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ADVANCE  
SUSTAINABILITY

# Reducing waste by advancing a circular economy for electronics

Microsoft circular economy policy brief

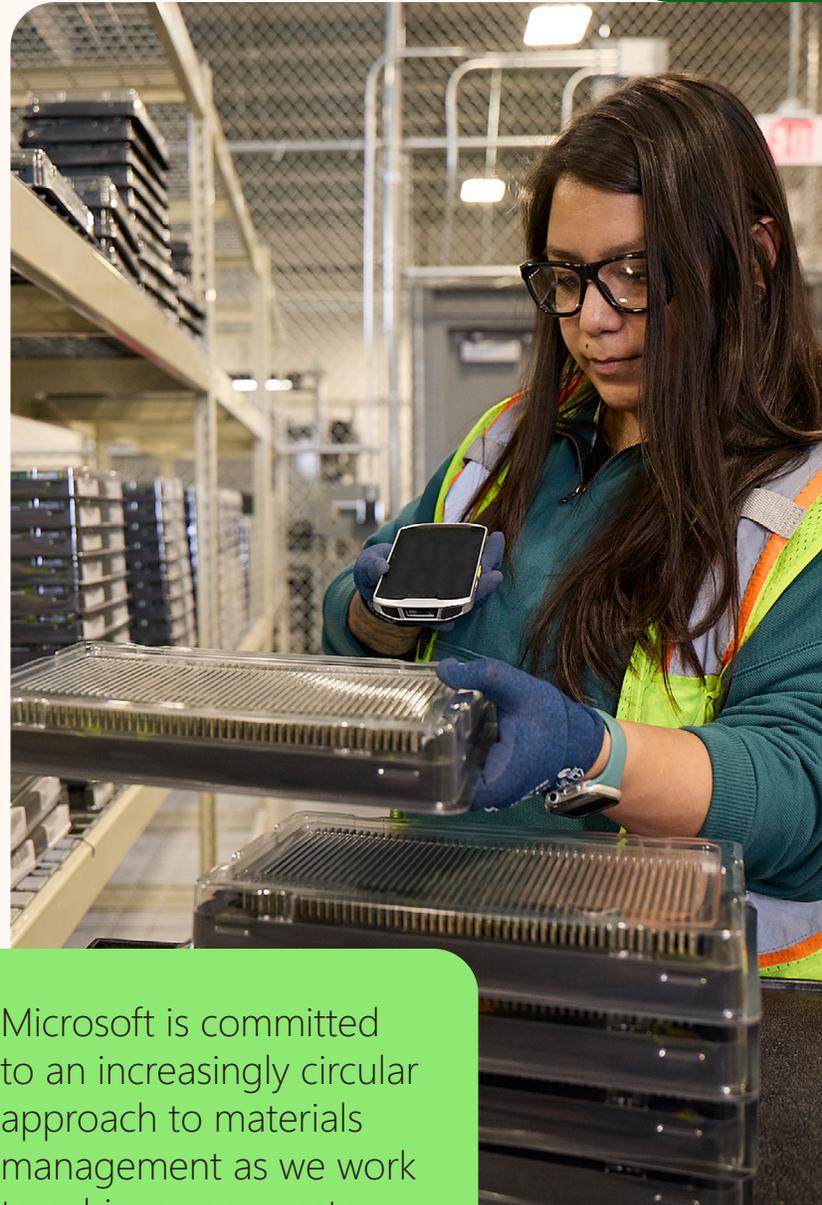
# Introduction



As a company that manufactures devices, builds campuses and datacenters, and uses manufactured goods in our operations, Microsoft recognizes a need to reduce waste and strengthen supply chain resiliency and security by implementing circular economy principles across the full life cycle of materials. In 2020, we announced our ambitious goal to achieve zero waste across our direct operations, products, and packaging by 2030. Microsoft is committed to an increasingly circular approach to materials management as we work to achieve zero waste.

Microsoft's zero-waste journey is detailed in our annual sustainability report. We are making progress toward achieving our targets of driving to zero waste in building construction and operations, increasing the reuse and recycling of servers and components, improving the reparability and recyclability of our products and packaging, and eliminating single-use plastic packaging.

This policy brief focuses on electronic products and the important role that public policy can play in reducing waste and advancing circularity. For the purposes of this policy brief, Microsoft defines electronic products as equipment that is dependent on electric current for operation, such as laptops, servers, and consoles. Electronic products underpin digital access, cloud computing, and the AI economy and are made up of multiple materials including steel, aluminum, plastics, copper, and critical raw minerals.



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## Global policy landscape

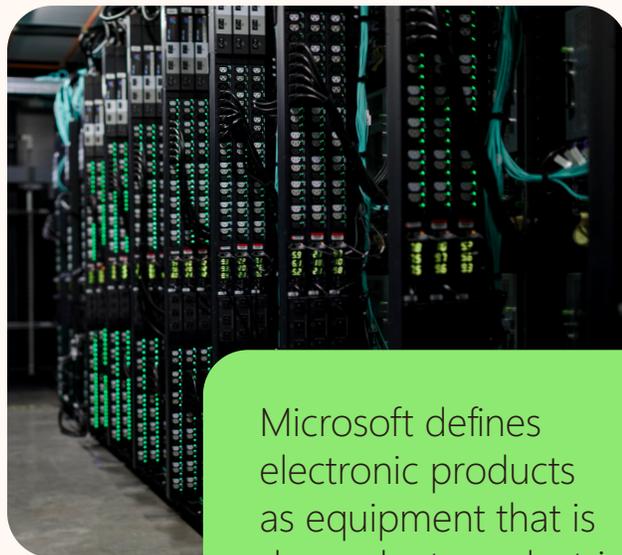
The circular economy is a system in which products and materials are kept in use through methods such as design, reuse, repair, and recycling in order to prevent increasing waste and pollution. From sourcing to end of life, the product life cycle requires supplier and customer engagement at a global and local level. As a result, the shift to a circular economy requires alignment across local, national, and global supply chains through the support of meaningful government policies and collaborative efforts among stakeholders.

Electronic waste and circular economy policies already exist in some jurisdictions across the globe. Various elements are incorporated into these policies, such as eco-design standards, extended producer responsibility (EPR) rules, and waste disposal requirements. For example, the European Union (EU) recently adopted the [Ecodesign for Sustainable Products Regulation \(ESPR\)](#), which will allow for comprehensive eco-design requirements to minimize impacts across the entire life cycle of products, including reusability, recyclability, and repairability. In the United States, electronics waste has been regulated at the state level with policies such as Washington's [Electronic Product Recycling Law](#) and California's [Electronic Waste Recycling Act](#). However, these types of policies vary by

jurisdiction and need to be interoperable in order to drive the investment required to reduce waste, increase availability of materials, and enhance the resiliency of technology supply chains.

## Using our voice for policy advocacy

At Microsoft, we believe that companies have an important role to play in advocating for effective electronic waste reduction and circularity policies. In this policy paper, we outline nine key principles—in the areas of advancing eco-design of products; increasing availability of recycled materials; and scaling system-wide recovery, reuse, repair, and recycling—that guide our circular economy policy engagement. By sharing our principles, we hope to encourage and align policies in a way that unlocks the ability for producers, consumers, and recyclers to scale markets and significantly reduce waste.



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# Advance eco-design of products



A circular economy starts with product design and materials selection. Today, many products are not designed for material reduction, recyclability, and repair. To effectively reduce the waste associated with electronics, Microsoft supports policies that 1) encourage design for material reduction, repair, and recyclability, 2) match design requirements with available recycled materials, and 3) promote interoperability of regulations.

- 1. Encourage design for material reduction, repair, and recyclability.** Design standards and guidelines can promote the use of recycled materials such as aluminum, plastics, and critical raw minerals. These guidelines can take different forms, including voluntary recommendations or mandatory requirements. Design guidelines are most effective when they consider product circularity, reuse, and repair from the start, such as prioritizing the use of recyclable materials and recycled content. We support policy design that focuses on outcome-based rules rather than specific design requirements, as overly prescriptive requirements can inhibit industry flexibility to innovate and tailor eco-design improvements to a wide range of products. We also encourage the adoption of standardized methodologies for assessing product eco-design across jurisdictions, where possible.
- 2. Match design requirements with available recycled materials.** For recycled content regulations to be most effective, it is important for requirements to align with current technologies, infrastructure, and availability. Only if sufficient sources of critical raw materials are available and affordable can designers and manufacturers satisfy regulatory and voluntary eco-label obligations. In addition, regulations impose static eco-design requirements and do not take recycled material markets into account, which can result in fragmented outcomes given that voluntary eco-labels often drive industry action and create additional requirements on top of regulation.

- 3. Promote interoperability of regulations.** Efforts to design for recyclability, lower-impact materials, and repair can be hampered when eco-design regulations vary or are inconsistent across regions or even within the same country. When designing products for a global market, ideally eco-design requirements align across all geographies to provide a consistent and reliable product experience for customers. This can be achieved through innovation and addressing challenges in regions where investment and capacity building is necessary. We support policy decisions that seek to harmonize design requirements, both voluntary and mandatory, across regions and within countries. The need for improved harmonization spans the product life cycle, from eco-design considerations in product design (including hazardous material restrictions, recycled content, recyclability, and repair requirements) to end-of-life programs (take-back and recycling programs). Harmonization that focuses on universal outcomes rather than specific requirements allows for the optimal balance between advancing product design and enabling industry flexibility to achieve these goals.



# Increase availability of recycled materials



The lack of available recycled materials and poor visibility into materials sourcing are key challenges to creating a circular economy for electronics. To increase the availability of recycled materials and markets, Microsoft supports policies that 1) drive innovation in the development of new recycled materials, 2) facilitate responsible movement of products and materials intended for recovery, and 3) enhance traceability and transparency for recycled raw materials.

- 1. Drive innovation in the development of new recycled materials.** We support policies that help increase the availability of recycled materials. This includes policies that support research, recycling, and use of these materials in electronics, as well as those that drive the development of new recycled material markets. These policies may include sustained funding, grants, and loan guarantees to facilitate the demonstration and deployment of new technologies and increase the recyclability of materials commonly used in electronics including critical raw materials.<sup>1</sup> For example, at Microsoft, we support market solutions through our Climate Innovation Fund (CIF). CIF has invested over \$793 million in capital to bring new supply to market and accelerate adoption and cost reduction in key target technologies like the sorting of waste and recycling and the recycling of rare earth materials.
- 2. Facilitate responsible movement of products and materials intended for recovery.** Closer coordination is needed for recovered materials to be sourced and consolidated for reuse and recycling at scale. We support policies that enable responsible and safe movement and processing of used electronics for reuse through material recovery, repair, or refurbishment operations, which result in lower net environmental impacts. This can drive the volumes needed to foster a more resilient and circular supply chain.

- 3. Enhance traceability and transparency for recycled raw materials.** Policies that support digital infrastructure, such as the digital product passport (DPP) for devices, can increase transparency in the availability of recycled materials. They can also promote efforts to trace the source and destination of these materials in a supply chain, while increasing consumer trust and reducing fraud in the marketplace. This is important given that recycling extends the supply chain, adding more complexity to tracing efforts and authentication. A DPP is a product-specific dataset that can provide information on origin, composition, and environmental impact, as well as guidance on product repair, recycling, or disposal.<sup>2</sup> By tracing these items through a DPP to document and verify chain of custody, manufacturers can comply with regulatory and eco-label requirements as well as validate the quality of the recycled materials and ensure ethical supply chains and raw materials collection. We support interoperable data standards to authenticate supply chain information and to enhance the accessibility and visibility of information. Interoperable data standards also help reduce fragmentation in compliance and reporting regimes. It is crucial that any digital infrastructure ensure privacy, security, and confidentiality to protect data and interactions in order to foster trust and compliance with international privacy standards. The ability to trace recycled materials promotes regional market interoperability and strengthens materials sourcing partnerships between manufacturers and those specializing in end-of-life material recovery and waste management.

<sup>1</sup>[Critical raw materials | European Commission](#)

<sup>2</sup>[Digital Product Passport | European Union](#)

# Scale system-wide recovery, repair, and recycling



Improving end-of-life recovery, repair, and recycling keeps resources in circulation for as long as possible. Current rules and labelling requirements make it difficult for governments, consumers, recyclers, and companies to sort products at the end of life, aggregate for recovery at scale, and invest in recycling infrastructure. Microsoft supports policies that 1) establish common measurements and methodologies, 2) expand materials sorting and recovery infrastructure, and 3) empower consumers to repair or recycle their electronics.

## 1. Establish common measurements and methodologies.

To create markets of scale for recyclable materials, there needs to be a common definition of recyclability and a common approach to measuring the recyclability of an electronic device in each jurisdiction. Without a standardized way to measure device recyclability, it is challenging to drive improvements in product design and know where to invest to scale recycling technologies. We support policies that establish common definitions, consistent approaches to measuring device recyclability, and standard approaches to materials recovery and classifications.

## 2. Expand materials sorting and recovery infrastructure.

Today, electronics recycling practices vary significantly between recyclers, even within the same country. Expanded material sorting and recovery infrastructure can drive consistency in recovery and recycling. We support policies that encourage innovations in recycling technologies for sorting and separating, investment in materials recovery infrastructure, protections for worker safety and the environment during recycling collection and processing, and incentives for device collection and procurement of recycled materials.

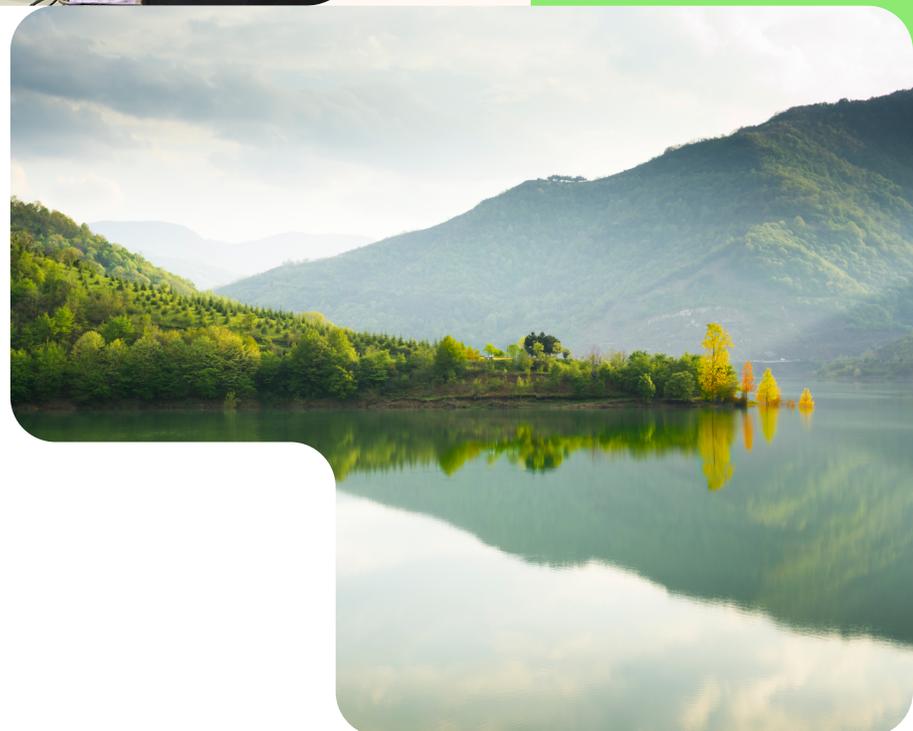
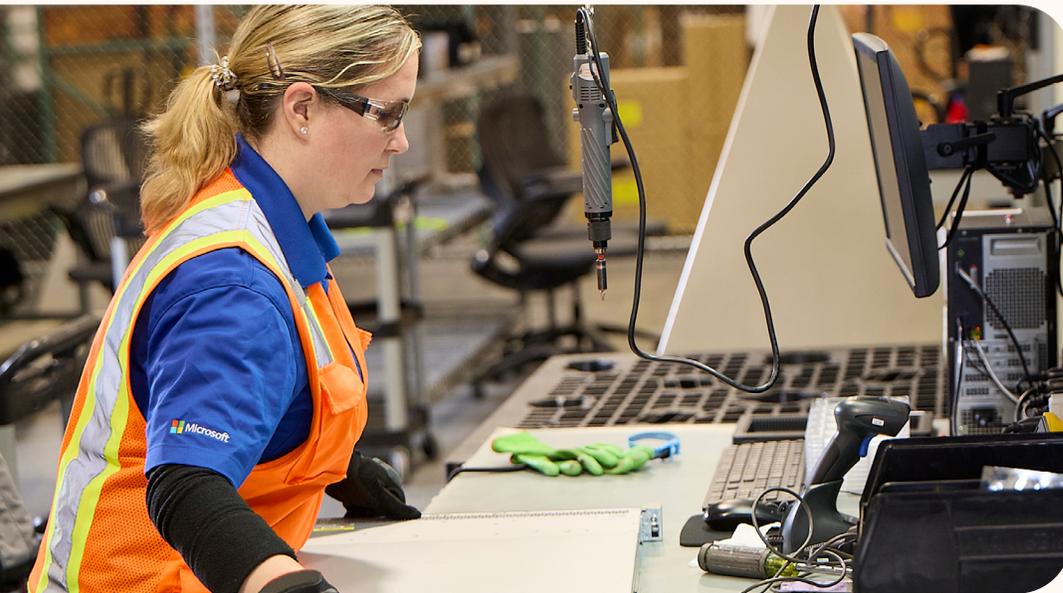


## 3. Empower the consumer.

Programs and partnerships can support and incentivize customers to repair and recycle electronics. Greater consumer awareness, activation, and whole-system efficiency can increase device collection volumes resulting in higher levels of recovery, repair, and recycling. Improving outcomes for the management of electronics, and the livelihoods of those who work with recycling and recycled materials, is a process that will always require continuous improvement. Microsoft and our partners have invested in repair hubs in major geographies to extend product use. We also offer take-back programs to process end-of-life devices for reuse or recycling. Solving device circularity will require partnerships and efforts across the technology industry, governments, and consumers.

## Conclusion

Public policies can help to reduce waste and promote a circular economy by advancing eco-design of products; increasing availability of recycled materials; and scaling system-wide recovery, reuse, repair, and recycling. By outlining our policy principles, we hope to promote and encourage policies that will create the opportunity for all stakeholders—suppliers, producers, consumers, and recyclers—to scale circular markets for electronics and as a result, significantly reduce waste and advance more resilient supply chains.



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