implementation	Uncertainty about underlying model assumptions.	There is a lack of transparency regarding: underlying model complexities; the relevance of assumptions; and the appropriateness of modelling. Transparency also varies depending on metric provider.	Enhancements to the Key Design Judgements are provided throughout Section 3 to drive convergence on methodological best practices.
1	Methodological	How should alignment be measured?	There is a lack of clarity regarding how to implement the fair-share carbon budget approach .	Section 3.1 features quantitative analytics examples and a practitioner case study to greater illustrate the fair-share carbon budget approach.
2	Methodological	What is the appropriate benchmark scenario?	There is a lack of clarity about how to select appropriate 1.5 degrees C-aligned benchmark scenarios for specific portfolio alignment use cases.	Section 3.2 features the outputs from the GFANZ workstream on Sectoral Pathways, including a framework that outlines the considerations that financial institutions should understand about benchmark scenarios to support selection and decision-making.
3	Methodological	The use of different emissions units.	There is a lack of clarity about which emissions unit is the most suitable to get representative company alignment outcomes in high-impact sectors (i.e., oil and gas) .	Section 3.3 features an exploration of the challenges in selecting an emissions unit for oil and gas companies. The final report for publication ahead of COP 27 will use feedback from consultation to provide guidance for the selection of unit for the oil and gas sector.

JUDGEMENT(S)	BARRIER CATEGORY	BARRIER	CHALLENGE(S)	HOW THIS DRAFT REPORT IS ADDRESSING THE CHALLENGE
6	Methodological	Lack of guidance on how to forecast issuer-level emissions.	There is a lack of guidance for assessing the credibility of companies stated emission reduction targets.	Section 3.6 provides a framework for assessing the credibility of companies stated emission reduction targets.
7	Methodological	What is the correct time horizon for measuring alignment?	There is a lack of clarity about how to select a time horizon that will appropriately capture the alignment of companies.	Section 3.7 provides guidance on the appropriate time horizons to use when assessing alignment.
8	Methodological	What are the appropriate metrics for expressing alignment for specific use cases?	There is a lack of agreement about which portfolio alignment metric to use. The variety currently used makes it hard to compare.	Section 3.8 provides guidance on the appropriate portfolio alignment metrics for particular use cases.
4	Implementation	Shortcomings in required data.	There is a lack of corporate emissions disclosure, in particular Scope 3 value-chain emissions. There is insufficient convergence on methodological best practices for reporting of Scope 3 emissions. Finally, there is a lack of clarity on the materiality of Scope 3 emissions by sector and category.	Section 3.4 features analysis on the materiality of Scope 3 emissions by sector and category.
-	Implementation	The impact of climate solutions financing is not reflected in portfolio alignment benchmarks.	Within current portfolio alignment metrics there is a lack of consideration for the role of climate solutions in avoiding emissions.	Section 3.10 features practitioner case studies illustrating possible approaches to account for climate solutions financing in alignment measurement.
-	Implementation	Lack of availability of portfolio alignment metrics across the full range of asset classes.	A lack of portfolio alignment metrics that are applicable to all asset classes limit full portfolio coverage.	Challenge to be addressed in future GFANZ work.

For further details on each barrier to adoption in Table 4, please refer to the GFANZ Portfolio Alignment Measurement Concept Note.[53]

53 GFANZ. "2022 Concept Note on Portfolio Alignment Measurement", 2022.

3. Enhancement

Progressing Portfolio Alignment Measurement

To address the methodological barriers to adoption outlined in Section 2, this section builds on the analysis and considerations contained in the 2021 Portfolio Alignment Team (PAT) Report. Furthermore, recommendations are provided for some Key Design Judgements, where engagement has indicated that this was required.

3.0 – HIGH-LEVEL SUMMARY OF ENHANCEMENTS TO KEY DESIGN JUDGEMENTS

Consultation question(s) for consideration:

- What is your opinion of the enhancements and guidance offered in Section 3.0?
- Where guidance stops short of what is needed, how should this be addressed?

Based on feedback the GFANZ workstream on Portfolio Alignment Measurement received from workstream members and other practitioners regarding the nine Key Design Judgements set out in the 2021 PAT Report, GFANZ has categorized the Judgements based on the type of support practitioners are looking for:

- Key Design Judgements where workstream members and other practitioners have expressed a desire for GFANZ to produce refined guidance to assist them with methodological barriers associated with these Judgements.
- Key Design Judgements where workstream members and other practitioners would like GFANZ to provide resources and case studies to assist them in implementing guidance and help end users overcome implementation barriers.
- Key Design Judgements where GFANZ is not proposing to provide additional guidance.

Table 5 describes the enhancements to the Judgements and new guidance that is provided in this draft report.

Table 5: Executive summary of enhancements to the Key Design Judgements

This draft report provides refined guidance | This draft report addresses implementation challenges

KEY DESIGN JUDGEMENT	KEY DESIGN JUDGEMENT CONTEXT	GFANZ ENHANCEMENT OF THIS JUDGEMENT AS COMPARED TO THE 2021 PAT REPORT	REFINED GFANZ GUIDANCE
Step 1			
1. What type of benchmark should be built?	• Single-scenario benchmarks are preferred due to their simplicity and ease of use. • There are three single-scenario benchmark approaches: the convergence, rate-of-reduction, and a fair-share carbon budget approach.	This draft report provides quantitative analysis examples and a practitioner case study demonstrating the challenges with convergence and rate of reduction approaches and how the fair-share approach can be operationalized to overcome these challenges.	N/A — This draft report addresses implementation challenges

KEY DESIGN JUDGEMENT	KEY DESIGN JUDGEMENT CONTEXT	GFANZ ENHANCEMENT OF THIS JUDGEMENT AS COMPARED TO THE 2021 PAT REPORT	REFINED GFANZ GUIDANCE
2. How should benchmark scenarios be selected?	• The 2021 PAT Report suggests practitioners should select science-based 1.5 degrees C-aligned benchmark scenarios and prioritize granular regional and sectoral benchmarks.	This section reiterates the 2021 PAT Report guidance and links to relevant developments from the GFANZ workstream on Sectoral Pathways.	N/A — This draft report addresses implementation challenges
3. Should absolute emissions, production capacity, or emissions intensity units be used?	• There are three units which are commonly used for measuring alignment: absolute emissions, production or production capacity, and emissions intensity (either economic or physical in nature).	GFANZ are providing refined guidance for the selection of units when calculating the alignment of companies in high-impact (fossil fuel) sectors (highlighted due to emissions profile and abatement potential).	*Feedback during consultation will be incorporated into the final report*
4. What scope of emissions should be included?	• The 2021 PAT Report suggests practitioners include Scope 3 emissions for the sectors for which they are the most material.	This draft report provides new guidance on recommended sector-specific thresholds for defining emissions scopes and categories.	For portfolio alignment measurement, financial institutions should consider including Scope 3 emissions for companies where Scope 3 emissions are material both in absolute magnitudes and percentage of total emissions. Practitioners should verify whether the most material Scope 3 categories (i.e., categories 1, 3, 11) are disclosed by companies in relevant sectors, whether based on reported data or extrapolated when data is lacking or insufficiently supported. A list of priority sectors and key categories include: Oil and Gas Category 11; Automotive Categories 1 and 11; Electric Utilities Categories 3 and 11; Chemicals Categories 1 and 11. In choosing what estimation data or methods to apply when using estimated Scope 3 emissions, practitioners should consider the company's sectors and activities. Consistent with PCAF's recommendations, practitioners should consider prioritizing bottom-up estimations, especially for categories 3 and 11 in homogeneous sectors. Regression models have broader coverage for heterogeneous sectors, where physical activities based estimates are challenging to perform. Wider adoption of such models depends on their reduced dependence on sector average emissions.

KEY DESIGN JUDGEMENT	KEY DESIGN JUDGEMENT CONTEXT	GFANZ ENHANCEMENT OF THIS JUDGEMENT AS COMPARED TO THE 2021 PAT REPORT	REFINED GFANZ GUIDANCE
Step 2			
5. How should emissions baselines be quantified?	• The 2021 PAT Report suggests practitioners cover all seven GHGs outlined in the Kyoto Protocol. • The 2021 PAT Report suggests prioritizing the PCAF Standard when quantifying emissions.	This section reiterates the 2021 PAT Report guidance.	N/A
6. How should forward-looking emissions be estimated?	• When forecasting a company's emissions, practitioners need to decide on the approach to forecasting emissions (e.g., using historical data or stated targets) and the method for combining these data sources. • Practitioners currently lack guidance on how to practically incorporate credibility assessments of stated targets into forecasting approaches.	This draft report provides a framework and guidance for conducting a credibility assessment of a company's stated emissions reduction targets. This draft report also provides refined guidance for projecting the forward-looking emissions of companies without stated emission reduction targets.	To project a company's emissions, two approaches should be considered: the first using backward-looking data (e.g., historical emissions) and the second using forward-looking data based on a company's stated emission reduction targets. The final alignment score should be a weighted combination of these two approaches, with the weighting derived from a credibility assessment of the stated emission reduction targets, reflecting the likelihood of the targets being achieved. When performing a credibility assessment of targets, practitioners should consider the key indicators outlined in this section, including but not limited to: whether the company has third-party validated short- and long-term targets, whether these targets are linked to executive oversight, and whether these targets are supported by a clear funding channel and a transition plan that lays out the pathway to achieving these targets. Depending on the assessed ambition and credibility of the targets, the target-related alignment score might be discounted.
7. How should alignment be measured?	• The 2021 PAT Report suggests that alignment be measured based on cumulative terms.	This draft report provides new guidance on the appropriate time horizon to use for measuring portfolio alignment.	Practitioners should consider computing alignment over short- and medium-term time horizons (e.g., up to 2030), supplemented by longer-term time horizon computations (e.g., 2050). The choice of time horizon should also be informed by the practitioner's use cases.

KEY DESIGN JUDGEMENT	KEY DESIGN JUDGEMENT CONTEXT	GFANZ ENHANCEMENT OF THIS JUDGEMENT AS COMPARED TO THE 2021 PAT REPORT	REFINED GFANZ GUIDANCE
Step 3			
8. How should alignment be expressed as a metric?	• There are four commonly used portfolio alignment metrics: binary target measurement, benchmark divergence, implied temperature rise (ITR), and maturity alignment scale. • Additionally, when calculating a temperature score (i.e., an ITR), there are two possible methodologies: the use of a TCRE multiplier or the use of the multiple benchmark interpolation approach.	This draft report provides refined guidance on the use of different portfolio alignment metrics and the calculation methodologies for temperature scores (i.e., ITR).	Practitioners should consider tailoring the selection of their portfolio alignment metric to their individual use case. A practitioner should consider the broad dimension of the use case (i.e., communication vs. decision-making) when selecting the metric. If converting alignment into an ITR metric, practitioners should consider using a multiple benchmark interpolation approach for all sectors where multiple, internally consistent temperature scenarios are available. If these scenarios are unavailable, an ITR can be calculated by converting a total carbon budget overshoot based on total cumulative emissions between today and the net-zero target date into a temperature outcome with the help of the TCRE multiplier. To minimize the technical issues associated with the TCRE multiplier approach for shorter time horizons, financial practitioners should consider using this approach to calculate ITR metrics for long-term time horizons.
9. How should counterparty-level scores be aggregated?	• There are three potential approaches which are commonly used to aggregate counterparty-level scores: aggregated budget approach, portfolio-owned approach, and portfolio-weight approach.	This section reiterates the 2021 PAT Report guidance.	N/A

Deep Dive: Key Design Judgements

3.1 – KEY DESIGN JUDGEMENT 1: WHAT TYPE OF BENCHMARK SHOULD BE BUILT?

Consultation question(s) for consideration:

- Which benchmark construction approach do you use?
- Why have you chosen this approach?
- What would be your preferred approach?
- What are the barriers to adopting this?

The first decision when calculating portfolio alignment metrics is how to construct the benchmark. This decision comprises two steps: 1) choosing between a single-scenario benchmark approach and a warming function, and 2) if using a single-scenario benchmark approach, choosing between the convergence, rate-of-reduction, and fair-share carbon budget approaches. This decision, particularly when choosing between different single-scenario benchmark approaches, is important because it impacts a variety of other Judgements, for example, the choice of unit[54] and compatibility with forward-looking scenarios.

More broadly, the benchmark construction approach has implications for how companies' decarbonization trajectories compare to the constructed benchmark which, in turn, will affect the final alignment result. This section focuses on single-scenario benchmark construction approaches, providing an overview of the limitations of the convergence and rate-of-reduction approaches. Examples then outline how the fair-share carbon budget approach could help address these limitations.

Current practices for Judgement 1

Per the 2021 PAT Report,[55] there are two ways to create a benchmark from a reference scenario: using a single-scenario benchmark or a warming function.

Single-scenario benchmarks benefit from their simplicity: they are easy to implement, easy to explain, and easy to understand. Furthermore, if all the benchmarks used by a portfolio alignment tool are drawn from a single scenario, the method is guaranteed to be internally consistent. The single-scenario benchmark approach also provides flexibility in the construction process, allowing for the use of either intensity or absolute emissions units. However, engagement has highlighted that the main drawback of using a single-scenario benchmark is the risk of selection bias through the choice of scenario, potentially anchoring portfolio-alignment approaches to a less conservative benchmark.

Warming functions have the benefit of reducing (though not eliminating) selection bias by drawing on a wider range of scenarios. They also allow users to tease out the independent effects of multiple variables on the alignment metric, instead of limiting the analysis to a single variable. With some additional configuration, warming functions can also provide the flexibility to use absolute emissions or intensity units. However, this approach has several drawbacks: it can be much more complex to implement, harder to explain and interpret, and more opaque in its assumptions and sensitivities to those assumptions.[56]

54 For example, absolute emissions (tons of CO_2e), production capacity (i.e., barrels of oil, number of vehicles sold), or emissions intensity (i.e., tons of CO_2 per tons of steel)

55 See Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.26 for further details on warming functions vs. single-scenario benchmark approaches.

56 See Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p. 26-27 for further details on warming functions vs. single-scenario benchmark approaches

Both single-scenario and warming functions have merit. However, based on broad feedback received through the engagement conducted by the GFANZ workstream on Portfolio Alignment Measurement, the single-scenario benchmark approach is generally the preferred choice. Additionally, multiple benchmark scenarios can be combined into a single scenario to help reduce the selection bias. As a result, the remainder of this section will focus on the challenges and potential solutions for constructing and using single-scenario benchmarks.

Challenges when constructing a single-scenario benchmark

As noted in the 2021 PAT Report,[57] there are three possible approaches for constructing a single-scenario benchmark: convergence, rate-of-reduction, and the fair-share carbon budget approach.[58]

While convergence approaches assume that all companies in a sector are expected to converge to a required sector average, the rate-of-reduction approach assumes that all companies are expected to reduce emissions at the same annual rates. By contrast, the fair-share carbon budget approach defines the average rate-of-reduction in emissions for a sector as a whole but recognizes that individual companies will be better- or worse-performing than the average. Based on a comparison of the company's emissions intensity with its industry average, this approach creates a company-specific rate-of-reduction benchmark for absolute emissions.[59] To ensure companies are not penalized for organic or inorganic growth, company absolute emissions can also be adjusted for changes in market share when compared to the benchmark. The fair-share carbon budget approach requires underperforming companies to reduce absolute emissions at a faster-than-average rate, while allowing overperforming companies to reduce at a lower-than-average rate. As a result, the fair-share approach resolves some of the challenges inherent to both convergence and rate-of-reduction approaches.

Challenges with convergence approaches

Convergence approaches have the potential to penalize carbon-intensive companies in hard-to-abate sectors while reducing incentives for companies with lower emissions intensities to continue decarbonization. Convergence approaches also typically rely on units of physical or economic emissions intensity, which means the approach does not directly link to the global carbon budget, unless other parameters or assumptions are made about changes in market share.

For example, in an assessment of climate change announcements of various oil and gas companies, TPI found[60] that in 2018 TotalEnergies SE (Total) cut their physical intensity from 75.6 tCO_2e/TJ in 2014 to 71.4 t CO_2e/TJ through a combination of expansion of liquefied natural gas, disclosure of biofuels, falling operational intensity, plus increased electricity sales. However, TPI calculated that TotalEnergies SE's absolute emissions actually rose 8% over the same period. This example demonstrates the challenge that reductions in intensity do not always correspond with the reductions in absolute emissions required to meet temperature goals. The indirect link between physical emissions intensity can result in perverse incentives, for example by communicating positive alignment outcomes despite a lack of reductions in emissions in the real economy. This is explored further in the Judgement 3 section (see Example 16:

57 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p. 29-30.

58 These approaches are also valid for warming functions.

59 See Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, Appendix 2 for mathematical approach to construction.

60 Transition Pathway Initiative. "Shell and Eni lead European oil majors' race to net zero emissions", 2020.

Quantitative Analysis — Reflecting the carbon budget). The fair-share carbon budget approach can help overcome the risks of unintentionally disincentivizing support for real-economy emissions reductions by assessing companies based on a company-specific, rate-of-reduction benchmark using absolute emissions, thereby preserving a direct link to company-specific performance.

Challenges with rate-of-reduction approaches
When using a rate-of-reduction approach, companies that have already taken the most economically efficient decarbonization measures will be expected to achieve the same year-over-year reduction rates as companies that have not reduced emissions in the past. As a result, rate-of-reduction approaches have the potential to penalize better performing companies relative to poor performing companies, which may lead to perverse incentives when calculating alignment. More broadly, companies of different sizes and, potentially, of different business models will face the same year-over-year reduction rates.

For example, consider two companies, Company C and D. Company C is a poor performer which has made minimal emissions reduction efforts to date while Company D has already made significant progress on decarbonization. This results in a physical intensity metric for Company C which is far higher than Company D. However, if both companies reduce emissions at the same annual rate and a practitioner uses a rate-of-reduction approach, then the companies will appear similarly aligned despite their carbon intensity differences.

The fair-share carbon budget approach solves for challenges that arise with rate-of-reduction approaches by accounting for the relative performance of companies' physical intensities at the starting point of the alignment calculation to meet its benchmark, which is slightly above D's current emissions.

Figure 14 and Figure 15 graphically demonstrate Company C and Company D's respective fair-share benchmarks. The fair-share approach (dotted lines in the graphs) adjusts the starting point of the benchmark to reflect the relative intensity performance of Company C and D. As a result, Company C will need to reduce absolute emissions at a faster-than-average rate to meet its benchmark, which is far below C's current emissions. Overperforming companies, such as Company D, will need to reduce at a lower-than-average rate to meet its benchmark, which is slightly above D's current emissions.

Figure 14: Company C's fair-share benchmark

Mt CO_2

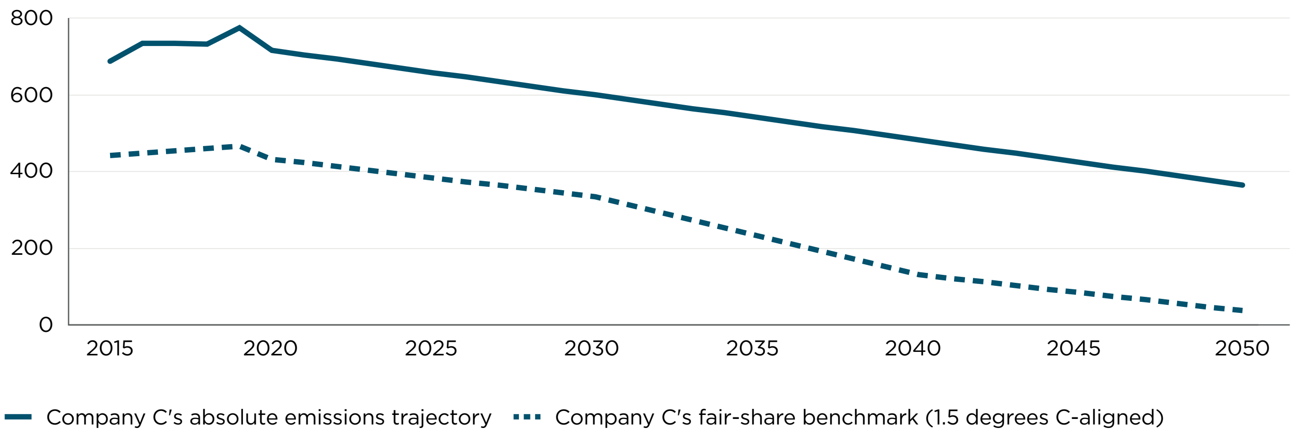
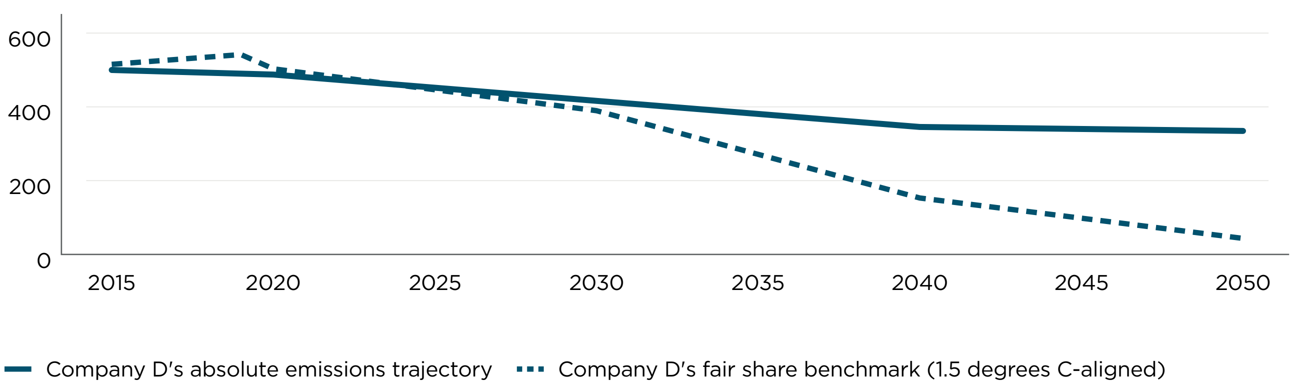


Figure 15: Company D's fair-share benchmark

Mt CO_2



Challenges with the fair-share carbon budget approach

Despite numerous advantages of the fair-share carbon budget approach, there are also inherent complexities that have limited its adoption to date. To implement the fair-share approach, a number of assumptions need to be made that can increase the uncertainty in the resulting portfolio alignment outcome. For example, to account for organic or inorganic growth, assumptions about companies' market shares may need to be introduced which may not be well understood by its end users.

The benefits and challenges of implementing a fair-share carbon budget approach have been illustrated in the following case study from MSCI. The implementation process showcased in Example 11 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Implementation

EXAMPLE 11: MSCI'S FAIR-SHARE CARBON BUDGET APPROACH

MSCI is a global financial services company, provider of ESG and climate metrics. It applies a fair-share carbon budget approach to calculate portfolio alignment metrics for a large range of sectors and companies. Though its methodology is continuously evolving, one of the ways MSCI has explored to implement the fair-share approach follows the following steps:

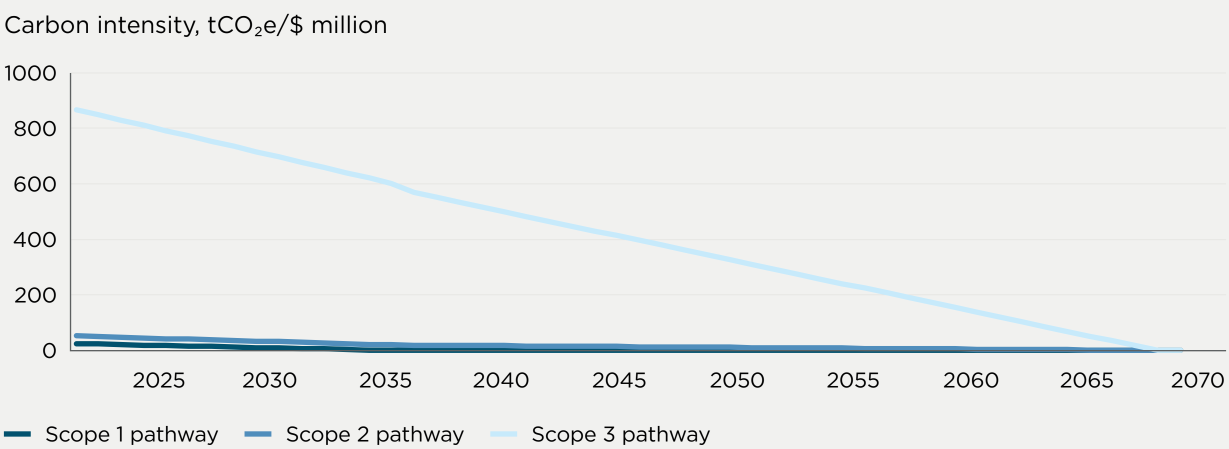
Step 1: MSCI defines a single global carbon budget and trajectory based on a 2 degrees C-aligned benchmark scenario from the IPCC.[61]

Step 2: MSCI then conceptualizes the global absolute emissions benchmark as an economic intensity scenario (tCO_2e/$ global wealth) and assumes an intensity of 0 tCO_2e/$ in 2070. MSCI calculates a company's specific benchmark scenario by adjusting the global carbon intensity scenario to the company's sector and country, breaking it out by emission scopes (Table 6 , Figure 16). MSCI's approach considers country and sector exposure because it may be unrealistic to align a company in a hard-to-decarbonize sector, or one in an emerging economy, with the same decarbonization benchmark as a company in an easy-to-decarbonize sector or developed economy.

Table 6: Example showing a carbon intensity benchmark scenario breakdown across two countries and two sectors based on Scope 1 emissions

	COUNTRY A		COUNTRY A	
HOW IS THIS COMPUTED?	SECTOR 1	SECTOR 2	SECTOR 3	SECTOR 4
Country/sector emissions reduction needed based on NDCs within 15 years	40%	99%	12%	8%

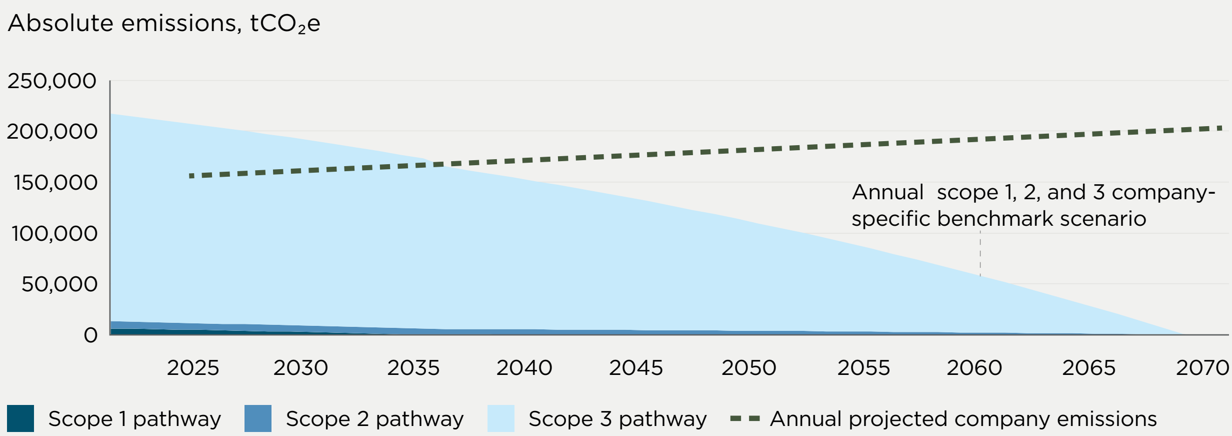
Figure 16: Example of a company-specific carbon intensity benchmark scenario for Scope 1, 2, and 3



61 Figures and tables for this case study provided to GFANZ by MSCI.

Step 3: MSCI translates company-specific intensity benchmark scenarios into carbon budgets by multiplying the company-specific scenarios by the company's revenues, applying a growth rate to future revenues. This yields a company-specific benchmark scenario based on absolute emissions with a cumulative carbon budget proportionate to company size, as measured by volume of revenue (Figure 17).

Figure 17: Emissions trajectory vs. allotted carbon budget for an example company



MSCI notes the following advantages with the fair-share carbon budget approach:

- The approach maintains a direct connection to the global carbon budget unlike convergence approaches.
- The approach does not penalize companies that have already made significant emissions reductions, unlike the rate-of-reduction approach, which requires reductions at the same rate for all companies.
- The approach more adequately assesses companies operating in different sectors. For example, a company might be operating in both the automotive and financial sectors, and this approach allows the individual business units to be compared to their appropriate sectoral benchmark scenarios.

However, MSCI noted several challenges to implementing the fair-share approach:

- The approach rests on a number of assumptions, such as revenue growth over time; the exact composition of sectors and countries; and how new companies to the market should be treated. Introducing more assumptions can lead to increased uncertainty regarding the accuracy and robustness of the resulting alignment outcomes.
- Increases in company revenues translate to increases in the companies' underlying carbon budget. A company might appear "aligned", though in reality it may be overshooting its emissions budget.

PROPOSED GUIDANCE FOR JUDGEMENT 1

As noted in the 2021 PAT Report, both single-scenario benchmarks and warming-function approaches may be technically viable to compute alignment.[62] However, the GFANZ workstream on Portfolio Alignment Measurement suggests financial institutions use a single-scenario benchmark approach because it more adequately reflects the carbon budget, it is simpler to implement, it is easier to interpret, and it is more transparent with regard to assumptions and to their effect on results.

The GFANZ workstream on Portfolio Alignment Measurement also suggests — as does the 2021 PAT Report[63] — that financial institutions follow one of two single-scenario benchmark construction approaches. Institutions should follow either: a) the fair-share carbon budget approach for all sectors where it is possible, or b) convergence-based benchmark scenarios for sectors for where it is possible to extract such intensity-based benchmarks from reference scenarios and, for sectors where reference scenarios with intensity data are not available, a rate-of-reduction benchmark should be used.

3.2 – KEY DESIGN JUDGEMENT 2: HOW SHOULD BENCHMARK SCENARIOS BE SELECTED?

The choice of benchmark scenario is important, as the selection will influence alignment results at the company and portfolio level.

The GFANZ workstream on Portfolio Alignment Measurement suggests that financial institutions select a 1.5 degrees C-aligned benchmark scenario that meets the following definition:[64]

A pathway of GHG emissions of greenhouse gases and other climate forcers that provides an approximately 50% or 66% chance, given current knowledge of the climate response, of global warming either remaining below 1.5 degrees C or returning to 1.5 degrees C by around 2100 following an overshoot. Pathways giving at least 50% probability based on current knowledge of limiting global warming to below 1.5 degrees C are classified as "no overshoot" while those limiting warming to below 1.6 degrees C and returning to 1.5 degrees C by 2100 are classified as 1.5 degrees C "low-overshoot."

Moreover, GFANZ recognizes that there may be additional or complementary benchmark scenario selection criteria developed by industry organizations or associations (e.g., net-zero alliances).

The GFANZ workstream on Sectoral Pathways has developed a framework[65] that outlines considerations that support selection and decision-making for benchmark scenarios. The framework can be used to analyze benchmark scenarios by focusing on three themes:

62 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations, 2021, p. 31, Consideration 5.
63 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations, 2021, p. 31, Consideration 6.
64 GFANZ. "Guidance on Use of Sectoral Pathways for Financial Institutions", 2022.
65 Ibid.

1. Scope and ambition of the benchmark scenario — identifying differences in scope and ensuring the benchmark scenario is in line with financial institutions' net-zero commitments.
   a. The first pillar of this framework includes a key component — the benchmark scenario's reliance on Negative Emission Technologies, such as carbon capture and carbon removal — which can significantly impact the resulting portfolio alignment outcomes.
2. Underlying assumptions of the benchmark scenario — understanding the assumptions should guide financial institutions in transition planning and implementation, including target-setting and decision-making.
3. Credibility and feasibility of the benchmark — understanding how/if the benchmark scenario has been validated by the scientific community (e.g., temperature alignment) and assessing the commercial feasibility of the benchmark scenario.

Financial institutions should consider prioritizing bottom-up benchmark scenarios where they meaningfully capture material differences in decarbonization feasibility across sectors or regions.[66] To support financial institutions with this objective, the GFANZ Sectoral Pathways workstream has taken stock of benchmark scenario coverage for three prominent benchmark scenario providers: the International Energy Agency's Net Zero Emission by 2050 (IEA NZE), the University of Technology Sydney's One Earth Climate Model (UTS OECM), and the Network for Greening the Financial System's (NGFS) GCAM, REMIND, and MG.[67,68] The results of this analysis are displayed in Figure 18.

Figure 18: Sectoral granularity provided by various benchmark providers

SECTOR		IEA NZE	UTS OECM	NGFS GCAM	NGFS REMIND	NGFS MG
Industry		✓	✓	✓	✓	✓
Sub-sectors	Iron/Steel	✓	✓	✓	✓	X
	Chemicals	✓	✓	✓	✓	X
	Cement	✓	✓	✓	✓	X
	Aluminum	X	✓	✓	✓	X
Transport		✓	✓	✓	✓	✓
Sub-sectors	Autos	✓	✓	✓	✓	✓
	Trucks	✓	✓	X	X	X
	Aviation	✓	✓	X	X	X
	Shipping	✓	✓	X	X	X
Buildings		✓	✓	✓	✓	✓
Sub-sectors	Residential	✓	✓	✓	X	X
	Services	✓	✓	✓	X	X
Energy		✓	✓	✓	✓	✓
Sub-sectors	Power	✓	✓	✓	✓	✓
	Oil and gas	✓	✓	X	X	X
	Coal	✓	✓	X	X	X
Other	Agriculture	X	✓	✓	✓	✓

66 Portfolio Alignment Team. "Consideration 8", Measuring Portfolio Alignment: Technical Considerations, 2021, p. 33.

67 Global Change Analysis Model (GCAM), Regional Model of Investment and Development (RM), and MESSAGEix-GLOBIOM (MG).

68 See GFANZ. "Guidance on Use of Sectoral Pathways for Financial Institutions", 2022, p.48 for a breakdown of the overshoot for each of these scenarios.

The Sectoral Pathways workstream also analyzed the regional coverage provided by benchmark scenario providers. Figure 19 summarizes the results of this analysis.

Figure 19: Regional granularity provided by various benchmark providers

SCENARIO	NUMBER OF MODELED REGIONS (INPUT)	MODELED REGIONS	REGIONAL GRANULARITY
IEA NZE	26 regions on the demand-side; on supply-side, all countries modeled individually	Asia-Pacific is split into 8 regions; Europe into 6; North America into 3; Central and South America into 3; Africa into 3; Eurasia into 2; and the Middle East is a single region	Global
UTS OECM	10 regions	OECD North America, OECD Pacific, OECD Europe, Eastern Europe/Eurasia, Middle East, Latin America, China, Africa, India, Non-OECD Asia	Global, OECD Europe, OECD North America
NGFS GCAM	32 regions	Africa (Eastern), Africa (Northern), Africa (Southern), Africa (Western), Argentina, Australia & New Zealand, Brazil, Canada, Central America and the Caribbean, Central Asia, China, Columbia, EU-12, EU-15, European Free Trade Association, Europe (Non-EU), India, Indonesia, Japan, Mexico, Middle East, Pakistan, Russia, South Africa, South America (Northern), South America (Southern), South Asia, Southeast Asia, South Korea, Taiwan, USA	180 countries
NGFS REMIND	12 regions	CAZ (Canada, Australia and New Zealand); China; European Union; India; Japan; Latin America; Middle East and North Africa; non-EU member states; other Asia; reforming countries; Sub-Saharan Africa; United States	180 countries
NGFS MG	11 regions	Sub-Saharan Africa; Centrally Planned Asia; Central and Eastern Europe; Former Soviet Union; Latin America and the Caribbean; Middle East and North Africa; North America; Pacific OECD; Other Pacific Asia; South Asia; Western Europe	180 countries

Quantitative

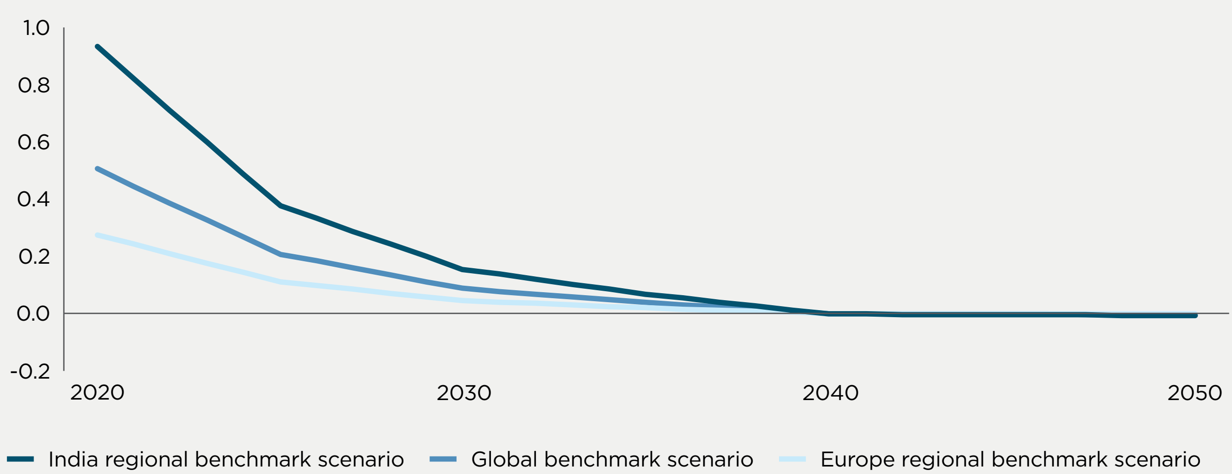
EXAMPLE 12: QUANTITATIVE ANALYSIS — IMPACT OF REGIONAL BENCHMARKS

The regional granularity of available benchmarks can have a tangible impact on the accuracy of companies' alignment outcomes. This is particularly relevant for companies in emerging markets where more representative, regional benchmarks can meaningfully portray the delayed peaking of emissions, in line with the "fair share" principal embodied by Article 4 of the Paris Agreement. Table 7 illustrates an example of how the granularity of benchmarks can affect the alignment outcome for two electric utilities that have a primary electricity mix which corresponds to the most prevalent source in their respective markets.[69] Company A, which operates in India, and Company B, which operates in Europe. Approach 1 uses a global, utilities-specific benchmark scenario while Approach 2 uses region-specific utilities benchmarks (see Figure 20). Both approaches assume companies meet their stated emission reduction targets and have the same utilities-specific sectoral granularity.

Table 7: ITR for Company A and B

ELECTRIC UTILITY COMPANY	REGION	COMPANY'S PRIMARY ELECTRICITY SOURCE	APPROACH 1: 2050 ITR USING A GLOBAL UTILITIES BENCHMARK	APPROACH 2: 2050 ITR USING REGION-SPECIFIC UTILITIES BENCHMARKS
Company A	India	Coal	4.3 degrees C	3.5 degrees C
Company B	Europe	Natural Gas	1.6 degrees C	2.5 degrees C

Figure 20: Utilities Benchmark Scenarios[70]



69 Our World in Data. "Electricity mix", 2022.

70 The three benchmark scenarios have been generated using the IEA's Net-Zero by 2050 scenario (IEA NZE), assuming that the regional breakdowns of the utilities sector follow the IEA Stated Policies and Announced Pledges scenarios.

Regardless of benchmark granularity, Company A scores less favorably because its primary electricity source is coal-based, and its stated emission reduction targets are not ambitious. However, when employing a regional benchmark scenario for the alignment calculation, the difference in alignment outcome between the two companies is significantly less in Approach 2. This is because the Indian power generation benchmark used for Company A in Approach 2 allows for a slower transition and a delay of peak emissions in this emerging economy. This example underscores the importance of granular, regional benchmarks in addition to granular, sectoral coverage for alignment calculations, especially for companies located in emerging markets.

Finally, benchmark scenarios used for portfolio alignment measurement activities should be regularly updated to help minimize the risk that the benchmarks substantially underestimate the counterparty-level actions needed to achieve a given warming outcome.[71]

SPOTLIGHT ON FUTURE WORK OF THE GFANZ SECTORAL PATHWAYS WORKSTREAM

As discussed under the Barriers to Adoption (in Section 2), practitioners are concerned that available benchmark scenarios lack sectoral and regional granularity. The GFANZ Sectoral Pathways workstream will be further engaging pathway developers and other key stakeholders to provide feedback and to inform development of pathways and tools to ensure they are useful to financial institutions.

The Sectoral Pathways workstream is also producing sector briefs for high-emitting/hard-to-abate sectors starting with steel, aviation, and oil and gas later this year. These briefs are being developed in collaboration with the GFANZ Real-economy Transition Plans workstream, benchmark developers, industry groups, real-economy firms, and other stakeholders to provide further comparison of sectoral benchmark scenarios. This work will be highlighted further in the final report for publication ahead of COP 27.

71 Portfolio Alignment Team. “Consideration 9”, Measuring Portfolio Alignment: Technical Considerations, 2021, p.33.

3.3 – KEY DESIGN JUDGEMENT 3: SHOULD ABSOLUTE EMISSIONS, PRODUCTION CAPACITY, OR EMISSIONS INTENSITY UNITS BE USED?

Consultation question(s) for consideration:

- What measurement unit is most appropriate for portfolio alignment measurement of companies in the oil and gas sector?
- What are the advantages and drawbacks of this measurement unit?
- How does your view differ (if at all), depending on whether an oil and gas company has more upstream or downstream operations?
- What other sectors and industries (outside of oil and gas) may require alternative guidance on the choice of emissions unit?

The choice of alignment metric unit (hereafter referred to as unit) is important because it might motivate different types of transition activities and influence subsequent design choices. This section first presents current practices and challenges for all sectors. Second, in response to GFANZ engagement findings, this section focuses on the choice of measurement unit for the oil and gas sector.

Current practices for Judgement 3

For all sectors, there are three choices of units, all capturing different elements of a company's activity, irrespective of the level of finance provided by the financial institution:

1. Absolute emissions, which is usually measured in units of weight (e.g., tons of CO_2);
2. Production or production capacity (e.g., barrels of oil produced, number of vehicles sold, watts of electricity generated); or
3. Emissions intensity (units of absolute emissions per unit of output), defined as either:
   - Physical emissions intensity based on units of production (e.g., kg CO_2/ton of cement)
   - Economic intensity based on economic units such as revenue (e.g., kg CO_2/$ million revenue)

In computing alignment, the choice of units is relevant at two decision points. The first is when measuring company-level alignment: what unit are company emissions expressed in? For example, company emissions measured in physical intensity can be assessed against a convergence benchmark scenario that prescribes sector-average physical intensity. The second is with respect to the choice of unit used to translate a company's alignment with the benchmark into an alignment metric that will, in turn, dictate the aggregation method at the portfolio level.

This subsection focuses on the first decision point; the aggregation method at the portfolio level is addressed further in Section 3.8 and Section 3.9 (i.e., Judgements 8 and 9)

Challenges with the choice of unit

Pros/cons of units for all sectors

As noted in the 2021 PAT Report, each of the potential unit choices has various pros/cons, such as:

1. Absolute emissions preserve a direct link to the carbon budget, and therefore provide the most direct measurement of climate impact. However, measuring company emissions performance in absolute emissions can penalize important transition activities, such as organic or inorganic growth or expansion into net-zero technologies separate from decarbonization activities, unless the portfolio alignment method includes specific adjustment mechanisms to compensate for these factors. For example, this may disincentive the growth of smaller, low-emitting companies seeking to gain market share from higher-emitting companies.

2. Production capacity methods may be more accurate than other estimation methods when self-reported data is not available. As well, assessing based on production capacity can help reinforce the link between measured transition progress and the business decisions that drive emissions changes in the real economy. However, using this method might also penalize specific transition activities, including inorganic growth. Furthermore, production capacity does not reflect the efficiency of different firms' production processes. For example, two auto manufacturers may produce similar volumes of cars but with different emission profiles. Finally, and most importantly, there are inherent limits to the usefulness of these approaches because they are only applicable to sectors for which the unit of production can be clearly defined.
3. Emissions intensity methods do not disincentivize transition activities in the same way as absolute or production-based methods do, but they can over or underestimate, warming if the projections of sector GDP or physical output used as a denominator are not kept up-to-date. A key disadvantage of intensity metrics is that they rely more heavily on energy demand assumptions compared to absolute emissions, thereby weakening the link to the carbon budget. This of particular relevance for the oil and gas sector, where the primary emissions reduction mechanism is assumed to rely on decreases in production and demand.
   As a result, a company could exceed its 1.5 degrees C carbon budget while appearing aligned based on intensity terms. Example 13: Quantitative Analysis — Impact of the choice of unit illuminates this issue further. It is important to note that emissions intensity can be expressed as either physical or economic intensity. Physical intensity metrics provide a stronger link to company production decisions and are less volatile than economic indicators based on company revenues. However, physical intensities are only available in sectors with homogeneous production units, while economic intensities are available more broadly.

For non-oil and gas sectors, this draft report reiterates the 2021 PAT Report guidance. If financial institutions follow a fair-share carbon budget approach, they will need to assess companies based on absolute emissions in combination with both physical and economic intensity. If financial institutions choose to employ both convergence and rate-of-reduction benchmark scenarios on a sector-by-sector availability basis, they should prioritize the use of physical emissions intensity for their convergence benchmark scenarios because convergence approaches cannot easily be constructed in absolute or production capacity terms. Where physical emissions intensity data is unavailable, practitioners should consider the use of economic intensity units for convergence approaches. If physical intensity is not available, financial institutions should use absolute emissions-based rate-of-reduction benchmark scenarios, to optimize scientific robustness and minimize volatility inherent in economic intensity measurements.

Oil and gas deep dive

The impact of the choice of alignment measurement units for the oil and gas sector

At present, a range of units are applied by practitioners when evaluating the oil and gas sector and no clear, discernible trend seems to be found regarding what measurement unit is most appropriate. Therefore, it is particularly important for the draft report to present the challenges on the choice of measurement unit for the oil and gas sector and enable these to be well understood.

Quantitative

EXAMPLE 13: QUANTITATIVE ANALYSIS — IMPACT OF THE CHOICE OF MEASUREMENT UNIT

This quantitative example illustrates that the choice of unit has a tangible impact on the resulting alignment outcomes. This in turn drives the companies' underlying transition strategies and decarbonization trajectories that are rewarded — or punished — to different extents by the choice of unit.

Table 8 shows the portfolio alignment results for Company E and Company F, two oil and gas companies that are assumed to meet their stated emissions reduction targets.

Table 8: ITR for Company E and F

COMPANY (OIL AND GAS)	2050 ITR — USING ABSOLUTE EMISSIONS	2050 ITR — USING PHYSICAL EMISSIONS INTENSITY	DIFFERENCE BETWEEN THE TWO APPROACHES
Company E	2.1 degrees C	3.5 degrees C	-1.4 degrees C
Company F	1.9 degrees C	1.5 degrees C	+0.4 degrees C

Company E analysis

Company E's emission reduction target in 2025 reflects its plans to transition some of its heavy crude oil assets to renewables (e.g., developing operational power generation in hydropower and wind). This results in an absolute emissions trajectory (see Figure 21) that compares more favorably to the 1.5 degrees C benchmark scenario until 2030. However, Company E's lack of a long-term emissions reduction target prevents it from continuing a favorable trajectory past 2030, assuming emissions are held constant.

Company E's physical intensity (90 Mt CO_2e/EJ) is much higher than the benchmark scenario (61 Mt CO_2e/EJ) in the baseline year of 2020. This occurs because Company E primarily relies on inefficient oil extraction methods and has a low proportion of natural gas production. As a result, even though physical intensity decreases compared to historical intensity levels, the physical intensity trajectory (see Figure 22) remains far above the 1.5 degrees C benchmark scenario. Company E's resulting alignment outcome is thus comparatively higher using physical intensity than when using absolute emissions.

Figure 21: Company E's absolute emissions trajectory

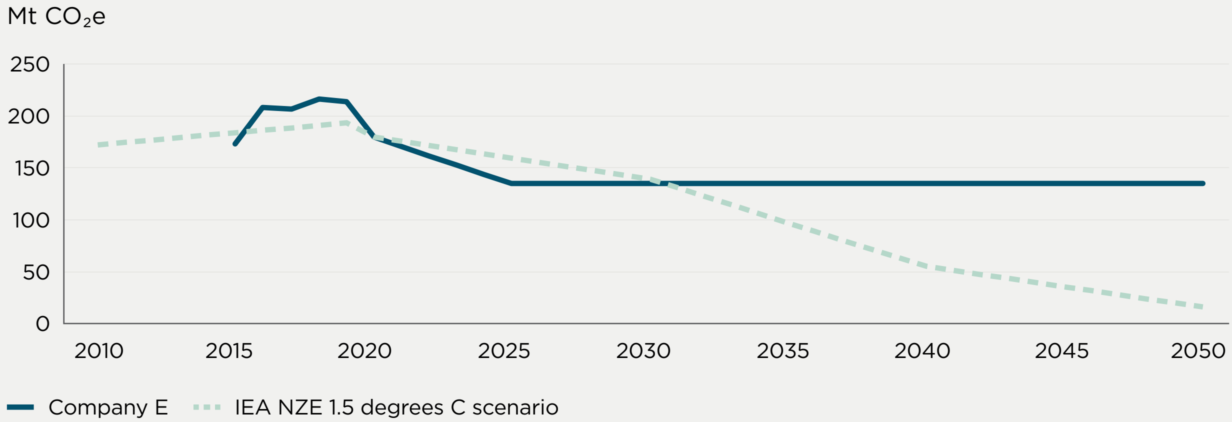
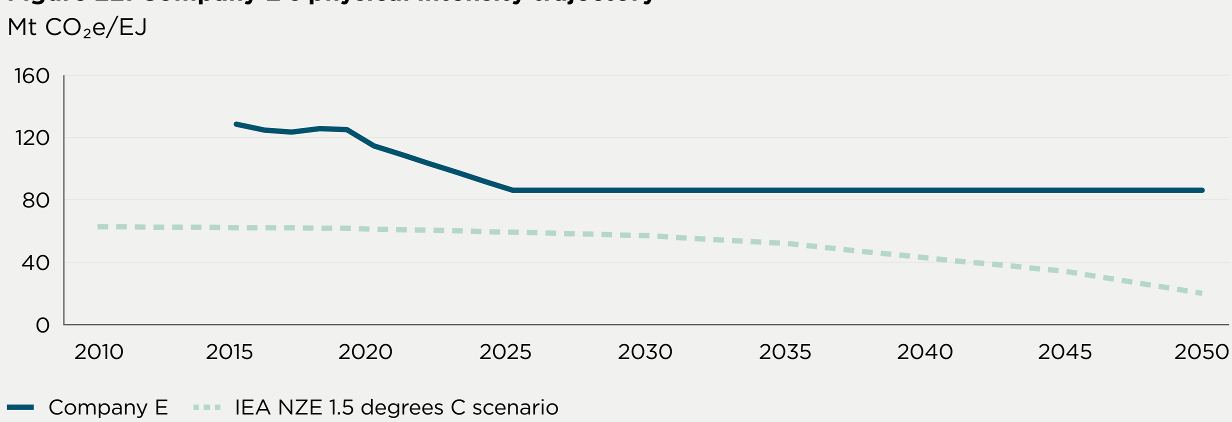


Figure 22: Company E's physical intensity trajectory



Company F analysis

On the other hand, Company F leverages best-in-class oil and gas extraction technology, such as carbon capture and storage, and zero routine venting and flaring. Application of these technologies leads to a physical intensity (46 Mt CO_2e/EJ) that is below the corresponding 1.5 degrees C benchmark scenario intensity (61 Mt CO_2e/EJ). Given this favorable starting point, Company F's alignment outcome when using physical intensity is roughly aligned with the 1.5 degrees C benchmark scenario (see Figure 23). However, there is a point at which technological advances to reduce the emissions per barrel of oil plateau, which translates into a constant physical intensity for Company F to 2050. At some point, for Company F to continue reducing its intensity in line with the benchmark, it will need to reduce its production and/or transition to renewable or low-carbon power generation.

As to absolute emissions, though Company F intends to use best-in-class technology while transitioning away from some of its more energy-intensive assets, the company plans to continue operating a core business unit that carries out oil and gas extraction. This results in an absolute emissions trajectory that decreases until 2040 and then levels off (see Figure 24). Using absolute emissions units thus results in an alignment outcome that is less favorably aligned with 1.5 degrees C scenario benchmarks than when using physical intensity units.

Figure 23: Company F's physical intensity trajectory

Mt CO_2e/EJ

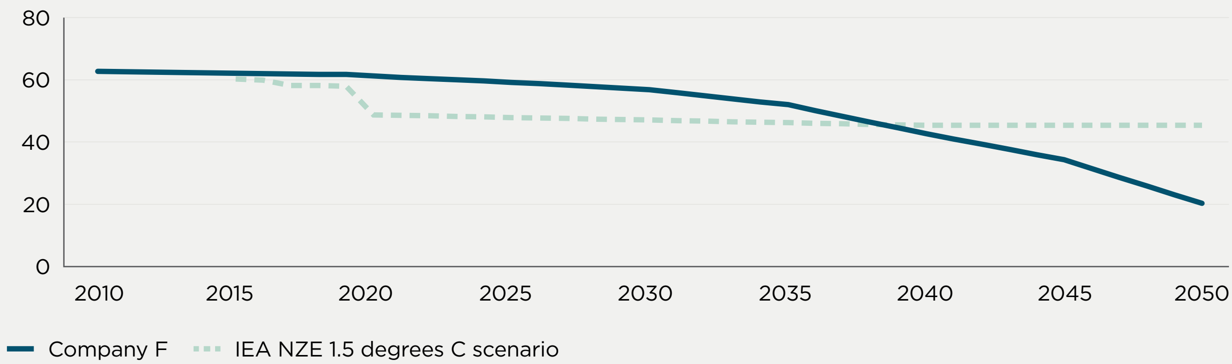
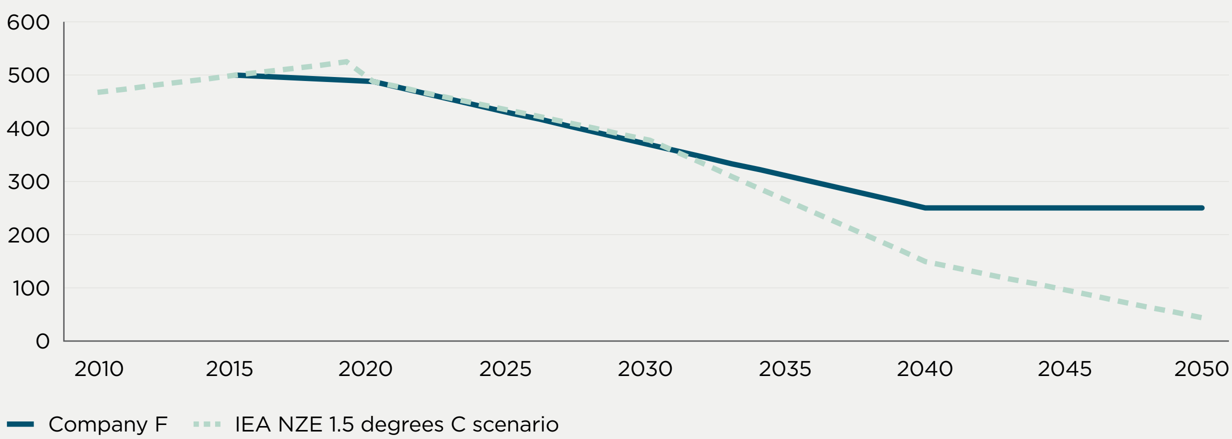


Figure 24: Company F's absolute emissions trajectory

Mt CO_2e



Impact of oil and gas company transition strategy on the choice of unit

GFANZ analysis has shown that the choice of unit can lead to diverging alignment results and might subsequently impact how financial institutions communicate and engage with companies. Oil and gas companies will develop their future business models in various ways and the resulting transition strategies might be incentivized (or disincentivized) to various degrees by a financial institution's choice of unit. Transition strategies have been identified through the engagement conducted by GFANZ and three of the primary transition strategies are explored below:

1. **Those companies that are likely continuing to produce significant emissions with a limited transition to renewables.**[72] Given the contribution of these firms to cumulative emissions with limited transition to renewables, absolute emissions may most accurately reflect their transition. Alternatively, financial institutions may use physical intensities to measure the alignment of these companies to benchmark scenarios. See Example 14: Quantitative Analysis – Reflecting the carbon budget for an example of potential challenges when using physical intensity-based approaches.
2. **Those companies that are partially shifting away from oil and gas towards other business lines (e.g., renewable power generation).**[73] The appropriate unit for measuring the alignment of companies pursuing this transition strategy is not without challenge. For example, the unit will need to simultaneously measure a growing green or low-carbon power generation business and the company's core oil and gas business lines.
3. **Those companies that are entirely transitioning to renewables.** These firms will be well aligned with 1.5 degrees C-aligned benchmark scenarios, provided they remain committed to their stated transition goals.

When measuring the alignment of oil and gas companies using absolute emissions or physical intensity, a number of issues arise. These issues are dependent on the underlying transition strategy of the oil and gas company being measured. The two main issues are:

- **Accurately reflecting the carbon budget:** Oil and gas companies that may continue to produce significant emissions with a limited transition to renewables (e.g., National Oil Companies (NOCs), upstream- and midstream-focused companies) may not be properly incentivized to reduce emissions when using physical emissions intensity as explored in Example 14: Quantitative Analysis — Reflecting the carbon budget.
- **Transition to power generation:** Neither absolute emissions nor standard physical emissions intensity units are fully suited to measure the alignment of companies substantially transitioning away from oil and gas to broader power generation through renewables and other energy sources (e.g., Integrated Oil Companies (IOCs), downstream-focused companies, etc.).

72 National Oil Companies (NOCs) are prominent examples of this category of company. Their limited transition may be due to minimal shareholder and regulatory pressure, plus the relative efficiency of their operations. NOCs are expected to maintain neutral or even increasing emissions by pursuing organic and inorganic growth. Upstream or midstream-focused companies (i.e., companies involved in exploration and refining) may fall into this category as well because there are limits to the emissions reductions that can occur in exploration and in the refining process, thereby limiting the extent of transition for these companies.

73 Integrated Oil Companies (IOCs) based in decarbonizing economies are a prominent example of this category of company. Their transition may be due to more significant shareholder, societal, and/or regulatory pressure. IOCs may also face pressure to demerge into "brown" entities focused on upstream and midstream activities and "green" entities focused on renewables. Downstream-focused companies may also fall into this category, depending on the capacity of their end users to electrify (e.g., it will be comparatively much easier to electrify in the automotive sector than in the airline sector). And finally, some midstream companies may also fall into this category, for example, those companies that convert their oil and gas refineries into biofuel refineries.

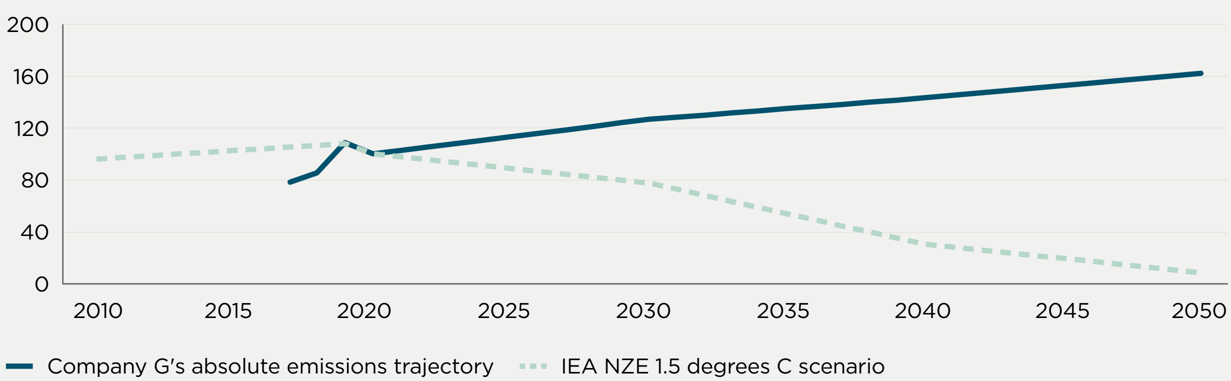
Quantitative

EXAMPLE 14: QUANTITATIVE ANALYSIS — INCENTIVIZING REAL ECONOMY EMISSIONS REDUCTIONS

Incentivizing emissions reduction in the real economy is one of several use cases of alignment metrics and particularly relevant for the choice of unit in the oil and gas sector. The use of physical intensity to measure alignment may not properly incentivize emission reductions in the real economy if the oil and gas company demonstrates only a limited ambition to transition to renewables and other energy sources. For example, a sophisticated NOC (Company G), which plans to expand its oil production through either organic or inorganic growth, might have an increasing absolute emissions trajectory to meet continued demand in the real economy, as depicted in Figure 25.

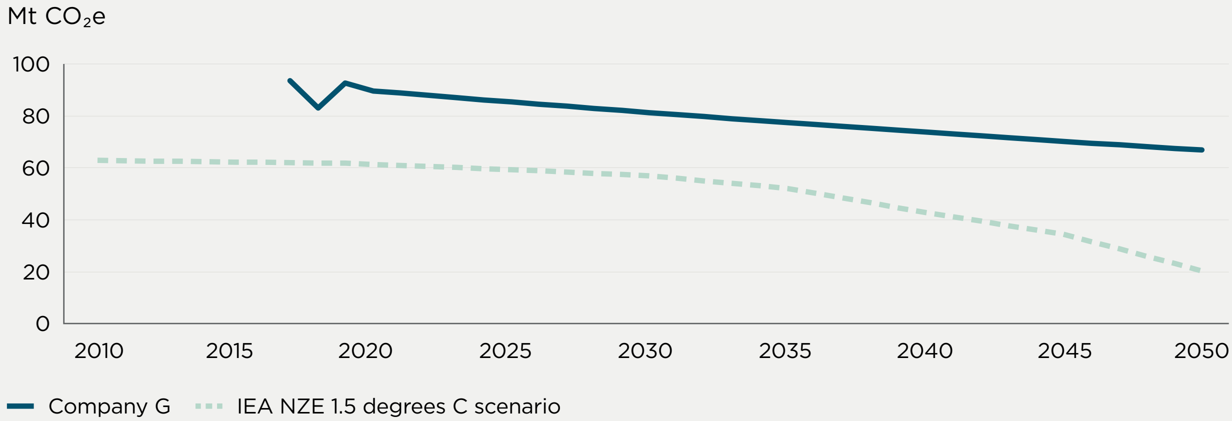
Figure 25: Company G's absolute emissions trajectory against a benchmark scenario

Mt CO_2e



Company G's absolute emissions trajectory results in a 138% cumulative benchmark divergence with the underlying 1.5 degrees C-aligned benchmark scenario. However, Company G might plan to simultaneously improve the efficiency of its operations by utilizing lower-carbon technology (e.g., enhanced oil recovery using CO_2 from carbon capture) and focusing on higher-efficiency fossil fuel products (e.g., natural gas rather than oil sands). This improvement in efficiency will lower Company G's physical intensity, measured in $MtCO_2e$/Exajoule (see Figure 26).

Figure 26: Company G's physical intensity trajectory against a benchmark scenario



Measuring Company G using physical intensity will result in a cumulative benchmark divergence from the 1.5 degrees C-aligned benchmark scenario of only 63%.

Key Takeaways

When using absolute emissions to measure the Company G's cumulative benchmark divergence, the alignment outcome is more than two times higher compared to when using physical emissions intensity (138% vs. 63%). The disparity in alignment outcome demonstrates that measuring alignment using intensity units may not directly make the link to the global carbon budget. Company G's technological enhancements allow it to abate the "low-hanging fruit" emissions without making a substantial transition to renewable power generation, a transition strategy that is better aligned with a 1.5 degrees C world.

Practitioners that use oil and gas specific physical intensity units to measure alignment may risk underestimating the contributions to global warming of oil and gas companies with increasing absolute emissions. Given the contribution of Company G to cumulative emissions with a limited transition to renewables, units of absolute emissions may most accurately reflect the company's transition.

Note that this issue is also fundamentally linked to the choice of single-scenario benchmark approach in Judgement 1. Practitioners who decide to use convergence-based approaches for the oil and gas sector will necessarily need to use physical intensity units and thus may face issues with not directly linking to the global carbon budget.

REQUEST FOR INPUT ON THE APPROPRIATE UNIT FOR OIL AND GAS COMPANIES

For oil and gas companies
Input from the public consultation will inform measurement unit guidance for this section, to be published in the final report ahead of COP 27

3.4 – KEY DESIGN JUDGEMENT 4: WHAT SCOPE OF EMISSIONS SHOULD BE INCLUDED?

Consultation question(s) for consideration:

- Is the analysis on the materiality of Scope 3 emissions useful?
- Please list additional sectors (if any) for which guidance on the materiality of their Scope 3 emissions would be useful.

In assessing company-level alignment, financial institutions need to decide what scope of emission should be included for a given company. The three emissions scopes are:

- Scope 1 — directly generated by owned or controlled assets
- Scope 2 — indirectly associated with generation of purchased energy
- Scope 3 — indirect upstream and downstream activities in the value chain

At present, Scope 1 and Scope 2 emissions are typically included in portfolio alignment considerations. However, according to the 2021 PAT Report, Scope 3 emissions are the most material emissions in most sectors and can account for more than 90% of total emissions.[74] For this reason, incorporating Scope 3 emissions should be considered in measuring alignment with net zero by 2050. The challenges with including Scope 3 emissions stem from low levels of disclosure for total Scope 3 emissions.[75] Additionally, reporting on the 15 categories of Scope 3 emissions (as defined by the GHG Protocol) can be inconsistent across companies, often due to challenges in primary data acquisition. Therefore, financial institutions should consider disclosing Scope 3 emissions for all sectors where they are material.

In this section, GFANZ reviews the materiality of Scope 3 emissions across economic sectors, provides recommendations on where financial institutions should consider prioritizing their efforts with regard to the inclusion of value chain emissions, and suggests approaches to address data limitations.

Current practices for Judgement 4

At present, there is no widely adopted standard for what scope of emissions should be included in portfolio alignment practices. The Global GHG Accounting and Reporting Standard for the Financial Industry (PCAF Standard)[76] recommends that financial institutions report borrowers' and investees' absolute Scope 1 and Scope 2 emissions across all sectors and include Scope 3 emissions for companies in sectors for which such emissions are most material, in line with the Securities and Exchange Commission's (SEC)[77] proposed new rule on climate risk disclosures. A common materiality threshold in target setting, as suggested by SBTi, requires companies to set Scope 3 emissions targets if such emissions represent

74 Portfolio Alignment Team, "Measuring Portfolio Alignment: Technical Considerations", 2021.
75 Bokern, David. "Reported Emission Footprints: The Challenge is Real", 2022.
76 PCAF, "The Global GHG Accounting and Reporting Standard for the Financial Industry", 2020.
77 SEC, "SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors", 2022.

more than 40% of a company's total emissions.[78] However, during this year's engagement process many financial institutions noted the lack of Scope 3 disclosures, low quality of reported data, and the resulting need to employ estimation methods. These factors impede the inclusion of Scope 3 data in their portfolio alignment practices.

Considerations for including Scope 3 emissions

For which sectors are Scope 3 emissions most material?

For the majority of sectors, the largest sources of a company's emissions lie upstream and/or downstream of their core operations, especially for large companies.[79] The Science Based Targets initiative (SBTi) requires a company to set a Scope 3 emissions target if such emissions represent more than 40% of the company's overall emissions. The PCAF Standard requires that Scope 3 emissions should be disclosed for the sectors with the largest emissions impact (e.g., oil and gas, auto manufacturing, and mining).

The aim of this section is to further identify where Scope 3 emissions are most material for different sectors, and which of the Scope 3 categories/activities are most relevant. This will enable financial institutions to determine if the disclosed data is adequate to measure a company's carbon footprint. This information could also facilitate financial institutions' engagement efforts with companies.

The relative importance of Scope 3 emissions varies across sectors. However, in several sectors commonly considered high impact, Scope 3 emissions, on average, account for 40-90% of total emissions (Table 9). Based on the 40% threshold, Scope 3 emissions are material for Oil and Gas, Electric Utilities, Automotive, Coal Mining, Chemicals, and several industrial sectors.

78 CDP, "How can companies address their scope 3 greenhouse gas emissions?", 2018.

79 ECB, "ECB Economy-wide climate stress test: Methodology and results", 2021, p.26-28.

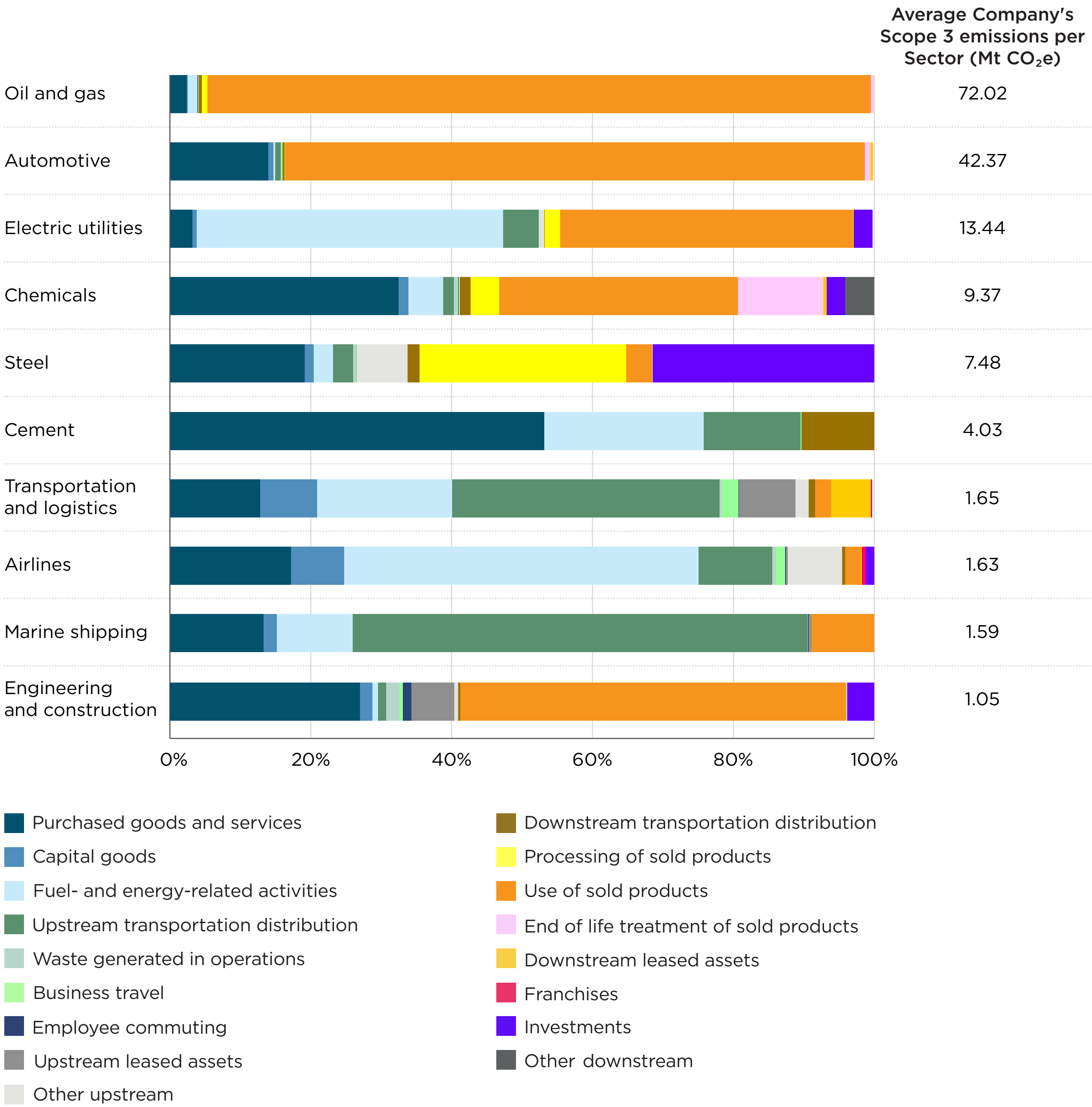
Table 9: GHG emissions percentage (%) by Scope 1, 2, and 3 in high impact sectors

SECTORS	SCOPE 1	SCOPE 2	SCOPE 3	SAMPLE SIZE
Energy*	10.42	1.20	88.38	130
Oil & Gas	10.41	1.19	88.40	113
Utilities*	39.83	1.96	58.20	154
Electric Utilities	44.50	1.88	53.62	118
Consumer Discretionary*	1.47	1.56	96.96	212
Automotive	0.50	0.89	98.61	42
Materials*	16.50	4.31	79.19	197
Steel	64.44	5.49	30.07	14
Cement	79.16	4.24	16.60	10
Coal Mining	7.47	0.72	91.81	4
Chemicals	20.67	9.06	70.27	67
Industrials*	7.23	0.97	91.80	293
Transportation & Logistics	57.09	2.32	40.59	77
Airlines**	74.80	0.67	24.53	17
Marine Shipping**	67.77	0.58	31.64	6
Engineering & Construction	22.10	8.82	69.08	53

Where emissions are above the SBTi 40% materiality threshold
* BICS level-1 industries, normal fonts denote constituent sectors
** Airlines and Marine Shipping are sub-sectors within Transportation & Logistics

Methods: Calculation based on companies that reported emissions in all three scopes in fiscal year 2020.
Source: Bloomberg BESGPRO Index

Figure 27: Scope 3 emissions percentage by 15 categories in high impact sectors[80]



Source: Bloomberg BESGPRO Index, FY2020

80 Methods: Calculated using companies that reported at least 2 categories within Scope 3 emissions. The values are averaged across companies within each of the sector under Bloomberg Industrial Classification Standard (BICS). Unit: million metric tons. Note that the number of companies (sample size n) in some sectors is small and this potentially introduces some bias. Additionally, some Steel companies report the emissions from their joint ventures and/or subsidiary companies as part of their Scope 3 Category 15 emissions, which may contribute to the relatively large proportion of Category 15 emissions for the Steel sector.

Taking a close look at Scope 3 emissions (Figure 27), the absolute magnitudes and associated upstream and downstream activities also vary by sector. Overall, GFANZ has used two criteria for identifying priority sectors for Scope 3 emissions from the listed high-impact sectors:

1. high absolute Scope 3 emissions magnitudes
2. high Scope 3 emissions as a percentage of total emissions.

Based on these criteria, Oil and Gas, Automotive, Electric Utilities, and Chemical sectors have been identified as priority sectors as they have approximately equal or larger than 10 million metric tons of average Scope 3 emissions per company, which makes up 50%-90% of their total GHGs emissions.[81,82] Within Scope 3, fifteen emission categories are defined by the Corporate Value Chain (Scope 3) Accounting and Reporting Standard ("Scope 3 Standard").[83] Table 10 further delves into the four sectors and maps out the material value chain classification and emission categories (see Appendix B for other sectors).

Table 10: Prioritized high-impact sectors and their material value chain classifications and emission categories

SECTOR	MORE MATERIAL VALUE CHAIN PART (>40%)	MOST MATERIAL CATEGORIES
Oil and Gas[84]	Downstream	• Category 11: Use of sold products (94%) – Emissions from the use of oil & gas goods and services.
Automotive[85]	Downstream	• Category 1: Purchased goods and services (15%) – Emissions from upstream material extraction • Category 11: Use of sold products (82%) – Emissions of the products sold to the end customers
Electric Utilities[86]	Upstream and Downstream	• Category 3: Fuel- and energy-related activities (not included in Scope 1 and 2) (44%) – Upstream generation and transmission and distribution losses of electricity that is traded or purchased and sold to customers. • Category 11: Use of sold products (42%) – When utilities have a gas retail business, the downstream use of the sold natural gas typically accounts for a substantial share of their Scope 3 inventory. This includes combustion emissions of natural gas sold to customers.
Chemicals[87]	Upstream and Downstream	• Category 1: Purchased goods and services (33%) – Emissions from machining and processing services, engineering services, industrial cleaning, and raw materials (e.g., ethylene, sodium carbonate, methanol). • Category 11: Use of sold products (34%) – Emissions from combusted fuels during use phase or products that contain or form GHGs that are emitted during use.

81 The Scope 3 emissions figures for these priority sectors have been benchmarked and verified against a third-party data sources. This analysis corroborated the materiality of Scope 3 emissions — in both absolute and proportional terms — for these priority sectors. Analysis from a variety of data sources will be provided in the final report for publication ahead of COP 27.

82 For reference, Switzerland's total GHG emissions in 2019 were 37 million metric tons.

83 Greenhouse Gas Protocol, "Corporate Value Chain (Scope 3) Accounting and Reporting Standard", 2011.

84 ipieca, "Estimating petroleum industry value chain (Scope 3) greenhouse gas emissions. Overview of methodologies", 2016.

85 Climate Action 100+, "Net Zero Company Benchmark", 2021, p.5.

86 wbcsd, "Setting science-based targets: A guide for electric utilities", 2020, p. 13, 15.

87 Climate Action 100+, "Net Zero Company Benchmark", 2021, p.5.

Understanding the materiality of the Scope 3 categories can help financial institutions determine whether the emissions disclosed by a company capture the company's more material activities. For example, an oil and gas company's Scope 3 emissions may not be credible if Category 11 emissions are not included. Similarly, a utility company which distributes gas should consider including Category 11 in its disclosures while a utility company which utilizes fossil fuels should consider including Category 3. Financial institutions might also find it useful to leverage the Scope 3 emissions materiality analysis for their engagement activities with companies in order to facilitate reductions in value chain emissions.

Besides the above high impact sectors, Figure 44 in Appendix B shows the material categories for all industry groups under the Global Industrial Classification Standard (GICS). In addition to the above commonly considered high impact sectors, Scope 3 emissions are also substantial in the Consumer Staples sectors, especially for consumer products (downstream, Category 11), food and beverage (upstream, Category 1), as well as wholesale and retail sectors (upstream, Category 1).

The current sparsity of Scope 3 disclosures for some companies could impact the quantification of material categories. As more Scope 3 emissions are disclosed, materiality considerations should be dynamically updated. For the time being, financial institutions could utilize the materiality considerations evidenced by present disclosures for portfolio alignment measurement.

Using Scope 3 emissions estimation approaches

One of the biggest challenges in including Scope 3 emissions in portfolio alignment measurement is incomplete disclosure from companies due to the indirect nature of Scope 3 emissions. The data challenges are characterized by an imbalance between disclosed and material emissions, data quality issues, and a need for convergence on methodological best practices to reporting Scope 3 emissions and type of data used and disclosed. Therefore, Scope 3 estimation methods are often used to fill these gaps and can generally be classified into:

- **Bottom-up models**, physical activity-based models that estimate emissions based on physical activity indicators and the associated emission factors. These are generally applied to homogeneous sectors, such as oil and gas, power generation, and steel, etc.
- **Regression models**, revenue-based models usually construct a large set of statistical models and use revenue as the proxy. These models are frequently applied to heterogeneous sectors, such as consumer staples.

Determining which estimation method is most appropriate will depend on the sector and activities. For example, CDP applies bottom-up and regression models separately based on sector characteristics. The table below summarizes when CDP uses the different estimation approaches:[88]

88 CDP, "CDP Full GHG Emissions Dataset Technical Annex IV: Scope 3 Overview and Modelling", 2020.

Table 11: Summary of CDP estimation approaches

	BOTTOM-UP MODELS	REGRESSION MODELS
Sector output type	Homogenous	Heterogenous
Sectors included	Coal Mining, Oil & Gas, Petroleum Refining, Electric Power Generation, Cement, Steel	Communications, Consumer Staples, Financial, Health Care, Real Estate, Technology, etc.
Estimation Approach	• Based on physical activity indicators and associated emission factors • Directly relate to emitting activity, overall better accuracy	• Based on revenue, CAPEX, or FTE (full time employees) • Rely heavily on sector average emission intensities
Scope 3 categories	3, 11	1, 4, 5, 6, 9 2, 7 use CAPEX or FTE as proxy

CDP's approach for homogenous sectors is consistent with PCAF's suggestion for financial institutions on prioritizing using physical activity-based estimates.[89] Therefore, where possible and practical considering data constraints, bottom up types of models are preferred for Category 3 (usually LCA-type models) and Category 11. Leveraging such estimates would conform to PCAF's recommendations and facilitate measuring companies' Scope 3 emissions impact.

In addition to traditional statistical models, emerging methodologies leverage big data and machine-learning models (Appendix B provides further details). This type of approach could potentially improve the estimation of individual companies' emissions and reduce the dependence on sector average emissions. As the reliability of traditional statistical, big data, and machine-learning models improves over time, they may be more widely adopted, especially in sectors where directly reported and physical activities-based estimations are difficult to source.

Additionally, practitioners should be aware that the estimated emissions from different sources can have large variations, driven by the underlying models and input data.

Overall, when using estimated Scope 3 emissions, practitioners should consider:

- Sector fit — Assessing whether the estimates are generated by models that fit the underlying sector output type (i.e., homogenous vs. heterogenous)
- Coverage — Ensuring the estimates sufficiently cover the company's key values chain activities/ categories.
- Robustness — Combining multiple sources of data for more robust estimations

The 2021 PAT Report suggests that financial institutions and data providers disclose the assumptions and approaches behind their estimations.[90] In addition, direct disclosures of high-quality Scope 3 emissions data by companies are fundamental for developing and validating these estimation methods.

89 PCAF, "The Global GHG Accounting and Reporting Standard for the Financial Industry", 2020.

90 Ibid.

PROPOSED GUIDANCE FOR JUDGEMENT 4

The GFANZ workstream on Portfolio Alignment Measurement suggests financial institutions follow SBTi criteria for assessing the materiality of a sector. For portfolio alignment measurement, financial institutions should consider prioritizing Scope 3 emissions for companies where Scope 3 emissions are material both in absolute magnitudes and percentage of total emissions. Practitioners ought to verify whether the most material Scope 3 categories (i.e., Categories 1, 3, 11) are disclosed by companies in relevant sectors, whether based on reported data or extrapolated when data is lacking or insufficiently supported. A list of priority sectors and key categories include:

- Oil and Gas — Category 11
- Automotive — Categories 1 and 11
- Electric Utilities — Categories 3 and 11
- Chemicals — Categories 1 and 11

When selecting the preferred approach to estimating Scope 3 emissions, practitioners should consider the sectors in which the companies operate. Consistent with PCAF's recommendations, practitioners should consider prioritizing bottom-up estimation models, especially for categories 3 and 11 in homogeneous sectors. Models that use sector average emissions data (i.e., regression models) have broader coverage for heterogeneous sectors, where it is challenging to derive estimates based on physical activity indicators. Wider adoption of such models requires increased accuracy at the company level (i.e., reduced dependence on the use of sector average emissions data).

GFANZ acknowledges that due to the current sparsity of some reported Scope 3 emissions data, in practice, practitioners often need to use a mix of reported data where available, and estimated data elsewhere. When sourcing Scope 3 emissions data, practitioners should consider prioritizing reported emissions data (when it is available and meets the materiality criteria outlined above) over estimated emissions data and estimates based on bottom-up models.[91]

91 Portfolio Alignment Team, "Measuring Portfolio Alignment: Technical Considerations", 2021, p.9.

3.5 – KEY DESIGN JUDGEMENT 5: HOW SHOULD EMISSIONS BASELINES BE QUANTIFIED?

During the engagement outreach, the GFANZ workstream on Portfolio Alignment Measurement generally found that practitioners agreed with the recommendations provided for Key Design Judgement 5 in the 2021 PAT Report. As a result, in this section GFANZ reiterates key points made in the 2021 PAT Report while noting new developments and feedback received.

Which greenhouse gases should be included?

To set adequate baselines, all seven greenhouse gases (GHGs) mandated by the Kyoto Protocol should be quantified.[92] In the immediate term, gases may be aggregated using the Global Warming Potential (GWP) framework detailed by The GHG Protocol Corporate Accounting and Reporting Standard ("GHG Protocol").[93] Among the seven GHGs, carbon dioxide (CO_2) and methane (CH_4) make up ~90% of the emissions.[94] Methane emissions are substantial in sectors such as energy, industry, as well as agriculture and land use, but they have a shorter lifetime than CO_2 and other GHGs.[95] Hence for warming estimates to be more scientifically accurate in the medium term, the PAT highlighted that separate methane scenario benchmarks need to be developed to allow for more accurate alignment measurement of methane emissions in relevant sectors.[96] For example, the United States Securities Exchange Commission (SEC) requires its registrants to disclose emissions both disaggregated by each GHG emissions type and in the aggregate, expressed in terms of carbon dioxide equivalent (CO_2e).[97] Moreover, based on feedback highlighted during the engagement outreach, practitioners suggest that methane should be considered separately for sectors in which methane forms a substantial proportion of total emissions (i.e., agriculture, fossil fuels, mining, waste management).

What are the GHGs included in net-zero scenarios?

This year, the GFANZ workstream on Sectoral Pathways has highlighted the GHGs modelled by three different pathway developers (IEA, UTS, and NGFS).[98] At present, all seven GHGs are considered by different pathways providers, except the IEA NZE pathway, which considers carbon dioxide (CO_2) for all sectors and only methane (CH_4) and nitrous oxide (N_2O) for the energy sector.[99] See Figure 28 for the full breakdown.

Figure 28: Greenhouse gases included by pathway developer

GREENHOUSE GASES	IEA NZE	UTS OECM	NGFS NET ZERO 2050(GCAM)	NGS NET ZERO 2050 (REMIND)	NGFS NET ZERO 2050(MG)
Carbon dioxide (CO_2)	✓	✓	✓	✓	✓
Methane (CH_4)	~	✓	✓	✓	✓
Nitrous oxide (N_2O)	~	✓	✓	✓	✓
Hydrofluorocarbons (HFCs)		✓	✓	✓	✓
Perfluorocarbons (PFCs)		✓	✓	✓	✓
Sulphur hexafluoride (SF_6)		✓	✓	✓	✓

92 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.43.

93 The Greenhouse Gas Protocol. A Corporate Accounting and Reporting Standard, 2004.

94 IPCC. "Summary for Policymakers", 2014.

95 EPA. "Overview of Greenhouse Gases", n.d.

96 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.40.

97 SEC. "SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors", 2022.

98 GFANZ. "Guidance on Use of Sectoral Pathways for Financial Institutions", 2022.

99 GFANZ. "Guidance on Use of Sectoral Pathways for Financial Institutions", 2022, pg. 46.

Sources of emissions data

When deciding between using data from disclosures or external estimates, the 2021 PAT Report suggested[100] that the PCAF Standard could be followed when prioritizing sources for emissions data and practitioners should consider disclosing the data sources and methodologies used to estimate emissions. Moreover, practitioners should consider PCAF's suggestion to prioritize reported emissions over estimated emissions data and for estimated data prioritize those based on activity levels as close as possible to the emissions drivers. Generally, the accuracy of emissions numbers increases as the proximity to the source increases and one can take account of individual factors such as location, efficiency, and yield. However, when selecting data sources, practitioners should also consider that for certain sectors and emissions types, the reliability of data may vary. For example, disclosed Scope 3 emissions in the oil and gas sector may have issues with accuracy and availability (see Section 3.4) which may require the use of estimated emissions. Financial practitioners should therefore consider ranking the quality of their emissions data sources (for example by using PCAF's standard data-quality scoring framework or other comparable approaches) as this may incentivize company disclosures and ensure that data gaps and quality concerns do not block the development of portfolio alignment methodologies.

Moreover, GFANZ recognizes a number of alternative approaches used by financial practitioners to develop emissions baselines for portfolio alignment measurement. One example is the use of committed rather than outstanding amounts for lending in the banking sector and in this way considering the maximum loan amount granted for measuring alignment.

3.6 – KEY DESIGN JUDGEMENT 6: HOW SHOULD FORWARD-LOOKING EMISSIONS BE ESTIMATED?

Consultation question(s) for consideration:

- Do you agree with the illustrative credibility assessment framework and related guidance provided?
- Please detail the indicators that you have found to be, or believe to be, the most informative for assessing the credibility of emissions reductions targets.
- Please indicate your preferred approach for projecting the emissions of companies with no stated emissions reduction targets.

To successfully direct capital flows compatible with the transition to a 1.5 degrees C-aligned world, portfolio alignment metrics need to be forward-looking and incorporate corporate transition planning. However, a forward-looking metric may not be fully credible if a financial practitioner takes a company's transition plan at "face value", as a transition plan is fundamentally a goal that may or may not be fulfilled. Therefore, a decision-useful framework to help assess the soundness and credibility of corporate transition planning is a useful tool for forecasting emissions through a forward-looking perspective to enable real-economy emissions reductions.

The PAT Report identified that the estimation of forward-looking emissions was a key area where further research and guidance are required. The 2021 report suggested that the projections of emissions should incorporate multiple data sources and be weighted based on a credibility

100 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.44.

assessment of short- and long-term targets (where available). However, the feedback GFANZ received from workstream members highlighted a lack of guidance regarding how to conduct credibility assessments of a company's stated emissions reduction targets and incorporate the assessment into a company's emissions forecast.

In this section, key qualitative and quantitative indicators are highlighted that might be included in a credibility assessment of targets. An illustrative framework is also provided for using those key indicators to assess the credibility of a company's stated emissions reduction targets and guidance is provided for how to incorporate the credibility assessment into a portfolio alignment metric. Alternative approaches to conducting credibility assessments of targets are also outlined. Finally, guidance is set out for handling companies without stated emissions reduction targets.

Current approaches to emissions forecasting

The 2021 PAT Report summarized the following data types that are often used in emissions forecasting:[101]

- **Neutral:** current emissions held constant
- **Backward-looking data:**
  - Historical emissions trend — practitioners use this data to extrapolate emissions from past trends
  - Historical trends in production/capacity — practitioners use this data to extrapolate activity levels (e.g., capacity, production, energy, consumption) from past trends, then apply average factors to recalculate emissions
- **Forward-looking data:**
  - Short-term plans for production/capacity — practitioners use this data to extrapolate activity levels (e.g., capacity, production, energy consumption) from tangible short-term evidence (e.g., production plans, capacity expansion plans, technology road maps, commercial bids), then apply average factors to recalculate emissions
  - Short-term emissions reduction targets — practitioners use this data to interpolate emissions data taking a target's start date, target year, and respective emissions baselines
  - Long-term emissions reduction targets — practitioners use this data to interpolate emissions data taking a target's start date, target year, and respective emissions baselines

Financial institutions and portfolio metric providers use different data types and methods to forecast emissions depending on whether the company has reduction targets or not.

Approaches for companies with stated emissions reduction targets

If a company has set emissions reduction targets, practitioners typically either:

- Incorporate the implied trajectory of the reduction target at face value, or
- Perform a "post-calculation score aggregation"

In the latter approach, a projection based on a simple linear trend forecast of historical emissions is typically combined and weighted with a simplified analyst projection of emissions reduction targets. This approach is becoming more common as practitioners seek to increase the accuracy of projecting future emissions. Where linear trend forecasts of a company's historical emissions are unsuitable, practitioners may use another projection method detailed in Table 17 below, such as benchmark growth rates or neutral projection. In practice, the weighting between the two projection approaches should be determined by performing a credibility assessment of the company's emissions reduction targets.

101 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p. 45-46.

Equation 1: Example approach for incorporating a credibility assessment of targets into a post-calculation score aggregation

A practitioner could incorporate a credibility assessment into a post-calculation score aggregation using the following Equation 1.

$$\textit{Final Company Alignment Outcome} = w * At + (1-w) * Ah$$

Where:
w = Target weighting (w-value)
At = Alignment outcome based on targets
Ah = Alignment outcome based on historical emissions

A practitioner would calculate an alignment outcome based on projections using emissions reduction targets (i.e., Alignment Outcome based on Targets) and they would also calculate an alignment outcome based on projections using historical emissions trends (i.e., Alignment Outcome based on Historical Emissions). The practitioner would then combine the outcomes using a target weighting (w-value) to the Alignment Outcome based on Targets ranging between 0% and 100%.

The target weighting represents the likelihood the company will achieve its emissions reductions targets. A practitioner could use either the simple or advanced assessment frameworks outlined in Table 14 to determine the target weighting (w-value).

There is a variety of possible approaches to assess the credibility of a company's emissions reduction targets. Case studies from the World Benchmarking Alliance (WBA)/CDP and Lombard Odier below demonstrate how a credibility assessment might be conducted in practice.

Implementation

EXAMPLE 15: WBA/CDP ACT ASSESSMENT FRAMEWORK

The World Benchmarking Alliance (WBA) is a multi-stakeholder global alliance focused on shaping the private sector's contributions to achieving the United Nation's Sustainable Development Goals. WBA measures a company's degree of alignment with the transition to a low-carbon world for key sectors (i.e., automotive, electric utilities, oil and gas, and transport). Table 12 shows the performance scores for three electric utilities using the WBA/CDP assessment framework, along with the qualitative indicators (performance modules) that drive the performance score. The performance score is "a broad view of company performance across core elements for low-carbon transition" and could be used as a stand-in for the credibility weighting feeding into the alignment outcome. Note: the performance modules assess a company on a scoring scale unique to the ACT framework.[102]

Table 12: World Benchmarking Alliance/CDP assessment framework

PERFORMANCE MODULE (% PERFORMANCE SCORE)	PERFORMANCE MODULE DESCRIPTION	EXAMPLE WBA/CDP ASSESSED COMPANIES[103]		
		ORSTED	RWE	NTPC
1. Targets (20% of Performance Score)	Alignment, time horizon, and past performance/ ambition of targets	4.0/4	3.1/4	0.8/4
2. Material Investment (35% of Performance Score)	The trend in past and future emissions as well as locked-in emissions	7.0/7	3.0/7	0.3/7
3. Intangible Investment (10% of Performance Score)	R&D in mitigation technologies related to energy generation, transmission, or distribution	1.0/2	0.1/2	0.0/2
4. Management (20% of Performance Score)	Oversight of climate change, the existence of a transition plan, and management incentives	3.7/4	2.5/4	0.7/4
5. Policy Engagement (5% of Performance Score)	Engagement policy with trade associations and on significant climate policies	0.8/1	0.3/1	0.5/1
6. Business Model (10% of Performance Score)	Integration of the low-carbon economy in current and future business model	2.0/2	1.8/2	0.5/2
Performance Score	**A weighted average of the six performance modules**	**18.5 /20**	**10.8 /20**	**2.7/ 20**

Note: The "Performance Score" has been derived by summing each of the individual performance module scores in that performance module.

102 World Benchmarking Alliance. "Electric Utilities Methodology", n.d.

103 Orsted is a Danish electric utilities companies and the world's largest developer of offshore wind; RWE is a German electric utilities company with mixed energy sources; and NTPC is an Indian electric utilities company operating primarily using coal based energy sources.

Example 16 from Lombard Odier also highlights how forward- and backward-looking information can be combined using a credibility assessment of stated emissions reduction targets to generate a company's emissions forecasts. The implementation process showcased in Example 16 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Implementation

EXAMPLE 16: LOMBARD ODIER'S TARGET CREDIBILITY FRAMEWORK

Lombard Odier is an independent Swiss banking group, with an investment management arm. Lombard Odier evaluates a company's emissions reduction targets using a Target Credibility Framework, focusing on a credibility assessment of the company's transition plan. The outcome of this assessment is used to determine the target weighting (w-value). Lombard Odier calculates one ITR metric based on the company's target emissions trajectory and one ITR metric based on the company's historical emissions trajectory. The two ITR metrics are then combined using the target weighting (w-value). Companies assessed to have the "most credible" plans can achieve up to 80% weighting toward the ITR metric based on targets.

Lombard Odier determines the credibility of a company transition plan using a scorecard that features indicators including, for example, the following components:

- Does the company have an executive responsible for climate action?
- Is executive compensation tied to climate outcomes?
- Have decarbonization projects already been (or are currently being) implemented?
- Is an internal carbon price used to guide CAPEX decisions?
- Does the company disclose its own emissions across all relevant scopes?
- Does the company's trade association membership align to the net zero transition?
- Are the company's targets SBTi approved?

A key challenge that Lombard Odier has encountered is the tension between indicator precision and coverage. To avoid manual extraction of the data while ensuring high level of coverage of companies, for certain criteria Lombard Odier has chosen to take a binary (i.e., "Yes" or "No") approach to assess a company's fulfilment of the criteria. Lombard Odier notes that while this approach is effective, it does increase the risk of false positives. For example, where companies fulfil the criteria for a "Yes" but have low ambition regarding achieving the target that it set. An additional challenge Lombard Odier notes is the lack of historic data to back-test the validity of this framework.

Approaches for companies with no stated emissions reduction targets

For companies with no stated emissions reduction targets, the engagement conducted by the GFANZ workstream on Portfolio Alignment Measurement indicates that practitioners currently apply a range of approaches to forecasting emissions, most often holding current emissions intensity constant or computing a linear trend based on historical emissions. Forecasting emissions for companies without reduction targets has also been identified as an area where further guidance is needed to help steer a more consistent approach. To address this challenge, GFANZ will provide guidance for companies with no emissions reduction targets in the final report for publication ahead of COP 27.

Challenges with the current approaches

Failing to combine backward- and forward-looking data could lead to alignment results that may not properly reflect the company's current business model and transition planning. For example, a company with a highly ambitious long-term target could have a poor track record of historic emissions reductions and other indicators, such as insufficient low carbon CAPEX plans that do not align with the ambition of the target. If the company's alignment is measured based on the reduction target only, the company might look well-aligned even though its target may not be credible. When combining backward- and forward-looking information by incorporating on a credibility assessment of a company's stated emissions reduction targets, the company's alignment metric may be more realistic.

Quantitative

EXAMPLE 17: QUANTITATIVE ANALYSIS — ITR BASED ON TARGETS VERSUS HISTORICAL EMISSIONS[104]

Table 13, which was developed based on quantitative analysis conducted by the GFANZ workstream on Portfolio Alignment Measurement, illustrates how the choice of emissions forecasting approaches (using emissions reductions targets vs. historical emissions trends) could affect the resulting alignment metric. In the example, the Implied Temperature Rise (ITR) for three electric utilities is relatively higher based on historical emissions trends as compared to the reduction target projections.

Table 13: Comparison of Implied Temperature Rise (ITR) for electric utilities based on targets versus historical emissions

		ALIGNMENT METRIC OUTPUT: 2050 ITR		
COMPANY (UTILITIES)	COMPANY'S PRIMARY ENERGY SOURCE	ITR BASED ON EMISSIONS REDUCTION TARGET	ITR BASED ON HISTORICAL EMISSIONS TRENDS	DIFFERENCE BETWEEN THE TWO APPROACHES
Company H	Coal	3.8 degrees C	4.4 degrees C	+0.6 degrees C
Company I	Natural Gas	1.6 degrees C	2.1 degrees C	+0.5 degrees C
Company J	Natural Gas	3.3 degrees C	3.5 degrees C	+0.2 degrees C

104 ITRs have been calculated using a multiple benchmark interpolation approach over a 2050 time horizon to account for the latest year of targets provided by the companies (i.e., 2050 in this case).

To further illustrate how the alignment metrics differ based on the choice of emissions forecasting approach, Figure 29 and Figure 30 compare the intensity projections for two steel manufacturers (in Mt CO2e/megatons of steel) when using emissions reduction targets at face value and when using a linear trend based on historical emissions intensity disclosures. The intensity projections are compared to two IEA benchmark scenarios: a 1.5 degrees C-aligned Net Zero Emissions by 2050 (NZE) scenario and a 2.8 degrees C-aligned Stated Policies Scenario (STEPS) scenario.

Figure 29: Comparison of intensity projections of sample steel companies using a linear trend based on historical emissions

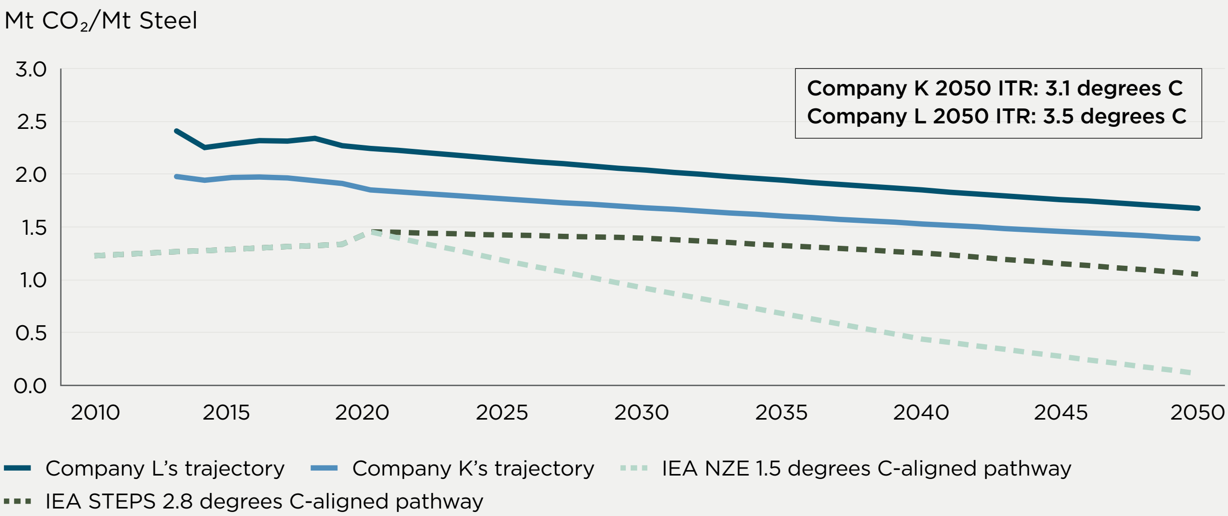
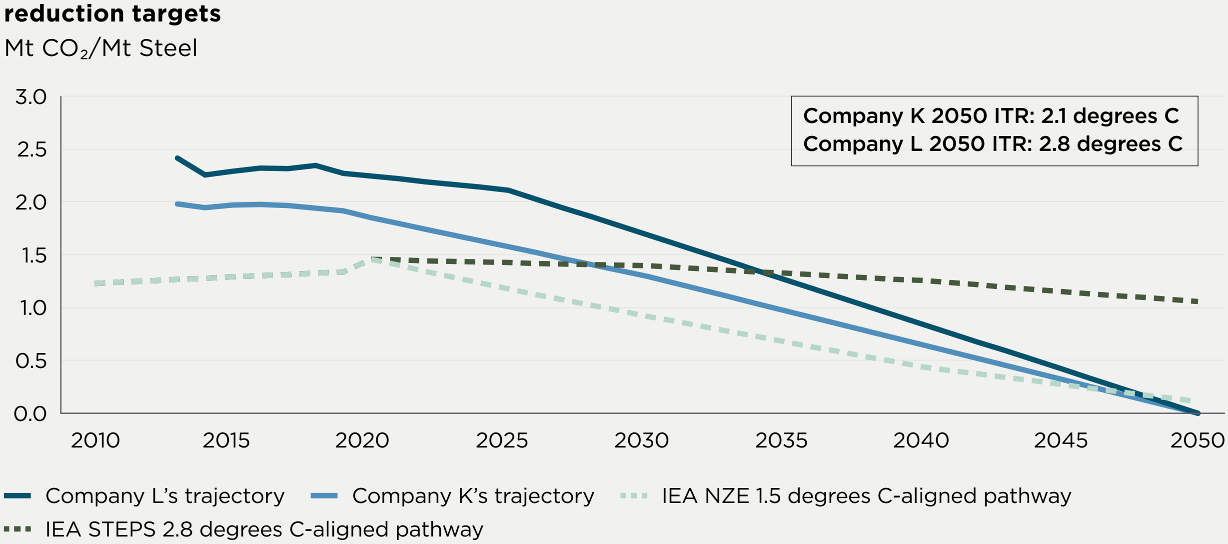


Figure 30: Comparison of intensity projections of sample steel companies using stated emissions reduction targets



When forecasting physical emissions intensity based on historical intensity trends alone (Figure 29), Company K and Company L's trajectory leads to alignment outcomes that demonstrate strong misalignment with the 1.5 degrees C-aligned world. However, when projecting their alignment outcomes using their stated emissions reduction targets, their alignment outcomes will be significantly different and closer to a 1.5 degrees C-aligned world (Figure 30).

A practitioner or end user that wants to determine the most accurate alignment outcome for Company K or Company L will thus need to decide whether to accept these companies' stated targets at face value or place some weight on their historical intensity trends. A credibility assessment of the targets could help to set a desired weight towards the company's targets.

Deep Dive: Conducting credibility assessments

Supporting indicators are required to help practitioners estimate the likelihood that reduction targets will be achieved. The Lombard Odier example (see Example 16) highlighted some key performance modules that could be indicative of a company's future carbon performance.

Using findings from the GFANZ workstream on Real-economy Transition Plans, which draws upon indicators from existing assessment frameworks (e.g., TPI, SBTi, ACT, Climate Action 100+), this report outlines typical indicators that practitioners could use to perform a credibility assessment of a company's stated emissions reduction targets. These qualitative and quantitative indicators are derived from the 5 themes and 10 key components of a credible transition plan, as described in the GFANZ publication "Expectations for Real-economy Transition Plans" (see Appendix C for a full list of key themes, components, and indicators). The 10 key components include indicators such as: whether the company's stated emissions reduction targets or transition plans have been assessed and validated by a third party; the timespan and frequency of the targets; how management oversight is connected to targets; whether planned production forecasts and accompanying business strategies are aligned with the targets; and whether an appropriate funding channel exists to implement the transition.

Please note that this list is not exhaustive of all potential indicators that a practitioner might use in a credibility assessment. Practitioners should consider leveraging indicators for their credibility assessment that they believe to be most predictive when estimating the likelihood that a company will achieve its stated targets, recognizing that there may be difficulties in sourcing the requisite data for some indicators and that there are not yet widespread measurement standards for these indicators. In the future, as transition planning and target setting become more commonplace, it is hoped that such a credibility assessment will fall under the purview of audit or regulatory bodies.

Additionally, practitioners should consider the differences in predictive accuracy for indicators based on their application to short- and medium-term targets vs. long-term targets.

The GFANZ workstream on Portfolio Alignment Measurement developed an example framework (outlined in Table 14 below) to illustrate how a practitioner might use the indicators mentioned above to conduct and incorporate a credibility assessment into the resulting alignment outcome.

Table 14: Target Credibility Framework

DESCRIPTION	ILLUSTRATIVE DETAILED ASSESSMENT USING EXAMPLE QUANTITATIVE AND QUALITATIVE INDICATORS	WEIGHTING USED IN THE CALCULATION OF FUTURE EMISSIONS TRAJECTORY	TARGET WEIGHTING (W-VALUE)
The company does not have published emissions reduction targets	• No emissions reduction targets have been set	100% based on historical emissions trends	**0%**
The company has a long-term emissions reduction target that is not third party verified	• Long-term targets exist but are not validated by a third party	25% on emissions reduction targets 75% on historical emissions trends	**25%**
The company has ambitious, but not third party verified, short- and long-term targets	• Short- and long-term targets exist but are not validated by a third party • Some executive oversight/incentives are linked to the target	50% on emissions reduction targets 50% on historical emissions trends	**50%**
The company has third party validated short- and long-term targets, supported by a transition plan	• The reduction target is validated by a third party (e.g., SBTi) and includes both short- and long-term components • A transition plan has been disclosed • Low carbon CAPEX plans are dedicated to activities required to meet the reduction target • Historical trends in production/capacity indicate progress towards alignment (where applicable by sector)	75% on emissions reduction targets 25% on historical emissions trends	**75%**
The company has validated short- and long-term targets, supported by a clear funding channel and a transition plan that lays out the pathway to achieving these. The company also has successfully met past targets.	• Executive oversight/incentives are linked to the target • A transition plan has been disclosed • Low carbon CAPEX plans are aligned with the set reduction target • Planned production forecasts and accompanying business strategies are aligned with the set reduction targets • Company has a successful history of meeting past 1.5 degrees C-aligned and third-party verified emissions reduction targets • There is an enabling policy environment	100% based on emissions reduction targets	**100%**

A simple and advanced assessment of credibility weighting

A simple application of the framework in Table 14 would be based solely on how a company's stated emissions reduction target aligns with the "Description" column. A more advanced analysis would assess a company's stated emissions reduction targets based on the example credibility indicators outlined in column "Illustrative detailed assessment using example quantitative and qualitative indicators" of Table 14.

The more advanced analysis could include indicators as, illustrated in Table 15. The target credibility framework might be applied to derive the target weighting for two companies M and N. Based on the analysis, the resulting target weighting is 25% for Company M and 75% for Company N. A 25% weighting for Company M means that the ITR metric based on emissions reduction targets gets attributed a weight of 25% while the ITR metric based on historical trends get attributed a weight of 75%. For Company N, it will be exactly the inverse.

Table 15: Assessment of credibility indicators

CREDIBILITY INDICATORS	COMPANY M	COMPANY N
Short-term targets		✓
Long-term targets	✓	✓
Target validated by external body		✓
Executive oversight/incentives linked to target	✓	✓
Transition plan		✓
CAPEX dedicated to activities		✓
Historical productions/capacity trends indicate progress		✓
Company has successful history of meeting past targets		
Resulting target weighting	**25%**	**75%**

✓ Indicates the company meets the criteria

Table 16 highlights the resulting impact on the final alignment metric, based on the calculated target weighting in Table 15, using the formula outlined in Equation 1.

Table 16: Impact of the credibility assessment on the resulting alignment metric (i.e., ITR)

2050 ITR METRIC WITH TARGET WEIGHTING = X	COMPANY M	COMPANY N
Target weighting = 100%	2.0 degrees C	1.5 degrees C
Target weighting = 75%	2.25 degrees C	2.0 degrees C
Target weighting = 50%	2.5 degrees C	2.5 degrees C
Target weighting = 25%	2.75 degrees C	3.0 degrees C
Target weighting = 0	3.0 degrees C	3.5 degrees C

The target weighting analysis illustrates the important impact that the credibility assessment has on the resulting alignment outcomes for the two companies. For example, when comparing alignment solely based on historical emissions (i.e., target weighting = 0%), Company N would appear less aligned than Company M. However, calculating alignment based on stated reduction targets (i.e., target weighting = 100%) Company N has a superior ITR metric based on more ambitious reduction targets. Given that Company N's target weighting is 75% compared to 25% for Company M, Company N therefore appears to be better aligned compared to Company M (2.0 degrees C versus 2.75 degrees C).

Companies without stated emissions reduction targets

While the total number of companies with science-based targets has increased, the majority of companies still have not set targets and the framework set out in Table 14 is not applicable for companies without emissions reduction targets. In such instances, the projection methods set out in Table 17 may be considered. For example, if a company has not set emissions reduction targets, a company's future emissions could be calculated based on a benchmark growth rate underpinned by a current policies or Nationally Determined Contributions (NDC) scenario (projection method 3). This choice is important when aggregating to an alignment outcome at the portfolio-level as a financial practitioner will need to calculate an alignment metric for each individual company within the portfolio. Given some companies have not yet set emissions reduction targets, the choice of approach for these companies will impact the portfolio-level alignment metric.

Table 17: Emission projection guidelines for companies without reduction targets

PROJECTION METHOD	TYPE	DESCRIPTION	ADVANTAGES	DRAWBACKS	GFANZ WORKSTREAM ON PORTFOLIO ALIGNMENT MEASUREMENT RECOMMENDATION
1. Neutral emissions intensity	Backward-looking linear forecast	Current emissions intensity held constant throughout the projection period	Simple to implement and communicate	Does not reflect the likely dynamics of the transition	Should consider when historic data and underlying growth rate data is not available
2. Historical emissions or activity trend projection		Median historic year-on-year emissions/activity trend is assumed to continue throughout the projection period	Rewards tangible past actions	Past emissions or activity level may not accurately reflect the future, particularly for companies operating in jurisdictions with evolving regulations, and where pressure to transition is mounting	Should consider where at least three years of historic data is available and underlying growth rate data is unavailable
3. Benchmark emissions growth rate	Forward-looking non-linear forecast	Relevant sector/region emissions "stated policies" benchmark growth rates are used as a proxy growth rate for future company-level emissions	Projection consistent with that of a company in a "business-as-usual" world	Likely overestimates the ambition of the decarbonization pathway when compared to projection based on method 2	Should consider if the company's resulting projection is more conservative (i.e., if it results in higher cumulative emissions) than projection method 1 (neutral projection)
4. Production forecasts	Forward-looking non-linear forecast	Production is projected based on a variety of factors (e.g., production plans, capacity expansion plans, technology road maps, etc.). Emissions factors could be applied to production to project emissions	Captures forward-looking metric with direct comparability to climate scenarios	Standardized emissions factors and production forecasts are not available for many sectors	Should consider for companies in homogenous sectors where robust production forecasts, production-based climate scenarios, and emissions factors are readily available

Providing guidance for the projection of emissions for companies without emissions reduction targets might help to achieve a greater level of convergence on best practice approaches. For this reason, the GFANZ workstream on Portfolio Alignment Measurement is using this consultation to develop guidance on the preferred approach for companies without emissions reduction targets.

PROPOSED GUIDANCE FOR JUDGEMENT 6

For companies which have set emissions reduction targets

While forward-looking projections solely based on stated targets may incentivize good target-setting behavior, they may not result in real-world emissions reductions. On the other hand, backward-looking projections based on historical emissions or near-term low carbon CAPEX or production plans do not necessarily reflect the fact that the future policy and economic environment may look very different.[105]

The findings of the engagement undertaken by the GFANZ workstream on Portfolio Alignment Measurement indicates that practitioners should consider calculating a company's alignment based on two approaches to projecting a company's emissions: an approach using backward-looking data (e.g., historical emissions) and a forward-looking approach using stated emission reduction targets. The final alignment score should be a weighted combination of these two approaches, with the weighting derived from a credibility assessment of the stated emissions reduction targets, reflecting the likelihood of the targets being achieved. When performing a credibility assessment of targets, practitioners should consider the key indicators outlined in this section, including but not limited to: whether the company has validated short- and long-term targets, whether these targets are linked to executive oversight, and whether these targets are supported by a clear funding channel and a transition plan that lays out the pathway to achieving these targets. Depending on the assessed ambition and credibility of the targets, the target-related alignment score should be discounted based on a target credibility framework like the one provided in this chapter.

Regardless of the data projection methods applied, practitioners are encouraged to be transparent about the assumptions they make.

For companies which have not set emissions reduction targets

Public consultation will inform guidance for this section to be published in the final report ahead of COP 27.

105 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.48.

3.7 – KEY DESIGN JUDGEMENT 7: HOW SHOULD ALIGNMENT BE MEASURED?

Consultation question(s) for consideration:

- What is the appropriate time horizon for measuring alignment?
- What time horizon is appropriate for each alignment metric?

Once a benchmark scenario has been constructed and a company's emissions are forecasted, the next design decision is the time horizon over which alignment should be calculated. Alignment can be calculated using either a cumulative emissions approach or a point-in-time emissions approach, either of which impacts the outcome significantly. The cumulative approach was highlighted by the PAT in 2021[106] as best reflecting the impact of alignment within the remaining carbon budget. Equally important — regardless of the approach chosen — is the decision of when to calculate alignment, as this can also profoundly impact a company's alignment outcome. As a result, practitioners need to be aware of this impact when assessing alignment outcomes.

This section provides an analysis of companies' alignment outcomes by applying the cumulative approach over different time periods. In addition, this section provides guidance on the most appropriate time horizons for measuring alignment.

Current practices for Judgement 7

There are two approaches to assessing a company's projected emissions against a given benchmark scenario:

1. Point-in-time assessments — these quantify a company's alignment in terms of its emissions relative to the applicable benchmark scenario at a given point in time. For example, a point-in-time assessment for 2030 could show that a company's emissions will be 20% higher than the respective benchmark scenario in 2030.
2. Cumulative assessments — these quantify alignment in terms of emissions relative to the applicable benchmark scenario throughout the measurement period in question. For example, based on a cumulative assessment from now to 2030, a company's cumulative emissions will be 50% higher than the benchmark scenario over that same time.

The drawback with point-in-time assessments is that they cannot be directly linked to a warming outcome. What matters to global warming is cumulative emissions between the present day and the point at which net-zero emissions are reached.[107] Therefore, based on engagement findings, GFANZ considers it is preferable that all alignment assessments be conducted cumulatively. Doing so prevents a situation where a company is seen as being aligned with 1.5 degrees C simply because it has reached a specific level of emissions prescribed by its sector benchmark at a specific point in time.

The remainder of this section therefore focuses on calculating alignment based on the cumulative approach.

Time horizons in cumulative approaches

At present, the following time horizons are employed when carrying out cumulative assessments of companies' projected emissions against a constructed benchmark scenario:[108]

- Short-term time horizon: time horizons up to 2025
- Medium-term time horizon: time horizons between 2026 and 2035
- Long-term time horizon: time horizons between 2036 and 2050

106 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p. 10.

107 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.49.

108 Climate Action 100+. "Net Zero Company Benchmark: Structure and Methodologies", n.d.

Several practitioners indicated to the GFANZ workstream on Portfolio Alignment Measurement that they seek guidance on the appropriate time horizon for measuring portfolio alignment and the resulting impact on emissions forecasting approaches. The quantitative analysis examples provided in this section will illuminate the time horizon impact, and guidance will be provided accordingly. Our finding indicate that there are compelling reasons practitioners should consider assessing company alignment over both short- and medium-term (e.g., 2030) and long-term (e.g., 2050) time horizons.

The time horizon conundrum

The choice of time horizon can impact the resulting alignment of companies to 1.5 degrees C-aligned scenarios. This impact is most pertinent where companies have set emissions reduction targets for multiple time horizons.

Table 18 shows how using different time horizons could impact the resulting alignment metrics. The benchmark divergence and implied temperature rises (ITRs) metrics shown were calculated by assuming that stated reduction targets can be met.

Table 18: Alignment metrics for three steel companies

			ALIGNMENT METRIC OUTPUT		
STEEL COMPANY	PHYSICAL INTENSITY IN 2020 (MT CO_2/MT OF STEEL)	EMISSIONS REDUCTION TARGET(S) % FROM BASELINE YEAR (2020)	BENCHMARK DIVERGENCE IN 2030	BENCHMARK DIVERGENCE IN 2050	2050 ITR METRIC
Company O	1.85	2030: -30% 2050: -100%	30%	14%	2.1 degrees C
Company P	1.65	2030: -12% 2050: -100%	23%	15%	2.1 degrees C
Company Q	2.24	2025: -7% 2050: -100%	64%	46%	2.8 degrees C

Companies O, P and Q have all set long-term (i.e., 2050) net-zero targets that are significantly more ambitious than their short-term targets. As a result, alignment improves for all three steel companies as the time horizon shifts from 2030 to 2050 (Table 18). At the same time, the companies' physical intensities align more favorably to the benchmark scenario after 2030, as the yearly intensity reductions from 2030 to 2050 are larger compared to those between the present day and 2030. Therefore, on a cumulative basis, the companies' overshoot is proportionally larger when compared to the benchmark in 2030 than in 2050, leading to higher benchmark divergence in the short term.

When selecting the time horizon over which to measure cumulative alignment, it is important to realize that there are distinct advantages and tradeoffs, highlighted in the following sections.

Use of short- and medium-term time horizons

Short- and medium-term time horizons (hereafter referred to as “shorter time horizons”) may better reflect realistic emissions reductions, as today's management is more likely to be held accountable for the targets set. Targets with shorter time horizons are more likely to be accompanied by strategic transition planning with a focus on near-term actions required to successfully meet the target. As the projection horizon increases, more uncertainty is introduced into emissions forecasting because prediction errors increase in size over time. As a result, using a shorter time horizon to measure cumulative alignment might be preferrable, as it could incentivize companies to set realistic short-term targets that are more likely to drive real-world emissions reductions while also improving corporate alignment.

The downside of using shorter time horizons is that they cannot capture the alignment of a corporate strategy that aims to achieve net zero at, or beyond, 2050. For example, a company that plans to aggressively decarbonize after 2030 will not be accurately captured in the alignment calculation using a 2030 time horizon (Example 19: Quantitative Analysis — A deeper look at Company R illustrates this). This is particularly relevant for companies in hard-to-abate sectors where emissions reductions are dependent on technological advances that may not be available within a short- or medium-term time horizon; as a result, companies may end up with inferior alignment outcomes.

On the other hand, for companies without reduction targets, shorter time horizons can underestimate misalignment. Heavy emitters without reduction targets may prefer to be measured against a shorter time horizon because their cumulative misalignment will only increase as the time horizon is extended.

Moreover, as discussed further in Section 3.8, shorter time horizons may not be compatible with the use of a TCRE multiplier approach when calculating an ITR metric. For shorter time horizons, a multiple benchmark interpolation may be more appropriate to translate benchmark divergence into a temperature. However, it is challenging to carry out such an interpolation for sectors where multiple benchmark scenarios are difficult to construct and/or unavailable. Hence, simpler portfolio alignment metrics (e.g., benchmark divergence) might be more appropriate to use because underlying scenario data is still evolving.

Use of long-term time horizons

Long-term time horizons (i.e., 2050 and beyond), may be better suited to capturing some companies' longer term ambitions to decarbonize to net-zero and can still incorporate a company's short- and mid-term emission reduction commitments. For example, the SBTi corporate target setting protocol recommends setting both near-term (5-10 years) and long-term science-based targets (net zero by 2050 or sooner).[109] Companies with ambitious short- and long-term reduction targets could benefit from more favorable alignment scores as the time horizon is extended to 2050 while, at the same time, helping to build a net-zero economy.

But, as the time horizon is extended, the uncertainty of the projection increases and the accuracy of the underlying benchmark scenario decreases, thereby introducing another source of potential error.

As discussed in Section 3.6 (i.e., Judgement 6), the time horizon choice is directly linked to the emissions forecasting approach chosen. So, with all else held constant, forecasts based exclusively on emissions reduction targets taken at face value are more likely to lead to diverging alignment results as the time horizon extends. Figure 31 and Figure 32 in Example 18.

109 SBTI. "SBTI Corporate Net-Zero Standard", 2021.

Quantitative

EXAMPLE 18: QUANTITATIVE ANALYSIS — IMPACT OF TIME HORIZON ON THE ALIGNMENT OF THREE STEEL COMPANIES

Figure 31: Company emissions projected based on trends in historical emissions
ITR (Degrees C)

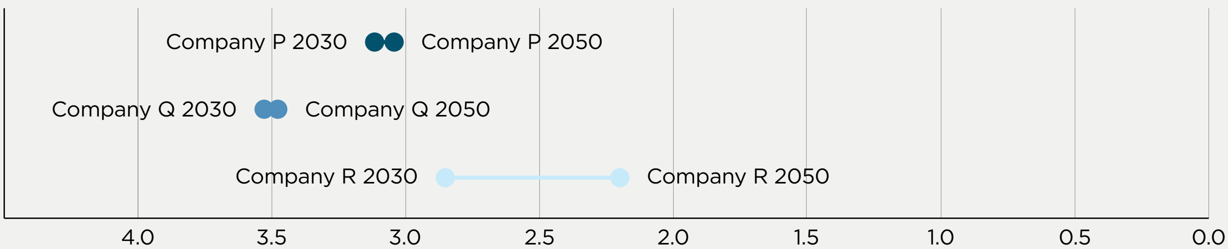


Figure 32: Company emissions projected based on stated emissions reduction targets
ITR (Degrees C)

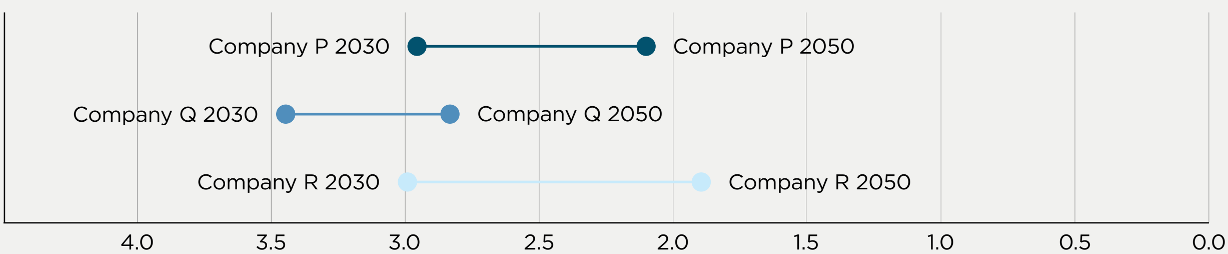


Table 19: Historical emissions and stated emissions reduction targets for three steel companies

STEEL COMPANY	MEDIAN ANNUAL HISTORICAL EMISSIONS INTENSITY REDUCTION RATE (2015-2020, IN %), PROJECTED FORWARD IN FIGURE 31	EMISSIONS REDUCTION TARGETS (IN %) FROM BASELINE YEAR (2020), PROJECTED FORWARD IN FIGURE 32
Company P	-3.3%	2030: -12% 2050: -100%
Company Q	0.5%	2025: -7% 2050: -100%
Company R	0%	2030: -30% 2045: -100%

The magnitude of the change in ITR metric across time horizons is highly dependent on the approach used to forecasting company-level emissions. If one assumes companies follow historical emissions trends, the difference in the resulting ITR metric across time horizons is typically smaller than if one assumes companies meet emissions reduction targets. As Figure 31 shows, Company P's and Company Q's ITR metrics (determined based on their historical emissions trends) are almost the same regardless of the time horizon chosen. Only Company R's ITRs differ substantially when projected using historical trends. This occurs because Company R has made emissions reductions in the past which translates in a decreasing future emissions trajectory.

As seen in Figure 32, however, when calculating the companies' ITR metrics based on their stated targets, the 2030 temperatures almost precisely match their historical temperatures while the 2050 ITR metrics are lower, reflecting the net-zero ambition of their 2050 targets.

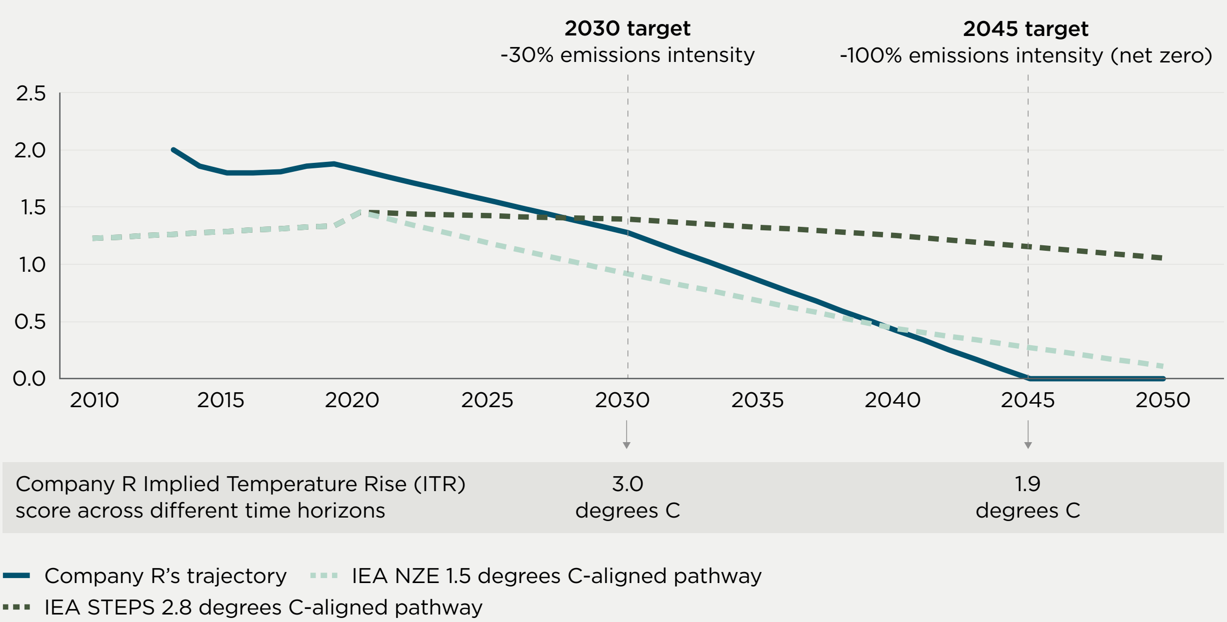
In reality, companies in hard-to-abate sectors, such as steel, often do not have decreasing historical emissions trajectories, because of a lack of past reduction targets or poor historic emissions performance. For these companies, one should consider whether the ambitious long-term targets they have set are credible, as their historical emissions performance may indicate that cumulative overshoots could increase over time. (Please refer to Section 3.6, Judgement 6, for more details on conducting credibility assessments.)

Quantitative

EXAMPLE 19: QUANTITATIVE ANALYSIS — A DEEPER LOOK AT COMPANY R

Company R has set ambitious long-term targets. A closer look at the company demonstrates how — from an alignment perspective — it might be punished when assessed based on a short-term time horizon. The solid line in Figure 33 shows Company R's emissions intensity trajectory over time, assuming it meets its stated reduction targets.

Figure 33: Company R's physical intensity trajectory based on stated emissions reduction targets
Mt CO_2/Mt Steel



When comparing Company R's emissions trajectory to the benchmark scenarios (STEPS and NZE[110]), the resulting alignment metric (i.e., ITR) will be less favorable over a shorter time horizon. Only the longer-term time horizon reflects the full ambition of the net-zero target when performing a cumulative under/overshoot calculation. For Company R, a short-term time horizon may be unfairly punitive, given that steel is one of several hard-to-abate sectors. On the other hand, the lack in ambition of the shorter-term target could indicate that the company is not fully committed to the net-zero goal, given that some low-carbon technology advances in steel have recently become available to companies (for example, see Company P's recent historic reductions in physical intensity in Table 19). For this reason, practitioners are advised to assess the credibility of long-term targets carefully (see Section 3.6 for more details on conducting credibility assessments).

PROPOSED GUIDANCE FOR JUDGEMENT 7

Practitioners should consider calculating alignment on a cumulative-emissions basis to reflect the remaining carbon budget.

Short- and medium-term time horizons may better reflect real commitments and may be more likely to translate to real-economy emission reductions because today's management is more likely to be held accountable. On the other hand, long-term time horizons align better with the end goal of net-zero emissions by 2050 and reflect the carbon budget. In addition, longer time horizons may more accurately reflect the lengthier transitions required in hard-to-abate sectors. As such, practitioners should consider computing alignment over short- and medium-term time horizons (e.g., up to 2030), supplemented by longer-term time horizon computations (e.g., 2050). The choice of time horizon might also be informed by the practitioner's use cases.

As noted in the Judgement 8 Section 3.8, ITR metrics can be used to calculate alignment over any time horizon. However, when computing alignment based on the single scenario approach using an ITR metric over short- and medium-term time horizons, multiple benchmark interpolation approaches may be more suitable (see Appendix D for more information). By contrast, TCRE multiplier approaches are better suited for long-term time horizons.

When measuring alignment, practitioners and metric providers should consider disclosing the chosen time horizon(s) and note the potential underlying uncertainties associated with the choice.

110 International Energy Agency. World Energy Outlook, 2021.

3.8 – KEY DESIGN JUDGEMENT 8: HOW SHOULD ALIGNMENT BE EXPRESSED AS A METRIC?

Consultation question(s) for consideration:

- Please indicate the portfolio alignment metrics that your organization uses.
- If you use a metric other than the four listed in this section, please detail how you express portfolio alignment as a metric for this use case(s).

The selection of a specific portfolio alignment metric by an end user is often dependent on the specific use case for which the metric is employed, as indicated by engagement findings. The discussion in this section is pertinent for end users and providers seeking to understand the range of different alignment metrics being used, enabling more robust comparisons across different alignment metrics.

For practitioners and metric providers that calculate Implied Temperature Rise (ITR) metrics, a technical annex (in Appendix D of this draft report) features analysis related to the application and suitability of the TCRE multiplier approach highlighted in the 2021 PAT Report.

Current practices for Judgement 8

There are a variety of portfolio alignment metrics that a financial institution or metric provider can use and there are advantages and limitations associated with the various metrics. As metrics are refined, GFANZ acknowledges that some practitioners may find it preferable to use multiple portfolio alignment metrics in a dashboard approach in order to minimize the limitations of particular metrics. Appendix E features a case study that highlights to end users the advantages of leveraging multiple portfolio alignment measurement metrics using a dashboard approach.

Binary target measurement metrics

As explained in the 2021 PAT Report, binary target measurement metrics measure the alignment of a portfolio with a given climate outcome based on the percent of investments or companies in that portfolio with declared net-zero/Paris alignment targets.[111] An assessment based on a binary target measurement can be made more robust by assessing the coverage of companies in the portfolio that have verified net-zero targets. Additionally, a practitioner can use more complex weighting approaches, for example, by considering financed emissions in the portfolio weight.

The implementation process showcased in Example 20 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

111 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.2.

Case studies

EXAMPLE 20: GENERATION INVESTMENT MANAGEMENT (GENERATION IM) BINARY TARGET MEASUREMENT

Generation IM, an asset management firm, uses a binary target measurement approach, along with an ITR metric as an additional forward-looking data point for investors.

Generation IM tracks portfolio companies that have made commitments to set science-based targets (SBTs) with SBTi, as well as portfolio companies with SBTs that are actually validated by SBTi. In addition, Generation IM notes whether the SBTs are focused on 1.5 degrees C or not. In its regular quarterly reporting to investors for its listed equity strategies,[112] Generation IM discloses the percentage of portfolio companies in SBTi (i.e., both companies that have formally committed to set a SBT to be validated by SBTi and companies with SBTs validated by SBTi) and how these companies compare to the fund benchmark.

Generation IM believes the advantage of binary target measurement is that commitments to SBTi are tangible and, through engagement, can be influenced by an investor.

Generation IM reports the following drawbacks with this approach:

1. While SBTi research indicates that companies with SBTs have achieved emissions reductions consistent with a 1.5 degrees C trajectory, setting a target is not the same as implementing the target and companies' performance must be carefully monitored. Setting a target is not the same as implementing the target and this difference must be kept in mind and carefully monitored.
2. The SBTi methodology can be challenging for some companies. For example, for high growth companies, achieving absolute emissions reductions while increasing their company's size can be challenging. It can also be challenging for companies that have already reduced their emissions using all existing technologies as they may find it difficult to further reduce emissions unless and until new technologies are developed.
3. And finally, SBTs can be a challenge for companies in high carbon sectors for which a sectoral methodology does not yet exist. In such situations, verification requirements are based on the requirements of the economy at large, which may not be applicable to the company's sector or region.

Finally, considering the enhancements laid out in Section 3.6 (Judgement 6), a practitioner could apply the credibility assessment framework to construct a credibility-weighted binary metric.

Benchmark divergence models

Benchmark divergence models assess portfolio alignment at an individual company level by constructing emissions benchmark scenarios from forward-looking climate scenarios and comparing company emissions against them.[113] These metrics are typically constructed by calculating the cumulative company-level emissions and the cumulative 1.5 degrees C benchmark scenario emissions. The cumulative over or undershoot of the company is then used to calculate the benchmark divergence (which is why benchmark divergence models can also be referred to as percentage misalignment metrics).

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112 Generation IM. Global Equity Quarterly Investor Letter, 2021.

113 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.2.

Implied temperature rise (ITR) models

Implied temperature rise (ITR) models extend benchmark divergence models one step further.[114] These metrics build on the benchmark divergence model, translating an assessment of over/undershoot into a global warming impact. This global warming impact represents the expected increase in temperature versus pre-industrial levels in 2100 if the whole global economy were to over/undershoot their own benchmarks by the same proportion. ITR models therefore provide a direct link between the company's alignment with future climate warming outcomes. This allows for a common language when comparing companies' alignment across different sectors. As noted in the Barriers to Adoption section above, ITR metrics are often criticized due to the perceived lack of transparency around underlying assumptions, resulting in a sense of false precision. For further details about limitations and advantages of ITR models, see Appendix E.

Case studies

EXAMPLE 21: EXAMPLE ITR CASE STUDY [115]

Placeholder for an example ITR case study to be published in the final report ahead of COP 27.

114 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.2 and p.18.

115 Example ITR Case Study link.

Maturity scale alignment

These metrics assign companies on a scale of alignment with a net-zero world based on a qualitative and quantitative assessment of various factors that might include, but are not limited to, stated emission reduction targets; past emissions performance; climate disclosure and governance. There are a variety of maturity scale metrics with varying levels of complexity that can be used to assess companies. These metrics provide a few advantages over the quantitative metrics presented above (i.e., benchmark divergence and ITR): there is less scope for "false precision", and they may be used without needing to develop a default approach for companies without stated targets. However, the link to specific future climate warming outcomes is less certain.

Maturity scale alignment metrics can be constructed with varying levels of complexity. A practitioner, using a set of quantitative and qualitative factors could use a simpler approach that assigns companies to discrete categories (see Example 22: the IIGCC and PAII NZIF Maturity Alignment Scale Metrics) or use a more complex, multi-faceted scaling approach (Example 15: the WBA/CDP ACT assessment framework).

Case studies

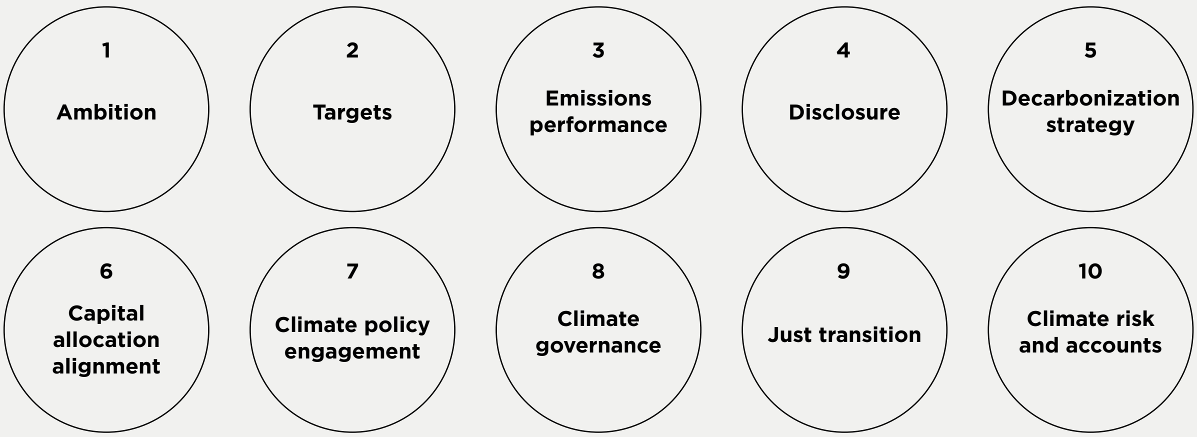
EXAMPLE 22: INSTITUTIONAL INVESTORS GROUP ON CLIMATE CHANGE (IIGCC'S) AND THE PARIS ALIGNED INVESTMENT INITIATIVE'S (PAII'S) NET ZERO INVESTMENT FRAMEWORK (NZIF) MATURITY ALIGNMENT SCALE METRICS

One framework for assigning companies on a maturity alignment scale is the Net Zero Investment Framework (NZIF) approach.[116] The NZIF recommends grouping companies into one of five categories on an "alignment maturity scale" based on an assessment that takes 10 key alignment criteria into account (see Figure 34).

116 IIGCC and PAII. "Net Zero Investment Framework", 2021.

Figure 34: NZIF approach

Alignment criteria



Alignment maturity scale

Net zero	Aligned	Aligning	Committed to aligning	Not aligned
• Companies that have current emissions intensity performance at, or close to, net zero emissions with an investment plan or business model to continue that goal over time	• Meeting criteria 1-6 (or 2, 3 and 4 for lower impact companies). • Adequate performance over time in relation to criterion 3, in line with targets set	• Have set a short or medium-term target (crietria 2) • Disclosure of Scope 1, 2 and (material) 3 emissions data (criteria 4) • A plan relating to how the company will achieve these targets (partial criteria 5)	• A company that has complied with criteria 1 by setting a clear goal to achieve net zero emissions by 2050	• All other companies

The NZIF framework notes that this assessment of categories enables financial institutions to set and measure performance against targets and inform the strategy for alignment actions. The NZIF framework also suggests that assets that are not aligning nor showing progress towards meeting the criteria to be considered as "aligning" should be the immediate and urgent priority for engagement or reweighting in portfolio construction.[117] Further, the framework states that consideration for selective divestment or exclusions should be given to assets that do not meet any of the criteria that indicate they have the potential to transition within a specified timeframe that is consistent with remaining on a global net-zero pathway. Finally, the NZIF framework suggests that financial institutions should also address companies that do not continue to improve performance against the criteria over the longer term.[118]

117 Ibid, p. 16.
118 Ibid, p. 16.

Challenges with Judgement 8

The 2021 PAT Report noted that financial institutions could select whichever alignment metric is most informative for their specific institution and use case. Each metric has advantages and drawbacks that should be weighed by the end user when considering the suitability of a metric for a specific use case. However, it can be challenging for an end user to select from the four categories of portfolio alignment metrics[119] and feedback during the consultation is therefore welcome from financial institutions.

Quantitive

EXAMPLE 23: QUANTITATIVE ANALYSIS — ALIGNMENT RESULTS USING DIFFERENT METRICS APPLIED TO UTILITY COMPANIES

Table 20 summarizes the alignment result for seven utilities companies, expressed using three different alignment categories.

Table 20: ITR metric and rank ordering for utilities companies

Utilities Company	Alignment Metric: Binary Target Measurement	Alignment Metric: Benchmark Divergence		Alignment Metric: ITR		Alignment Metric: Maturity Scale Alignment
	Does the company have a declared net-zero/Paris-alignment targets?	2050 benchmark divergence using emission reduction targets	Absolute difference in misalignment score (compared to subsequent company)	2050 ITR using emission reduction targets	Absolute difference in ITR (compared to subsequent company)	Maturity scale alignment score (Net zero 2050)
Company S	No	578%	+276%	4.3 degrees C	+1.0 degrees C	Not Aligned
Company T	No	302%	+44%	3.3 degrees C	+0.1 degrees C	Not Aligned
Company U	Yes	258%	+131%	3.2 degrees C	+0.9 degrees C	Not Aligned
Company V	No	127%	+123%	2.3 degrees C	+0.7 degrees C	National Pledges
Company W	Yes	4%	+16%	1.6 degrees C	+0.1 degrees C	Below 2 Degrees
Company X	Yes	-12%	+7%	1.5 degrees C	0.0 degrees C	1.5 Degrees
Company Y	Yes	-19%	-	1.5 degrees C	-	1.5 Degrees

Table 20 illustrates that the level of alignment is typically signaled in a consistent manner across all three types of metric. Therefore, the challenge is to consider the broad dimension of the metric's use, to ensure that the most suitable selection is made. There are two broad dimensions to which a use case can be broadly assigned, the first is decision-making and the second is communication. The former applies when the metric is required to assess the climate impact of portfolio companies or lending counterparties in order to align capital allocation to the net-zero economy. The latter would be considered when communicating these changes in capital allocation to internal and external stakeholders.

119 See Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p. 51 for considerations relevant to metric selection.

PROPOSED GUIDANCE FOR JUDGEMENT 8

The findings of the engagement undertaken by the GFANZ workstream on Portfolio Alignment Measurement suggest that practitioners consider tailoring the selection of their portfolio alignment metric to their individual use case. A practitioner should consider the broad dimension of the use case when selecting the metric.

Table 21: Categorization of portfolio alignment measurement use cases by broad dimension

USE CASE TYPE	BROAD DIMENSION
Investment research and selection	Decision-making
Portfolio construction	
Manager selection and monitoring	
Disclosure of progress	Communication
Engagement	
Understanding the impact of internal policies and conditions	
Supervisory activity[120]	

3.9 – KEY DESIGN JUDGEMENT 9: HOW SHOULD COMPANY-LEVEL ALIGNMENT OUTCOMES BE AGGREGATED?

Consultation question(s) for consideration:

- Please detail your preferred approach for aggregating company-level alignment metrics (e.g., sub-sector, sector, portfolio) and the rationale for this approach.

The GFANZ workstream on Portfolio Alignment Measurement learned that financial practitioners generally concurred with the considerations provided for Key Design Judgement 9 in the 2021 PAT Report. Therefore, in this section, GFANZ reiterates key points made in the 2021 PAT Report while noting new developments and feedback received during the engagement conducted.

Individual company-level alignment metrics (e.g., ITR or benchmark divergence metrics) may be aggregated to understand the alignment for a portfolio of companies. The aggregation can occur at multiple levels, but there are some theoretical challenges to aggregating beyond the sector-level (where companies will have been assessed using the same benchmark scenario). Nevertheless, no matter the aggregation level, a key condition for building a portfolio alignment tool is that it facilitates aggregation and provides a universal alignment metric across sectors.

120 This use case is very nascent and its fundamental purpose may differ from this initial assessment.

There are three primary aggregation approaches, each of which provides financial institutions with different information: aggregated-budget approach; portfolio-owned approach; and portfolio-weight approach.[121] The 2021 PAT Report[122] suggests that, if disclosing portfolio alignment information, financial institutions use an aggregated-budget approach in order to maximize the scientific robustness of their disclosures. If supporting internal capital allocation decisions, financial institutions may use a simple weighted average approach. The 2021 PAT Report[123] also suggests financial institutions disclose the proportion of their portfolio covered by portfolio alignment scores, and that they clearly label the aggregation methods applied, as each comes with their own use cases.

In this section, GFANZ has summarized a high-level overview of the three approaches.

Aggregated budget approach

The aggregated budget approach uses a weighting based on financed emissions to determine a portfolio or sub-portfolio "owned" portion for each company's emissions and benchmark using a PCAF attribution factor. For example, if a financial institution owns 10% of a company, then the financial institution will be allocated 10% of the company's emissions and carbon budget over time. A practitioner would then combine the owned portions of each company's emissions to get a cumulative owned emission for the portfolio or sub-portfolio. The owned carbon budgets for each company would also be combined into a cumulative owned carbon budget. The cumulative owned emissions would then be compared to the cumulative owned carbon budget in order to estimate the total carbon budget under/overshoot. An ITR metric, or other portfolio alignment metric, could then be calculated using the total carbon budget under/overshoot. Per the 2021 PAT Report, the primary benefit of the aggregated-budget approach is that it is based on the same physical science principles as the actual climate system: the warming caused by a given portfolio is a direct function of the cumulative under/overshoot of its unique proportion of the global carbon budget. As a result, of all available aggregation methods, the aggregated budget approach results in the most scientifically robust scores.[124]

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121 All relevant considerations for Judgement 9 can be found in Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.52-57.

122 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.57.

123 Ibid, p. 57.

124 For greater explanation of the advantages, limitations, and mechanics of the aggregated budget approach see Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.52-57.

Table 22: Illustrative example of the aggregated budget approach for two companies

COMPANY	FINANCIAL INSTITUTION'S OWNERSHIP STAKE (%)	COMPANY'S EMISSIONS (MT)	COMPANY'S ALLOTTED CARBON BUDGET (MT)	FINANCIAL INSTITUTION'S "OWNED" EMISSIONS (MT)	FINANCIAL INSTITUTION'S "OWNED" BUDGET (MT)
Company Z	30%	100	10	30	3
Company AA	10%	200	60	20	6

CALCULATION STEP	CALCULATION STEP OUTCOME
Portfolio's combined "owned" emissions	30 + 20 = 50 Mt
Portfolio's combined "owned" carbon budget	3 + 6 = 9 Mt
Portfolio's total carbon budget overshoot	50/14 = 3.57 x overshoot
Portfolio's resulting ITR	2.7 degrees C

Portfolio-owned approach

The portfolio-owned approach is similar to the aggregated budget approach but, instead of combining owned emissions and owned carbon budgets into a single combined emissions trajectory and carbon budget, this approach simply assigns a weight to the final alignment metric (e.g., ITR) of each investment/company, based on what proportion of total portfolio-owned emissions the company's emissions represent.[125] The example outlined in Table 23 demonstrates the portfolio-owned approach for Companies Z and AA:

Table 23: Illustrative example of portfolio-owned approach

CALCULATION STEP	CALCULATION STEP OUTCOME
Company Z ITR	3.7 degrees C
Company AA ITR	2.2 degrees C
Company Z proportion of total owned emissions	30/50 = 0.6
Company AA proportion of total owned emissions	20/50 = 0.4
Portfolio's resulting ITR	(0.6 x 3.7) + (0.4 x 2.2) = 3.1 degrees C

Portfolio-weight approach

The portfolio-weight approach calculates the portfolio-level score by weighting individual company alignment metrics (e.g., ITR) by the outstanding values held in the portfolio. It provides insight on the impact of capital-allocation decisions (through the respective value of each investment) rather than focusing on each individual investment's contribution to emissions.[126] For example, Table 24 demonstrates the impact of the portfolio-weight approach on the resulting ITR, assuming 20% of the portfolio is invested in Company Z and 80% is invested in Company AA:

125 For greater explanation of the advantages, limitations, and mechanics of the portfolio-owned approach see Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.52-57.

126 For greater explanation of the advantages, limitations, and mechanics of the portfolio-weight approach see Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p.52-57.

Table 24: Illustrative example of portfolio-weight approach

CALCULATION STEP	CALCULATION STEP OUTCOME
Company Z ITR	3.7 degrees C
Company AA ITR	2.2 degrees C
Company Z proportion of portfolio investment	0.2
Company AA proportion of portfolio investment	0.8
Portfolio's resulting ITR	(0.2 x 3.7) + (0.8 x 2.2) = 2.5 degrees C

Challenges with aggregation

In theory, all three approaches can be used to aggregate companies from a variety of sectors and regions. In practice, practitioners primarily use one of two approaches, choosing either the aggregated budget approach or portfolio-weight approach. However, GFANZ engagement also highlighted a number of aggregation challenges that may limit the adoption of these approaches.

Challenges with the aggregated budget approach include its dependence on the quality and availability of data as the method requires both company and benchmark emissions data for all companies being aggregated. This can limit its usage for portfolios which include investments and companies with incomplete or no data.

On the other hand, portfolio-weight approaches will underestimate the climate impact of portfolios that have relatively smaller portions of the portfolio value in high-emitting companies. For example, a portfolio could include a high-emitting Company AB which represents a small proportion of the total portfolio value (e.g., 5%) but a large proportion of the portfolio's total carbon budget overshoot (e.g., 80%). Portfolio-weight approaches will systematically underestimate Company AB's actual contribution to global warming. Additionally, if all portfolios use a portfolio-weight approach and Company AB represents a small proportion of the total portfolio value for each financial institution, this could result in collective inaction towards addressing Company AB's emissions.

There are also broader concerns regarding the robustness of all aggregation approaches when combining companies from disparate sectors and regions. Moreover, company-level alignment metrics aggregated at the portfolio level do not provide insight into the level of dispersion: for example, two different portfolios may be rated as 2 degrees C-compatible, but one of them may be comprised of only 2 degrees C-compatible companies, while the other could be comprised of 1.5 degrees C- and 4 degrees C-compatible companies.

These challenges should be weighed against the significant advantages to portfolio-level measurement, namely that alignment can be monitored at the financial institution level.

3.10 – ALIGNMENT MEASUREMENT CONSIDERATIONS FOR CLIMATE SOLUTIONS

Consultation question(s) for consideration:

- How should the alignment of climate solutions be measured so that their mitigation impact is fully considered?
- How should nature-based solutions be addressed in portfolio alignment measurement?

Climate solutions are technologies that directly contribute to the elimination of real-economy GHG emissions, as well as services supporting the expansion of these technologies. These solutions include scaling up zero-carbon alternatives to current high-emitting activities. Examples of climate solutions are energy efficiency technologies, the development of renewable power, the growth of natural sinks through nature-based solutions and reforestation projects. One of the four approaches of the GFANZ Financial Institution Net-Zero Transition Plan publication highlights the importance of financing or enabling the development and scaling of climate solutions to replace high-emitting technologies or services.

Engagement undertaken by the GFANZ workstream on Portfolio Alignment Measurement found that the challenge with assessing net-zero alignment for providers of climate solutions arises due to the fact that low-carbon technologies, just like fossil-fuel power technologies, generate substantial emissions during the manufacturing process. However, the crucial point about providers of climate solutions are not their induced emissions generated during the production process but the fact that these companies help other real-economy actors to reduce emissions over the life cycle of the climate solution deployed. Take the example of a solar panel manufacturer. Induced emissions during the production process are significant because the panels are made of silicon which requires substantial levels of heat for proper shaping. However, when considering the relevance of these emissions over the total lifetime of the panel[127] the payback period is between one and three years,[128] depending on where the panel has been manufactured and where it is finally used. This will in turn impact the lifetime emissions savings.

While the current Key Design Judgement Framework on portfolio alignment would capture the Scope 1, 2, and 3 emissions for companies providing climate solutions (which for example would include emissions from electricity use during the manufacturing process or emissions from the sourcing of carbon-intensive raw materials), the framework does not currently capture the climate solution's life cycle emissions. As illustrated in the solar panel example above, emissions arising during the production process of climate solutions are negligible when considering the total emissions saved over the lifetime of the solution deployed. Furthermore, the current framework includes net-zero aligned decarbonization pathways but does not consider production/capacity-based net-zero aligned technology pathways that need to be scaled up over time in order to achieve net-zero emissions. Consequently, when employing the current Key Design Judgement Framework as outlined in this draft report, providers of climate solutions may have unfavorable alignment outcomes due to the fact that only the company's induced emissions are accounted for. Therefore, the inability to capture this nuance within portfolio alignment metrics may limit the incentives for financial institutions to provide climate solutions financing.

127 Estimated at 25 years.

128 The Renewable Energy Hub, Solar Photovoltaics — Cradle-to-grave analysis and environmental cost, 2018.

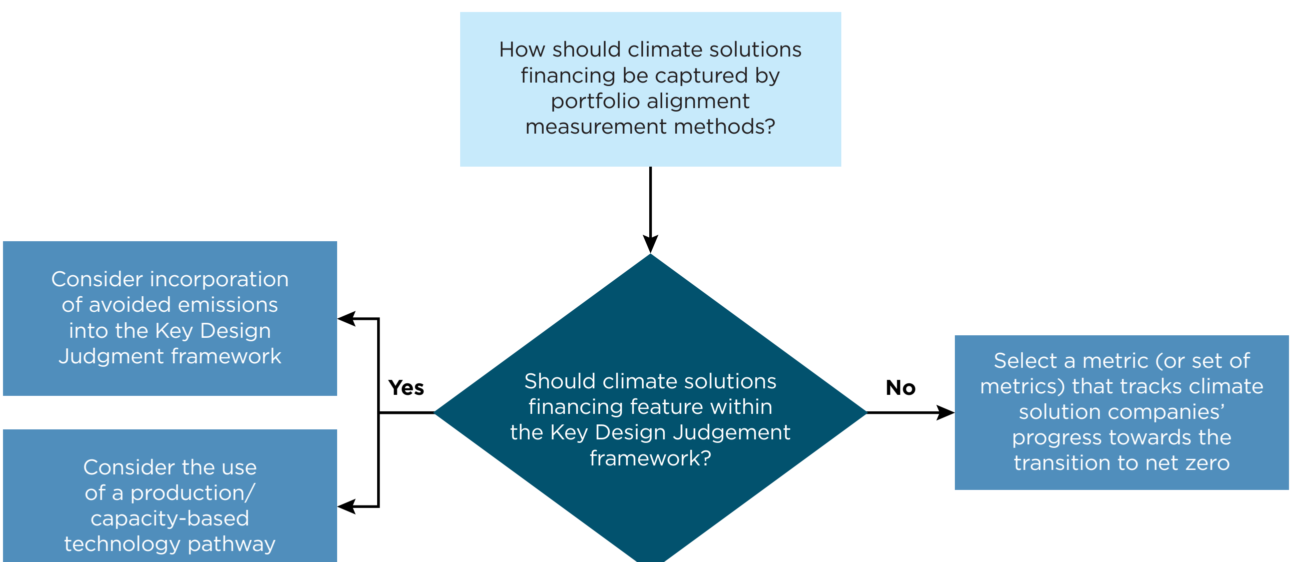
This section begins to address this shortcoming and features via practitioner case studies how the impact of climate solutions could be measured. The case studies shall help to illustrate potential methodological options for capturing climate solutions when measuring net-zero portfolio alignment.

Based on feedback received on the topic of climate solutions, two schools of thought emerged (Figure 35):

1. Measuring the alignment of climate solutions as part of the nine Key Design Judgements. Thus far, two approaches have been identified. The first approach considers the computation of avoided emissions that could then feed into the framework, for example by including a fourth scope in Judgement 4. The second approach considers the use of production-based technology pathways that would scale up over time and would be complementary to the emissions reduction pathways employed. The production pathways could feed into the benchmark construction considerations in Judgements 1 and 2 and could be used to increase the benchmark budgets assigned to climate solution providers who in turn would obtain more favorable alignment scores.
2. Or alternatively, measuring the alignment of climate solutions separately from the current Key Design Judgement Framework and considering separate final metrics. For example, the IIGCC suggests a number of alternative metrics, for example based on the EU's taxonomy for climate change mitigation and adaptation activities.

In the following section, four case studies from financial practitioners illustrate the approaches outlined above.

Figure 35: Decision landscape for a financial institution considering tracking the alignment of a climate solutions company



MEASURING ALIGNMENT OF CLIMATE SOLUTIONS COMPANIES AS PART OF THE NINE KEY DESIGN JUDGEMENTS: CASE STUDIES ON AVOIDED EMISSIONS

The information discussed in Example 24 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Climate solutions

EXAMPLE 24 — INSTITUTION: MIROVA

Institution Sub-sector: Asset Management

Mirova is a French Asset Manager focused on sustainable investing. They suggest that investment approaches considering only Scope 1, 2, and 3[129] emissions for providers of climate solutions do not necessarily paint a complete picture of a company's climate impacts. For example, a manufacturer of cosmetics products might have the same total emissions as a wind turbine manufacturer. However, relying exclusively on induced emissions might be counterintuitive as a turbine manufacturer contributes substantially more to the creation of a net-zero economy and would benefit from it, compared to a cosmetics company. Therefore, they have examined approaches to incorporating emissions savings[130] into their sustainable investment strategies and note that a whole ecosystem of real economy actors contributes to the net-zero economy by helping others decarbonize, particularly in the renewable electricity sector, energy efficiency, the buildings sector and mobility in general.

Therefore, to consider a company's positive climate contributions more adequately, emissions savings relative to an adaptable, net-zero aligned reference scenario need to be estimated alongside induced emissions. Emissions savings are hypothetical and represent emissions that were not emitted thanks to a company's low carbon products or processes. They represent the difference in induced and saved emissions, over the lifecycle of the solution deployed. Mirova splits emissions savings into two types: "reduced increase" where the solution has enabled the avoidance of an increase in emissions compared to historical emissions, and "reduction" where the solution has enabled for a reduction compared to historical emissions.

129 Induced Emissions: the company's carbon footprint.

130 Emissions savings: reduction in induced emissions compared to a reference scenario, over the whole life-cycle of the solution considered

Figure 36: Aggregated static (left) and dynamic (right) representations of life-cycle emissions savings from a solution, differentiated into "reduced increase" ($ESRI_{RI}$) and "reduction" (ESR_R)

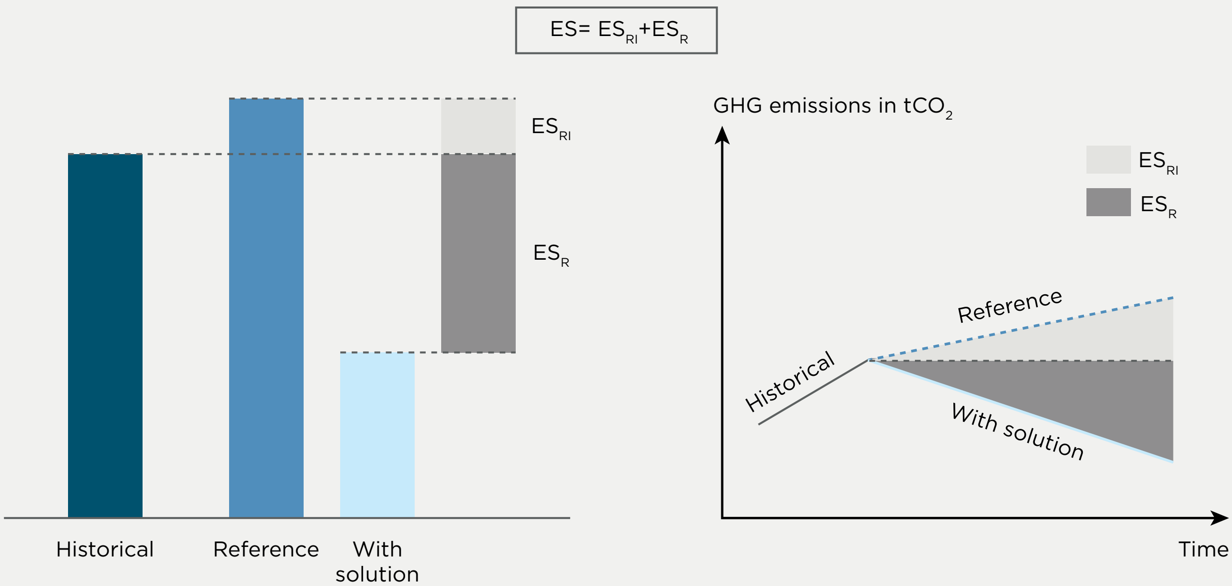
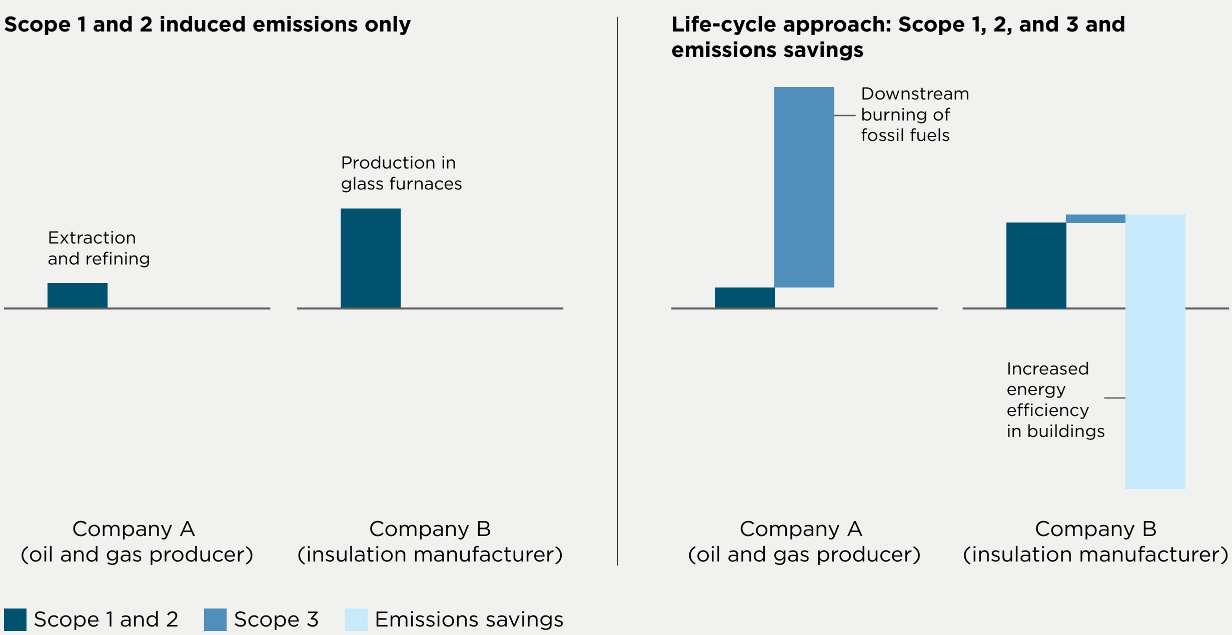


Figure 37: Illustration of the importance of a life-cycle approach and the measurement of both induced emissions and savings in the assessment of companies' climate performance



The above example outlines the approach more clearly:

In the illustrative example provided by Mirova (Figure 37), an Oil and Gas company has lower Scope 1 and 2 emissions from extraction and refining compared to a manufacturer of insulation products where emissions during the production process from glass furnace combustion are significant. On the other hand, when considering the impact over the entire life cycle of both companies, the Oil and Gas company could be attributed significant downstream emissions from the combustion of Oil and Gas by end consumers. By contrast, the insulation manufacturer aids the building sector in becoming more energy efficient and therefore contributes to an overall reduction in emissions when considering the impact over the entire life cycle of deploying the insulation materials in buildings.

Nevertheless, Mirova notes several remaining challenges with regards to the use of an emissions savings approach in net-zero aligned investment strategies:

- **Reference scenarios:** The main challenge around emissions savings is the availability and granularity of appropriate reference scenarios that reflect sector-specific low-carbon technologies that are required to help the sector achieve net-zero emissions.
- **Computations:** Companies can calculate their own emissions savings based on reference scenarios but to be used in the construction of net zero aligned investment strategies, emissions savings must be calculated in a standardized fashion, similar to approaches for induced emissions as defined by the GHG Protocol: scopes of calculation must be the same and reference scenarios must be shared for every company in the investment universe.

The information discussed in Example 25 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Climate solutions

EXAMPLE 25 — INSTITUTION: JUST CLIMATE BY GENERATION INVESTMENT MANAGEMENT

Institution Sub-sector: Asset Management
Just Climate is an investment business focused on climate-led investing, launched by Generation Investment Management. Just Climate defines climate-led investing as investing in climate solutions that can deliver highest positive climate impact and appropriate market returns.

Just Climate invests into growth stage companies (e.g., climate solutions providers), or their projects, that are deploying or are on the cusp of deploying proven technologies or innovative business models that:

- can mitigate very significant greenhouse gas emissions in the next decade;
- are consistent with the 1.5 degrees C-aligned target of the Paris Agreement, do no significant harm and enable a Just Transition;[131]
- can have transformational positive climate impact potential – in other words, accelerate the decarbonization of an industry or sector; and
- can deliver market risk-adjusted returns.

For each investment, Just Climate assesses the company or project-specific Expected GHG Mitigation,[132] using an internal methodology developed based on existing standards. The forward-looking assessment includes various inputs, including a 10-year forward-looking view of the company's business plan, a dynamic view on the baseline, and the consideration for possible negative second-order effects. Cumulative mitigated emissions will then be calculated and, post investment, tracked from this 10-year view. The business plan, inclusive of the forecasted mitigated emissions, is updated every year to reflect changes in the company's development. At portfolio level, the sum of the Expected GHG Mitigation of investee companies and projects is compared to an overall target, which drives alignment of the team's incentives with the climate goal. There is also a process to ensure that the company is System Positive[133] through a series of environmental and social factors identified and managed during the investment process.

This approach facilitates Just Climate's investment strategy by measuring a company's potential to drive highest impact climate solutions. It guides the firm's research process and leads to a focus on solutions that can have a transformational impact on the highest-emitting hard-to-abate sectors. For example, climate solutions such as long-duration energy storage facilities, green steel facilities, and plants that produce syngas from waste all share similar investment characteristics: they have the potential to abate very significant GHG emissions in the next ten years, they are at a tipping point moment when a largely de-risked technology can now be deployed at scale, and their business models offer the potential for significant follow-on investment to roll out more plants/ facilities. In the case of green steel, the firm's preliminary estimates suggest that a specific company developing a greenfield green steel production plant can avoid circa. 90% of the GHG emissions involved in the production of steel, which are circa 1.8 tons CO_2e/ton of steel today. By applying this avoidance factor to the company's business plan, after considering all material impacts across the lifecycle of the project, Just Climate can calculate the Expected GHG Mitigation of investing in such a climate solution.

131 Just Climate define "a just transition to net zero as one which pursues the necessary shift away from GHG emissions across all industries while proactively addressing the associated social and economic impacts, particularly for marginalized communities. Core to a just transition is a process in which workers and communities have understanding and agency over the decisions that affect their daily lives, as part of the shift to net zero".

132 Expected GHG Mitigation is defined by Just Climate as "the forecasted greenhouse gas emissions a specific investment or project is expected to avert, compared to a baseline scenario, or remove, based on a realistic business model, measured in metric tons of CO_2e".

133 System Positive is defined by Just Climate as "solutions that are in line with a desirable and sustainable end-state, including a pathway to limit global temperature rise to 1.5°C, that do no significant harm to, and ideally have material co-benefits for, people and planet; and which enable a Just Transition".

MEASURING ALIGNMENT OF CLIMATE SOLUTIONS COMPANIES AS PART OF THE NINE KEY DESIGN JUDGEMENTS: CASE STUDY ON CONSIDERING PRODUCTION/CAPACITY-BASED PATHWAYS

The information discussed in Example 26 has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Climate solutions

EXAMPLE 26 — INSTITUTION: ROCKY MOUNTAIN INSTITUTE (PACTA)

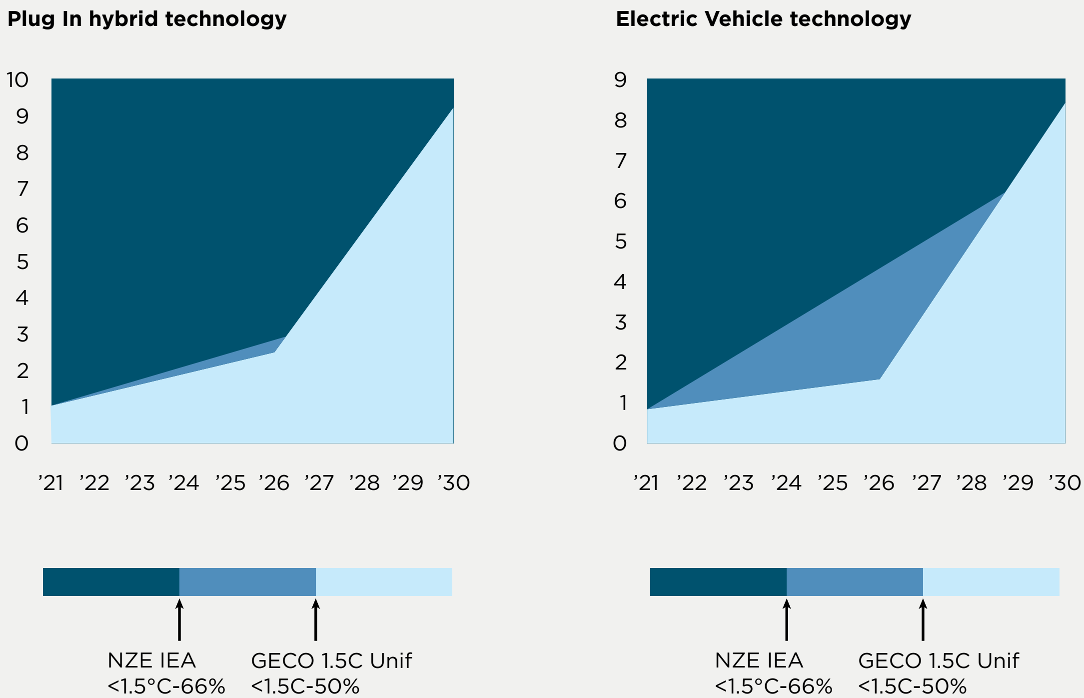
Sub-sector of institution: NGO
The Rocky Mountain Institute is a nonprofit organization and the steward of The Paris Agreement Capital Transition Assessment (PACTA), a methodology and set of tools for measuring the scenario alignment of financial portfolios. It measures scenario alignment based on forward-looking production metrics and can be used to analyse production plans for commercially mature climate solutions, such as renewable power and electric vehicles. The tool's underlying methodology compares the technology trends of net-zero aligned decarbonization pathways with the assets and production plans of portfolio companies. Forward-looking production plans in low carbon technologies can be considered as an alternative to calculating avoided GHG emissions for climate solutions, which are in practice complex to attribute, and has the potential advantage of measuring real economy change against production values in the same units as given in a scenario.

A critical sector covered in the PACTA tool is automotive, being a critical demand-side driver for the fossil fuel use that is estimated to account for around 14% of global CO_2 emissions. Taking two scenarios, the IEA's Net Zero by 2050 and the European Commission's 1.5 degrees C GECO 2021 Unified, the PACTA tool can identify the need to increase production of two main climate solutions — plug-in hybrids and electric vehicles. Figure 38 shows the normalized increase in unit production prescribed by the scenarios.[134] The IEA NZE scenario is more ambitious, as reflected in the higher probability of achieving the climate goal and a faster increase in electric vehicle production. For electric vehicle technology, this implies an eight-fold increase in production to keep the sector in the shaded area that represents alignment with the IEA NZE scenario.

134 How to interpret the numbers: The trajectories are indexed to the start value of 1. Therefore, an increase to 10 would represents a 10-fold increase in production.

Figure 38: Automotive sector 1.5 degrees C decarbonization pathway technology production trajectories to 2030

Cumulative increase in production (indexed to the start year)



Using the PACTA methodology, a target production trajectory for plug-in hybrids and electric vehicles can be calculated for each vehicle manufacturer. The target is therefore an allocation from the overall increase in production needed across the sector to the manufacturer, quantifying the role the respective manufacturer will need to play in decarbonizing the motor vehicle market.[135] By comparing each vehicle manufacturer's 5 year planned technology production data[136] with this target trajectory it is possible to measure how aligned the auto companies are with the decarbonization pathway and the overall goal of net-zero.

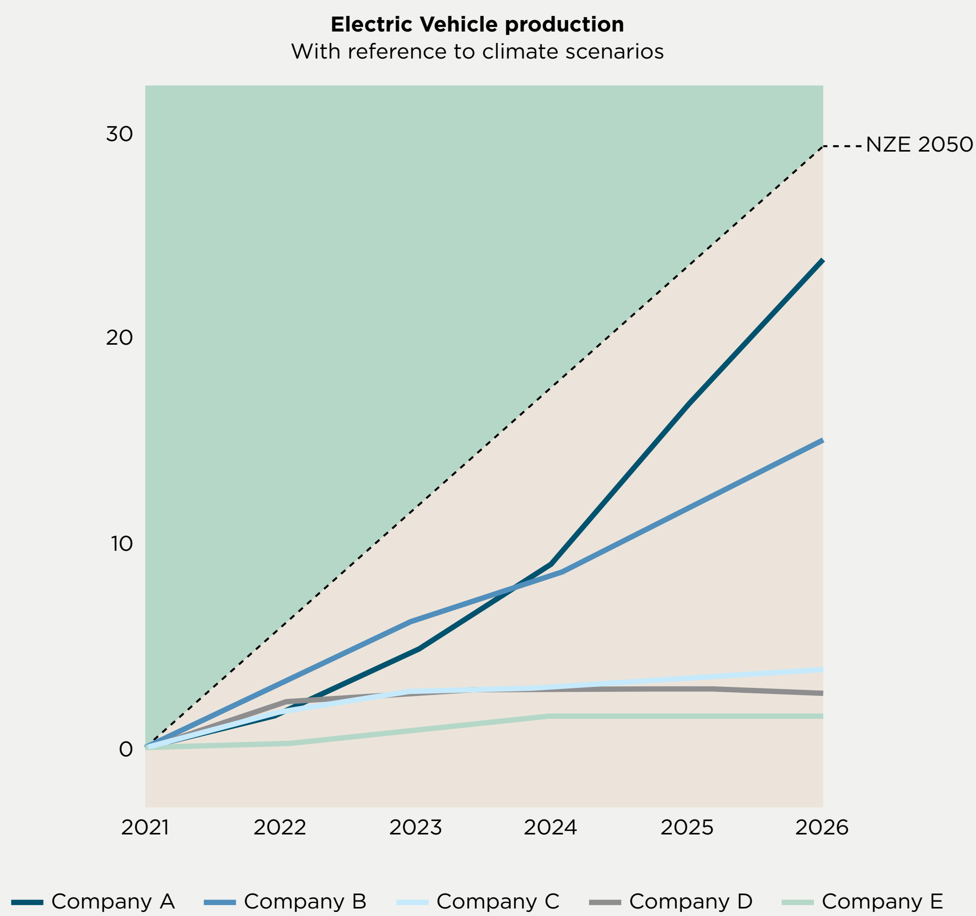
Figure 40 shows the 5-year forward looking alignment of five major international automotive manufacturers with the IEA NZE automotive production trajectory.

135 See the following PACTA methodology note on allocation rules.

136 The planned production data used in PACTA is based on the roll-up of asset level data for production plants to company level and is collated from sectoral business intelligence sources by Asset Resolution.

The Rocky Mountain Institute notes that the results indicate that only one of the manufacturers is planning a production increase that is almost aligned with their target production calculated based on their sector's market share. On the other hand, three auto manufacturers are at a significant distance from being aligned and would need to substantially revise their planned production targets. These results provide insight on exposure to potential business transition risk, as well as helping to quantify the real economy change that is needed. Results using this method could therefore provide a basis for follow-up action by investors and lenders to track net-zero alignment for climate solutions. In PACTA, these company level results are also attributed to investment and lending portfolios in order to give sectoral alignment results.

Figure 39: 2026 electric vehicle 1.5 degrees C scenario production trajectory alignments for five major LDV manufacturers
Changes as % of total production (normalised to sector production in 2021)



Note: the y axis shows the change as a % of a company's total production, indexed to the starting value for both the market and each manufacturer.

MEASURING ALIGNMENT OF CLIMATE SOLUTIONS VIA ALTERNATIVE METRICS

Several other metrics could be used by financial practitioners in order to identify the climate solution potential of individual companies in a net-zero context. These metrics may be less suitable for integration within the existing Key Design Judgement Framework but have merit in that multiple metrics can paint a more complete picture of how aligned companies are to the goal of net zero.

Climate solutions

EXAMPLE 27 — INSTITUTION: INSTITUTIONAL INVESTORS GROUP ON CLIMATE CHANGE (IIGCC)

Institution Sub-sector of: Net-Zero Alliance for Asset Managers and Asset Owners
The IIGCC is a European membership body for investor collaboration on climate change, including both asset owners and asset managers.

In the latest climate investment roadmap, they have outlined four potential metrics to measure and report investments in climate solutions.[137] The aim of these metrics is to help investors track their investments portfolio's contribution to climate mitigation efforts, assess their portfolio's Paris alignment, and inform capital reallocation and engagement with portfolio companies.

IIGCC state that no single metric is a silver bullet to achieve all these objectives, with some metrics particularly constrained by limited availability of data and methodological issues. Given this, investors can consider applying a combination of metrics in the future to track their exposure in a meaningful way. The four metrics discussed are outlined below.

1. The **Green investment ratio** measures a portfolio's investment in overall climate solutions relative to total investments and is aligned with the EU's green taxonomy.
2. The **Priority net zero investment ratio** measures each portfolio's investments in priority technologies or regions relative to its total investments.
3. The **Green capex intensity alignment metric** measures the alignment of a sector's green capex intensity relative to a Paris-aligned benchmark.
4. The **Portfolio carbon return metric** measures the emissions abated relative to total investments, helping to quantify the relative impact of investment decisions, similar to the avoided and emissions savings examples illustrated above. This metric might be suitable for the integration into the Key Design Judgement Framework, as discussed in the previous section.

137 IIGCC. Climate Investment Roadmap, 2022.

Figure 40: Pros and cons of the four potential approaches

At the portfolio level, investors can measure their exposure to climate solutions via:

GREEN INVESTMENT RATIO

Pros:
- Measure % of a portfolio financing climate solutions, aligned with a green taxonomy
- Aligned with the EU taxonomy reporting requirements
- Measured using asset-level revenues from today

Cons:
- Requires more granular revenues disclosures
- Requires regional taxonomies with high interoperability
- Does not capture the varied impact that climate solutions have on emissions reductions

PRIORITY NET-ZERO INVESTMENT RATIO

Pros:
- Measure % of a portfolio financing climate solutions in regions critical for achieving net zero by 2050
- Helps identify solutions facing financing gaps, which require policy support
- Measured using asset-level revenues from today

Cons:
- Requires regional taxonomies with clear investment priorities
- Requires more granular revenue disclosures

As data & methods improve, investors can seek to track their exposure via:

SECTORAL GREEN CAPITAL ALIGNMENT

Pros:
- Measures alignment to Paris-aligned green capex intensity by region and sector
- Forward Looking indicator of emissions and green revenues

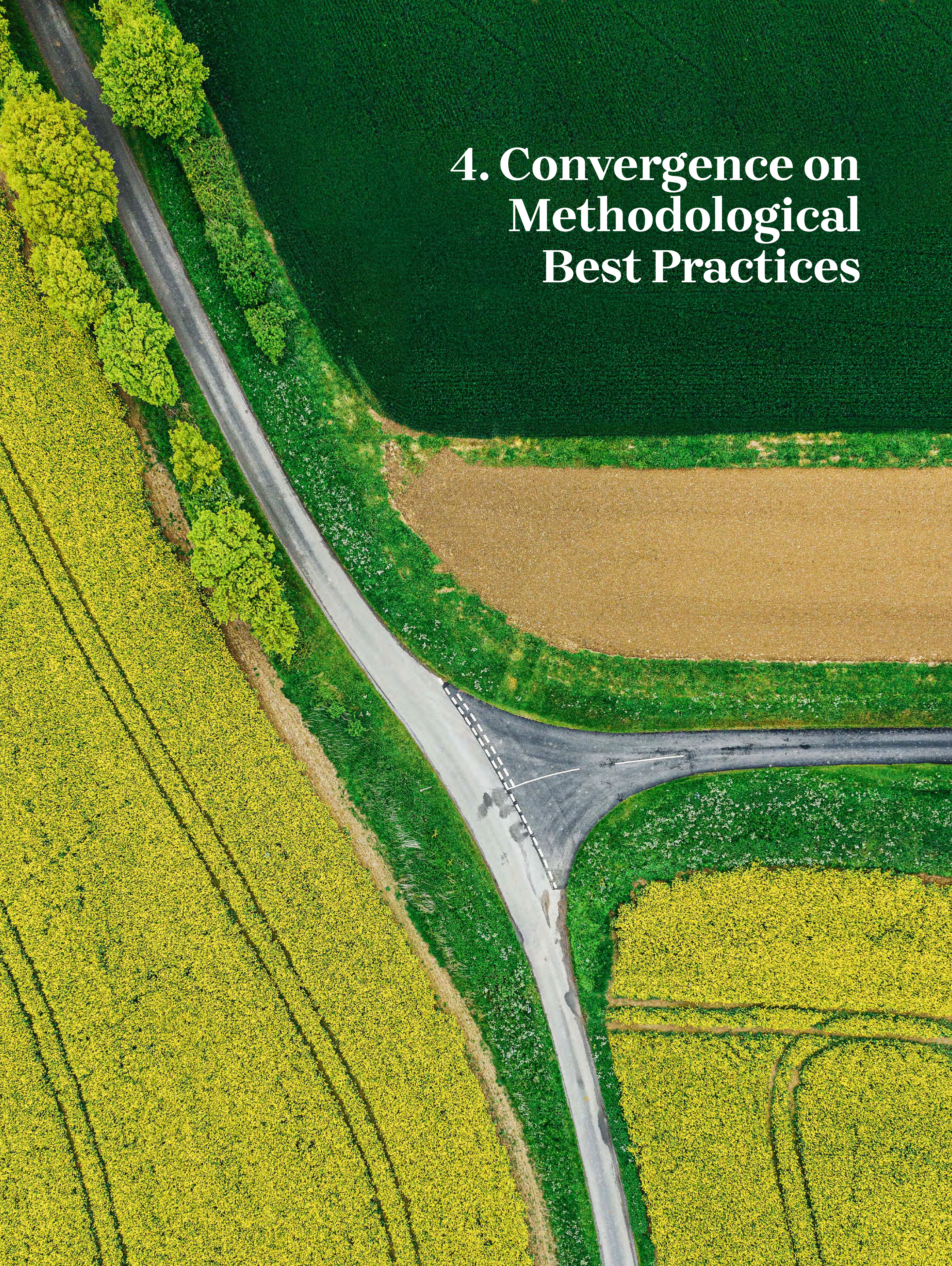
Cons:
- Requires better corporate disclosures on capex, which lag behind revenue disclosures

PORTFOLIO CARBON RETURN

Pros:
- Quantifies impact of investment on emissions reductions
- Recognises avoided emissions from products or services sold

Cons:
- Multiple methodological challenges, complex to solve

4. Convergence on Methodological Best Practices



4.1 – DRIVING TRANSPARENCY WITH METRIC PROVIDERS

Consultation question(s) for consideration:

- Should portfolio alignment metric and data providers publicly disclose their methodology?
- If you indicated yes, should portfolio alignment metric providers disclose their methodology using the Key Design Judgement Framework?

At the time of writing, some initial assessments comparing the portfolio alignment scores of different metric providers indicate that the company-level results diverge substantially, with no systematic pattern for the differences found.[138] This low correlation can be explained by differences in a variety of methodological design choices (e.g., scenario choice, cumulative emissions versus point-in-time approaches, and emissions projections).

More disclosure on how different providers adhere to the guidance on Key Design Judgements proposed in this draft report could be helpful to achieve greater levels of convergence on methodological best practice approaches. To drive convergence on best practice approaches, GFANZ suggests that metric providers disclose their choices against the nine Key Design Judgements. Additional disclosures might aid end users of portfolio alignment metrics in understanding the underlying assumptions and choices portfolio alignment metric providers have made and why alignment outcomes might differ for the same universe of companies. A more detailed analysis of how portfolio alignment metric providers approach the nine Key Design Judgements is planned for inclusion in the final report for publication ahead of COP 27.

Call-to-Action

To drive convergence on best practice approaches, GFANZ suggests that metric providers disclose their choices against the nine Key Design Judgements. Additional disclosures might aid end users of portfolio alignment metrics in understanding the underlying assumptions and choices portfolio alignment metric providers have made and why alignment outcomes might differ for the same universe of companies.

4.2 – THE RELEVANCE OF THE NINE KEY DESIGN JUDGEMENTS FOR THE NET-ZERO ALLIANCES

The net-zero alliances acknowledge the large potential of alignment methods, especially for systematically incorporating forward-looking data.[139] However, at the time of writing, net-zero alliance members are reluctant to rely on temperature-based alignment methods such as ITR for investment and lending decisions for reasons laid out in Sections 1.1 and 4.1 of this draft report. For this reason, the use of alternative alignment metrics is currently preferred. The following are important alignment considerations of the net-zero financial alliances:

The **IIGCC's and PAII's NZIF Net Zero Investment Framework**[140] suggests measuring alignment along a net-zero alignment maturity scale based on categorizing assets across five dimensions: net zero, aligned, aligning, committed to aligning, and not aligned. Companies in high-impact sectors are considered aligned if they fulfil a minimum of six criteria: they set and disclosed short-, medium- and long-term targets compatible with net-zero by 2050 pathways, and their current emission performance is on track to meet ongoing targets, accompanied by a net-zero transition

138 "Portfolio Climate Alignment, Understanding unwanted disincentives when using climate alignment methodologies", Draft Report,
Switzerland Federal Office for the Environment (FOEN), 2022.

139 NZAOA. "Target Setting Protocol Second Edition", 2022.

140 IIGCC and PAII. "Net-Zero Investment Framework", 2021.

strategy and consistent low carbon capital expenditures. The alignment target in NZIF is one of four recommended targets, in addition to an engagement threshold, a climate solutions target, and a portfolio decarbonization target, to which the Key Design Judgements 1-3 can be applied.

The **Net Zero Asset Owner Alliance**'s (NZAOA) **Target Setting Protocol** focuses on absolute emissions or intensity reductions of 22% to 32% by 2025 as a binding commitment demonstrating alignment with a net-zero pathway. The forward-looking element of the protocol comes into play with the use of **binary** metrics as part of the protocol's KPI framework. For example, members should consider their portfolio's science-based target coverage based on the number of underlying portfolio companies with science-based targets. The objective of this KPI is to demonstrate progress on engagement based on an increasing number of portfolio companies setting science-based targets.

Several net-zero alliances — Net Zero Asset Managers initiative (NZAM),[141] NZAOA,[142] Net Zero Financial Service Providers alliance (NZFSPA),[143] Net Zero Investment Consultants initiative (NZICI)[144] — include SBTi metrics as part of their target setting approaches within their net-zero commitments. For example, the Net Zero Asset Managers Initiative (NZAM) recognizes and endorses SBTi's methods as one of three possible target setting approaches.[145] **SBTi's Financial Sector Science-Based Targets Guidance**[146] presents three methods that a financial institution can use to set targets: 1) Sectoral Decarbonization Approach (SDA) focusing on physical emissions intensity-based targets, 2) SBTi Portfolio Coverage Approach focusing on binary target measurement of SBTi-approved targets, and 3) Temperature Rating approach focusing on tracking the temperature rating of portfolios in relation to long-term temperature goals. The Portfolio Coverage and Temperature Rating approaches in particular are focused on measuring portfolio companies' forward-looking emissions data and both approaches have the characteristics of portfolio alignment metrics; namely binary target measurement in the case of the Portfolio Coverage Approach and ITR for the Temperature Rating Approach.

Net-Zero Banking Alliances' (NZBA's) Guidelines[147] have a strong focus on absolute emission reductions[148] in high-emitting sectors to demonstrate alignment with a net-zero pathway. The target setting process, according to NZBA, can be forward-looking. For example, to identify the emissions gap between clients' (counterparties') ambitions and an appropriate 1.5 degrees C-aligned scenario pathway for a 2030-time horizon, a bank could project the emissions of its lending book based on science-based targets set by counterparty clients. Based on the emissions gap, the bank could then redefine lending policies to achieve the interim target set for 2030. Such a forward-looking approach could enable **transition finance**, as those counterparties with sufficiently ambitious net-zero targets would be more likely to ensure continued access to finance and, as a result, they might see their cost of capital decline.[149] Of course, the bank would need to track its clients' progress to ensure that target ambitions are back up by real-world future actions.

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141 NZAM. "Initial Target Disclosure Report", 2022.

142 NZAOA. "Target Setting Protocol Second Edition", 2022.

143 Net Zero Financial Service Providers Alliance. "Commitment", n.d.

144 NZICI. "Guidance and Q&A", n.d.

145 NZAM. "Initial Target Disclosure Report", 2022.

146 SBTi. "Financial Sector Science-Based Targets Guidance", 2022.

147 UNEP FI. "Guidelines for Climate Target Setting for Banks", 2021.

148 Scopes 1, 2 and material Scope 3 emissions.

149 Oxford Sustainable Finance Group, Smith School of Enterprise and the Environment, University of Oxford. "Sustainable Finance and Transmission Mechanisms to the Real Economy", 2022.

While the entire Key Design Judgement Framework is relevant for the construction of benchmark-divergence and ITR models, the insights provided by individual judgements might also inform binary and maturity scale metrics that are currently widely used by asset owners and asset managers (Table 25).

Table 25: How the nine Key Design Judgements may apply to a range of metrics used for portfolio alignment measurement

KEY DESIGN JUDGEMENT	BINARY TARGET MEASUREMENT	BENCHMARK DIVERGENCE	ITR	MATURITY SCALE[150]
Judgement 1	X	✓	✓	X
Judgement 2	X	✓	✓	X
Judgement 3	X	✓	✓	✓
Judgement 4	X	✓	✓	✓
Judgement 5	X	✓	✓	✓
Judgement 6	✓	✓	✓	✓
Judgement 7	X	✓	✓	X
Judgement 8	X	✓	✓	X
Judgement 9	X	X	✓	X

The guidance provided for each of the individual nine Key Design Judgements can help to inform the alignment approaches of the net-zero alliances. For example, guidance on constructing a benchmark with an appropriate sector-specific scenario pathway and assessing the distance of individual portfolio companies in high-impact sectors to the benchmark could help during the engagement process. The credibility framework developed to evaluate transition plans could be leveraged to identify aligned and aligning companies on a maturity alignment scale, as suggested in the Net Zero Investment Framework.[151] Guidance on emission units, Scope 3 emissions, and the appropriate time horizon for assessing alignment might provide additional insights for alliance members during the target setting process.

Example 28 has been sourced has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

150 Given the variation in methodologies used across different maturity scale alignment metrics, this assessment may vary.

151 IIGCC. "Net-Zero Investment Framework", 2021.

Implementation

EXAMPLE 28 — CASE STUDY WILLIS TOWERS WATSON (WTW): MEASURING ALIGNMENT ON A MATURITY SCALE

Willis Towers Watson (WTW) is a major global advisory firm to asset owners. To help clients measure progress toward top-down decarbonization goals in line with net-zero, WTW use a framework it calls a **Carbon Journey Plan** (CJP). The CJP is similar to funding journey plans commonly used to manage financial goals for defined benefit pension schemes. The CJP is an "absolute emissions index" which allows for changes in both carbon footprint and asset price inflation, with the aim of achieving a 50% emissions reduction between 2019 and 2030. It is used to determine whether portfolios are on an appropriate long-term emissions trajectory. WTW believes "that important for the long-term financial outcomes for our clients' portfolios are the destination and the overall trajectory of decarbonization, rather than the position at every point along the path to net-zero." To reflect the non-linear nature of progress, a review range at 30% above and 30% below the target pathway is implemented.

A "**decision tree**" based on a proprietary methodology developed by WTW is used to implement Net Zero Investment Framework's (NZIF's) *alignment maturity scale and to determine whether a security is "committed to aligning", "aligning", "aligned" or "net-zero"*. WTW's methodology uses a combination of Climate Action 100+, TPI and SBTi indicators, supported by broader ESG data sources to fill gaps in coverage, to derive the indicators recommended by the NZIF to categorizing companies along the alignment maturity scale. The result of applying the alignment approaches to a multi-asset portfolio managed by WTW is set out below:

ASSET CLASS	ALLOCATION	EMISSIONS (tCO_2e)	EMISSIONS CONTRIBUTION	% EMISSIONS ALIGNED	% EMISSIONS ALIGNING	% EMISSIONS NOT ALIGNED	CONTRIBUTION TO MISALIGNED EMISSONS
Equities	38%	26,066	27%	4%	36%	60%	35%
Real assets	18%	22,058	23%	15%	41%	44%	15%
Credit	14%	33,026	34%	2%	14%	84%	44%
Diversifying strategies	30%	15,267	16%	3%	34%	63%	15%
Total portfolio	**100%**	**96,417**	**100%**	**6%**	**29%**	**65%**	**100%**

The approach provides insight into the current degree of misalignment in portfolios and identifies those asset managers with whom the portfolio manager should engage to ensure that at least 70% of emissions in each asset class are aligned, aligning, or subject to engagement/stewardship activities. The next step is then to assess the likely timeframe over which engagement activities will result in improvements in the alignment of individual strategies, which translates into targets for the "aligned" category that increases progressively over time and targets for the "aligning" category that increase initially and then flatten out/decrease as the target level of aligned emissions is achieved.

The measurement of progress towards stewarding the transition to a net-zero and climate-resilient economy is an important and complex issue and there is no single definitive metric that can be used to adequately measure progress. As a result, WTW measures progress against climate goals requires using multiple metrics in the form of a **climate dashboard** that considers the multiple dimensions of "success". Progress towards net-zero needs to be achieved with reference to clients' financial goals as well as the clients' needs to contribute to a reduction in system-level emissions (e.g., by investment in climate solutions). For this reason, WTW believes that the use and interpretation of portfolio alignment metrics can be enhanced by considering other metrics, for example, transition risk and climate solution financing. Figure 41 below shows an illustrative heatmap assessment of individual managers and the resulting suggested management actions that will be considered.

Figure 41: Illustrative heatmap assessment of managers and suggested management action[152,153]

ASSET CLASS	MANAGER	LEVEL OF MISALIGNMENT	CONTRIBUTION TO MISALIGNED EMISSIONS	TRANSITION RISK EXPOSURE	CLIMATE SOLUTIONS CONTRIBUTION	DATA QUALITY	SUGGESTED MANAGEMENT ACTION
Equities	Manager 1					High	No near-term action
Equities	Manager 2					High	No near-term action
Equities	Manager 3					High	No near-term action
Real assets	Manager 4					High	No near-term action
Real assets	Manager 5					High	High priority engagement target
Credit	Manager 6					High	Low priority engagement target
Credit	Manager 7					High	Medium priority engagement target
Credit	Manager 8					High	High priority engagement target
Credit	Manager 9					High	High priority engagement target
Diversifying strategies	Manager 10					Low	Prioritise data quality improvements

152 The GFANZ workstream on Portfolio Alignment Measurement received this graphic from WTW, who created this graphic using data from WTW, Climate Action 100+, Factset, Germanwatch, MSCI, TPI, SBTi.

153 Note: in the table above, "committed to aligning" and "aligning" have been consolidated into a single "aligning" category, and "aligned" and "net zero" have been combined in the "aligned" category".

5. Conclusion

With this draft report, the GFANZ workstream on Portfolio Alignment Measurement hopes to further progress enhancement, convergence on methodological best practices, and adoption of portfolio alignment methods. It is hoped that this will support financial practitioners' use of decision-useful portfolio alignment metrics to reallocate capital to the net-zero economy. GFANZ acknowledges that there is scope for further developing and enhancing guidance on the Key Design Judgement Framework. This scope could include measuring alignment of climate solutions companies, the phasing out of high-emitting assets and additional asset classes such as private equity. Therefore, feedback gathered during the consultation period will support the development of the final report for publication ahead of COP 27 and inform how this work is taken forward.

6. Appendices

GLOSSARY

1.5 degrees C-aligned	A pathway of emissions of greenhouse gases and other climate forcers that provides an approximately one-in-two to two-in-three chance, given current knowledge of the climate response, of global warming either remaining below 1.5 degrees C or returning to 1.5 degrees C by around 2100 following an overshoot.[154] Pathways giving at least 50% probability based on current knowledge of limiting global warming to below 1.5 degrees C are classified as “no overshoot”, while those limiting warming to below 1.6 degrees C and returning to 1.5 degrees C by 2100 are classified as “low-overshoot”.
Alignment outcome	The resulting output when a portfolio alignment metric is calculated at the portfolio- or company-level.
Carbon budget under/overshoot	The cumulative emissions of a company (or portfolio) compared to the cumulative emissions that the company (or portfolio) is allotted based on the benchmark scenario.
Climate solutions	Technologies directly contributing to the elimination of real-economy GHG emissions, and services supporting the expansion of these technologies, that financial institutions can support in order to enable the global transition to net zero. These solutions include scaling up zero-carbon alternatives to high-emitting activities — a prerequisite to phasing out high-emitting assets.
Emissions reduction target	A company’s stated pledge to reduce its absolute GHG emissions and/or physical GHG emissions intensity by a set figure within a defined time period.
Hard-to-abate sectors	Economic sectors with relatively higher abatement costs than the rest of the economy. These include, for example, heavy industry sectors (cement, steel, chemicals) and heavy-duty transport (heavy-duty road transport, shipping, aviation).[155]
ITR	Implied temperature rise
Portfolio alignment metric provider	An institution (other than a financial institution) that provides portfolio alignment metrics.
Practitioner	A financial institution or portfolio alignment metric provider that provides their own portfolio alignment metrics
End user	A financial institution that does not calculate its own portfolio alignment metrics, but uses portfolio alignment metrics provided by others.
Net zero	This term refers to a state when anthropogenic emissions of greenhouse gasses to the atmosphere are balanced by anthropogenic removals. Organizations are considered to have reached a state of net zero when they reduce their GHG emissions following science-based pathways, with any remaining GHG emissions attributable to that organization being fully neutralized, either within the value chain or through purchase of valid offset credits.[156]

154 IPCC. “Annex 1: Glossary”, 2019.

155 Energy Transitions Commission. “Mission Possible: Reaching Net-Zero Carbon Emissions from Harder-to-Abate Sectors by Mid Century”, 2018.

156 United Nations. “Race to Zero Lexicon”, 2021.

Net-zero transition plans	A net-zero transition plan is a set of goals, actions, and accountability mechanisms to align an organization's business activities with a pathway to net-zero GHG emissions that delivers real-economy emissions reductions in line with achieving global net zero. For GFANZ members, a transition plan must be consistent with achieving net zero by 2050, at the latest, in line with global efforts to limit warming to 1.5 degrees C, above preindustrial levels, with low or no overshoot.[157,158]
Overshoot	The temporary exceedance of a specified level of global warming, such as 1.5°C. Overshoot implies peak followed by a decline in global warming, achieved through anthropogenic removal of CO_2 exceeding remaining CO_2 emissions globally.[159]
Pathway	A goal-oriented scenario or combination of scenarios answering the question, "What needs to happen?", to accomplish a specific objective (e.g., what are the steps needed to reach net zero by 2050; to limit global warming to 1.5 degrees C, with low or no overshoot).
Portfolio alignment metric	A metric that measures the alignment of a portfolio with a selected benchmark scenario.
Real economy	This refers to economic activity outside of the financial sector. Financial institutions are significant intermediaries that support activity in the real economy—production and consumption by households, businesses, and government—through their lending, investing, underwriting, and advising activities.
Real-economy companies	Companies primarily operating in the real economy.
Scenario	Projections of what can happen by creating plausible, coherent, and internally consistent descriptions of possible climate change futures. Scenarios are not predictions of the future.[160]
Time horizon	The time period over which a portfolio alignment metric is calculated (e.g., a 2030 time horizon means that the portfolio alignment metric is calculated from the present day until 2030). • **Short-term time horizon:** time horizons up to 2025.[161] • **Medium-term time horizon:** time horizons between 2026 and 2035.[162] • **Long-term time horizon:** time horizons between 2036 and 2050.[163]

157 These requirements reflect sector-specific alliance member commitments, with minimum criteria established by the Race to Zero. The Race to Zero criteria consultation process has recommended including low/no overshoot in the Race to Zero commitment.

158 As part of the UN Race to Zero, GFANZ members have also committed to setting an interim target (by 2030 or sooner) reflecting maximum effort toward or beyond a fair share of the 50% global reduction in emissions required by 2030 identified in the IPCC Special Report on Global Warming of 1.5C.

159 IPCC. Global Warming of 1.5 degrees C, An IPCC Special Report on the impacts of global warming of 1.5 degrees C above pre industrial levels and related global greenhouse emission pathways, in the context of strengthening global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, 2018.

160 Climatescenarios. "Primer", n.d.

161 Climate Action 100+. "Net Zero Company Benchmark: Structure and Methodologies", 2021.

162 Ibid.

163 Ibid.

APPENDIX A

Background on GFANZ and the Portfolio Alignment Measurement workstream

GFANZ is a global coalition of leading financial institutions in the UN Race to Zero that is committed to accelerating and mainstreaming the decarbonization of the world economy and to reaching net-zero emissions by 2050. GFANZ brings together seven financial sector net-zero alliances, representing more than 500 members, into a global strategic alliance, to address common challenges and elevate best practices across the sector. GFANZ core areas of work are practitioner-led and advised by leading technical civil society organizations.

GFANZ members have committed to membership criteria developed by their sector-specific alliance in consultation with the UN Race to Zero. The Race to Zero campaign has an independent Expert Peer Review Group (EPRG) tasked with reviewing applications to join the Race to Zero and ensuring they meet the ambitious criteria for participation. This means all GFANZ members must align with the Race to Zero Starting Line criteria, which are detailed in the following section.

GFANZ is led by a Principals Group of top executives from member firms representing diverse geographies and business models. This group sets GFANZ's strategic direction and priorities, monitors progress against them and provides oversight over the GFANZ work program. These priorities are implemented through a Steering Group comprising of senior staff from each of the firms represented on the Principals Group, representatives from the secretariats of the sector-specific alliances, and the chairperson of the GFANZ Advisory Panel. The GFANZ Advisory Panel is a group of civil society organizations who provide technical climate expertise to the GFANZ work program.

The elements of the GFANZ work program under Financial Institution Net-zero Transition Plans are all connected and intended to collectively support financial institutions' net-zero transition planning and implementation efforts. For the provision of finance to be aligned with net-zero goals, financial institutions need to understand and evaluate the transition strategies of their clients and portfolio companies.

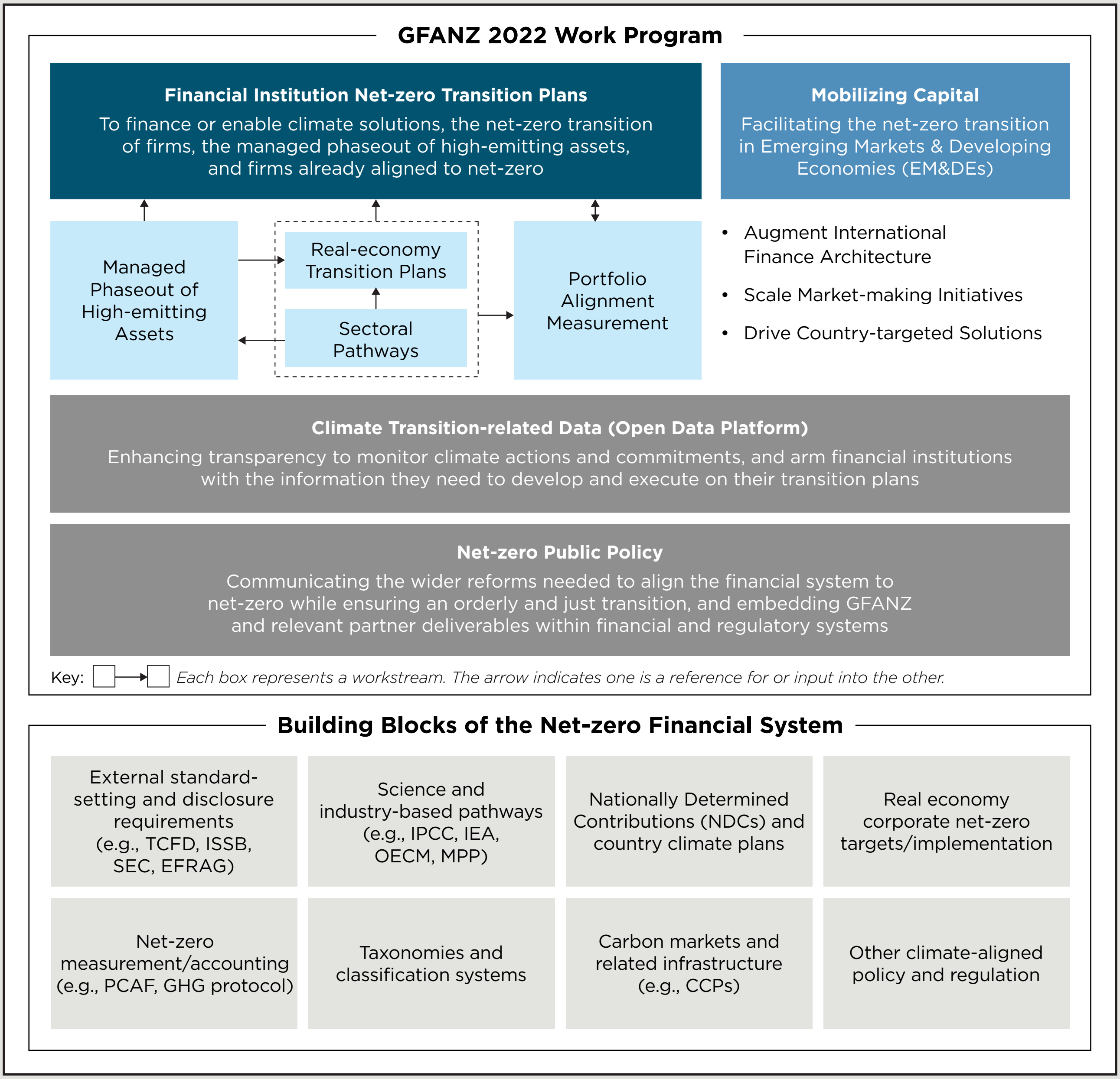
GFANZ's work on real-economy transition plans will support this by delineating the financial sector's expectations for real-economy firms' transition plans to ensure that they include specific, consistent information that financial institutions can use in decision-making.

Sectoral pathways help inform transition strategy development for both real-economy firms and financial institutions, providing information on the alignment of real-economy activities with net-zero objectives.

Portfolio alignment metrics contribute to methodologies for evaluating the alignment of financial portfolios with net-zero objectives.

One approach to net zero-aligned finance is financing or enabling the early retirement of high-emitting assets, informed by sectoral pathways. The GFANZ work on Managed Phaseout sets out preliminary thinking and a work plan to support the use of early retirement as part of net-zero transition planning for both financial institutions and real-economy firms.

Figure 42: GFANZ 2022 work program[164]

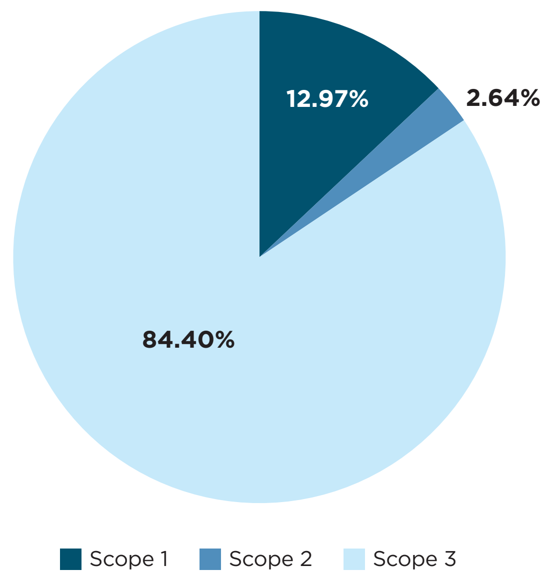


164 GFANZ uses the term "orderly transition" to refer to a net-zero transition in which both private sector action and public policy changes are early and ambitious, thereby limiting economic disruption related to the transition (e.g., mismatch between renewable energy supply and energy demand). For reference, the Network for Greening the Financial System (NGFS), which develops climate scenarios used by regulators and others, defines "orderly scenarios" as those with "early, ambitious action to a net-zero GHG emissions economy," as opposed to disorderly scenarios (with "action that is late, disruptive, sudden and/or unanticipated"). In an orderly transition, both physical climate risks and transition risks are minimized relative to disorderly transitions or scenarios where planned emissions reductions are not achieved. This explanation applies to all mentions of the term "orderly transition" in this document.

APPENDIX B

Supplemental graphics for Judgement 4

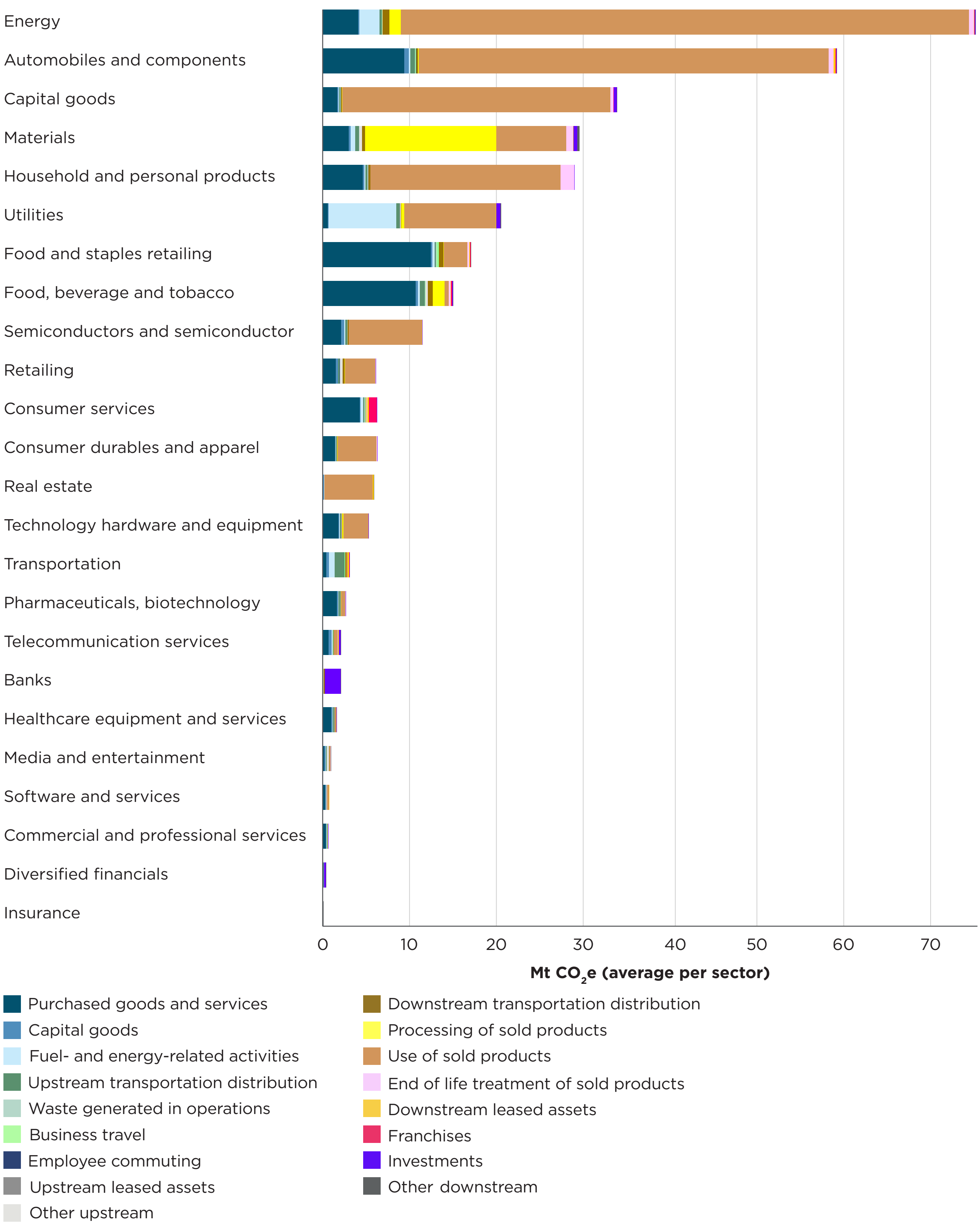
Figure 43: Emissions breakdown by Scope 1, 2, and 3



Methods: the percentage is calculated using ~2000 companies that reported all three scopes in fiscal year 2020.

Source: Bloomberg BESGPRO Index

Figure 44: Scope 3 emissions distribution by 15 categories in GICS industry groups



Methods: Calculated using ~1300 companies that reported at least 2 categories within Scope 3 emissions. Unit: million metric tons.
Source: Bloomberg BESGPRO Index, fiscal year 2020.

Table 26: Comparisons of traditional statistical and machine learning methods

MODELS	PROXIES	ASSUMPTIONS	PRIMARY MODELS	ADVANTAGES
Traditional statistical models (e.g., CDP)[165]	• Revenue, Capex, FTE, and production	• Emissions are linearly related to revenue	• Gamma family Generalized Linear Model	• Straightforward statistical relationships • Sector and industry specific • Require less data
Machine learning models	• ESG, fundamentals, and industry segmentation data	• No specific assumption	• Gradient Boosted Tree	• No specific assumption leads to less prescriptive bias • Can learn relationships across industries • Model emissions uncertainties

APPENDIX C

Full list of key credibility indicators[166]

			DISCLOSURE AND DATA COLLECTION			TARGET-SETTING & VALIDATION		ASSESSMENT TOOLS		
			TCFD	ISSB	CDP	SBTI	TPI-CP	ACT	CA 100+	TPI-MQ
Foundations	Objectives and priorities	• Objectives and over-arching strategy								
		• Just transition								
Implementation strategy	Activities and decision-making	• Business planning and operations								
		• Financial planning								
		• Sensitivity analysis								
	Policies and conditions	• Transition-related policies								
		• Nature-based impact								
	Products and services	• Products and services								
Engagement strategy	Value chain	• Clients/portfolio companies and suppliers								
	Industry	• Industry peers								
	Government and public sector	• Government and public sector								

165 CDP. "CDP Full GHG Emissions Dataset Technical Annex IV: Scope 3 Overview and Modelling", 2020.

166 From GFANZ publication: "Expectations for Real-economy Transition Plans".

			DISCLOSURE AND DATA COLLECTION			TARGET-SETTING & VALIDATION		ASSESSMENT TOOLS		
			TCFD	ISSB	CDP	SBTI	TPI-CP	ACT	CA 100+	TPI-MQ
Metrics and targets	Metrics and targets	• GHG emissions metrics	■	■	■	■	■	■	■	■
		• Sectoral pathways	■	■	■	■	■	■	■	
		• Carbon credits	■	■	■	■			■	
		• Business and operational metrics	■	■	■			■	■	
		• Financial metrics	■	■	■			■	■	■
		• Nature-based metrics	■		■					
		• Governance metrics	■	■	■			■	■	■
Governance	Roles, responsibilities, and remuneration	• Board oversight and reporting	■	■	■					
		• Roles and responsibilities	■	■	■					
		• Incentives and remuneration	■	■	■			■	■	
	Skills and culture	• Skills and trainings		■	■			■	■	
		• Change management and culture	■	■	■					

APPENDIX D

ITR Calculation Methodology

Background

GFANZ engagement found that several metric providers and practitioners have identified the desire for an exploration into the applicability and limitations of methodologies for calculating ITR metrics within Judgement 8. This appendix explores the two methods for calculating an ITR metric as put forward by the 2021 PAT Report:

- **Method 1:** For each company, calculate its carbon budget overshoot compared to the relevant benchmark scenario and then translate that overshoot into warming terms by making the explicit assumption that the rest of the world will exceed its carbon budget proportionally. This can be done by applying a TCRE multiplier.[167]
- **Method 2:** Follow the carbon budget overshoot approach described above, but to calculate the cumulative carbon budgets for multiple benchmarks — e.g., a carbon budget for a 2 degrees C-aligned benchmark, and then a 3 degrees C-aligned benchmark, and a 4 degrees C-aligned benchmark. An ITR can then be interpolated based on the proportional relationship between a given company's cumulative emissions and the various provided industry carbon budgets.

167 Portfolio Alignment Team. "Measuring Portfolio Alignment: Technical Considerations", 2021, p. 76.

ITR calculation challenges

Guidance issued in Section 3.7 and 3.8 (developed on the basis of engagement by GFANZ) details that interpolation (Method 2) is the preferable calculation methodology for short- and medium-term time horizons because a TCRE multiplier (Method 1) that translates carbon budgets into warming outcomes has several issues that may lead to underestimation of warming. The calculated ITR metric when using a TCRE multiplier is dependent on the chosen time horizon over which the cumulative oversight/undershoot is measured. TCRE multipliers are derived based on 2100 global carbon budgets and temperatures. Therefore, using the TCRE approach have the potential to result in proportionality issues in the resulting alignment outcome if budget overshoot assessments are done using significantly earlier time horizons (e.g., 2030). Finally, a TCRE multiplier is set at an economy-wide level, thereby reducing the relevance of sector- and industry-specific benchmarks: the TCRE multiplier assumes that the percentage gaps between climate outcomes (e.g., between 2 and 3 degrees C) is the same across all sectors, which is incorrect. For example, a 20% overshoot of the carbon budget for a 2 degrees C benchmark scenario in the steel sector does not imply the same warming as a 20% overshoot of the carbon budget for a 2 degrees C benchmark scenario in the utilities sector, where decarbonization is comparatively easier.

Despite avoiding the issues associated with the TCRE multiplier approach, multiple benchmark interpolation approaches are dependent on the availability of sector-specific benchmarks. Additionally, the scenarios selected to generate the benchmarks need to be internally consistent. If, for example, the 2 degrees C scenario assumes Europe will lead the world in decarbonization, but the 3 degrees C scenario assumes that China will lead the world, the division of carbon budgets across industries and geographies will be so different between scenarios that interpolating an alignment outcome based on a given company's position between the two will not be possible. Therefore, it is not always possible to use multiple benchmark interpolation and a TCRE multiplier should be utilized.

Example 29 has been sourced has been sourced from direct engagement with a member of GFANZ, as part of the broader, public consultative work undertaken by this workstream.

Implementation

EXAMPLE 29: MOODY'S TCRE MULTIPLIER APPROACH

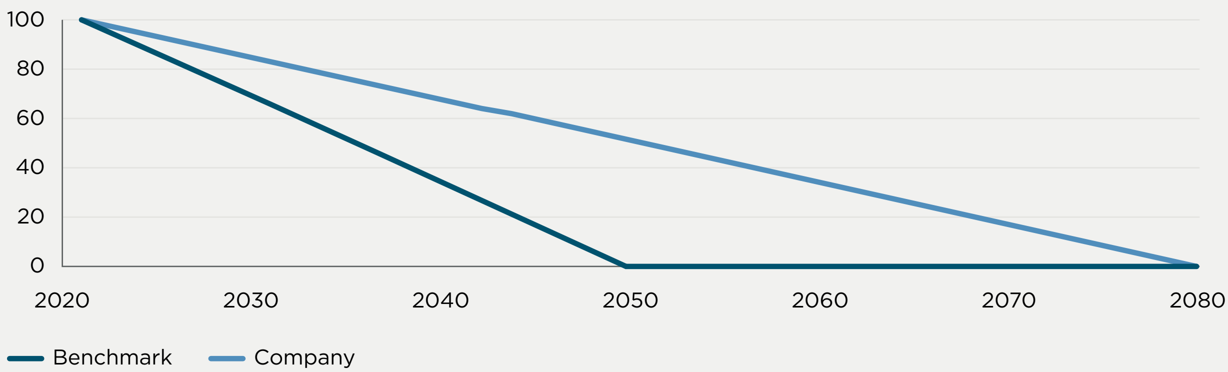
Moody's Corporation, a global financial services provider, is an integrated risk assessment firm. Moody's Temperature Alignment Data assesses how individual companies' emissions targets align with global temperature benchmarks.

The proportionality issues with the TCRE multiplier approach are illustrated in Moody's Temperature Alignment Data, which primarily measures companies' alignment using a 2030 time horizon. Moody's selected this time horizon for two reasons: 1) "the approach encourages a focus on the crucial next decade, giving credit for near-term action rather than that which is deferred over a multi-decade period", and 2) "the closer to the present day, the greater reliability around the assumptions used to build up an emissions projection for a company".

However, Moody's note that using the 2030 time horizon may preclude the use of the TCRE multiplier approach, as it requires an assessment of the total over/undershoot of the global carbon budget. The over/undershoot of the company to the benchmark when calculated from the present day to 2030 will not accurately capture the over/undershoot for the same company to the benchmark when calculated using a longer time frame out to 2100. To illustrate this, consider an emissions benchmark and a company emissions projection, both of which start in 2021 and progress in straight lines to reach net zero in 2050 and 2080 respectively, remaining at zero emissions thereafter (Figure 45).

Figure 45: Illustrative emissions pathways

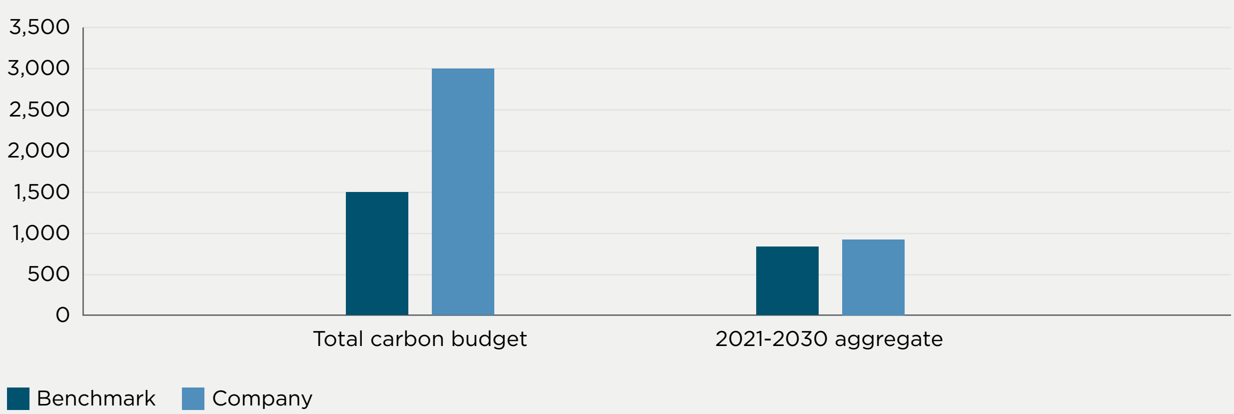
Mt CO_2e



When measured using a 2080 (or later) time horizon, the total aggregate emissions for the company projection are double that of the benchmark (3,000 Mt for the company to 1,500 Mt for the benchmark), leading to a carbon budget overshoot of 100%. However, when measured using a 2030 time horizon, the company's carbon budget overshoot is just 9% (Figure 46).

Figure 46: Aggregate emissions for illustrative pathways

Mt CO_2e



At the company-level, applying the TCRE approach using the 9% overshoot would underestimate the company's resulting ITR metric compared to the later time horizon.[168] At the portfolio level, assuming companies follow a similar emissions trajectory, the likely effect would be that the company-level ITR metrics would cluster near the ITR metric of the benchmark. When aggregating into a portfolio, this would misrepresent both the distribution of the results as well as the overall portfolio ITR metric.

It is possible to use the 2030 time horizon and assume that the over/undershoot of the carbon budget in that time period is proportionally representative of the over/undershoot over the total time period. In this example, one would assume that the 9% overshoot from 2020 to 2030 would lead to 9% overshoot in each 10-year period, leading to a cumulative 54% overshoot from 2020 to 2080. However, when comparing it to the actual overshoot of 100%, it becomes clear that this approach still has significant limitations.

As a result, Moody's determined that the TCRE multiplier approach may not be appropriate for a 2030 time horizon, and it uses multiple benchmark interpolation instead.

PROPOSED GUIDANCE FOR CALCULATING AN ITR

If converting alignment into ITR metrics, GFANZ suggests that financial institutions and third-party metric providers should consider using a multiple benchmark interpolation approach for all sectors where multiple, internally consistent benchmark scenarios are available. If these scenarios are unavailable, then ITR metrics can be calculated by converting alignment into absolute emissions terms, from which total carbon budget overshoot between today and the net-zero target date can be calculated and combined with a TCRE multiplier to derive temperature outcome. To minimize the technical issues associated with the TCRE multiplier approach in earlier time horizons, practitioners and third-party metric providers should consider using this approach to calculate an ITR metric for time horizons beyond 2050.

Connection to guidance from other sections

Judgement 1: Both multiple benchmark interpolation and TCRE multiplier approaches are suitable for any of the three single-scenario benchmark construction approaches (i.e., fair-share, convergence, and rate-of-reduction)

Judgement 7: When calculating an ITR metric over short- and medium-term time horizons, a practitioner should consider using multiple benchmark interpolation whereas either multiple benchmark interpolation or a TCRE multiplier approach can be used over long-term time horizons.

168 An estimate of the corresponding ITR using a TCRE multiplier approach for a 9% budget overshoot would be 1.62 degrees C whereas the ITR using a TCRE multiplier approach with a 100% budget overshoot would be 2.8 degrees C.

APPENDIX E

Portfolio Alignment dashboard approach

Instead of using one of the portfolio alignment metrics outlined in Section 3.8, a practitioner may find it appropriate to use multiple metrics in conjunction within a dashboard approach. This approach allows for the deployment of multiple metrics that can be suitable for different use cases. Example 30 from the Thinking Ahead Institute shows how a climate dashboard might be implemented. This example has been sourced has been sourced from direct engagement with a workstream member of the GFANZ workstream on Portfolio Alignment Measurement, as part of the broader, public consultative work undertaken by this workstream.

Implementation

EXAMPLE 30: WTW'S THINKING AHEAD INSTITUTE

WTW's Thinking Ahead Institute's 1.5 degrees C investing working group released a research report[169] on possible approaches to climate impact reporting and concluded that "a dashboard comprising multiple measures should always be used because there is no single perfect metric that tells the whole story."[170] In the report, the Thinking Ahead Institute (TAI) outlines three portfolio alignment metrics that can be combined into a portfolio alignment component as part of a broader climate dashboard:

- **Portfolio Warming Potential** — this portfolio-level ITR metric is a weighted aggregate of all the individual portfolio companies' warming potentials (i.e., individual company-level ITR metrics).
- **Projected key scope weighted average carbon intensity in 2030** —this metric measures the projected weighted average carbon intensity (WACI) in 2030 of portfolio companies that operate within selected sectors that contribute to the majority of emissions and thus are highly critical to the transition to a low carbon economy.
- **Largest contributors to portfolio misalignment** — this metric determines the companies that are the largest contributors to the Portfolio Warming Potential metric, considering the extent the company's projected carbon emissions exceed the levels that would be consistent with its allocated 1.5 degrees C carbon budget and the weight of the company in the portfolio.[171]

169 Thinking Ahead Institute. "Climate dashboard reporting: How is your portfolio impacting the planet?", 2021.

170 Thinking Ahead Institute. "Climate dashboard reporting: How is your portfolio impacting the planet?", 2021, p.3.

171 Thinking Ahead Institute. "Climate dashboard reporting: How is your portfolio impacting the planet?", 2021, p.20.

The portfolio alignment climate dashboard approach demonstrates that different metrics can be used in conjunction to fulfill different use cases. In this case study, the warming potential (i.e., ITR) metric gives a holistic overview of the portfolio alignment performance and allows for tracking of the portfolio's alignment over time. It is a simple, intuitive metric that may be best suited for a communication/disclosure use case. The sectoral WACI metric provides a clear view of each sector's progress towards 1.5 degrees C-aligned benchmark targets and can assist in portfolio construction decisions. The final metric identifies the largest contributors to portfolio misalignment, allowing for targeted interventions and engagement with companies to improve the portfolio's overall warming potential. Taken together, the three metrics provide a useful basis for disclosure, portfolio construction, and engagement.

An example application of this approach is found in the following dashboard (Figure 47):[172]

Figure 47: Portfolio Alignment Climate Dashboard

Portfolio alignment		Portfolio				MSCI World		
		Key scope	% weight	Alignment metric	1.5°C aligned benchmark[1]	% weight	Alignment metric	1.5°C aligned benchmark[1]
Portfolio warming potential				3.25-3.5°C	<1.5°C		3.25-3.5°C	<1.5°C
Projected key scope weighted average carbon intensity in 2030 allowing for company targets (tCO_2e / US$m revenue)	Cement	1+2	0.5%	3,073	3,044	0.2%	1,694	1,732
	Power generation	1+2	1.5%	526	24	2.0%	2,324	65
	Automobiles	3	1.5%	2,610	230	2.0%	1,274	230
	Mining	3	0.5%	7,340	230	0.7%	5,654	230
	Oil & gas	3	1.4%	5,421	230	2.5%	4,000	230

Largest 5 contributors to portfolio misalignment	% portfolio	Warming potential (incl scope 3)	Scope 1+2 carbon intensity	Scope 3 carbon intensity	GICS sub-industry
Company A	0.6%	8°C	32	2,523	Auto parts & equipment
Company B	0.6%	8°C	13	3,054	Automobile manufacturers
Company C	0.8%	8°C	1,328	753	Industrial gases
Company D	1.2%	6°C	259	796	Semiconductors
Company E	1.0%	6°C	188	781	Semiconductors

[1] Weighted average carbon intensity for portfolio companies in the relevant industry that is consistent with a 1.5°C global mean temperature increase. Scope 1 aligned intensities are based on sector-specific pathways whereas Scope 2 and 3 aligned intensities are calculated using a sector agnostic approach.

172 Thinking Ahead Institute. "Climate dashboard reporting: How is your portfolio impacting the planet?", 2021, p.13.

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