

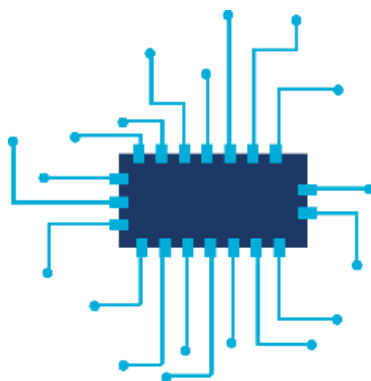


Up2Circ – Boosting the Uptake of Circular Business Model, Product and Process Innovation

Horizon Europe 2021-2027

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Sectorial Catalogue Electronics



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Short Introduction

The Electronics sector is a cornerstone of modern technological innovation in the European Union, driving advancements in communication, health, transport, and entertainment. As consumer demand and technological progress surge, the lifespan of electronic goods shrinks, culminating in a significant waste challenge. The integration of circular economy principles in this sector is paramount not just for environmental sustainability, but also for the long-term viability of the industry itself.

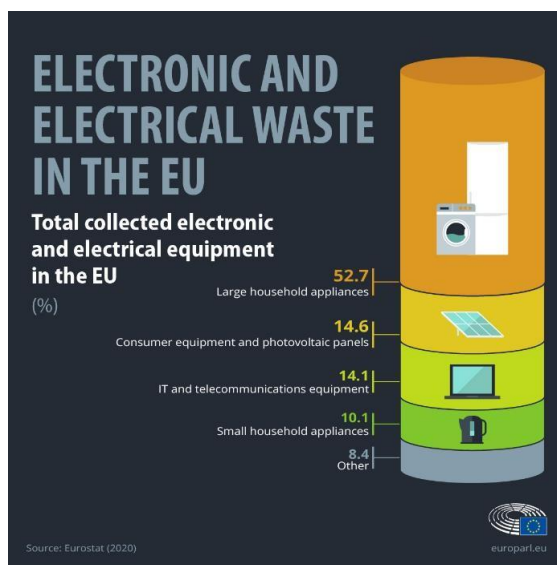
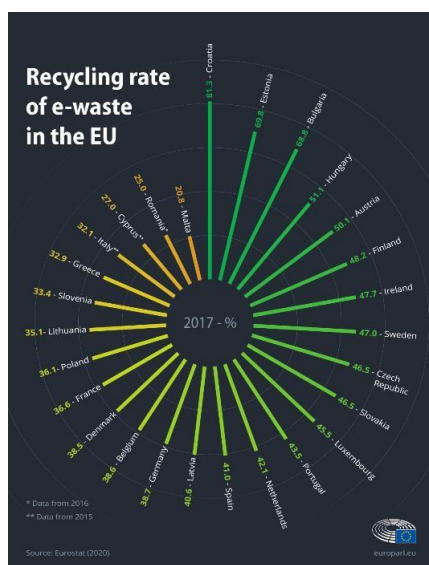
See also:

- [Carriages preview | Legislative Train Schedule \(europa.eu\)](https://european-council.europa.eu/media/e30004/nr/en/policies-and-initiatives/legislative-train-schedule)
- [European Standards will make Common Chargers a reality - CEN-CENELEC \(cencenelec.eu\)](https://www.cenelec.eu/en/standards/eurostandards/eurostandards-will-make-common-chargers-a-reality)


Challenges for the Sector regarding Sustainability Demands

- **E-Waste Proliferation:** Rapid obsolescence leads to vast amounts of electronic waste and other chemical waste e.g. discharge of acidic solutions of metals during PCB manufacturing process which is often not recycled or disposed of properly.
- **Resource Scarcity:** Electronics manufacturing relies on rare earth metals and minerals, which are finite.
- **Energy Consumption:** Intensive manufacturing processes and usage of electronics consume significant amounts of energy.
- **Regulations:** The EU's Waste Electrical and Electronic Equipment (WEEE) Directive aims to reduce the environmental impact of unwanted electronics. Additionally, the RoHS Directive restricts the use of hazardous substances in electronic equipment.

[E-waste in the EU: facts and figures \(infographic\) | News | European Parliament \(europa.eu\)](#)



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Circular Economy Opportunities for the Sector

As the electronics sector grapples with mounting environmental challenges, the circular economy presents a beacon of hope, offering pathways to sustainable growth. By rethinking design, recycling practices, and production strategies, the industry can transition from linear models to more regenerative approaches. In this context, let's explore some of the most promising circular economy opportunities that are poised to reshape the electronics sector for a greener future.

- **Product Longevity:** Designing products for longer life, modularity, and easier repair can reduce waste.
 - **Fairphone:** This smartphone is designed for longevity and modularity. Users can easily replace parts like the camera, speaker, and battery, extending the phone's lifespan and reducing electronic waste.
 - **Dell's Latitude 5000 and 7000 Series:** These laptops are built with a design that allows for easy upgrades and repairs, ensuring a longer product life.
- **E-Waste Recycling:** Advanced processes to extract valuable metals and materials from discarded electronics as well as utilisation of valuable waste (e.g. solutions of metals) produced during manufacturing process itself
 - **Apple's Liam Robot:** This robot disassembles old iPhones to recover valuable materials like silver and tungsten, which can then be reused in new products.
 - **Umicore:** A global materials technology group that has developed advanced processes to recover precious metals from e-waste, turning them into valuable resources for new electronic products.
- **Eco-design:** Incorporating environmental considerations during the design phase of electronic products.
 - **HP's Pavilion Wave:** A desktop computer made with 85% post-consumer recycled plastic, showcasing the company's commitment to sustainable design.
 - **Sony's "One Blue Ocean" Project:** As part of this initiative, Sony developed a headphone model made from recycled ocean plastic.

Three important questions from [A circular approach to tackling e-waste \(economist.com\)](https://www.economist.com/ideas/2021/03/27/a-circular-approach-to-tackling-e-waste)


Are you procuring devices that are durable and built to last?

Are these devices built using materials that are recyclable?

Are you able to minimise the downstream impact from recycling and reusing?



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Legislative overview:

The electronics industry in the EU is significantly influenced by various legislative measures aimed at promoting circular economy and sustainability. Key pieces of legislation and initiatives include:

Ecodesign for Sustainable Products Regulation (ESPR):

This regulation replaces the previous Ecodesign Directive and establishes a framework for setting ecodesign requirements across almost all categories of physical goods. It aims to improve product durability, reusability, upgradability, and reparability, as well as increase recycled content and make products more energy and resource-efficient. A notable feature is the Digital Product Passport, which stores relevant information to support product sustainability and circularity (European Commission).

Circular Economy Action Plan (CEAP):

Adopted as part of the European Green Deal, this plan includes measures such as the revision of packaging and packaging waste rules, the introduction of green claims and right to repair proposals, and the promotion of biobased, biodegradable, and compostable plastics (Environment).

Circular Electronics Roadmap:

This roadmap provides guidelines for the electronics industry to transition to a circular economy by 2030. It emphasizes the importance of understanding consumer needs, consistently measuring and communicating circular business model performance to investors, assessing Scope 3 GHG emission benefits, and adapting accounting practices to support circular electronics (CEP | Circular Electronics Partnership).

Right to Repair Legislation:

This proposed directive aims to make repair services more accessible and affordable, addressing planned obsolescence and ensuring products can be kept in use for as long as possible. It includes a Europe-wide quality standard for repairs and sets up online platforms to connect consumers with repair services (Circle Economy).

Extended Producer Responsibility (EPR):


EPR schemes aim to shift the responsibility of disposing of obsolete or broken products upstream to producers, incentivizing them to design products that are easier to recycle and have longer lifespans. New schemes are being rolled out across Europe to enhance the effectiveness of EPRs (Circle Economy).

The Corporate Sustainability Reporting Directive (CSRD):

The CSRD significantly impacts the electronics sector, including SMEs. From 2026, listed SMEs in the electronics industry will be required to disclose sustainability-related information under the CSRD. This includes reporting on environmental, social, and governance (ESG) aspects, focusing on material sustainability issues relevant to their operations. Non-listed SMEs, while not directly mandated, may face indirect pressures from larger companies in their supply chains that need comprehensive ESG data. The directive aims to balance the reporting burden with simplified standards tailored for SMEs, offering opportunities for enhanced transparency, brand reputation, and access to sustainable investment.



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Overview of tech-savvy companies that offer/apply solutions

According to the [A circular approach to tackling e-waste \(economist.com\)](https://www.economist.com/technology-and-science/2020/05/25/a-circular-approach-to-tackling-e-waste) article, “tech companies have stepped up to become part of the solution to the e-waste problem. For example, HP designs products to be **durable** and **easily repaired** so they can stay in use for as long as possible, while its **service-based solutions** reduce environmental impacts through extended life, **device optimisation and product take-back**. HP’s repair, reuse and recycling services also help to recover products, components and materials for the next generation of products.”

- [REEcycle \(reecycleinc.com\) \(USA\)](https://reecycleinc.com)
 - purchase disposed of NdFeB magnets from recyclers. The source of these magnets is very broad. Some examples include: Wind Turbines; Electric Vehicles and Bikes; Hard Drives; MRI Machines; Magnet Swarf
- [MusicMagpie](#)
 - MusicMagpie is at the forefront of the ‘global recommerce revolution’, in allowing customers to sell and buy from the tech business, in a way that also supports the planet.
- [Currys \(UK\)](#)
 - Technology company Currys is advising its shoppers to be more considerate of how they manage their electronic waste items. Customers can recycle with Currys - even items brought from other retailers.
- [Klyk \(UK\)](#)
 - Founded only in 2020 and headquartered in London, the company collects e-waste through its recycling programme, refurbishes the products and then sells them.
- [Fairphone](#)
 - A social enterprise that produces modular smartphones designed for longevity, easy repair, and the use of ethical and recycled materials. Circular Value Proposition: Includes a buy-back program, a spare parts shop, and a repair network.
- [Philips](#)
 - A global leader in health technology and lighting that has shifted from selling products to providing performance and outcome-based services. Philips applies circular design principles and practices such as using renewable energy, minimizing waste, and maximizing reuse and recycling.
- [HP](#)
 - HP designs products to be durable and easily repaired so they can stay in use for as long as possible, while its service-based solutions reduce environmental impacts through extended life, device optimisation and product take-back. HP’s repair, reuse and recycling services also help to recover products, components and materials for the next generation of products.
- [Dell Technologies](#)



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- A multinational technology company that is involved in creating long-lasting products and promoting the recycling and reuse of electronic products.
- [Google](#)
 - Google is actively working towards reducing e-waste by designing products with recycled materials and ensuring that their products can be recycled at the end of their life cycle.
- [Microsoft](#)
 - Microsoft is committed to sustainability and aims to be carbon negative by 2030. They are also working towards reducing e-waste by creating durable products and promoting recycling
- [TerraCycle](#)
 - TerraCycle specializes in recycling hard-to-process waste, including electronics, and creating new products from it.
- [UNTHA](#)
 - UNTHA is a manufacturer of machines for the disassembly and recycling of electronic devices, helping to reduce electronic waste.
- [EnviroLeach](#)
 - This company specializes in environmentally friendly recycling and metal extraction processes from electronic waste, including acidic solutions used in PCB manufacturing.
- [Umicore](#)
 - Umicore is a global company specializing in metal recycling technologies. They offer services for the extraction and recycling of valuable metals from various sources, including acidic solutions.
- [Veolia](#)
 - Veolia is a global waste management and recycling company that conducts various recycling processes, including metal extraction from acidic waste solutions.
- [Metalor](#)
 - Metalor is a specialized company in the processing and recycling of precious metals, including processes that involve extracting metals from electronic waste and industrial acidic solutions.
- [Johnson Matthey](#)
 - Johnson Matthey is a company specializing in metal extraction and processing technologies, including those related to the extraction of metals from electronic waste and industrial acidic solutions.
- [Suez](#)
 - Suez is an international company specializing in waste and resource management, providing services for recycling and metal extraction from various solutions.



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- **EU Circular Economy Action Plan:** <https://ec.europa.eu/environment/circular-economy/>
- **WEEE Directive Overview:** [Waste from Electrical and Electronic Equipment \(WEEE\) \(europa.eu\)](https://ec.europa.eu/waste/equipment/wEEE/equipment_en)
- **ECCP Resources for Electronics:** <https://www.eccp.eu/>
- **Sector-specific Funding Opportunities:** For sector-specific funding opportunities related to sustainability in electronics you can explore the [EU Funding & Tenders Portal](#).



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