Microsoft

Integrity built-in.

Microsoft Devices
Sustainability Report FY20

Contents

Links throughout the document to further information

⬂ Link to web pages

⬇ Link to downloads

▶ Find out more elsewhere in this document

Direct download

For the best experience, we recommend using the free software Adobe Reader, or iBooks if viewing on an Apple mobile device. Interactive functionality may be limited when viewed in a web browser.

Feature story

24

Read a Q&A with one of our designers about how they are innovating for sustainability

Feature story

42

Discover how workers' voices are being heard

Feature story

51

Find out how we made the Xbox console carbon neutral

Feature story

62

See how integrity is built into the environmental performance of the Surface Pro 7

About this report

Microsoft Devices is a business group of Microsoft Corporation. We are responsible for the ideation, design, development, manufacturing, packaging and distribution of Microsoft's hardware, packaging and related software products.

As we continue to improve the sustainability of our products and supply chain, this report provides an overview of our strategy, approach and performance for the period July 1 2019 – June 30 2020 (FY20).

Global frameworks

We follow the internationally recognized Global Reporting Initiative (GRI) Sustainability Reporting Standards. The GRI Standards are a set of indicators covering social, economic and environmental impacts created by experts representing business, labor, investors, NGOs, accountancy academia, among others.

GRI STANDARDS

Download
our GRI Standards Index

We also map our contributions to the UN Sustainable Development Goals (SDGs) and the results of this mapping are available in the Microsoft SDG report.

SUSTAINABLE DEVELOPMENT GOALS

Find out more
in our SDG Report

Our reports

The Microsoft reports hub provides links to other disclosures and reports:

Corporate Social Responsibility Report

Modern Slavery and Human Trafficking Statement

Annual Human Rights Report

Diversity and Inclusion Report

Conflict Minerals Report

Overview

"What does integrity built-in mean to me?"

"The integrity we build into our products is the reason we share them with the world. We believe in these products 100%. If we don't believe in them, then why should the world believe in them?"

Panos Panay, Chief Product Officer

Message from Panos Panay, Chief Product Officer

Our mission is to empower every person and every organization on the planet to achieve more.

It depends on continuously pushing the boundaries of technology in almost every facet of the product and processes we use, and more importantly, in the ways we can sustain a healthy planet.

We believe that our products reflect the people that make them and that use them. That's why we continue to push ourselves to set higher standards and goals to further reduce the impact our products have on the world around us.

During the last year, we've seen our Windows and Devices business continue to grow as people use our products to safely connect, work, and learn. From frontline healthcare workers developing new tele-health protocols with patients, to communities collaborating on social justice, to students using our products to continue learning remotely from home... our customers inspire us every day.

We are committed to driving innovation that helps people accomplish more and fosters a more sustainable future together with our customers, suppliers, and partners.

▲
The Surface Pro X is the most efficient Pro Microsoft has made when using the ENERGY STAR Computer Specification version 8.0 test method.

The passion and commitment you all have for sustainability will help us further our efforts and enable us to set higher standards year on year.

Earlier this year, Microsoft made a commitment to become carbon negative by 2030. To contribute towards achieving this goal, integrity must be built into every product we make. That means our design process integrates our focus on the customer and building products of the highest quality, with a responsible supply chain that meets higher ethical and environmental standards.

This includes our growing efforts to reduce carbon emissions, design waste out of our products, use renewable resources, hold suppliers to higher ethical standards in our sourcing, and expand protocols to ensure workers' health and safety.

We know that we have only just begun our journey with much to learn. With every challenge, we find opportunities to learn, adapt, and aspire to bigger goals. The passion and commitment you all have for sustainability will help us further our efforts and enable us to set higher standards year on year.

Thank you for grabbing an oar with us. Together we'll continue to collaborate on the policies, practices, and products for our customers and a sustainable future.

Thank you,

Panos Panay, Chief Product Officer

This FY20 report details our progress and efforts, including the following key results and goals:

Product design
Key results and goals

100%*
recyclable packaging and Surface devices by 2030

20%*
post-consumer recycled content in new Surface Dock 2

10%*
Pilot project to develop new material containing 10% ocean plastic

▶ 19 Find out more

Responsible sourcing
Key results

99.5%
of audited factories in China have access to the Workers' Voice Hotline for grievance reporting

100%
new suppliers are qualified and reviewed prior to onboarding

5.4ᵏ
factory workers were reimbursed $275k in recruitment fees and insufficient payments

▶ 30 Find out more

Product use
Key results and goals

37%
of units fulfilled by carbon neutral fulfillment centers by 2021

825ᵏ
Xbox consoles obtained Carbon Neutral® certification

1ᵇ
Windows 10 powering 1 billion active devices monthly

▶ 47 Find out more

Climate and environment
Key results and goals

91%*
Surface Laptop 3 assessed to be 91% recyclable

2030
Microsoft carbon negative

2x
Surface Pro 7 and packaging contain more than 2x the average global circular resources

▶ 57 Find out more

*   (w/w)

Microsoft Devices Sustainability Report FY20

About Microsoft Devices

Our mission: Build extraordinary products that create and complete magical experiences to empower every person and every organization on the planet to achieve more.

Our organization

We are responsible for the ideation, compliance, design, development, sourcing, manufacturing, packaging and distribution of Microsoft's hardware, packaging and related software products.

Devices is committed to increasing the sustainability of Microsoft's products and supply chain. Our mission pushes us to create technologies that unlock potential for people, the planet and organizations.

100+
countries of operation

2,748
employees

418
directly contracted supplier factories

94
different products shipped[1]

1   Excluding variants and SKU bundles.

Our products

Our products include Windows, Surface computers, Surface accessories, Xbox, other intelligent devices and PC accessories.

2.

3.

1.

1. Surface Pro X
Built for web-first experiences, ultra-thin and always connected, combining blazing-fast LTE with 2-in-1 versatility.

2. HoloLens
An untethered mixed reality device with apps and solutions that enhance collaboration.

3. Arc Mouse
Slim, light and ready to travel.

How are we doing?

#3
Forbes World's Most Reputable Companies for Corporate Responsibility 2019

#6
Corporate Responsibility Magazine's 100 Best Corporate Citizens 2019

#1
Responsible Sourcing Network Mining the Disclosures 2019: Application Software category

A List
for corporate Climate Action, CDP

The journey of our products

To truly embed sustainability in Devices, we need to consider every area of our business. It begins with understanding our impacts and opportunities at each stage of the value chain.

Product design

We design devices that are reliable, durable and made to last. Our approach focuses on three key areas: carbon reduction, designing out waste, and extending product lifetime.

▶ Find out more
page 20

Raw materials sourcing

Our devices are made using critical raw materials, including metals such as aluminum, cobalt, gold, lithium, tantalum, tin, and tungsten. We apply strict standards to our raw materials sourcing.

▶ Find out more
page 43

Product manufacturing

Our products are manufactured in 418 directly contracted supplier facilities in 23 countries. We manage the impacts of our manufacturing on people, the planet and natural resources by investing in innovation, supplier engagement and latest technologies.

▶ Find out more
page 31

Packaging and distribution

Our packaging connects with consumers and ensures our products reach them in perfect condition. Sustainable packaging reduces our environmental impacts, drives innovation in design and sustainable materials, and creates business value.

▶ Find out more
page 61

Product use

Our goal, once the customer completes the out-of-box setup, is to maximize energy efficiency and extend the usable life of each product. Product safety and security is paramount, and our design solutions support digital inclusion.

▶ Find out more
page 48

End-of-life

We embrace circularity and ensure product components are recovered, recycled and kept in use for as long as possible. We extend our commitment by supporting recycling programs around the world that cover our devices, batteries and packaging.

▶ Find out more
page 66

Return at end-of-life for repair, refurbishment or recycling

Our changing world

We need to understand the trends affecting the world in which we operate. They drive us to manage our risks, act on opportunities, and develop partnerships to meet the needs of society.

Many of the trends that affect our business are interconnected, and technology is a common theme running through them all.

1 Responding to the global pandemic

In just a few short months, the COVID-19 global health crisis has transformed our lives and impacted every area of society and business.

For responsible companies, the health and safety of employees, business continuity and supply chain resilience have stood out as crucial elements of an effective response. When we eventually emerge from the crisis, the future of commerce, work, medicine, education and public services will have changed. Our data shows that two years' worth of digital transformation were concentrated into just two months as COVID-19 fast-tracked the use of technology to support e-commerce, remote working, online learning and telemedicine. For example, we saw a 500% increase in usage of Teams meetings, calling, and conferences in China during the coronavirus outbreak. Access to digital tools has become more critical to our lives and livelihoods than ever before – allowing people to connect, businesses to work from home and communities to mobilize. With COVID-19 acting as an accelerant that has driven many essential activities online, we must bridge the digital divide to ensure those without access to the online world are not left behind.

▶ Find out how we worked to maintain high standards for workers in our supply chain during the pandemic
page 32

2 An era of bold climate commitments

Despite international climate commitments, like those made through the Paris Agreement, global emissions continue to rise – driving temperature increase and climate-related impacts.

The recovery phase of the global pandemic is a crucial opportunity to rebuild stronger. We must embed resilient, long-term climate solutions into economic recovery plans. Progress will require targeted policies and investments to drive the transition to a low-carbon world and build resilience against future shocks by holding global temperature rise to within 1.5°C, in line with reaching net zero emissions before 2050. As public understanding of climate change grows, pressure on business to deliver meaningful action will only increase. Those leading the way are making bold climate commitments and setting science-based targets to reduce their emissions across the value chain in line with what is needed to limit climate change.

▶ Read more about our commitment to be carbon negative by 2030
page 60

3 Towards supply chain transparency

Demand for transparency is influencing the way businesses operate and manage their supply chains. Respect for human rights has become a basic expectation of businesses, within their own operations and across their supply chains.

With the complexities involved, supply chain transparency and robust due diligence are key to managing the risks, while cross-sector collaboration can help tackle the root causes of issues such as forced labor and child labor. Technologies like blockchain and geo-tracking have a key role to play, extending transparency, security and traceability to the farthest reaches of global supply chains.

▶ Discover how we are leveraging partnerships to embed human rights in our raw materials sourcing
page 46

Our changing world (continued)

4 Designing out waste

In 2019, over 92 billion tons of raw materials were extracted and processed. The resulting waste is taking a huge toll on the environment and human health, and contributing around half of global CO$_2$ emissions.[2]

Technology has the power to transform lives, but the disposal of electronic goods is a global problem that must be urgently addressed. Around 50 million tons of electronic and electrical waste are generated every year, equivalent in weight to all commercial aircraft ever made. Only 20% is formally recycled.[3] Transitioning to a circular economy is crucial to address the problem. E-waste represents a huge opportunity, valued at $62.5 billion.[4]

To unlock that value, we need a new vision for electronics that designs out waste and supports circular systems in which resources are valued and reused. It begins with design for circularity, selecting the right materials and enabling reuse and recycling at the end of a product's life.[5] Cross-sector partnerships spanning the entire value chain – from producers to waste managers – are key to unlocking the systemic change that is required.

▶ **Discover the Ecodesign principles we apply to design our products and packaging for circularity**
page 20

2 https://www.weforum.org/projects/circular-economy
3 https://www.unenvironment.org/news-and-stories/press-release/un-report-time-seize-opportunity-tackle-challenge-e-waste
4 http://www3.weforum.org/docs/WEF_A_New_Circular_Vision_for_Electronics.pdf
5 https://www.weforum.org/agenda/2020/01/circular-economy-marine-plastic-litter/

5 The changing relationship between consumers and brands

In today's era of consumer awareness, technology and social media have given people and organizations the power to stand up for their values and make their voices heard. Informed consumers know that business impacts occur all the way along the value chain.

Consumers expect the products they buy to be designed and sourced responsibly and to add sustainable value to their lives. Some 62% of customers say they want companies to take a stand on issues like sustainability, transparency or fair employment practices with more than half prepared to complain when they are disappointed with a brand's words or actions and 47% are willing to walk away.[6]

People have a growing awareness of planetary impacts and are placing more importance on health and well-being. This is reflected in their purchasing decisions and lifestyle choices, driving demand for digital solutions that support their goals. At the same time, society is becoming more aware of the potential negative impacts of technology ownership, including data privacy and security concerns.[7]

▶ **Read about how we are designing products that have safety, security, reliability and accessibility at their heart**
page 54

6 https://www.accenture.com/_acnmedia/thought-leadership-assets/pdf/accenture-competitiveagility-gcpr-pov.pdf
7 https://docs.wbcsd.org/2020/05/WBCSD_V2050IB_Macrotrends_Disruptions_20202030.pdf

6 Using tech for good

Technology has the power to enable economic and social opportunities to create a more sustainable and accessible world.

Since the declaration of the global Sustainable Development Goals (SDGs), a new generation of technology is paving the way to progress.[8] Developments such as big data, robotics and artificial intelligence are accelerating the pace of change and leading to smarter products, faster processes, deeper insights and greater transparency. Relevant, affordable and innovative cloud solutions are driving digital transformation and enabling stakeholders to tackle key challenges.

In recent months, technology innovation has played a crucial role in almost every facet of addressing the global pandemic – from using AI to crunch massive datasets to analyzing disease vectors and identifying treatment impacts. We must continue to focus on innovation and collaboration to unlock the potential that technology holds to creating a more sustainable and resilient future.

▶ **Find out how we are leveraging technology during the pandemic to maintain transparency in mineral supply chains**
page 46

8 https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2071

Our sustainability strategy

Sustainability shapes how we do business. We are rethinking our commitments and increasing our ambition to reflect the needs of people, the planet and our business.

Sustainability at Devices is delivered through our Responsible Sourcing Strategy and our Environmental Sustainability Strategy. This year, we reached the end of our 2020 Environmental Sustainability Goals. As we embark on a new phase in our journey, we are setting our sights on a bold new set of 2030 targets, developed with internal and external stakeholders.

Responsible Sourcing

Our Responsible Sourcing Strategy reflects Microsoft's mission to "empower every person and every organization on the planet to achieve more."

We work with our suppliers to embed sustainability throughout our supply chain to its farthest reaches. Our approach is based on a deep understanding of our risks and opportunities, robust assurance and accountability, building supplier capability and driving innovation through collaboration to transform supply chains globally.

▶ **Find out more**
page 30

Environmental sustainability

Microsoft's Environmental Strategy focuses on the four areas where we can have the greatest impact – carbon, waste, water and ecosystems.

We will work with our teams to mobilize progress and positive change by applying science-based targets and best practice standards in our operations, building trusting relationships with customers and partners, developing products and services that support environmental solutions and advocating for public policy to enable change.

▶ **Find out more**
page 57

Microsoft's bold environmental commitments for 2030

In 2020, Microsoft announced three bold commitments. As a business group within Microsoft, we are aligning our strategy and goals to support these commitments.

Carbon negative ambition

Our goal

To be carbon negative by 2030 and, by 2050, to remove from the environment all the carbon the company has emitted either directly or by electrical consumption since it was founded in 1975.

How we will do it

We have launched an aggressive program to cut carbon emissions by more than half by 2030, including direct emissions from our operations and emissions generated across our supply and value chains. We will invest $1 billion in a new Climate Innovation Fund to accelerate the development of carbon reduction and removal technologies.
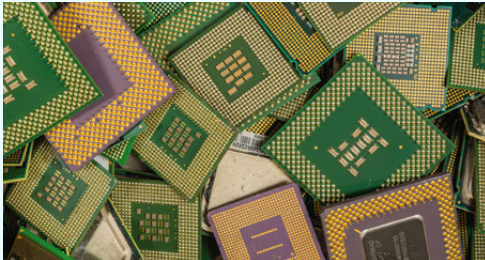
Tech for biodiversity

Our goal

To preserve and protect the species, biodiversity and ecosystems that are vital to the planet's health.

How we will do it

A groundbreaking initiative to put data and technology to work to protect biodiversity will create a new "Planetary Computer". It will aggregate environmental data and enable it to be used by decision-makers worldwide. We will take responsibility for the ecosystem impacts of our direct operations, protecting more land than we use by 2025.

Zero waste ambition

Our goal

Achieve zero waste for Microsoft's direct operations, products and packaging by 2030.[9]

How we will do it

We will reduce nearly as much waste as we generate while reusing, repurposing or recycling our solid, compost, electronics, construction and demolition, and hazardous wastes. We'll eliminate single-use plastics in our packaging by 2025, increase electronic reuse on-site at our datacenters with Microsoft Circular Centers, and use technology to improve our waste accounting.

Our sustainability strategy (continued)

Devices Sustainability 2030 – Healthy Design, Healthy Planet

Launched in 2020, Healthy Design, Healthy Planet is how Devices will deliver Microsoft's sustainability commitments – by integrating Healthy Design into our products and packaging, and reducing end-to-end carbon emissions and waste for a Healthy Planet.

Our Healthy Design strategy integrates sustainability elements during the product and packaging design and development stages. Our Healthy Planet strategy addresses carbon emissions, waste reduction, and water use and quality. Healthy Design is a Healthy Planet enabler.

We have already announced some of the targets we will deliver. Table 1 provides a summary of our Sustainability 2030 ambitions. As we drive for continual improvement, more goals will be announced throughout FY21, bringing our ambitions to life with measurable targets.

Our science-based carbon target sets out our ambition to help tackle the climate crisis.

Healthy Design

Healthy Design drives innovative solutions through design and development to reduce environmental impacts and address challenges across the product and packaging value chain.

Ecodesign guides our approach, influencing our decisions from selecting materials to innovative designs enabling repair and recycling. We use product environmental lifecycle assessments to inform our decisions, from concept to manufacturing. Healthy Design also shapes customer solutions, for example, broadening our repair network to bring repair closer to the customer.

This year, we launched new targets that will reduce hazardous substances and increase repairability, recyclability and circularity.

▶ **Find out more**

Healthy Planet

Healthy Planet addresses climate change, waste and water across the entire product lifecycle – from sourcing to end-of-life.

In FY19, we set a science-based target for Scope 3 carbon reductions to be achieved by 2030. Approved by the Science Based Targets initiative (SBTi) in September 2019, our target establishes how we will help tackle the climate crisis by reducing emissions across our value and supply chains. We have made progress against this target in FY20, but we still have much more to do.

We have also set a 2030 "zero waste" goal for Surface devices and packaging and we are now defining the underlying targets. Setting recyclability targets was our first step. Measuring, monitoring and improving recyclability is key to reaching our zero waste goal. We have also committed to expand our consumer mail-back program for hardware and packaging worldwide by 2030. Additional targets enabling zero waste will be announced over FY21.

▶ **Find out more**

Table 1: Our Sustainability 2030 ambitions

Healthy Design
Sustainable design
Increase recycled content and renewable materials across the portfolio — Incorporate 100% recycled, renewable or responsibly sourced content in packaging
Reduce hazardous substances
Replace brominated flame retardants in resins — Eliminate beryllium from metal alloys — Reduce volatile organic compounds in coatings

Healthy Planet
Carbon negative
Reduce Scope 3 carbon emissions by 30% and aspire to reduce carbon emissions by more than half
Zero waste products and packaging
Achieve 100% recyclable Surface devices — Accomplish 100% recyclable packaging — Expand mail-back program for Microsoft branded electronics and packaging worldwide — Increase the circularity of our products and packaging

Our sustainability strategy (continued)

Our environmental principles
Our environmental principles are foundational to our Healthy Design, Healthy Planet strategy.

Sustainable products and packaging

Our environmental policies and practices aim to protect the world's natural resources and ensure the well-being of our customers and communities. We use Microsoft digital technology to manage our impacts and we design our products and services to enable our customers to do the same.

Conserve, reuse, and recycle

Where feasible, we conserve natural resources by using recycled and renewable materials, increasing energy efficiency, repairing and refurbishing products and supporting product recycling programs.

Reduction and disposal of waste

We reduce and, where possible, eliminate waste at our facilities by designing out waste and reusing and recycling materials. All our waste is handled and disposed of via safe and environmentally responsible methods.

Continually improve our performance

We set challenging objectives and targets to improve our environmental performance and management systems. We engage our employees and regularly review our business activities, programs, practices and goals to drive progress at scale. We proactively manage environmental risks and opportunities and we collaborate with suppliers to improve across the value chain.

Responsibly source raw materials

We are committed to responsibly sourcing our raw materials as per our Responsible Sourcing of Raw Materials Policy. We collaborate with industry groups, non-governmental organizations (NGOs) and other stakeholders to establish responsible practices in the harvesting and extraction of raw materials across the value chain.

Demonstrate responsibility and transparency

We engage with stakeholders to shape our environmental objectives and targets and we communicate progress to our Board, shareholders, customers and members of the public.

Supporting global progress

The UN Sustainable Development Goals (SDGs) have been a game changer in mobilizing global stakeholders to bring about positive change.

Helping to deliver the UN Sustainable Development Goals

Our mission to empower every person and every organization on the planet to achieve more aligns strongly with the ambitions of the SDGs. Our industry is an essential enabler of all 17 SDGs and contributes to more than half of the 231 SDG indicators. Devices plays an important role in delivering solutions that accelerate the transformation, through our products and solutions, of our responsible business practices, our programs, our policy and advocacy work and our philanthropic investments.

↘ **Find out more** about Microsoft's contribution to the SDGs

Microsoft's contribution to achieving the UN Sustainability Goals

We track our contribution to the UN Sustainability Goals as part of Microsoft's commitment to empowering sustainable development for everyone, and ensuring everyone has access to the benefits technology provides and the opportunities it creates.

UN Global Compact

The UN Global Compact (UNGC) seeks to advance universal principles on human rights, labor, environment, and anti-corruption through the voluntary engagement of the corporate community. Microsoft endorsed the UNGC in 2006. Over a decade later, we remain firmly committed to its 10 principles and we communicate progress annually on how we are meeting them.

What are the SDGs?

The SDGs are the global blueprint for a better and more sustainable future for all by 2030. The 17 Goals address crucial challenges including those related to poverty, inequality, climate change, environmental degradation, peace and justice.

↘ **Read more online** about the SDGs

1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS	

Digital solutions for 21st century challenges

Improve people's quality of life

450m

Digital solutions can provide better access to education for 450 million people

Foster equitable growth

$11t

Digital solutions could generate over $11 trillion in economic benefits per year by 2030

Protect the environment

20%

Digital solutions can enable a 20% reduction in global CO_2e emissions by 2030[10]

10 2smarter2030.gesi.org

Engaging our stakeholders

Our stakeholders are passionate about our devices and their views are a powerful force for change. We view our stakeholders as partners in extending our positive impact. They challenge us to keep raising the bar and provide the reach to drive improvements and scale our ambitions.

By working with others, we can unlock the true power of technology. We engage openly with our stakeholders to uncover shared challenges and develop solutions. To help drive the pace of change, where appropriate we make technology available through open sourcing. We contribute technology, resources and expertise to empower those working to solve humanitarian issues and create a more sustainable and accessible world.

Our key stakeholders are the people, groups, organizations and institutions that are interested in, impacted by, or have an influence on our business.

Transparency in our communications

Credible and honest communications help to build trust in our products. A wide variety of people and organizations contact us for information on our products and programs. We strive to be transparent, direct and personal in the way we respond.
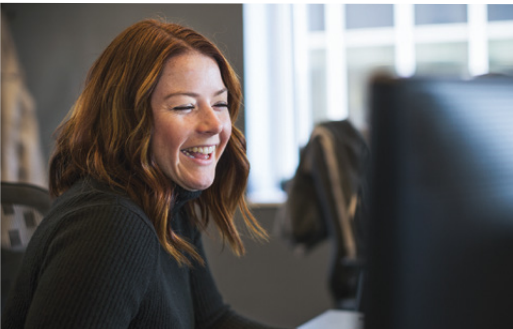
We are improving access to information about the sustainability of our practices and products through a self-service portal on our corporate site.

In FY20, we added a universal footer on the Microsoft web pages ("Safety & Eco") to directly link to sustainability information.

⬊ Environmental compliance information: microsoft.com/en-us/legal/compliance/environmental-compliance

⬊ Responsible Sourcing information: microsoft.com/en-us/responsible-sourcing/hardware-supply-chain

We continue to enable the reverse lookup of product documentation by model number and material aspect.

We publish an external interactive Power BI dashboard to provide transparency over supplier non-conformance against our standards. This dashboard is unique in the industry and highlights our commitment to empowering others through our technology.

◀ **Customers, employees and suppliers are three key stakeholder groups.**

Clockwise from left: a customer support professional at a digital consulting firm which uses Microsoft Devices; a Microsoft employee in the Singapore office; a worker at one of our supplier factories in China.

"The new Surface packaging made deployment much easier; we have over 10,000 students gathering at 17 university locations, unboxing the devices, conducting initial set-up and receiving hands-on instruction on how to use Surface. In the past, packaging disposal posed a big challenge as the box was hard to bend and bulky to recycle; with the new material, it is much easier for students and Co-op staff, leaving more time for hands-on sessions they need to start using Surface."

Kenta Koso, Merchandising Dpt. Manager, University Co-op

Engaging our stakeholders (continued)

Communications with stakeholders

Employees

Why they are important

Our employees are crucial to our long-term success and sustainability. They bring challenge, feedback, innovation and creativity to help shape our approach and improve product and operational sustainability.

How we engage with them

We ask for and act on employee feedback in multiple ways, including through the annual, anonymous Microsoft Poll of all global employees.

Employees directly impact our sustainability programs and contribute to each stage of the process starting from development, new product introduction, and manufacturing all the way to repair and refurbishment.

We have established a Sustainability Culture of Learning within Devices to educate and engage with employees on sustainability programs.

Customers

Why they are important

Our customers challenge us to deliver more; their feedback drives us to innovate new product, packaging and customer solutions.

How we engage with them

We gain insights from online feedback, support communities, product satisfaction surveys, usability studies, research forums, business account managers and our customer service representatives.

We use feedback from our customers to shape our approach. For example, our commercial customers challenged the packaging we used to deliver Surface devices. We listened and designed a new packaging system to specifically address their concerns and reduce unnecessary waste.

▶ **Find out more**
page 26

Suppliers

Why they are important

Our relationships with suppliers are integral to our ability to achieve our vision and sustainability priorities. We set clear standards which we expect them to adhere to and we work with them to promote transparency and accountability.

How we engage with them

We engage with suppliers through capacity-building workshops and trainings, audits and collaborations. Microsoft conducts anonymous Voice of the Supplier Surveys, which include questions on sustainability.

From FY20, newly onboarded suppliers are expected to understand our standards, complete standard training and complete an Initial Capability Assessment to determine compliance before they begin production.

▶ **Find out more**
page 35

Regulatory bodies and standards organizations

Why they are important

Laws, regulations, and standards set the baseline for industries in addressing environmental and social challenges.

How we engage with them

Microsoft engages actively in policy issues relevant to our business, both directly and through industry associations.

For example, we have worked in partnership with the European Commission and other manufacturers of video game consoles to set aggressive targets for console energy and material efficiency.

▶ **Find out more**
page 50

Engaging our stakeholders (continued)

Communications with stakeholders (continued)

Civil society/NGOs

Why they are important

Our partnerships with NGOs and cross-industry stakeholders enable us to tackle strategic challenges and achieve meaningful change in our operations, supply chain and wider society. Our partnerships offer diverse points of view that challenge our ambitions and raise our thinking.

How we engage with them

Across the breadth of our business, we engage with NGOs working on issues ranging from environmental sustainability to human rights.

For example, we partner with CDP to disclose our greenhouse gas emissions and supply chain water usage information publicly, creating global transparency, trust, and credibility. CDP also gives us visibility into the environmental performance of our key suppliers, allowing us to track and encourage improvement.

▶ **Find out more**
page 61

Investors

Why they are important

Investors are an important influence as we consider ways to enhance our corporate governance principles and policies to serve the interests of our shareholders and other stakeholders.

How we engage with them

We actively engage with our investors, including impact investors, to inform our strategies and communications.

We value the perspective of our investors and engage in ongoing dialogue with them on focused topics such as responsible sourcing of raw materials and broader supply chain responsible sourcing.

Local communities

Why they are important

We depend on healthy and open relationships based on two-way communication with local communities. Ensuring our manufacturing operations do not detrimentally impact on local communities is a high priority.

How we engage with them

We support international NGO partners who bring the necessary expertise and local knowledge to develop and implement vital programming that brings value to local communities.

For example, we have partnered with Pact, an international NGO, to implement programming that has sought to address critical concerns in the mining sector in the Democratic Republic of Congo. Pact's programming has sought to reduce child labor and to promote safe, ethical working conditions in the mining sector, but also to address root causes by building capacity in mining-affected communities with literacy programs and micro-banking initiatives to assist women and girls with access to credit and finance to build household incomes and reduce the reliance on children for supporting household incomes.

Industry coalitions and trade groups

Why they are important

We actively participate in industry coalitions to address important sustainability issues. In many cases, we are among the leaders bringing companies together to work collaboratively to solve challenges.

How we engage with them

We engage in partnerships and drive collaboration with trade groups and industry peers, contributing technology, resources and expertise to scale our influence and impact.

An example is our partnership with the E-waste Solutions Alliance for Africa, an industry group that collaborates with governments to create and expand sustainable framework policies and long-term solutions for end-of-life product management in Africa.

Embedding sustainability

We ensure that sustainability is embedded in our actions and that risks and opportunities are operationalized through robust governance, principles and frameworks.

Materiality – identifying what matters

Materiality guides our approach by identifying the sustainability-related issues that matter to our business and our stakeholders.

We carried out our last materiality assessment in 2018. We revisited the results in 2019 to better understand and prioritize our efforts and communication. We will update our materiality assessment in the first half of 2021 to inform our strategy and communications.

Governance

Panos Panay, Microsoft's Chief Product Officer, leads Devices and is the executive sponsor of our sustainability programs.

The Regulatory and Public Policy Committee of the Microsoft Board of Directors has oversight authority for regulatory and citizenship issues, including sustainability.

⬊ Read more about our governance online

Our principles and frameworks

Our principles are shaped and guided by the recommendations, frameworks and standards of leading international organizations and experts.

Microsoft Global Human Rights Statement

Our commitment to human rights is consistent with the United Nations Guiding Principles (UNGPs) on Business and Human Rights and guides our Responsible Sourcing Program.

Microsoft Supplier Code of Conduct

Our suppliers must comply with the Microsoft Supplier Code of Conduct, including training their employees to understand it.

Microsoft Responsible Sourcing of Raw Materials Policy

The Microsoft Responsible Sourcing of Raw Materials Policy formalizes our values and approach to responsible upstream sourcing at the far reaches of our supply chain.

Microsoft Environmental Compliance

Our ISO 14001 certified Environmental Management System drives continuous improvement in our environmental programs. Our compliance declarations assure our customers and stakeholders of conformance to both laws and environmental regulations.

Microsoft Devices Product Safety Principles

Product safety, quality and ease of use are cornerstones for Microsoft products and product safety is inherent to our business. Our Product Safety Principles ensure we provide quality products that are safe for their intended use.

▶ Find out more page 54

Our compliance model

We integrate a myriad of sustainability-related legal and market requirements and voluntary measures into our business operations. Our compliance model provides an end-to-end system to ensure we meet these requirements. It follows the International Organization for Standardization (ISO) management systems approach, including the requirement for continuous improvement. We interpret this requirement by applying the Microsoft growth mindset to our thinking about sustainability.

⬊ Read more online www.microsoft.com/en-us/legal/ compliance/environmental-compliance

Our strong foundation

Our technical experts, digital technology and documented processes are foundational to our operating model. Devices' many in-house experts partner with each other and with external stakeholders throughout the value chain to drive innovation and knowledge sharing.

Our sustainability programs are designed and managed by experts including industrial designers, environmental sustainability specialists, regulatory program managers, product and packaging engineers, manufacturing managers, sourcing category managers, health and safety managers, human rights and supplier labor experts, distribution program managers, policy experts, attorneys, auditors, sustainability reporting and communications experts, our suppliers and others.

Staying ahead of product regulations in FY20

637

new product regulations reviewed by Microsoft team for applicability

229

regulations found to be applicable

Product design

Why does sustainability start with design?

"From choosing the right materials to designing out waste, the design decisions we make determine the impact of a product across its lifecycle. Our Healthy Design strategy looks for solutions to reduce environmental impacts and address challenges across the product and packaging value chain."

Patrick Gaule, Lead Product Designer

Overview and approach

The sustainability of our products begins with their design. We focus as much of our innovation effort on what our devices are made of, and how they are made, as on what they can do for our customers.

From choosing the right materials to designing out waste, the decisions we make during design determine the impact of a product across its lifecycle.

Healthy Design means identifying solutions to reduce environmental impacts and address challenges across the product and packaging value chain – including extraction of raw materials, production, distribution, product use and end-of-life.

We apply the following tools and approaches to reduce impacts across the product lifecycle:

- Lifecycle assessments (LCAs) to guide sustainable design and manufacturing decisions.
- Selecting materials and design elements that increase circularity, including recycled and recyclable materials.
- Designing for reliability and durability to keep products in use for as long as possible.
- Designing solutions to increase repairability and serviceability.
- Selecting design elements with lower manufacturing and carbon impact.
- Designing for energy efficiency.

Healthy Design

Healthy Design means finding innovative solutions through design and development to reduce environmental impacts and address challenges across the product and packaging value chain. Ecodesign guides our approach, influencing our decisions from selecting materials to innovative designs enabling repair and recycling.

Our Ecodesign program focuses on three key areas:

1 Material efficiency
increasing recycled content, selecting recyclable materials and designing out waste

2 Reducing hazardous materials
substituting materials to improve recyclability and reduce risk to recycling workers

3 Extending product life
designing for and promoting repair, refurbishment and reuse of devices

Healthy Design goals and outcomes

Many of our programs and targets ended in 2020. We highlight their impacts and results throughout this chapter. In FY20, we began work to set our Sustainability 2030 goals and milestones using the ISO 14001 framework.

Some of these new goals and targets are presented in this report. Our FY21 Sustainability Report will provide a complete list of Sustainability 2030 goals and targets.

Looking ahead, we will focus on improving material efficiency and selecting materials that are suited for recycling and circularity. We continue to reduce hazardous substances used in our products.

The major advances in packaging sustainability reflected here were highly influenced by the roll-out of our new commercial packaging platform for Surface devices in FY20. In the case of pack ratio, the decrease was the result of an intentional trade-off to achieve weight and carbon reductions.

2020 packaging goals (est. 2016)	FY20 progress: New product packaging vs baseline design
Year-on-year reduction in "as designed" weight	21% weight reduction
Recycled content >70%	58% recycled content, a 5.6% increase
Pack ratio >40%	30% pack ratio, a 5.5% decrease
Year-on-year reduction in greenhouse gas[1] (GHG) emissions	25% reduction
End-of-life recyclability score over 80%	92% end-of-life score, a 2.6% increase

1   Also referred to as "carbon emissions" in this report.
2   Plastic waste removed from oceans, waterways, and beaches.
3   In Organization for Economic Cooperation and Development (OECD) countries.

Our new Devices target

100%

recyclable Surface devices by 2030[3]

Our new packaging targets

100%

recyclable packaging by 2030

>80%

Portfolio average of >80% PCR content by 2030

100%

All packaging made from 100% recycled, renewable or responsibly sourced content by 2025

Eliminate all virgin, single use petroleum-based plastics by 2025

100%

of virgin paper materials will be sourced from forests that have been certified or verified to be responsibly managed by 2025

Key outcomes in FY20

Reformulated paints and coatings to reduce volatile organic compounds (VOCs)

10/20%*

Partnered with key suppliers to deliver a 10% ocean plastic[2] and up to 20% post-consumer recycled (PCR) plastic blend, and a prototype product for qualification

20%*

Delivered Surface Dock 2 containing 20% PCR material

Developed and launched a commercial bulk packaging pilot for Surface Pro 7

91%*

Improved recyclability of Surface Laptop 3, making it one of the most recyclable Surface devices on the market

*   (w/w)

Design for sustainability

Materials production requires a large amount of energy, producing 25% of global CO_2 emissions.[4] Materials production also generates a significant amount of waste – both during processing and at product end-of-life.

We focus a significant amount of effort and innovation on increasing material efficiency because of the potential for reducing carbon emissions and waste. We are addressing material efficiency by increasing the recycled content of our devices and improving their recyclability and circularity.

Product registration

We apply EPEAT standards to our Surface devices. EPEAT is the leading global ecolabel for the IT sector, managed by the Green Electronics Council. The program requires independent verification of product and corporate eco-attributes. Surface devices must meet specific design and performance criteria to achieve the baseline "Bronze" EPEAT registration level. The achievement of additional optional criteria results in a higher registration of "Silver" or "Gold" level.

We are continuously working to improve the EPEAT registration level of our devices, boosting our portfolio from Bronze to Silver and eventually to Gold.

Our Surface Pro 5, Surface Pro 6, Surface Book 2 and Surface Go products are currently registered at the Bronze level in the computer category. Surface Pro 7, Surface Pro X, Surface Go 2, Surface Book 3 and Surface Laptop 3 are all registered at the Silver level.

These ratings are used by customers to make purchasing decisions based on product and corporate environmental and social attributes. We track progress against EPEAT targets across our Surface portfolio.

EPEAT Design criteria for computers and displays:

1 Substance Management
2 Materials selection
3 Design for end-of-life
4 Product longevity/ lifecycle extension
5 Energy conservation
6 End-of-life management
7 Packaging
8 Lifecycle assessment and carbon footprint
9 Corporate environmental performance
10 Corporate social responsibility

91%*

Surface Laptop 3 was assessed to be 91% recyclable when conducting our baseline recyclability assessments

100%

All Surface computers are ENERGY STAR certified in the U.S.

We also measure and communicate the sustainability of our products using other environmental leadership programs, standards and ecolabels. They include ENERGY STAR® and a voluntary industry agreement for gaming consoles. All Surface computers are ENERGY STAR certified in the U.S.

▶ **Find out more**
page 52

Design for repair and recycling

Surface Laptop 3, released in 2019, shows the progress we are making in solving repairability and disassembly challenges.

In just two years, new innovations transformed the laptop from a so-called nonrepairable "glue-filled monstrosity"[5] to achieving a repairability rating of 5 out of 10, calling out its "clever design."[6] Much innovation effort and investment went into making Surface Laptop 3 easier to repair and to disassemble for improved repairability, and recycling at end-of-life. As a result, Surface Laptop 3 was assessed to be 91% recyclable[7] when conducting our baseline recyclability assessments. We will use this experience, technology and innovation to address disassembly challenges across the Devices product portfolio to increase repairability and recyclability.

4 The Role of Material Efficiency in Environmental stewardship, Ernst Worrell, Julian Allwood, and Timothy Gutowski https://www.annualreviews.org/doi/full/10.1146/annurev-environ-110615-085737#:~:text=Material%20efficiency%20aims%20to%20reduce,service%20demand%20does%20not%20change

5 iFixit teardown https://www.ifixit.com/Teardown/Microsoft+Surface+Laptop+Teardown/92915

6 iFixit teardown https://www.ifixit.com/Teardown/Microsoft+Surface+Laptop+3+(15-inch)+Teardown/127277

7 Recyclability assessment of Laptop 3 15-inch with metal palm rest, performed by a qualified third-party following the IEC 62635 standard.

* (w/w)

Design for sustainability (continued)

Using lifecycle assessment to guide sustainable design

To reduce the impact of our products, we first need to understand the environmental impacts across the product lifecycle. This is where a product environmental lifecycle assessment (LCA) comes in to play. LCA tools enable us to compare the environmental impact of materials, processes and components to enable Microsoft's designers and engineers to make informed decisions during the planning, concept, design and development phases.

Product environmental LCA is a science-based methodology that calculates the environmental impacts of all activities associated with the product lifecycle – from the extraction of raw materials through the activities of producing, using, transporting and end-of-life treatment.

We perform LCA calculations[8] using GaBi digital technology – a software tool that runs on the Windows platform. Our LCA results represent our best understanding of a product's lifecycle environmental impacts at the time of LCA publication. LCAs are revised, as needed, to accommodate updates to underlying lifecycle inventory data and improvements in LCA methodology. We are working towards expanding the scope of our LCAs to cover all our hardware devices.
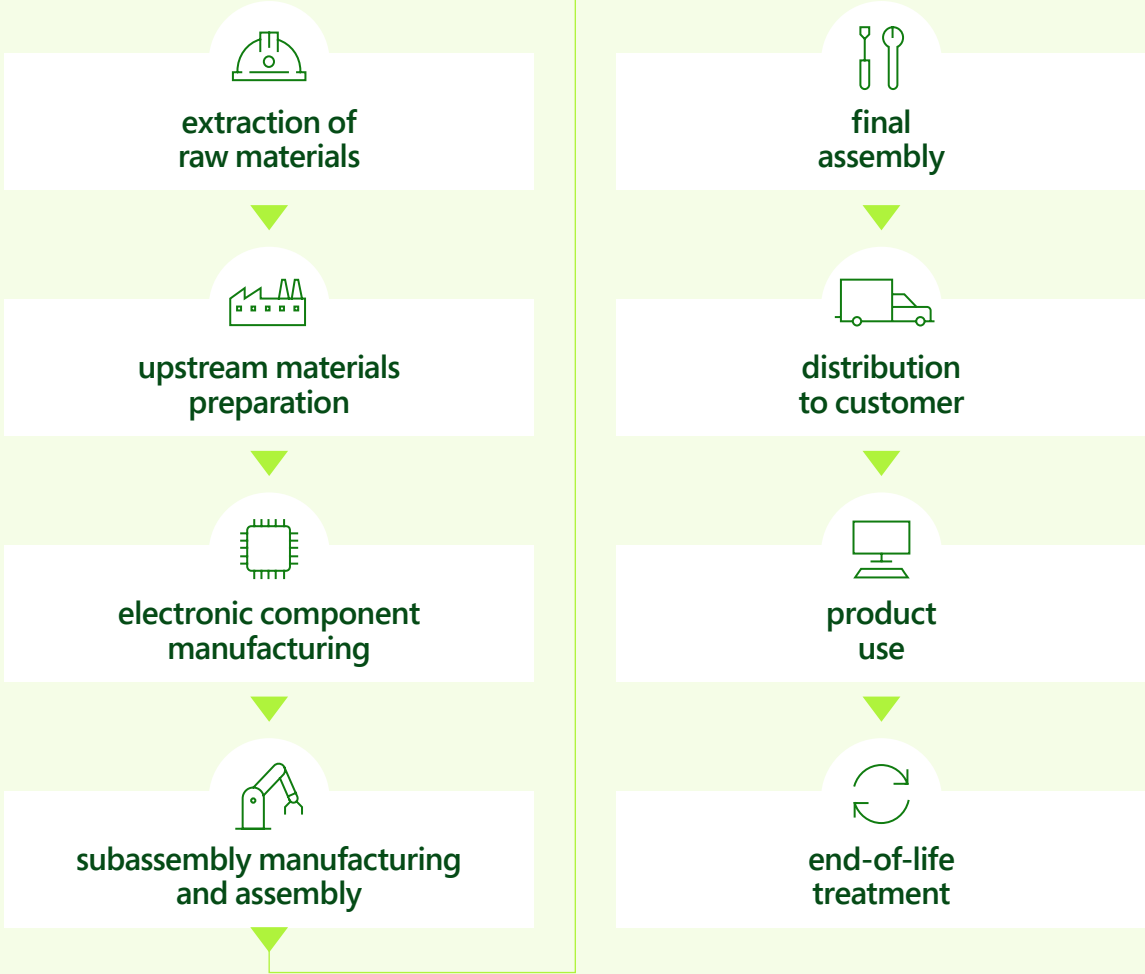
To increase transparency and credibility with customers and stakeholders, we publish environmental data, including LCA results, for our Xbox consoles and Surface devices. These LCA results are contained in our Eco Profiles, which are available on our website and provide carbon emissions and nonrenewable energy use over the lifetime of a product and identify the product's material usage, energy consumption, ecolabels, product recycling and other environmental attributes.

▶ **See our feature story on the lifecycle emissions of a Surface Pro 7**

8   Our LCA calculations are in accordance with ISO 14040 and ISO 14044 standards, complemented by ETSI TS 103 199 and ITU-T L.1410.

Scope of LCA calculations

LCA calculations include environmental impacts across the following lifecycle stages

extraction of raw materials

upstream materials preparation

electronic component manufacturing

subassembly manufacturing and assembly

final assembly

distribution to customer

product use

end-of-life treatment

Design for sustainability (continued)

Why is the role of designers important?

"It's on designers to spot areas we know can be improved and to think of innovative and inspiring ways to do just that."

Patrick Gaule, Lead Product Designer

22-25%*

Our Surface products and packaging currently range from 22-25% circular

80%*

post-consumer recycled content across our entire packaging portfolio by 2030

*   (w/w)

Q&A with a Lead Product Designer, Microsoft

Q. What role can designers play in circularity?

A. As designers, we're used to making decisions because we face choices every step of the way. Every call we make has an environmental impact, so it's on us to spot areas we know can be improved and to think of innovative and inspiring ways to do just that. The best tool I have to help make those decisions is lifecycle assessment.

Q. What is lifecycle assessment?

A. Lifecycle assessment is a method used to evaluate the environmental impact of a product throughout its lifecycle – a full environmental assessment of the product's journey. By looking at every single step in that journey in minute detail, we can see where we're potentially wasting energy or materials, and what we can do to avoid it.

Q. How do you build circularity into a Microsoft product?

A. We started by looking at the recyclability of the materials we select and the ability to disassemble a product. Now that we have a baseline for some of our products, we better understand the challenges and where improvements can be made across the entire product lifecycle.

Q. What happens when you know how to solve a problem, but don't yet have the technology?

A. That's the real beauty of working at Microsoft – we can make that technology happen. By working closely with our suppliers this year, we created a higher percentage PCR resin which met our high standards for material properties – enabling the premium quality our consumers expect – while increasing the percentage of PCR materials in our resins. These resins will reduce the use of virgin materials and the overall product carbon footprint.

Design for sustainability (continued)

Design for circularity

Our approach

Design is a key enabler for moving away from the linear "take-make-use-dispose" economic model which science shows is not sustainable. In contrast, a circular model keeps materials in use for as long as possible – reducing reliance on finite virgin materials, lengthening product lifetime through repair and reuse, and enabling recycling at end-of-life.

According to The Circularity Gap Report 2020, the world is currently only 8.6% circular, compared with 9.1% two years ago.[9] If this trend continues, we will need two planets to meet the world's natural resource needs by 2030.[10] Without widespread change, achieving the SDGs and Paris Agreement will be virtually impossible.[11]

Measuring the circularity of our devices

We used the WBCSD Circular Transition Indicators (CTI) methodology to measure the circularity of our Surface products and packaging. We partnered with KPMG to complete the assessment. The circularity results ranged from 22-25% cycled resources, more than twice the reported global cycled resources of 8.6% (according to The Circularity Gap Report 2020), nonetheless revealing a sizeable opportunity to increase cycled resources. The data and insights we have gained will enable us to identify circularity levers so we can make informed decisions at the design stage of product development. Opportunities identified by the CTI assessment include designing for disassembly, designing for repairability, addressing coatings that inhibit recycling, and increasing recycled content in metals and plastics.

8.6%

Reported global cycled resources

Working together for a circular economy

A circular economy is based on three key principles: designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.[12]

As the circular economy grows in momentum as a way of tackling waste and enabling better resource efficiency, companies must prepare for their transition to new business models, products and services based on insights into their circular performance, risks and opportunities. To enable this, we need a universal and consistent way to measure circularity.

Factor10 is the WBCSD's Circular Economy project, which brings companies together to reinvent how business finds, uses and disposes of the materials. We worked with 25 other partners to develop the Circular Transition Indicators V1.0 (CTIs), published in January 2020. During this process, we learned how a single tool could be used to measure the circularity of a single product to an entire company. We will use this tool to direct our next steps.

wbcsd

Working towards circular packaging

We aim to use 100% recycled, renewable or responsibly sourced content by the end of 2025. We will use the highest levels of PCR content possible while still meeting the performance requirements for brand and product protection. Our goal is to exceed 80% PCR content across our entire packaging portfolio by 2030.

We continuously look for ways to transition to more renewable materials in our packaging. Where virgin wood fiber materials are required, 100% will be sourced from sustainably managed forests by 2025. In addition to traditional wood-based papers, we use materials derived from bagasse (a renewable by-product of sugarcane processing) and bamboo.

9   The Circularity Gap Report 2020: https://www.circularity-gap.world
10   https://www.theworldcounts.com/challenges/planet-earth/state-of-the-planet/overuse-of-resources-on-earth
11   https://www.circle-economy.com/resources/implementing-circular-economy-globally-makes-paris-targets-achievable
12   https://www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy

Design for sustainability (continued)

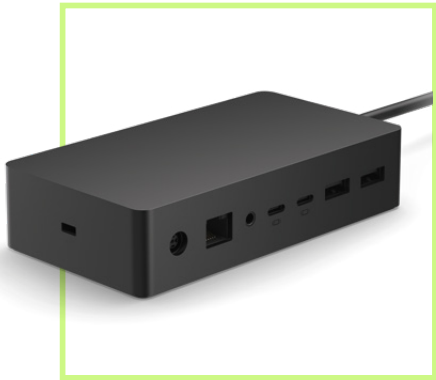## Recycled and renewable materials

Using recycled plastic in our hardware and packaging

We began introducing recycled materials into our Surface hardware last year when a selection of devices and accessories went to market containing PCR resins. They include the Surface Dock 2, Surface Laptop 3 and various Surface power supply units.

These devices are the first successful outcomes of work we have been conducting to increase PCR content across our portfolio. This year, our work included finding new recycled material sources. Our work was split into three work streams: Evaluation and qualification of commercially available engineering PCR resins for hardware, new recycled material sources such as ocean plastics,[13] and plastics used in packaging.

Most of the commercially available engineering PCR resins are polycarbonate-based. The feedstock for this plastic is mainly discarded polycarbonate sources such as water jugs, CDs and car headlights.

These polycarbonate-based PCR resins showed promise of meeting our mechanical, chemical, visual and flammability specifications. We have been testing these PCR resins to understand how they perform compared to virgin plastics. Common concerns with commercially available PCR resins include color-matching, reliability and continuity of supply. We have been conducting manufacturing trials, reliability testing and lifecycle analysis to learn how to increase utilization of PCR resins across our devices to decrease waste and our carbon footprint. We have also been providing feedback to our suppliers to help them develop materials that will meet our specifications.

▲ The Surface Dock 2 is one of our products containing PCR plastics.

"Sustainability is a fundamental pillar that underpins and informs our packaging design philosophy. It is not simply an outcome at the end of a package's journey to our customer. It's an inherent part of the overall packaging lifecycle – from ideation, through our supply chain, to our customers, and beyond. This cannot be achieved without a commitment to designing in sustainability and elevating it as a core metric of our success."

Julian Duffy, Director of Packaging and Content

Reducing petroleum-based plastics in packaging

Global recycling rates for plastic packaging stand at only around 10%, depending on the market, and plastic packaging can cause significant harm when released into the environment. As a result, we are highly focused on reducing petroleum-based plastics in our packaging. In FY20, plastic constituted 7.7% of our packaging material use.

In FY20, we launched a program to assess the use of plastic in our packaging portfolio and identify opportunities to replace it. We achieved several wins in the first year. An ethylene-vinyl acetate (EVA) foam sheet that was traditionally used to protect laptop screens has been eliminated across a range of products through innovative use of the existing protective wrap. We have also replaced many of the polyethylene bags that we used to protect boxes from scuffing with a new glassine paper solution. It's anticipated that this change alone will eliminate 38,000 kg of plastic packaging in FY21.

Transforming our packaging solutions for commercial customers

First introduced in FY19, we have expanded our offer of specially designed packaging for commercial customers with the introduction of new bulk packaging configurations.

On average, the new packaging system weighs 47% less than the comparable retail counterpart and has reduced average carbon emissions by 48%. We also increased the PCR content of the packaging by an average 12%.

Our end-of-life score represents the ease of recycling or disposing of packaging without harm to the environment. The end-of-life score for all commercial packaging configurations now surpasses our 2020 target of 80%, indicating a high level of recyclability. We are learning from this new system to apply solutions more broadly to other parts of our packaging portfolio.

>80%*

The end-of-life score for all commercial packaging configurations now surpasses our 2020 target of 80%

13 Plastic waste removed from oceans, waterways, and beaches.
*   (w/w)

Design for sustainability (continued)

Partnering for systemic change: Using ocean plastics in consumer products

Every year, about eight million metric tons of plastic ends up in the ocean. There are now five huge patches of plastic debris covering large swaths of the ocean.[14] The annual flow of plastic into the ocean could nearly triple by 2040, adding up to 110 pounds of plastic trash for every meter of coastline worldwide.[15] The enormity of the issue requires urgent action.

We set out to partner with our suppliers to see how plastic waste recovered from our oceans, waterways and beaches (mainly PET) can be processed and used in consumer products, including Microsoft products, to accelerate the cleanup of oceans and waterways.

We started with a series of feasibility tests to determine if the recovered ocean plastic can be reused in consumer products. We have been working to develop a material that is made of at least 10% ocean plastic, which can pass the mechanical and chemical reliability tests required for our devices. In parallel, we are working to understand how fabrics spun from ocean plastic can be used in packaging and products.

8m

Eight million metric tons of plastic ends up in the ocean every year

10%*

We have been working to develop a material that is made of at least 10% plastic recovered from oceans, beaches, and rivers

Gathering data on how to reuse this waste PET is a big step towards finding a new feedstock to replace virgin plastics while supporting ocean cleanup efforts around the world. Although research is ongoing, the initial results look promising – especially as the technology for plastic recycling continues to evolve. We are committed to scaling the positive impact of technology. Any material that results from our research will be available through our suppliers to any organization that wishes to use it.

14 http://science.sciencemag.org/content/347/6223/768
15 https://www.pewtrusts.org/en/about/news-room/press-releases-and-statements/2020/07/23/research-finds-plastic-flows-into-the-ocean-expected-to-triple-by-2040
*   (w/w)

"When I stepped into this role, I was surprised how sustainability felt like a core priority – not just for the environmental compliance team but for the whole organization. Projects such as the Ocean Plastic initiative are an example of how the engineers here are willing to go the extra mile to have a positive impact on the world. Watching our work lead the way to more sustainable devices over the past year has been empowering, and I believe we can use our devices as a vehicle to combat some of the world's toughest problems."

Christopher Seely, Environmental Compliance and Sustainability Engineer

Design for sustainability (continued)

Design for recyclability

While recycling infrastructure and practices vary widely between countries, in most countries, recycling rates are increasing. Increased recycling leads to reduced waste volumes and, generally, lower carbon emissions.[16] Even in countries with advanced recycling infrastructure, full recovery of materials requires improved design for recyclability.

Surface device recyclability

In August 2020, we committed to achieve 100% recyclable Surface devices (in Organization for Economic Cooperation and Development, OECD, countries) by 2030. As an important step towards achieving this goal, we partnered with a third-party to measure the current recyclability of our Surface devices.

▶ **Find out more**

These assessments have provided a better understanding of changes designers and engineers can make to increase recyclability. The results identified the following principles as levers to improve recyclability of our devices over time:

- Ease of disassembly.
- Eliminate mixed materials and limit the number of material types and composites.
- Limit use of films and coatings that inhibit recycling.
- Limit or eliminate hazardous materials to improve recyclability and reduce risk to recycler workers.

100%

recyclable Surface devices by 2030

Packaging recyclability

We have committed to 100% recyclable packaging by 2030. Our packaging end-of-life score represents the ease of recycling or disposal of packaging without harmful environmental impact. During the packaging design process, we score the recyclability of each design based on its construction and the amounts and types of materials.

▲
We have committed to 100% recyclable packaging by 2030.

Design for longevity

Our aim is for our products to reach the highest levels of quality and durability. Microsoft's hardware designers make careful choices on how components and materials are assembled. These choices have a profound impact on the length of a product's usable life and on the value they deliver to customers.

We use computer simulation and materials characterization techniques to design products for longevity. Thermo-mechanical computer techniques like Finite Element Methods identify the loads on components and materials under different application scenarios. Materials are characterized according to their initial strength and degradation over time. Product designs are guided by choices that ensure strength exceeds loads over extended use.

Our emphasis on longevity also covers our components and materials, which we source globally. We implement an intensive selection and qualification process and products are only launched once components are proven to exceed our product life requirements.

After a product is launched, we monitor its health based on quality monitors in the factory, customer experience reports and product returns. We analyze returns to understand the actual cause, and we incorporate the learnings into future production and design. This closed-loop feedback system reduces the probability of product failure and prolongs the life of our devices.

Our design and quality principles, coupled with product service models, contribute to the length of customer use. Software is an important factor that can influence the length of customer use. Microsoft extends product life through firmware and Windows 10 software updates, allowing continued use of older generation devices and decreasing the need to replace hardware. The positive impact of these software updates can extend the use phase of third-party and Microsoft first-party devices.

16 The Role of Material Efficiency in Environmental stewardship, Ernst Worrell, Julian Allwood, and Timothy Gutowski https://www.annualreviews.org/doi/full/10.1146/annurev-environ-110615-085737#:~:text=Material%20efficiency%20aims%20to%20reduce,service%20demand%20does%20not%20change

Managing hazardous substances

As part of our commitment to Healthy Design and a Healthy Planet, we design hazardous substances out of our products and packaging. Reducing or eliminating hazardous substances from our products improves recyclability and reduces risk to recyclers.

Our approach to substance management

Use of hazardous substances is controlled through our Restricted Substances for Hardware Products specification (H00594). This specification sets clear requirements that restrict substances of concern in our products, packaging and manufacturing. Our packaging and hardware suppliers are required to conform to the requirements of this specification through their contracts with Microsoft.

Our science-based approach to restricting substances follows the precautionary principle to ensure we protect human health and the environment. In addition to proactive compliance with regulations, Microsoft evaluates other substances which have feasible and environmentally preferable alternatives. As a result, our substance restrictions may be more stringent than regulatory requirements.

We actively participate in regulatory developments and track new changes to gain insight into emerging substances of concern so that we can proactively review them for possible incorporation into the Microsoft substance restriction specification.

⬋ **Find out more online**

GreenScreen® materials

We work to replace substances of concern with safer alternatives using GreenScreen for Safer Chemicals – a method for assessing the hazards of chemicals and their potential effect on human health and the environment. We use the GreenScreen methodology to support product design and materials selection. Our goal is to meet sustainability standards, scorecards and ecolabel requirements through the robust analysis and selection of flame retardants and plasticizers used in our products.

Testing products and packaging

We submit our products for independent, third-party testing during the development and manufacturing stages to verify supplier declarations related to restricted substances. We test products before customer distribution to ensure compliance with European Union (EU) Restriction of Hazardous Substances (RoHS) Directive, Packaging Directive, Battery Directive and Microsoft's own requirements. The tests are conducted in a third-party ISO 17025-qualified laboratory.

Engaging with our suppliers
Restricted substance control audits

Supplier conformance with our restricted substances specification, H00594, is crucial to ensure products meet Microsoft and regulatory requirements. We verify supplier conformance through a restricted substances control (RSC) audit program. This provides the opportunity to connect with suppliers to increase their control system capabilities by answering questions and offering training. The RSC audit checklist covers end-to-end incoming and outgoing processes such as supplier management, material management, manufacturing process management, traceability system, testing system, and ozone-depleting chemicals (ODCs) management. The RSC audit focuses on factories in China, where most of our suppliers are located.
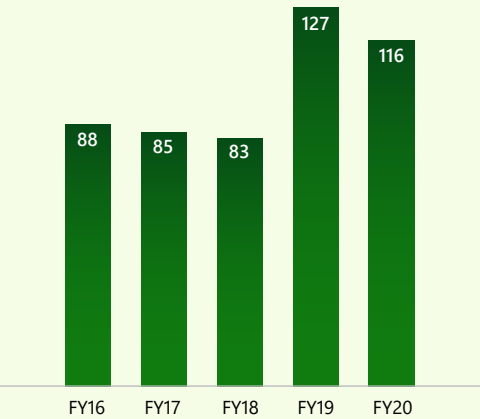
In FY20, the third quarter audit schedule was disrupted due to the COVID-19 outbreak. We moved most planned audits to the fourth quarter.

499+

restricted substance control audits conducted over the past five years

Figure 1

Restricted substance control audits

FY16: 88
FY17: 85
FY18: 83
FY19: 127
FY20: 116

By the end of FY20, we had conducted 118 audits covering assembly, molding, enclosure and electrical suppliers.

We analyze our findings monthly, communicating results to suppliers and our own management. We use the outcomes to identify training needs and additional partnering requirements.

As shown in Figure 1, Restricted substance control audits, we have conducted more than 499 audits over the past five years.

Responsible sourcing

How do you continue raising standards in your supply chain?

"Achieving meaningful change means sharing problems and finding solutions together. Our Responsible Sourcing program is anchored in the Microsoft growth mindset – we have to keep learning to create a shared understanding of risk and manage that risk together. This is how we build trusting relationships with our suppliers."

Ephi Banaynal dela Cruz, Senior Director, Responsible Sourcing

Overview and approach

We have relationships with thousands of suppliers around the world – from the factories that make our devices to the companies that transport our products and materials.

Our values of integrity, accountability and respect provide the foundation for responsible sourcing. We set high standards for all our suppliers and we work with them to support their people and improve their operations.

Enabling people to achieve more is core to our mission and is the lens through which we view our supply chain impacts. We don't compromise when it comes to aiming for high standards of safety and to treating workers in our supply chain fairly and with dignity.

Our Responsible Sourcing program ensures that hardware and packaging suppliers meet the robust standards set out in the Microsoft Supplier Code of Conduct and Supplier Social and Environmental Accountability (SEA) Manual. These requirements cover human rights, living conditions, safe working practices, environment, health and safety (EHS) and ethical practices.

Our approach
We invest heavily in advancing our responsible sourcing commitments with the focus on:

Assurance and accountability
Increasing transparency within and beyond our supply chain

Capability building
Investing in the skills and knowledge of our suppliers, auditors and Microsoft employees

Analysis of risks and opportunities
Creating shared understanding and management of risks

Creating shared value
Working with others to shape global supply chains and deliver the Sustainable Development Goals (SDGs)

Overview and approach (continued)

Our suppliers are crucial to our success. We work with them to drive meaningful improvements to benefit workers, local communities and their own businesses.

Auditing provides vital insight into our suppliers' risks, activities and improvements. The results inform our strategy to enable us to build supplier expertise, develop robust management systems and target our interventions where they are needed most.

We are increasing our touchpoints with suppliers – carrying out more checks, more often. This provides a truer picture of reality, rather than relying on a single snapshot in time. We value transparency and we make the results of our audits publicly available through our interactive Power BI dashboard.

Our primary motivation is improving suppliers' capability, accountability and performance but, when improvement is not possible, we will restrict further business and we may phase a supplier out of our supply chain.

Responsible sourcing of raw materials

The Microsoft Responsible Sourcing of Raw Materials (RSRM) Policy extends our Supplier Code of Conduct to the furthest reaches of our upstream supply chain.

We hold ourselves and our suppliers accountable for addressing human rights, labor, environmental health and safety, and ethical business practices upstream in our supply chain. This includes addressing the risks inherent in raw materials extraction, harvesting, processing, refining and transportation – including unsafe working practices and forced and child labor. We require our suppliers to incorporate our standards in their own sourcing practices.

▶ **Find out more**
page 43

Partnerships for change

Microsoft's size and influence means we can leverage efforts to help transform supply chains on a global scale. As a downstream purchaser, our influence is greatest among our directly contracted suppliers. With suppliers with which we lack a direct contractual relationship we drive improvements through strategic cross-sector partnerships and co-innovation spanning global supply chains to gain stronger visibility, influence and accountability.

We collaborate with individuals, NGOs, governments and enterprises to foster equitable growth in our supply chain. Examples of our collaborations and capability building include the Responsible Business Alliance (RBA), Responsible Mineral Initiative (RMI), and our partnerships with Pact and the Alliance for Responsible Mining (ARM).

▶ **Find out more**
page 46

Responding to COVID-19

The COVID-19 outbreak posed unique challenges for our supply chain, beginning when the impacts were first seen in China in early 2020.

We worked with our supplier factories to ensure the safety of their workers and continued compliance with our human rights and labor standards.

▶ **Find out more**
page 38

We also worked with the Initiative for Responsible Mining Assurance (IRMA) to maintain transparency of mining supply chains.

▶ **Find out more**
page 46

21% of our FY20 planned audits were impacted by the pandemic, with 10% of audits postponed to FY21. We are working with the industry and our audit firms to develop methodologies to monitor supplier performance and build resiliency into our program to ensure we continue to understand supplier performance under unusual and unpredictable circumstances.

Responsible sourcing goals and outcomes

Our responsible sourcing goals support Microsoft's mission to "empower every person and every organization on the planet to achieve more." We tackle a broad range of issues to advance sustainability in our supply chain.

Safety performance

To monitor safety performance in our supply chain, we collect data on injuries and illnesses at our Tier 1 suppliers' factories. Supplier factories must record all work-related accidents, injuries, illnesses and fatalities according to U.S. Occupational Safety and Health Administration (OSHA) Standards.[1]

Injuries are considered by OSHA to be work-related when an event or exposure in the work environment causes or contributes to the condition. In FY20, we achieved zero accidents and zero OSHA recordable injuries at Tier 1 supplier factories.

Progress in FY20

100%
of risk assessments on treatment devices for volatile organic compounds (VOCs) were completed in supplier factories within the enclosure category

99.6%
Conflict Minerals smelter compliance, up from 85% in FY19

100%
Strengthened onboarding to ensure 100% of new suppliers are qualified and reviewed before beginning production

99.5%
of audited factories in China have access to the Workers' Voice Hotline for grievance reporting

100%
of forced labor issues identified were mitigated

100%
of reported Hotline cases/allegations mitigated or under investigation

5,401
factory workers were reimbursed $256,954 of recruitment fees and insufficient payments

1   https://www.osha.gov/

Managing risk in our supply chain

We work with suppliers to manage risk and improve transparency. It starts with onboarding and is sustained through risk assessments and social and environmental accountability audits, followed through with corrective and preventative actions.

Robust due diligence is our foundation, designed to ensure the workers who make our devices are safe, and are treated fairly and with the dignity every human being deserves. Recognizing the complexity in our supply chain, we have developed a robust, risk-based approach to working with our suppliers.

We target our efforts according to factors including a supplier's social, environment, health and safety (EHS) and ethical risks; the value of spend and our ability to influence the supplier; and the extent to which a supplier is connected to our products and services. Our framework is aligned to the UN Guiding Principles on Human Rights for identifying salient human rights issues. We conduct due diligence aligned to the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas.

Our management system

We apply a strong management system approach that focuses suppliers on managing and mitigating risks in their operations. Our global risk assessment and audit programs generate valuable data and drives improvement and transparency across our supply chains. The data they provide enables us to deeply understand our risks and develop strategies and programs to address such risks.

We carry out regular assessments and audits of all directly contracted hardware manufacturers, logistics suppliers and repair and refurbishment partners. The audits include independent third-party initial capability assessments, sustaining maintenance audits, corrective action audits, the Devices Responsible Sourcing team-led factory visits and investigations, and Responsible Business Alliance validated audit assessments.

Microsoft's Audit Management System (AMS) is the one source of truth for Responsible Sourcing assurance. It connects suppliers, audit firms, Microsoft sourcing managers and the Devices Responsible Sourcing team and allows tracking of conformance against Microsoft's standards and closure of non-conformances (NCs) and investigations.

Our aim is to turn audits around quickly and efficiently so that we can act on the results to deliver meaningful outcomes on the ground. We require corrective action to remedy any non-conformance with our standards and follow-up audits ensure actions are implemented and closed.

Audits in FY20

We actively monitor 100% of all directly contracted supplier facilities involved in our Responsible Sourcing program. In FY20, all factories were monitored through a risk-based approach via tools including risk assessments, factory visits and third-party audits.

We completed 648 social and environmental accountability audits and assessments of 418 active factories, including 240 third-party audits and 266 corrective action audits. 5,166 workers were interviewed to understand their working conditions and crosscheck information from other sources, ensuring risk areas were fully identified for improvement.

648

audits completed in FY20

◀ In FY20, all factories were monitored through a risk-based approach via tools including risk assessments, factory visits and third-party audits.

Managing risk in our supply chain (continued)

21%

of our FY20 planned audits were impacted by the pandemic

In FY20, we analyzed risks in new geographies and developed a category risk management strategy aimed at enabling our suppliers to self-report compliance with our standards.

The Devices Responsible Sourcing team was integrated into the Devices Strategic Sourcing organization to further embed responsible sourcing at the heart of our sourcing decision making and to increase the impact of our strategy and processes.

Bringing new suppliers up to our standards

We have worked with many of our suppliers for years; they understand our standards and have taken part in many of our trainings, audits and programs. When a new supplier or factory joins our supply chain, they inevitably bring new risks and capability requirements which need to be managed.

In FY20, we strengthened our onboarding of new suppliers to manage any risks before they begin mass-production. The onboarding ensures suppliers fully understand our standards and are prepared to engage with us, exposes their willingness to devote resources to ongoing improvement and identifies suppliers who share our values.

During onboarding, suppliers receive training on the Microsoft Supplier Code of Conduct, Supplier SEA Manual (H02050), Responsible Sourcing of Raw Materials Policy and SEA Specification training. A corrective action plan must be put in place to address any non-conformances found during the Initial Capability Audit (ICA) before production begins. If a factory cannot meet our requirements, they are restricted from doing business with us until the issues are remedied.

"Our assurance program is focused on building strong processes and tools that help us proactively identify and mitigate risks in our supply chain. Aligned with our company values of integrity and accountability, it is crucial we demonstrate to our stakeholders that we continue to uphold our standards while scaling globally and meeting our strategic business objectives."

Liza Georgie, Senior Manager, Responsible Sourcing

In FY20, 21 factories followed the new process and completed the ICA before starting production and 93 non-conformances were found. All suppliers have established corrective action plans to address such non-conformances.

Improving audit quality

Quality assurance is one of the essential building blocks of our accountability process to build integrity into our products. Third-party audits are fundamental to managing supplier performance – enabling us to understand risks and monitor improvements.

We have a strict quality assurance process for third-party audit firms to ensure reliable and accountable results. We partner only with audit firms and auditors that have a good reputation and meet our defined criteria for expertise, experience and competence. Only auditors approved by the Devices Responsible Sourcing team make it on to our qualified auditor list and can conduct a Microsoft SEA audit.

Learn more about our auditor qualification program

21

factories followed the new process and completed the ICA before starting production in FY20

93

non-conformances were found. All suppliers have corrective action plans in place to address the issues

Microsoft Devices Sustainability Report FY20

Managing risk in our supply chain (continued)

FY20 audit program results

As part of our ongoing commitment to transparency, we publicly released the audit non-conformance (NC) results online beginning in FY18. Available in an interactive Power BI dashboard, stakeholders can view non-conformance data by audit type, severity and country.

⬊ **Explore the interactive audit results online**

20%

Overall, there was a 20% decline in the total count of top 10 audit non-conformance results in FY20 compared with FY19

Similar to FY19, the top NCs were: working hours; occupational safety; emergency preparedness; hazardous substances; wages and benefits; supplier responsibility related to labor and ethics (LE) and EHS; industrial hygiene; and freely chosen employment.

Overall, there was a 20% decline in the total count of top 10 NCs in FY20 compared with FY19. There were fewer NCs across each subcategory except for "Working Hours" and "Supplier Responsibility" – both of which saw an increase from FY19. A new category, "Child Labor Avoidance", made it to the FY20 list. Sanitation, food, housing and transportation moved out of the top 10.

Engaging our logistics providers

We expect our logistics suppliers to meet our Microsoft Supplier Code of Conduct and Supplier SEA requirements. In FY19, we rolled out an initial risk assessment questionnaire and initiated pilot management system audits at two logistics suppliers. Given the complexity of laws and regulations that regulate the industry, we refined our approach in FY20 by developing a comprehensive self-assessment checklist that will be administered in FY21.
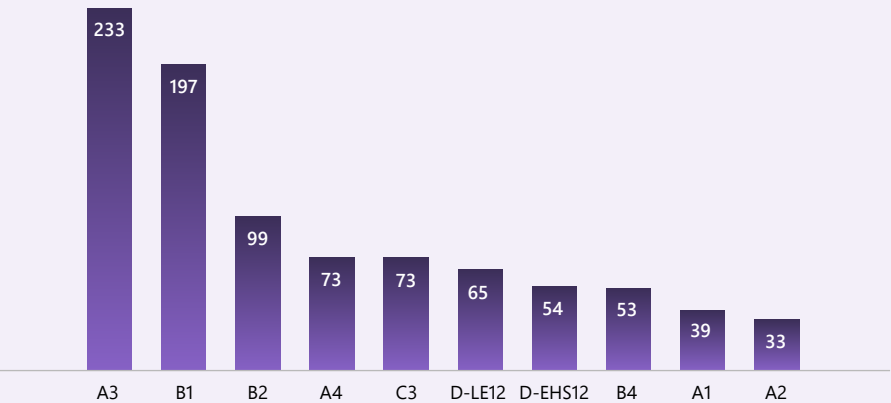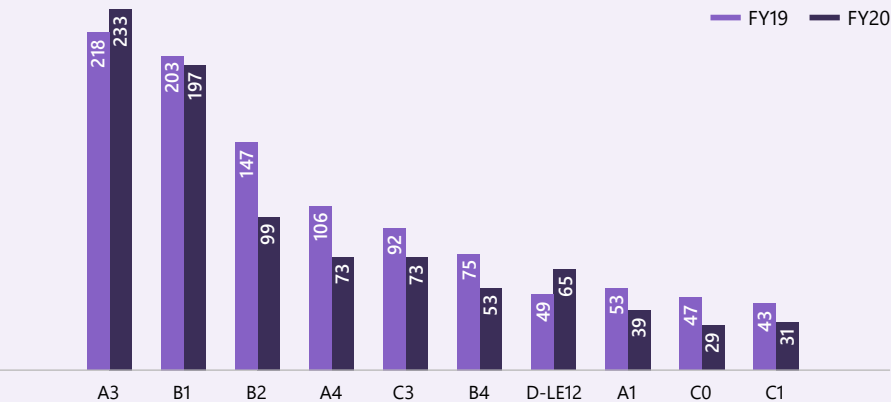
Figure 1

FY20 top 10 non-conformance sub-section

A3	B1	B2	A4	C3	D-LE12	D-EHS12	B4	A1	A2
233	197	99	73	73	65	54	53	39	33

Figure 2

Comparison of FY19 top 10 non-conformance to FY20

■ FY19   ■ FY20

	A3	B1	B2	A4	C3	B4	D-LE12	A1	C0	C1
FY19	218	203	147	106	92	75	49	53	47	43
FY20	233	197	99	73	73	53	65	39	29	31

A1 – Freely chosen employment; **A2** – Child labor avoidance; **A3** – Working hours; **A4** – Wages and benefits; **B1** – Occupational safety; **B2** – Emergency preparation and response; **B4** – Industrial hygiene; **C0** – Compliance with the law; **C1** – Environmental permits and reporting; **C3** – Hazardous substances; **D-LE12** – Supplier responsibility; **D-EHS12** – Supplier responsibility

Supporting supplier self-management

Suppliers make greater and lasting impact when they own their social and environmental performance. To support our suppliers' SEA journey, we are driving greater self-management.

In FY20, we reviewed the SEA maturity of suppliers across different sourcing categories. Based on the audit data collected over the past three years, our learnings led us to rethink and reset our category strategies to support increased supplier self-management.

We have developed category-specific checklists for suppliers to facilitate and demonstrate self-management. Key performance metrics are connected to the top risks in each category. By refining individual category strategies, our team is better positioned to engage with suppliers in the context of their risks and partner with them to develop stronger management systems to tackle the root causes of specific issues.

Managing risk in our supply chain (continued)

Investing in our suppliers' capabilities

Our due diligence begins with using what we learn from auditing and risk management to build suppliers' capabilities where they are needed.

Using technology to scale supplier learning: SEA Academy

Microsoft's SEA Academy is an online platform that provides training programs to build supplier capabilities. We train suppliers' management, workers and third-party auditors, as well as internal Microsoft teams, to increase skills and collaboration throughout the supply chain.

In FY20, 5,853 supplier workers were trained on personal health by our Tier 1 suppliers through HER project™, initiated by Microsoft – a collaborative initiative that strives to empower low-income women working in global supply chains.

We also used the SEA Academy platform and Microsoft Teams to provide training to 2,057 supplier employees to improve SEA management capabilities.

SEA Academy promotes these two objectives:

1) **Understanding our requirements**

   Conformance with our standards is a basic requirement for a supplier to work with Microsoft. Embedded in our new supplier onboarding process, the SEA Academy assigns online courses to each new supplier to increase their knowledge of our SEA standards, labor and EHS requirements, business ethics, audit processes and tools.

   In FY20, 37 new suppliers were onboarded via the SEA Academy, 10 of which have completed the onboarding training while the rest are in progress. Key strategic suppliers received refresher online training, including all final assembly manufacturers (Tier 1) and strategic components manufacturers (Tier 2). 750 participants from 189 suppliers took part in the training and their knowledge increased by 29%.

2) **Supporting continuous improvement**

   Maintaining continuous compliance and improvement is our priority. The SEA Academy connects capability building for suppliers with targeted program strategies – developed to address specific risks in different areas of the supply chain and deliver Microsoft SEA priorities.

In FY20, the focus areas included:

Improving management and worker communication: Developing supplier management capability for handling workers' feedback has been identified as a priority through previously reported worker complaints. 10 factories identified as having this development need were assigned mandatory training. 130 people from 65 factories received the training and their knowledge increased by 103% based on pre-training and post-training assessments. In FY20, 100% of workers' complaint cases were addressed.

Human trafficking and forced labor prevention: We leveraged the SEA Academy to scale training and improve awareness and management of forced labor risk identification and mitigation. 648 participants from 165 suppliers received training on Microsoft's requirements on human trafficking and forced labor. Their knowledge regarding this topic increased by 18% based on pre-training and post-training assessments.

Process chemicals safety program: 110 participants from 19 suppliers took part in cyanide risk management training and gave 100% positive feedback (see more on page 38). 96% said they would utilize the skills in their daily work. 341 participants joined chemical lifecycle management training and 90% reported that they would reinforce their chemical management system.

▶ Find out more
   page 39

Automation risk management: Over 200 participants from 75 suppliers received training on identifying and managing automation risk.

▶ Find out more
   page 39

Internal stakeholder training

Embedding compliance doesn't depend solely on our suppliers; our own sourcing decisions and daily factory management play a crucial role. We provide orientation and refresher SEA training to Microsoft employees who manage relationships with suppliers.

In FY20, 190 new hires in the Strategic Sourcing team, Factory Management team and New Product Introduction team received deep-dive training designed to help them better understand SEA requirements, potential risks and management measures.

Maintaining compliance and resilience during the global pandemic

We leveraged the SEA Academy to continue to engage with suppliers throughout the COVID-19 outbreak, communicating timely information and guidance to help them proactively mitigate and manage risks.

This included communicating supplier guidance on the prevention and treatment of coronavirus to all suppliers globally at the start of the outbreak in China. As production recovered, we continued to communicate Microsoft requirements to all suppliers.

▶ Find out more
   page 38

Supplier health and safety

A safe and healthy workplace is a basic human right and a fundamental building block of responsible sourcing. We are determined to ensure no worker is injured or harmed in the making of our products.

Managing worker safety begins with the design of techniques and processes in supplier factories. We work with the factory management to develop innovative processes and technologies for the safe production of our products. Having invested heavily on driving supplier compliance over the years, we are now turning our attention to finding innovative ways to continue to build the safety culture and support safe behaviors in supplier factories.

Worker safety and grievance monitoring during COVID-19

The COVID-19 outbreak posed an unprecedented challenge for our supply chain partners, especially when the impacts were first seen in China. Aligned with our core values, protecting people is our first priority and this includes our suppliers' workers.

As the outbreak in China progressed, we reviewed and shared best practice aligned with World Health Organization (WHO) and local country guidance. We shared this with all our suppliers globally, before the pandemic spread to other countries, supporting them to prepare and develop their processes.

Our Workers' Voice Hotline was a valuable tool for monitoring worker concerns attributed to COVID-19.

Our main concern was to protect workers from potentially poor health and safety practices, longer working hours or unfair compensation. We emphasized to our suppliers the importance of continuing to comply with labor and human rights laws.

We aligned with the Responsible Business Alliance (RBA) and provided guidance to our internal partners, audit firms and suppliers on working hours, ensuring overtime was voluntary and paid at a premium, and compliance was maintained with all applicable laws and regulations and Microsoft standards. We also closely monitored the unfolding situation and reviewed processes at factories to identify and contain identified COVID-19 cases and potential factory shutdowns.

Providing leadership insights on evolving government policy across our global footprint enabled sourcing managers to develop strategies to meet our production needs while protecting worker rights.

Our Workers' Voice Hotline was a valuable tool for monitoring worker concerns attributed to COVID-19. We received four grievances related to excessive working hours and pay. We applied robust processes to investigate and remedy the grievances and put corrective actions in place.

▲ Managing worker safety begins with the design of techniques and processes in supplier factories.

Reducing the risk of exposure to cyanide

We launched the Microsoft Supplier Cyanide Risk Assessment Project in FY19 to control and manage occupational health and safety risks associated with cyanide processes. We have developed a Guideline for Cyanide Management and a self-assessment checklist to help suppliers complete and strengthen their cyanide risk management systems.

All supplier factories that use cyanide will be expected to implement the management practices set out in this guide and to monitor the status of cyanide management in the factory.

We ran a webinar training for supplier factories and third-party auditors to communicate and clarify our requirements. It was attended by 44 high-risk auditors and 110 employees from 19 supplier factories. The training received 100% positive feedback and 96% of participants who provided feedback said they would utilize the learnings in their daily work. We have developed an online training course on factory cyanide management – available on our SEA Academy online platform – to support continued learning and best practice.

Supplier health and safety (continued)

Strengthening process chemical risk management

We have developed a new Supplier Process Chemical Management Manual to assist suppliers in managing hazardous chemicals and reducing associated EHS risks.

The manual will help suppliers better understand chemicals management and identify solutions to mitigate risks for their workers. It contains the fundamental elements of chemical lifecycle management – chemical classification, inventory and purchase, risk assessment, hazard communication, in-plant risk control, emergency response procedures and employee training.

90%

of those who provided their feedback after online training said they would refer to the manual to reinforce their factory chemical management system

We also updated our Supplier Chemical Management Tool Kit which provides templates and instructions on how to develop and standardize chemical management plans, new chemical/hazardous material approval processes, standard chemical operation procedures, chemical inventory, qualitative exposure assessment implementation and a chemical management self-inspection checklist.

The toolkit was supported by webinar training for all supplier factories in China and Taiwan and online training delivered via our SEA Academy platform. 341 people attended the webinar and 90% of those who provided their feedback said they would refer to the manual to reinforce their factory chemical management system.

Developing an industry-leading standard for explosion risk management

The processes involved in manufacturing our products give rise to gases containing volatile organic compounds (VOCs) and odorous emissions. Managing VOC emissions is a hot topic in China as environmental protection and air pollution are government agency policy priorities.

A regenerative thermal oxidizer (RTO) is a piece of air pollution control equipment used to remove these gases from factory exhaust fumes. We have developed an industry-leading safety risk assessment for RTO systems, working with external experts. Specifically targeted at our painting suppliers, we completed four risk assessments and identified five serious risks to help prevent explosions at painting supplier factories.

Managing the risks involved in automated manufacturing

Automated production systems using robots and robotic arms are tailor-made for our suppliers' manufacturing processes, but they can pose a safety risk – mainly related to injury from moving parts caused by inadequate machine guarding, accidental start-up of equipment, control system failure or misuse by workers.

We have launched a new Automation Safety Risk Assessment (ASRA) program to support suppliers in undertaking risk assessment and self-evaluation of automated machinery and processes.

We developed and shared the ASRA Nine Principles, guidance and checklist as a tool to help suppliers identify gaps, deliver improvements and document transparent risk evaluation records. Online ASRA training and self-learning materials, including videos, have been added to the SEA Academy.

200+

More than 200 participants from 75 factories received training to increase their capability for self-evaluation

15

By June 2020, 15 suppliers had completed checklists and they were also adopted for new automated product lines

More than 200 participants from 75 factories received training to increase their capability for self-evaluation. By June 2020, 15 suppliers had completed checklists and they were also adopted for new automated product lines.

Labor and human rights

When it comes to labor and human rights, we leave no doubt as to the standards we expect. Our standards apply to all our suppliers, including those at the farthest reaches of our supply chain.

We strive to ensure that every person who makes our products is treated with equity and dignity, and that we respect the rights of the communities in which we operate.

Modern slavery and human trafficking are among the most severe hidden issues in global supply chains. They are caused by complex factors, requiring a multi-stakeholder effort to achieve meaningful change.

In addition to ensuring fair labor practices in our operations and supply chains, we invest time and money in collaborative efforts to address the root causes of modern slavery and human trafficking globally.

▶ **Find out more**

The Microsoft Supplier Code of Conduct, SEA requirements and Responsible Sourcing of Raw Materials (RSRM) Policy reflect our deep commitment to ensuring workers in our supply chain are kept safe and treated with fairness and dignity.

Participants in the mineral supply chain can be many tiers away from a directly contracted Microsoft supplier and this can limit our ability to take direct action or to influence them.

To improve sub-tier conformance, we work with directly contracted suppliers to ensure our SEA and RSRM requirements are passed on to sub-tier suppliers and enforced across the minerals supply chain. We further our commitment by engaging in strategic partnerships that address human rights and modern slavery risks and challenges in supply chains globally.

Microsoft human rights and fair labor standards

We require that all Microsoft suppliers must, without limitation:

Not discriminate	Prohibit the use of child labor	Use only voluntary labor
Ensure workers have access to work-related documents	Provide return transportation for foreign migrant workers	Use appropriately trained recruiters to support compliance
Promote awareness of human trafficking concerns	Make conditions of employment clear when hiring	Provide fair compensation
Treat employees with dignity and respect	Meet working hour and rest day requirements	
Ensure freedom of association	Provide grievance procedures	

⬊ For full details, download the Microsoft Supplier Code of Conduct

Labor and human rights (continued)

Zero tolerance of forced or bonded labor

We believe people should be free to choose their employment and no one should have to pay money to get a job. The Microsoft Supplier Code of Conduct bans any kind of forced or bonded labor. In FY19, we strengthened our Supplier Code of Conduct to prohibit all forms of prison labor.

Since FY15, we have required our suppliers to implement a zero fees policy for worker recruitment, even if those fees are legally allowed in the supplier's operating country or the employee's country of origin. If we discover a case of non-conformance with our requirement, we require the supplier to remedy the non-conformance and repay any fees paid by a worker to obtain a job.

1

In FY20, there was one serious and 38 major findings under the Freely Chosen Employment category

Due diligence to mitigate forced labor risks

We have continued to enhance our due diligence process through supplier contracts, onboarding training, supplier assessment and audits, corrective action and verification, sub-tier management and the Workers' Voice Hotline.

239 factories were audited in FY20, with one serious and 38 major findings under the Freely Chosen Employment category. $256,954 of recruitment fees and insufficient wages were repaid by suppliers to 5,401 employees, including $207,445 of recruitment fees repaid to 2,316 employees.

Our suppliers are required to implement compliance plans to identify and mitigate forced labor risks. Of 239 supplier factories audited in FY20, 198 had implemented these plans. 42 were identified as not having sufficiently implemented plans and these were all corrected or mitigated during the fiscal year.

Repayment of recruitment fees

To further enhance our human rights due diligence, we have adjusted our strategy to strengthen how we manage supplier risks from outset, beginning with our supplier onboarding process.

In FY20, we identified a foreign migrant worker recruitment fee issue with a new supplier in Taiwan. We required the supplier to repay $188,293 to 123 employees and implement a zero-payment program to systematically mitigate the risks before we started working with them.

▶ We build understanding and capability among our suppliers and Microsoft employees to prevent and correct forced labor issues.

648

supplier participants completed online training on the Microsoft human trafficking and forced labor requirements

198

out of 239 supplier factories audited in FY20 had implemented compliance plans to identify and mitigate forced labor risks

Raising awareness to prevent forced labor

Besides risk assessment and management, we build understanding and capability among our suppliers and Microsoft employees to prevent and correct forced labor issues.

In FY20, we leveraged the SEA Academy online platform to scale training across our global supply chain. All final assembly manufacturers and strategic component manufacturers completed online training on the Microsoft human trafficking and forced labor requirements. Based on the pre-training and post training assessment, 648 supplier participants stated that they increased their knowledge of the issues by 18%.

Internally, our Strategic Sourcing team and Factory Management teams received training on human trafficking and forced labor to enable them to incorporate conformance requirements into procurement decisions and detect and address risks. Detailed requirements were shared to build awareness regarding the potential risks of forced labor and human trafficking in supply chains.

▼ **Download** Microsoft FY2020 Modern Slavery and Human Trafficking Statement

Labor and human rights (continued)

How do you make sure workers' concerns are heard?

"The Microsoft Workers' Voice Hotline provides an external channel through which workers in our supply chain can rely on to report concerns anonymously and without fear of retaliation."

Joann Huang, Senior Manager, Responsible Sourcing

>300ᵏ

The Workers' Voice Hotline is now available to 300,334 workers

We use anonymous feedback from workers supplied through the Hotline to improve our Responsible Sourcing program design.

We have now extended the Hotline to 188 factories, accounting for 99.5% of the audited factories in China including our final assembly and strategic component manufacturing suppliers. This means the Workers' Voice Hotline is available to 300,334 workers, up 24.5% compared to last year.

In FY20, we received 160 cases and resolved 156 cases, with four cases still under investigation. The majority of cases concerned wages and benefits, humane treatment, working hours, freely chosen employment, and legal and customer requirements. There were four potential involuntary labor practice issues reported by workers through the Hotline.

We work directly with suppliers to correct the issues identified through the Hotline and mitigate risks.

We have taken actions, including conducting on-site investigations – sometimes with support of the third-party auditors – to verify and address all reported cases.

A Workers' Voice Hotline third-party provider representative said: "We can see the value of a third-party-run Workers' Hotline platform. These are some comments we, as the Hotline operators, have received from service users: 'If there were no such Hotline, my colleagues and I would not have a channel for filing our grievances and protecting our basic rights,' and 'Thank you very much for your help! I feel that there is no pressure now.'"

Top 10 reported case distribution in FY20 (percentage)

Wages and benefits	31.88
Humane treatment	15.63
Working hours	11.88
Freely chosen employment	10.63
Others	9.38
Legal and customer requirements	8.13
Sanitation, food, housing, transportation	4.38
Occupational injury and illness	2.5
Industry hygiene	2.5
Disclosure of information	1.25

Responsible sourcing of raw materials

Microsoft does not harvest or mine raw materials, but we do use them in our devices. We aim to influence upstream harvesting and mining through our policies and practices to manage the risks inherent in raw materials extraction, harvesting, processing, refining and transportation.

Our approach to raw materials begins with the Microsoft Responsible Sourcing of Raw Materials (RSRM) Policy. This policy covers all minerals and materials used in our devices and packaging, unbounded by geography.

Our RSRM Program is framed by the five steps of the Organization for Economic Cooperation and Development (OECD) Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (OECD Guidance) and the UN Guiding Principles on Business and Human Rights. As a baseline, we have incorporated RSRM requirements aligned to the OECD Guidance in the Supplier SEA Manual.

We aim to impact and influence global social and environmental improvements through strategic cross-sector and key partnerships and to support the use of fairly applied global standards.

Examples of our collaboration and capability building efforts include Responsible Business Alliance, Responsible Minerals Initiative, Pact, the Initiative for Responsible Mining Assurance (IRMA), and the Alliance for Responsible Mining (ARM).

⤵ **Find out more** on our raw materials policy and program at the Responsible Sourcing hardware supply chain page
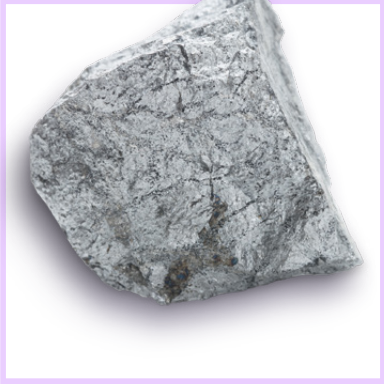
Creating a transparent battery supply chain

Batteries are central to modern life and mobile workplaces, but global demand over the past decade has resulted in environmental and social challenges throughout the battery supply chain.

Our foundational work to strengthen responsible sourcing of raw materials includes identifying the cobalt smelters and refiners who are sub-tier suppliers of our contracted battery suppliers. Next, we will expand our view to include lithium, copper, aluminum and nickel upstream producers.

The following geographical data begins to paint a picture of our battery supply chain:

Material	Smelter locations	Potential sources
Lithium	China	Australia, Chile, China
Nickel	China	China
Copper, Aluminum	China	To be determined

▲
Microsoft is committed to driving change and accountability in the cobalt supply chain through robust supplier due diligence.
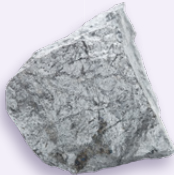
Cobalt due diligence and transparency

The world's cobalt supply is extracted from both mechanized and artisanal mining operations. Reports have highlighted concerns over the social and environmental impacts of cobalt extraction – including child labor and unsafe working conditions in artisanal operations.[2]

Microsoft is committed to driving change and accountability in the cobalt supply chain through robust supplier due diligence. We started working with our directly contracted battery suppliers to gather cobalt smelter information from their sub-tier suppliers in FY18. We have continued to hone our survey and data collection processes. Our active battery cell suppliers have identified 19 confirmed cobalt smelters located in China, Finland, Korea, and Russia. The full list can be found at the Responsible Sourcing hardware supply chain page.

2   http://www.responsiblemineralsinitiative.org/minerals-due-diligence/cobalt/

Responsible sourcing of raw materials (continued)

Prioritized mineral update

Mineral	Key Risk Typologies	At-Risk Geographies[3]	FY20 Updates	FY21 Goals	
Aluminum Al	**Environmental degradation** **Pollution** (Greenhouse Gas/Carbon Emissions)	China Ghana India	• Worked with internal teams to understand feasibility of recycled materials and to increase the production efficiency of material usage. • Continued to seek opportunities to leverage our technology to improve aluminum supply chains. • Conducted circularity assessments on our product line as an initial step to understand the status and opportunities for recycled materials in our products.	Expand transparency initiative to begin mapping our aluminum supply chains in-depth.	Examine industry-level engagements and factory level improvements to reduce the impacts of aluminum in our supply chain.
Cobalt Co	**Environmental degradation** **Community Health and Safety** **Labor** (forced labor, child labor) **Association with conflict and high-risk areas** **Occupational Health & Safety** (i.e. poor/unsafe working conditions) **Financial crimes** (bribery and/or corruption)	Democratic Republic of Congo	• Continued partnership with Pact to increase project sustainability and refine success metrics. (See page 46). • Expanded transparency projects beyond cobalt to other major battery materials. (See page 43).	Scope additional opportunities for engagements on cobalt due diligence.	Work with our suppliers to source from RMAP conformant cobalt smelters.
Copper Cu	**Environmental degradation** **Association with conflict and high-risk areas** **Water pollution and/or unsustainable water usage**	Peru	• Conducted circularity assessments on our product line as an initial step to understand the status and opportunities for recycled materials in our products. • Broadened engagement with large scale mines involved with copper production.	Support ongoing collaboration between the RMI and International Copper Association to drive best practices and processes identified into our supply chains.	
Gold Au	**Pollution** (Mercury) **Environmental degradation** **Occupational Health & Safety** (i.e. poor/unsafe working conditions) **Association with conflict and high-risk areas**	China Democratic Republic of Congo Peru	• Continued improvements with RMI gold team to drive conformance in smelters. • Continued to drive smelter conformance and integrate RMAP conformance status into internal supplier management tools. • Grew partnership and participation with ARM to establish program sustainability.	Implement digitization roadmaps developed for internal supplier management tools.	Leverage newly refreshed RMI smelter engagement team.

3   Defined only by featured Key Risk Typologies.

Responsible sourcing of raw materials (continued)

Prioritized mineral update (continued)

Mineral	Key Risk Typologies	At-Risk Geographies[3]	FY20 Updates	FY21 Goals	
Lithium Li	Association with conflict and high-risk areas Water pollution and/or unsustainable water usage	Argentina Australia Chile China	• Integrated lithium into our prioritized materials as part of our expanded responsible battery initiative. • Commenced mapping the lithium supply chain. • Scoped partnership for on-the-ground interventions in major lithium producing areas. • Piloted transparency projects with our suppliers to identify challenges in gathering data and scaling the process throughout our supply chain.	Expand our transparency project to all battery cell providers to dive deeper into the supply chain.	Begin to assess information for engagement strategies with upstream actors.
Magnesium Mg	Environmental degradation	China Russia Turkey	• Assessed waste reduction opportunities at additional suppliers to increase the program impacts. • Launched magnesium waste reduction process at an additional factory this year with the purpose of minimizing our environmental impacts associated with production.	Continue to work with our suppliers to further traceability work in our magnesium supply chain as well as pursuing waste reduction program.	
Tantalum Ta	Association with conflict and high-risk areas	Democratic Republic of Congo	• Continued work on RMI smelter engagement team (including 100% conformance in tungsten and tantalum smelters).	Implement digitization roadmaps developed for internal supplier management tools.	Leverage newly refreshed RMI smelter engagement team.
Tin Sn	Environmental degradation Occupational Health & Safety (i.e. poor/unsafe working conditions) Association with conflict and high-risk areas	China Indonesia Myanmar	• Continued to drive smelter conformance and integrate RMAP conformance status into internal supplier management tools.		
Tungsten W	Association with conflict and high-risk areas	Democratic Republic of Congo	• Established user requirements and a roadmap forward for development teams.		

3   Defined only by featured Key Risk Typologies.

Partnerships for change

Industry-wide partnerships enable us to achieve positive, long-term change across global supply chains. We contribute technology to enhance due diligence and help drive improvements in social and environmental impacts.

Working with Pact to address child labor in mining

Microsoft has partnered with Pact, an international NGO with a long history of promoting social responsibility in supply chains, since 2015.

We used the learnings of our Watoto Inje Ya Mungoti (WIM) or "Children Out of Mining" project to expand the partnership to cover Lualaba province – the former region of Katanga in the Democratic Republic of Congo, a major producer of cobalt and copper production.

The three-year project, Baadaye ya Watoto (BYD), or "Children's Future" launched in 2017, is a fundamental part of our holistic and multifaceted approach to promoting safe, ethical working conditions in the farthest reaches of our supply chain.

This year, Pact focused on community sensitization activities, literacy trainings for the community and participation in a micro-banking program that empowers women to lift themselves out of poverty. The WORTH project brings women and older girls together in groups of 20-25 people to save money, access credit and start small businesses.

WORTH activities have been a huge success within the project communities. Participation has enabled members to start generating complementary incomes so that they can earn the necessary income to send their children to school rather than needing them to work to support their families.

10,000

Nearly 10,000 people have been reached so far with information on the dangers of child labor in mining, child rights, and parental responsibilities

Working with IRMA to raise standards in mining

Microsoft actively supports IRMA in its mission to protect people and the environment from the impacts of mining. Microsoft takes a leadership role in IRMA, representing the purchaser constituency on the Board of Directors and helping steer the initiative in its work to unlock value for mining organizations through the implementation of the IRMA standards.

In 2020, Microsoft supported IRMA's critical programmatic response to the COVID-19 pandemic, which has created challenges for the auditing and verification of mine performance. IRMA and Microsoft are collaborating to leverage technology and remote sensing to enhance assurance programs and ensure robust review of mine performance.

Additionally, we will work together to develop enhanced distance-learning tools that will continue to build the capacity of mining companies and auditors through the challenging times of the pandemic and beyond. These programs are investments in a future where the need for advanced technology and stakeholder engagement will continue to rise.

"Microsoft's engagement and leadership in IRMA over the past several years has been pivotal in advancing IRMA's vision for best practices and increasing capacity for continuing improvement in the mining and minerals sector."

Aimee Boulanger, Executive Director, Initiative for Responsible Mining Assurance

While Microsoft does not directly purchase raw materials from mining companies, the work is also core to our mission of reducing the carbon, ecosystem, water and waste impacts of our operations across the entire value chain.

Visit our website to read more about our partnerships for change

Product use

What are you doing about the energy efficiency of your products?

"We're constantly improving the energy efficiency of our products by embedding energy-saving features in our hardware and software – helping customers save energy while they use them."

Ted Eckert, Principal Engineer

Overview and approach

Microsoft has transformed the way people live, work, play and connect through high-performance technology. When customers use our products, they expect high standards of durability, safety, security and accessibility, as well as energy efficiency. These are a key part of our commitment to customers as they use our products.

The use phase of our devices begins when the customer completes the out-of-box setup and continues while the product is functional and in use. We perform detailed assessments to calculate the environmental impact of our hardware products. This data helps us identify the stages that have the greatest impacts and target areas for improvement.

Microsoft's contribution to carbon reduction includes helping our customers reduce their own carbon footprints. We are committed to reducing the energy used by our products, including battery chargers. We work to improve the energy-saving features of our hardware product portfolio to help customers save energy.

FY20 Highlights

825,000
Xbox consoles certified as CarbonNeutral®

1ᵇ
monthly active devices empowering the world with energy-saving features using Windows 10

Our approach
When our customers use our products, they expect high standards of durability, safety, security and accessibility, as well as energy efficiency. These are a key part of our commitment to customers as they use our products.

Energy efficiency
Improving the energy efficiency of our devices is one of the main opportunities we have to address climate change during the use phase

Accessibility
We practice Microsoft Inclusive Design Principles to achieve accessibility in our products

Security
We continue to advance the security of our Surface devices, along with Microsoft 365

Safety
We apply rigorous safety strategies based on industry standards, regulations and internal specifications

Energy-efficient devices

Improving the energy efficiency of our devices is one of our main opportunities to address climate change during the use phase. It extends battery life, increases the competitiveness of our business, reduces environmental impacts due to energy generation, and cuts energy bills for consumers.

Energy production and consumption is the largest source of global greenhouse gas (GHG) emissions globally. Science shows that energy efficiency will play a crucial role in cutting the growth of world energy demand.[1] However, energy consumption continues to grow.

With only a third of global power capacity based on renewable energy,[2] we focus on improving the energy efficiency of our Surface product portfolio to enable customers to use less energy during the product lifetime.

As part of our ambitious carbon reduction commitment, we have set 2030 targets to reduce carbon emissions due to the energy consumption of our Surface portfolio by 3%.

1   https://www.iea.org/reports/energy-and-climate-change
2   Renewable Energy now accounts for a third of global power capacity: https://www.irena.org/newsroom/pressreleases/2019/Apr/Renewable-Energy-Now-Accounts-for-a-Third-of-Global-Power-Capacity
3   Based on ENERGY STAR Computer Specification 8.0 measurements at 115 VAC, 60 Hz.

Energy efficiency improvements in Surface Pro X

Launched in 2019, the Surface Pro X combines the computing power of the Surface Pro line with the energy efficiency of modern mobile devices.

The Surface Pro X uses less power than the Surface Pro 6, while providing the same high performance that Microsoft users demand.

Estimated total energy consumption for the Surface Pro X is 13.1 kWh/year, compared with the Surface Pro 6's 18.2 kWh/year, equivalent to a 28% reduction.[3]

This energy improvement would not be possible without the innovation of Windows 10 for mobile ARM devices and Universal Windows Platform (UWP). These platforms allow users of energy-saving ARM-powered devices to run Windows and to use the applications they are familiar with wherever they go, using a cellular data connection.

13.1kWh

Estimated total annual energy consumption for the Surface Pro X

28%

Reduction in estimated total annual energy consumption compared to the Surface Pro 6

Energy-efficient devices (continued)

Reducing the environmental footprint of gaming consoles

We want to provide users with a rich gaming experience in the most energy-efficient way for our customers.

Video game consoles require more power to play than other media players because of their separate video circuitry. Due to this, the European Commission has identified consoles as a priority product group to be covered by regulation or a self-regulatory initiative to reduce greenhouse gas emissions.

An important part of our business strategy includes reducing the energy consumed by our game consoles within a generation, without compromising on gaming power.

The European Game Consoles Voluntary Agreement is the result of many years of work between its three signatories – Microsoft, Nintendo and Sony – and other stakeholders.

The first phase of the partnership focused on reducing the energy consumption of consoles during the use phase.

Microsoft worked with the Self-Regulatory Initiative (SRI) to reduce energy consumption on each generation of console, resulting in the Xbox One X – a 4K-capable console that consumes less energy than the original Xbox 360 when it was first sold in 2005. This energy reduction was accomplished despite a 16-fold increase in display resolution and an even greater increase in computing power.

What is the European Game Consoles Voluntary Agreement?

It is a Self-Regulatory Initiative (SRI) that aims to reduce the environmental impact of game consoles over their lifecycle and achieve energy savings and material efficiency through better design.

How Microsoft Windows drives energy efficiency

As the world becomes more digital and Microsoft Windows usage continues to grow, software is a powerful enabler of energy efficiency with over one billion active users of Windows 10 across 200 countries.[4]

When the COVID-19 stay-at-home restrictions affected people around the world, we saw a 75% increase in minutes-per-month Windows usage. This also meant a rise in energy consumption, driven by Windows PCs.

In May 2020, we launched the Windows Software Sustainability initiative. It aims to reduce the carbon footprint of Windows software and will establish a set of best practices for energy-efficient Windows app development, leveraging existing sustainable cloud-app development guidelines created by Microsoft.

Our aim is to significantly raise environmental awareness among the Windows developer community, both inside and outside Microsoft, to help make Windows the world-leading sustainable operating system.

We will develop open-source sample code for developers and engage directly with developers of the most impactful first-party and third-party Windows experiences. Best practices will involve app development frameworks, development and release-cycle management, app optimization for new silicon technologies and device resources such as Graphic Processing Units (GPUs). Although rooted in Windows apps, activities will also cover Windows engineering to optimize and holistically reduce its carbon footprint.

Our initial focus in FY21 will be on reducing the energy consumption of the top 20 most-used Windows experiences, which together represent 90% of active Windows energy usage. For example, we are working with VLC (VideoLAN Client) to implement accelerated GPU video decoding, lowering total power consumption by over 55% in some scenarios.

4   https://blogs.windows.com/windowsexperience/2020/03/16/windows-10-powering-the-world-with-1-billion-monthly-active-devices/

Energy-efficient devices (continued)

What are you doing to make Gaming more sustainable?

"Xbox One is the world's first gaming console to be carbon neutral."[5]

Lucas Joppa,
Chief Environmental Officer

825k

Xbox consoles are now certified
CarbonNeutral®

As part of our journey to become carbon negative, Xbox One X console is the first gaming console to be carbon neutral across the lifecycle of its emissions. 825,000 Xbox consoles are now certified CarbonNeutral®.[6]

We have achieved this by making reductions to the lifecycle emissions through purchasing renewable electricity and verified emissions reductions, known as carbon offsets.

To achieve CarbonNeutral® certification, we worked with an independent third-party to conduct a lifecycle assessment (LCA) of the greenhouse gas emissions of the Xbox console – from the raw materials, manufacture and distribution to the use and disposal of the console, its controllers and its packaging. It is estimated to save about 616,000 tons of CO_2e a year, equivalent to driving 130,786 passenger vehicles.[7]

We are the first company to use a combined investment in energy-efficient design, renewable energy credits and carbon offsets to mitigate the estimated GHGs associated with the complete lifecycle of a gaming console.

As part of the project, Microsoft is financing the Sichuan Biodigesters project in China, where Xboxes are manufactured. The project distributes small-scale biogas plants to low-income rural households with livestock in China. So far, the project has reduced carbon dioxide emissions and harmful smoke in 400,000 smallholder farmer households.

Xie Guo 'An is a farmer who lives in a traditional house with his wife and son. Since the installation of the biodigester, the family have been able to invest some of the money saved on fuels and fertilizers in their agricultural activities.[8]

▼

Phil Spencer, Executive Vice-President of gaming, Microsoft said: "Climate change is impacting each industry and every sector, and we believe technology can play a critical role in enabling and empowering the response to this challenge. Initiatives like the CarbonNeutral® Xbox pilot provide a great opportunity to tap into Microsoft's technology sustainability and gaming community to make a difference in this key area of our business."

5   Ambition is good; action is better: Making progress on our climate commitments.
6   Third-party certification Carbonneutral.com
7   EPA Greenhouse Gas Equivalencies Calculator https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
8   Story courtesy of Natural Capital Partners.

Energy-efficient devices (continued)

Tracking real-world energy use

To drive meaningful progress and add credibility to our claims, we need to understand how energy efficiency improvements to our products translate into carbon reduction when the products are used by our customers. It's a complex task that requires understanding how a customer uses their device and for how long.

Industry standard benchmarks such as ENERGY STAR® in the US and the European Commission Energy related Products (ErP) regulation use broad assumptions designed to cover most real-world cases. Fortunately, we have access to real-world insights from users of our devices who have chosen to share their information with us. Because of this, we have been able to explore the differences between the industry benchmarks and our shared device data.

Figure 1 shows, in comparing real-world data with ENERGY STAR, we found the standard does sometimes model real-world performance, but it can also be significantly inaccurate. The ENERGY STAR model is based around a typical laptop and it is not too surprising that Surface Laptop 3, similar in form-factor and use profile to those modeled, is well represented.

Surface Go, on the other hand, is modeled with a far greater energy footprint and Surface Book with a lower energy footprint, reflecting the specialties of these devices in terms of mobility and performance, respectively.
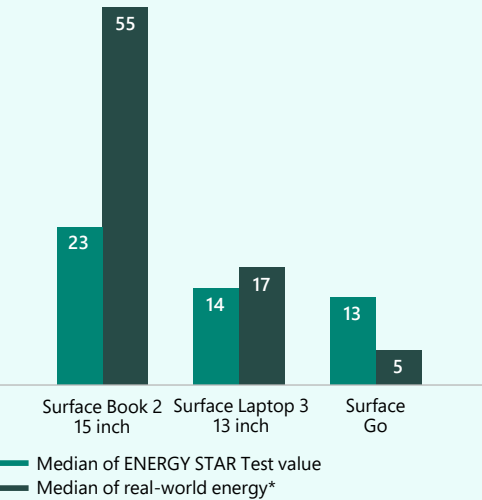
In addition to using data to track differences between devices, we can also use data to gain insights into user behavior across different activities. For example, a user working in the media sector will have a very different usage pattern and energy footprint compared to a home user.

We intend to leverage these insights to develop our own model of Total Energy Consumption. By adding more variables to the model, we will capture the energy footprint of different types of device and different types of user. Ultimately, this refined model will enable our engineers to find ways to further reduce energy consumption and provide a more accurate estimation of real-world energy usage.

+160%

Higher ENERGY STAR test value than real-world energy footprint for Surface Go

–58%

Lower ENERGY STAR test value than real-world energy footprint for the Surface Book 2

Figure 1

ENERGY STAR vs real-world usage
Total energy consumption (kWh/year)

	Surface Book 2 15 inch	Surface Laptop 3 13 inch	Surface Go
Median of ENERGY STAR Test value	23	14	13
Median of real-world energy*	55	17	5

■ Median of ENERGY STAR Test value
■ Median of real-world energy*

* Created from a PowerBI dashboard developed by a Devices' specialist based in Sweden.

▲
We need to understand how energy-efficiency improvements to our products translate into carbon reduction when the products are used by our customers.

Enabling repair and refurbishment

We help customers minimize waste and maximize product life. This includes providing the processes, tools and equipment needed to repair our devices.

Making repair easily accessible

We aim to make repair easily accessible to customers. For Surface software issues, Microsoft's free Surface Diagnostic Toolkit enables customers to fix common software issues at home. We also provide self-help guidance to fix common issues related to software and device settings. The Refurbished PC program provides affordable access to technology through favorable pricing on Windows to encourage reuse of devices that may otherwise be discarded. Obtaining help and repairs is also simple for Xbox customers with warranty and service information provided online. Customers can obtain online information about warranties for all Microsoft products.

A second life through refurbishment

We offer repair of our devices through robust refurbishment programs. We also give new life to Original Equipment Manufacturer (OEM) devices using the Windows platform through Microsoft Authorized Refurbishers (MAR) and the Refurbished PC program.

Our MAR partners provide professionally refurbished computers preinstalled with genuine Microsoft software for use at home and by commercial businesses and nonprofit organizations. The Refurbished PC program provides affordable access to technology through favorable pricing on Windows to encourage reuse of devices that may otherwise be discarded.

Privacy and data security safeguards

Customer concerns over loss of privacy and data issues can discourage them from sending devices for refurbishment. To address this and build customer confidence, Windows 10 offers a data wiping feature. Within organizations, as devices get enrolled into mobile device management (MDM) systems, such as Microsoft Intune, organizations can easily replace any Surface device or redeploy it to a new employee in a fast and secure way by removing all organizational data.

▶ Find out more about our data wiping feature

▲
We aim to make repair easily accessible to customers.

Safe, secure and inclusive products

Product safety, security, reliability and accessibility are central to Microsoft's mission to empower every person and every organization to achieve more. It's another way integrity is built into our devices.

To ensure the safety of devices, we conduct engineering product safety reviews at initial product concept and repeat them through design, prototype review, testing, manufacturing, consumer use and at the end of the product's useful life. We apply our Inclusive Design Principles to create accessible products and embed solutions that open up our products and services to more people.

▶ **Find out more**
page 55

Product quality and reliability

People buy a Microsoft product to address a need or add value to their lives. Product quality covers all the characteristics that ensure a product is able to satisfy customer needs and expectations. Reliability ensures product quality persists over time, ultimately keeping products in use for longer.

Microsoft uses a wide range of tools during product development and after launch to provide customers with a high-quality experience while interacting with us and our products. They include quality practices and protocols, monitoring schemes, control procedures, redressal, and corrective action procedures.

We design our products for effectiveness so that they do what the customer wants, whenever the customer wants it. We also design to extend product "worthiness", taking into account the overall cost for the customer including purchase price, costs associated with operation and maintenance, and repair and disposal costs. These two concepts provide the conceptual framework for defining product quality and reliability specifications and requirements. They determine how best to direct design and development efforts to achieve a desired high-quality product that customers aspire to own.

Product safety

Product safety is crucial. It enables us to provide superior products which customers and employees can enjoy with confidence, throughout their usable life. We ensure all products are safe for their intended use by applying rigorous safety strategies based on industry standards, regulations and internal specifications. Microsoft experts examine safety performance in detail at various stages throughout the product lifecycle.

Our Product Safety Principles

Product safety comes first

Microsoft cares about the safety of its customers and employees. We plan, design, manufacture, offer and maintain products that are safe for their intended use by identifying and addressing product safety issues early on in product development.

Educate employees and partners

We educate our employees and require our industry partners, device manufacturers and suppliers to follow design and manufacturing specifications that are consistent with our Product Safety Principles.

Safe use and handling

We believe that customers should understand how to safely use our products. To support them, we provide customer safety education through labeling, user guides and online content to build upon the customer safety experience.

Safety monitoring and continuous improvement

We closely monitor product performance, customer concerns and the effectiveness of our product safety programs to ensure and improve the safety of our products.

Our community

We examine ideas and guidelines from industry associations, governmental agencies and customers, and search for new and emerging practices and technologies. Creating safe products supports Microsoft's mission to empower every person and every organization on the planet to achieve more.

Safe, secure and inclusive products (continued)

Our product safety management system

Microsoft's product safety management system is designed to conform to ISO 10377:2013 – Consumer Product Safety Guidelines for Suppliers. These Guidelines provide practical guidance on assessing and managing the safety of consumer products, including effective documentation of risk assessment and risk management to meet applicable requirements. They guide us to identify, assess, reduce or eliminate hazards, manage risks by reducing them to tolerable levels, and provide consumers with hazard warnings and instructions essential to the safe use and disposal of consumer products.

We strive to generate and foster a product safety culture both within and outside the organization. Internally, we adhere to international product safety standards and regulations, as well as our own specifications. Safety findings and lessons learned are fed back into design specifications for future products and shared with Microsoft's engineering teams as part of a continuous improvement loop.

We provide consumers with the information they need to safely assemble, use, maintain and dispose of our products.

This information is available online at Microsoft.com. All Microsoft.com webpages have a link in their footer titled Safety & Eco for quick access to this information. Additionally, our in-market monitoring program captures and addresses product safety concerns raised by our customers. We regularly share best safety practices related to consumer products with industry and trade associations, as well as other manufacturers.

Championing accessibility and inclusivity

Microsoft's mission to empower every person on the planet to achieve more means our devices must be designed to meet the needs and aspirations of diverse individuals, organizations and communities.

Inclusive Design is a methodology born out of digital environments that enables and draws on the full range of human diversity. Most importantly, it aims to include and learn from people with a range of perspectives and abilities.

We practice Microsoft Inclusive Design Principles to achieve accessibility in our products. We continue implementing innovative solutions in pursuit of making the benefits of technology available to everyone.

Our Inclusive Design Principles

Recognize exclusion

Exclusion happens when we solve problems using our own biases. As Microsoft designers, we seek out those exclusions and use them as opportunities to create new ideas and inclusive designs.

Learn from diversity

Human beings are the real experts in adapting to diversity. Inclusive design puts people in the center from the very start of the process, and those fresh, diverse perspectives are the key to true insight.

Solve for one, extend to many

Everyone has abilities and limits to those abilities. Designing for people with permanent disabilities results in designs that benefit people universally. Constraints are a beautiful thing.

Inclusive Tech Lab

We have hosted more than 7,000 visitors at our Inclusive Tech Lab facilities to engage and understand the challenges people with disabilities face with technology.

One of the roles of the Inclusive Tech Lab team is to advise on accessibility policy and to evaluate and report on our compliance. We adhere to the guidance of the Microsoft Accessibility Standard when designing our products, ensuring a consistent baseline of accessibility from which we can build truly inclusive devices.

Inclusive design changes to Surface devices

We have made intentional changes to our keyboards, enhancing them for customers who are blind. We rearranged media keys based on feedback from the community, made the state of the FN-Lock key available to Windows Narrator and we added tactile bumps to the F4 and F8 keys. These enhancements have been made to Surface Laptop 3, Surface Pro 7, Surface Pro X, Surface Book 3 and Surface Go 2 and will be standard for all future Surface keyboards.

We have made intentional changes to our keyboards, enhancing them for customers who are blind.

Safe, secure and inclusive products (continued)

Empowering organizations and individuals with secure devices

Surface devices empower teams and individuals to collaborate freely and to create and work with confidence. We continue to advance the security of our Surface devices, along with Microsoft 365, so that our customers can trust they are safely accessing their applications and data, whether in the cloud or on-premises. This peace of mind enables efficient processes, effective collaboration and a better experience for all users.

Surface devices with security in mind

Surface devices use firmware engineered by Microsoft which is updatable automatically via Windows Update, keeping devices secure for years after launch. Surface UEFI firmware is based on Project Mu, an open source UEFI code base signed and verified upon start-up to prevent tampering.

Enhanced security through authentication and encryption

Surface devices are equipped with a Trusted Platform Module (TPM) version 2.0 that meets the requirements of the most security-conscious organizations, including governments and military. Keys used in authentication and encryption are protected by the TPM which shields several use cases, including authentication to Windows and to Microsoft 365 preventing spoofing of users' credentials and biometrics, using virtual applications, and accessing data encrypted in disk at rest.

Security from the factory

Surface devices include verifiable device security from the factory. Each device is provisioned with an individual key that chains to the Microsoft Root of Trust. With Secure Boot, customers can have confidence that the Surface firmware is tamper free.

Protection when users collaborate

When users connect from Surface devices to applications in the cloud and on-premises, authentication tokens and session keys from Azure Active Directory (Azure AD) are protected in the TPM of the device. This effectively prevents bad actors from replaying stolen tokens on a different device to gain unauthorized access.

Mitigating risks associated with passwords

Biometrics on Surface devices allow secure authentication to Windows and Microsoft 365 through Windows Hello and Windows Hello for Business. This feature provides the convenience of using biometrics for user sign-in while keeping authentication secure by reducing the risks associated with passwords security.

Secure modern management of firmware settings

With Device Firmware Configuration Interface (DFCI), IT professionals can securely manage firmware settings on their Surface devices using a mobile device management (MDM) solution like Microsoft Intune. Administrators gain the efficiency of cloud-scale remote firmware management with zero-touch device provisioning and built-in security.

Secure access to applications

Surface devices can participate in device-based conditional access to make sure they meet organization compliance policy. This access extends to devices that are joined to the organization, users with strong authentication (such as Windows Hello for Business), and devices that meet specific policies (for example, encrypted disk and complexity of PIN).

Devices easily deployed to a secured state

Windows Autopilot applies verifiable device security from factory to customer for when a new Surface device is deployed in an organization. With the factory security, Surface devices can be pre-registered in Azure AD so that, upon first boot, they authenticate to Azure AD and obtain a new organization-based identity. This allows the device to be enrolled and configured to the organization's MDM solution and the organization to trust that only devices it has purchased and authorized can access organizational resources.

User-driven deployment

Windows Autopilot simplifies and modernizes the deployment of Surface devices. IT professionals can customize the out-of-box experience for their Surface devices and enable end users to achieve a fully configured device ready for business use with just a few clicks. There are no images to deploy, no drivers to inject and no infrastructure to manage. Most importantly, users can go through the process independently, without the need to involve IT.

▲
We continue to advance the security of our Surface devices, along with Microsoft 365, so that our customers can trust they are safely accessing their applications and data.

Climate and environment

How will you meet your goal of being carbon negative by 2030?

"It's an ambitious goal and we don't yet have all the answers for how we'll get there. We'll be analyzing every area of our business, from working with suppliers to set science-based targets to further improving the energy efficiency of our portfolio. It'll take every ounce of our innovation, creativity and determination – but we're up for the challenge."

Elizabeth Willmott, Carbon Program Manager

Overview and approach

The scientific consensus is clear. The world is facing an urgent climate crisis and we have just 10 years to act if we are going to limit temperature increase to a maximum of 1.5°C.[1] Beyond this, science tells us the results will be catastrophic.

According to the World Health Organization (WHO), climate change affects many dimensions that are crucial to human health – from clean air and safe drinking water to food security and shelter. Between 2030 and 2050, climate change is expected to cause around 250,000 additional deaths per year from malnutrition, malaria and heat stress. Reducing GHG (referred to herein as carbon emissions[2]) would result in improved health outcomes, with reduced air pollution playing a significant role.[3]

Every stage of a product's lifecycle – extraction, manufacturing, distribution, use and disposal – indirectly or directly contributes to carbon emissions in the atmosphere and affects the global climate.

Waste prevention and recycling offer significant potential for decreasing emissions. The U.S. Environmental Protection Agency estimates that simply increasing the U.S. national recycling rate from its current level of 30% to 35% would reduce carbon emissions by 10 million metric tons of carbon equivalent (MTCE). That is equivalent to the average annual emissions from the electricity consumed by roughly 4.6 million households.[4]

1   https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/
2   Expressed as carbon dioxide equivalent.
3   https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health
4   https://archive.epa.gov/epawaste/conserve/smm/wastewise/web/html/change.html
5   Redmond, WA USA; Suzhou, PRC; San Juan, Puerto Rico; Dublin, Ireland; Munich, Germany.

Our Healthy Planet strategy

A healthy society requires a healthy planet. Our Healthy Planet strategy addresses two of the most pervasive challenges society faces: climate change and waste. These are material issues for Microsoft Devices; we can have a significant positive impact by reducing end-to-end carbon emissions and waste across the lifecycle of our products.

Climate change

We have set a science-based target to reduce our Scope 3 carbon emissions.

We are making progress, but more needs to be done. Understanding the carbon and environmental implications of our decisions can help drive meaningful and impactful change. We are focused on enabling informed decision-making about product and packaging materials, design and manufacturing using carbon emission and environmental impact data, quantified by lifecycle assessments.

Waste

We have set a zero waste by 2030 goal.

Measuring and improving recyclability and circularity are essential to reach this goal. We have set recyclability targets for products and packaging. We are also working to address air emissions and water use in our supply chain through our Responsible Sourcing programs.

Managing our impacts

Identifying, measuring and managing our environmental impacts is a prerequisite to reducing carbon emissions and waste. ISO 14001 is widely recognized as the primary standard for helping organizations to limit the environmental impact of operations, products, packaging and services. It provides a framework for organizations to manage and continuously improve their environmental performance. Planning, reviewing and improving through an effective Environment Management System (EMS) can help mitigate environmental impacts such as carbon emissions and waste.

Microsoft Devices has maintained ISO 14001 Certification since 2014 and all significant operating locations[5] are ISO 14001 certified. This provides our customers and other stakeholders with the objective assurance that we comply with environmental, legal and regulatory requirements. ISO 14001 also helps drive continuous improvements, which are verified through the certification process.

In FY20, this process led to specific environmental management programs including reduction of hazardous substances, design for sustainability, and reduction of carbon emissions and waste. The ISO 14001 framework will continue to be a key tool for enabling us to reach our 2030 Healthy Design, Healthy Planet goals.

Find out more
www.microsoft.com/en-us/corporate-responsibility/sustainability

Healthy Planet goals and outcomes

FY20 was the closing year for many of our environmental programs and targets. It was also an opportunity to review progress and set new goals for 2030. We will announce detailed targets underpinning our Sustainability 2030 aspirations in FY21.

Find out more
https://www.microsoft.com/en-us/corporate-responsibility/sustainability

New targets for 2030

100%
recyclable Surface devices by 2030

100%
recyclable packaging by 2030

Key outcomes in FY20

Climate change
37%
Targeted two of the largest fulfillment centers to be carbon neutral by end of 2021, covering 37% of units fulfilled

Climate change
>50%
Satya Nadella, CEO of Microsoft, announced an ambitious commitment to be carbon negative and launched an aggressive program to cut carbon emissions by more than half by 2030

Waste
Quantified the recyclability of our Surface portfolio,[6] identified improvement opportunities and set recyclability targets:
– 100% recyclable Surface devices by 2030
– 100% recyclable packaging by 2030

Waste
Quantified the circularity of Surface devices using the WBCSD Circular Transition Indicators (CTI). Specific targets are now under development

Climate change
8.9%
Our Scope 3 carbon emissions reduced by 8.9% (-524k $mTCO_2e$) from a 2017 base year, moving towards our 2030 goal of 30%. We are working to improve our methodology, refine our baseline and develop a roadmap to meet a more ambitious target

6   Methodology used was UL Inc. 2789, according to IEC 62635.

Microsoft Devices Sustainability Report FY20

Climate change

Curbing climate change requires a comprehensive global response from all sectors of society. If left unmanaged, it will have a direct and adverse impact on the planet with increasingly unpredictable climates and environmental systems threatening to disrupt society.

Our ambitious carbon goals

The international scientific community is aligned in its recommendations that, to avoid the worst of these problems, we must not allow average global temperatures to rise more than 1.5°C above historical baselines. To begin stabilizing our climate system, the world must reduce carbon emissions 45% by 2030 and transition to a carbon negative economy by 2050.[7]
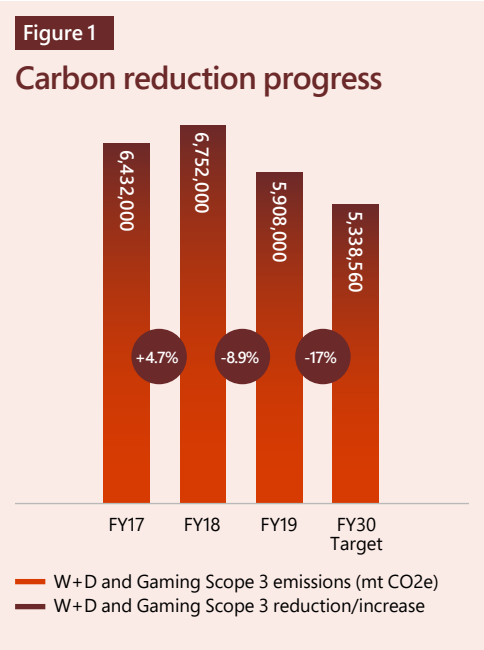
Answering the call to action, Microsoft has signed the United Nations' 1.5-degree Business Ambition Pledge and we encourage other companies to join us. In January 2020, Microsoft announced that it will be carbon negative by 2030.

As part of this commitment, we will reduce our emissions by more than half across our business and supply chain.

We will remove more carbon than we emit annually as a company, resulting in a carbon impact that is below net zero. By 2050, our goal is to remove from the environment all the carbon Microsoft has emitted either directly or via electricity consumption since our founding in 1975.

Our science-based approach

In 2019, Microsoft set a science-based target, certified by the Science Based Targets initiative, to reduce Scope 3 carbon emissions by at least 30% per unit of revenue by 2030 (from a 2017 base year). Devices and Gaming are responsible for 17% of the carbon reduction that will be required to achieve it, which contributes directly to our carbon negative ambition. Figure 1 provides an overview of our progress towards meeting the target.

Figure 1

Carbon reduction progress

	FY17	FY18	FY19	FY30 Target
	6,432,000	6,752,000	5,908,000	5,338,560
		+4.7%	-8.9%	-17%

— W+D and Gaming Scope 3 emissions (mt CO2e)
— W+D and Gaming Scope 3 reduction/increase

The increase in Scope 3 emissions in FY18 was in part due to sales leaning towards products with greater energy consumption. The decrease in FY19 was in part attributable to a pilot project to explore the use of renewable energy in the manufacture of Xbox and Surface devices. We will look to expand this pilot in the future.

In response to Microsoft's climate ambitions for 2030 and 2050, Devices has launched a project to reassess its 2019 target to identify additional opportunities to reduce Scope 3 emissions and exceed our original target.

We are working to improve our assessment methodology, refine our baseline and develop a roadmap to meet a more aggressive target. Initiatives include encouraging suppliers to set science-based targets, driving fulfillment and logistics efficiency, improving the energy efficiency of the Surface and Xbox portfolio, and re-thinking the design of our products. The table below shows the approximate impact of some of our initiatives to date.

	FY19 Impact (million tons CO2e)
Xbox and Surface renewable energy in use phase	-0.61
Surface energy efficiency improvement	0.06
Device Ecodesign	-0.02
E+D suppliers setting science-based targets	-0.21
Total reduction	**-0.78**

▶ **Find out more in Product use** page 48

▶ **Find out more in Product design** page 20

We have started to develop a baseline emissions profile for our supply chain in partnership with a leading consultancy firm. Our aim is to identify our most carbon-intensive supplier categories and develop short- and long-term strategies to work with them to reduce their footprint. We will work with our suppliers to define and validate goals to support Microsoft's overall strategy. We will also implement processes to enable and incentivize them to reduce and report on their own Scope 1, 2, and 3 emissions.

Lifecycle assessment (LCA) is central to our methodologies for calculating the impacts of products. We use it to track product performance and as a tool to inform our Healthy Design decisions. Like any analytical tool, the accuracy of the LCA depends on the data on which it is based. Initially, LCAs will be based on respected third-party databases. Over time, we are shifting towards using more primary data and models that reflect how customers actually use our devices and the resulting environmental impacts.

▶ **Find out more on Healthy Design decisions** page 23

7 https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Summary_Volume_Low_Res.pdf

Climate change (continued)

Reporting and transparency

Microsoft has committed to publicly disclose the carbon footprint of its products, services and solutions. Quantifying and reporting our carbon footprint is a complex challenge requiring significant investment. We support strong industry-wide standards for transparent reporting of carbon emissions and removal.

Expanding on our Devices Sustainability Report, we will report our carbon reduction progress via a new annual environmental sustainability report, to be released in FY21.

Microsoft's annual CDP report covers Scope 1, 2, and 3 carbon emissions, corporate climate change policy, carbon reduction targets, energy and renewable energy usage, total carbon emissions from operations, emissions reduction targets and progress towards these targets.

Using a carbon tax to inform our decision-making

Microsoft applies an internal carbon tax to increase transparency and awareness around the environmental cost of design decisions. The tax is assessed against the Scope 1, 2 and 3 carbon emissions of each business group.

Empowered with science-based information on the environmental consequence of choosing a supplier, technology or material over another, Microsoft designers and engineers are well positioned to develop the next generation of products with lower carbon emissions.

Reducing carbon emissions in manufacturing and packaging

Our approach

Due to continued energy-efficiency improvements to our Surface devices, the carbon emissions associated with the use phase of the product lifecycle is relatively small. It is the product manufacturing stage which represents the highest carbon emissions in the end-to-end Surface product lifecycle.

Our carbon reduction strategy aims to better understand the emissions baseline during this phase and to partner with manufacturing suppliers to build efficient production systems. We pursue technologies to decrease carbon intensity and encourage our suppliers to set and meet science-based carbon reduction targets.
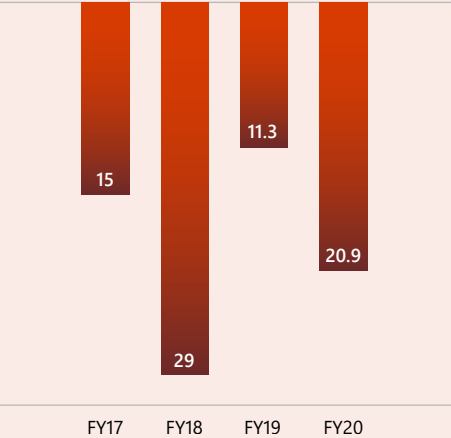
We request hardware suppliers representing 99% of supplier spend to report climate change and water usage to the CDP. Their CDP disclosures include corporate climate change policies, carbon reduction targets, energy and renewable energy usage, total carbon emissions from production and transport of products, and more. We use the information submitted to track carbon emissions, monitor progress towards meeting carbon targets and gauge where future opportunities for carbon reductions exist.

Of the suppliers requested last year to participate in CDP reporting, 83% submitted reports. This included all Tier 1 suppliers and was an increase from 80% the previous year.

	CY17	CY18	CY19
% of hardware suppliers responding to emissions reporting section	80%	83%	83%
% of suppliers responding to CDP	81%	82%	83%
% of suppliers with climate objective	67%	67%	82%
% of suppliers with science-based targets	24%	27%	40%
% of suppliers reporting CO$_2$e reduction	53%	61%	69%
Total GHGs reported (metric tons CO$_2$e)	**49.4m**	**62.7m**	**76.6m**
Total GHGs (metric tons CO$_2$e) reduced	**-5.1m**	**-8.0m**	**-7.4m**

Figure 2

Carbon emissions in packaging
% reduction

Overall emissions have increased as monitoring methods have improved, more suppliers are reporting, and suppliers have increased production/transport of goods. For newly introduced packaging, carbon emissions have continued to reduce year-on-year vs baseline designs. These reductions are primarily a result of less material being used.

Climate change (continued)

How are you reducing environmental impacts across the lifecycle of your products?

These figures represent the estimated environmental impact across the Surface Pro 7 lifecycle.[8]

124.2kg

carbon emissions[9] equivalent to carbon emissions from driving 308 miles in an average passenger vehicle[10]
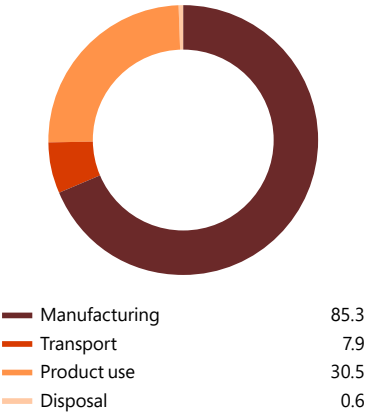
1,563.9MJ

CO_2-equivalent energy use

"We use lifecycle assessments to identify opportunities to reduce our products' environmental impact. We collaborate with a large and growing community of sustainability champions in Microsoft Devices who are innovating and finding ways to improve each stage of the product's lifecycle."

Kelly Stumbaugh, Ecodesign Team Manager

Sustainability is integral to our mission to build products that create magical experiences while empowering every person and organization to achieve more. From product design through sourcing, manufacturing, delivery and product end-of-life, we are driven to make a difference with our products in how customers create with them and how they impact on the environment.

We have conducted product environmental LCAs for each of our Surface devices and Xbox consoles to establish a baseline and identify opportunities to reduce the environmental impact of our products. Our LCA process utilizes a model and datasets developed by experts in consumer electronics LCA, along with commercially available lifecycle inventory datasets, data obtained from our suppliers and Microsoft's own data.

Greenhouse gas emissions across Surface Pro 7 lifecycle
kg CO_2eq

Manufacturing	85.3
Transport	7.9
Product use	30.5
Disposal	0.6

↘ **Find out more** about the full product Eco Profile

8   The calculations are based on the Intel® Core™ i5 128GB SSD 8GB RAM configuration of Model 1866 (Wi-Fi) and include the main device, power supply unit, and packaging. Other accessories are not included. The system boundaries include manufacturing (extraction of raw materials, upstream materials preparation, electronic component manufacturing, subassembly manufacturing and assembly, and final assembly), distribution to customer, three years of product use, and end-of-life treatment.

9   The carbon emissions and energy use figures are based on a Lifecycle Assessment (LCA) in accordance with ISO 14040 and ISO 14044 complemented by device-specific ETSI TS 199 and ITU-T L 1410. The Lifecycle Inventory (LCI) data is based on our own measurements, collected from suppliers, and internationally available LCI databases.

10 Based on calculation from https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Climate change (continued)

Smarter fulfillment and logistics

Our end-to-end fulfillment and logistics network enables us to deliver products to consumers directly from the manufacturing line and via our distribution network. The efficiency of our network is a significant focus of our carbon reduction strategy representing around 1.3% of Scope 3 emissions.

Our approach

Our world-class transportation management system optimizes freight by reducing the number of shipments and using the appropriate transportation mode to deliver products from factory to final destination.

We use smart technology in our distribution centers to select the most efficient mode of fulfillment, reducing our carbon footprint and increasing customer satisfaction.

Since July 2017, our state-of-the-art distribution centers have used energy efficient technologies such as lighting and warehouse material-handling systems that operate only when they detect activity and are idle when not in use. The technology is in use at distribution centers accounting for 75% of our shipments.

To increase the energy and environmental efficiency of our freight operations, we partner with SmartWay®, a public-private collaboration between the U.S. Environmental Protection Agency (EPA) and the freight transportation industry, to accelerate the availability and adoption of advanced, fuel-efficient technologies and operational practices. As a certified SmartWay Transport Partner, we improve fuel efficiency and overall environmental performance. For the last reporting cycle, 89% of shipments were shipped with SmartWay certified carriers.

Microsoft is also an active member in the Global Logistics Emissions Council (GLEC), an industry collaboration through Smart Freight Centre committed to reducing logistics emissions through sustainable freight initiatives.

In FY20, the Devices Supply Chain adopted the method for measuring CO_2 outlined by GLEC. Our method was officially Certified by Smart Freight Centre. All our transportation emissions calculations are now aligned to the GLEC framework and we have developed a reporting tool for our emissions baseline for internal reporting purposes and benchmarking, along with a CO_2 calculator for internal business partners to aid future program modeling.

19%

In FY20, our consolidation efforts resulted in a 19% reduction in emissions to targeted locations
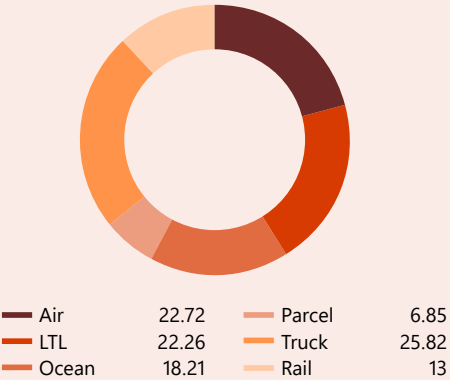
Transforming shipment efficiency

At our fulfillment locations, we use technology to maximize shipment consolidation on outbound orders and identify the least impactful mode of shipment for carbon emissions, while meeting customer's delivery requirements.

In FY20, our consolidation efforts resulted in a 19% reduction in emissions to targeted locations within 33 of our brick-and-mortar stores network. For inbound deliveries, we have shifted from a Less than Truckload Shipping (LTL) model to consolidated Full Truckload Shipping (FTL). This enables us to maximize containers and reduce emissions, with fewer miles traveled per unit shipped.

Figure 3

Devices transportation modes
FY20 (% units shipped)

Air	22.72	Parcel	6.85
LTL	22.26	Truck	25.82
Ocean	18.21	Rail	13

Building a state-of-the-art fulfillment network

We are converting key distribution centers into carbon neutral operations through solar power or other green energy initiatives. Implementation will be completed at two distribution centers in FY21, covering 37% of units shipped. Our distribution partner is also in the process of securing ISO 14001 certification, further committing to continuous environmental improvements.

We are also continuously refining our processes to improve efficiency across our fulfillment centers. Packaging size is predetermined to ensure the optimal packaging for outbound shipping to reduce emissions and waste.

For specific customers, we use CHEP[11] pallet assets which are reused to minimize use of natural resources and waste. Additionally, we have minimized bundling requirements through the implementation of a BTO (Bundle to Order) process enabling us to build only what is required, thus eliminating unnecessary materials and waste.

Maximizing pallet efficiency

Our primary packaging is designed to support efficient distribution – minimizing waste, energy and emissions and reducing product costs.

We aim to maximize the quantity of product per pallet based on the dimensions of our transport packaging and the dimensional and weight constraints of carriers. In the process, we consider product-to-package ratio, product fragility, load stability and the distribution channel. Palletization software enables us to run models and select the best pallet pattern for maximum quantity and load stability. We aim for pallet densities of no less than 90% space utilization, and we frequently adjust packaging size and the quantity of units per shipping case to improve this score.

11 Commonwealth Handling Equipment Pool.

Waste and circularity

As the global market for electrical and electronic equipment (EEE) continues to grow, EEE waste has become one of the most critical waste challenges facing society. The UN predicts that e-waste is the fastest-growing waste stream in the world – estimated at 50 million tons annually.[12]

Overview and approach

EEE waste holds the potential to be used as a valuable resource, but only if we successfully step away from the current take-make-waste economic model to adopt circular practices (which reduce reliance on finite raw materials), cut emissions and deliver significant cost benefits.

Our technology has a key role to play in protecting the planet, such as partnering with organizations like SilviaTerra, The Nature Conservancy and others as part of our AI for Earth Initiative to create a Planetary Computer that connects trillions of data points about our environment.[13] Our efforts to protect the planet require that we directly address electronic waste. Disruption begins with designing for recyclability and circularity.

50m^t

e-waste is estimated at 50 million tons annually

As momentum towards a circular economy grows, it is imperative that companies prepare for the transition by focusing on their circular performance and associated risks and opportunities. Embracing circularity is a high priority for Devices. It will enable us to achieve our zero waste goal. We have been working towards quantifying the recyclability and circularity of our products and packaging.

Our circular transition

We have begun our circular transition by partnering with KPMG to measure the circularity of our Surface devices and their packaging. We selected the World Business Council Sustainable Development (WBCSD) Circular Transition Indicators as the method with which to measure our circularity. The Circular Transition Indicators (CTI) help to answer questions like: How circular are our products and packaging? How do we improve circularity? How do we set targets for improvement? And how do we monitor improvements resulting from our circular activities?
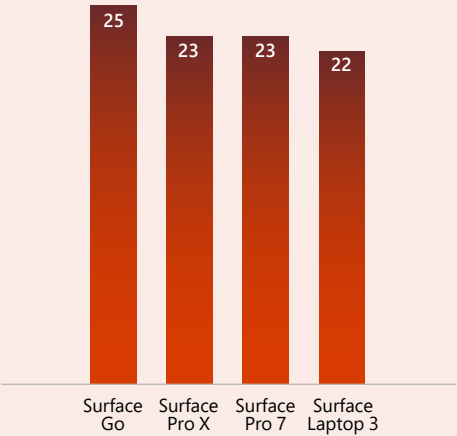
Figure 4, Circularity, shows the percent circularity of combined products and packaging for some of our Surface devices. This data provides a baseline for future targets and has been instrumental in identifying factors that we can improve on in the future. The CTI results, compiled by KPMG, provide ranked opportunities to increase the circular inflows and outflows for our products. Our top opportunities include increasing the recycled content of aluminum in our device enclosures and resins used in components.
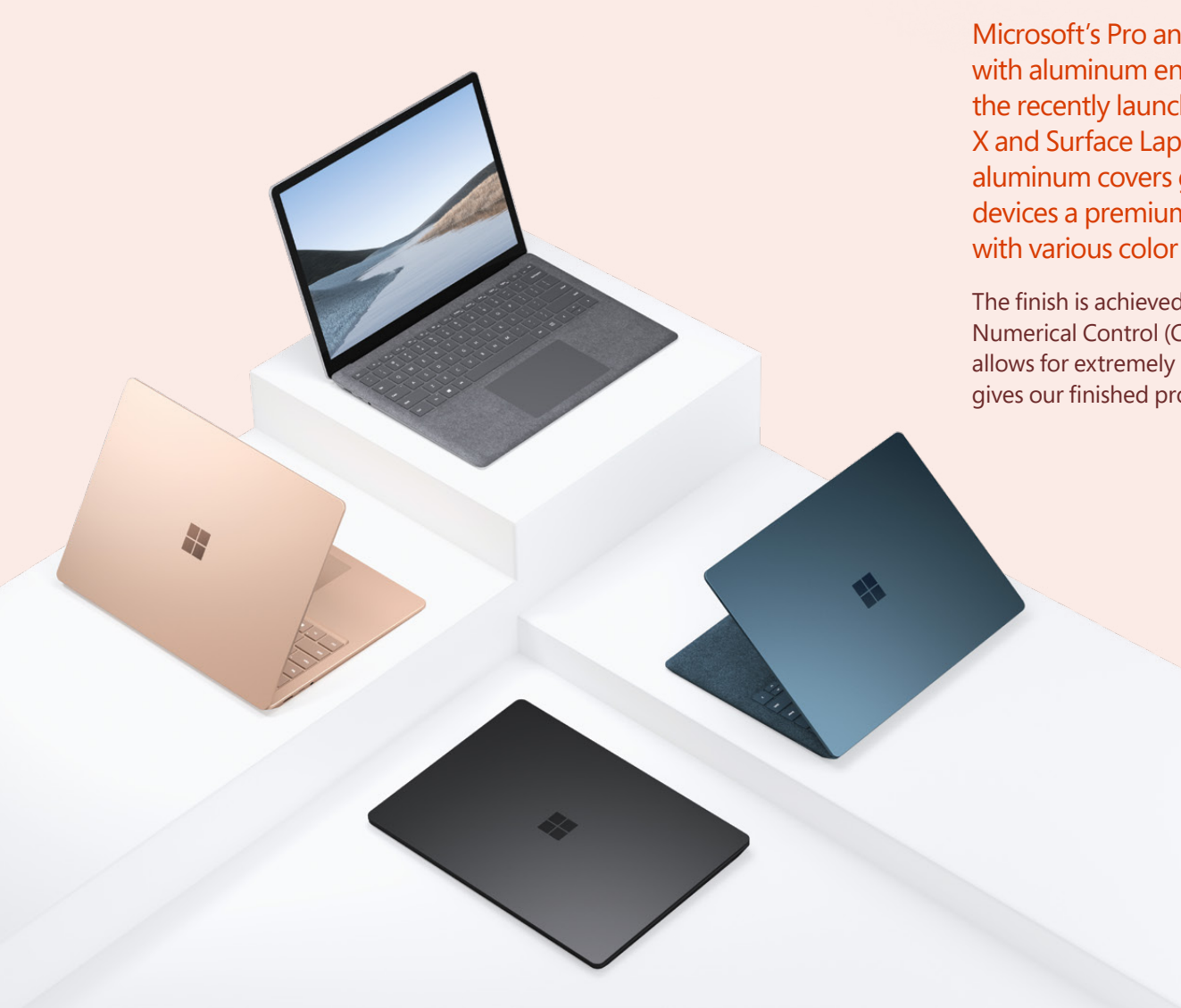
▶ **Find out more**
page 65

Figure 4

Circularity
Percent circularity using WBSCD Circular Transition Indicators (CTI) quantification method

Surface Go	Surface Pro X	Surface Pro 7	Surface Laptop 3
25	23	23	22

Waste and circularity (continued)

Developing circular processes for recycling aluminum

Microsoft's Pro and Laptop lines with aluminum enclosures includes the recently launched Surface Pro X and Surface Laptop 3. Anodized aluminum covers give these Surface devices a premium metallic finishing with various color variances.

The finish is achieved using a Computer Numerical Control (CNC) machine, which allows for extremely precise production that gives our finished products their quality.

80-90%

When machining covers, 80-90% of the mass of raw aluminum blank is machined off and a huge amount of waste, known as CNC chips, is generated

The device enclosure begins as an extruded block of aluminum. CNC machines precision cut every detail into the enclosure. When machining covers, 80-90% of the aluminum blank mass is machined off and a large amount of waste, known as CNC chips, is generated.

The growing popularity of Surface devices means it is urgent for materials engineers to develop CNC chip recycling technologies and processes to recover and reuse aluminum chips. This has significant financial and environmental benefits, as well as reducing waste and carbon emissions.

One of the challenges is that impurities, such as iron and copper, are inevitably accumulated during recycling.[14] It is a challenge to make laptop enclosures using secondary aluminum without compromising premium cosmetic finishes.

We have launched a pilot project to investigate processes for collecting and purifying aluminum waste from CNC operation to create a closed-loop recycling process. Initial proof-of-concepts studies have shown recycled aluminum alloy passes quality requirements. Covers based on recycled aluminum met mechanical, cosmetic and reliability specifications. The next steps are to qualify the process and material and then apply the closed-loop recycled aluminum to our product portfolio.

14 Wagstaff S.R., Wagstaff R.B., Allanore A. (2017) Tramp Element Accumulation and Its Effects on Secondary Phase Particles. In: Ratvik A. (eds) Light Metals 2017. The Minerals, Metals & Materials Series.
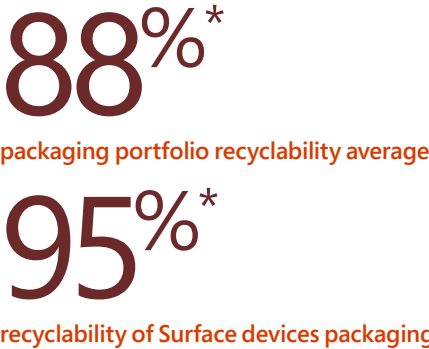
Waste and circularity (continued)

Recyclability

We have made significant steps in evolving our waste reduction strategy to target recyclability. Our 2030 targets are 100% recyclable Surface devices and 100% recyclable packaging in OECD countries. These are the first two targets in our zero waste goal. We are now in the process of assessing our waste sources and we will set more targets in FY21.

Assessing the recyclability of our devices

To establish a baseline for our recyclability target, we conducted third-party recyclability assessments of several of our devices, including Surface Go, Surface Go 2, Surface Pro 6, Pro 7, Pro X, Surface Laptop 3, Book 3 and Xbox One X.[15]

Recyclability is expressed as a percentage by mass of the product that can be sent for material recycling by a suitable process. Recyclability varied within the portfolio, with Laptop 3 (with metal palm rest) achieving the best score at 91% mainly due to the ease of disassembly and materials used.

88%*

packaging portfolio recyclability average

95%*

recyclability of Surface devices packaging

Our challenge is to integrate the new innovations, technologies and learnings of Surface Laptop 3 across the portfolio to improve the recyclability. The data provided on the fractions of products not currently recyclable has been relayed to Microsoft's planning and development engineers to inform their decision making during the design phase.

▶ **Find out more**
page 22

Assessing the recyclability of our packaging

We also measured the recyclability of the entire Microsoft hardware packaging portfolio. Averaged together, the recyclability of our packaging portfolio was 88% at the end of FY20. For Surface devices specifically, the recyclability of our packaging is 95%. Eliminating use of single use plastics by 2025 is a key priority to reach 100% recyclable packaging in OECD countries.

Recovery and recycling of electrical and electronic equipment, batteries and packaging

When repair or refurbishment is not an option, we have established programs and processes to recover and recycle as many product components as possible. With environmentally sound management of waste electrical and electronic equipment (WEEE), valuable materials can be recovered, retaining their material integrity and supporting circularity.

We partner with collection schemes and Microsoft-contracted asset recovery and recycling suppliers to manage the complexity of the return and recycling of WEEE, batteries and packaging. Engagement through OEMs enables customers to return and recycle our devices, batteries and packaging.

We extend our commitment to waste management by investing in and contributing to recycling programs around the world that cover our products and packaging. Collection and recycling of WEEE, batteries and packaging are often organized with other manufacturers through collective arrangements. Microsoft embeds end-of-life recycling costs into the cost of new products to encourage producers to design more sustainable products that can be easily reused, disassembled and recycled.

Investing in global end-of-life waste management programs

Our strategy for addressing consumer WEEE includes implementing and sustaining recycling programs and material recovery initiatives and setting requirements for suppliers.

Regulatory recycling programs

We are a member of over 90 producer responsibility organizations (PROs) worldwide, covering WEEE, batteries and packaging. PROs act exclusively on behalf of their member companies to collect and recycle waste and materials in an environmentally sound manner and in compliance with applicable laws and regulations.

Unlocking the value of old electronics

In 2019, the European Economic and Social Committee (EESC) published a study[16] which found a large, untapped potential for recovering materials from stockpiled electronics "hibernating" in peoples' homes.

Consumers concerned about data privacy tend to hold on to devices instead of recycling them to recover valuable materials. While the retention of old electronics seems like a good way to protect personal data, storing them indefinitely is a major barrier to recovering materials, which include metals like aluminum, copper, gold, platinum, silver and palladium. The materials also include lithium and cobalt – essential building blocks of batteries – which are projected to come into short supply in the next decade due to increasing demand.

To reassure consumers and encourage them to recycle their old devices, Microsoft created a four-step data wipe feature which will remove all personal data from the device.[17] Xbox One can also be reset to remove all personal data and settings.

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15 The assessments were based on Underwriters Laboratories Inc. 2789, according to IEC 62635 method, which provide a standard and repeatable methodology to measure recyclability.

16 https://circulareconomy.europa.eu/platform/sites/default/files/impact_of_ce_on_fmcg_-_mobile_phones_case_study.pdf

17 https://support.microsoft.com/en-us/help/10547/microsoft-account-selling-gifting-windows-10-device-xbox-one

* (w/w)

Waste and circularity (continued)

Voluntary recycling programs

Microsoft offers several types of free, voluntary recycling programs for WEEE, batteries, and packaging to make recycling easier and more convenient for customers. We are constantly evolving new initiatives to enhance the customer experience. The latest information on where and how to recycle WEEE, batteries and packaging is available on our website.
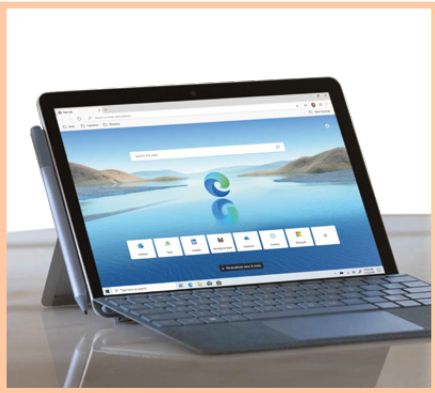
Recycling by mail

We have committed to expand our mail-back program to achieve worldwide coverage by 2030 to ensure every customer has an option to recycle their Microsoft branded products and packaging.

Find out more
microsoft.com/en-us/store/locations/recycle

Extending high standards to our suppliers

Microsoft is committed to protecting the environment and the health and safety of its employees, suppliers, customers and local communities – and this extends to the management of WEEE. Microsoft corporate specification H09117 provides the minimum compliance standards for environmentally sound management of WEEE, including waste components, waste batteries and waste residuals.

It applies to all Microsoft internal business units and third-party contracted suppliers, including manufacturers, suppliers and vendors (including their subcontractors), that either perform services that generate WEEE (including waste components, waste batteries and waste residuals) or that provide end-of-life management services. Covered services include hardware manufacturing, repair, refurbishment, parts harvesting, recycling and disposal.

▲
Finished using your device and thinking of leaving it in a drawer because you are concerned about data privacy?
Think again, because Windows 10 has a data wiping feature that you can use before turning in your device for refurbishment or recycling.

Waste in supply chain and hazardous waste

The waste streams generated in our supply chain include general industrial waste, recyclable waste, hazardous waste and domestic waste. Our waste management requirements focus on hazardous waste compliance and driving waste reduction/recycle. From FY21, we will pilot a Zero Manufacturing Waste program at some strategic Tier 1 and 1.5 supplier sites to address our 2030 sustainability goals.

Magnesium waste minimization and reuse

We use magnesium as an alloy for enclosures on some of our devices. We started working with our suppliers in 2017 to increase the safety and materials efficiency of magnesium processing and waste disposal. By stamping magnesium scraps into ingots, fire and explosion risk during processing, storage and transportation has been reduced.

At the same time, the carbon footprint of transportation has been reduced compared with transportation of scraps, which take up a much larger volume and need more shipping batches. Machining is a typical operation which uses coolant as part of its processes. Magnesium scraps mixed with coolant are classified as hazardous waste. Stamping magnesium scraps into ingots separates out the coolant, which can be reused in production or recycled at the site, rather than being disposed of as hazardous waste.

All suppliers of enclosures with magnesium operations are now covered by our magnesium recycling program – currently comprising four factories. In FY20, enclosure suppliers with magnesium operations reported over 7,096 tons of scraps were processed before being transferred for off-site recycling, with an average 82% recycling rate. We will continue working with our suppliers to optimize the process and increase the recycling rate in future years.

Waste coolant disposal has been an issue for some suppliers due to limited qualified waste disposal vendors in the areas where they are located, and high disposal costs. Our Responsible Sourcing team has been working with one supplier to recycle waste coolant on-site with introduction of distilling equipment.

In FY20, the on-site treatment avoided 288 metric tons of hazardous waste and reduced the off-site disposal costs of $40,970. 238 metric tons of water was also recovered and reused in production. Due to COVID-19, the scaling of this on-site treatment to another key supplier was delayed. We plan to involve more suppliers in adopting the program moving forward.

288mt
of hazardous waste avoided by on-site treatment

Air emissions

In 2018, the Government of China launched its Blue-Sky Battle Plan to address the long-term issue of air pollution in the country. Our main air quality impacts occur as a result of our supplier manufacturing operations in China – including printing, coating and plating processes.

Our approach

Our air management requirements include air permitting, operational control covering source identification and characterization, treatment and monitoring, and carbon emissions reduction. We require our suppliers to comply with legislation regarding carbon emissions from countries ratifying the Kyoto Protocol, including amendments.

Suppliers are encouraged to reduce their use of hydrochlorofluorocarbons, hydrofluorocarbons and other Annex listed greenhouse gases. We strongly advise our suppliers to take steps to reduce fluorinated greenhouse gas (F-GHG) emissions. Semiconductor and display manufacturers are requested to report F-GHG emissions. We restrict the use of Ozone Depleting Substances (ODS) in manufacturing. Relevant suppliers are required to report GHG emissions through CDP.

Ozone-depleting chemicals

The ozone layer prevents harmful ultraviolet radiation from reaching the Earth's surface. To safeguard it, most nations adopted the Montreal Protocol in 1987 and agreed to phase out the production and use of ozone-depleting chemicals (chlorofluorocarbons).

We restrict the use of ozone-depleting chemicals (ODCs) in the production of our devices and packaging. We require annual declarations of compliance from Tier 1 suppliers of taxable imported products and high-risk Tier 1.5 and Tier 2 suppliers. Compliance is verified through RSC audits.

In FY20, we launched electronic declaration of compliance forms using an automated delivery system. This has enabled electronic confirmation by suppliers, reducing response times, enabling faster review times and eliminating the need for paper-based documentation. We delivered electronic survey forms to 129 suppliers in FY20 and we plan to build a dashboard using Power BI to provide instant analysis on trends and to aid identification and return of incomplete submissions.

129

We delivered electronic declaration of compliance forms for ozone-depleting chemicals to 129 suppliers in FY20

Volatile organic compounds

In FY20, national and local governments in China maintained strict legislative controls on volatile organic compounds (VOC) emissions. We continue to support our suppliers in relevant supplier categories, including mechanicals and enclosures, printed circuit boards and printing suppliers, to meet the requirements through risk evaluation and capability building.

Efforts include tracking and analyzing relevant VOC regulations, rules and policies and providing timely information to suppliers. Several special VOC control measures were released in FY20 to address serious ozone and VOC issues in Yangtze River Delta and other regions in China.

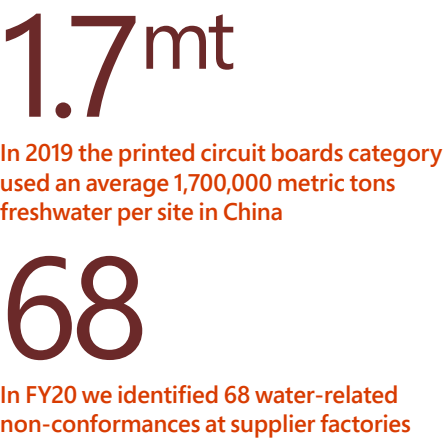### Reducing high VOC content materials in our product lines

Promoting the use of low-VOC products is one of the actions of source control to prevent air pollution. The Chinese government published four national mandatory standards regulating VOC limits in coatings, adhesives, inks and cleaning agents in March 2020. When the standards come into effect, manufacturers and users of coatings, adhesives, inks and cleaning agents will only be allowed to produce and use material that are compliant with the standards. While the standards were still in draft form, our Responsible Sourcing team worked to interpret and analyze them. This enabled the technology teams to take proactive action to reduce high VOC content materials in our product lines and ensure compliance in advance of the standards coming into force. We also conducted a VOC Compliance Survey of existing suppliers and provided necessary guidance and support.

Water stewardship

Water management is critical to water conservation and water management requirements are included in our supplier SEA audit program. The requirements mainly focus on water monitoring and conservation, wastewater treatment and pollution prevention.

Microsoft's device supply chain is not a heavy user of water resources. However, there are some water-intensive categories, like the printed circuit boards category. This category used an average 1,700,000 metric tons freshwater per site in China in FY19.

In FY20, we identified 68 water-related non-conformances out of 240 third-party audits at supplier factories. Our water stewardship activities focused on addressing these non-conformances by driving suppliers' improvement of water protection and conservation including drinking water quality monitoring, stormwater management, wastewater compliance and water reduction.

1.7mt

In 2019 the printed circuit boards category used an average 1,700,000 metric tons freshwater per site in China

68

In FY20 we identified 68 water-related non-conformances at supplier factories

▲
Our water stewardship activities focused on addressing non-conformances by driving suppliers' improvement of water protection and conservation including drinking water quality monitoring.

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We'd love to hear from you.

Please get in touch if you have any questions or comments regarding this report.

AskSEA@microsoft.com