DfE program

IBM established its product design for the environment (DfE) program in 1991 to bring additional focus to the corporate environmental policy objectives on product environmental design and performance. Throughout the 1990s and continuing through today, IBM has introduced many industry-leading practices in design for the environment, product environmental metrics and product recycling. The company's DfE program is incorporated into IBM's worldwide Environmental Management System (EMS) which is certified to the ISO 14001 EMS standard.

The DfE program provides IBM's business organizations with direction and goals, infrastructure, tools and expertise to apply environmental life cycle considerations to IBM's products, from product concept through product end-of-life management. The objectives of IBM's DfE program include:

- Develop products that are durable, and with consideration for their ability to be repaired, upgraded, refurbished, or remanufactured to extend product life
- Develop products with consideration for their reuse, dismantle-ability, recyclability and recoverability at the end of product life
- Develop products that can safely be disposed of at the end of product life, including the ability to easily remove hazardous components and assemblies prior to scrapping and disposal
- Develop and manufacturing products that use recycled or renewable materials where they are technically and economically justifiable
- Develop products that are increasingly energy efficient
- Develop products that minimize resource use and environmental impacts through selection of environmentally preferred materials and finishes

These objectives are implemented through internal standards, product specifications, and other requirements in IBM's offering management process. Product environmental attributes such as energy efficiency, materials content, chemical emissions testing, design for recycling, end-of-life management plans, and packaging data must be documented and reviewed in IBM's Product Environmental Profile tool at various check points during the development process.

Environmental design requirements are communicated and verified with suppliers through the following tools: Engineering Specification 46G3772: Baseline Environmental Requirements for Supplier Deliverables to IBM, and the Product Content Declaration for IBM Suppliers.

Baseline Environmental Requirements for Supplier Deliverables to IBM

The IBM Engineering Specification (ES 46G3772) establishes the baseline environmental requirements for supplier deliverables to IBM. Other IBM

specifications, contracts or procurement documents may contain additional environmental requirements for suppliers. ES 46G3772 contains restrictions on materials in products and on certain chemicals used in manufacturing. It also requires suppliers to disclose information about the content of certain materials in their products. In addition, the specification includes requirements for batteries, marking of plastic parts, and other product labeling requirements. Questions about this specification should be referred to your IBM Procurement representative.

IBM Engineering Specification 46G3772: Baseline Environmental Requirements for Supplier Deliverables to IBM (Last updated: 7 April 2023)
View the PDF (5.5MB)

Product environmental compliance

IBM has robust processes and state-of-the-art tools to help ensure our continued compliance with applicable environmental laws and regulations worldwide. Design and compliance controls, including a specification for Baseline Environmental Requirements for Supplier Deliverables to IBM, a Product Content Declaration for IBM Suppliers (PCD) and compliance assessment protocols, are managed by an interdisciplinary team with representatives from IBM organizations that design, manufacture, procure, deliver and service our product offerings. The team's activities are coordinated by IBM's Center of Excellence for Product Environmental Compliance.

Frequent verification of product data is required to maintain compliance of parts and products relative to both IBM's product environmental requirements and the latest regulatory requirements. IBM conducts quality audits of PCDs to drive improvements in the content of the declarations and the supporting administrative processes. Improvements in data management regarding the materials contained in IBM's products ensure that IBM's technical documentation for product hardware meets the quality requirements described within European Norm 50581: "Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances." Going forward and in line with the five year transition period, IBM will migrate to the new European Committee for Electrotechnical Standardization (CENELEC) International Standard EN IEC 63000:2018.

Product Content Declaration for IBM Suppliers

Suppliers of materials, parts and products to IBM must provide information to verify the compliance of their products to IBM's environmental requirements. The Product Content Declaration for IBM Suppliers below can be used to document the environmental data necessary to establish compliance of procured materials, parts and products to IBM Engineering Specification 46G3772: Baseline Environmental Requirements for Supplier Deliverables to IBM.

Product Content Declaration for IBM Suppliers (Version 10/18/21 Rev: 001 Release Date: May 2022)
Download the Microsoft Excel document (3.7MB)

Materials

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. 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. For more information, please see:
Materials use and conservation
Voluntary materials restrictions

Product energy efficiency

Product energy efficiency was formalized as one of the company's corporate objectives when IBM established its product design for the environment program in 1991. Through the collaboration of IBM Research and our product development teams, we have combined hardware and software technologies to improve the energy efficiency of IT equipment and in turn, data centers.

Product energy efficiency goal

View Product energy efficiency goal

For more than two decades, we have maintained a goal to improve the computing power delivered for each kilowatt-hour of electricity consumed for new server products as compared to equivalent, previous-generation products with a valid upgrade path.

In July 2022, IBM announced a significant expansion of its Power10 server line with the introduction of four mid-range and scale-out systems (S1014, S1022, S1024 and E1050). These systems' energy efficiency score, as measured using the SPEC SERT suite, improved 24%, 25%, 22% and 13% respectively when compared to equivalent previous- generation IBM POWER9® systems. For additional details, please see the Product Energy Efficiency section of the 2022 IBM Impact Report.

IBM continues to utilize innovations in semiconductor, hard drive/storage system and networking technologies to improve server and storage system performance for each unit of power consumed by the equipment.

The company also continues to certify products to the U.S. Environmental Protection Agency's (EPA) ENERGY STAR® program.

ENERGY STAR certified products

View ENERGY STAR certified products

IBM has a long history with the U.S. EPA's ENERGY STAR program. ENERGY STAR is a voluntary program which sets energy efficiency and labeling requirements for different product types to identify and promote energy-efficient products.

IBM became a charter member of the EPA's ENERGY STAR Computer Program in 1992 and helped define criteria for computers and monitors. In March 2001, IBM became the first company to win an ENERGY STAR Excellence in Corporate Commitment Award recognizing IBM's overall commitment and contributions to energy conservation and efficiency across the company's operations and in the design of its products.

The company continues to certify eligible products to its criteria. In 2022, IBM had 11 enterprise POWER9-based and Power10 servers and 4 storage products certified to ENERGY STAR.

For a list of IBM's ENERGY STAR certified servers and storage products, please visit:

IBM Power Systems servers
IBM storage products

Server power use and temperature data

View Server power use and temperature data

Regulatory development activities

View Regulatory development activities

IBM actively assists in the development of external product energy efficiency standards. The company's engineers are working with industry peers and technical associations to support the development of harmonized worldwide energy efficiency standards for server and storage products, such as:

- Supporting the ENERGY STAR program and other regulatory programs to assist in the development of new criteria for certifying server and storage products.
- Performing extensive evaluations of SERT test data and other industry metrics in support of creating a single metric that can be used to effectively assess the energy efficiency of server products, with the goal of driving a reduction in server power required to deliver a given workload.
- Working in collaboration with The Green Grid, the Information Technology Industry Council and its China affiliate, USITO, and DIGITALEUROPE to evaluate SERT and Storage Networking Industry Association Emerald Power Efficiency Measurement Specification results and to advocate for SERT and Emerald as the harmonized energy efficiency test metrics for server and storage products.
- Assisting the ENERGY STAR program and regulatory bodies in China, the European Union and Japan with the development of server energy efficiency criteria based on the SERT metric.

Product packaging

IBM has had a program focused on the environmental attributes of its product packaging since the late 1980s. A key priority is to design products which can be shipped with a minimum amount of packaging materials. Beyond that, whenever possible, we choose packaging materials that have the least adverse impact on the environment, collaborating with suppliers to use recycled and recyclable materials and to promote reuse.

Our corporate environmental requirements for product packaging are embedded in various engineering specifications and procurement documents, which extend their reach beyond IBM to include our supply chain and other business partners.

All product packaging suppliers that pack or ship products to customers on behalf of IBM worldwide must submit packaging environmental data to IBM, along with other relevant compliance and performance data. Suppliers that do not conform to an IBM specification or other requirement must submit and implement improvement plans to close out the identified issues within an agreed timeframe.

IBM's strategy for reducing the environmental impact of our packaging includes:

- Minimizing the environmental impact of packaged products through the efficient use of materials and improved product ruggedness.
- Implementing sustainable packaging designs through efficient form and function, use of recyclable and/or renewable materials, while maintaining overall low cost to ensure economic viability.
- Implementing solutions that reduce the amount of packaging required and costs while maintaining the essential protective quality of the productpackaging system.

IBM set a goal in 2021 to eliminate nonessential plastic from the packaging of IBM logo hardware by year-end 2024. For essential plastic packaging, our goal is to ensure such packaging is designed to be 100% reusable, recyclable, or compostable, or incorporates 30% or more recycled content where technically feasible. We established a team of packaging engineering and logistics experts to execute the goal. The team completed an inventory of plastic packaging items and determined whether the items were essential. We have started to eliminate nonessential items and identify possible alternatives for the remaining items.