

Smarter technology for all

Reimagining Sustainability *Circular Economy*

eBook developed by Lenovo ISG



ISG Sustainability Value Statement

Lenovo is committed to supporting our **customers' efforts to reduce their environmental footprint**. Our sustainability thinking begins in the early stages of product design. From providing customers with innovative, **energy-saving** components like **liquid cooling** and **energy control software to decreasing packaging waste** on to reusing essential elements via **closed loop post consumer content**, sustainability is a factor from acquisition to disposal. Environmental impact is a vital business criteria and Lenovo is dedicated to leading in the development of technologies that **minimize the use of precious resources**, like water, to **build a more sustainable future**.

Circular economy, post-consumer recyclable content, net-zero emissions. These and dozens of other buzzwords and catchphrases are flowing from the mouths of corporate leaders. Today, it is trendy to jump on the sustainability bandwagon with announcements of “green” goals. Ambition is nice, but what are companies really doing on a day-to-day basis to not only build their internal sustainability operations, but to support their customers’ sustainability initiatives?

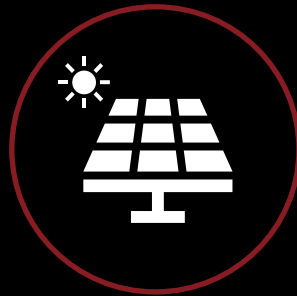
To start, Lenovo is committed to innovation and sustainability in our operations.



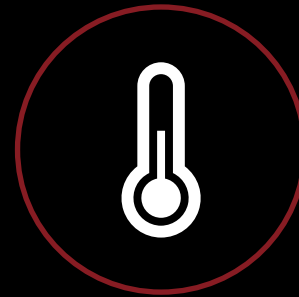
Achieved LEED
certifications in Beijing,
China and Morrisville,
North Carolina
headquarters



Installed low energy
lighting, including light
and motion sensors



Operates on-site solar
energy capacity over 16
megawatts



Implemented a low-
temperature solder
process in PC
manufacturing



Reduced the number of
company operated
vehicles

This eBook covers how Lenovo not only delivers solutions when it comes to our own sustainability efforts but how we are partnering with customers to support them along their own sustainability journeys.

For more information, contact your Lenovo sales representative.

A photograph of a bamboo forest with a path and light trails. The path is a narrow, unpaved trail that curves through the forest. The bamboo stalks are tall and slender, creating a dense canopy. The ground is covered with dry, brown grass and fallen bamboo leaves. Two bright, glowing orange-red light trails curve along the path, suggesting a long-exposure photograph of a moving light source.

Circular Economy

Smarter use, design and return

Lenovo

Introduction

Circular Economy

Lenovo ISG's call to action is to innovate the future-defined data center, today. From the simplest to the most complex IT environments for all types of workloads, Lenovo servers, storage, networking, and solutions help maximize data center potential. Establishing a data center is a feat in and of itself. But doing so sustainably adds a layer of complexity. As a result, Lenovo employs the circular economy approach which includes Smarter Design – Smarter Use – Smarter Return, to address internal and customer-focused sustainability goals. While each segment has many facets, this section digs into how Lenovo ISG plugs into each.



Lenovo Circular Economy Approach

A model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products for as long as possible.

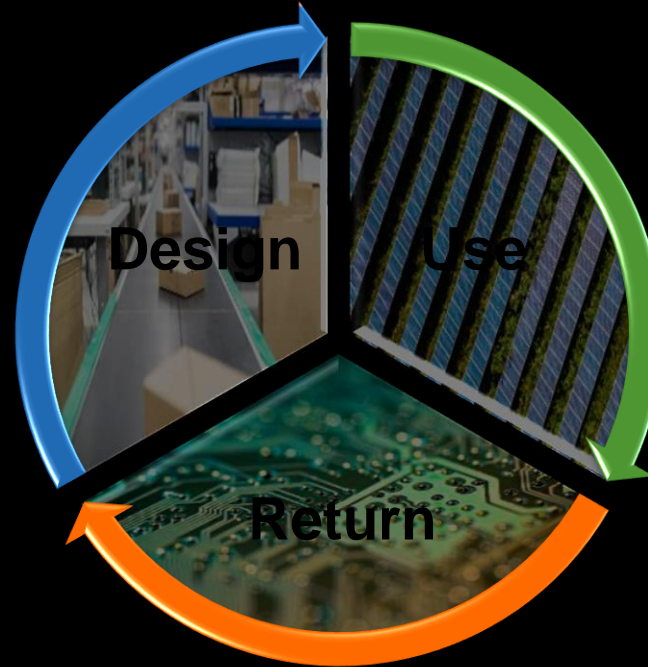
Smarter Design (circular design) *designing out waste and pollution*

Products & Packaging

- Sustainable materials and recycled content in products & packaging
- Packaging – sustainable design
- Product design for durability & recyclability

Manufacturing & Operations

- Smart sustainable manufacturing
- Responsible sourcing
- Supplier impact minimization
- AI & HPC



Smarter Use (circular use) *optimized use of products & resources*

Products & Packaging

- Product energy efficiency
- Device as a Service (DaaS) and other solutions
- Product repair and warranties
- Bulk packs & re-use

Manufacturing & Operations

- Renewable energy use
- Carbon optimized operations and logistics
- Water, waste and energy smart facilities

Smarter Return (circular return) *capturing resources & value*

Product take-back & Value Recovery

- Consumer, SMB & commercial product take-back
- Optimized life cycle values and processes
- Intelligent parts management

Lenovo ISG Circular Economy Plug-in

Smarter Design

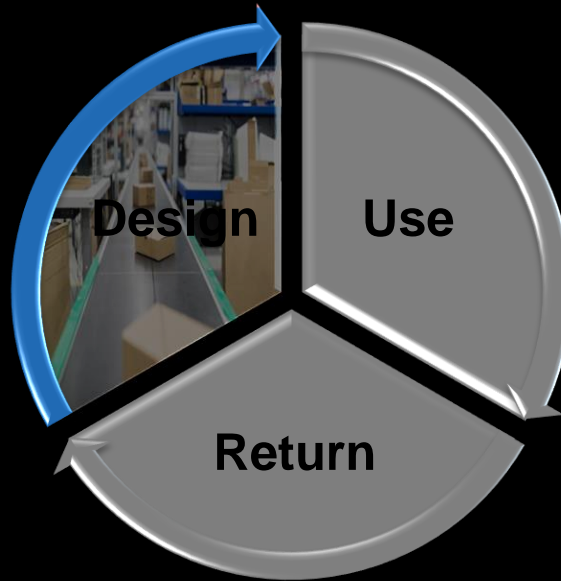
Smarter Design (circular design)
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Recycled content in products

- PCC and Closed-loop PCC
 - Post consumer content (PCC) is composed of recycled plastic such as water bottles and other used consumer products. Lenovo has used more than 110 million pounds of net recycled plastic in its products. Since 2018, Lenovo has used more than 12 million pounds of closed-loop PCC in 66 different products. Closed-loop PCC is derived from recycled content from end-of-life IT infrastructure and electronics equipment. Instead of outdated hardware finding a final resting place in a landfill, the materials are recycled to breathe life into new servers (examples are Lenovo ThinkSystem ST50 V2 and Lenovo ThinkSystem ST650 V3).

Packaging – sustainable design

- Server Rack Integration
 - Instead of individually packaging and shipping the server nodes, chassis and racks, all servers are pre-installed within the racks themselves.
 - Estimated reduction of waste per rack is 105 pounds of cardboard, 55 cubic feet of foam cushioning, 288 linear feet of wood and over 21,000 less instruction paper inserts.
- Ocean-bound Plastic (OBP) Server Bags
 - OBP is derived from abandoned plastic waste, such as milk jugs, shopping bags, and laundry detergent bottles, that is at risk of ending up the ocean. Lenovo's server bags are composed of 30% OBP. The plastic waste is processed - collected, sorted, cleaned – and transformed into plastic packaging. The new packaging is recyclable, so once it has served its purpose, it can be recycled and reused.

Lenovo ISG Circular Economy Plug-in

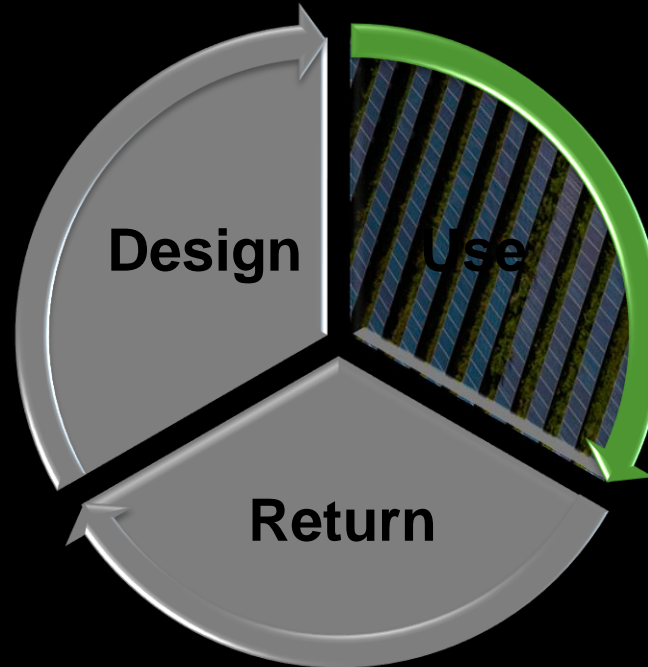
Smarter Use

Product energy efficiency

- Lenovo Neptune™ liquid cooling technology.
 - Direct water cooling (DWC) which reduces up to 40% of power costs by using water circulated through the system to remove heat from the CPUs, memory, storage, PCIe and voltage regulation infrastructure. Using water means fans can be eliminated.
 - Energy Aware Runtime (EAR) smart control software minimizes power consumption
 - Adaptive air technologies like the Thermal Transfer Module (TTM) or Liquid to Air heat exchanger (L2A) which uses closed loop liquid with an air-cooled system to reduce power consumption or increase processing power.
 - Rear door heat exchanger is 3.5 times more efficient than air alone and removes enough heat to power 4,000 LED lightbulbs

Carbon optimized operations and logistics

- Lenovo Carbon Offset Service is available on select server products



Smarter Use (circular use)

optimized use of products & resources

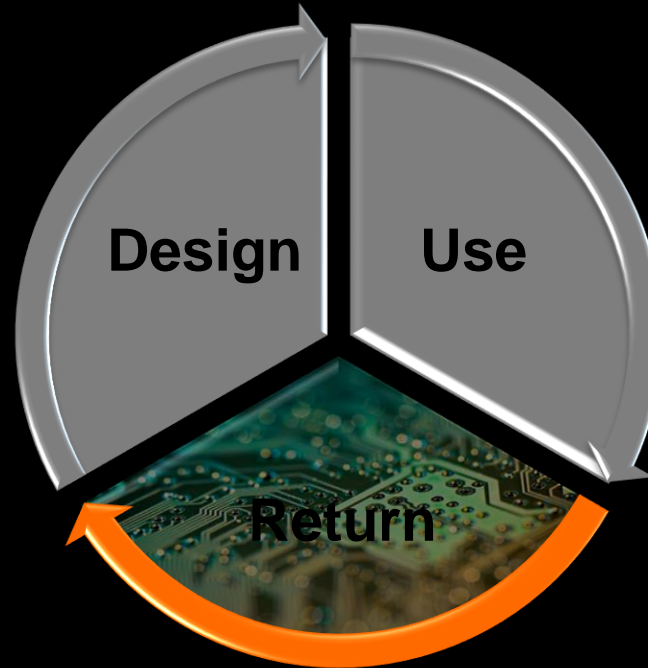
Products & Packaging	Manufacturing & Operations
<ul style="list-style-type: none">• Product energy efficiency• Device as a Service (DaaS) and other solutions• Product repair and warranties• Bulk packs & re-use	<ul style="list-style-type: none">• Renewable energy use• Carbon optimized operations and logistics• Water, waste and energy smart facilities

Lenovo ISG Circular Economy Plug-in

Smarter Return

Product take-back

- Lenovo Asset Recovery Service (ARS)
 - Securely transport assets from client location
 - Receive, test, and prepare equipment for resale
 - Recycle to ensure proper disposal of obsolete equipment
 - Donate equipment to an organization of the customer's choice



Smarter Return (circular return)
Capturing resources & value

Product take-back & Value Recovery

- Consumer, SMB & commercial product take-back
- Optimized life cycle values and processes
- Intelligent parts management

Circular Economy Recap

- A model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products for as long as possible.
- Lenovo Circular Economy Approach
 - Smarter Design:
 - Recycled content in server products
 - Packaging reduction and composition
 - Smarter Use
 - Neptune™ cooling technology
 - Carbon offset service
 - Smarter Return
 - Asset Recovery Service (ARS)

**Want to learn more about sustainability?
Ask about our packaging initiatives.**

The Lenovo logo is displayed in white text on a red rectangular background. The background of the entire slide features a photograph of a wind farm at sunset or sunrise, with the turbines reflected in a body of water. The sky is filled with soft, orange and pink clouds.

Lenovo



thanks.

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