

03

Products and Services



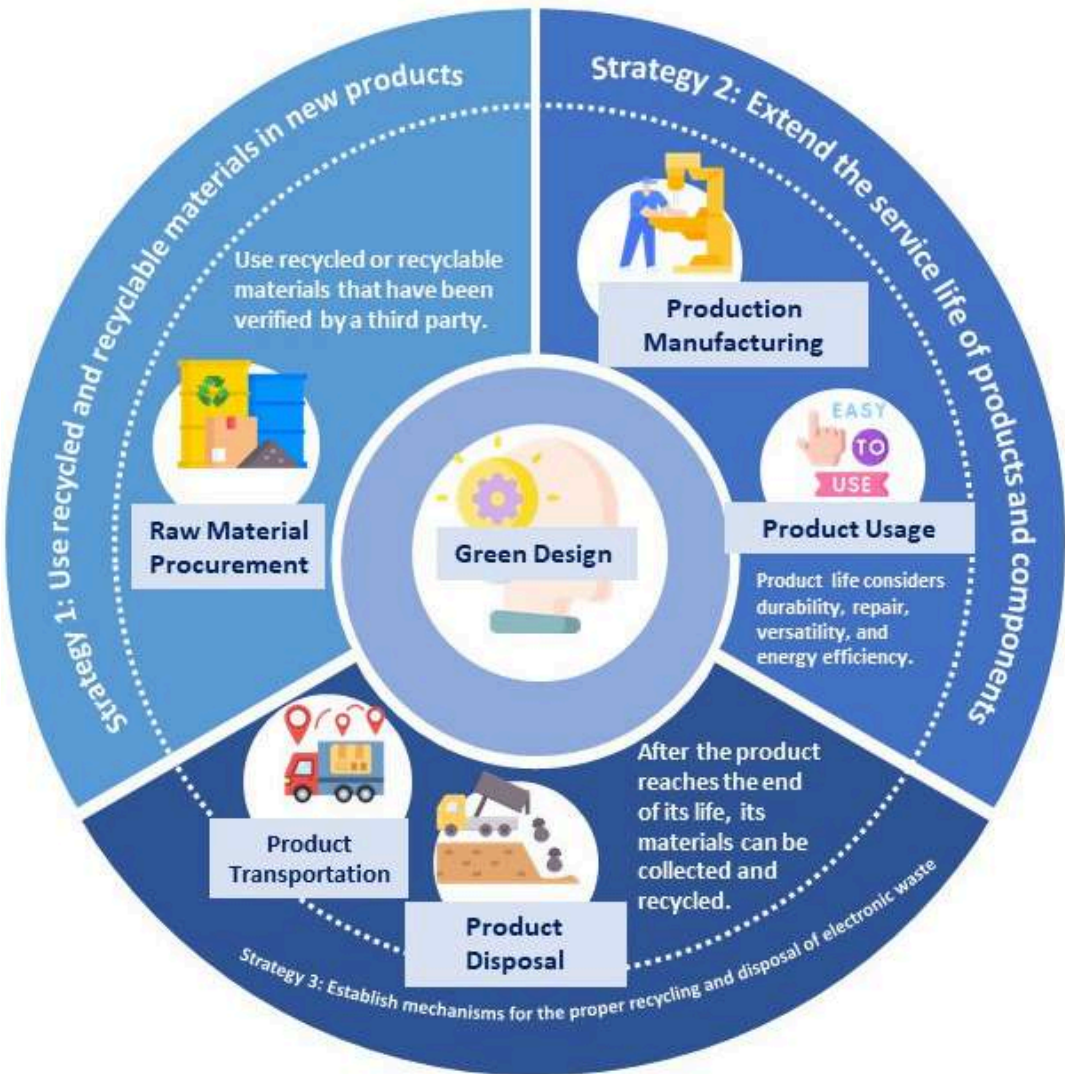
3.1 Green Design

Material Issues Impact Assessment and Management Approach

Impact Assessment	Positive: Growing customer concern about green product design, combined with In response to domestic and international carbon reduction and circular economy, drives the Company's investment in green product R&D and environmental protection. This also accelerates low-carbon transformation across supply chain and boosts the sustainable impact of the entire value chain.
	Negative: Failure to meet customers' green product requirements may reduce market competitiveness, affect investors' and shareholders' willingness to invest, and slow the Company's progress toward low-carbon transformation.
Policies and commitments	The Ennoconn Corportation Sustainable Procurement Guidelines and Ennoconn Sustainable Raw Materials Policy have been established, committing to lifecycle assessment covering product design, raw material usage, manufacturing, and packaging transportation. The Company is gradually setting carbon reduction targets to minimize environmental impact and maintains annual ISO 9001 quality management system certification.
Responsible unit	R&D Center and Global Operations Management Center
Management actions	Impact prevention & mitigation management: Actively formulate green product design principles and develop product models that have with environmental labels, comply with conflict mineral-free requirements, and meet international green regulations.
Action Tracking	Resources and actions: The President and Chief Sustainability Officer supervise KPI implementation.
	Target: Responsible units set KPIs to track achievement status.
	Were previous actions effective: Yes
	Lessons learned: Maintain or improve existing actions.
Stakeholder Engagement	Stakeholders include: customers, suppliers, and employees.
	Contact window: stakeholder concern communication channels.

3.1.1 Circular Economy and Green Design

Ennoconn promotes five major transformation strategies: digitalization, AI, energy, cybersecurity, and ESG. Product and service innovation is a vital opportunity for sustainable operations. By integrating software and hardware to add value, we enable customers to maximize the utilization of technological tools and provide tailored solutions. In line with the three major strategies for electronic product transformation to circular economy, as proposed by the World Economic Forum's Platform for Accelerating the Circular Economy, and Ennoconn has set its circular economy direction and targets. From the perspective of green design and development, we aim to shift from the traditional linear economy to a circular economy for electronic products, keeping products and raw materials within the electronic product circulation. This approach helps reduce carbon emissions, prevent excessive electronic waste entering landfills or incineration, and mitigates the risks of raw material shortages and supply chain disruptions.



Ennoconn prioritizes the concept of green design, considering the environmental and social impacts at each stage from a product lifecycle perspective. In the design stage, we enhance product resource utilization and low energy consumption to help customers achieve energy conservation and carbon reduction goals. We extend product durability using the 4R concept (Reduce, Recycle, Remanufacture and Reuse). In the raw material stage, we ensure materials comply with international green regulations such as REACH, RoHS, WEEE, PFOS, Halogen-Free, and conflict minerals requirements, reducing harmful substances and using raw materials with lower environmental, water, and energy impacts. Ennoconn is committed to continuously reducing greenhouse gas and wastewater emissions, waste, and chemicals through green manufacturing and services. From design and development, raw material procurement, production and manufacturing, product transportation, product use, to product disposal stages, we incorporate environmental and social impact factors to provide customers with the most sustainable products and services. Through the ISO 20400 Sustainable Procurement Guidelines training, R&D center and Sourcing employees are equipped with green product knowledge and understanding of the goals and impacts of sustainable raw materials.

Stages of Green Product Life Cycle Assessment (LCA)	Standards and Specifications	Actions
Design and Development	1.Ennoconn Sustainable Procurement Guidelines 2.Ennoconn Sustainable Raw Materials Policy 3.Outsourced Design Management Procedures 4.EU Restriction of Hazardous Substances (RoHS)	1.Streamlined Manufacturing Process. 2.Reduce Product Energy Consumption. 3.Extend Product Durability. 4.Component Circular Usage Design. 5.Increase the Ratio of Recycled Materials Used. 6.Conducting an assessment to prioritize raw materials.
Raw Material Procurement	1.Ennoconn Sustainable Procurement Guidelines 2.Ennoconn Sustainable Materials Policy 3.Biodiversity and No Deforestation Commitment 4.Conflict-Free Minerals Declaration 5.EU Chemicals (REACH)	1.Choice of raw materials or components that have a lower environmental footprint (e.g. select Low-Carbon, Low Environmental and social Impact, Low-Toxicity Materials). 2.Use Non-Conflict Mineral Materials and trace the origin of raw materials. 3.Hazardous Substance Management. 4.Prioritize the use and set target of recycled and renewable raw materials. 5.Prioritize the use and set target of third-party certified sustainable raw materials.
Production and Manufacturing	1.Incoming Material Inspection Standards 2.OEM Operations Management Procedures 3.Halogen-free	1.Improve Material (Component) Usage Efficiency. 2.Improve Manufacturing Process Efficiency. 3.Use Clean Energy (Green Energy) for Smart Manufacturing Production Lines.
Product Transportation	1.Packaging Material Incoming Inspection Instruction 2.Ennoconn Sustainable Procurement Guidelines	1.Reduce Product Packaging and Materials. 2.Adopt Biodegradable and Recyclable Packaging Materials. 3.Optimize Delivery Schedule and Routes with Low-Carbon Transportation.
Product Usage	1.Ennoconn Sustainable Procurement Guidelines	1.Component Circular Usage Design. 2.Reduce Energy Consumption and Carbon Emissions.
Product Disposal	1.Waste Electrical and Electronic Equipment Directive (WEEE)	1.End-of-Life Product Design (e.g. recycle, recovery, disposal and biodegradation).

3.1.2 Innovation and R&D Examples

Research and development form a vital foundation for the sustainable growth of the Ennoconn Group. In addition to continuously strengthening our presence in POS system markets and ATM market equipment, we also invest in certain resources in other markets, such as industrial control, fleet management, network communication security, medical care, and smart homes. Technology-related directions include wireless transmission (including 5G, GPS, WiFi, Bluetooth, etc.), handheld mobile devices, and RTOS-dedicated machines based on RISC or MCU. In the past, hardware development in highly specialized markets enabled shared benefits but has resulted in products lacking differentiation. To succeed in an increasingly competitive environment, R&D will shift toward more fundamental and specialized fields, such as 5G, AI, IoT, blockchain, and image computing, building higher competitive barriers. To safeguard Ennoconn's professional knowledge, strengthen quality and efficiency, preserve advanced technological achievement and leadership, enhance competitive advantages, the Board of Directors meeting approved the establishment of an intellectual property management organization on November 11, 2021 and formulated Intellectual Property Management policy that align with the Company's operational objectives, took effect following the Board's approval and announcement. Reports are regularly submitted to the Board of Directors annually in the fourth quarter, with the latest report submitted on November 13, 2024. Reports on implementation status include five major parts: patent management, trademark management, copyright management, trade secret protection, and human resources management. In 2024, Ennoconn and Ennoconn (Suzhou) accumulated a total of 11 valid patents on file, with R&D expenses increasing year by year. In 2024, compared to 2023, R&D investment increased by NT\$2.462 billion.

Year	Number of R&D Personnel	R&D Expenses (NT\$)	Number of Valid Patents on File
2021	54	7,397,394,000	7
2022	52	7,975,853,000	9
2023	47	9,123,481,000	11
2024	47	11,585,588,000	11

Ennoconn primarily implements three major green design strategies: 1. Innovative Modular Design: In certain new motherboard development projects for customers, Ennoconn adopts flexible and expandable structural designs that enable upgrades without replacing the entire unit. By replacing motherboards or universal modules through expandable solutions, this approach improves product adaptability, longevity, and scalability, reduces resource waste effectively, and supports environmental protection and sustainability goals. 2. Reduced Material Usage Design: While ensuring product reliability and performance, the thermal management mechanism of industrial control products developed is changed from fans to heat fins, which not only reduces material costs and assembly time but also maximizes efficiency with minimal cost while effectively reducing environmental burden during the supply chain manufacturing process; 3. Green Packaging Design: Ennoconn actively promotes eco-friendly packaging with core objectives of simplifying or recycling packaging, reducing shipping requirements, and improving logistics efficiency. For instance, in large gaming machine models, buffer packaging materials are optimized to serve both as protective packaging and shipping containers for mechanical components, significantly reducing packaging material use and waste while ensuring product safety. This initiative not only reduces resource waste and carbon footprint but also enhances transportation efficiency, achieving a triple-win outcome of environmental protection, waste reduction, and optimized logistics.

Successfully Developed Technologies or Products


Innovative Modular Design	<div>1.Developed smart meter HAN module with wireless meter reading technology that synchronizes with Taiwan Power Company data and automatically receives electricity consumption data to provide extended value-added services.</div> <div>2.Introduced a fanless compact industrial wide-voltage and high-performance AI BOX PC based on Intel Meteor Lake platform, providing diverse interfaces and built-in NPU computing units to deliver AI-related application computing power.</div> <div>3.Designed an affordable magnetic high-efficiency barcode scanner paired with dedicated POS terminal, featuring humanized structural design where the magnetic device can be placed on either side of the machine depending on usage scenarios, increasing flexibility in field equipment installation.</div> <div>4.Engineered proprietary failure prediction IC, providing standardized modular reference circuits, combined with cloud software-hardware integrated platform to provide monitoring data, recording and early warning capabilities, enhancing maintenance efficiency and offering subscription-based functional options.</div> <div>5.Collaborated with customers on the production and development of bar-style gaming machines, where the main system can be embedded and installed on the bar counter, improving main system space utilization.</div> <div>6.Designed a next-generation lottery machine system based on Intel Alder Lake-P platform, delivering a brand-new experience of lightweight, streamlined, and high-performance system integration.</div>
ESG Energy Conservation, Carbon Reduction, and Information Security	<div>1.Developed 56-channel smart electrical panel device to achieve cloud software-hardware integration, enabling multi-circuit monitoring to analyze power consumption by floor and formulate power-saving plans, thereby supporting energy conservation and carbon reduction goals.</div> <div>2.Established cybersecurity anti-hacking firmware and integrated related encryption mechanisms into IoT devices.</div>

Green packaging design: Examples of packaging reduction and eco-friendly solutions

Ennoconn actively procures products that promote environmental protection, or those that consume fewer environmental resources, emit less carbon, and cause less pollution throughout their manufacturing, usage, and disposal. We also encourage the use of circular economy, recycled materials in manufacturing processes or products.


Circular Reuse

>> Delivered motherboard products are packaged in reusable cardboard boxes




Reuse

>> Finished products use recycled and reusable cardboard boxes



Reduction

>> Use bubble bags to pack components and ship them together with cabinets to reduce the use of cardboard box packaging



3.1.3 Customer Satisfaction Survey

Ennoconn is dedicated to product development that meets all customer requirements through innovative services. The R&D Center prioritizes innovation and collaboration, formulating technologies and solutions that support environmental protection responsibilities. Green product design and supply chain management are key to driving the overall company's sustainable development. The Company has established management procedures and measures related to customer service to ensure professional service quality in all aspects. The Company also offers customers with various channels to submit suggestions or complaints. Upon receiving a case, the Company documents and tracks it, collaborate with relevant departments to discuss and analyze improvement methods, proposes preventive measures, and promptly communicates progress and solutions to the customer. No customer complaint incidents violating regulations and contractual requirements were occurred in 2024. Ennoconn places great importance on customer development and relationship management. The Smart Business Division conducts annual satisfaction questionnaire surveys with key customers, aiming for a target score above 80 points. The evaluation results and recommendations are compiled into tables and submitted to senior management for review. For areas with lower customer satisfaction scores, improvement plans are developed, written responses are provided to customers, and product and service quality are continuously enhanced to address customer needs. The 2024 customer satisfaction score of 84.6 points exceeded the target of 80 points.

Historical Customer Satisfaction	2021	2022	2023	2024
Score	80	82	81.7	<div>+1+ 84.6</div>