2017-2020 Total waste by category (tonnes)

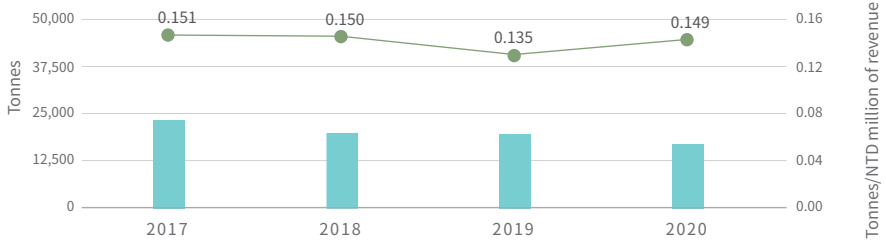
	General industrial waste (incineration)	General industrial waste (landfills)	Hazardous industrial waste	Waste from resources	Total waste
2017	209	4,149	660	18,487	23,505
2018	219	3,900	1,609	17,278	23,007
2019	236	3,590	2,003	12,610	20,132
2020	270	4,500	2,023	14,024	20,817

2017-2020 Total waste by processing method (tonnes)

	Landfill	Recycling and reuse	Landfill
2017	4,149	19,356	23,505
2018	3,900	19,107	23,007
2019	3,590	16,542	20,132
2020	4,500	16,317	20,817

Note: 1. The Solid-State Drive (SSD) Business Unit completed transferring the business in the first half of 2020. For consistency in the calculation, the SSD Business Unit was removed from the 2017-2019 data, which were then recompiled accordingly.
2. Recycling and reuse processing volume = incineration of general business waste (recycling) + hazardous business waste (recycling) + resource waste (recycling and reuse)

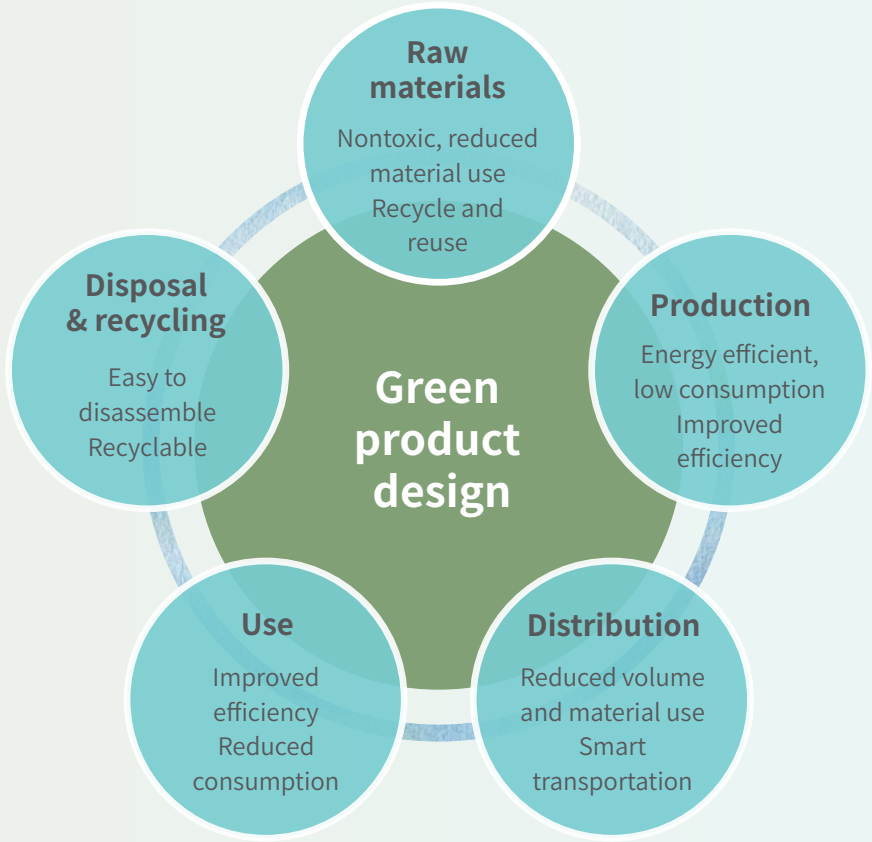
Total waste and waste intensity 2017-2020



3.5 Product Green Design and Management

3.5.1 Product Life Cycle Assessment

LITEON takes inventory for product life cycles by stage through raw materials, production, transportation, use, and disposal according to the ISO 14040/44 standards. Meanwhile, LITEON follows the IEC62430 standard and builds environmentally conscious design into the product development process. Quantitative carbon emission analysis is performed on the ITRI domestic life cycle assessment software and database, DoItPro Version 2020.0003.



Stage in product life cycle	Standards and guidelines	Results and benefits
Acquisition of raw materials	・IECQ QC 080000 ・LITEON Product Green Design Criterion ・LITEON Standard of Controlled Hazardous Substance (LS301) ・LITEON Restricted substances management procedure ・LITEON Design development management procedure ・LITEON Guidelines for Green Procurement	**Reduce：** ・AC metering IC integration technology in server power products reduces the use of resistors, multilayer ceramic capacitors, metal-oxide-semiconductor field-effect transistors and other components. The technology saves close to 4.9 million active/passive components and reduces carbon emissions from raw materials by 29.98 tonnes CO_2e or more at the same time. Meanwhile, cooling copper rows were rearranged to reduce the size, and the material was switched to aluminum to reduce weight. As a result, carbon emissions from the products were reduced by close to 49.1 tonnes CO_2e. ・The shape of magnetic core in transformers was modified to improve product performance. The modification also reduced the use of powdered metals for magnetic core by 703 tonnes and carbon emissions from the products by 434 tonnes CO_2e. ・Technology optimization in the LED product packaging process focused on the use of phosphor powder. Consumption of precious rare-earth phosphor powder was reduced by 2.7 tonnes and carbon emissions from raw materials by 57.9 tonnes CO_2e. **Recycle：** ・Up to 50% use of Post Consumer Recycled plastic materials in power supply and casing products. Cumulative consumption of virgin plastics was reduced by 377.66 tonnes or more, and therefore carbon emissions were reduced by 887.94 tonnes CO_2e. In addition, some products have also helped brand customers obtain the EPEAT label. ・Plastics recycled from Styrofoam marine waste were introduced successfully into UV LED reels, and the part acknowledgment procedure was completed. and switch to use in a total of 1000 pieces. It is projected that a total of 10 tonnes of plastics recycled from Styrofoam marine waste will be used in 2021.
Production	・LITEON Product Green Design Criterion	**Reduce：** ・The compact design in smart office machines reduces material use and structural complexity and cuts production hours by 7.3%, which translates to a power saving of 108 MWh and carbon reduction of 108 tonnes CO_2e。 ・LED products use adhesion promoters developed in-house instead of traditional adhesion promoters. The substitution increases yield to 10.55%, and reduces the single mode dry time by 300 seconds. It also translates to a cumulative energy saving of 474MWh and carbon reduction of 472 tonnes CO_2e based on the total shipment of 13.3 million pieces in 2020.
Shipping and distribution	・LITEON Product Green Design Criterion ・Pallet standards (GB/T) ・Container standards (GB/T) ・Packaging standards (GB/T) ・Loading, unloading and handling standards (SJ/T, JT/T, TB)	**Reduce：** ・The MFG Portal system and SAP shipping documents are combined to effectively manage logistics. The integration also improves dispatch efficiency in shipping, and increases 20% to 50% loading on trucks to 90% or higher. It helps reduce energy consumption and carbon emissions during distribution and shipping. ・To reduce plastic materials in enclosure products, EPE packaging materials were substituted with materials with a lower density. EPE consumption was reduced by 9.84 tonnes. The dimensions of packaging materials were optimized to save cardboard and EPE. The resulting carbon reduction was 382.2 tonnes CO_2e. ・An improved packaging design for street lighting products led to a 27% saving of materials in cardboard boxes. EPE consumption was cut by 49 tonnes, and total reduce weight by 126 tonnes. It also reduced waste generated from packaging materials, which was a carbon reduction of 167.98 tonnes CO_2e based on the total shipment in 2020. **Recycle：** ・Energy efficient LED streetlights are packaged in cardboard boxes made with 95% or more recycled pulp to reduce the use of virgin pulp. The carbon reduction was 593.6 tonnes CO_2e based on the total shipment in 2020.

Stage in product life cycle	Standards and guidelines	Results and benefits
Product use	・IEC 62430 ・ErP ・LITEON Product Green Design Criterion	**Reduce：** **I. Energy efficient products:** ・Energy conversion efficiency of power supply products was improved by 4.56% compared to 2016, and reached the 2% improvement target ahead of schedule. The improvement, based on the shipments in 2020, can help users worldwide save close to 466 GWh in electricity and reduce carbon emissions by 237,000 tonnes CO_2e per year. ・In particular, AC metering IC integration technology in server power products reduces power consumption by 0.034W while metering IC is working. The cumulative power saving would be 42.89MWh based on the shipments. The technology also reduces carbon emissions by 21.83 tonnes CO_2e or more at the same time. ・Energy conversion efficiency of the latest generation of server power products has risen from Platinum (94%) for the previous generation to Titanium (96%). The carbon reduction from energy saving is estimated at 32,920 tonnes CO_2e. ・UV-LED energy efficiency improved by 25% compared to 2018. The improvement, based on the useful life of a product and application scenarios, is the equivalent of 1.94 GWh in power saving and 988 tonnes CO_2e in carbon reduction. Meanwhile, low-power UV-LED (0.65W) energy efficiency also improved by 10%. The cumulative power saving is estimated at 3.43 GWh and carbon reduction at 1,750 tonnes CO_2e at a shipment of 6kkpcs. ・Given identical luminous flux, LED lighting is used to replace traditional high-pressure sodium (HPS) streetlights. Energy efficiency is improved significantly by 75%, and the product lifespan is 1.8 times that of an HPS streetlight. The energy saving, based on a total shipment of 140,000 units in 2020, is 184 GWh and the carbon reduction is 93,640 tonnes CO_2e per year. **II. Consumable reduction** ・Power consumption by wireless mice is reduced through energy efficiency enhancements. The saving in battery use is estimated at 1619kpcs and the carbon reduction at 98.8 tonnes CO_2e based on a projected shipment of 2 million devices in 2021.
Disposal & recycling	・Waste Electrical and Electronic Equipment Directive (WEEE) ・LITEON Product Green Design Criterion	**Reduce：** ・Given LITEON manufactures primarily optoelectronics and key electronic components and some ODM/OEM terminal systems, 95% or more LITEON products have to rely on brand name clients for recycling and reuse. Therefore, LITEON's approach to green design is to make its products easy to assemble and disassemble and made of recycled materials. The goal is to help customers recycle more effectively as end users. ・For example, LITEON hired BV Laboratories to deliver a WEEE disassembly assessment report. The report showed that LITEON exceeded the requirements under the WEEE Directive, which stimulated a reuse and recycling rate of 55% or higher (currently 98% or higher) and a recovery rate of 75% or higher (currently at 99% or higher). The achievement significantly reduces waste to be generated from disposed products.

Note: Quantified carbon emissions in this table were quoted from the carbon factors in the ITRI domestic life cycle assessment software and database, DoItPro Version 2020.0003. These factors included electronic parts and components, metal materials and power factors.

LITEON offers a wide range of products, including power supply, optoelectronics parts, automotive electronics, computer peripherals, and network communication. To make more energy efficient products and reduce their impact on the environment, LITEON performs green product design assessments based on life cycles, and evaluates environmental benefits in different stages, such as materials, production, transportation, use, and disposal. Meanwhile, the continuous development and application of sustainable Styrofoam marine waste and the reduction of packaging volume, material, and weight and reuse of materials are two of the ways to achieve the vision of manufacturing products with zero toxins, zero waste, and zero environmental impact.

3.5.2 Green Mark and Environmental Declarations of Product

Green mark product certification

Green Mark are labels awarded by governments to products of which the type and specifications are established in compliance with ISO 14024 and which have been certified by a third party to be compliant with or exceed the regulatory requirements for the corresponding product type and specifications. Taiwan's EPA Green Mark, for example, is awarded to quality products ranked in the top 20% to 30% among their peers in terms of environmental performance. Other Green Mark follow similar rules. Given most LITEON products are ODM or OEM products, most Type I label applications are made on behalf of brand name clients. Applications made for LITEON itself are listed as follows.

Mark	Product type and quantity
Taiwan energy efficiency label	Five items energy efficient streetlights received Taiwan's Energy conservation Labeling.
Energy Star	・Four products in two different type, including scanners and EV chargers, received the Energy Star labels. ・In addition, LED packaging arrays or modules have been certified by the US EPA Energy Star program.
Electrical safety regulations	・Four products in two different types, including scanners and server power, received Mainland China CCC labels. ・Six products in two different types, including projectors and power chargers, received the EU CE mark.
Mainland China Environmental Labelling	Scanners are certified by Mainland China Environmental Labelling.
US EPEAT	Helped clients obtain one silver and four bronze ratings for five enclosure products.

Product carbon footprint declaration

LITEON, in fulfillment of its green product commitment, gives customers complete environmental details on the company's products. For key products, LITEON took the initiative to complete carbon footprinting. Inventory taking and quantitative methods followed the full life cycle assessment under ISO 14067:2018. In particular, A01 automotive LED modules had been certified by a third party, while desktop keyboards and laptop keyboards were assessed in house. The results are as follows:

Product	Appearance	Carbon emissions per functional unit
A01 automotive LED modules		0.63 $kgCO_2e$
Desktop keyboards SK2086 series		・Virgin material based keyboards 6.788 $kgCO_2e$ ・Styrofoam marine waste based keyboards 6.347 $kgCO_2e$
Laptop keyboards SG-8775X and SG-9040X series		1.612 $kgCO_2e$

Furthermore, all LITEON products comply with their respective information and labeling requirements. In 2020, LITEON did not violate any product or service information or labeling regulations or receive any customer complaint regarding health and safety regulations for products and services.

3.5.3 Environment-Related Substances Management

In 2010, LITEON implemented the LITEON LS301 standards by following the IECQ QC 080000 system and taking into account the latest trends in other countries, regulations, and customer needs. The LS301 standards apply to all products. The LS301 standards are revised from time to time after calibration with different versions adopted by different business units. The total number of restricted substances reached 323 in 2020.

The in-house Green product Management System (GMS) works with the "restricted substances management" and " design development management" procedures already in place as well as the LS301 standards for hazardous substance management. LITEON also requires that suppliers (including contractors) comply with the LITEON Guidelines for Green Procurement and submit the Supplier Statement of Restricted Substances Compliance for material/part acknowledgment and internal control. Furthermore, LITEON states explicitly in all procurement contracts the strict requirement for materials, parts, or semi-finished goods to comply with or exceed RoHS, REACH, California Proposition 65, and Montreal Protocol. With the implementation of green supply chain management, we hope to achieve the goal of sourcing environmentally friendly materials, manufacturing and providing to our customers low-toxicity and low-pollution products to minimize any harmful impact they may have on the human body or the environment.

LITEON Standard of Controlled Hazardous Substance (LS301)	
112 restricted substances (including 13 items Reporting Substances)	・Lead (Pb) and compounds ・Cadmium (Cd) and compounds ・Mercury (Hg) and compounds ・Hexavalent chromium (Cr(VI)) and compounds ・Polybrominated biphenyls (PBBs) ・Polybrominated diphenyl ethers (PBDEs) ・Phthalate esters (DEHP/DBP/BBP/DINP/DIDP/DNOP)
REACH 211 substances of very high concern	・EU REACH SVHC 1-211 ・Bis(2-(2-methoxyethoxy)ethyl)ether ・Dioctyltin dilaurate, stannane ・Stannane, dioctyl-, bis(coco acyloxy)derivs

LITEON installs the Green product Management System (GMS) to effectively manage and review compliance with the LS301 criterion for raw materials, parts, or semi-finished goods provide by the suppliers. GMS combines material requirements, international laws, international directives, customer policies, and supplier information. Suppliers file product testing and analysis results for the system to determine automatically whether they comply with the rules and directives. LITEON will summarize and analyze the data, and check the degree of compliance with the LS301 standards. Furthermore, GMS not only actively delivers information on green product management at LITEON to customers, but also feeds environmental requirements or provisions for green products, such as ErP, WEEE, and 3R, from customers into the management system to provide a basis for green product design.