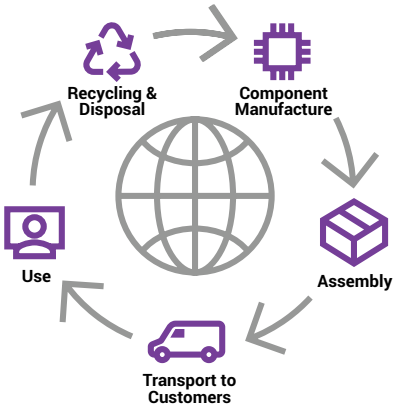
LIFE CYCLE ASSESSMENT OF

Ribbon NPT 1250 Router



Ribbon is committed to reducing the environmental impacts of our products, covering all stages of the lifecycle. We use lifecycle assessment to find the most significant contributors to the environmental impact of our products and inform our sustainability strategies at the product and corporate level.

What is an LCA?

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.)

Product Chosen

A Ribbon NPT 1250 is a fully redundant, modular router designed to provide multi-access edge and pre-aggregation for services, applications and architectures requiring a high-availability multiservice solution. The NPT 1250 router was chosen for this study to support Ribbon's engagement with key customers. NPT 1250 provides 560Gbit interface switching, 300 Gbit/s processing capacity and 100G interfaces in a 2 RU form factor. It provides an extensive set of interfaces for multiple access technologies, such as Ethernet, MPLS, PON, and legacy TDM (CES), and has the capacity to be used for pre-aggregation or a large access edge deployment. The chosen configuration represents the most frequently purchased option. The mass includes packaging, power cords and accessory kits.

Study Parameters	
Lifetime of the product	15 years
Use location	Germany
Cards	2 x 300G TM and 560G switching + 19 packet cards
Memory	8 GB
Storage	16 GB eMMC
Power Supplies	1 + 1 redundancy
Mass	24.91 kg

Results Summary

The impact categories assessed as part of the LCA concentrated on global warming potential over a hundred-year time horizon (GWP100). Global warming potential is also known as a "product's carbon footprint". The results show that 94% of the lifetime impacts are attributed to the in-use phase via electricity consumption. On a global basis, Germany falls in the mid-range of carbon impact per kWh of electricity, which means the use-phase impact can be proportionally lower or higher depending on its installed location. For example, deployment on the NPCC electrical grid, which supports New York and other major US north eastern cities, would see the overall impact reduce to 9,481 kgCO2e over the product lifetime with 90% from in-life energy usage. Transportation and end-of-life management are smaller contributors to the overall footprint.

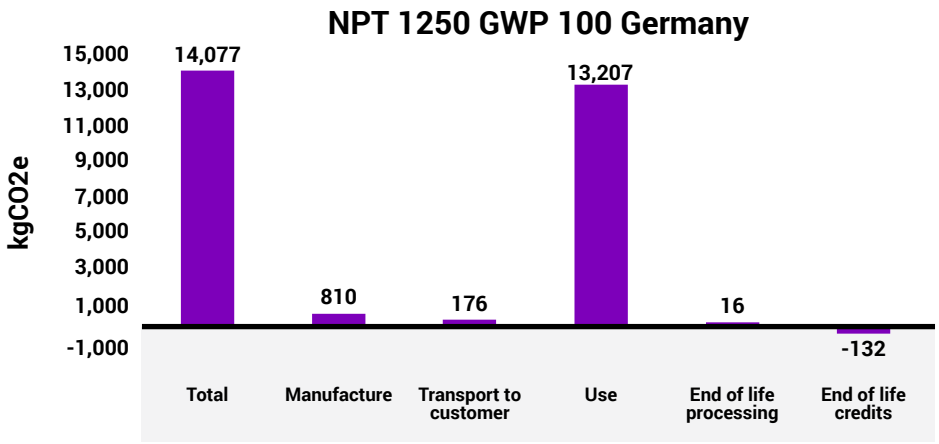


Figure 1. Lifecycle stage contribution to the GWP100 impact of a Ribbon NPT 1250 deployed in Germany.

The manufacturing stage represents 6% of the lifecycle impact in Germany and 9% if installed in New York. Approximately half of the production impact is derived from the installed cards, followed by the main chassis, and then accessories. Just under half of the production emissions originate from printed circuit board production, with the integrated circuits representing the next most significant individual contributor at 19%. There are no further individual items that comprise more than 10% of the manufacturing impact.

While the use phase impact is reduced if installing in New York, the transport impact increases by approximately 65% due to increased travel distance.

Conclusion

The environmental impact of the NPT 1250 in its most commonly purchased configuration is equivalent to the annual footprint of 2 German citizens in 2023 (link). The manufacture and transport stages are equivalent to approximately one year of in-use impact, demonstrating that extending the lifetime of the product in the network to 20 years will reduce the overall impact compared to an updated product in after 15 years.

Key Facts

- The use phase contributes to 94% of the lifetime emissions in Germany and decreases in countries with lower carbon intensity electricity networks
- The manufacturing stage represents 6% of the product carbon footprint in Germany, rising to 11% in New York.
- Printed Circuit Board production is the greatest source of emissions in the manufacturing stage
- The transport stage's impact is dominated by the air freight transport leg, which accounts for 99% of the transport emissions. This is due to air freight covering the longest distances, as well as being the most intensive transport mode used.
- Recycling of the products resulted in a reduction in the lifecycle footprint of 116 kgCO2e.
- The largest gains from recycling come from the recycling of metals. Gold is the single largest contributor, followed by the recovery of copper. Avoiding virgin aluminium, steel and cardboard production further enhances the recycling credits attributed to the product system.

Contact Us Contact us to learn more about Ribbon solutions.