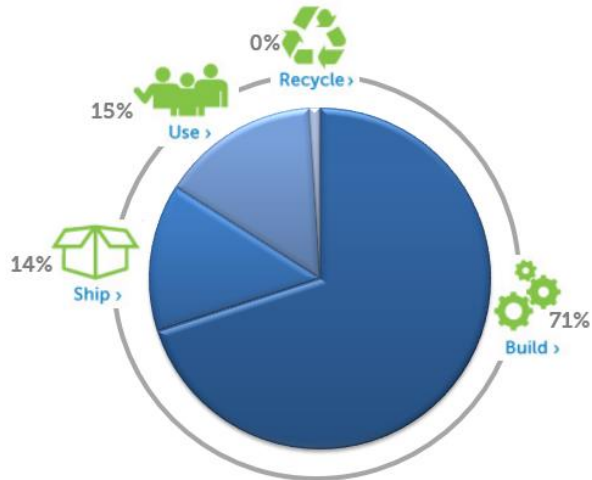# Carbon Footprint of Dell Venue 8 Pro

Stephanie Schafer Regulatory Engineer, Environmental Affairs
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Total greenhouse gas emissions for the Venue 8 Pro are comparable to those for filling up a VW Golf fuel tank fewer than two times.

Dell Venue 8 Pro.

0% Recycle ›
15% Use ›
14% Ship ›
71% Build ›

Breakdown of Contributions to Carbon Footprint.

From product design to end-of-life recycling and everything in between, we consider the environment at every stage of a product's lifecycle. Our environmental programs and initiatives help Dell and our customers reduce consumption and minimize environmental impact.

We have adopted a strategy that takes into account the GHG impacts of our products and our suppliers. We look at each stage of the product life cycle — from developing, designing and sourcing through manufacturing and operations, order fulfilment, customer use and product recovery. By assessing the carbon footprint of a tablet, we are able to identify areas for improvement to reduce overall GHG emissions and also help customers do the same.

What is Dell doing, and how you can help?

By optimizing consumption of energy, we can reduce costs, shrink our carbon footprint and develop expertise that allows us to help our customers do the same.

Build: We committed in early 2009 to further reduce our worldwide facilities' GHG emissions by 40% by 2015. We require our primary suppliers to measure and publicly report their GHG emissions, and we ask them to set improvement goals of their own and set expectations for

their suppliers. We also continue to making smarter choices about the materials that go into our products by using environmentally preferable materials and avoiding those that are not.

Ship: With the introduction of "Smart Selection" systems, the vast majority of purchases will be premade models. These will ship via ocean and will change the transportation from the manufacturer to the customer from a 70% air–30% ship ratio to 20% air–80% ship or better.

Use: All Latitude laptops, OptiPlex desktops, Precision workstations, and Venue tablets can be configured for Energy Star® compliance and are among the most energy-efficient in the industry. As of fiscal year 2013, we also offer approximately 200 products registered for Electronic Product Environmental Assessment Tool (EPEAT).
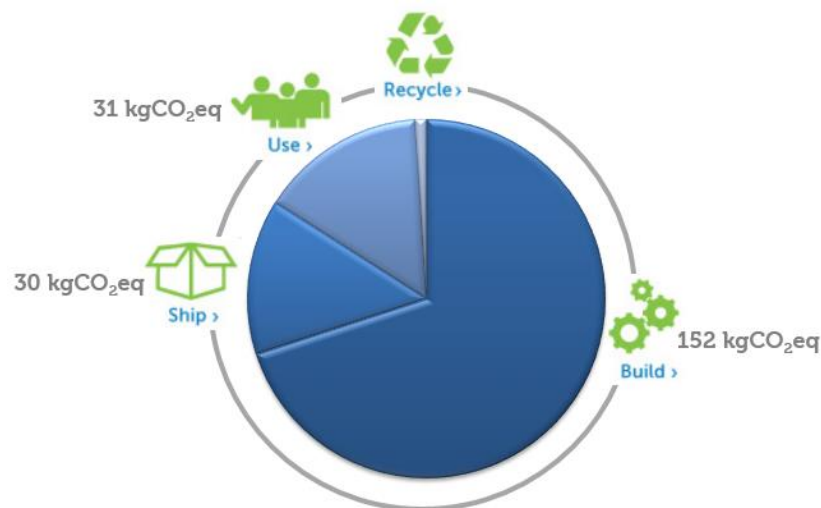
The use of power management features, which put the tablet into sleep mode when not used, needs to be applied by the users more uniformly. This is best achieved by leaving the power management in the factory-default setting.

Recycle: Dell's goal was to offer safe, responsible recycling solutions to all of our customers globally. We were the first in the industry to ban the export of non-working electronics and e-waste to developing countries and we work hard to develop convenient technology recycling programs available to communities worldwide. We have partnered with shipping companies to provide free mail-back recycling of Dell-branded electronics equipment.

Calculating the carbon footprint of a tablet

The total carbon footprint of a Dell Venue 8 Pro (32GB) is approximately 213 $kgCO_2eq$ when used in the US. This is comparable to 24 gallons of gas, enough to fill a VW Golf fuel tank 1.65 times. The comparison demonstrates that the GHG emissions over a two-year lifespan of the tablet are relatively modest.

Increasing the memory capacity to 64GB results in a raise in the carbon footprint to 219 $kgCO_2eq$, primarily due to the ICs contribution within the manufacturing phase.
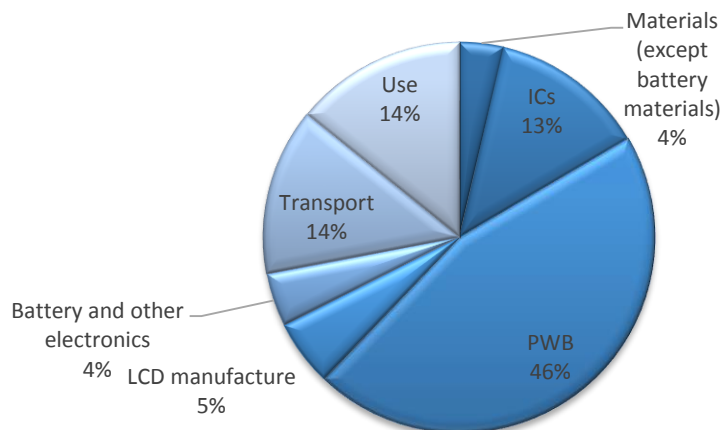

Total Product Carbon Footprint [$kgCO_2eq$] of the Venue 8 Pro Tablet in the US.

The GHG emissions from manufacturing is approximately 70% of the total, with use and transportation making up the remaining 30%. The relative complexity of the tablet, its low power consumption, and its relatively short lifetime are key factors. A lot of effort has gone into enhancing the energy efficiency of mobile products. For most other computer equipment (e.g., desktop PCs and servers), the use phase is typically a much larger component.

The life-cycles phases taken into account are Manufacturing, Transportation, Use, and Recycling. Assumptions made and information required for each phase are as follows:

Build: Manufacturing traditionally includes the extraction, production, and transport of raw materials, the manufacturing of components, and subassemblies (including the product packaging), the manufacturing of the product, and the final assembly of the tablet. These values can be derived from attribute information that is gathered from general dimensions, screen resolution, memory, additional features, and release date.

The overwhelming percent of GHG emissions from manufacturing can be attributed to the steps taken to decrease the carbon input in the other phases. The majority of the emissions contributing to the manufacturing phase come from the materials and production of the electrical components - printed wiring board (PWB) and integrated circuits (ICs).

Breakdown of manufacturing phase in the carbon footprint. Total manufacturing contribution is 152 kgCO2eq, or 71% of the total carbon footprint.

Ship: Transportation contributions include air, ocean, and land transportation of the tablet and its packaging from the product manufacturing location to the final assembly sites, and from there to the distribution centers. Transport of the tablet from distribution centers to the end customer was also included. Transport can be quite varied, depending on region, tablet customization level, and lead time.

Currently, transporting products from the assembly location to the country of use relies a large part on air transport, with a smaller portion being shipped via ocean. Within the country of use, Dell transports primarily by truck. Air transportation has a very high impact due to the fact that is very energy intensive. In contrast, truck and ship transport have much lower impact.

Use: Lifetime of the tablet was estimated at 2 years. This is consistent with general business customer use models. It was assumed that the external power supply is connected to the

electricity 24 hours a day, 365 days a year. To determine the energy consumption in use, the US Environmental Protection Agency's Energy Star® Typical Energy Consumption (TEC) method was used. This method focuses on the typical energy consumed while in normal operation during a representative period of time and can be used to compare the energy performance of computers. The use phase was considered in the US only.

Considering the average use of a tablet, a yearly TEC, or typical energy consumption, can be calculated. For the Venue 8 Pro, yearly TEC is 21.1 kWh.

Recycle: It is common for tablets to be refurbished and/or reused at the end of the first customer use. For this study, however, it was assumed that the tablet was sent for recycling at the end of the first customer use. Following US electronics recycling requirements, we assumed 75% of the tablet is recycled, while the rest is incinerated to recover the energy contained. Transport to recycling as well as energy used in mechanical separation and shredding were taken into account.

Recycling does not significantly contribute to the carbon footprint when compared to the other phases, and makes up 0% of the total emissions. PAIA uses the cut-off method for end-of-life. The impact of end of life is calculated, but recycling is not credited to offset the carbon footprint. However, a market mix of recycled metals is assumed on the front end (raw materials phase), so recycled content is taken into account upstream.

Acknowledgements