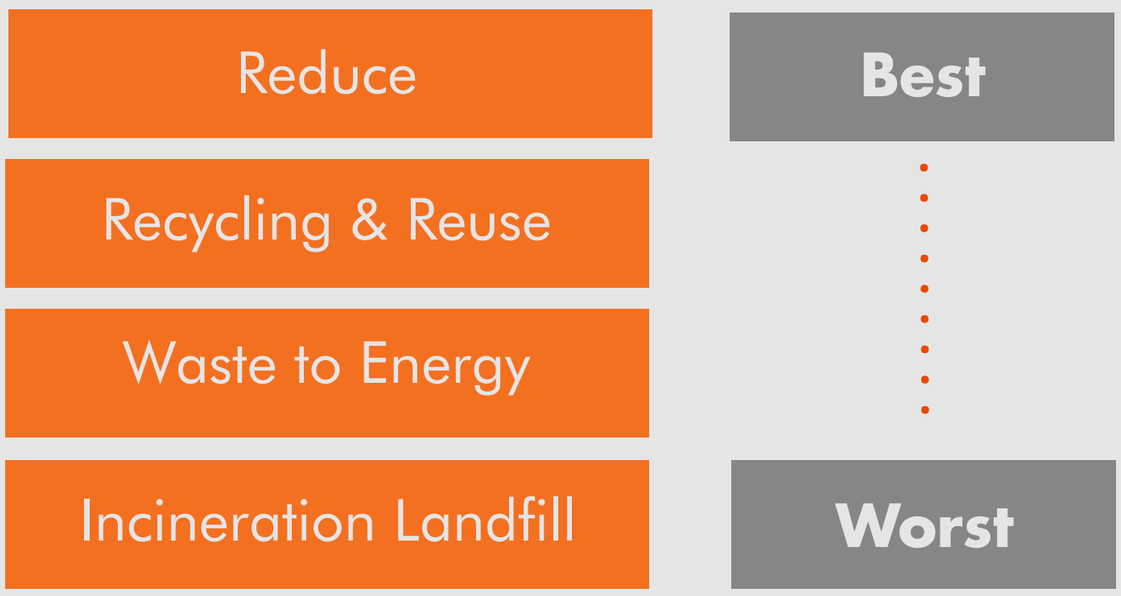
The environmental impact of reuse vs. recycling of toner and inkjet cartridges:

OEM print cartridges are environmentally preferable across their entire lifecycle

- The life cycle assessments of non-Original Equipment Manufacturer (OEM) remanufactured print cartridges show that issues with print quality, reliability, and end-of-life management practices offset the benefits accrued through reuse of third party remanufactured cartridges.
- Superior print quality and reliability combined with material recycling can yield the best environmental outcome for print cartridges.

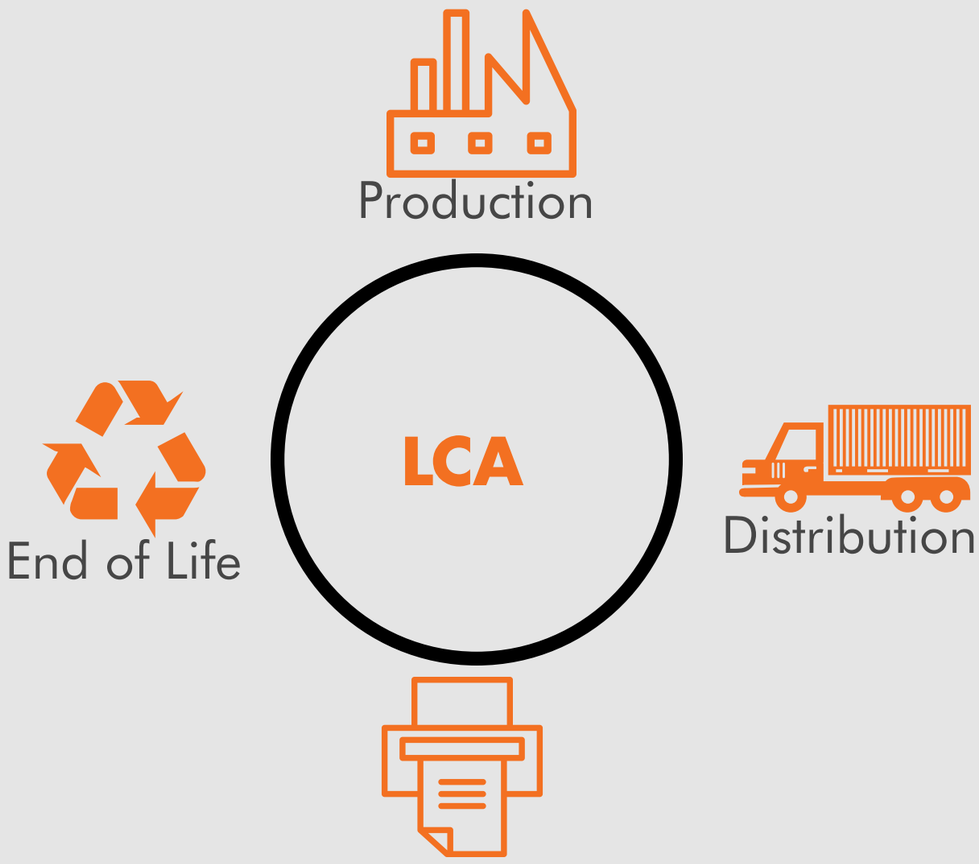
How to best assess the environmental performance of recycled and remanufactured cartridges?

The Waste hierarchy is a useful starting point



- The most beneficial options after waste reduction are material recycling and reuse.
- Issues with cartridge print quality, reliability or inadequate end-of-life management can quickly offset the benefits of materials reuse.

Life cycle analysis (LCA) must be used to assess the environmental performance of recycled and remanufactured cartridges



- OEMs represented by EuroVAprint are working towards circular business models and LCA is a robust and science-based tool to achieve this objective and to eliminate waste through careful design.
- LCA studies adhere to the ISO14040 series standards to ensure that they are accurate and reputable.

The cartridge use phase is the highest contributor to the overall environmental impact of a print cartridge and must therefore be assessed when comparing OEM and remanufactured cartridges.

OEM print cartridges are environmentally preferable when you consider the total impact of their lifecycle

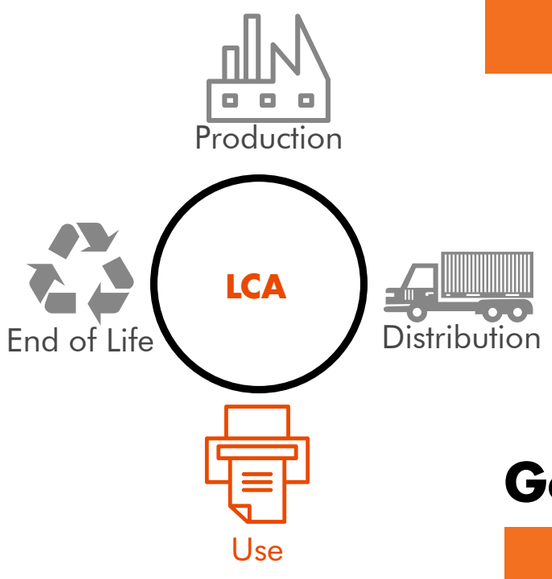
DESIGN: Foresighted engineering reduces overall impact

- ☑ Eliminating waste through the use of recycled plastic
- ☑ Eliminating waste by reducing the complexity of the consumable
- ☑ Incorporating design criteria from recognised environmental labels
- ☑ Eliminating waste thanks to new business models

USE: Print quality and reliability determines the environmental impact of a print cartridge

Consistent print quality saves paper

Paper consumption during printing has the largest impact across the life cycle of a printing system.



Good cartridge reliability avoids premature replacement

Reliability problems waste the energy and materials put into remanufacturing and distributing the cartridges

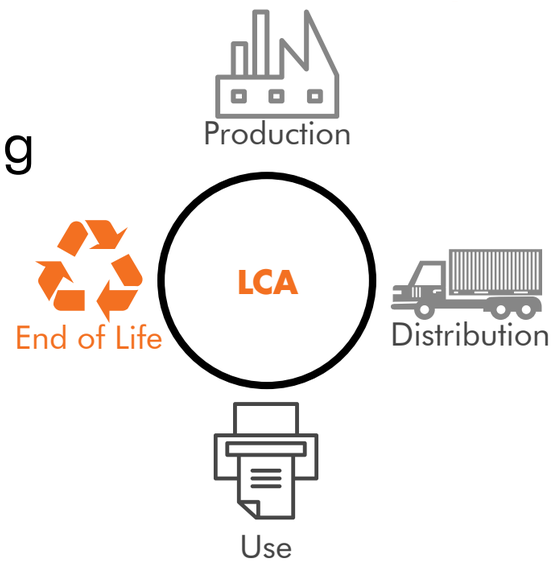
Good cartridges reliability reduces use-phase energy consumption

The environmental benefit of selecting an energy-efficient printer is undermined if unreliable cartridges results in increased product use.

Superior and consistent print quality, dependable page yield, and overall reliability are key criteria in a toner cartridge's carbon footprint because consistent prints mean less wasted paper and the need for fewer cartridges.

END OF LIFE: OEMs offer free cartridge take-back and recycling programmes

- ☑ OEMs provide free and convenient recycling of empty cartridges
- ☑ OEMs provide clear and accurate product environmental information (REACH, RoHS)



Major OEMs offer free cartridge take-back and recycling programmes, diverting millions of cartridges from landfills and responsibly recycling tens of millions of kilograms of ink and toner cartridge materials annually.

Conclusions & policy recommendations

- The quality and reliability of print cartridges, besides their final end-of-life treatment are the most important factors to determine overall life cycle environmental impact.
- Life cycle assessments show that third party remanufactured print cartridges are not environmentally preferable to original OEM cartridges.

- Good environmental public policy for printers and cartridges considers all life cycle phases
- All producers of ink and toner cartridges, including non-OEM remanufacturers and refillers that put cartridges on the EU market under their own trademark, are responsible for the free take-back and environmentally sound treatment of their cartridges at the end of their life, and for providing the same level of data on material content and environmental standards as OEMs.
- Public policy should emphasize on quality, reliability, and final product end-of-life.

For more information, read our full position paper

References:

- 2016 Four Elements Consulting LCA study, commissioned by HP, compared Original HP 80A and 83A monochrome toner cartridges with a sample of remanufactured alternatives across eight environmental impact categories. For more, visit www.hp.com/go/EMEA-LJLCA-2016.
- The LCA leverages a SpencerLab 2016 study, commissioned by HP, comparing Original HP LaserJet toner cartridges with six brands of non-HP toner cartridges sold in EMEA. For details, see www.spencerlab.com/reports/HPReliability-EMEA-RM2016.pdf
- HP 2016 Sustainability Report. http://h20195.www2.hp.com/V2/ GetDocument.aspx?docname=c05507473

About EuroVAprint

EuroVAprint ASBL is a non-profit association consisting of the major manufacturers of imaging equipment that operate in Europe.

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