

Biodiversity

IBM's operational activities, products and services do not have a significant impact on biodiversity. However, IBM has been a member of the Wildlife Habitat Council (WHC) since 1991 — over 30 years. Four IBM sites (IBM Corporate Headquarters, New York; IBM Research Triangle Park, North Carolina; and IBM Almaden Research Center and IBM Silicon Valley Laboratory, California) have maintained WHC Conservation Certification for their wildlife habitat management and conservation education programs for over 17 years. In 2022, we worked with the WHC to develop training materials on habitat restoration. These materials complement those previously developed for establishing and maintaining pollinator gardens and have been shared with employees worldwide.

In 2021, to further support biodiversity, we established a global program focused on creating, enhancing, or restoring habitats for pollinators at IBM locations. We also set a goal to plant 50 pollinator gardens at IBM locations globally by year-end 2023. At year-end 2022, 32 pollinator gardens were established.

IBM also has local EcoTeams—employees who volunteer to participate in a variety of local environmental initiatives—lead projects to support ecosystem diversity and protection. EcoTeams span 64 IBM locations across 20 countries. In 2022, participants completed approximately 80 activities, including learning events, tree plantings, beach clean ups, bike to work events, coral restoration, sea turtle conservation efforts, as well as maintaining pollinator gardens, bird boxes, and beehives.

Materials use and conservation

At IBM, we take a precautionary approach in selecting materials that we use in our products and processes, endeavoring to select materials that are safe for their intended use and that have the least impact on the environment.

IBM has a wide range of initiatives that conserve materials including the company's chemical management, product design for the environment, and pollution prevention programs.

Chemicals

Chemicals needed for research, development, manufacturing processes and services are selected and managed, from purchase through storage, use and disposal to avoid release to and contamination of the environment.

Prior to using new chemicals or materials in processes or technologies, IBM requires those chemicals or materials to undergo an extensive environmental, health and safety evaluation called an upstream chemical review. This has been a long-standing practice within IBM to ensure that we are using the least hazardous chemicals possible for a specific application, and it is a key element of IBM's approach to chemical management.

IBM's precautionary approach to materials and process stewardship is informed by our global chemical management staff, industrial hygienists and toxicologists. As a result, IBM has proactively prohibited or restricted the use of many hazardous substances in our products and processes well in advance of potential regulatory actions.

Metrics for chemical use are focused on the selection of more environmentally preferable chemicals, safe and environmentally sound handling, and responsible disposal.

[Learn more about materials restrictions](#)

Products

IBM does not procure large amounts of materials for use in the company's products and operations. The majority of IBM's materials use comes in the form of components and parts incorporated into IBM's hardware products. Raw materials that are directly procured by IBM for use in products include metals used in systems enclosures and plastics used for structural parts internal to products as well as for decorative accents on enclosures. Most of our products, based on weight, consist of metals which contain significant amounts of recycled content and are readily recycled at end of life. Metrics IBM focuses on include sourcing of certain critical materials, reuse, recycling and disposition of products at end of life.

IBM products are designed to so that they can be reused, recycled or disposed of properly at the end of their useful lives.

[Learn more about product design](#)

Paper and paper/wood-based packaging

Raw materials used in packaging for IBM hardware products represent one application where the company uses materials. For this application, IBM focuses on the following metrics: reuse, reduction due to improved design, use of more environmentally preferable materials, and incorporation of recycled contents.

IBM also has sustained a voluntary goal for the responsible sourcing of paper and paper/wood-based packaging since 2002, requiring that paper and paper/wood-based packaging directly procured by IBM come from suppliers that source from sustainably managed forests. Suppliers must provide evidence that their sources have been certified by an accredited third-party certification program such as the Forest Stewardship Council, Programme for the Endorsement of Forest

Certification, Sustainable Forestry Initiative, or the Canadian Standards Association Group Sustainable Forest Management System standard. In 2022, 99.5% (based on spend) of the paper and paper/wood-based packaging IBM directly procured worldwide came from suppliers that warranted that the source was derived from sustainably managed forests.

Product reuse, recycling and disposal

Product end-of-life management

As part of its product end-of-life management (PELM) activities, IBM began offering product takeback programs for clients in Europe in 1989 and has extended and enhanced these activities over the years. Today, IBM's Global Asset Recovery Services (GARS) is responsible for remarketing pre-owned and end-of-lease IBM assets externally, reutilizing and redeploying assets internally, and providing an environmentally responsible process for the disposal of scrap IT equipment.

When assets cannot be directly reused, they are remanufactured or refurbished using rigorous processes and original manufacturing standards. Assets may also be reconfigured to meet specific client requirements. Parts are harvested for reutilization, as well as sold externally. These practices extend the life of IT equipment and reduce the need to manufacture new products. After all reuse and remarketing opportunities are exhausted, remaining components are sent for materials recovery and recycling.

IBM's voluntary environmental goal is to reuse or recycle end-of-life products such that the amount of product waste sent by our operations to landfills or to incineration for treatment does not exceed a combined 3% by weight of the total amount processed.

In 2022, we processed approximately 12,400 metric tons (MT) of end-of-life products and product waste from 60 countries, with 97.3% (by weight) resold, reused, or sent for recycling, 2.4% sent to waste-to-energy for final disposition, and 0.4% sent to landfills or for incineration. The reduction in end-of-life products and product waste processed versus 2021 is attributed to the separation of our managed infrastructure services business.

IBM established its corporate-wide requirement for the environmental evaluations of the company's PELM suppliers in 1991, an expansion of our supplier environmental evaluation program introduced in 1972. We evaluate these suppliers prior to doing business with them and every three years thereafter. Our objective is to use only suppliers that have a strong focus on environmental management, including complying with laws and regulations as well as sound management practices.

Since we began reporting on product disposal in 1995, IBM has processed 1.13 million MT (2.49 billion pounds) of products and product waste worldwide.

To learn more about IBM's requirements for PELM suppliers, visit:

[Supply chain environmental requirements](#)

Information for recyclers under the WEEE Directive

Upon request, and in accordance with Article 15 of the EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) and its respective transpositions into national law of the EU Member States, IBM will provide information to recyclers in accordance with the 'EICTA, CECED, AeA and EERA Joint Position Guidance on Implementing Article 15 of Directive 2012/19/EU Concerning Information for Treatment Facilities.'

[Information for recyclers \(not customers\)](#)

Product take back programs

Many jurisdictions (countries, states, provinces, and/or cities) require manufacturers to create programs for no-charge product recycling for certain electronic equipment (e.g., personal computers, computer monitors and related accessories, etc.) that they have manufactured and sold.

IBM participates in a variety of take back for recycling programs for covered products, batteries or packaging which vary depending on local regulations. For more information on collection and recycling in your area, visit:

[IBM Product Take Back Programs](#)

Cryptographic coprocessor card return program

IBM has established a program for the return of certain IBM Cryptographic Coprocessor Cards. The mercury information sheet below includes information about this program and the part numbers of the cards for which the program is applicable. Contact IBM at rlnadeau@us.ibm.com for more information on the return of these cards.

[Mercury Information Sheet](#)

Printer supplies return program

Information about the Ricoh Printer Supplies Return Program can be found on the Ricoh Resource Smart Recycling website.

Water conservation

Preserving water resources and safeguarding watersheds are important environmental protection priorities. IBM's first water conservation goal was established in 2000 and has evolved over time.

IBM operations are not generally water intensive. The company's water conservation goal prioritizes efforts to reduce water use where it will have the greatest potential environmental impact. IBM's goal is to achieve year-to-year reductions in water withdrawals at larger IBM locations in water-stressed regions. In 2022, withdrawals at these locations decreased by 0.19% versus 2021.

This decrease in water withdrawals was primarily due to temporary or permanent building closures and reduced lawn irrigation, including some lawn irrigation reductions mandated by government. For example, three major projects involved lawn conversions that replaced over 100,000 square feet of grassy area with drought resistant native plants reducing the total annual landscape irrigation by approximately 9,200 cubic meters. In addition, we reused or recycled over 24,000 cubic meters of water for landscape irrigation. Other water conservation efforts consisted of the installation of faucet aerators, reduce flush cisterns, and automatic faucet sensors in washrooms. Results from our efforts to reduce water withdrawals during 2022 were largely offset as more employees returned to offices.

Our primary use of water at locations subject to this goal is domestic water consumption in the workplace (46% of total water withdrawals), cooling and humidity control at office buildings (25% of total water withdrawals), and irrigation of lawns and gardens (19% of total water withdrawals). We installed more than 100 water meters in campuses in India and South America which resulted in more accurate measurement of our water consumption in multi-tenant buildings where we previously relied upon estimates.

IBM also continues to look for opportunities to reduce water consumption at locations outside of water-stressed regions. In 2022, more than 11,400 cubic meters of water were saved through various conservation projects, including optimization of reverse osmosis deionized water systems to generate less wastewater, utilization of rainwater, and routine maintenance of water pipes.

Energy and climate

IBM has been demonstrably committed to addressing climate change through the company's energy conservation and climate protection programs for decades. As a founding partner, IBM helped the U.S. Environmental Protection Agency launch ENERGY STAR in 1992. The company began disclosing its carbon dioxide (CO₂) emissions in 1994 and set its first CO₂ emissions reduction goal in 2000. IBM made its first purchase of renewable electricity in 2001. The company published its policy position on climate change in 2007, long before today's acute focus, recognizing that climate change is a serious concern that warrants timely, meaningful action on a global basis. IBM supported the Paris Agreement in 2015, and in 2017, the company publicly reiterated its support for the U.S. to remain a party to it. IBM

became a founding member of the Climate Leadership Council in 2019, supporting its bipartisan plan for a carbon tax with 100% of the net proceeds returned to citizens as a carbon dividend.

In 2021, IBM established its third consecutive goal for the use of renewable electricity; its fifth consecutive goal to reduce greenhouse gas (GHG) emissions; a new goal to achieve net-zero GHG emissions by 2030; and new goals for energy conservation, data center cooling efficiency, individual fleet carbon intensity reduction targets with key carrier and shipment suppliers, GHG emissions reductions for key suppliers in emissions-intensive business sectors, and more. For details on our climate position and energy and climate goals, please see:

[IBM's 21 goals for environmental sustainability](#)

Climate change position and policy

IBM recognizes climate change is a serious concern that warrants timely, meaningful action on a global basis to reduce the atmospheric concentration of GHGs in accordance with scientific judgment.

- IBM believes all sectors of society, the economy and governments worldwide must participate in solutions to climate change.
- IBM supports joint efforts by the private and public sectors to reduce global GHG emissions. These initiatives are most effective when they are implemented through market-driven mechanisms and are economically efficient, environmentally effective, and sustainable.
- IBM believes a diverse energy portfolio is necessary to achieve an orderly adaptation to a world in which GHG emissions are constrained while maintaining successful economies and secure supplies of energy, and also meeting the needs of humanity.
- IBM considers energy conservation to be a cornerstone of climate protection. IBM will continue to conserve energy and continually improve the energy efficiency of its operations, products and services while collaborating with and encouraging its global suppliers to do likewise.
- Consistent with its values, IBM will continue to collaborate with clients, governments and other partners to create innovations and solutions to address climate change.

IBM first published its position on climate change in 2007, and our commitment remains steadfast today.

IBM supports putting a price on carbon

IBM endorses the plan outlined by the Climate Leadership Council that would put a tax on carbon dioxide emissions, with the proceeds of that tax — a "carbon dividend" — to be returned to citizens. The company believes this represents the most realistic and appropriate opportunity to get a majority of people to agree on a public policy towards carbon emissions that is mindful of both the environment and

the economy. This plan would place an economy-wide \$40/ton fee on carbon dioxide emissions, increasing by 5% above inflation every year, putting in place strong economic incentives for energy companies to reduce carbon emissions and for energy consumers to reduce their own energy consumption. To learn more, please visit:

[IBM and Climate Change \(IBM Policy Lab Blog\)](#)
[Climate Leadership Council Plan](#)

Energy conservation

We recognize that the most effective way to reduce our GHG emissions is to make our operations more efficient and thereby reduce IBM's actual consumption of energy, which is the company's most significant source of GHG emissions. IBM established its global energy conservation program in 1973 and developed the methodology leading to its first energy conservation goal in 1975. The company continues to focus on ways to further reduce its energy consumption.

Energy consumption

IBM's energy use decreased by 1.5% in 2022 from 2021, adjusted for acquisitions and divestitures. Our global operations consumed approximately 2,448,000 megawatt-hours (MWh) of energy across all commodities, of which 80% was electricity. Ongoing consolidation of our real estate and improvements in operational efficiency, along with our continued focus on energy conservation contributed to the lower use of energy during 2022.

Energy conservation projects

During 2022, we implemented 519 energy conservation projects across more than 150 IBM locations globally, avoiding 71,000 MWh of energy consumption and 25,600 metric tons (MT) of CO₂ emissions, and saving \$9.5 million. In measuring performance against IBM's energy conservation goal, we only include the first year's savings from projects. Accordingly, IBM's total energy savings and CO₂ emissions avoidance from these projects are greater than this simple summation of the annual results. We do not include reductions in energy consumption resulting from downsizings, the sale of operations or cost-avoidance actions, such as fuel switching and off-peak load shifting, in our energy conservation results.

In 2021, we set a goal of 3,000 energy conservation projects by 2025. We have completed 1,455 as of year-end 2022, avoiding 161,000 MWh of energy consumption.

From 1990 through 2022, IBM conserved 10 million kWh of energy — equivalent to more than triple IBM's current annual energy consumption — saving \$680 million and avoiding 4.63 million MT of CO₂ emissions. For more details on our energy conservation projects, please see the latest [IBM ESG Report](#).

Data center energy efficiency

IBM's approach to managing and enhancing the energy efficiency of our data centers is comprehensive, encompassing various strategies such as optimizing existing space to improve workload per area, upgrading IT infrastructure to reduce energy consumption, and leasing new, more efficient spaces.

We measure the power usage effectiveness (PUE)¹ at the data centers we operate where possible and obtain PUE data from landlords of co-location data centers. For data centers where we are unable to obtain PUE data, we utilize industry average data. Using this approach, we calculated our 2022 weighted average PUE to be 1.52 compared to our baseline PUE of 1.55² in 2019. New requirements for co-location landlords implemented in our leasing strategy have begun to yield results, and our ongoing efforts to enhance the utilization of our data centers offer a viable route towards accomplishing our goal to improve the average cooling efficiency of our data centers by 20% by 2025 against our baseline.

¹PUE is the ratio of the total energy consumed by the data center divided by the energy consumed by the IT equipment. The closer the value is to 1, the more energy efficient the data center and its cooling delivery are.

²Our 2019 PUE baseline was updated to include only those data centers that remained with IBM after its managed infrastructure services business was separated.

Renewable electricity

Renewable electricity consumption

IBM made its first purchase of renewable electricity in 2001. In February 2021, the company established its third-generation renewable electricity procurement goal: to procure 75% of the electricity IBM consumes globally from renewable sources by 2025, and 90% by 2030. The amount includes renewable electricity in the grid mix IBM receives from utilities or energy retailers, and renewable electricity for which IBM specifically contracts over and above the renewables in the grid.

IBM increased its consumption of renewable electricity to approximately 1,299,000 MWh in 2022, representing 65.9% of its total electricity consumption, up from 62.7% in 2021. That includes 51.8% contracted directly from power suppliers or obtained via landlords, and 14.1% already in the electricity mix we received from the grid.

We remain on track to meet our current goal of 75% renewable electricity by 2025 through continued efforts to procure more renewable electricity. In 2022, we executed additional renewable electricity purchases for several IBM Cloud data

centers, our manufacturing site in Mexico, and for office locations in the United States, India, and Australia.

Even though we strive to do so one day, it is not possible today or in the foreseeable future for IBM to actually consume 100% of electricity from renewable sources given our physical presence in more than 100 countries along with the need for uninterrupted power, which is usually only made possible today by the use of fossil fuel and nuclear generation sources.

Data center renewable electricity consumption

After the separation of IBM's former managed infrastructure services unit, the quantity of data centers that we operate decreased. Today, the vast majority of IBM data centers reside in co-location data center facilities that are managed by third parties. These data centers continue to account for a significant share of IBM's global electricity consumption. In 2022, 66% of the electricity consumed in our data centers came from renewable sources, including both contracted and grid-supplied. Approximately 30% of IBM data centers were supplied with 100% renewable electricity during 2022, although they still depend upon backup power from fossil fuels when renewable sources become interrupted.

To learn more about the company's progress toward its renewable electricity goal and sources of renewable electricity, please see the latest [IBM ESG Report](#).

Procurement strategy and reporting

Our reporting of renewable electricity consumption counts only what is generated in the grid regions where our consumption actually occurs. We do not rely upon the purchase of unbundled renewable energy certificates to comprise any "percent renewable" if we cannot credibly consume the electricity those certificates represent. Our definition of "grid region" aligns with how the US Energy Information Administration defines power balancing authorities' territories. We apply the same concept for other jurisdictions.

Renewable electricity procurement strategy

[View Renewable electricity procurement strategy](#)

Transparent reporting of renewable electricity consumption

[View Transparent reporting of renewable electricity consumption](#)

Greenhouse gas (GHG) emissions

IBM has been a leader in addressing climate change through the company's energy conservation and climate protection programs for decades. The company has set and attained a series of GHG emissions reduction goals covering its operations.

IBM set its fifth-generation GHG emissions reduction goal in 2021: Reduce GHG emissions 65% by 2025 against base year 2010, adjusted for acquisitions and

divestitures¹. It covers all of IBM's Scope 1 and Scope 2 emissions, as well as Scope 3 emissions associated with IBM's electricity use at co-location data centers.

The company's goal is based on science. The United Nations Intergovernmental Panel on Climate Change (IPCC), in its "Special Report: 1.5 C°," indicates that anthropogenic CO₂ emissions must decrease 45% between 2010 and 2030 to limit Earth's warming to 1.5 degrees Celsius above pre-industrial levels. This translates to an annual rate of reduction of 2.25%. IBM's goal achieves a rate of reduction of 4.3% per year.

In 2022, IBM reduced emissions 63.3% against base year 2010 adjusted for acquisitions and divestitures, placing IBM on track to meet its goal. These reductions occurred primarily due to our increase in renewable electricity purchases, our continued focus on operational efficiency and energy conservation, and our overall lower energy consumption.

IBM will continue to prioritize energy conservation and the use of renewable electricity to reduce GHG emissions as we pursue our goal to reach net-zero operational GHG emissions by 2030, using feasible technologies to remove emissions in an amount that equals or exceeds IBM's residual emissions. We aim for IBM's residual emissions to be 350,000 metric tons or less of CO₂-equivalent. Our net-zero goal covers Scope 1 and Scope 2 emissions, as well as Scope 3 emissions associated with our electricity consumption at co-location data centers. IBM included these specific Scope 3 emissions in our energy and climate goals because we know the actual quantity of electricity that we consume, and we have control over that consumption.

Supply chain

IBM is committed to doing business with environmentally responsible suppliers. We work with our suppliers globally to enhance their ability to manage environmental responsibilities and encourage them to report transparently on their environmental impacts.

Environmental requirements for suppliers

Since 2010, IBM has required that its first-tier suppliers maintain a management system to address their social and environmental responsibilities. The company's objective is to help its suppliers build their own capability to succeed in this area. In summary, IBM requires suppliers to:

- Define, deploy and sustain a management system that addresses the intersections of their operations with employees, society and the environment.
- Measure performance and establish voluntary, quantifiable environmental goals in the areas of waste, energy and greenhouse gas emissions.

- Publicly disclose results associated with these voluntary environmental goals and other environmental aspects of their operations.
- Conduct self-assessments and audits, as well as management reviews, of their management system.
- Cascade these requirements to their suppliers who perform work that is material to the products, parts and/or services supplied to IBM.

[View the full set of environmental requirements](#)

Supplier environmental goals

In 2021, IBM established three goals to help accelerate greenhouse gas (GHG) emissions reductions in our supply chain and to encourage suppliers to take ownership and build their capabilities across a broad range of sustainability topics.

These goals:

- Require key suppliers in emissions-intensive business sectors to set an emissions reduction goal by 2022, addressing their Scope 1 and Scope 2 GHG emissions, that is aligned with scientific recommendations from the UN Intergovernmental Panel on Climate Change to limit Earth's warming to 1.5 degrees Celsius above pre-industrial levels.
- Establish, by year-end 2021, individual baselines for fleet carbon intensity with each key carrier and shipment supplier involved with IBM's product distribution globally. Starting in 2022, convene with each supplier to set a fleet carbon intensity reduction target covering the services they provide to IBM.
- Convene an annual Sustainability Leadership Symposium to recognize progress and achievement among suppliers in emissions-intensive business sectors across applicable areas of environmental stewardship.

To learn more about IBM's progress against these goals, see the company's latest [IBM ESG Report](#).

Environmental evaluations of suppliers

In line with IBM's longstanding commitment to doing business with environmentally responsible suppliers, and as part of its global environmental management system, IBM conducts environmental evaluations of suppliers who:

- Provide services on a non-IBM location with considerable environmental impacts (including but not limited to services where IBM specified chemical use, repair, and remanufacturing services);
- Provide hazardous waste treatment and/or disposal services;
- Recycle and/or recover end-of-life IT products; or
- Provide Extended Producer Responsibility (EPR) solutions used by IBM.

These suppliers are evaluated prior to entering into a contract with them, and approximately every three years thereafter, to ensure their operations and sound environmental practices continue to meet IBM's requirements. The scope of the evaluation covers:

- Facility operational activities, capabilities and services;

- Established and maintained environmental management system;
- Permits, licenses, other applicable regulatory requirements and compliance control; and
- Environmental liability and financial assurance.

Under IBM's waste management program, hazardous wastes are treated, recycled or disposed of at IBM-approved facilities within the country where they are generated, whenever possible. IBM does not export hazardous wastes from the U.S. or any other country where suitable processing facilities are available within the country.

If there are no suppliers in a country that meet IBM's environmental requirements for hazardous waste or product processing, the waste generated by IBM's operations is shipped to facilities in other countries where those requirements can be met. This shipping is done in compliance with country laws and regulations, and in accordance with international treaties such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

Though rare, there are sometimes situations in which local processing of waste is not possible and shipping to IBM-approved suppliers in other countries is not allowed due to legal requirements. In these situations, IBM will store wastes and product end-of-life materials in properly managed storage facilities, as allowed by law, until suitable processing facilities are available.

Supplier Code of Conduct

IBM is a founding member of the Responsible Business Alliance (RBA), a nonprofit industry group that helps its members support continuous improvement in the social, environmental, and ethical responsibility of their supply chains. We require our first-tier suppliers of hardware, software, and services (and IBM's own operations) to adhere to the RBA Code of Conduct, which contains provisions on labor, health and safety, environmental requirements, ethics, and management systems.

[Learn more about the RBA Code of Conduct](#)

Key milestones

- 1972: Established a corporate directive requiring the environmental evaluation of suppliers of hazardous waste services.
- 1980: Expanded our environmental evaluations of suppliers by establishing a second corporate directive to require the environmental evaluation of certain production-related suppliers.
- 1991: Further expanded our environmental evaluations of suppliers, adding a requirement that product recycling and product disposal suppliers be evaluated.

- 1993: Established product environmental compliance specification 46G3772 with environmental requirements for parts and products IBM procures from suppliers.
- 2002: Added a requirement to assess our suppliers and certain subcontractors they may use to handle recycling and/or disposal operations in countries outside the Organisation for Economic Co-operation and Development.
- 2004: Established environmental and social requirements for all IBM supplier via IBM's Supplier Conduct Principles and also formed, jointly with other companies, the Electronic Industry Code of Conduct (now the Responsible Business Alliance Code of Conduct).
- 2005: Created a part and product compliance declaration form (referred to as Product Content Declaration or PCD) to facilitate transfer of part and product compliance information from the supply chain to IBM.
- 2010: Required all suppliers having a direct relationship with IBM to establish a management system that addresses their social and environmental responsibilities and to cascade these requirements to their suppliers who perform work that is material to the products, parts and/or services supplied to IBM.
- 2013: Incorporated the assessment of product environmental compliance requirements into the supply chain audit process and introduced reviews via a sampling approach of PCD forms for data integrity.
- 2014: Expanded our supplier evaluation program to include suppliers providing collective solutions for the management of IBM's end-of-life product waste.
- 2016: Established an environmental goal to have first-tier suppliers providing product end-of-life management, recycling and disposal services in the U.S., Canada and the European Union achieve third-party certification to an acceptable electronic product recycling standard or demonstrate compliance with an IBM approved alternative.
- 2021: Established three goals to help accelerate greenhouse gas emissions reductions in IBM's supply chain.