Life Cycle Assessment of Dell Latitude 7300 25th Anniversary Edition

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From design to end-of-life and everything in between, we work to improve the environmental impact of the products you purchase. As part of that process, we estimate the specific impacts throughout the lifecycle. The lifecycle phases included in a LCA are illustrated in figure 1.

LCA Definition

'A life cycle assessment is the compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle' – *ISO 14040: 2006, sec 3.2.*

Figure 1: 'Cradle to grave' Life Cycle Assessment phases

The product selected for this LCA is the Dell Latitude 7300 25th Anniversary Edition notebook. The Dell Latitude 7300 25th AE is a 13" notebook equipped with 16GB RAM, a 256GB M.2 SSD and an Intel Core i7-8665U processor. The configuration modelled in this LCA study represents that of a typical configuration (see table 1).

Table 1: Assumptions

Assumptions	
Lifetime of product	5 Years
Use location	EU & USA
Memory	16GB RAM
Storage	256GB M.2 SSD
Processor	Intel Core i7-8665U

Results Summary

The impact assessment results within this study include but are not limited to; global warming potential (GWP), ozone layer depletion potential and eutrophication potential. The results discussed in this LCA focus on the GWP impact category as it is considered the most robust and widely used impact category. Climate change is also referred to as GWP or the 'carbon footprint'. A detailed view of the carbon footprint is shown in figure 2. The major fraction of the impact (approximately 85%) derives from the manufacturing and use phase of the Dell Latitude 7300 25th AE. Transportation and end of life management has a less relevant contribution to the overall impact of the Dell Latitude 7300 25th AE.

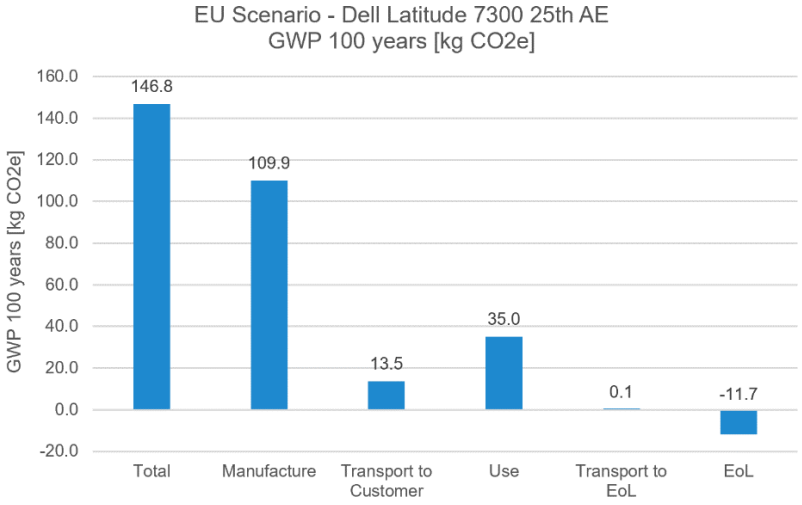

Figure 2: Contribution of the different stages of the lifecycle to the GWP of the Dell 7300 25th AE (EU)

Dell Latitude 7300 25th Anniversary Edition

Key Findings:

- *The use phase contributes to approx. 25% of the total life cycle global warming potential of the laptop.*
- *The manufacturing phase contributes to approx. 65% of the product carbon footprint.*
- *The transport to assembly has minimal effect overall, since all components are sourced from the same location as the assembly takes place (China).*
- *Considering the manufacturing stage only, the electronic components have by far the highest impacts (~88%) of all modules, dominated by the printed wire boards and M.2 solid state drive.*
- *While 88% of the part production comes from the components containing electronics, they only account for 33% of the total weight of the notebook. It is thus possible to show that the global warming potential is not directly linked to mass.*
- *Recycling resulted in a net reduction of 11kgCO2 equivalents, which represents a reduction of the total impact by around 6%.*
- *Considering the net gains from recycling, the largest gain comes from recycling gold (>90%), followed by copper (~5%) and aluminum (~3%).*

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As outlined in figure 2, the manufacturing of the Dell Latitude 7300 25th AE contributes to approximately 75% to the total of the life cycle impact. Figure 3 presents the contribution of the different parts to the total impact resulting from part production. The large majority of the impacts come from the electronic components (˜88%), particularly the PWB's and SSD. The majority of the impact of the 256GB M.2 SSD comes from the NAND flash chips while the three main submodules that generate almost all the impact from the PWBs include; the mixed PWB (16GB RAM bar, Wi-Fi adapter, touchpad), the mainboard and the CPU. PWB manufacturing is a multi-step, highly energy intensive process with a significant amount of waste production and direct emissions.

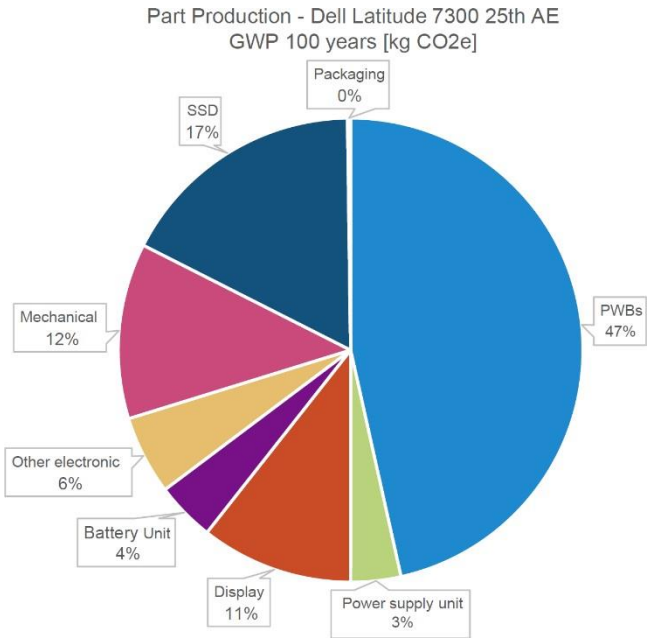

Figure 3: Contribution of the production of different modules to the GWP of the Dell Latitude 25th AE

Conclusion

With portable electronic devices such as the Dell Latitude 7300 25th AE becoming more energy efficient by adopting the newest low-power technology, the shift of the environmental burden from the use phase to the manufacturing is evident. In addition, components that are commonly configurable as *Build to Order* (BTO), such as the SSD, can have a high impact on the environmental results of the product. One would expect the impact of the SSD to increase with increasing storage capacity, as the SSD impact is primarily a function of the area of dies and number of dies within a chipset. Overall, this leads to the recommendation to focus more on the manufacturing part of products and hence more on the supply chain of those components.

How will Dell use the LCA Results?

The results obtained from the Dell Latitude 7300 25th AE LCA will be used to:

- Support EPEAT standard regulations;
- Determine environmental hotspots over the product's life cycle which can be used to support the development of environmentally sustainable products;
- Provide answers to customer enquiries

Did you know?

1 of these products…
has a footprint approx. equivalent to **driving 360 miles** in a passenger car.

10 of these products…
have a footprint approx. equal to what **1.7 acres of US forests** can absorb in a year.

100 of these products…
have a footprint about the same as the annual average carbon footprint of **3 people.**

Further Information:

Full LCA

Zendesk

Progress Made Real – Our Vision for 2030

PAIA

Dell Product Carbon Footprint Datasheets

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Calculations are based on the following methodologies: 2.45 miles driven per 1 kg co2e (source: U.S. EPA); approx. 850 kg co2e absorbed per acre of forests over a year (source: U.S. EPA); global personal carbon footprint estimated at 5 MTco2e per person (source: World Bank).

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