2 Innovation Value

Management Approach

Topics	Strategies	2022 Targets	2022 Results	Progress Signal	2023 Targets	2025 Targets	2030 Targets
Customer Relations	Increase customer satisfaction	Customer QBR ranking: More than 80% ranked first or second	Customer QBR ranking: More than **80.8%** ranked first or second	🟢	Customer QBR ranking: More than **83%** ranked first or second	Key Customer QBR ranking: More than **90%** ranked first or second	Key Customer QBR ranking: More than **95%** ranked first or second
Innovation Management	Strategically maintain patent portfolio (6,000 ~ 8,000 granted patents)	Add 5%~10% new patent applications and release 5%~10% patents of the portfolio	The number of active and granted patents is around 6,255. Added **9.72%** new patent applications and released 5.39% patents of the portfolio	🟢	Add 5%~10% new patent applications and release 5%~10% patents of the portfolio	Add 5%~10% new patent applications and release 5%~10% patents of the portfolio	Add 5%~10% new patent applications and release 5%~10% patents of the portfolio
	Expand technology fields and country coverages, enhance patent quality and increase overall patent value	Percentage of utility patents > 87%	Percentage of utility patents: **88.39%**	🟢	Percentage of utility patents > 88%	Percentage of utility patents >90%	The ratio of patented technologies and products apart from computers, tablets, and servers **> 50%**; The ratio of patent countries other than Taiwan, China, and the U.S. **> 10%**
	Revitalize patent assets, e.g., transactions, licensing, or monetization	Participate in patent related projects , e.g., patent pools or organizations	**Participated in a patent related project (32 patents)**	🟢	Participate in a patent related project	Participate in 2 or more patent related projects	Participate in 4 or more patents patent related projectss
	Expand new businesses	1) Investment in R&D and innovation of cutting-edge technology 2) New businesses: 5G, AI, IoT, Smart Home, Professional Display Solutions, Smart medical, automotive electronics. 3) Startup O.I. as a percentage of all O.I: 28%	Startup O.I. as a percentage of all O.I: **25.30%**	🟡	Startup O.I. as a percentage of all O.I: **30%**	Startup O.I. as a percentage of all O.I: **35%**	Startup O.I. as a percentage of all O.I: **40%**
Information Security	Establish an updated information security system and mechanism to ensure information security for the company and customers	The plant has passed the audit of customers' information security regulations. Pass rate = 100%	A total of 16 customer audits have been completed in 7 Sites, **100%** completed and passed. (WHN*2,WIH*2,,WZS*7,WMI*1, WCD*1,WVN*1,WCZ*2)	🟢	The plant has passed the audit of customers' information security regulations. **Pass rate = 100%**	The plant has passed the audit of customers' information security regulations. **Pass rate = 100%**	The plant has passed the audit of customers' information security regulations. **Pass rate = 100%**
		1) ISO27001 certificate has been obtained in 8 Sites and it is continuously updated and valid. 2) ISO 27001 certification has been newly introduced and obtained in 7 sites (WCQ/ WCZ/WVN/ WMY/ WMI,/WMX/ KOE)	ISO27001 certification has been obtained in 15 offices and plants, and the **coverage rate** of manufacturing plants is **100%.**	🟢	ISO27001 certification has been obtained 100% in all manufacturing plants and it is continuously updated and valid.	Copied to other business groups and plants with previous experience in obtaining ISO-27001 certification.	ISO27001 certification has been obtained for 100% of all manufacturing sites and it is continuously updated and valid.

Note: The progress light is 🟢 green light with more than 95%   🟡 yellow light with 90%~95%   🔴 red light with 90% or less.

2.1 New Businesses Development

2.1.1 Circular Economy

Wistron, as one of the world's largest suppliers of information and communication products, focuses on product development, design, manufacturing, and services. Product sustainable design and development is based on the concept of life cycle. It reduces the impact of products on the environment from the aspects of raw material acquisition, manufacturing, distribution, product use, discarding and recycling. This can create sustainable value, make sustainable use of resources, and create a sustainable business model of green circulation. Recycling Business Group of Wistron has provided brand customers with green services for recycling since 2013. A closed cycle of regeneration from cradle to cradle creates the maximum benefits of a circular economy.

Green Resources Business Achievements

Item	2019	2020	2021	2022
Disposal of electronic waste(tons)	11,363	10,000	7,300	4,660
PCR plastic materials shipping volume(tons)	13,512	16,930	26,288	21,577
Reduction in usage of new plastic materials(tons)	4,730	7,620	11,131	11,047
Revenue (in million RMB) of Wistron Advanced Materials (Kunshan) Co., Ltd.	797	921	1,680	1,380

Disposal of Electronic Waste

In 2022, due to the continued covid-19 pandemic in the United States, the lack of work and the impact of inflation in the second half of the year, about 4,660 tons of electronic waste have still been processed. It includes the existing Closed-loop Gold (recycling gold) and the Plastic Closed-loop (plastic recycling) service provided to customers in conjunction with Wistron's Green Resources Plant in Kunshan, China. In addition, we are committed to expanding our service targets, from the existing customer groups in the information and communication industry, medical industry, battery recycling and aviation industry, to OEM customers who are provided with secured product destruction and recycle service.

Provision of PCR Environmentally Friendly Materials

In 2022, the shipment of PCR (Post-consumer-recycled) environmentally friendly materials has reached 21,577 tons. 11,047 tons of e-waste recycled raw materials have been used. Estimated by Simapro and the carbon footprint and carbon emission coefficient of recycled plastics in the database, the carbon reduction benefit is equivalent to reducing emissions by 47,698 tons of CO_2e. In 2022, a total of 20 UL yellow card product recognitions have been obtained. The application of recycled plastic products has continued to extend from monitors, desktop computers, and televisions to routers, servers, mice, keyboards, fans, and other fields.

| Category	2022 Shipments (tons)	2022 PCR Addition Amount (tons)	2022 Reduction of Carbon Emissions tCO_2e
Recycled ABS Series	15,169	8,424	32,324
Recycled PC/ABS Series	2,861	1,545	10,064
Recycled HIPS Series	767	575	1,967
Recycled PC Series	706	377	2,860
Recycled Marine Material Series	148	126	483
Others	1,926	0	0
Total	21,577	11,047	47,698

Raw Materials and Technological Innovations

In the past ten years, the Green resources team has been committed to the recycling and reuse of electronic waste resources. The team's cooperation with Wistron and its OEM customers under the premise of circular economy has created achievements and contributions, and OEM customers have also given high recognition. At the same time, in McKinney, Texas, where the company operates, it won the honor of the Outstanding Enterprise Performance Award due to the emphasis and efforts on local environmental protection.

In 2022, sales to new customers have reached 4,022 tons, an increase of 49% over last year, indicating that it has successfully entered new OEM/ODM customers, including servers, fans, Netcom, TV and other electronic products. The development of new materials has mainly involved in new fields such as peripheral accessories, Netcom, and industrial computers, such as: Coffee grounds are added to the MNT back shell, transparent PC, or ABS is used for keycaps, PC/OBP marine material alloy is used for Netcom, and high-proportion flame-retardant PCR PC is used for Adaptor and other products. Sales of new materials for the whole year of 2022 have reached 2,656 tons, an increase of 48% compared to last year.

Ocean Bound Plastic (OBP) has developed ABS/OBP, PBT+GF/OBP, and newly added PC/OBP. Current applications have covered the product components such as display casings, keycaps, fans, and routers. A total of 148 tons was shipped in 2022. The total revenue is NT$1,380 million.

In line with brand customer announcements, 100% of packaging materials and more than 50% of product materials in 2030 must use recycled or renewable materials. Therefore, in 2022, Wistron has cooperated with customers to introduce 50% PCR in laptop products, introduce hydroelectric recycled aluminum in commercial models, and introduce 12% recycled steel in desktop computers. In addition, expanding the application of recycled metals is another innovative focus areas.

| Item	Raw Materials/ Technologies	Characteristics and Environmental Benefits
Renewable Materials	Bio-based Plastic	Currently, the main source of bio-based plastics is castor oil from renewable plants to reduce the use of petroleum and to reduce carbon emissions. In 2022, 50% of PCRs have been introduced into laptops.
	Ocean-bound plastic	Ocean-bound plastic is applied for product development, and PC/OBP were newly developed. The application has covered display case, key cap, fan, router and other product components. In 2022, a total of 148 tons of marine recycled plastic products have been shipped.
Innovative Technology	Hydroelectric recycled aluminum	The energy used to produce recycled aluminum in the form of remelting ingots is lower than that of virgin aluminum ingots. Moreover, the carbon dioxide emitted by one ton of electrolytic aluminum produced by hydropower is much lower than that of thermal power. In 2022, it has been introduced to laptop products.
	Recycling and reuse of lithium batteries	In cooperation with technical partner in 2022, a lithium battery cathode material recycling refinery has been established in the Green Resources Plant in the State of Texas, with an annual processing capacity of 500 tons. It is scheduled to production pilot run in 2023 and mass production in 2024.
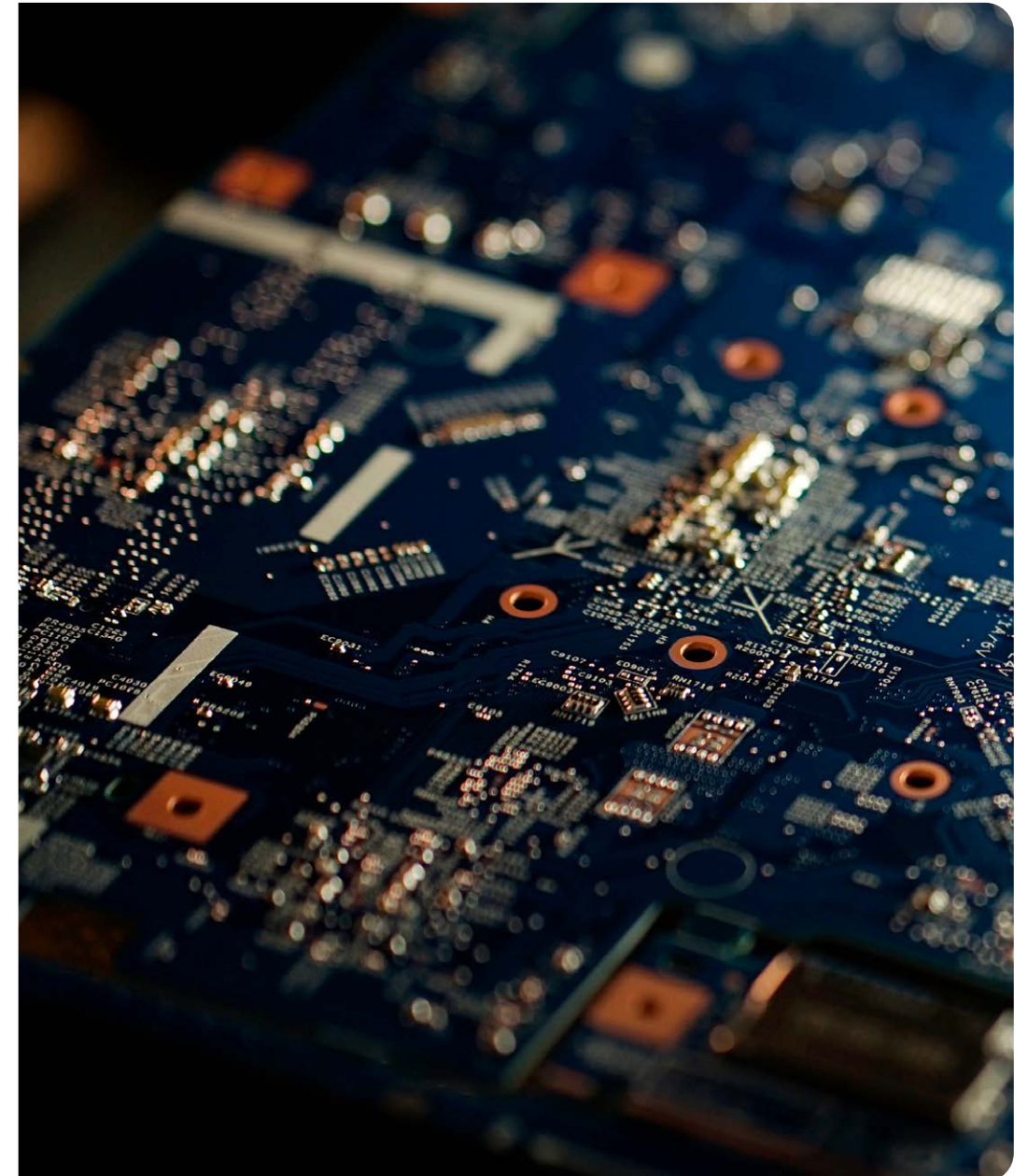
Performance of Green Product

In the development stage of product design, Wistron introduced the "Green Product Design Guidelines and Review Procedures" and other specifications. We start to consider waste disposal and recycling reuse from the design stage, and strive to minimize the impact on people and the environment after the products are discarded. Wistron's Green Resources Business subsidiary focuses on the recycling of electronics and refining of renewable plastics, continuing to cooperate with customers on PCR plastics for various products. In 2022, Wistron's shipped products using PCR plastics accounted for 80.3% of its hardware revenue, representing an increase of 1.2% compared to the previous year. This proves that Wistron's green brand continues to be recognized by the international market.

Wistron's product packaging is also designed in accordance with the concept of green circulation. From cartons and cushioning to printing inks, recyclable and reusable materials are used wherever possible. Moreover, we cooperate with the requirements of national laws and regulations, such as: China's Blue Sky Plan, French Mineral Oil Law, etc. We replace packaging materials with more environmentally friendly characteristics to reduce the impact on the environment. In 2022, the products that used Wistron's packaging design with recycled materials accounted for 98.7% of overall revenue. Among which, 98.6% of the external boxes were made from recycled pulp; 92.2% of the cushioning materials were made from recycled EPE; and 98.1% of the printed materials were printed with environmentally friendly water-based ink.

80.3%
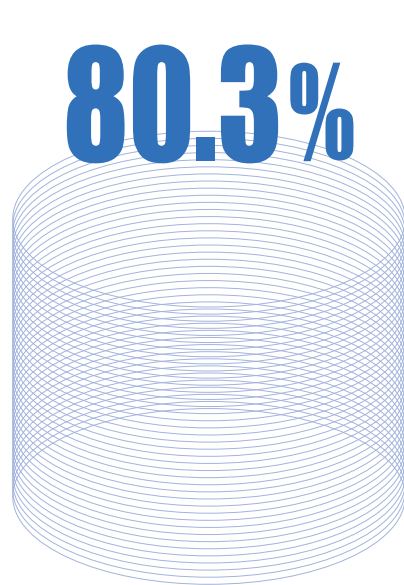
PCR Plastic Materials Revenue Percentage of Hardware Products

98.7%
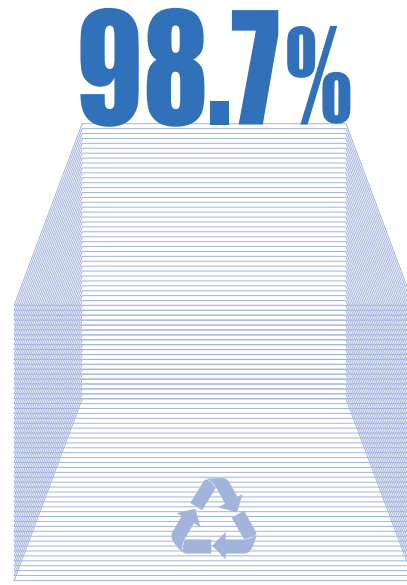
Packaging Designed with Recycled Materials Percentage of Hardware Revenue

Products Using PCR Plastic Materials as Percentage of Hardware Revenue (%)

Item	2019	2020	2021	2022
Laptops	52.2%	61.8%	85.6%	90.9%
Desktop computers	65.8%	58.1%	68.4%	81.7%
LCD monitors	97.7%	95.8%	96.5%	94.2%
Servers/ Voice over Internet Protocol (VoIP)	1.3%	0.5%	0.65%	0.8%
Total	53.5%	58.7%	79.1%	80.3%

Note: Hardware products refer to laptop / desktop computers, and all-in-one (AIO) computers/monitors/servers/Voice over Internet Protocol (VoIP)

Key Performance Indicators of Green Product (%)

Item	2019	2020	2021	2022
Percentage of products compliant to WEEE regulations	100%	100%	100%	100%
Percentage of products with environmental labels	87.0%	89.5%	90.7%	85.1%
Percentage of packaging designed with recycled materials	95.0%	98.0%	98.1%	98.6%
Percentage of products that use recycled plastic materials	53.5%	58.7%	79.1%	80.3%

Note: Data and examples of packaging designs using recycled materials before 2020 in Wistron Technology

Recycled Materials Used in Product Packaging as Percentage of Hardware Revenue in 2022 (%)

Item	Recycled Pulp for Cardboard boxes	Cushioning Materials Using Recycled EPE	Environmentally Friendly Water-Based ink for Printed Materials
Laptops	99.6%	99.6%	99.6%
Desktop computers and all-in-one (AIO) computers	96.2%	78.2%	96.2%
Monitors	95.1%	67.6%	95.1%
Servers/ Voice over Internet Protocol (VoIP)	99.0%	92.8%	96.1%
Keyboards	100%	0%	100%
Speakers	100%	0%	88.2%
Handheld mobile devices	100%	100%	100%
Total	98.6%	92.2%	98.1%

2.1.2 Product Design and Development

Wistron, as a pioneer in providing innovative services, improves the capabilities of R&D and innovation and the development of diversified products. At the same time, in order to ensure the high quality of our products, we have established a quality management system, incorporating the PDCA management cycle into our daily operations to implement the monitoring, analysis and continuous improvement of quality-related indicators. In terms of after-sales service from the design and development stage to mass production, the Wistron R&D team provides customers with comprehensive and friendly integrated services, allowing our products to continuously improve and enhance our customer satisfaction.

Investments in Innovative Developments	2019	2020	2021	2022
Funds invested in R&D (NT$ hundred million)	162	190	208	250
R&D funding as percentage of revenue (%)	1.84	2.25	2.41	2.54
R&D personnel (number of people)	4,556	4,896	5,350	6,330
Percentage of R&D personnel per total employees (%)	6.5%	7%	8.5%	13.4%

Wistron's Integrated Design Services

Integrated Design Services

International Certification for Products

According to the characteristics of the information and communication product, heat transfer, vibration, emission frequency, energy consumption, structure, and reliability design services are developed to ensure that the products can pass global or regional market quality assurances

Green Design Concepts

When designing and developing products, we introduce life cycle assessments, the use of recycled materials, and modular designs to implement the circular economy.

Large Investments in R&D and Innovation

In addition to investing a large amount of research and development funds, we are also actively strengthening our R&D manpower and capabilities to expand our R&D portfolio. Encouragement for employees to invest in innovative research

Environmentally Friendly

In compliance with the Wistron Hazardous Substance Management Regulations and the Green Design Guide, we have imposed bans on hazardous substances, and we have introduced the reduction of resource waste and the designs of energy saving and recyclable, allowing the products to comply with customers' environmental protection requirements and related laws and regulations.

Integrated Design Services for Various Products

The services range from industrial design, electronic, software, mechanical and function testing, reliability testing services, and environmental considerations for packaging development.

Wistron Invention Reward Regulation

In order to maintain the competitive edge in innovative technologies, Wistron encourages our employees to continuously improve their engineering capabilities and develop new technologies. The company has stipulated the "Wistron Invention Reward Regulation" to encourage our employees to boldly innovate. The regulation provides incentives in the invention disclosure, patent application, patent grant, and technology licensing stages. Annual Patent Award Ceremony is held to encourage employees to continue researching and innovating. Wistron will continue to utilize our innovative energy and increase our R&D competitiveness.

Accumulative Number of Patent Applications and Granted Patents

Wistron continues to devote itself to R&D and innovation in having new patents. In 2022, in addition to continuing to focus on the quality of patents, we have also increased the number of applications for patents directly related to the company's R&D direction or business development for new technologies, new products and new businesses. In particular, we have established and accumulated a robust global patent portfolio in the fields of 5G+AI smart applications, smart healthcare, in-vehicle information and communication systems, and cloud technology services.

Award	2018	2019	2020	2021	2022
Number of patent award winners	320	248	246	237	248
Number of patent applications	495	532	429	386	608
Number of granted patents	446	440	459	401	414

Note: Wistron was named one of the Top 100 Global Innovators™ by Clarivate in 2023

Number of Patents Granted in Different Countries and the Ratio in 2022

Country	Taiwan	China	USA	Others
Number of granted patents	**140**	**112**	**110**	**52**
Ratio of granted patents	**33.8%**	**27.1%**	**26.6%**	**12.5%**

Encourage the Development of Green Product Patents

In order to implement Wistron's Green Product Policy, we also included the ideas of green innovation in the development of our products. Among the patents granted in 2022, green product patents with environmentally friendly designs accounted for 34 patents. Green product patents increase the added value of products, protect the environment with innovative technologies, and create a better life for the entire society.

Wistron's Green Product Patents

Number of green product patents

2018	2019	2020	2021	2022
13	13	20	15	34

Green Product Patent Design Achievements in 2022

Co-constructed power generation device EP3499032	The present invention is a dual mechanical power generation device with special structural design. That is, electricity can be generated with good efficiency in a shaking or rotating manner. The power demand of small devices can be met without installing a battery, so environmental protection and convenience are taken into consideration.
Electronic device and charging foot seat thereof TWI768643	The present invention is a new type of wireless charging stand. It improves the charging efficiency, reduces the time required for charging, and avoids the loss of electrothermal conversion caused by long-term charging and the thermal damage to electronic devices through the design of special electrode configuration.
Charging method and electronic device using the same CN109256825	The charging device of the present invention can properly implement different fast/normal charging programs according to the user's demand for charging time or usage time, and it also takes into account the charging efficiency to avoid the battery damage.

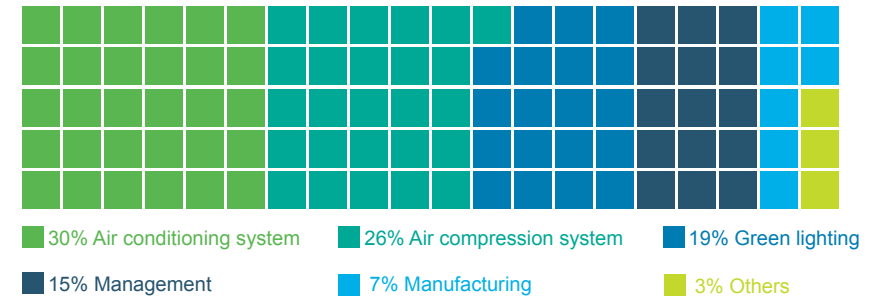## 2.1.3 Low-Carbon Manufacturing and Energy Saving Innovations

With the 2030 carbon neutral goal in mind, Wistron is proactively driving actual carbon reduction in addition to increasing renewable energy use. We use low-carbon manufacturing processes, smart energy conservation technologies, and improvement of energy efficiency to achieve the goal of energy saving. All plants carry out energy-saving projects to practice low-carbon production. The project is divided into six dimensions: air conditioning, air compressor, production, management, green lighting and others. It is moving towards two aspects, including the introduction of smart energy management system, and the strengthening of management and data base. Diversified solutions have also been drawn up to realize low-carbon manufacturing and energy saving innovations.

The manufacturing plants have achieved remarkable results in the carbon reduction performance of the six energy-saving dimensions mentioned above under the long-term promotion of energy-saving activities. Air-conditioning and air compressor power consumption thereof are high-energy-consuming hot spots in the plants. Carbon reduction planning is actively carried out in the two hotspots of high energy consumption through the inventory of hardware equipment and energy use diagnosis. The goal of effective management is achieved through the introduction of smart energy conservation technology, combined with AI and IoT control technology in addition to replacing old equipment consuming energy. One of the energy-saving achievements in 2022 is smart energy conservation and innovative projects with a power saving rate of 20-30%. Wistron will continue to commit to low-carbon innovative manufacturing with the help of smart solutions. We combine digital platforms and virtual factories to realize the vision of sustainable management through energy management, intelligent repair and maintenance systems, and ice water systems.
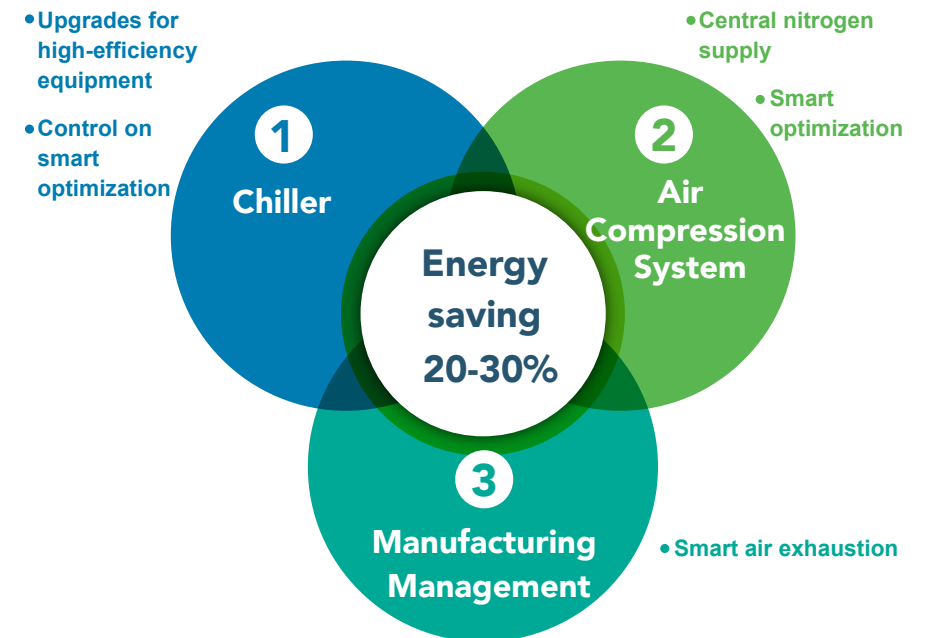
Low-Carbon Manufacturing / Energy Saving Innovative Initiatives - Central Nitrogen Supply

Through the soldering process, it is necessary to react with nitrogen to ensure the quality of the soldering tin. The nitrogen production process is mainly from the atmospheric air that is transmitted to the nitrogen supply machine through the air compressor, and passes through the filter to produce high-purity nitrogen, which is supplied to the reflow furnace and soldering tin. Common nitrogen supply machines are erected beside the production line. However, in the process of nitrogen production, there are disadvantages such as high energy consumption due to high ventilation frequency, excessive noise in the nitrogen production process, and equipment occupying some space in the production area. After various assessments and improvement plans, the Wistron Zhongshan plant introduced a central nitrogen supply system to increase nitrogen flow and centralize nitrogen supply. Therefore, compressed air gas is saved and energy consumption is reduced. It is also installed centrally on the roof to reduce working noise, and it can also reduce the electricity consumption and land occupation of the air conditioner installed in the onsite nitrogen generator for heat dissipation. The annual electricity saving of this project is estimated to reach 2471.43MWh. It will continue to be introduced into other plants in the future.

Scale Diagram of Energy Saving Project

- 30% Air conditioning system
- 26% Air compression system
- 19% Green lighting
- 15% Management
- 7% Manufacturing
- 3% Others

A Trilogy to Smart Energy Conservation

- Upgrades for high-efficiency equipment
- Control on smart optimization
- Central nitrogen supply
- Smart optimization
- Smart air exhaustion

① Chiller
② Air Compression System
③ Manufacturing Management

Energy saving 20-30%

Scale Diagram of Energy Consumption before Smart Energy Conservation

| Air conditioning and ventilation 29% | Electricity of air compressor 31% | Production facilities 30% | 10% |

0%   25%   50%   75%   100%

Electricity consumption of air conditioners and air compressors accounted for 60% Thus has the highest priority of efficiency improvement

Electricity consumption of production facilities lighting & IT & others
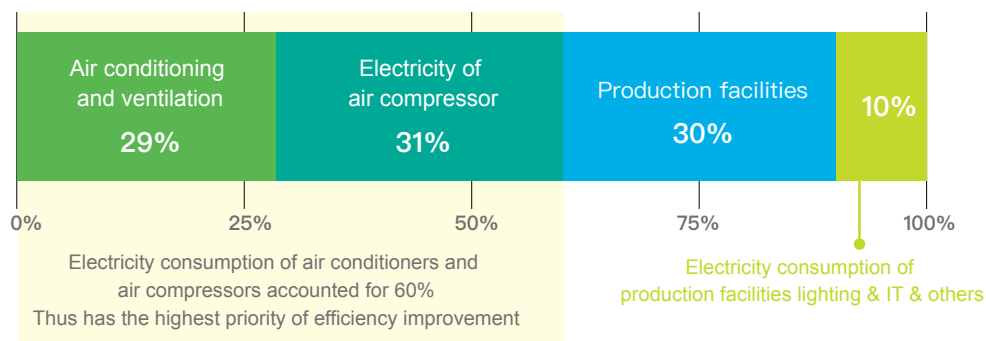
2.2 Pursuing the Highest Quality

2.2.1 Green Products

Wistron follows the framework of ISO9001 and QC080000 management system in the product development stage. The Green-design Guide is adopted to introduce the concept of life cycle assessment into products. Moreover, Wistron can design compliant products to meet customer needs and the requirements of environmental protection laws and regulations, energy consumption labels and safety regulations in various regions.

The products are guaranteed to avoid the use of harmful substances, the design is easy to disassemble and easy to recycle, the percentage of PCR recycling is increased, and it is connected to Reduce/Reuse/Recycle to reduce the use of raw materials.

A circular economy is implemented through recyclable designs for products and proper waste disposal.
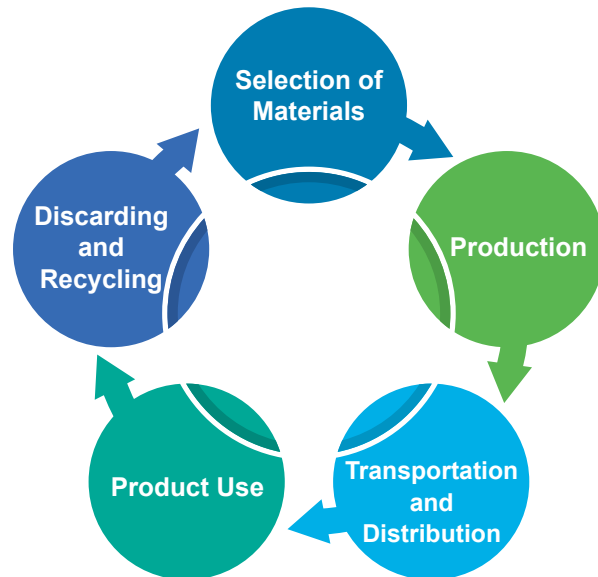
Energy management, greenhouse gas management, resource management, and waste management are implemented to achieve Cleaner Production.

Selection of Materials

Production

Discarding and Recycling

Transportation and Distribution

Product Use

Energy conservation and easy to repair designs are used to reduce product energy consumption and extend product lifecycles.

Improvement in transportation efficiency: Lightweight product designs and reduced packaging

By 2022, all product lines have attained 100% compliance with Waste Electrical and Electronic Equipment Directive (WEEE) regulations. In 2022, the company's products that assist brand customers to obtain various environmental protection labels account for 85.07% of hardware revenue. All product lines are 100% in compliance with customer requirements, environmental protection laws and regulations, energy consumption labels and safety regulations in various regions. Meanwhile, there was no incident of non-compliance with regulations and voluntary codes concerning product information and labeling. In 2022, Wistron;s products that meet the Energy Star standard saved 580,048,154 (kwh) and reduced 295,244,510 (kgCO$_2$e) annually. Product age is considered, and the energy saving benefit of the product is 3,590,806,033 (kwh) with a reduction of 1,827,720,271 (KgCO$_2$e). Energy Star products accounted for 84.3% of hardwares' revenue.

Wistron strictly complies with the import laws, regulations and directives of various countries.

Achieving a passing rate of 100% in previous years

Laws, Regulations and Directives	Wistron's Products
EU RoHS directive: Control of substances hazardous to the environment	100% compliant
REACH	100% compliant
WEEE: Recycling of electronics/appliances wastes:	100% compliant
CA65	Products exported to California are 100% compliant
POPs（Persistent organic pollutants)	Products exported to EU are 100% compliant
VOCs	Products exported to China are 100% compliant
Mineral oil of France	Products exported to France are 100% compliant

Passing rate for other industrial certification standards

Certification Standards	2019	2020	2021	2022
Products certified by Energy Star	82.9%	86.7%	89.5%	84.3%
Products meet EPEAT certification or equivalent standards	56.6%	62.4%	74.6%	77.9%

Number of Products to Obtain Important Environmental Protection Labels in 2022

Label name	Product Type and Quantity
Taiwan Green Mark	82 personal computer products (including 50 laptop computers, 32 desktop computers, and all-in-one computers) and 6 monitor products obtained the Taiwan Green Mark
China Environmental Labelling	215 personal computer products (including 138 laptop computers, 77 desktop computers and all-in-one computers), 100 monitor products, and 4 corporate products obtained the China Environmental Labelling
U.S.A. EPEAT	326 personal computer products (including 251 laptop computers, 75 desktop computers and all-in-one computers) and 104 monitor products obtained US EPEAT certification
TCO certification	147 personal computer products (including 101 laptop computers, 46 desktop computers and all-in-one computers) and 100 monitor products obtained US EPEAT certification
US Energy Star	639 personal computer products (including 467 laptop computers, 172 desktop computers and all-in-one computers) and 148 monitor products obtained TCO certification

Sales of Products with Important Environmental Protection Labels as Percentage of Hardware Revenue in 2022 (%)

Item	Energy Star	EPEAT / TCO / Taiwan Green Mark / China Environmental Labelling
Laptop computers	98.9%	89.9%
Desktop computers and all-in-one (AIO) computers	70.3%	60.5%
Monitors	89.0%	93.3%
Servers/ Voice over Internet Protocol (VoIP)	4.8%	1.6%
Total	84.3%	77.9%

Product Safety Management and Guidelines

In order to ensure that raw materials do not use hazardous substances to comply with international environmental protection regulations and customer regulations on hazardous substances, Wistron has formulated "Wistron Hazardous Substance Management Regulations" and "Control Operation Procedures for Products Containing Hazardous Substances" by following the management framework of IECQ QC080000. We have developed Product Lifecycle Management (PLM) and Green Product Management (GPM) on our own to confirm that all parts and packaging materials used in products must comply with international environmental protection regulations and customer regulations on hazardous substances.

In 2022, there were currently 10 banned substance and 186 regulated substances. Wistron re-examines regulations and customer standards every six months for the amendment of Wistron regulations to ensure compliance with raw material regulations and customer specifications. Wistron's packaging materials mainly use renewable materials. We compile statistics every year based on the import/export customs declaration system for the weight of product materials and packaging materials.

Use of Product Materials and Packaging Materials

Usage Volume of Product Materials and Packaging Materials Over the Years

Item	2019	2020	2021	2022
Product material usage volume (tons)	230,657	196,097	238,388	219,161
Packaging material usage volume (tons)	68,229	63,101	78,979	76,947
Percentage of renewable materials (%)	29.6%	32.2%	28.6%	35.1%

Notes 1:The weight of all materials and packaging materials is denominated in "gross weight", which is defined as the total weight that includes the weight of packaging materials.
Notes 2:Product material usage volume (ton) = product weight + packaging material weight
Notes 3:Packaging material usage volume (ton) = packaging material weight
Notes 4:Percentage of renewable materials = (total renewable materials/total materials) x 100%

Wistron Hazardous Substance Management Regulations

In accordance with international environmental protection regulations and customer environmental protection requirements, Wistron has formulated "Wistron Hazardous Substance Management Regulations" to define the standards for restricting hazardous substances such as components, packaging materials, and auxiliary materials used in products. This is used to establish a list of control and monitoring items, and cooperate with suppliers to reduce the impact on the environment and protect human health.

1 Hazardous substances restricted by the EU RoHS Directive

2 Wistron restricted items: Established based on IEC62474 of the Material Declaration Standards and environmental friendly requirements from each brand customers.

3 Wistron monitoring items: Include substances of concern that have yet been banned. We collect information on the usage status as the basis of evaluation for future reduction schedule or new bans.

4 Halogen-free or low-halogen product regulated items: Halogen-free or low-halogen regulations for specific products are introduced in response to customer demands.

5 Substances of Very High Concern (SVHC) under REACH

6 Battery regulations: Because batteries contain a lot of chemicals, they should be recycled and separated before disposal to avoid environmental pollution. The batteries are all marked with recycling marks in accordance with customer requirements and the requirements of various countries.

7 Packaging material regulations: The main controls will be with the packaging materials for final product shipments, such as: corrugated boxes, packaging bags, cushioning materials, labels, tapes, pads, etc.

Information System and Management Procedures

- Invention and innovation reward scheme
- Project tracking system (pts)
- Quality management system（iso 9001）
- Hazardous substance process management system (iecq qc 080000)
- Green-design guide
- Product lifecycle management (plm)
- Green product management (gpm) system
- Sap system
- Rohs directive
- Registration, evaluation, authorization, and restriction of chemical substances (reach)
- International safety regulations (bsmi, cb, ccc, cul, ul, and tuv certification from different countries)

2.2.2 Product Life Cycle Assessment

Through life cycle assessment, enterprises can evaluate the potential impact on the environment of various inputs and outputs in the process of product or service life cycle. In addition, the evaluation results are applied to the commodity, manufacturing or service stages to achieve the purpose of continuously providing environmentally friendly products. In 2022, Wistron complies with ISO 14040 and 14044 life cycle assessment standards in the life cycle assessments of laptop computers and All-in-One computers. The scope of the system boundaries has been defined according to the product category rules (PCR) for IT equipment by the EU Environmental Footprint Category. The boundaries have been defined as cradle to grave, which includes raw material, manufacturing, distribution, use, and end of life stages. The LCA analysis tool is used to conduct the computational analysis to obtain the environmental impact assessment results and carbon footprint of the product. Currently, products that have completed LCA analysis account for 20.24% of the revenue of laptop computers, desktop computers, All-in-One computers and handheld devices.

Wistron established a standard operating procedure for product life cycle assessment. Our colleagues are trained through e-learning classes. At the same time, an LCA analysis team was established to continuously strengthen the knowledge and capabilities of the company's product life cycle assessment. In addition, Wistron has started the development of the product carbon footprint system (PCF System) in 2022. It obtains product-related information by connecting Wistron's internal systems in series to greatly reduce the manual work time for life cycle assessment. In the future, this system will be used to accelerate the LCA coverage of Wistron's products, and continue to develop low-carbon products through carbon emission hotspot analysis and improvement.

Carbon Footprint Analysis Result of Each Life Cycle Stage

Product Scope	Raw Materials	Manufacturing	Distribution	Product Use	End of Life	Total Carbon Emissions
Laptop computer (13 inches)(Chengdu Plant)	45.88	2.08	17.12	15.70	1.66	82.44
Laptop computer (14 inches)(Chengdu Plant) -A	48.30	2.97	23.20	23.00	1.97	99.44
Laptop computer (14 inches)(Chengdu Plant) -B	49.99	2.67	17.56	27.24	1.80	99.25
AIO (24 inches) (Zhongshan Plant)	177.33	6.74	38.32	97.50	3.81	323.70

Note: Unit kgCO$_2$eq
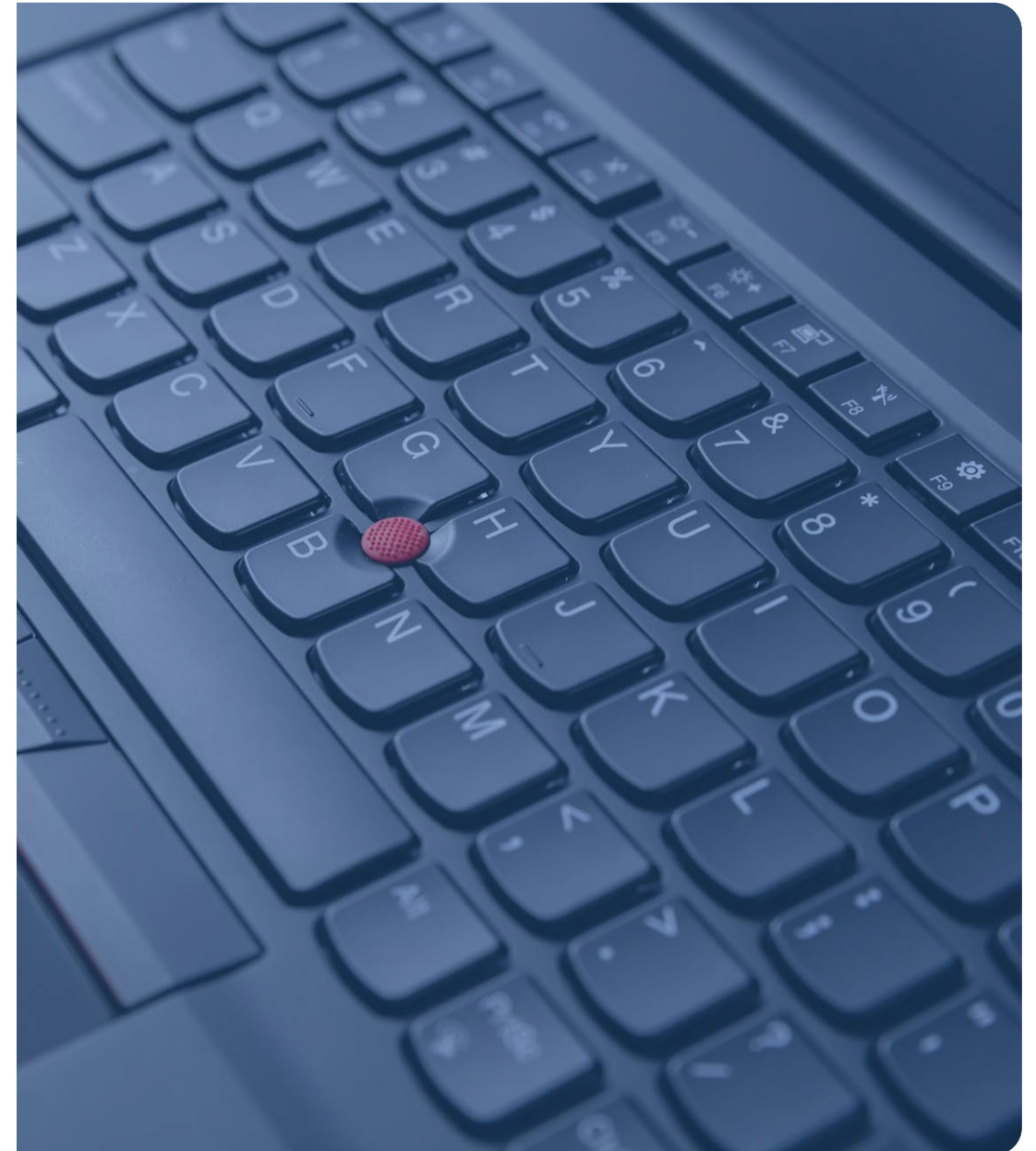
Results of Environmental Impact Assessment

| Impact Category	Unit	Environmental Impact Results			
		Laptop Computer (13 inches) (Chengdu Plant)	Laptop Computer (14 inches) (Chengdu Plant) -A	Laptop Computer (14 inches) (Chengdu Plant) -B	All in One (24 inches) (Zhongshan Plant)
Global warming	kg CO_2 eq	77.41	78.11	100.96	323.78
Stratospheric ozone depletion	kg CFC-11 eq	0.000036	0.000401	0.000048	0.000163
Ionizing radiation	kBq Co-60 eq	8.66	11.61	14.47	46.10
Ozone Formation, Human Health	kgNOx eq	0.22	0.18	0.28	0.85
Formation of fine particles	kg $PM_{2.5}$ eq	0.17	0.19	0.21	0.69
Ozone formation, terrestrial ecosystems	kgNOx eq	0.22	0.19	0.29	0.87
Soil acidification	kg SO_2 eq	0.36	0.36	0.44	1.29
Freshwater eutrophication	kg P eq	0.07	0.07	0.08	0.27
Ocean eutrophication	kg N eq	0.02	0.02	0.03	0.16
Terrestrial ecotoxicity	kg 1,4-DB eq	1,190.83	1,229.27	1,245.92	2,466.55
Freshwater ecotoxicity	kg 1,4-DB eq	22.18	25.17	27.24	70.77
Ocean ecotoxicity	kg 1,4-DB eq	29.22	32.98	35.53	91.99
Carcinogenic human toxicity	kg 1,4-DB eq	7.41	8.70	10.48	31.42
Non-carcinogenic human toxicity	kg 1,4-DB eq	347.56	381.99	402.40	1,014.40
Use of land	m^2 a crop eq	2.31	2.76	3.24	10.66
Water resources consumption	m^3	1.39	1.54	1.60	4.41
Scarcity of mineral resources	kg Cu eq	19.94	19.54	26.48	83.00
Scarcity of fossil resources	kg oil eq	0.92	0.96	1.05	3.32

2.3 Maintaining Customer Relations

2.3.1 Product Quality

Wistron not only focuses on product quality, but also continues years of design and manufacturing experience to win the trust of customers with complete product testing and strict quality control. Wistron's quality policy regards "deliver zero-defect and competitive products and services to customers on time" as the long-term quality management goal.

As the world's leading technical service provider (TSP) for the information and communication industry, we have introduced the ISO 9001 quality management system. We integrate the spirit of ISO, "say what you do, do what you say, document what you did" and continuous improvement, and PDCA management cycle into daily operation management. Therefore, it is possible to ensure that the quality policy can be implemented in detail, resulting in no major quality incidents in Wistron in 2022.

Wistron has established the "Quality and Hazardous Substance Management Systems Committee", which is chaired by the President of the Company. The various business units appointed committee members to implement the quality and hazardous substance management requirements to the various units under it.
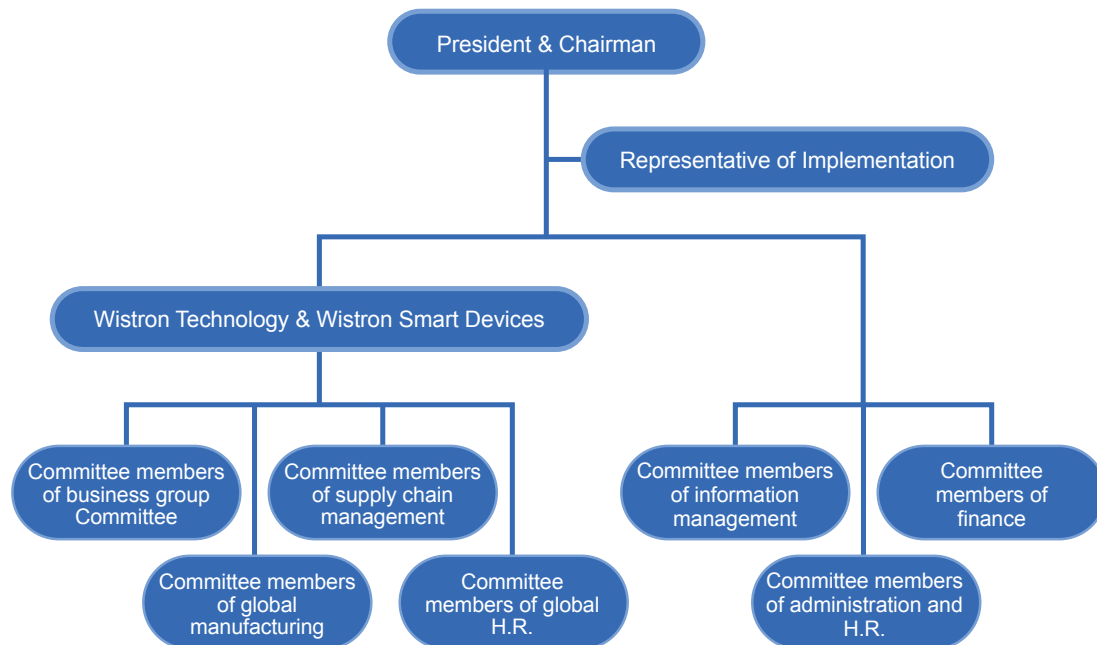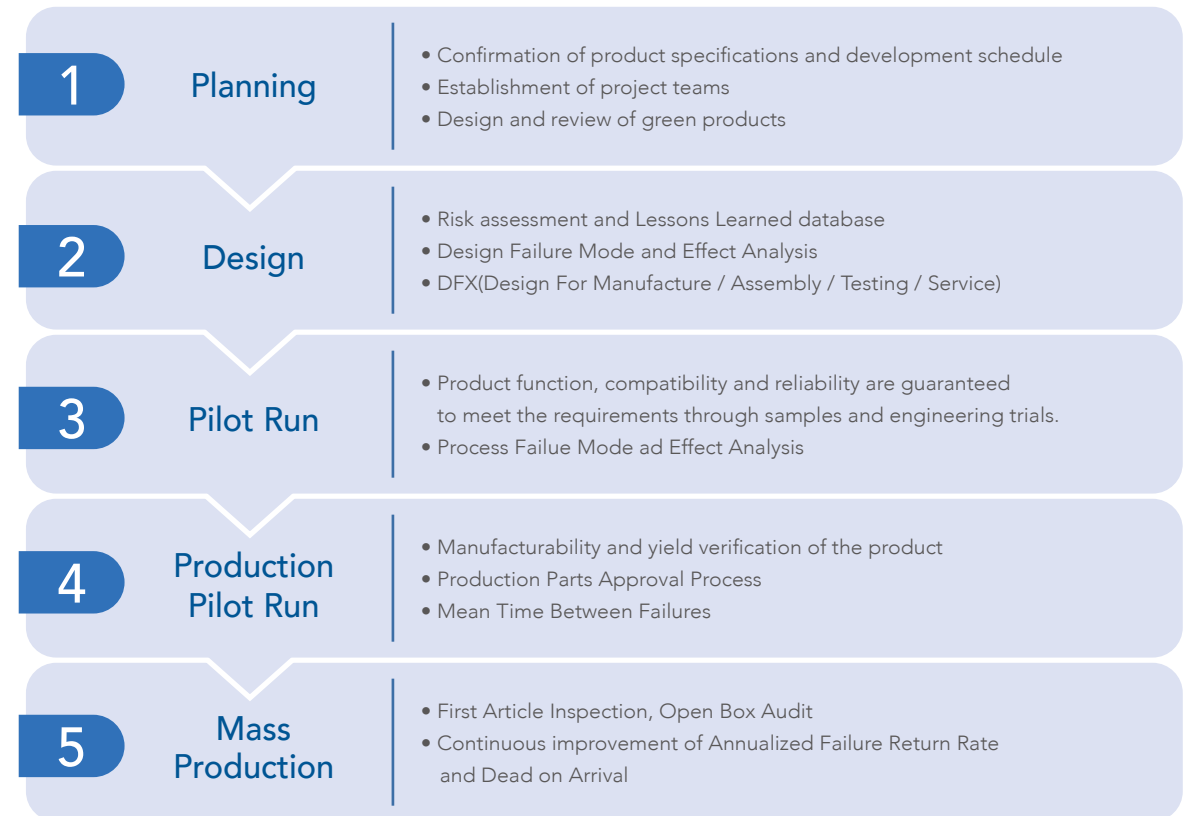
Quality Certification Testing

In order to meet the quality requirements of customers, Wistron's product must pass related quality inspections and tests to ensure that the products meet specifications and customer quality requirements before starting mass production. They include function certification, compatibility certification, reliability certification, environmental specifications and requirements, and DFx (design for manufacture / assembly / testing / service) requirements. In the early periods of design and development, we use risk assessments and the lessons learned database to jointly and continuously improve product design capabilities, ease of production, and product quality with Wistron plants.

In order to be able to develop high-quality products that meet the needs of customers and the market in real time, Wistron develops the process according to the product, including planning, design, pilot run, production pilot run, and mass production. At the same time, the digital transformation project was introduced to automate the design verification and standardize the process. Design problems are avoided in the front-end design to reduce the time and cost of the R&D unit's back-end debugging and verification-end repeated testing.

Product Development Process

1 Planning
- Confirmation of product specifications and development schedule
- Establishment of project teams
- Design and review of green products

2 Design
- Risk assessment and Lessons Learned database
- Design Failure Mode and Effect Analysis
- DFX(Design For Manufacture / Assembly / Testing / Service)

3 Pilot Run
- Product function, compatibility and reliability are guaranteed to meet the requirements through samples and engineering trials.
- Process Failue Mode ad Effect Analysis

4 Production Pilot Run
- Manufacturability and yield verification of the product
- Production Parts Approval Process
- Mean Time Between Failures

5 Mass Production
- First Article Inspection, Open Box Audit
- Continuous improvement of Annualized Failure Return Rate and Dead on Arrival

President & Chairman

Representative of Implementation

Wistron Technology & Wistron Smart Devices

Committee members of business group Committee

Committee members of supply chain management

Committee members of information management

Committee members of finance

Committee members of global manufacturing

Committee members of global H.R.

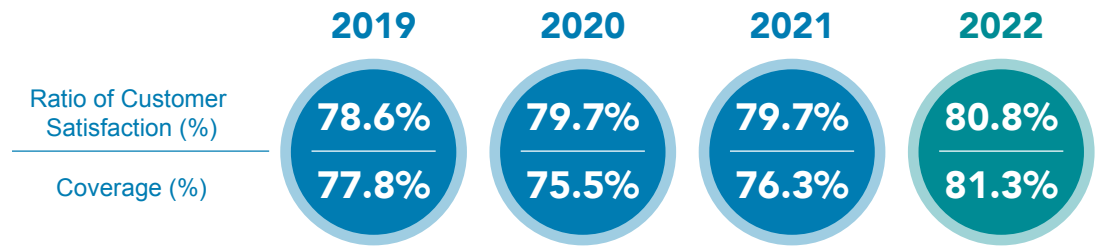Committee members of administration and H.R.

2.3.2 Customer Satisfaction

With the attitude of pursuing customer satisfaction and quality first, Wistron strengthens existing customer relationships. Moreover, we optimize the existing product portfolio to provide products and services that satisfy customers and exceed customer expectations. Our value is based on developing dependable partnerships with all customers.
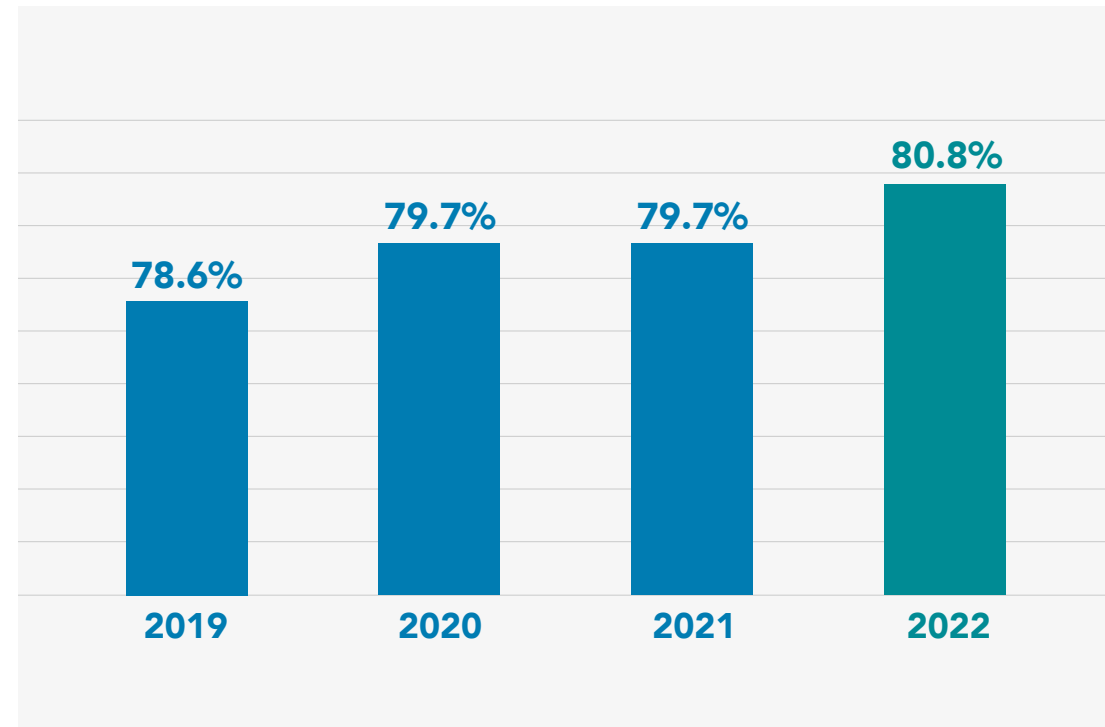
In order to improve customer satisfaction, we carefully listen to the voices of customers through internal assessment operations and customer satisfaction questionnaire, or through the process of customers' Quarterly Business Review (QBR) on Wistron's quarterly business performance (refer to the table). We will continue to improve related results. In 2022, we launched the Wistron Customer Satisfaction Questionnaire for the first time to all customers in addition to the feedback from the existing regular customer business performance appraisal. The ratio of customer satisfaction is 83.3%. In order to understand customers' multi-faceted feedback on quality, cost, delivery, service and technology, etc., it is used to actively respond to customer needs. Therefore, we look forward to bringing more benefits to customers and providing better services.

Customer Quarterly Business Review (QBR)

	2019	2020	2021	2022
Ratio of Customer Satisfaction (%)	78.6%	79.7%	79.7%	80.8%
Coverage (%)	77.8%	75.5%	76.3%	81.3%

Customer Satisfaction — Increase the ranking of client QBR year over year

Innovation of Products and Services — Improvement of product quality, creation or development of new services and methods to serve the activities of customers and markets

Customer Partnership — Build far-reaching partnerships centered on customer value

Helping Customers Improve Their Competitiveness — Providing customers with first-class products and services, and leading the industry, sharing product designs or new technological trends with customers

Ratio of Customer Quarterly Business Review Satisfaction (%)

2019	2020	2021	2022
78.6%	79.7%	79.7%	80.8%

Customer Complaint Handling Procedure

An effective customer complaint handling process has been established to ensure that customer complaint cases can be properly handled and resolved. This is an important task for Wistron to continuously improve and increase customer satisfaction. In addition to understanding customer needs through customer satisfaction, there is also a complete tracking process for customer complaints. At the same time, we can serve customers more flexibly and efficiently, and make adjustments according to their demands, according to industry characteristics and practical requirements. The procedures are mainly based on the RFQ (Request for quotation) or SOW (Statement of Work) provided by individual customers. Customized mission teams are organized to respond to the customers in a timely fashion and provide the best service and quality.

Input

Submitting customer complaints about product quality

Preliminary information provided to customers (within 24 hours)

Process

Confirmation of problem categories to carry out related processing procedures

SQM — Parts issues → **Asking suppliers for the Corrective Action Report**

Product replacement → Function Team → **Product recall for problem verification**

CFE/AQM → **Assess whether the issue harms or creates significant faults for the product function**

President → **Confirming if the product is recalled** — N → **End**

Engineering issues → Function Team → **The effective strategy to validate and responds to the failure analysis and corrective actions:**
1. Reply to customers within 3 working days at the earliest
2. Reply to customers within 5 working days at the earliest

Y → Function Team → **Propose plan and corrective actions**

CFE/AQM → **Review the effectiveness of CIP**

Output

AQM — **Weekly/monthly report on customer complaint handling to compile customer complaint analysis report and countermeasure strategy list**

AQM — **Provide CAR to customers**

SQM — **Supplier Corrective Action Report (SCAR)**

51

2.3.3 Privacy Protection

In order to implement personal data protection and management, Wistron refers to the regulations of the operational location and relevant requirements of the EU General Data Protection Regulation (GDPR) to establish Privacy policy. The Policy is the highest governing principle for privacy protection and covers all employees, suppliers, contractors, and external consultants of Wistron, subsidiaries, and joint venture companies with significant influence. The Policy contains clear regulations and requirements for personal data usage and protection. We require all members and partners to comply with the Policy, in order to effectively protect personal data and rights and interests.

At Wistron, the Audit Department proactively conducts Internal control system every six months in accordance with company policies. The scope of this audit activity includes the collection, processing, and transfer of personal data to ensure compliance with local regulations and internal codes of conduct.

Wistron has established privacy appeal channels. If incidents that may violate privacy or violate the Policy occur, the incidents may be reported through the privacy protection hotline, (02)6616-9999 ext. 25740 or the email address, web_master@wistron.com. In order to implement privacy protection, we periodically conduct trainings of privacy protection for all employees and review the effectiveness of the training. Wistron adopts a zero tolerance policy for privacy protection. If any personnel violates the Policy, the discipline will be determined by the regulations according to the Company's code of conduct.

Wistron is committed to ensuring the confidentiality of customer information and upholding the principle of good faith for customer privacy rights. Wistron absolutely complies with the Policy for customer information and will not use customer information for secondary purposes. Therefore, the percentage of using customer information for secondary purposes is 0%. From 2019 to 2022, no complaints or penalty related to privacy from external organizations or the competent authority were received.