Microsoft

The Responsible Public Cloud

Microsoft briefing

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Introduction

Digital perseverance

We live in turbulent times full of promise and peril. The world now stands at the crossroads of momentous change: geopolitical, economic, social, and technological. This places us at an historic intersection where tremendous opportunity is matched by an equally great responsibility towards the world around us. While no organization or nation can ever be 100% resilient in the face of adversity, those who persevere on the road to digital transformation will be more resilient than those who do not.

One of the greatest measures of progress for the nearly eight billion humans living on the Earth today is economic growth, the kind of strong and sustained growth that will lift every person on the planet out of poverty, that will bring equitably distributed wealth to every nation and every group, while protecting our environment and fundamental human rights.

Ubiquitous digital technologies—the cloud, AI, big data, modern networks, and the digitization of every experience and business process—will provide the keys to delivering that growth. At Microsoft, we see our fundamental job as providing the platforms and tools—the digital factors of production—that allow others to grow and prosper. That is our ambition and why, in the face of the many challenges of today's world, we choose the path of digital perseverance.

The building blocks for a responsible public cloud

Brad Smith
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Today every organization must become a digital organization to grow and prosper. This is why nations around the world are focusing on the cloud, both for its potential to spur equitable economic growth and as a powerful, possibly unsettling force that requires close scrutiny. As a cloud provider with a leading global presence, we know that we must continually earn the trust and confidence of those we serve.

We also know that investment is the key to achieving growth. We are investing in technologies in every area, from hybrid work and resilient supply chains to AI and 5G, from the Internet of Things and digital twins to the metaverse. Our unvarying goal is to help organizations achieve their goals in the face of new and often unprecedented conditions.

The scale and breadth of capabilities of the cloud present responsibilities that we are committed to meet. This document presents our vision of the four fundamental building blocks of a responsible public cloud. A responsible public cloud is one that makes these blocks the foundation for its products, its culture, and its business practices.

1. The cloud must be an engine for inclusive economic prosperity. It should drive economic growth in every country where it operates.

2. The cloud must be worthy of trust.

It must be secure and must respect both privacy and sovereignty.

3. The cloud must protect the fundamental rights of all people, especially those who have historically been excluded.

4. The cloud must be environmentally sustainable. It must help move the world to a net zero carbon economy by 2050.

Inclusive economic opportunity

What Microsoft stands for

The cloud must be an engine for strong economic growth for everyone on the planet. Its benefits must reach every country, every community, every organization, every person— especially the groups who have been marginalized in the past. Such a cloud is designed and operated as an open platform that brings digital transformation to every organization, whatever its size and sector of activity, whether it is a business, a government body, or a non-profit.

Aim for inclusive 5% world GDP growth
Strong and sustainable economic growth is the only way to lift the world's poor and marginalized out of poverty. We must have the courage to aim for 5% GDP growth. Technology will be critical to achieving that.

Make tech skills accessible to all
Inclusive economic growth starts with ensuring that everyone has access to the technology and skills needed to succeed in a digital economy.

Deliver universal broadband
Digital transformation cannot happen without Internet access, but billions in the world still lack affordable broadband.

Close the disability divide
More than one billion people live with disabilities, but there will be no limit to what they can achieve when technology matches their diversity of talents.
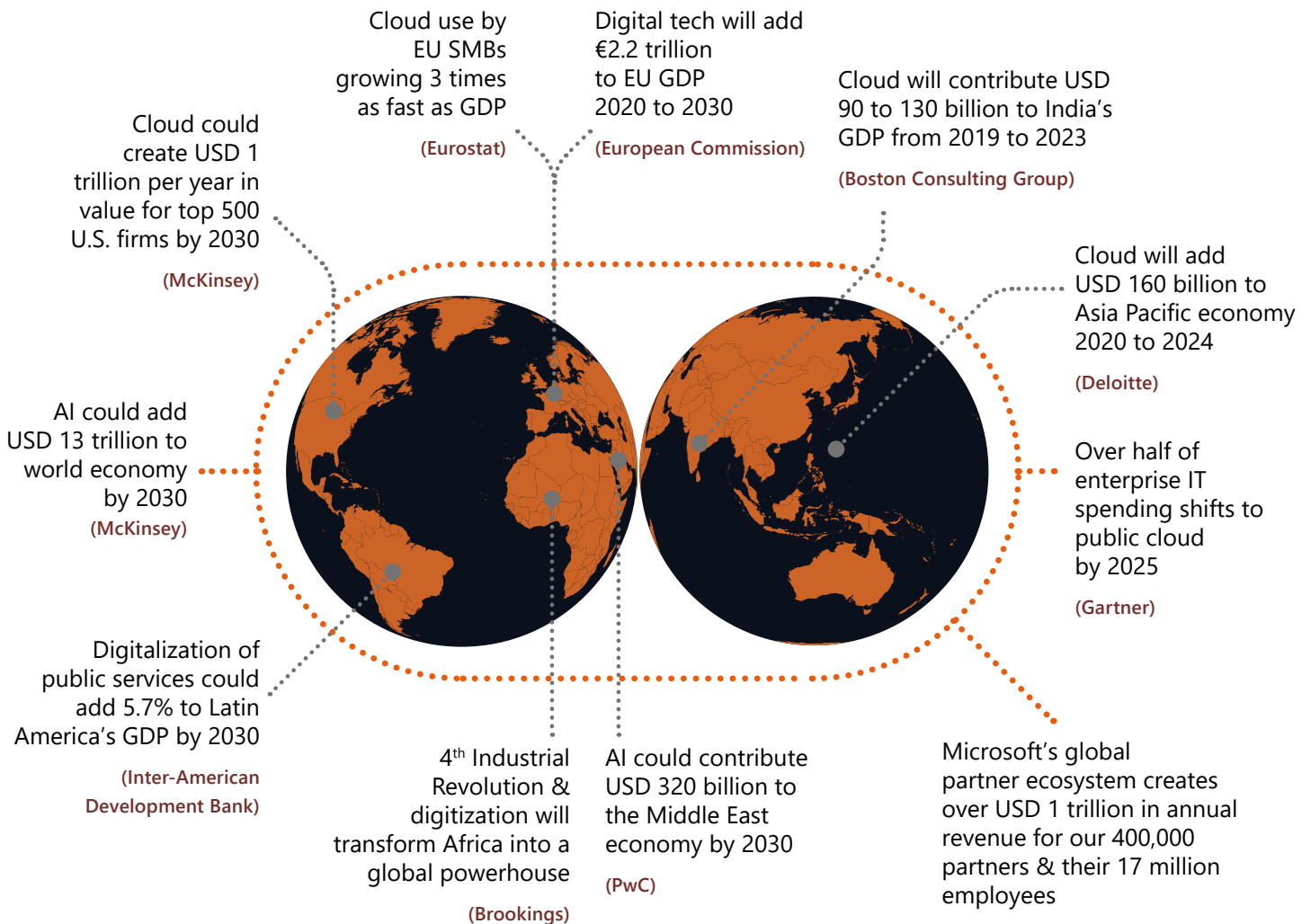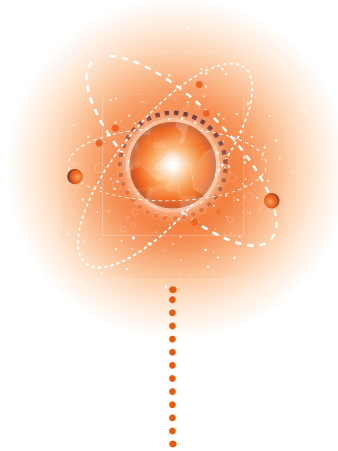
Open the world's data
Data is vital for growth, but access to data remains a daunting challenge. Let's work together to make the world's data as open as possible.

Key facts

The public cloud drives economic growth and digital transformation in every region of the world.

Cloud use by EU SMBs growing 3 times as fast as GDP

(Eurostat)

Digital tech will add €2.2 trillion to EU GDP 2020 to 2030

(European Commission)

Cloud will contribute USD 90 to 130 billion to India's GDP from 2019 to 2023

(Boston Consulting Group)

Cloud could create USD 1 trillion per year in value for top 500 U.S. firms by 2030

(McKinsey)

Cloud will add USD 160 billion to Asia Pacific economy 2020 to 2024

(Deloitte)

AI could add USD 13 trillion to world economy by 2030

(McKinsey)

Over half of enterprise IT spending shifts to public cloud by 2025

(Gartner)

Digitalization of public services could add 5.7% to Latin America's GDP by 2030

(Inter-American Development Bank)

4th Industrial Revolution & digitization will transform Africa into a global powerhouse

(Brookings)

AI could contribute USD 320 billion to the Middle East economy by 2030

(PwC)

Microsoft's global partner ecosystem creates over USD 1 trillion in annual revenue for our 400,000 partners & their 17 million employees

Growth for all

Microsoft is striving to ensure that our cloud offers the benefits of growth to everyone on the planet.

Tech skills for all

Our global skills initiative has helped over 40 million people learn new skills and pursue in-demand roles in the digital economy. We are committed to helping tens of millions more in the years to come. In 2021 we helped 250,000 companies make skills-based hires. We have launched a cybersecurity skilling campaign in 24 countries with special emphasis on bringing women and historically excluded groups into the cybersecurity workforce.

Social entrepreneurship

Our Entrepreneurship for Positive Impact program offers qualified startups in 140 countries access to technology, education, customers, and grants for projects that use technology to meet important social or environmental challenges.

Closing the disability divide

We're expanding our work on accessibility with a new five-year commitment to spur the development of accessible technology, expand opportunities for people with disabilities, and build a more inclusive workplace.

Closing the broadband gap

Since 2017, we've helped more than 33 million people in underserved communities get affordable broadband. We pledge to redouble our efforts.

Making data as open as possible

In addition to developing cloud-based tools to enable data set sharing, our Open Data Campaign team is working with nonprofits, universities, and governments to establish a broad range of open data collaborations that address key social and business challenges.

Policy measures to promote an inclusive economy

Policymakers and regulators can take many steps to ensure that the benefits of the cloud reach all members of society, including groups that have historically been excluded.

Encourage open data

Non-private data should be as widely available as possible. Governments should publish public sector data for research and private sector innovation.

Focus on accessibility

Adopt globally accepted standards that encourage innovative accessible technology. Incorporate accessibility standards such as ETSI EN 301 549 into government procurement.

Help the developing world

Development finance agencies such as USAID, DFC, World Bank, and IFC should target funding for digital transformation and workforce development projects.

Pursue international consensus on digital trade and standards

Agreements on digital trade and on fairness and non-discrimination in standard settings will offer powerful stimulus to global economic growth.

Bring affordable broadband Internet access to all

Close the broadband gap for underserved communities, especially rural populations in low- and middle -income countries. Close the Internet usage gap between men and women.

Make it easier for everyone to acquire tech skills

Help people gain tech skills by increasing funding for workforce training programs. Encourage employers to upskill employees and hire from non-traditional backgrounds. Help job seekers and employers identify in-demand skills by encouraging interoperable learning records.

Earning trust

What Microsoft stands for

As a public cloud provider serving over a billion users in 140 countries, we recognize that it is our civic duty to deploy our technical resources and human expertise to defend the global digital ecosystem from attack. Our responsibility also extends beyond technology to encompass respect for the privacy of individuals and the sovereignty of nations.

Defend the global digital ecosystem
The scale of our cloud puts us on the front lines of world cyber defense. We recognize that it is our duty to deploy our technical resources and human expertise to defend the digital ecosystem from attacks.

Be a good security partner for government
We work with the governments of democratic nations to detect and defend against cyberattacks by state-sponsored groups and criminal gangs.

Treat privacy as a fundamental right
Privacy is a fundamental right for all. We advocate around the world for strong privacy laws everywhere.

Respect digital sovereignty
Customers require confidence that foreign governments cannot gain access to their confidential or personal data in violation of the law.

Deploy multi-stakeholder diplomacy to protect civilians
Cyberattacks on vital civilian facilities have become dangerously normalized. Nations must adopt binding rules to protect civilians in cyberspace. Digital peace requires a multi-stakeholder approach bringing governments, the tech industry, and civil society together.

Key facts

Our global cloud puts us on the front lines of the world's cyber defense. We document our cybersecurity learnings and actions in the annual Microsoft Digital Defense Report.

24 trillion potential threat signals analyzed each day

500 million devices rescued from hackers

35.7 billion malicious emails blocked last year

9.6 billion malware threats blocked last year

8,500 security experts around the world

We will invest $20 billion for cybersecurity 2021-2025

25.6 billion authentication attacks blocked last year

600,000 malicious website registrations blocked

20,500 nation state threat notifications to customers

10,000 malicious websites taken down

The Microsoft public cloud is built on a network of more than 100 datacenters in 35 countries

Respecting the rights of all

Privacy, security, enforceable international norms for cyberpeace, & multi-stakeholder partnerships are key values for us.

We are committed to protecting the privacy of all

We design and build our products with privacy in mind from the ground up. We were early supporters of the European Union's General Data Protection Regulation (GDPR) and the first major tech company to extend GDPR's core rights from the EU to all our users worldwide.

Digital diplomacy in pursuit of digital peace

To address rising cyberattacks on civilians, in 2017, we initiated a call for a Digital Geneva Convention modeled on the original Geneva Conventions. Creating such a framework will be the work of many years. To this end, we are engaging in a sustained effort with NGOs, experts in international law, the UN, and democratic governments to establish enforceable international norms that forbid cyberattacks on civilians. We actively participate in and support forums such as the Paris Call for Trust and Security in Cyberspace and the Oxford Process legal workshop on international cyber law.

We are building a cloud that respects digital sovereignty by combining global reach with local control

Every cloud customer should be able to choose the degree of data isolation, encryption, network segmentation, and legal control required for its mission and risk profile. While these choices will always involve trade-offs in cost and functionality, we are working to offer our customers a unique and unified technology suite that covers every significant step from our global hyperscale public cloud to fully isolated environments that can operate without external dependencies.

We are investing across a broad front to protect the global digital ecosystem

In addition to investing $20 billion over five years to develop advanced new cybersecurity technologies, we have thousands of engineers, lawyers, digital forensics specialists, intelligence analysts, and policy experts working across our company and around the world to monitor, deter, and disrupt the most dangerous threat actors.

We aim to be the best cybersecurity partner for governments

We want governments to know that we accept our responsibility as a leader to do more, and we pledge to use our unparalleled resources in the interests of all. When major cyber emergencies occur, we immediately mobilize our experts to work with the targeted victims and the appropriate authorities to shut down the attacks.

Spotlight on Europe

We are building a cloud that respects digital sovereignty by combining global reach with local control. To accomplish this, we are developing multiple product initiatives to reinforce our compliance with the privacy, data protection, and digital sovereignty requirements of EU regulators and customers. These include:

Enhanced data residency options

EU Data Boundary program

Cybersecurity protection

Founded on the unrivaled depth of our technical resources and human expertise, backed by the insight we gain from a global network that sees trillions of security signals per day

Our commitment to defending our customers' data rights by

- We will challenge all government requests for public sector or enterprise customer data, where there is a lawful basis for doing so
- We commit to providing monetary compensation to customers' users if we disclose their data in response to a government request in violation of GDPR

Suite of sovereignty controls

- Encryption at rest and in transit
- Customer controlled encryption for most sensitive data
- Customer Lockbox
- Azure Confidential Computing
- Sovereignty controls ensured by in-country partners (in development)

Support for the Trans-Atlantic Data Privacy Framework

To provide further assurance to our customers, we will:

- Increase certainty for customers by seeking certification from the U.S. government
- Bolster the legitimacy of the redress process through participation in review of claims

Support for lasting diplomatic solutions

Longer term, we continue to support diplomatic solutions to issues of cross-border government data access through U.S. CLOUD Act and the OECD Global Principles
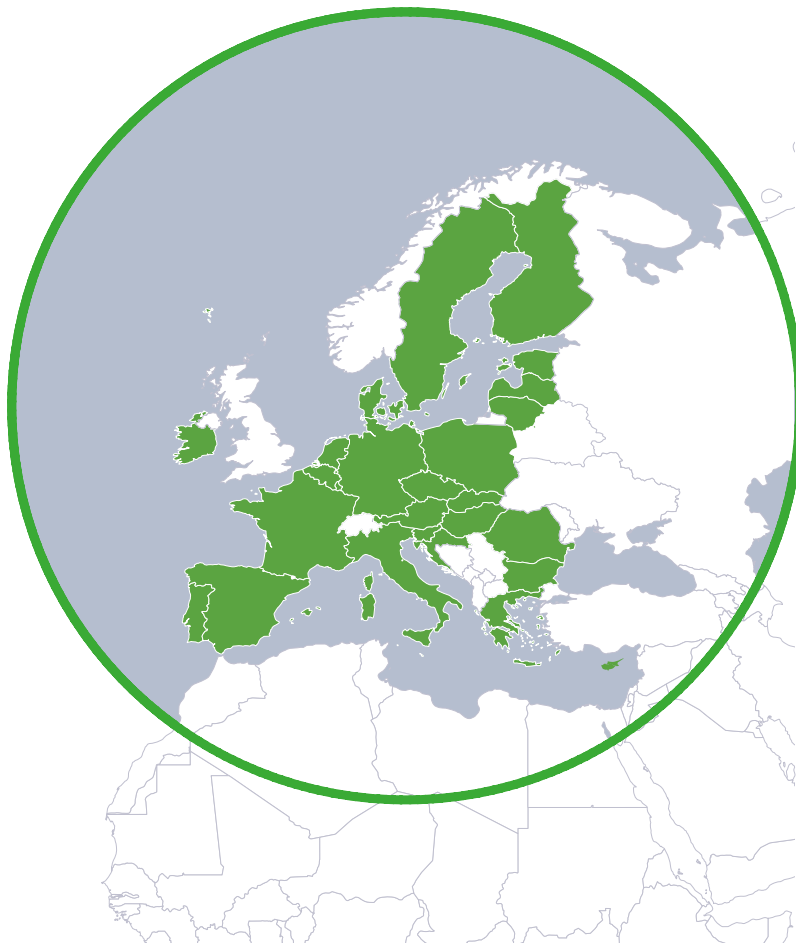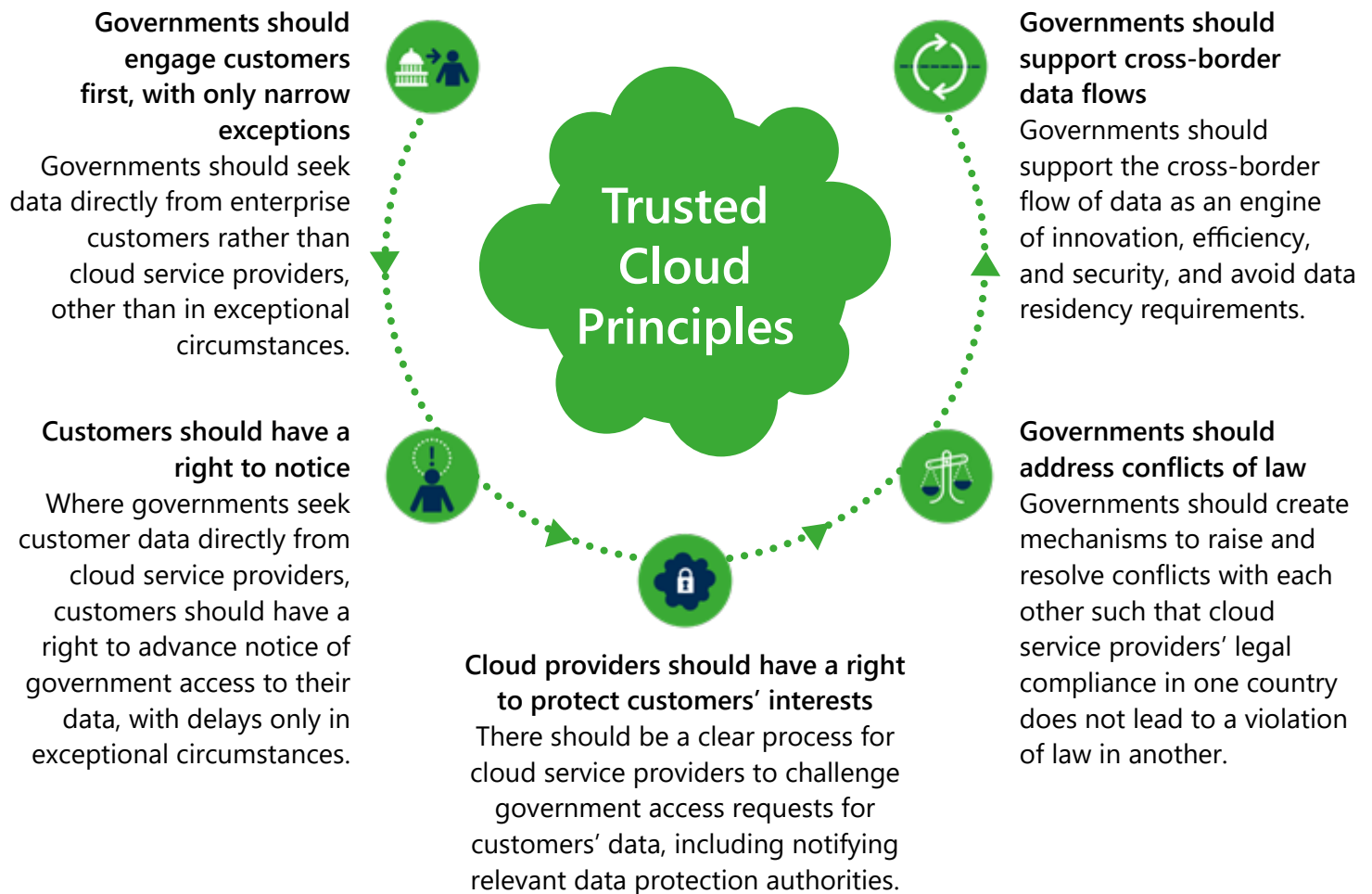
Shielding customer data

We defend customer privacy, practice transparency about government data requests, and advocate for international agreements to avoid conflict of laws.

Microsoft's unique insights into nation state actors and cybercrime activity often generate government requests for access to data relevant to these attacks. Governments may also seek customer data from us for investigations of terrorism, human trafficking, child exploitation, drug smuggling, and other crimes. When responding to these requests, we vigorously defend our customers' privacy rights. We disclose customer data to governments only when we are clearly compelled to do so by law, and we systematically challenge requests that are unreasonable, invalid, or otherwise present a clear conflict of law.

As part of our commitment to full transparency about government data requests, every six months we publish detailed statistical reports about the requests we have received from U.S. and foreign law enforcement agencies and U.S. national security authorities. We have also joined with other leading cloud companies from the U.S., Europe, and Australia to endorse a set of Trusted Cloud Principles that advocate for reform of the international rules governing cross-border government requests for data from cloud providers.

Governments should engage customers first, with only narrow exceptions
Governments should seek data directly from enterprise customers rather than cloud service providers, other than in exceptional circumstances.

Governments should support cross-border data flows
Governments should support the cross-border flow of data as an engine of innovation, efficiency, and security, and avoid data residency requirements.

Trusted Cloud Principles

Customers should have a right to notice
Where governments seek customer data directly from cloud service providers, customers should have a right to advance notice of government access to their data, with delays only in exceptional circumstances.

Governments should address conflicts of law
Governments should create mechanisms to raise and resolve conflicts with each other such that cloud service providers' legal compliance in one country does not lead to a violation of law in another.

Cloud providers should have a right to protect customers' interests
There should be a clear process for cloud service providers to challenge government access requests for customers' data, including notifying relevant data protection authorities.

The Responsible Public Cloud

Defending Ukraine

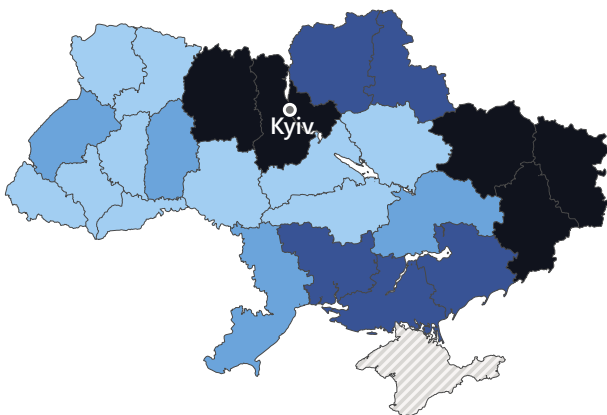## Microsoft is fully engaged in the cyber defense of Ukraine and its people.

One of our principal responsibilities as a global public cloud company is to defend governments and countries from cyberattacks. Microsoft is only a company, not a country or government. However, we have unique cybersecurity skills and resources to draw on, and we are using them to defend Ukraine and its people.

To ensure that the world knows what is happening, we publish in-depth reports describing Russian cyberattacks against civilians in Ukraine and the defensive measures we are taking.

We believe it is important to share this information so that policymakers and the public of all nations know what is happening and so that the global cybersecurity community will be better armed to defend against such attacks.

Throughout the war, Microsoft security teams have worked closely with Ukrainian officials and cybersecurity staff to identify and remediate threat activity against Ukrainian networks. Our actions include 24/7 sharing of threat intelligence and deployment of technical countermeasures to defeat malware. Throughout the war, our cyber teams have also worked in close coordination with the European Union, European nations, the U.S. government, NATO, and the UN.

The hybrid war in Ukraine

The principal Russian cyber threat actors that the Microsoft Threat Intelligence Center observed conducting cyberattacks against Ukrainian targets before the start of the war, with examples of their activities.

Kinetic and cyber activity

- High kinetic /high cyber
- High kinetic /low cyber
- Low kinetic /high cyber
- Low kinetic /low cyber

GRU

Unit 26165	Unit 74455	Suspected GRU affiliation
Russia **Sr** APT28 Fancy Bear	Russia **Ir** Sandworm	Russia **DEV-0586**

Strontium
Data theft, phishing (military targets)

Iridium
Destruction, Foxblade wiper; CaddyWiper, Industroyer2

DEV-0586
Destruction WhisperGate wiper, data theft, influence operations

SVR

Russia **No** UNC2452/2652

Nobelium
Password spray, phishing (Ukrainian and NATO member diplomatic targets)

FSB

Unit 71330		
Russia **Ac** Gamaredon	Russia **Br** Energetic Bear	Russia **Kr** Turla

Actinium
Phishing, data theft

Bromine
Data theft

Krypton
Reconnaissance, phishing

Policy measures to promote a trusted cloud

Enforceable international norms will protect civilian infrastructures from cyberattacks by state actors. Consistent and practical global cybersecurity standards are also essential.

Protect healthcare providers

There must be an unambiguous international expectation that healthcare institutions are off-limits to state-sponsored cyberattacks.

Cybersecurity regulations should be risk-based and consistent

Regulations should reflect actual risks, be interoperable across borders, and leave room for new solutions in response to threats.

Accountability and deterrence for nations

Strong and enforceable international norms are needed to deter reckless behavior against civilians by state-sponsored actors.

Reciprocal norms for cross-border government access to data

Law enforcement access to data should meet legitimate expectations of privacy and avoid conflicts of law between nations.

Secure the ICT supply chain

State-sponsored cyberattacks against the ICT supply chain, in particular the software update process, must be prohibited.

Multi-stakeholder cooperation for cybersecurity

Cooperation between democratic nations and the tech industry is essential to securing critical civilian infrastructures and shaping effective policies.

Protecting fundamental rights

What Microsoft stands for

The conduct and offerings of a cloud provider must always support democratic values and fundamental human rights.

Protect elections & democratic institutions
The cloud should offer dedicated software tools that protect the institutions of democracy.

Combat disinformation
State-sponsored disinformation threatens democracy and public health. The cloud should offer tools to identify the sources of disinformation and prevent its spread.

Ensure technology causes no harm
AI may create risk by behaving in ways that human users don't expect. It may also be used in ways that violate ethical, legal, or safety norms. Our strong governance procedures ensure we develop AI responsibly, and we decline business that violates our principles.
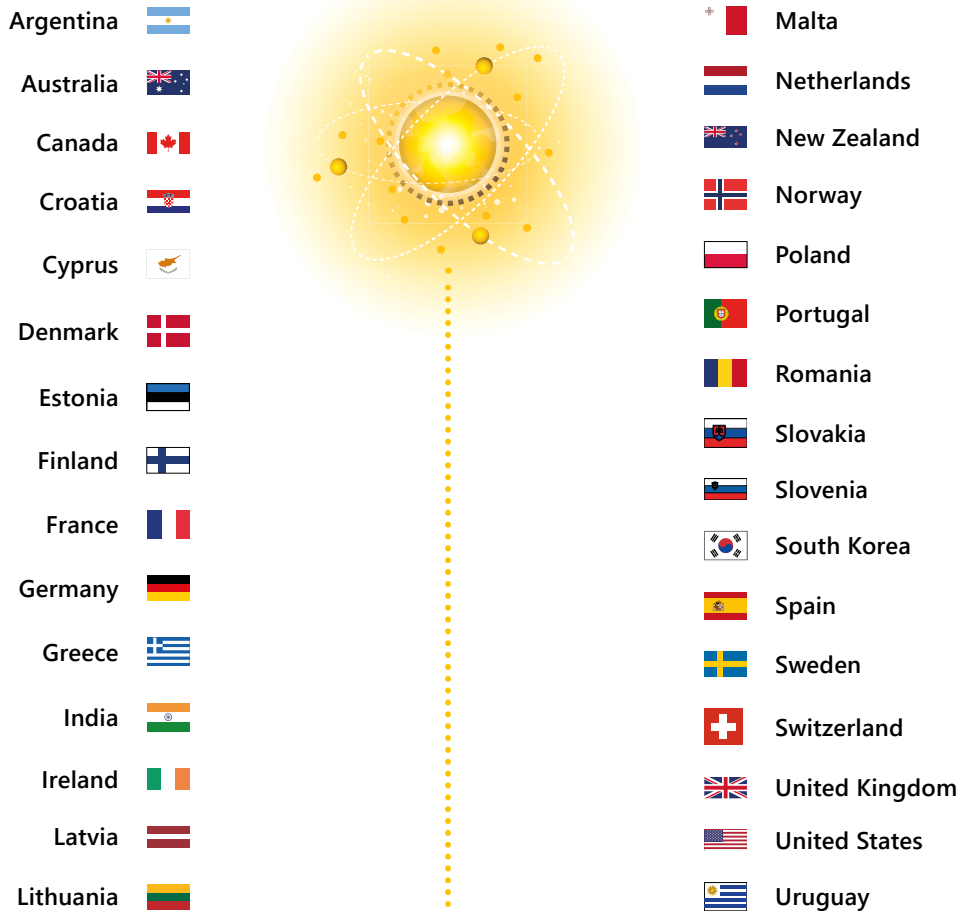
Leverage technology for humanitarian action
A cloud provider must deploy its technology and resources generously to alleviate the suffering of people overwhelmed by disasters or injustice.

Key facts

Microsoft's Democracy Forward Program protects elections & human rights in 31 countries

Argentina

Australia

Canada

Croatia

Cyprus

Denmark

Estonia

Finland

France

Germany

Greece

India

Ireland

Latvia

Lithuania

Malta

Netherlands

New Zealand

Norway

Poland

Portugal

Romania

Slovakia

Slovenia

South Korea

Spain

Sweden

Switzerland

United Kingdom

United States

Uruguay

Protecting democracy

Democracy is vulnerable to cyberattack—we are deploying our technologies to protect it.

Democracy Forward

Our Democracy Forward program works to protect open and secure democratic processes and preserve access to trusted journalism to help build a healthier information ecosystem.

AccountGuard uses enterprise technology to defend democracy

To protect political parties and campaigns that use our cloud from state-sponsored cyberattacks, Microsoft's AccountGuard program offers these organizations enterprise cybersecurity features at no cost combined with unique threat monitoring and notification services. We offer AccountGuard to human rights organizations, newsrooms, and healthcare organizations in 31 democracies.

Our open source ElectionGuard software verifies election results

ElectionGuard is open source software designed by Microsoft Research to make elections more secure and end-to-end verifiable.

Algorithms to combat disinformation

To fight disinformation, we are developing technology for certifying the origin, authenticity, and history of online media.

We are working with the Coalition for Content Provenance and Authenticity to develop open standards for content provenance and authentication. We are also working to support healthy journalism.

AI for Humanitarian Action

We work with crisis-affected communities and humanitarian organizations to bring relief to those in need. We have committed $40 million over five years to support disaster response, aid to refugees and displaced persons, human rights, and the needs of women and children.

Documenting international crimes in Ukraine

Microsoft is providing Ukraine's government, the International Criminal Court, and the Clooney Foundation for Justice with technology to document and preserve evidence of international crimes in Ukraine.

We are building a corporate culture that develops AI responsibly

We're building responsible AI with strong governance procedures. Our AI principles guide how we design, develop, and sell our products. Our Office of Responsible AI ensures that our actions and business processes align to these principles.

Policy measures to promote fundamental rights

Agreements among democratic governments can do much to make the world's shared digital ecosystem safer and more secure for everyone.

Protect elections

Agreements among democratic nations and the technology industry can protect against attacks on elections and support trusted journalism.

Implement the Christchurch Call

Governments and the tech industry should come together to implement the Christchurch Call to prevent the use of social media to organize and promote terrorism and violent extremism.

Embrace the Trusted Cloud Principles

Governments should adopt the Trusted Cloud Principles as a basis for international rules governing cross-border government access to data.

Promote responsible AI

Nations and the tech industry should agree to norms and export policies governing the responsible use of AI and other sensitive technologies.

Content moderation should protect rights and interests

Regulation of online speech should have clear scope and not incentivize platforms to over-censor content to avoid liability. Rules should avoid "one-size-fits-all" obligations and focus on the relative risk of harm, especially when human rights or privacy are at stake.

Building a sustainable future

What Microsoft stands for

Climate change is the defining issue of our time. Addressing the crisis will require collective action and technical innovation on a vast scale over many years. At Microsoft, we are committed to ambitious goals for improving our climate footprint, and we have detailed plans for achieving them.

Carbon negative by 2030
We will become carbon negative by 2030 by reducing emissions and removing CO2 from the air. We will match 100% of our electricity with zero carbon energy 100% of the time. By 2050 we will remove all carbon we have emitted since our founding in 1975.

Water positive & zero waste
We will become water positive and zero waste in our direct operations by 2030. We will also provide at least 1.5 million people with access to clean water and sanitization services by 2030.

Protecting ecosystems with data
We combine the power of big data, machine learning, and the cloud to help scientists monitor, model, and manage the planet's natural resources.

Helping customers reach their own climate goals
We are building a suite of cloud-based tools to help customers reduce their own climate footprints and measure their progress.
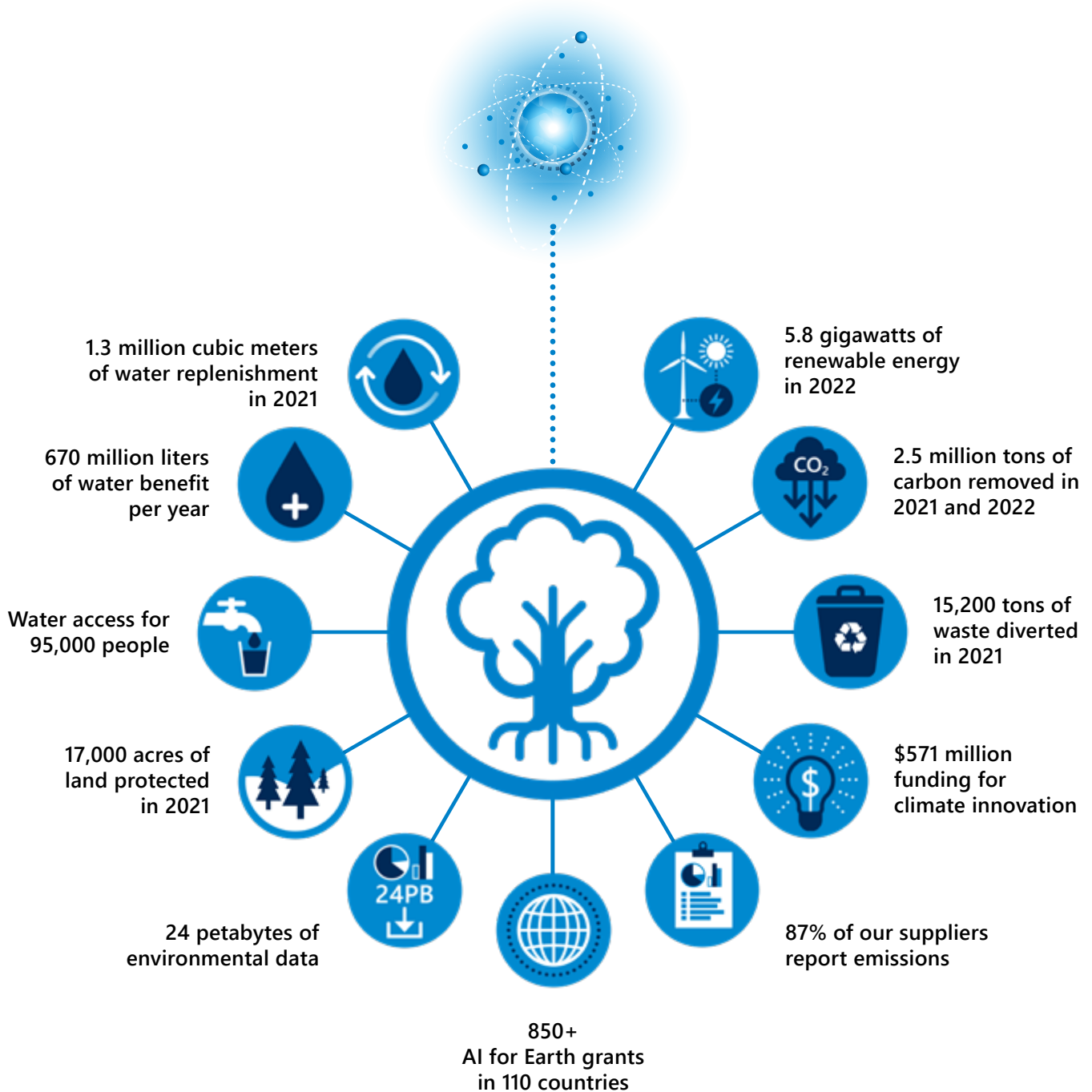
Reporting our progress transparently
Transparency means reporting on everything, including setbacks. We are committed to measuring our emissions accurately and reporting transparently on our progress.

Key facts

We are building a sustainable future by taking climate action today

1.3 million cubic meters of water replenishment in 2021

670 million liters of water benefit per year

Water access for 95,000 people

17,000 acres of land protected in 2021

24 petabytes of environmental data

850+
AI for Earth grants in 110 countries

5.8 gigawatts of renewable energy in 2022

2.5 million tons of carbon removed in 2021 and 2022

15,200 tons of waste diverted in 2021

$571 million funding for climate innovation

87% of our suppliers report emissions

Working toward sustainability

Our many initiatives to reach our carbon negative goal by 2030 are extensively documented in our annual [Microsoft Environmental Sustainability Report](#).

We are reducing our scope 1 and 2 emissions

Last year we reduced our scope 1 (direct emissions from operations) and 2 (indirect emissions from electricity consumption) by 58,654 metric tons of carbon dioxide equivalent (mtCO2). We will reduce scope 1 and 2 emissions to near zero by 2025.

We are striving to reduce our scope 3 emissions

Our scope 3 emissions, which come from our supply chain and device use by our customers, account for 98% of our total emissions. Last year these emissions increased by 23%, driven by our significant global datacenter expansions and growth in Xbox during the pandemic. Despite this temporary setback, we remain fully committed to reducing our scope 3 emissions by 50% by 2030. To accomplish this, we are engaging in in-depth discussions with our suppliers to understand and limit their emissions, while designing carbon out of our buildings and undertaking a fundamental rethink of the design of our devices.

We are moving to 100% renewable energy 100% of the time

By 2025, our datacenters and facilities will use 100% renewable energy on an annual basis. We have set a new goal for 2030 to have 100 percent of Microsoft's energy supply from zero carbon resources 100 percent of the time. Our newest datacenters are already operating 100% carbon-free.

We are greening our campuses and datacenters

We are taking many steps to reduce the emissions of our campuses and datacenters, including certifying them to LEED Gold or Platinum, managing server usage more efficiently, installing on-site renewables, and eliminating diesel-powered backup generators.

The Microsoft Cloud for Sustainability helps our customers reach their climate goals

The [Microsoft Cloud for Sustainability](#) offers comprehensive, integrated, and automated sustainability management for organizations at any stage of the sustainability journey. With this tool, companies can more effectively record, report, and reduce emissions on a path to net zero.

Investing in carbon removal

Lessons and future priorities from our pioneering investments in carbon removal.

In the last two years we have contracted for removal of 2.5 million metric tons of CO2 from the Earth's atmosphere. These purchases are among the largest ever made by a corporation. Here we summarize the lessons learned from this experience and our future priorities. For more details, please see the September 2021 article in *Nature* by Joppa et al.

Lesson 1: More carbon removal capacity is needed

The world will need from 2 to 10 gigatonnes of annual carbon removal capacity to reach global net zero by 2050. The amount currently on offer is only a small fraction of that. In a recent request for proposal, Microsoft received 189 proposals offering 154 megatonnes of CO2 but only 55 MtCO2 $MtCO_2$ were available immediately, and a mere 2 $MtCO_2$ met our criteria for high-quality CO_2 removal.

Lesson 2: Standards and clear definitions for carbon removal are needed

Today there are no standard definitions for carbon removal. Such ambiguity is a barrier to investment. Many proposals we received confused carbon removal with the more modest goal of avoiding new emissions and lacked the technical data needed to ensure reliability. We need a standard way to measure, report, and verify carbon removed.

Lesson 3: The difference between short-term and long-term carbon storage

CO2 removed from the atmosphere must be stored. The two main options are (1) nature-based, which means sequestering carbon in trees and soil, and (2) geological, which means storing it in rocks and minerals. Nature-based storage is relatively cheap, around $16 per metric ton, but returns carbon to the atmosphere within a century. Geological storage is very expensive, on average $141 per metric ton, but retains the carbon for 1,000 years or more.
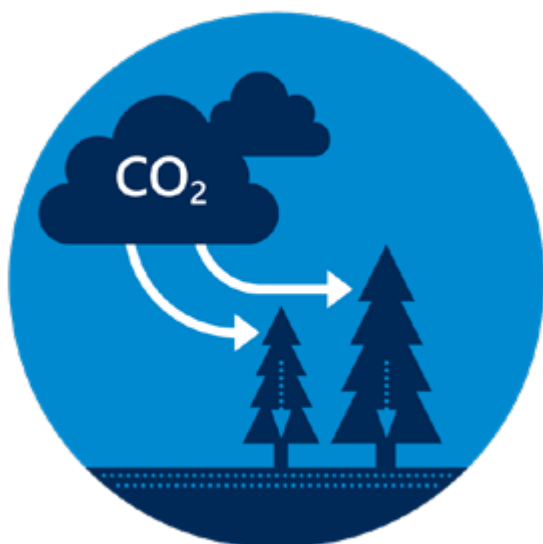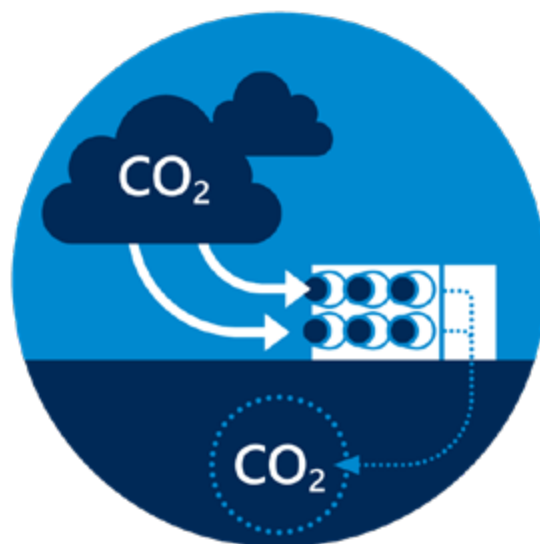
Short term carbon removal

Sequestering
carbon in trees and soil

Cost per metric ton:
$16

Expected storage period:
100 years

Long term carbon removal

Geological storage
in rocks and minerals

Cost per metric ton:
$141

Expected storage period:
1,000 years

How to make progress in carbon removal

We need to invest more in long-lasting technological approaches and geological storage systems. We also need better ways of measuring and accounting for carbon, especially from supply and value chains, the so-called scope 3, which for many companies such as Microsoft account for the vast majority of emissions. Finally, we need better economic incentives to promote the most effective forms of CO_2 removal.

Water, waste, and ecosystems

Creating a sustainable environment requires more than reducing carbon. We set ourselves ambitious goals for water, waste, and ecosystems.

Becoming water positive

To meet our goal of becoming water positive by 2030, we are pursuing new approaches to water collection, treatment, reuse, and reduction at our campuses and datacenters. We are exploring ways to cool our datacenters with less water or even without water at all. We have just opened our first net zero water campus in California.

Taking responsibility for our land footprint

Microsoft directly operates on 11,000 acres of land around the world, and we recognize that our land footprint has an impact. We will permanently protect more land than we use by 2025.

We are taking a circular approach to waste

To reach our zero waste objective by 2030, we are reducing, reusing, and diverting waste in our campuses and datacenters, and adopting a circular approach to materials management. Our goal is to divert 90% of operational solid waste from landfills and incinerators across our datacenters and campuses. 2025 we expect that 90% of our servers and cloud hardware components will be remarketed or reused after recycling.

We are building a Planetary Computer

The Planetary Computer is a powerful cloud platform that combines dozens of petabytes of global environmental data with a flexible scientific environment to help users answer global questions about this data. Using open source and open standards, it provides intuitive tools for developers to create applications that put those answers in the hands of conservation stakeholders. Developers are using the power of the Planetary Computer to create applications ranging from conservation planning and forest risk assessment to land cover and classification.

We are replenishing water and helping communities gain access to water

By 2030 we will replenish more water than we consume, focusing on water-stressed regions. We will achieve this goal by investing in water projects that protect watersheds, restore wetlands, and improve infrastructure. We are also committed to providing access to safe drinking water and improved sanitation solutions for 1.5 million people in areas where we operate in Mexico, India, and Indonesia.

Policy measures to achieve sustainability

A strong and forward-looking policy framework is essential if the world is to make progress toward a sustainable future.

Establish plans

Establish net zero aligned national contribution commitments and implementation plans.

Set standards

Set standards and reporting requirements for carbon and other environmental impacts.

Promote market mechanisms

Market and pricing mechanisms will support innovation and incentivize people to make better carbon decisions. Removing regulatory barriers will help carbon-reduction technologies mature and scale more quickly.

Empower consumers to make better choices

Through transparent and universal standards for information about the carbon content of goods and services.

Conclusion

How we see our role as a responsible cloud provider

One of the most pressing needs in the world today is to realize economic growth. That growth must be environmentally sustainable, socially just, equitably distributed, and humane in every sense. The responsible public cloud promises to be the greatest technological enabler of the sustainable and humane economic growth that the nations and people of the world require.

Microsoft recognizes that its paramount duty as a private provider of a public cloud is to deliver on this promise. Our cloud is an interconnected global ensemble of hyperscale datacenters that offers the extraordinary potential of modern computing, particularly AI and big data, to every nation, every organization, and ultimately every individual on the planet.

Our ambition is to build a public cloud that is secure and respectful of both individual privacy and national sovereignty. Our entire corporate culture is based on the understanding that as the operators of this cloud we can only thrive when the world thrives.