Sustainability Leaders, 2022

A review of sustainability initiatives in the print industry

Excerpt report: Xerox
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QUOCIRCA

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_2 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.

Contents

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_2 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_2), 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).

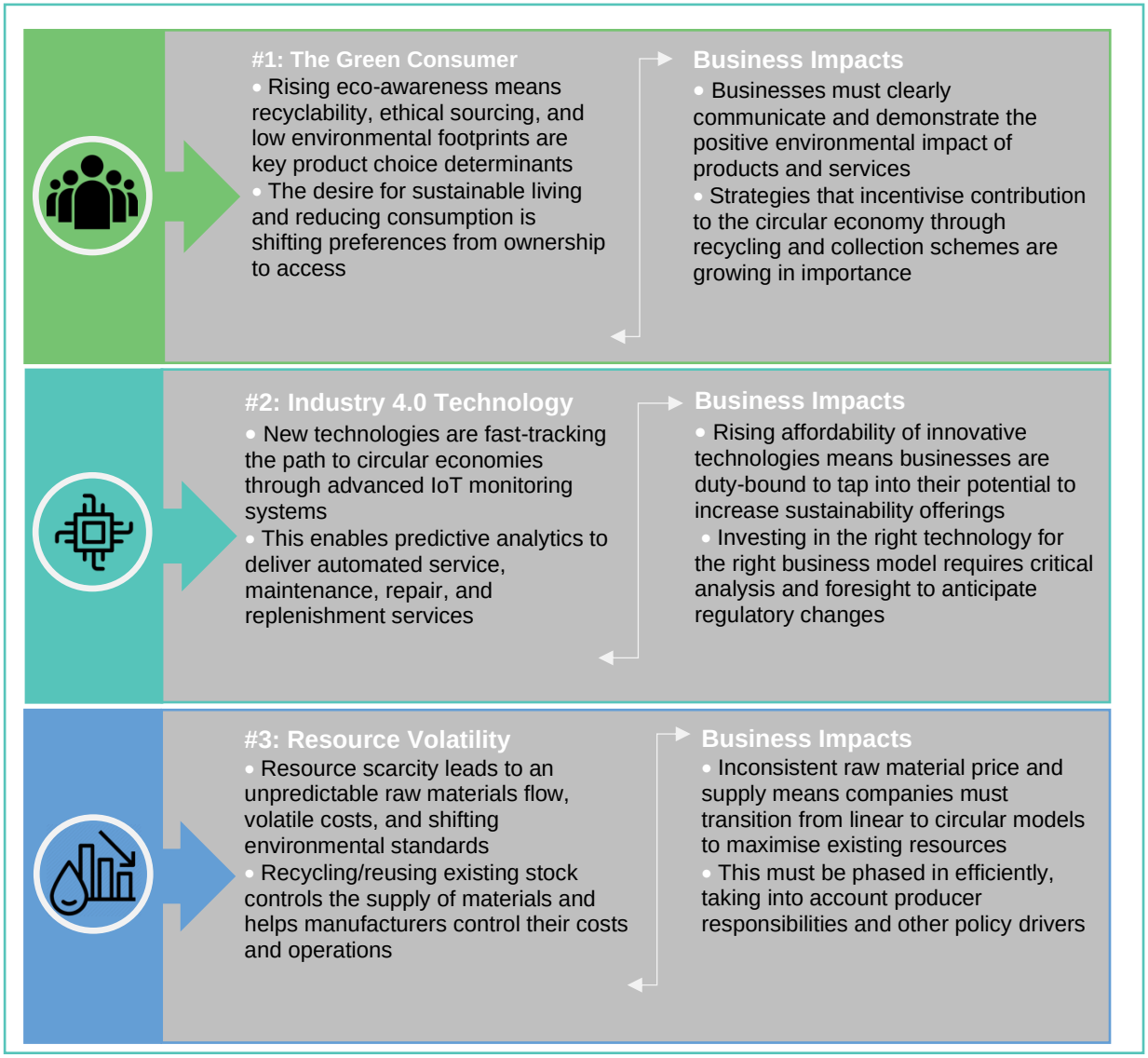

Figure 1. How consumer, technological, and resource megatrends are driving the circular economy

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).

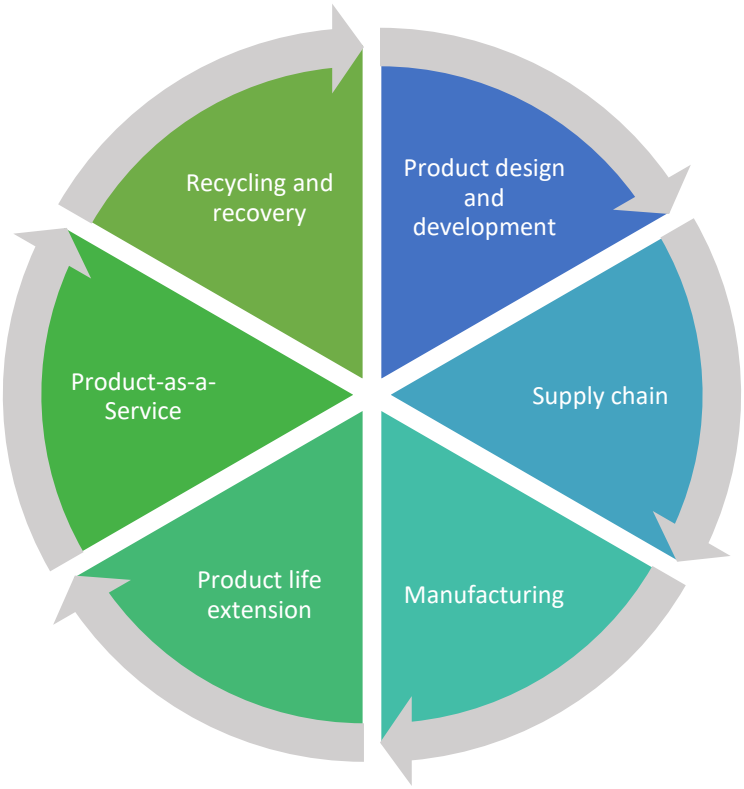

Figure 2. Circular economy principles

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[1]. 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).

[1] https://print2025.com/reports/quocirca-cloud-print-services-landscape-2022/

Vendor profile: Xerox

Key targets and initiatives

Carbon, energy and resource consumption reductions

- Net zero by 2040: Fast-tracked its net zero goal by 10 years and created a roadmap encompassing the entire value chain and beyond to achieve net zero emissions by 2040
- By 2030: reduce GHG emissions by 60%
- Registered 100% of new, eligible products with ENERGY STAR® and EPEAT
- Achieved 98% landfill avoidance for equipment and supplies and 100% landfill avoidance for returned toner cartridges, supporting the circular economy it created
- The 2020 goal of 35% reduction in water usage from 2010 levels was surpassed. In 2020, Xerox managed to achieve 52% reduction in water usage compared to 2010 levels
- Expanded Xerox Green World Alliance® (GWA), which is a collection and reuse/recycling program for spent consumables
- In 2020, more than 1.5 million Xerox® toner cartridges were manufactured using recovered cartridges, representing as much as 50% of toner cartridge production depending on the cartridge family

Awards, ratings and reporting standards

- Manufacturing operations certified to ISO 14001
- Member of the Responsible Business Alliance
- Listed on the Wall Street Journal's inaugural ranking of the 100 Most Sustainably Managed Companies
- Ranked No. 26 on the Global 100 Corporate Knights list of most sustainable corporations
- Awarded the Terra Carta Seal by the Prince of Wales, recognising companies driving innovation and demonstrating commitment to creating sustainable markets
- Supports TCFD reporting framework
- Awarded CDP Supplier Engagement Leader in recognition of supplier engagement on climate change issues
- Founder member of Sustainable Electronics Recycling International (SERI)
- Named an ENERGY STAR Partner of the Year in 2021
- Awarded EPA's Sustainable Materials Management Gold Tier
- Achieved ENERGY STAR and EPEAT registration for 100% of newly launched eligible products

Products and services

- Remanufactured consumables contain an average of 90% recycled parts
- Introduced A4 printers and MFDs with 10–16% PCR plastic content and toner cartridges with 21% PCR content
- Xerox sustainable MPS helps customers cut energy use and emissions, reduce paper consumption, and waste and transform paper-based processes to digital
- Xerox Reforestation Service® powered by PrintReleaf was one of the first vendor reforestation programs allowing customers to balance paper consumption with tree planting
- CareAR end-to-end service experience management platform makes the user into an expert capable of solving technical issues, eliminating the need to dispatch technicians
- EarthSmart feature in printer driver unifies eco-settings, allowing users to choose more sustainable printing with a single click
- Cleantech Initiative: Xerox is focusing on identifying technologies that reduce humankind's negative environmental impact, e.g., the company is currently developing an air conditioning solution that could reduce the energy consumption of air conditioners by up to 80%

Overview

Sustainability is core to Xerox's business operations, and circularity principles are applied across the product lifecycle. In 2021, Xerox fast-tracked its net zero goal by 10 years to 2040. Its sustainability roadmap covers its

full value chain, focusing on improving processes, energy efficiency, and designing environmentally responsible products and clean technologies that extend beyond print.

Xerox is innovating in service delivery with a new service experience platform from CareAR, a Xerox company. It enables non-expert users to solve technical issues, reducing the need to dispatch technicians. The company is also pursuing innovation that could cut HVAC energy consumption by up to 80% – a major benefit with a technology responsible for 10% of global electricity consumption and 4% of GHG emissions.

The company is also making advances in Cleantech, additive manufacturing and IIoT, aiming to optimise operations and reduce waste, energy consumption and emissions. It introduced remanufacturing as a concept in its first commercial product in 1959, and continues to put circular economy principles at the heart of the product lifecycle. Xerox worked with the EPA to devise and roll out ENERGY STAR criteria for remanufactured products, indicating its commitment to partnerships that drive improvements.

Sustainability initiatives

Strategic initiatives include achieving ENERGY STAR and EPEAT registration for 100% of eligible new products; pioneering a new service experience platform from CareAR. Xerox believes partnerships accelerate progress in meeting sustainability targets. It has joined the UNFCCC's Race To Zero and SBTi's Business Ambition for 1.5°C campaigns. Its success criteria for these alliances/partnerships is reaching its net zero 2040 goal.

Sustainability-driven innovations

Xerox is committed to innovation as a critical step to achieving sustainability goals. One example is its Service Experience Management (SXM) platform from CareAR. This platform makes any user an expert capable of solving technical issues. This means companies can dispatch fewer technicians, which leads to lower greenhouse gas emissions. In addition, Xerox is already making advancements in additive manufacturing (3D printing), Industrial Internet of Things, and Cleantech. The company will continuously improve its operating model for greater efficiency and invest further in robotic process automation, augmented reality, and analytics to drive efficiencies, reduce complexity, and simplify billing and offerings. This optimisation will reduce waste, energy use and greenhouse gas emissions.

Circular economy principles

Xerox's first commercial product in 1959, the Xerox 914, introduced electronics remanufacturing long before the term 'circular economy' became prevalent. The company is a founding member of Sustainable Electronics Recycling International (SERI) and designs products, packaging, and supplies that efficiently use resources, minimise waste, reuse material where feasible, and recycle what cannot be reused. To meet this commitment, Xerox has developed several collection and waste reduction programs, while also designing technology to align with the circular economy's key elements. Xerox remanufactured consumables contain an average of 90% reused and recycled parts and are built and tested to the same performance specifications as new products. In 2021, the company introduced A4 printers and multifunctional devices with 10–16% post-consumer recycled (PCR) plastic content, and associated toner cartridges with 21% PCR. Also in 2021, Xerox achieved 98% landfill avoidance for combined equipment and supplies and 100% landfill avoidance for returned toner cartridges.

Manufacturing

Xerox's major manufacturing operations have been certified to ISO 14001 since 1997. Quarterly status meetings and use of an environmental performance scorecard provide visibility, best practice sharing and innovation across its operations. All major manufacturing sites and some administrative offices employ an environmental management system that conforms to ISO 14001:2015.

Xerox continues to innovate for design for disassembly, energy reductions and lowering of materials impact through increased use of post-consumer recycled content. Examples include cutting the power consumption of its laser-based printing products by adjusting the fuser design, changing the properties in its toner, and developing more efficient electronic controls and performance within the xerographic system. The AltaLink C8100 series realised a 14% energy reduction average over the AltaLink C8000 series.

Supply chain

Xerox joined the RBA in 2008 to strengthen its approach to managing CSR across its supply chain, and has adopted the RBA Code of Conduct as its Supplier Code of Conduct. The company includes terms and conditions in its supplier purchase agreements and contracts, requiring suppliers to represent and warrant their compliance with all applicable laws and regulations for the sale of goods and materials.

The company performs risk assessments and requires suppliers to participate in the Xerox Compliance Program. It conducts initial risk assessment to determine whether any suppliers pose high corporate social responsibility risks. Suppliers classified as high risk and those considered critical to its supply chain are required to complete a self-assessment questionnaire annually. If any significant risks are indicated, Xerox schedules an audit and takes appropriate actions. All suppliers are reminded of their contractual obligations annually.

Xerox purchasing agents operate under the socially responsible purchasing policy that gives preference to suppliers and goods/services that meet voluntary standards such as ENERGY STAR, EPEAT and ISO14001 certification. Scope 3 emissions are included in its net zero 2040 roadmap, with purchased goods and services representing the largest share. Xerox is also looking to increase supplier engagement to include requiring them to share GHG emissions data and commit to carbon neutral and/or net zero goals.

Recycling and reuse

Xerox diverts millions of pounds of used supplies from landfill every year through its Green World Alliance supplies take-back program. The company expanded this program in 2020 to add more European countries.

Xerox is committed to collecting and reusing equipment after the end of its useful life. In geographies where it exercises direct control over the end-of-life management of equipment, return rates are high. In 2020, 6,030 metric tonnes of equipment and parts-related waste were diverted from landfills to recycling at its US Reverse Logistics Center. Globally, that volume is 13,020 metric tonnes. The company also participates in several EU WEEE programs, although equipment collected and recycled through these schemes is not included in its recycling data.

Procedures include:

- **Reuse of complete end item.** This approach requires the least reprocessing, transportation and energy usage.
- **Remanufacture or conversion into a newer-generation product or part.** Xerox remanufactures parts to like-new quality and performance specifications, while reusing 70–90% of the machine components by weight. In 2020, Xerox remanufactured approximately 6,050 office devices, and its programs diverted 8,800 metric tonnes of electronic devices and components from landfills or other forms of uncontrolled disposal.
- **Used equipment.** Based on the condition and market demands, equipment may be put through an extended maintenance and verification process to return it to a high standard before it is redeployed. In 2020, approximately 44% of machines returned in the US were sold as used or sent for remanufacturing.
- **Reuse of modules, subcomponents, and parts for spares or manufacturing.** Xerox has continually increased the number of reused components in upstream and downstream processes after the original machine has been designated for recycling. Spare parts returned from the field by service technicians are also included in this process.

- **Material recycling.** Any remaining portion of an end-of-life device is stripped of any recyclable material (e.g., plastics, copper wire) and material requiring special disposal services, such as printed wire boards, batteries and lamps. The remainder of the machine is then sent to an industrial reclaim facility.

Environmental certification

Xerox products are designed to meet ecolabels such as ENERGY STAR, EPEAT and Blue Angel. The company has been committed to launching all new eligible office products with EPEAT Silver or Gold certification since 2014, and will continue to support EPEAT initiatives, future success and global expansion. Xerox registers products in the US, Canada, the UK, France, Germany, the Netherlands, Belgium, Luxembourg, Switzerland, Norway, Sweden, Finland and Denmark. All new Xerox VersaLink, AltaLink and PrimeLink products are EPEAT Gold certified, with a few country-specific exceptions.

Xerox also collaborated with the EPA to roll out ENERGY STAR criteria for remanufactured products. The company provided input on terms and definitions, as well criteria remanufactured products are required to meet for ENERGY STAR certification. It also supplied the EPA with energy consumption data from several of its professional imaging products to help develop a new specification for professional imaging equipment. As a result of these activities and other initiatives promoting ENERGY STAR products, Xerox was named an ENERGY STAR Partner of the Year in 2021. Additionally, the company was awarded the Terra Carta Seal, named to the Wall Street Journal's inaugural ranking of the 100 Most Sustainably Managed Companies, and made No. 26 on the Global 100 Corporate Knights list of most sustainable corporations. These recognitions further demonstrate Xerox's commitment to creating sustainable products and services.

Partnerships

- **Responsible Business Alliance (RBA).** Xerox has been a member of RBA since 2008 and adopted the RBA Code of Conduct as its supplier code of conduct.
- **Environmental Protection Agency (EPA) (United States).** Xerox collaborates with the EPA to help define more stringent energy consumption criteria every few years, and has collaborated on new criteria for remanufactured products and professional imaging equipment within the last couple of years.
- **EPEAT (United States).** Xerox participates in the Electronic Product Environmental Assessment Tool (EPEAT), a voluntary standard for product ratings that measures the environmental impact of electronics products. Xerox strives for GOLD or SILVER rating for all new eligible product introductions.
- **100 Best Corporate Citizens.** Xerox has been listed among the 100 Best Corporate Citizens by 3BL Media consecutively since 2009.
- **TCFD.** Xerox has supported the TCFD framework since 2020.
- **The CDP.** Xerox was recognised by the CDP, an international environmental organisation, for climate change transparency in 2015, and was recently awarded CDP Supplier Engagement Leader for the second consecutive year.
- **PrintReleaf.** Xerox was one of the first vendors to partner with PrintReleaf to administer reforestation services for MPS clients. Xerox feeds paper usage metrics directly from Xerox Services Manager to PrintReleaf software to determine the number of trees to reforest in geographic areas of need. In July 2022, Xerox will offer Carbon Offset Services through PrintReleaf. This service will also feed paper usage metrics directly from Xerox Services Manager to PrintReleaf software. The software will then determine the metric tonnes of CO_2 released from manufacturing the paper used, and then purchase the corresponding carbon offsets on the client's behalf.
- **Abour Day Foundation.** In honor of World Environment Day, Xerox announced a partnership with the Arbor Day Foundation to plant nearly 23,000 trees – one for each Xerox employee. The partnership coincides with 2022's World Environment Day focus on the continuation of the UN Decade on Ecosystem Restoration, a global mission to revive billions of hectares, from forests to farmlands.
- **Xerox Ventures:** Xerox Ventures invests in early and growth-stage start-ups. There are three focus areas: Connected Work, Empowered Businesses and Green Enterprise. Green Enterprise includes Cleantech – Decarbonization, Electrification, Sustainably Built Environments, and Circularity.

Sustainability services for clients

Xerox offers a range of products and services that enable customers to assess, monitor and lower environmental impact.

Sustainable MPS

Xerox works with MPS customers to improve the efficiency of office document management and help them meet the following goals:

- **Energy and greenhouse gas reduction.** Print asset optimisation and updates improve energy consumption, reduce greenhouse gas impact and decrease waste materials.
- **Reduced paper usage.** Changing behaviours to reduce unnecessary prints via print authentication and authorisation.
- **Reduce waste.** Sustainable print technologies and consumables can reduce the amount of waste generated from printing.
- **Digital transformation**. Reducing paper through the adoption of digital workflows integrated with ECM and other digital alternatives.

In addition, Xerox was among the first vendors to offer a reforestation program for its MPS clients through a partnership with PrintReleaf. Based on a theme of 'You print one. We'll plant one', Xerox Reforestation Service® leverages paper usage reporting and equates the number of trees to reforest that usage in geographic areas of need. Its strategy is to develop other carbon compensation/neutralisation technologies to achieve net zero for its clients and full value chain.

Xerox ConnectKey

Xerox ConnectKey is a software solution that enables secure movement of information to and from the cloud. Cloud computing is recognised as less energy intensive than data centres and generates fewer GHG emissions. In addition, Xerox ConnectKey, in combination with power management software, facilitates energy management by allowing for control, management and reporting of a device's power consumption and setting power states and timeout intervals.

Effective print management

Xerox's equipment and software are designed to help customers operate efficiently. The Earth Smart feature, integrated into the Xerox global print driver, brings several resource-saving settings together at the click of a button. These features, such as duplex (two-sided printing), N-up (multiple pages per sheet), proof print, and toner-saving modes make it easier for customers to make responsible print choices.

Xerox Enterprise Print Services customers have access to sophisticated print management and reporting tools, such as Xerox Print Agent, which provides additional methods of encouraging and tracking responsible print behaviour. Software products such as DocuShare and FreeFlow Digital Workflow Collection help customers reduce paper consumption by facilitating electronic data management, scan to email, print-on-demand and distribute-then-print workflows.

Xerox Workplace Solutions/Xerox Print Awareness Tool
By using the Print Awareness Tool, users can see their print usage, review their progress toward company print and sustainability goals, and learn of available steps to improve.

Xerox CareAR

CareAR created the industry's first end-to-end service experience management (SXM) platform, which makes any user an expert capable of solving technical issues. CareAR replaces a technician driving to a customer site (and the associated GHG emissions), creating greater operational efficiencies and better environmental, health and safety results.

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.

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