Xerox® ColorQube® 8900
Color MFP
Technical Brief

Solid Ink Lowers Lifetime Energy Investment

Cumulative Energy Demand of a Solid Ink MFP Compared with a Color Laser MFP

A Life Cycle Assessment (LCA)[1] is an evaluation of the environmental impacts of a product or service over all stages of its life. An LCA model typically begins with the extraction of raw materials to create the components of a product, and continues through its manufacture, use, and end-of-life disposition; including transportation steps along the way. The goal of this study was to quantify the differences in environmental impact between current models of two printing technologies, solid ink and conventional color laser. One of the environmental impacts evaluated in the study, Cumulative Energy Demand (CED) is presented. CED is the total lifetime energy invested in the manufacture, transportation, use, and disposal of a product. Both devices have equal print quality, monthly print volumes, and lifespan: 7,500 prints per month over a four year life.

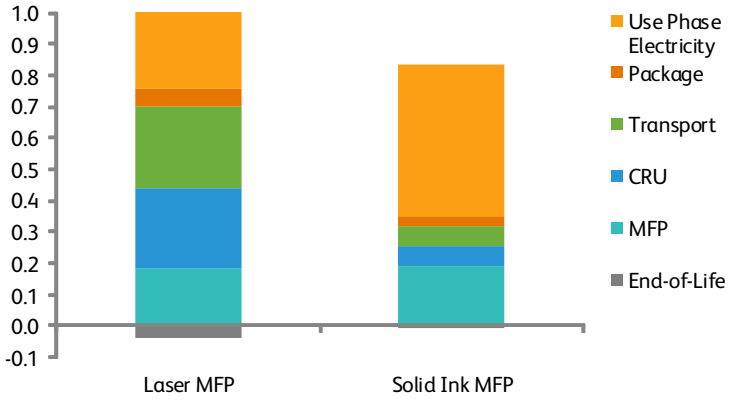
The relative contribution of the Cumulative Energy Demand is expressed across these life cycle categories:

- **Use-Phase Electricity:** the electricity powering the machine during its day-to-day customer use
- **Packaging:** the material acquisition and manufacturing of the packaging for both the printer and replaceable units
- **Transport:** transportation of goods and parts in all life cycle stages except end-of-life
- **Customer Replacement Unit (CRU):** the material acquisition and manufacturing of the CRUs including consumables (ink, toner and cartridges, etc.)
- **Printer:** the material acquisition and manufacturing of the device itself (excluding consumables and packaging)
- **End of Life:** the impact offset by recycling some of the materials and sending the rest to the landfill

The largest contributor to the solid ink printer Cumulative Energy Demand was use-phase electricity, but this impact was more than offset by the solid ink printer's low impact in the other categories when compared to the laser printer. The laser printer's impacts were more evenly distributed between categories with the largest impact contributed by customer replaceable units. The smaller packaging, transport, and CRU environmental impacts of solid ink can all be contributed to the minimal consumables needed to support printing with Solid Ink technology.

Solid Ink's Cumulative Energy Demand is Approximately 17% lower than Laser![2]

Relative Contribution of Cumulative Energy Demand by Category



These results are primarily driven by the design of the solid ink printer, which does not require a cartridge for the ink. Due to this fundamental difference in technology, the solid ink printer produces less waste in the customer environment and uses less embodied energy than a similar laser printer over its life cycle. This study helps designers understand potential areas of improvement for both printing technologies, and helps customers make educated decision when purchasing and using their printing devices.

[1] This brief underwent a peer review to confirm that it adheres to generally-accepted Life Cycle Assessment principles and methodologies. This brief was not required to follow ISO 14040-44 standards, but much of the methodologies and report are in alliance with the standard. .
[2] The Total Lifetime Global Warming Impact of the Solid Ink MFP compared to the Laser MFP had consistent results.