

# Sustainability Leaders, 2022

A review of sustainability initiatives in the print industry



## Executive summary

The climate crisis has propelled environmental, social and governance (ESG) issues to the top of the business agenda. Amidst increased pressure from government, employees, investors, and customers, organisations across all sectors are increasing their focus on sustainability. As a major segment in the technology industry, which generates 2–3% of global carbon emissions, the print industry has a significant opportunity to reduce carbon emissions and waste. Print manufacturers, like other technology suppliers, face a number of challenges in reaching net zero emissions. They must first minimise impacts across their operations, supply chains, and business models. This means embedding sustainability along the value chain, from product design through component sourcing to delivery, usage, and reuse. Second, vendors must develop products, services and technologies to help their customers minimise their own environmental impact.

The print industry is in a unique position at the cusp of print and digital convergence, at which it must take the lead in applying new technologies to drive sustainable impact. Across the industry, print manufacturers are setting net zero goals to lower carbon emissions, reduce waste, improve social responsibility and contribute to a circular economy. As well as lowering their own emissions, print manufacturers have a key role to play in helping other sectors become more efficient and sustainable. Through smart and sustainable products, solutions and services – from energy-efficient devices to cloud printing and digital workflow automation that minimises paper usage – the print industry is well positioned to help organisations lower their environmental impact.

As the industry strives for sustainability, there is no doubt its solutions will be in demand. Organisations are responding to a combination of consumer pressure, investor concern, and new regulatory requirements in prioritising sustainability strategy. Quocirca's research shows that reducing environmental impact will be a top priority by 2025, with 71% reporting that they already have a sustainability strategy in place. The positive correlation between ESG and corporate performance is also widely acknowledged, with 68% saying sustainability will be important to business strategy by 2025, a rise from 41% today.

In practical terms, paper reduction and recycling play a key role in many organisations' sustainability strategies. Seven in 10 are already recycling paper, and 61% are reducing paper use (with three-quarters aiming to cut paper consumption by 30% by 2025). As the drive for digitisation continues, the industry must support paper reduction with digital workflows that simultaneously meet environmental targets. Hardware recycling is another focus area, with 59% of organisations already ensuring they dispose of hardware responsibly.

The regulatory environment will also have an impact on customer expectations around the sustainability performance of suppliers. The EU Directive on Sustainability Due Diligence was formally adopted in February 2022 and requires large European companies and non-EU companies that operate in the EU to conduct environmental and human rights due diligence throughout their value chains. In the US, the SEC is moving towards mandatory disclosure of the risks corporations face from climate change, as well as actions taken to manage those risks. Companies affected by these regulations will be strategic clients of the print industry, and their expectations will escalate accordingly as sustainability moves from the realm of reputational safeguarding to become a major compliance issue. Already, 45% say it is extremely important that suppliers demonstrate they are reducing their own environmental impact and provide a range of sustainable products and services; this rises to more than half by 2025.

This report discusses sustainability in the broader print ecosystem and reviews the commitments and actions of the major industry players. It also looks at how suppliers incorporate sustainability into their product and service offerings. This report supplements the recent Quocirca Sustainability Trends 2022 Study, which explored print sustainability trends amongst UK and US IT decision-makers.

## Key findings

- **Sustainability leaders in the print industry demonstrate a strong vision and commitment to net zero.** Quocirca's Sustainability Vendor Landscape has identified HP, Xerox, Canon, Ricoh, Lexmark, Konica Minolta and Epson as leaders with respect to their sustainability strategy and vision. Many print manufacturers with net zero targets have science-based targets as milestones, and during 2020 some brought their net zero targets forward from 2050 to 2030 or 2040. HP Inc. aims to achieve net zero GHG emissions across its value chain by 2040 and carbon neutrality within its supplies business by 2030. In 2021, Xerox fast-tracked its net zero goal by 10 years to 2040. Canon and Ricoh have maintained their net zero target at 2050, with intermediate targets for consumption reduction established. Lexmark aims to reach carbon neutrality across its entire operations by 2035. Konica Minolta's target is to be net zero in Scope 2 by 2050. Epson aims to be carbon negative by 2050.
- **Circular approaches are well established in the industry.** This applies not only to manufacturing processes, but also to provision of energy-efficient products and recycling. Manufacturers are also making the shift from product- to service-based sales models and providing intelligent hardware and software that support the transition to the 'less-paper' workplace. Product lifecycle approaches that are based on reduce, reuse and recycle are widespread, with mature recycling programmes for hardware and consumables across the industry.
- **Sustainability services for customers are fragmented.** While most have set goals to reduce carbon emissions across their operations, there is a more fragmented approach to delivering sustainable products and services to customers. Some suppliers offer environmental and carbon footprint assessments and analytics as part of managed print services (MPS) engagements. However, while MPS is a standard offering in the industry, only a few print manufacturers align this with a broader sustainability proposition. Notable here is HP's Carbon Neutral MPS, which was launched in 2020. In Europe, Ricoh's Sustainability Optimisation Programme offers a five-step consultancy process that helps achieve measurable reductions in document workflow CO<sub>2</sub> emissions.
- **Remanufactured hardware product portfolios support circular strategies.** Circular products move away from the traditional linear product creation model of 'take-make-dispose' to a 'make-use-recycle' route. Remanufactured hardware can support carbon footprint and waste reduction goals. As opposed to refurbished products – those that are returned, retested and redistributed – remanufactured devices are rebuilt from individual components (reused/repaired or new parts). Remanufactured product lines include Ricoh's GreenLine series of MFPs (the first remanufactured MFPs to receive ENERGY STAR certification) and Canon's imageRUNNER ADVANCE EQ80 remanufactured portfolio. Lexmark offers Lexmark Evergreen, a remanufactured hardware programme that refurbishes devices in selected regions. The Xerox Factory Produced New range is remanufactured to deliver a device that has been restored to meet Xerox product specifications and is deemed to be in 'like new' condition. The Xerox Factory Produced New products are upheld to the same ecolabel criteria as newly manufactured products, such as ENERGY STAR and EPEAT.
- **Sustainability-focused channel programmes are emerging as a key differentiator.** Vendors may have different approaches to guiding their channel partners to enhance their sustainability efforts, but to date, HP leads with the only channel programme built specifically around sustainability. As part of its Amplify partner programme, HP has introduced Amplify Impact, offering partner assessment, training and resources around sustainability. These partners will be better positioned to operate in a more sustainability-aware market, while HP benefits from improved downstream sustainability in its channel and end customers.
- **Print manufacturers are extending sustainability to other markets and further through the value chain.** Notably, Xerox's Cleantech initiative is currently focused on developing air-conditioning solutions that cut energy consumption by up to 80%. The company is also pioneering its CareAR augmented reality remote visual support experience, which reduces technician callouts. Similarly, Konica Minolta offers AIRe Link, which enables customers to solve problems while supported by Konica Minolta remotely. Epson has developed an in-office secure paper recycler that turns wastepaper into new paper using a process powered by its dry fibre technology.
- **Amongst IT decision-makers in the UK and US, HP leads in brand perception as a sustainability leader, followed by Xerox and Canon.** Perceptions vary slightly by region, company size and age. Epson is particularly strongly viewed in organisations with between 500 and 999 employees.

**Conclusion**

The print industry has established practices regarding the sustainability of its own operations and management of product lifecycle impact. The nature of the consumables industry created an early focus on take-back, recycling, and reuse schemes, and this is extending to hardware, with several vendors beginning to pursue remanufacturing and circular economy initiatives. In-use impacts, such as energy consumption and eco-settings, are also mature. We are also seeing sustainability leaders drawing on their own innovative capabilities to extend into broader areas for environmental improvement and impact mitigation. Now, as customers come under increased pressure to justify supplier choices and technology strategy from a sustainability perspective, the industry must go beyond hardware to deliver solutions and services that actively help reduce customers' environmental impact. Customers will be looking for measurable, reportable improvements as they pursue their own sustainability goals.

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## Methodology

The following report is based on public ESG data and statements as published by each vendor. Note this data is for the whole company group which reflects the manufacturing of a diverse range of all products, not just the manufacturing of printing products, which all involve different manufacturing processes that can have varying impacts on the ESG data included in this report. Wherever possible, audited data (by either an external auditor or a public ESG body) has been used. To avoid issues around comparison between companies of different sizes, all data has been normalised to be per million USD of revenue. Vendors were also invited to complete a detailed survey. Quocirca would like to thank the following vendors for participating:

Brother, Canon, Epson, HP Inc., Konica Minolta, Kyocera, Lexmark, Ricoh, Sharp (ESG data only) and Xerox.

## Definitions

Industry-accepted definitions of terms have been used wherever possible. All qualitative statements are Quocirca's own.

### Net zero and carbon neutral

- **Net zero** is defined as a target of negating the amount of greenhouse gases produced by human activity, to be achieved by reducing emissions and implementing methods of absorbing carbon dioxide from the atmosphere.
- **Carbon neutral** means any emissions of CO<sub>2</sub> into the atmosphere that are not eliminated altogether are balanced by an equivalent amount being removed (carbon offsetting).

### Greenhouse gas (GHG) emissions

The term greenhouse gas emissions is used to describe the gases that are emitted into the air by various sources, trapping heat in the earth's atmosphere. This is usually caused by burning fossil fuels for electricity, heat and transportation. The main gas is considered to be carbon dioxide (CO<sub>2</sub>), but other gases, such as fluorocarbons, methane and nitrous oxides, can impact global warming. The GHG protocol, which sets the standard for measuring and managing carbon emissions, divides emissions into three separate scopes. Scope 1, 2 and 3 categorise the different kinds of carbon emissions a company creates in its own operations and wider value chain.

- **Scope 1:** Scope 1 emissions are direct GHG emissions that occur from sources controlled or owned by an organisation – for example, emissions from running boilers and vehicles.
- **Scope 2:** Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling from third-party sources.
- **Scope 3:** Scope 3 includes all other indirect emissions that occur in a company's value chain. This includes all the emissions not associated with the company itself, but that the organisation is indirectly responsible for, up and down its value chain. For example, there will be GHG emissions associated with buying products and services from its suppliers, and with its products when customers use them. As Scope 3 emissions usually account for more than 70% of a business's carbon footprint, it is crucial that companies tackle Scope 3 emissions to meet the aims of the Paris Agreement and limit global warming to 1.5°C.

### Science-based targets

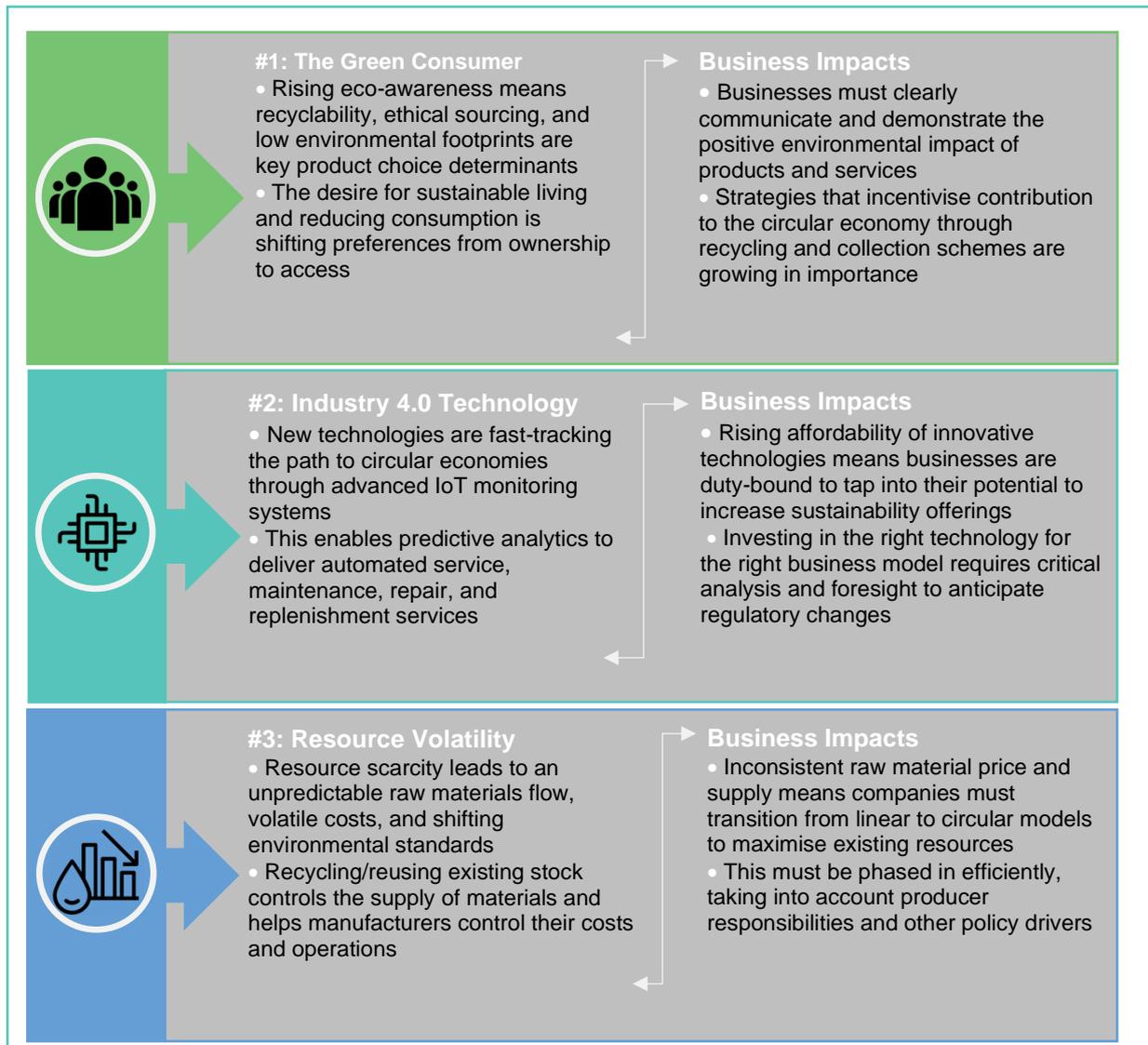
Science-based targets provide companies with a clearly defined path to reduce emissions in line with the Paris Agreement goals. More than 2,000 businesses around the world are already working with the Science Based Targets initiative (SBTi).

### Zero deforestation

Zero deforestation means no forest areas are cleared or converted, while zero net deforestation allows for clearance or conversion of forests in one area as long as an equal area is replanted elsewhere.

## Introduction

The need to shift to more sustainable practices is well recognised among print manufacturers. For many years, the print industry has embedded circular economy practices to ensure that operations are more sustainable, products and consumables are recyclable, and raw materials are reused. The circular economy is a departure from the linear model, which is based on take-make-dispose. The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products for as long as possible. In this way, the lifecycle of products is extended. This is driven by a complex interaction of consumer, technological, and resource factors that have specific implications for businesses (Figure 1).

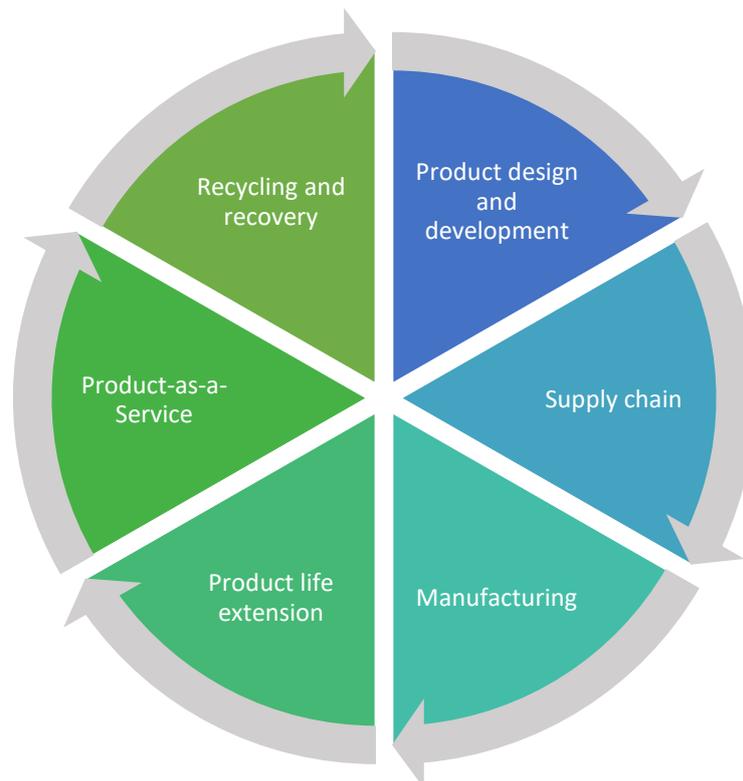


**Figure 1.** How consumer, technological, and resource megatrends are driving the circular economy

## What is sustainability in the print industry?

While the industry is making real progress, with some manufacturers on target to reduce their carbon footprint, most still need to advance their sustainability goals across their value chain. As well as examining their operations and supply chains to reduce carbon emissions, they must develop products and services that can help customers achieve their own sustainability goals.

Quocirca has identified the following areas where sustainability and circular principles can be applied across the print industry value chain (Figure 2).



**Figure 2.** Circular economy principles

1. **Product design and development.** Investing in R&D to design efficient products and services that include biodegradable or recyclable parts and achieve better environmental performance. Increasingly, this is also being extended to cover the use of non-virgin raw materials, such as reuse of precious and semi-precious metals and ethical and sustainable sourcing of any virgin raw materials that cannot be avoided. Environmental features of printers and multifunction products (MFPs) can be guided by the use of ecolabel programs and certification requirements such as Blue Angel or the Electronic Product Environmental Assessment Tool (EPEAT). In addition, indoor air quality (IAQ) performance is relevant to both hardware and ink and toner cartridges.
2. **Supply chain.** Environmentally responsible sourcing of materials and ensuring suppliers comply with environmental commitments and regulatory standards across the supply chain. Use of recyclable packaging and minimising packaging in general should also be a focus. Mass transport of large volumes has lower environmental impact than transporting small volumes. Local storage hubs can be more sustainable than regional warehouses – but only if planned and managed efficiently.
3. **Manufacturing.** Reducing the manufacturing footprint and conserving resources by implementing maintenance, quality, and production processes to reduce waste and improve recyclability and reuse

of material. The use of standard parts across a broader range of products can also help minimise environmental impact – as well as the need to maintain stocks of different parts along the supply chain.

4. **Product life extension.** Extending the lifecycle of the product by repairing, upgrading, or remanufacturing. Repairing, upgrading, and remanufacturing of used products and components boosts their lifecycle with existing or new customers. Manufacturers can extend product life through management software upgrades and new solutions that are backwards compatible with older products, and device firmware updates can optimise device reliability. Design also has a critical role to play; modular MFPs improve device upgradeability and repairability, reducing the need for costly fixes or outright replacement.
5. **Product-as-a-Service.** As-a-service and subscription models are an alternative to the established ‘buy and own’ approach. These models include leasing, renting, or pay-for-use agreements. This is a shift to selling services and outcomes rather than products. As-a-service models are well established in the print industry as manufacturers shift from transactional models to managed print services (MPS) contracts in the commercial space and automated ink services in the consumer market. Data-driven MPS leverage analytics to measure the carbon footprint of the print infrastructure. This can reduce the unnecessary consumption of paper, toner, ink and energy. In addition, cloud print services minimise or eliminate the need to operate print servers on-premise, lowering energy usage.
6. **Recycling and recovery.** End-of-life processes that maximise reuse and recycling, ensuring safe disposal of non-recyclable parts, are becoming a major aspect of sustainability and business models for manufacturers and end-user organisations alike. Effective recovery of resources from disposed products or by-products is central to manufacturers improving circularity, in order to enable more recycled materials to be incorporated into new products and simultaneously reduce the need for future raw materials extraction. Prompted in part by regulations such as the waste electrical and electronic equipment (WEEE) directive introduced by the EU in 2003, print manufacturers have developed comprehensive take-back programmes at devices’ end of life, making it easy for organisations to responsibly return printer hardware and supplies. These closed-loop lifecycles enable recycling of toner cartridges and remanufacturing of MFPs into brand-new or refurbished products.

## The path to a sustainable print industry

The print industry plays a major role in creating a more sustainable digital economy. Print manufacturers are elevating their commitment to environmental responsibility and transparency, setting the bar higher for themselves and their supply chain partners. This means not only minimising the carbon emissions of internal operations and supply chains, but also offering products and services that lower environmental impact and help companies achieve their own sustainability goals.

Most manufacturers, including Brother, HP Inc., Konica Minolta, Ricoh and Xerox, have set science-based targets. Lexmark has set one of the most ambitious net zero targets, aiming to reach neutrality by 2035. HP and Xerox have committed to net zero by 2040; Brother, Canon and Ricoh aim to reach net zero by 2050; and Epson arguably goes further, aiming to be carbon negative by 2050. Konica Minolta aims to have reached net zero in Scope 2 by 2050. Incorporated into these targets are interim goals such as renewable energy procurement, reductions in raw material resource usage, and elimination of single-use plastic. These are common goals across the industry, and are being pursued alongside innovation aimed at devising lower-impact alternatives.

Circular models are already embedded in the print industry. This applies to not only its manufacturing processes, but also its provision of energy-efficient products and recycling. Manufacturers are also making the shift from product- to service-based models (for instance, managed print services) and providing intelligent hardware and software that supports the transition to the 'less-paper' workplace.

As organisations accelerate their digitisation initiatives, software innovation around print and digital technologies plays an important role in driving sustainability. A diverse ecosystem of independent software vendors (ISVs) offers a range of solutions that can help organisations lower their environmental impact. These encompass print management platforms that track and analyse print volumes and offer 'pull printing', which only releases documents to authenticated users; this can minimise wasteful printing and support paper reduction initiatives. Alongside these options, cloud printing platforms can minimise or eliminate the need for physical print servers, leading to reduced energy costs<sup>1</sup>. In addition, to help customers monitor their carbon footprint, organisations can use carbon calculators to track energy and paper usage, as well as consumables consumption. One software platform that takes this a step further is PrintReleaf, which offsets paper footprints through reforestation.

Some print vendors are also applying advanced digital technologies such as the IoT, AI, and blockchains/distributed ledgers to improve sustainability performance. One example is Lexmark, which, as part of the EU-funded C-SERVEES project, is working on a private blockchain data scheme. The data provides a reliable system for sustainable material optimisation throughout the stages of the circular economic process (origination, manufacturing, recycling, transportation, and use phase).

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<sup>1</sup> <https://print2025.com/reports/quocirca-cloud-print-services-landscape-2022/>

## Quocirca Sustainability Vendor Landscape, 2022

Quocirca's Sustainability Vendor Landscape is a visual representation of the environmental commitments of the major print manufacturers, their market presence, and the breadth and depth of their sustainability-led products and services. For inclusion, each vendor must have a published ESG statement plus a range of print and digital workflow automation sustainability offerings.

Vendors are allocated a score in each area, with scores averaged to present a score out of 5. Quocirca has based this landscape on the following areas:

### Strategy

Each vendor has been scored on a range of criteria that encompass its overall sustainability strategy and commitments, as well as its sustainability strategy and vision for its print business. Please note that the published ESG data used for this are for the whole company group, as vendors do not break out print business ESG data separately. As such, organisations with large footprints across different manufacturing and service functions will have different ESG scores than those with a smaller focused portfolio.

- **Sustainability commitments.** Commitments to net zero and progress in reducing Scope 1, 2, and 3 emissions. This includes energy usage, renewable energy usage, total waste output and waste recycled, total water used, and target dates and percentage of reduction in CO<sub>2</sub> or CO<sub>2</sub> equivalent outputs. Quocirca has also evaluated approaches to circularity and broader sustainability-led industry partnerships.

### Market credibility

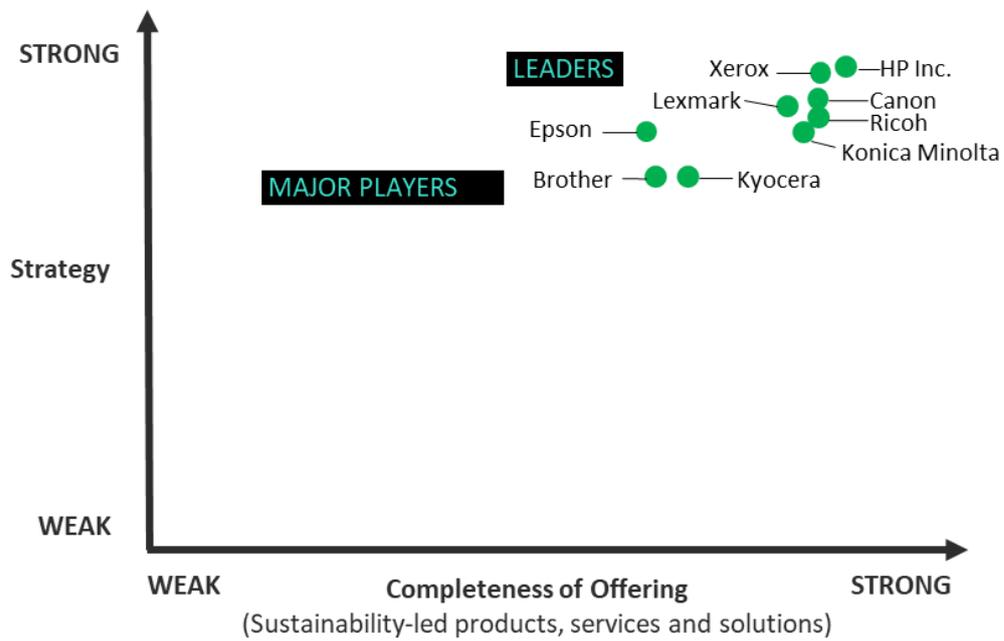
- **Market presence.** This accounts for brand perception with respect to sustainability, drawn from Quocirca's recent sustainability trends study and ongoing industry brand studies.

### Completeness of offering

Quocirca analysed a range of criteria, with vendors allocated higher scores for broader sustainability-centric services for customers beyond hardware energy efficiency and recycling programmes.

- **Customer enablement.** This evaluates how vendors are helping their customers reduce their carbon footprint and environmental impact. Included in this evaluation are:
- **Energy efficiency.** The overall energy efficiency of a print vendor's portfolio. This is not just based on the power levels of the printer directly, but also areas such as deep sleep mode and proprietary methods of addressing extra energy savings.
- **Recycling programmes.** In the majority of countries, vendors by law have to offer equipment take-back at end of life under the WEEE Directive, which was originally mandated in the EU. This criterion looks at what basic and advanced recycling programmes vendors have in place around print devices and consumables.
- **Remanufacturing/Refurbishment.** Some vendors offer specific programmes around refurbishment and reuse of print devices, while others focus on complete remanufacturing (often changing more parts than refurbishment and offering greater levels of guarantee and support). Some vendors offer both services.
- **Sustainability services.** Vendors offer a range of services to help customers in their own sustainability goals. This includes environmental assessments, sustainability-led MPS offerings, cloud printing platforms, and digital workflow solutions to lower environmental impact.
- **Sustainability-led channel services.** Some vendors have well-thought-through, documented and supported sustainability services that fully embrace and involve their channel. Others just provide marketing collateral, or in some cases, nothing at all.

This evaluation of the print sustainability market landscape is intended as a starting point only. Please note that Quocirca's scoring is based on an unweighted model and prospective buyers should use this as guidance along with the more detailed vendor profiles to assess suppliers based on their specific requirements.



*This information is provided as a visual representation only and should be combined with other sources to determine the suitability of any vendor product or service.*

**Figure 3.** Quocirca Sustainability Vendor Landscape, 2022

## Vendor profile: Lexmark

### Key highlights

#### Carbon, energy and resource consumption reductions

- Ambition to be fully carbon neutral by 2035
- 62% reduction in global emissions since 2005, on track to meet target of 40% reduction from 2015 levels by 2025
- 100% of returned cartridges are reused or recycled; zero-landfill and zero-incineration policy
- 39% reclaimed plastic used in new devices, 92% of new devices have PCR content
- Goal to increase the use of reclaimed plastic through the PCR and reuse processes to 50% by 2025
- Pledge to reduce single-use plastic packaging by 50% from 2018 to 2025

#### Awards, ratings and reporting standards

- Carbon Disclosure Project member
- Member of Responsible Business Alliance and Responsible Minerals Initiative
- EcoVadis Gold rating (top 3% in the industry for sustainability)
- Signatory of the United Nations Global Compact
- 90% of products Blue Angel certified

#### Customer services

- Managed print services and cloud print management enable customers to use shared computing power in the cloud, reducing energy and paper use
- AI calculations for timely resupply and IoT sensors, enabling remote fault diagnosis and fix 70% of the time
- PrintReleaf partnership, empowering customers to plant trees to offset paper use
- Smart Refresh data-based approach to determining when devices genuinely need replacing

### Overview

Lexmark has integrated sustainability across its operations, with board-level oversight of a programme focused on improvement and integration of CSR, the circular economy, the environment, and health and safety. It has one of the most ambitious targets for achieving operational carbon neutrality. In 2021, it announced its plan to be carbon neutral by 2035. The company has lowered emissions by 62% globally since 2005, and is on track to meet a 40% reduction target (from 2015 levels) by 2025. Reductions to date have been achieved by lowering energy, reducing virgin material in plastics, reusing products, global recycling efforts, and engineering products that are built to last. The company supports each of the 17 SDGs through its global initiatives, and deploys cost-effective best practices for energy conservation, wise water use, resource protection and waste reduction across its operations.

A strong focus on consumable reuse and recycling means toner cartridges can be remanufactured more than 10 times before recycling. Lexmark has also pioneered use of post-consumer regrind (PCR) plastics in new products and claims it has the highest PCR content model in the industry. As a founder member of the European Remanufacturing Council, Lexmark is sharing its expertise in extending product lifecycles and retaining valuable materials in end-of-life components.

Lexmark's respect for human rights, safety standards and environmentally sound business practices are embedded in the Lexmark Code of Business Conduct – a pledge to provide customers with innovative, high-quality products and services in an environmentally and socially responsible manner. Across its operations, Lexmark deploys cost-effective best practices for energy conservation, wise water use, resource protection and waste reduction.

#### Sustainability strategy

Sustainability is integrated across all business areas and in all levels of the company. Lexmark supports each of the 17 United Nations Sustainable Development Goals (SDGs) through its global initiatives. Lexmark's sustainability strategy is directed by the company's chief sustainability officer and reviewed by the executive leadership team, with all activities led by the CEO. The board of directors' finance and audit committee oversees ESG topics, as well as risks and opportunities related to climate change. Additionally, global cross-functional teams with representation from various business areas provide oversight. They are focused on improvement and integration of corporate social responsibility, the circular economy, the environment, and health and safety.

### **Committed to carbon neutrality**

In 2021, Lexmark announced its plan to be fully carbon neutral by 2035. The company has lowered emissions by 62% globally since 2005, and is on track to meet a 40% reduction target from 2015 levels by 2025. Reductions to date have been achieved by lowering energy and new plastics use, reusing products, making global recycling efforts, and engineering products that are built to last. In order to meet the 2035 neutrality goal, Lexmark will continue to pursue and invest in new programs. For example, Lexmark plans to install a solar array at its corporate headquarters in Lexington, Kentucky. Once operational, it will reduce carbon impacts for the site by 10% per year.

### **Supporting the circular economy**

As part of its focus on the circular economy, Lexmark offers sustainable services and programs for recycling supplies and equipment. These include the Lexmark Cartridge Collection Program (LCCP), Lexmark Evergreen remanufactured hardware program and Lexmark Equipment Collection Program (LECP).

Consumables is one area in which Lexmark has excelled in reducing its footprint. This began in 1991 with reclaiming material through the LCCP, a program that helps it fulfil a zero-landfill and zero-incineration policy. All of the cartridges returned by customers are either reused or recycled. Each year, LCCP prevents millions of Lexmark toner cartridges from ending up in landfill. In 2020, LCCP collected 5,365 metric tonnes of returned cartridges, and 96% of materials reclaimed from these cartridges were reused or recycled. All collected cartridges can be remanufactured more than 10 times before being recycled. Cartridges returned through the LCCP are disassembled, and components suitable for a second life are used in the production of Lexmark Corporate Cartridges. Designed and developed for maximum sustainability benefits, the Corporate Cartridge product line closes the loop during its production through the reuse of components returned via the LCCP.

The LCCP plant in Juarez, Mexico is a Responsible Recycling (R2)-certified facility and Leadership in Energy and Environmental Design (LEED) Gold-certified building. Importantly, reuse efforts at its recycling facility support the United Nations SDGs in increasing resource efficiency and promoting responsible production.

## **Manufacturing**

Lexmark products are manufactured using materials derived from the most sustainable sources and designed to have minimal effects on the environment throughout the product lifecycle, including manufacturing and distribution. The company designs its devices to last seven or more years. Device life is extended further through remanufactured and repaired parts and supplies. Longer-life devices save finite resources, reduce waste to landfill and lower carbon emissions.

Of Lexmark's devices, 96% are ENERGY STAR certified, which means they meet high standards of energy efficiency. Lexmark also has a solid track record with Blue Angel certifications. Blue Angel has a goal that 25% of products in the imaging space receive certification. Well over 90% of Lexmark's printers are certified. When devices do reach end of life, Lexmark aims to reuse as much material as possible. The company has used 39% reclaimed plastic in new devices and 37% in new branded cartridges, and plans to grow these numbers.

Regional manufacturing has improved supply chain efficiency and helped Lexmark respond more quickly to customer needs. It also benefits the environment by reducing greenhouse gas emissions and providing jobs for people in the regions where the company's cartridges are used most.

As one example, in 2020, regional manufacturing in Poland eliminated the need to ship an estimated 464 containers from China, resulting in 1,346 metric tonnes of CO<sub>2</sub> reduction. Lexmark also continued to grow regional manufacturing for hardware in North America in 2020.

## Distribution

Lexmark has taken measures to lessen the environmental impacts associated with physical shipping of its products worldwide, as well as product handling and storage in distribution centres. These include working with environmentally progressive partners that apply innovative ideas, best practices and new technologies to their transportation and logistics processes. Lexmark has been a US Environmental Protection Agency (EPA) SmartWay-registered partner since September 2008. SmartWay is chartered to increase the use of energy-efficient vehicles and has impressive goals to reduce GHGs and decrease air pollution.

To reduce impacts on product shipping, Lexmark has implemented a number of transport initiatives, including:

- Cube utilisation and packaging for a smaller packaged footprint and increased cargo packaging efficiency
- Intermodal freight transportation for time, money and fuel savings
- Direct shipping and replenishment for reduction in total miles travelled
- Transport management systems for product transportation optimisation, which reduce air shipments, handling, and travel distance
- Inbound container optimisation for improved space utilisation and a smaller CO<sub>2</sub> footprint.

## Sustainable warehousing

Improvements in warehousing include reducing the space required to store and distribute products; reducing the number of shipments and mileage through Lexmark's Reverse Logistics and Returns, thereby reducing energy use related to returned goods; and partnering with best-in-class third-party logistics warehouse providers that have a shared sustainability focus to increase recycling, manage an overall CO<sub>2</sub> footprint, and reduce the use of electricity, natural gas, propane and water.

## Packaging

When designing products, Lexmark considers product size, shape, accessories and ruggedness so it can use less packaging, lower costs, reduce materials disposed of in local landfills, and ensure that goods are transported in the most efficient manner. The company catalogues the amount of packaging material used with every product to ensure that designs adhere to a minimalist approach and remain highly recyclable. These efficiencies result in energy and natural resource savings, and fewer greenhouse emissions.

Package design revisions of the Lexmark MS33/43x printers improve container efficiency during shipping by over 30% through volume-efficient packaging and utilising alternate materials, use 50% less plastic to facilitate an increase in recovery, and are recycled to reduce the total material by 38%. Lexmark has pledged to reduce single-use plastic packaging by 50% from 2018 to 2025, and for hardware programs introduced in 2020, it reduced single-use plastic in packaging by an average of 19%.

## Supply chain

Lexmark works closely with suppliers to ensure its products and services have a positive impact on people, communities and the environment. The company monitors the performance and compliance of its suppliers by regularly analysing their social, environmental and economic data.

Lexmark maintains the Lexmark Product Environmental Specification, which defines the minimum environmental requirements associated with the design, manufacture and marketing of Lexmark products. The criteria stem from global regulatory obligations, international treaties, and conventions to specific market demands. In addition, the company audits select suppliers for compliance with the Lexmark Product Environmental Specification during the delivery of parts and assemblies. Furthermore, to support materials management efforts, it maintains an annual materials content data collection and management system that allows its teams to address regulatory issues, communicate with suppliers about substances of concern and respond to customer questions.

Membership in the Responsible Business Alliance (RBA) has further strengthened Lexmark's efforts in support of human rights, labour standards and other corporate social responsibility values. Lexmark has adopted and pursues conformance to the RBA Code of Conduct, supplemented by the Lexmark Supplier Code of Conduct. In accordance with RBA guidelines, it conducts third-party audits for several of its Tier 1 suppliers to monitor this.

## Responsible reuse and recycling

Lexmark continuously seeks new ways to reduce its footprint, actively embracing the concept of a circular economy. While making great strides in waste reduction at its global manufacturing facilities, it also provides an opportunity for customers to reduce their waste and increase the number of Lexmark products that are reused and recycled.

By incorporating lifecycle assessment results into its design process, Lexmark develops sustainable products that combine performance, efficiency and environmental stewardship through each lifecycle stage. At the end of product life, the company recovers components and parts to reuse or recycle via its LCCP and LECP programs.

Devices returned to Lexmark go through a process that assesses whether they can be remanufactured for reuse. If the products are not reused, parts are harvested for the refurbishment process. Lexmark works with recyclers to reclaim parts that can be used to refurbish printers, which keeps devices in service longer and reduces the need to recycle hardware.

Lexmark has used PCR plastic reclaimed from electronic waste for over 25 years. Innovative processes created by its engineers recover PCR plastic from empty cartridges for integration into new parts. Reclaimed PCR plastic features in more than 60 Lexmark components at a level up to 100%. The company claims it has the highest PCR content model in the industry, and all Lexmark-developed products already exceed the 2024 PCR minimum set by Blue Angel (5%) by nearly 800%.

Over 90% of the materials by weight used in Lexmark's hardware products are recyclable. Of its device models, 92% have PCR content, 80% of which have over 30% PCR content, an industry-leading best practice. Lexmark-branded, in-house laser printer and MFP hardware models sold in 2020 contain an average of 39% PCR plastic by weight, with 100% of these models containing some PCR plastic. In the future, Lexmark plans to incorporate closed-loop recycled materials from its hardware recycling streams into new devices in much the same way as for cartridges. Its goal is to increase the use of reclaimed plastic through the PCR and reuse processes to 50% by 2025.

## Partnerships

Lexmark is involved in industry coalitions, trade associations and externally developed environmental and social charters. These include:

- **European Remanufacturing Council (CER).** As a founding member, Lexmark has the opportunity to share with other businesses how to extend product life and retain valuable materials.
- **C-SERVEES.** Lexmark has received an EU Horizon 2020 grant and works closely with other C-SERVEES project participants to develop an innovative circular economic business model in areas such as device refurbishment for the electrical and electronic sector.
- **Carbon Disclosure Project (CDP).** Success criteria for CDP involves annual reporting of operation and product greenhouse gas emission measurements to show continual reduction of the company's environmental impact. Public release of this data ensures Lexmark is committed to reducing its emissions through tracking and initiatives.
- **Responsible Business Alliance (RBA) and Responsible Minerals Initiative (RMI).** Memberships involve tracking suppliers' corporate social responsibility initiatives.
- **Chemical Watch, DIGITALEUROPE and Information Technology Industry (ITI).** As members of these organisations, Lexmark has access to the latest regulations and legal requirements of the electronics industry.

- **Close the Loop.** Lexmark has collaborated with Close the Loop on ways to reuse toner. Lexmark captures toner from recycled printer cartridges and manufacturing processes, and 85% is used by TonerPave for asphalt and other engineered composites. Finding new ways to use waste and protect natural resources is the basis of Lexmark's successful sustainability partnerships.
- **PrintReleaf.** Lexmark has partnered with PrintReleaf to offer customers an automated sustainability program focused on reforestation, a big contributor to tackle climate change. PrintReleaf's technology integrates with its print management software to measure paper consumption data – consumption is then converted into an equivalent number of trees, which are planted around the world to offset the impact of the printed pages.

## Sustainability services for customers

Intentional engineering is where sustainability begins, but it continues with services, solutions and programs that reduce paper consumption, promote efficient use and support customers' sustainability efforts. Through Lexmark, customers can leverage:

- Proven product efficiency, with a solid track record with Blue Angel certifications. Blue Angel's goal is for 25% of products in the imaging space to receive certification. Well over 90% of Lexmark's printers are certified.
- Lexmark managed print services (MPS) and cloud print management (CPM) offerings enable customers to use shared computing power in the cloud, saving energy and paper use.
- Artificial intelligence (AI) calculations for remaining supplies that eliminate early or unnecessary resupply.
- Internet of Things (IoT) sensors provide data analytics that continuously monitor performance, allowing Lexmark to diagnose and enable remote fixing of service issues 70% of the time – an industry-leading statistic.
- Paper-saving solutions and industry-capture solutions to digitise hard-copy documents and eliminate shadow copying.
- PrintReleaf, a partnership that empowers customers to plant trees to offset the amount of paper they print.
- Smart Refresh, a data-based approach to determining when it is truly time to replace devices.
- The company is currently developing a carbon calculator that will allow customers to view the carbon impacts of their printers.

## About Quocirca

Quocirca is a global market insight and research firm specialising in analysing the convergence of print and digital technologies in the future workplace.

Since 2006, Quocirca has played an influential role in advising clients on major shifts in the market. Our consulting and research is at the forefront of the rapidly evolving print services and solutions market, trusted by clients seeking new strategies to address disruptive technologies.

Quocirca has pioneered research in many emerging market areas. More than 10 years ago we were the first to analyse the competitive global market landscape for managed print services (MPS), followed by the first global competitive review of the print security market. More recently Quocirca reinforced its leading and unique approach in the market, publishing the first study looking at the smart, connected future of print in the digital workplace. The [Global Print 2025 study](#) provides unparalleled insight into the impact of digital disruption, from both an industry executive and end-user perspective.

For more information, visit [www.quocirca.com](http://www.quocirca.com).

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