



Green Guide

How changing your printing habits
can help the environment

Protecting the planet together

Each day, office workers around the world print billions of pages.



What is the impact of office printing on global warming and resource depletion?



What can be done to reduce the footprint?



What are the top tips for users?

Let's see how we can take action now.



What is the impact of office printing on global warming and resource depletion?

Making and using printers generates greenhouse gases and depletes resources

Paper is the single biggest environmental impact of printing.

Lexmark conducts life cycle assessment studies to understand, evaluate and improve the environmental performance of its products and help users to adopt better printing habits.

The study* shows that the use phase of an office laser printer generates 94% of its lifetime environmental impact—of which nearly 84% is generated by the paper alone.

Action can be undertaken at every stage of the product lifecycle.

Global Warming Potential



39.1 barrels of oil consumed



1.8 homes' energy use for one year



2.5 homes' electricity use for one year

Printer Manufacturing

5.77%

Distribution

0.75%



0.05%

EOL

93%

Use

A printer's main impact occurs during the use phase

Legend

- ¹ Use Phase - Energy
- ¹ Use Phase - Maintenance
- ¹ Use Phase - Cartridges
- ¹ Printer manufacturing

¹Lifetime comparison of total global warming potential (kg CO₂ equivalent) during printer life cycle phases, excluding paper



Lexmark conducts LCAs according to the international standards ISO 14040:2006, ISO 14044:2006, and prepares Environmental Product Declarations (EPDs) according to ISO 14025:2007, and follows the requirements of the Product Category Rules (PCR) for preparing an EPD for Printers and Multi-function Printing Units published by UL Environment (ULE) on Dec 12, 2012. The EPDs are third-party verified for accuracy and completeness.

* CX825dte LCA data represented using the assumption of a 5-year lifetime and number of pages printed per day as established by the ENERGY STAR Typical Energy Consumption test procedure. Greenhouse gas equivalencies calculated use the EPA Greenhouse Gas Equivalencies Calculator(<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>)

What can be done to reduce the footprint?

As your manufacturer, Lexmark strives to provide superior printing solutions while demonstrating strong environmental leadership. Our goal is to reduce resource consumption, lower emissions and produce less waste at every stage of our product's lifecycle. With your help, we can achieve these goals.



Reducing resources consumption

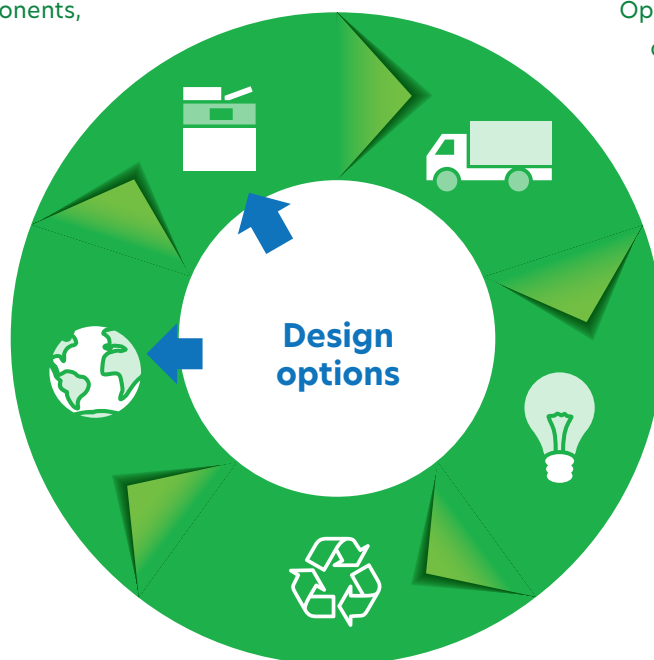
From recyclable designs focused on circular economy concepts to optimised packaging and transport of our products, we continuously seek to lessen the resources consumed by our products.

Environmental design: resource minimisation, long-life components, recyclable designs

Optimised product packaging and product distribution

Reuse and recycle incoming materials, closing the loop when possible

Promote efficient printing and partner with customers to realise the environmental benefits



Robust end-of-life collection programmes



Energy Efficiency

Designing energy-efficient products is a core priority for us, though its real impact is actually limited over a printer's lifespan. To make sure our printers manage power consumption effectively, they are designed to meet ENERGY STAR standards whenever possible. **ENERGY STAR** is a label awarded to energy-efficient products. ENERGY STAR power management dramatically reduces power consumption.

Indeed, **the electricity required to print 8,000 pages a month during 1 year is equivalent to 158 kWh or 6,100 hours using a laptop.**

**Source: Bio Intelligence LCA*

For individual printers, Lexmark recommends turning off the equipment when you know it won't be used overnight for an extended period of time. Additional energy can be saved by shortening the time a printer waits before going into sleep mode.

Produce less waste

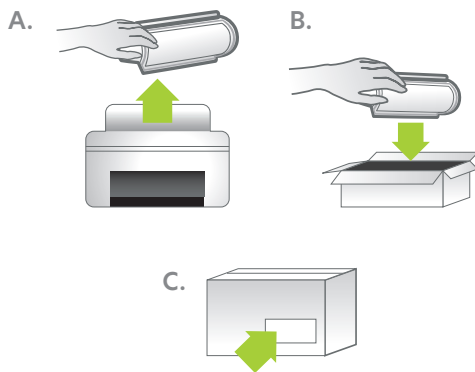
Lexmark is actively embracing the emerging concept of a circular economy—a restorative industrial system focused on maximising the utility and value of products and materials whilst also eliminating waste.

Our extensive cartridge collection network has made Lexmark an industry leader in the recovery, remanufacturing and recycling of used toner cartridges. Lexmark operates product collection programmes in over 60 countries, which represents approximately **90%** of our global market.

Lexmark's promise in action: zero waste to landfill

Every year, Lexmark recycles tonnes of used printers through our individual or collective schemes. Cartridges need to be managed properly due to the large quantity distributed in the marketplace. The Lexmark Cartridge Collection Programme prevents millions of Lexmark print cartridges from ending up in landfill. This free programme encourages our customers to return used print cartridges to Lexmark so that they may be reused or recycled.

For small companies



For large companies



Since 1996, Lexmark has reused over 52 million pounds of recovered cartridge material by converting millions of used toner cartridges into Lexmark-certified reconditioned toner cartridges. The eligible cartridges are disassembled and cleaned, and then the critical components are replaced with genuine Lexmark parts. Finally, each reconditioned cartridge is tested to assure the same high-quality output and reliable performance as a cartridge with all new components.

If a returned cartridge is not a good candidate for reconditioning, it is disassembled in such a way to maximise the materials recovered for use in secondary products. Examples of materials given a second life include toner as an asphalt additive to improve quality and performance and post-consumer recycled (PCR) plastic integrated into new parts.

Lexmark is an industry leader in the use of reclaimed plastic in its cartridges with 18% average post-consumer recycled plastic content, by weight, across all toner cartridges. In fact, 95% of Lexmark branded toner cartridges contain at least some post-consumer recycled content. Lexmark's goal is to increase the post-consumer recycled plastic content in our toner cartridges to 25% by 2018.



Decision Makers

IT Managers, purchasers, systems directors can reduce the environmental impact of their printing systems by optimising the way the employees are going to use them.

Choose eco-designed products

- ▶ Prefer **multifunction products** over single-function personal units

Ever wondered why many companies are replacing copiers, printers and fax machines with multifunction printers? Multifunction products can reduce energy consumption by an average of 30%* and up to 50%**.

- ▶ Use **sustainable paper**

Papers sourced from certified forests, with a third-party eco-label such as the EU Ecolabel can make a big difference. Ask your paper provider to share their sustainable management practices. Lexmark printers are tested to print not only on standard office paper but also on recycled paper and lower weight paper.

- ▶ Purchase **high yield cartridges**

Using high yield cartridges helps reduce the number of materials, shipments, storage costs and number of units to be recycled.

- ▶ Consider buying **Lexmark Corporate Cartridges**

Lexmark Corporate Cartridges have the benefit of using designated components that may have been selectively recovered through Lexmark's cartridge collection programme. High component reuse minimises impacts of sourcing new raw materials for these parts. Additionally, Lexmark has invested in the European production of these cartridges which provides an environmental and local economic advantage.

Explore Lexmark Services offerings

- ▶ Lexmark solutions will help you scan documents, **distribute them by email**, archive the **copies electronically** and, as such, avoid unnecessary prints greatly improving the efficiency of your processes. To tackle paper waste and confidentiality, you can also install **print release systems** in your offices.



*On average, Energy Star-qualifying imaging equipment will be 30 percent more efficient than conventional models."

** Source: EPA Newsroom 2006 - A Better Image with Less Energy

Materials Highlight

Use of plastic and post-consumer plastic in Lexmark products

Lexmark is a global technology leader creating enterprise software, hardware and services, embracing the vision of building a circular economy. It is now Europe's leading remanufacturer of printer cartridges in proportion to its share of the market. For Lexmark, being a responsible neighbour, employer and global corporate citizen is woven into everything it does. To align with the corporate sustainability goals, Lexmark has identified many opportunities to utilise post-consumer recycled (PCR) materials in its products.

Changing regulations have led to an increase in suppliers offering quality recycled plastic materials. Lexmark engineers study the broader use of post-consumer recycled plastic in its products to identify new sources and grades of post-consumer recycled plastics for use in electronics. The consistency of both supply and quality of post-consumer plastic is of primary importance. Lexmark looked at third-party resin suppliers for

PCR in printers, identified stable suppliers and quality resins focusing on 8-10 material grades, and taking more risk, convinced Design Engineers to use more PCR in printers.

The product PCR initiative has evolved from 2007 when PCR was returned to cartridges, and 2009 when Lexmark returned PCR content to its printers with 4% PCR content in one high-end colour laser printer. In 2012, Lexmark's new product line announced three lines of printers having 5% to 40% PCR content.

These achievements are especially notable for their closed-loop use of electronic waste into new electronic products. To expand its goal of prioritising long-life, reliability and sustainability in its products, Lexmark announced its 2016 product line meeting EPEAT Gold. The series' plastic components are qualified to contain up to 50% PCR material by weight, diverting what would otherwise be landfill waste. Lexmark has taken the circular economy to heart, with more than 91% of Lexmark

printers containing post-consumer recycled plastic content.

The company also follows a zero-landfill policy for all the used cartridges it collects. Of the empty cartridges returned to the company, 100% are either reused or recycled.

Lexmark also continues its innovative closed-loop toner cartridge recycling operations. Through the award-winning LCCP, its engineers reclaim feed streams of various types of plastics in Lexmark's own R2 Certified Recycling Centre. Lexmark is an industry leader in the use of reclaimed plastic in its cartridges reporting 18% average PCR plastic content, by weight, across all toner cartridges, with several cartridges containing over 25% PCR in 2015. The 2018 goal is to average 25% PCR plastic content across the entire toner cartridge product line. Over 90% of Lexmark branded cartridges contain some PCR content.

Where post consumer plastic is used

ABS and PC/ABS

Covers
Trays
Internal parts

PC and PC-G

Internal parts
Brackets

POM

Bushings

ABS and HIPS

Housings

PC-GF

Housings
Functional parts



Lexmark has a growing presence within the European Union and has established printer cartridge (re)manufacturing lines in Poland, employing more than 300 people. By 2017, Lexmark expects to source 80% of its cartridges being sold in Europe from within the continent. By 2018, Lexmark also aims to reuse 50% by weight of the cartridges returned, a substantial increase from the current figure of 34%, which establishes the company as the industry leader.

Lexmark has partnered with the Ellen MacArthur Foundation to unlock the commercial opportunities that arise through such factors as designing products for reuse, new or enhanced recovery models and the introduction of new business models that promote greater circularity. Taking part in the "Circular Economy 100" programme allows Lexmark to work together with a group of like-minded businesses to promote the benefits of the circular economy, and its involvement maintains and improves its own approach to incorporating such practices.

Integrating sustainable thinking into the Lexmark product strategy optimises the manufacturing process, reduces environmental impact and ultimately eliminates waste. Leveraging circular economy principles to help retain more value from the material, energy and labour that goes into its products, Lexmark is committed to creating a home within its products for recycled plastics to return to the cycle.

Closed-loop recycling process



Importance of Users

Using setting provided by the organisation will help users achieve the greatest environmental savings.

1 in 6

The number of pages printed in the workplace that are never used. They either remain on the printer or photocopier or thrown away without ever being read.

Source: Ipsos survey 2005

► Use **Duplex** printing in default mode

Why does paper have such a big impact on the environment?

Despite the increased use of information technology, per-head consumption of paper currently exceeds 200 kg/year. It is estimated that the pulp and paper industry generates 6% of the world's industrial energy use.* CO2 emissions are produced primarily by the fossil fuels used to generate power and clear forests.

The most effective way, therefore, to reduce the environmental impact of office printing is to **print mindfully.**

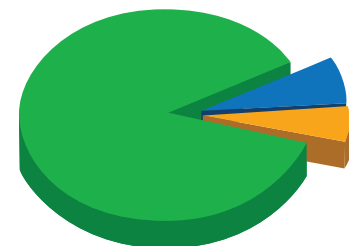
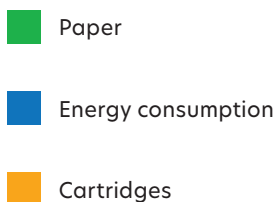
Printing in duplex can reduce CO2 emissions by up to 45%.

► Use adequate setting of **Toner Darkness**

Print in draft mode for internal use. (Drafts for external use should not be printed in draft mode if higher print quality is required). Whilst this reduces toner consumption, it may downgrade print quality and should therefore only be used when printing documents intended for internal use.

► Ensure **separate collection bins** for empty print cartridges and paper are available and used.

Global warming potential



*Source: International Energy Agency and International Council of Forest and Paper Associations

Employees should do their part

Changing our habits is not always easy.

Lexmark and your company are working together to reduce our ecological impact.

Only **you can go further!**

Additional printing improvements:

- ▶ Use **print preview** to avoid printing mistakes
- ▶ Print only **the page you need**, not the whole document
- ▶ **Avoid printing** emails and drafts
- ▶ Use **N-up, multiple page**, printing whenever possible
- ▶ **Do not deactivate** the printer Duplex settings and Power-saver modes





What are the top tips for users?

Let's put an end to printing waste!

1	Avoid printing e-mails and drafts	8	Print in N-up when possible
2	Scan and distribute documents	9	Use recycled paper to save natural resources
3	Archive copies electronically	10	Use workgroup printers rather than individual desktop printers
4	Use print preview	11	Use high yield cartridges
5	Print only the page you need, not the whole document	12	Recycle printed pages after use
6	Print internal documents in draft mode	13	Place empty consumables in designated recycling bins or return packaging
7	Use automatic duplex settings	14	Do not de-activate the power saver mode to save energy



Let's protect the planet together.

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