4 Green Operations

4.1 Eco Design and Sustainability Liability of Product

Name of materiality	Importance of this materiality to Advantech
Policy or commitment	Advantech responds to SDG 9 (Industry, Innovation and Infrastructure) and SDG 12 (Responsible Consumption and Production) by setting goals and implementing standards across product raw materials, design, manufacturing, and environmental management. We are committed to minimizing environmental impact and producing eco-friendly products.
Impact description	Advantech regards eco design and eco product sustainability as both a challenge and an opportunity. In the short term, in response to stringent regulations and evolving market demands, we are focused on strengthening R&D to overcome technical barriers. In the medium to long term, we strive to facilitate supply chain transformation to enhance overall competitiveness, generating both environmental benefits and economic benefits. **Positive impact：** ◆ Enhance corporate image: Low-carbon products help shape Advantech's sustainable image, meet the environmental sustainability requirements of international markets, strengthen marketing efforts, and expand the customer base. ◆ Implement product carbon footprint calculation: Promote carbon reduction through transparency in carbon footprint data and collaboration across the supply chain. Effectively address regional environmental regulations and carbon reduction requirements, while enhancing green competitiveness to support market expansion. ◆ Eco product innovation and sustainable raw material application: Effectively elevate brand value and attain long-term advantages by forming a green supply chain, choosing eco-friendly materials, optimizing logistics, and minimizing waste. **Negative impact：** ◆ Supply chain risks: Supply disruptions resulting from financial difficulties, natural disasters, political factors, or climate events impact production plans and delivery schedules, leading to a decline in customer trust and a weakening of market competitiveness. Adjustments made in response to energy-saving and carbon reduction requirements may lead to increased raw material costs and management complexity. ◆ R&D and technical risks: Eco product certification and low-carbon technology R&D demand high investment and long lead times. These are influenced by differences in certification standards and technological uncertainties, which may result in delayed market launches and weakened market competitiveness. At the same time, design costs may be affected due to the use of compliant materials. ◆ Post-launch sales impact: High costs and delays related to eco product certification and low-carbon technology R&D may result in low market acceptance and increased revenue dependency risks after launch, ultimately weakening brand competitiveness and sales performance. **Advantech's countermeasures to mitigate negative impacts：** ◆ Introduce green packaging materials and eco design, establish a green packaging material supply chain in conjunction with a recycled materials supply chain for mechanical components, supported by a dedicated material number classification system. Also, regularly review the environmental certifications of supply chain materials. ◆ The cost increase associated with using energy-saving key components will be managed through centralized selection and procurement by the procurement and parts management units, promoting component commonality and achieving cost reduction. ◆ Establish internal energy-saving standards by introducing x86 architecture systems with hardware energy-saving designs and energy-saving software development to meet the energy conservation and carbon reduction trend and requirements.
Key actions or programs	◆ Advantech product design standards: Continuously invest in eco design R&D using green materials (Advantech's low-halogen requirement) and product energy-saving design to increase the coverage of eco-friendly products. ◆ Increase the proportion of recycled materials and set targets for the use of recycled materials (plastic/metal) in eco design products. Green packaging materials feature reduction designs to achieve carbon reduction, demonstrating Advantech's commitment to environmental sustainability. ◆ Energy Star target setting: Choose appropriate product lines for design implementation ◆ Introduce energy-saving SW Utility into product design: Expand specific product lines to introduce Windows x86 products and increase the coverage of energy-saving products.

Name of materiality	Importance of this materiality to Advantech
Effectiveness assessment	◆ Eco Design Committee: The Project Process Management Department will convene relevant departments to formulate, implement, and manage standards, and revise the Advantech green ecologicaldesign standard guidelines according to international trends. ◆ Regular review and adjustment: The ESG-Environment team reviews target progress every two weeks to ensure the effectiveness of execution and strategy. ◆ External professional support: Invite consultants and lecturers to provide counseling and make sure that internal processes comply with policy and regulatory developments.
Stakeholder engagement	◆ Information disclosure and communication: Gather stakeholders' opinions through diverse channels and ensure transparency. ◆ Sustainability topic evaluation: Analyze operational impacts and risks, identify material topics and prioritize responses. ◆ Annual reporting and verification: Publish annual Sustainability Reports and undergo verification by external verification bodies. ◆ Continual internal communication: Strengthen the implementation and results of eco design and sustainability responsibility.

Annual initiatives, performances, and future goals

Integrate the Advantech eco design Silver medal standard to form internal regulations

Establish Advantech's energy-saving design and green material (Advantech's low-halogen requirements) internal regulations to effectively increase the coverage of eco products

Energy Star goal setting

Introduce Energy Star energy-saving design requirements for specific product lines and obtain the internal energy-saving Gold medal.

Optimization of eco design products

Continue to standardize the eco design product Silver medal standard guidelines as mandatory requirements for Advantech's new model development, as well as vigorously design and develop eco design product Gold medal models

Energy saving SW Utility development

By using energy-saving software to support hardware energy efficiency, introduce it into new x86 Windows specific product line models

2024 annual performance

60% new product percentage
The percentage of eco design system category products achieving the internal self-declared Silver medal certification

90% achievement rate
Products under 5kg use molded pulp packaging instead of EPE Achievement rate

14.04% revenue share
The revenue share of mass-produced products achieving eco design product Silver medal / Advantech Energy Saving Seal for the entire year.

91.2 %
Percentage of Advantech Low Halogen mechanical plastic parts used in products sold for the year

Achieved Goals	Description
2024	◆ Ensure that 100% of raw materials comply with international environmental protection regulations and Advantech Regulated Substance Standards. ◆ 60% of new eco design products attained Silver medal (successfully achieving the annual target) ◆ The revenue share of mass-produced products achieving eco design product Silver medal/Advantech Energy Saving Seal for the entire year reached 14.04% (successfully achieving the annual target) ◆ All new standard system is 100% compliant with ErP energy-saving design specifications ◆ The newly developed model's external mechanical components are required to comply with Advantech's low-halogen requirement.
2025	◆ Continuously ensure that 100% of raw materials comply with international environmental protection regulations and Advantech Regulated Substance Standards ◆ Over 80% of new eco design products achieve Silver medal ◆ Mass-produced products achieve Silver medal for eco design products/ Advantech Energy Saving Seal, accounting for 15% of annual revenue ◆ 20% of new products in selected product lines meet Energy Star reqirements or received Advantech internal Gold Label for energy-saving performance. ◆ For new products in specific product lines, the adoption rate of Software Utility in x86 Windows Image will reach 20%
2026	◆ Continuously ensure that 100% of raw materials comply with international environmental protection regulations and Advantech Regulated Substance Standards ◆ Over 90% of new eco design products achieve Silver medal ◆ Mass-produced products achieve Silver medal for eco design products/ Advantech Energy Saving Seal, accounting for 20% of annual revenue ◆ 25% of new products in selected product lines meet Energy Star reqirements or received Advantech internal Gold Label for energy-saving performance. ◆ Achieve Gold medal in four major aspects: Specific product line 5% ◆ For new products in specific product lines, the adoption rate of Software Utility in x86 Windows Image will reach 40%

4.1.1 Product Eco Design and Lifecycle Management

Advantech follows the concept of product lifecycle, using life-cycle assessment (LCA) and product carbon footprint to quantify the environmental impact analysis of Advantech products. The assessment covers carbon emissions across all stages, including raw material selection, manufacturing, transportation, usage, and final disposal. The Company will establish carbon reduction targets and implement corresponding actions, integrating these goals into its overall operational management strategy.

In addition, Advantech has established eco product design management and standard guidelines, integrated into the product lifecycle process to guide Product Departments in creating eco-friendly and innovative products.

Different stages of product lifecycle	綠色設計準則	Regulations, standards, guidelines	Results and benefits (Achievements as of 2024)
Raw material selection	Green materials Green packaging materials Product Recycling	1. Advantech GPM Controlled Substances Standard 2. Advantech Green Ecological Design Standard Guidelines 3. Advantech Green Policy-Hazardous Substances Reduction Plan	**Management and reduction of hazardous substances and the introduction of recycled materials** 1. By the end of 2024, all newly developed models are required to comply with the compulsory introduction of Advantech's low-halogen requirements. The proportion of mechanical plastic parts meeting the "Advantech Low-Halogen Control" reached 91.2%, representing a 4.2% increase. 2. Select representative products based on product type to incorporate recycled materials. Models to undergo pilot production in 2025 ◆ The external structural components of fanless embedded computers (ARK-1125C, ARK-1222) utilize metal steel containing 13% recycled content. Recycled materials are used in 3.2% of the products ◆ The external structural components of the all-in-one (AIO)computer (GSC-7153W) and medical devices (POC-6) utilize plastic containing 30% recycled content. (Medical equipment also undergoes rigorous chemical resistance testing). Recycled materials are used in 9.4% of the products
Product manufacturing process	Green materials Green packaging materials Product Recycling	1. Advantech GPM Controlled Substances Standard 2. Advantech Green Ecological Design Standard Guidelines 3. Environmental and Occupational Health and Safety Policy	**Process hazardous substance management and recycling** 1. The generation of waste and pollution is minimized during the production process, and harmful chemical substances are prohibited. 2. Waste solder dross recycling: ACL introduced a project for solder dross recycling in 2022. Using a solder dross separator, harmful waste solder dross has been successfully recycled, achieving a recycling rate of 70%. Nearly five tons of solder dross have been reused, thereby reducing the generation of hazardous waste. For details, please refer to 4.4.2. Energy Resource Use and Waste Management
Distribution and transportation	Green materials Green packaging materials	1. Advantech Green Ecological Design Standard Guidelines 2. Environmental and Occupational Health and Safety Policy	**Green packaging material optimization and logistics packaging material recycling** 1. According to the guidelines outlined in the Advantech Green Ecological Design Standard Guidelines, the Company will use at least 90% recycled fiber materials for cardboard boxes to lower packaging material usage, improve packaging design, and optimize packaging dimensions to minimize environmental impacts during transportation. 2. Recycle cardboard boxes used for supplier incoming, outgoing, and installation processes to reduce packaging material waste. For details, please refer to 4.4.2. Energy Resource Use and Waste Management 3. Advantech' s new products are designed to reduce size and weight through eco product design. Furthermore, beginning in 2025, the Company will utilize vehicles powered by 10% sustainable fuel for overseas air freight, aiming to reduce carbon emissions from product transportation.

Different stages of product lifecycle	綠色設計準則	Regulations, standards, guidelines	Results and benefits (Achievements as of 2024)
Product usage stage	**Product energy saving**	Advantech Green Ecological Design Standard Guidelines	In 2024, Advantech continued to advance green design by integrating energy-saving features into software modules during the R&D stage to enhance product energy efficiency. A new power-saving software suite was successfully developed based on existing utility modules and implemented on x86 Windows-based products (e.g., AIR-150). Energy consumption testing under maximum power-saving scenarios indicates that the product can reduce approximately 242.4 metric tons of carbon emissions annually starting in 2025. This achievement significantly reduces environmental impact and contributes to a broader adoption of energy-efficient solutions across the company.
Product waste recycling management	**Product Recycling**	Advantech Green Ecological Design Standard Guidelines	**The product's easy disassembly and recycling design, and waste management** 1. Design products for ease of recycling and disassembly. Based on product categories, conduct actual inventories and calculate the proportion of recyclable products. In 2024, the average recyclability rate reached approximately 97%, a 3% increase compared to the previous year, exceeding the requirements of the WEEE Directive. 2. 2. Product waste management: In response to WEEE specifications, Europe collaborates with product recyclers to reuse resources and prevent improper or illegal disposal. Comply with waste recycling regulations in various countries according to Extended Producer Responsibility (EPR), covering major markets including Asia, Europe, and the Americas.

Table 4.1.1 Eco design product LCA

Eco product design management and standards formulation

Advantech’ s standards are grounded in international environmental regulations and assessment tools, such as the U.S. Electronic Product Environmental Assessment Tool (EPEAT). These standards focus on four major aspects of products: (1) green materials, (2) green packaging materials, (3) product recycling, and (4) product energy saving. Environmental impacts are evaluated at different stages of the product lifecycle. Drawing on extensive experience in regulatory compliance and collaboration with global brand customers, Advantech has established the Green Ecological Design Standard Guidelines to enhance energy efficiency, promote ecological design, and reduce environmental toxicity and hazards.

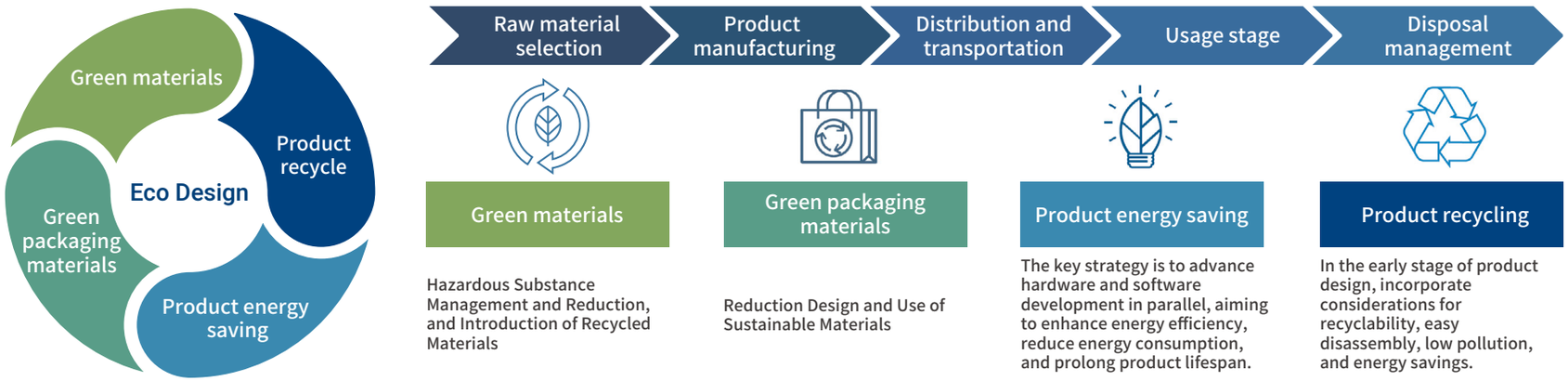


Figure 4.1.1 Product lifecycle and Advantech's eco product design aspects

Advantech develops intelligent product carbon footprint solution to comprehensively manage product carbon footprint.

Amidst the global net zero and carbon neutral trend, the industrial PC industry must not only provide high-performance, low-power solutions but also actively implement carbon reduction measures to meet the sustainability requirements of customers, investors, and the international market. With the implementation of the EU's Carbon Border Adjustment Mechanism (CBAM), national carbon disclosure policies, and growing emphasis from major multinational corporations, transparency in carbon footprint disclosure has become a key factor in maintaining international competitiveness.

In light of this, Advantech launched a product carbon footprint inventory project in 2023 and, in the same year, obtained the first ISO 14067 verification for an integrated computer product's carbon footprint. Through product life-cycle assessment (LCA), we evaluated the depth of material selection and identified the top five key materials contributing to the carbon footprint. Additionally, in the same year, we completed the establishment of Advantech's product carbon footprint inventory methodology, laying the foundation for the internal development of product LCA. Starting in 2024, we successively completed carbon footprint inventories for representative products across various business units and initiated the construction of Advantech's internal Product Carbon Footprint Intelligence Platform, creating our intelligent solution for product carbon footprint calculation, which is applied to eco product design projects.

Advantech is actively developing a product carbon footprint calculation system, which will not only help determine the carbon footprint of each product on the market but also promote carbon pricing and product carbon footprint reduction strategies. This system adopts the LCA methodology, referencing international standards such as ISO14040, ISO 14067, and the GHG Protocol. By integrating Advantech's internal raw material, supplier information, and production management systems with external APIs, and incorporating AI technology to build a carbon footprint factors database for each raw material, the system can rapidly calculate product carbon footprint and generate carbon footprint reports. This allows for the evaluation of emissions during various stages of the product lifecycle. It is expected that the calculation of all products sold in 2024 will be completed by 2025, accounting for about 100% of the total revenue.

This system not only simplifies the complex manual calculation process but also enables Advantech to quickly identify product emission hotspots, laying a solid foundation for future reduction efforts. Through this system, Advantech can not only actively adjust design and production strategies by identifying products with high carbon emission risk in advance but also offer customers the necessary product carbon footprint information to meet global customer demands, further strengthening Advantech's leadership position in sustainability.

4.1.2 Product Liability

Advantech integrates eco design and circular design principles into the product lifecycle during the development process, emphasizing strategies, goals, and directions. The Company is committed to continuing to research and develop innovative eco products and solutions, delivering high-efficiency, reliable energy-saving integrated solutions and services, while minimizing waste generation at the source of design. We will continue to uphold the eco design philosophy by implementing strategies such as low-carbon material selection, product lifespan extension, and value enhancement. Our products will be free of hazardous substances, easy to disassemble and recycle, and designed to increase the use of recycled materials. Through these efforts, we actively practice the principles of Reduce, Reuse, and Recycle, promote corporate producer responsibility, and support the achievement of SDGs.

Raw material selection

To mitigate the negative environmental and social impact of raw material use, Advantech has established the "Hazardous Substances Reduction Plan" and the "Sustainable Raw Materials Management Policy" to implement sustainable procurement and optimize supply chain management efficiency, further contributing to the realization of the net zero by 2025 target. In line with this policy, we prioritize the use of raw materials with minimal environmental and social impact across all business activities, including R&D, procurement, production, operations, and services.

Green materials and hazardous substance management

Every year, Advantech reviews the current status of hazardous substance management in accordance with international regulations, the IEC 62474 electronic industry standard, customer requirements, and environmental trends. Based on this, the Company established the Advantech Green Policy (Hazardous Substances Reduction Plan), which goes beyond international regulatory requirements. By 2024, we had successfully controlled over 500 chemical substances. Furthermore, we regularly update the Advantech eco product hazardous substance management regulations, which are managed through the Green Product Management System (GPMS). Advantech is also a Sony Green Partner, and our main factories have implemented the IECQ QC 080000 system. Upholding the spirit of rigorous quality management, we continuously control every aspect of product responsibility, ensuring that all Advantech products comply with relevant regulatory requirements. In 2024, we introduced recycled materials for product pilot production to realize the SDGs. In 2024, Advantech products did not violate any international directives on prohibited and restricted substances, nor did they exceed the threshold limits for prohibited and restricted substances in any related incidents.

Furthermore, we have also implemented the concept of reducing per- and polyfluorinated alkyl substances (PFAS) according to US regulatory requirements in 2024. We also initiated a comprehensive PFAS inventory to assess the presence of PFAS in our products and supply chain, and are actively promoting a phased reduction plan to lower environmental and health impacts.

Figure 4.1.3 Advantech Green Policy - Hazardous Substances Reduction Plan

Note: For all relevant details on hazardous substance management, please refer to the-
Advantech' s Green Policy, which includes: Commitment to Hazardous Substance Management ; Hazardous Substance Reduction Plan ; Environmental and Human Health Risk Assessment

Performance presentation

Continue to achieve 100% compliance of raw materials with international environmental regulations

IEC 62474

Advantech GPM Regulatory Substance Standards

(All raw materials are disclosed and declared according to IEC 62474-related substance usage, accounting for 100% of product revenue)

Raw Material Source Management	◆ Select qualified suppliers, uploadinformation on Green Data platform. ◆ Establish Advantech's regulated substances standards. ◆ Component part compliance through approval processes and review by green reviewer.
Substance and Component Risk Assessment	◆ Assess substance usage in Advantech products ◆ Ensure component compliance with the latest regulations.
Product Compliance Reports	◆ Evaluate Advantech products for RoHS & REACH compliance. ◆ Assess compliance with other relevant regulations.
Information System Integration	◆ Green Mark management.
Supply Chain Information Communication	◆ Advantech information announcement. ◆ Notification of regulatory updates and customer requirements.
Conflict Minerals Investigation	◆ Completion of conflict minerals reporting forms as required by RBA. ◆ Maintain an up-to-date smelter registry , promptly initiate investigations, and generate compliant reports.

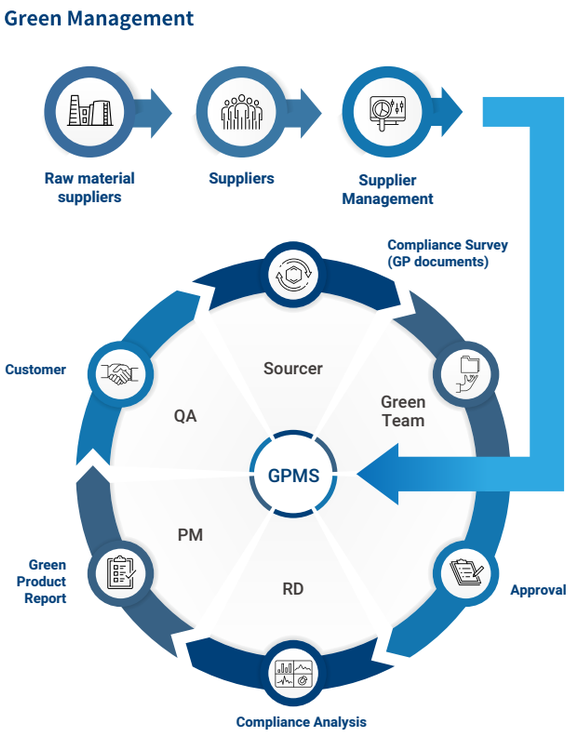


Figure 4.1.4 Green Product Management System (GPMS)

Sustainable raw material management

As part of Advantech's raw material procurement strategy, we conduct sustainability risk assessments, in addition to cost-benefit considerations, to determine procurement priorities and ensure the effective implementation of sustainable management. We collaborate with suppliers to increase the transparency of raw material sources, assess the potential environmental and social impacts of their development and production processes, and select the most appropriate raw materials for Advantech based on the outcome of supplier sustainability risk assessments.

In the third quarter of 2024, Advantech launched the sustainable raw material project to evaluate the use of recycled materials by tracing the source of raw materials. Moreover, recycled materials were introduced to major business groups to conduct the pilot production plan. The project extends into the first quarter of 2025, and it has successfully achieved its phase goals, including compiling statistics on raw material traceability, evaluating the effectiveness of trial integration of recycled materials into product structural components, and drafting preliminary targets for future implementation. In terms of raw material traceability, considering the characteristics of Advantech's products, we prioritize the top three raw materials by usage volume for implementing control: plastics, steel/iron, and aluminum. These three recycled materials were introduced to the sustainable raw materials pilot program. Furthermore, in addition to managing product structural components, we also conducted a traceability survey for packaging materials. Currently, the implementation outcomes of recycled material usage ratios, categorized by product type, are detailed in Figure 4.1.4.

Raw material category		Raw material usage (ton, pcs)	Recycled material usage percentage (%)
Mechanical materials (ton)	Plastic	121.510	0
	Iron/steel material	599.095	0
	Aluminum material	170.244	0
Packaging material (pcs)	Plastic bags/ bubble bags	10,297,701	0
	Cardboard boxes	6,289,309	90
	EPE cushioning material	8,979,745	0

Table 4.1.2 2024 raw material usage overview

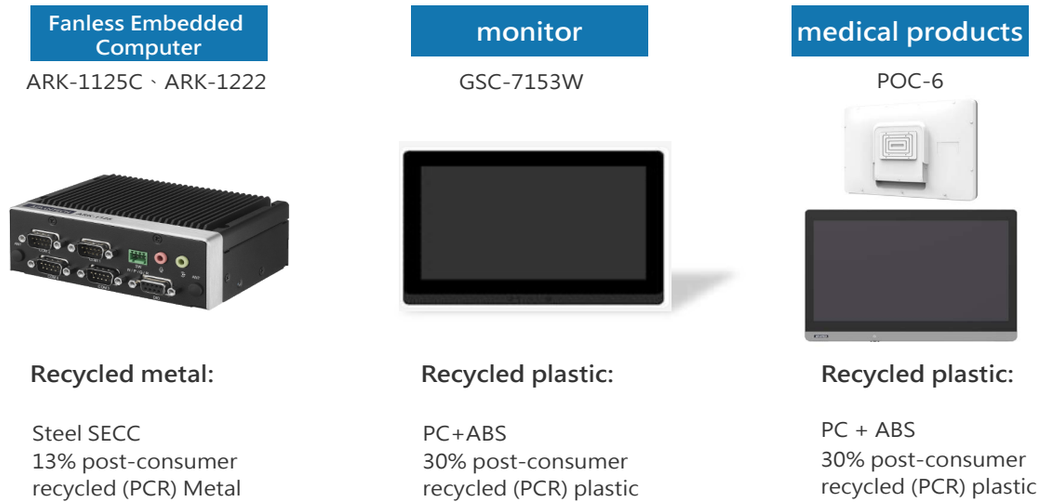


Figure 4.1.5 Sustainable raw material pilot program implementation effectiveness

Targets have been established for the use of recycled materials (plastic/metal) based on project analysis and international trends. In addition, specific recycled material content requirements have been defined for mechanism casings and components of selected models.

Year	Recycled Material Usage Targets for Mechanical Components (Plastic/Metal)					
	Plastic (Recycled Material Content Percentage)		Metal (Recycled Material Content Percentage)			
			Steel material		Aluminum material	
2025	External Mechanical Components	>30%	External Mechanical Components	>10%	–	
2026	Mechanical Components	>30%	Mechanical Components	>10%	Mechanical Components	>50%
2030	Mechanical Components	>50%	Mechanical Components	>20%	Mechanical Components	>80%
Note: The foregoing mechanism casing or component refers to Advantech-designed parts and follows Advantech's eco design product Gold medal criteria.						

Table 4.1.3 Target setting for recycled material (plastic/metal) usage in eco design products

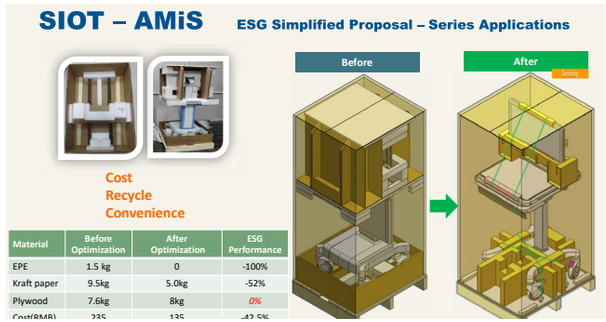
Green packaging materials

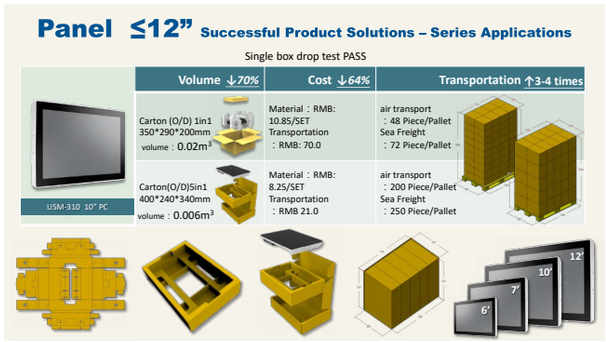
Reduction design and usage of sustainable materials

To make tangible contributions toward biodiversity, deforestation prevention, and land preservation, Advantech requires key packaging material suppliers to obtain FSC ™ CoC (Forest Stewardship Council Chain of Custody) certification. As of 2024, we have successfully applied FSC ™ certified paper materials to the packaging cardboard boxes of one Network model.

Since 2023, the product packaging design team has actively optimized green packaging by adopting honeycomb design dividers to replace traditional EPE cushioning materials and increasing the proportion of recycled materials used. At present, our packaging materials contain over 90% recycled fibers, achieving 100% of the target. For packaging materials of products weighing 5kg or less, molded pulp is used to replace EPE. The achievement rate reached 90% in 2024.

Additionally, the successful implementation of the product project in medical products and AIO computers has enhanced our green packaging design capabilities while maintaining product safety standards. Key optimizations include improved packaging design, redesigned stacking methods based on reduction principles, increased shipment efficiency through packaging adjustments, and the adoption of sustainable materials. These efforts have led to a downward trend in material usage and costs, as well as reduced transportation frequency, thereby effectively contributing to carbon reduction across several aspects and demonstrating Advantech's commitment to environmental sustainability.





Product energy saving

Product usage stage

Key strategies are implemented on hardware and software to improve energy efficiency, decrease energy consumption, and extend product lifespan.

Hardware: Continuing previous energy-saving targets, design internal regulation standards were officially adopted in new standard products with X86 architecture in 2024. Certain products are designed in alignment with Energy Star standards standard, serving as benchmark models that deliver greater carbon reduction benefits and progressively enhance overall emission reduction performance.

New Products

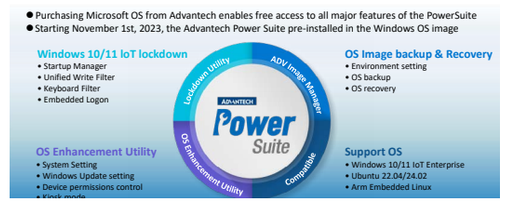
New Products Achieve Eco Design Silver Medal	Advancing Product Energy-saving Design
Standardization of Green Design Silver Criteria	Aiming for Energy Star Ready
◆ Introduce low-halogen into product design standard	◆ Each business group nominated Panel PC/ Box PC products
◆ Introduce energy-saving into product design standard	

Software: Starting in 2024, the EIoT Software and Hardware Team vigorously researched and developed energy-saving features for software modules, successfully implementing them in the Power Suite software module. Through BIOS energy-saving detection suggestions, OS energy-saving settings, and optimized power management, equipment energy consumption was lowered effectively. The introduction of model trial runs was completed for the X86 system product AIR-150 and the RISC platform EPC-R3720. Furthermore, a standardized energy consumption testing mechanism was developed to ensure the software energy-saving effectiveness. In maximum energy-saving mode, carbon emissions can be reduced by 242.4 tons annually. In 2025, this feature is expected to be introduced to new specific product lines, including Windows x86 products, significantly expanding the coverage of energy-saving solutions.

Software Power-Saving Module

Software-Assisted Power Efficiency for Products

Software developed for selected x86 & RISC platforms



EIoT AIR-150

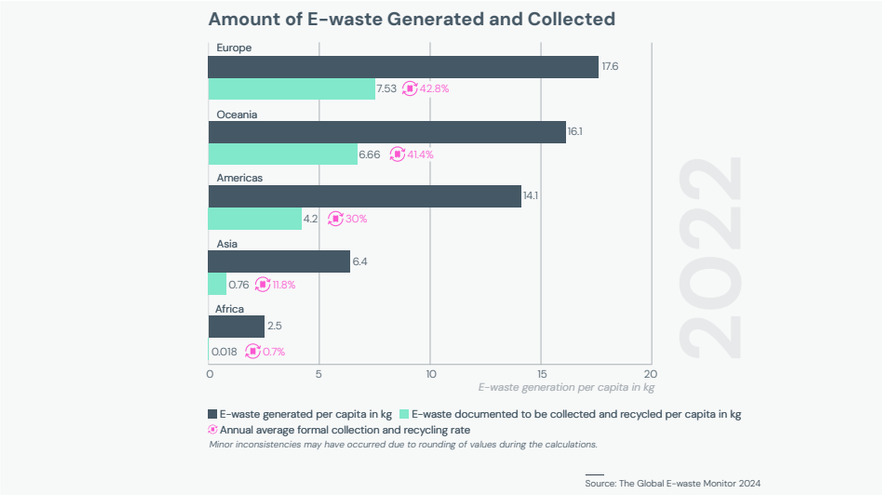
EIoT EPC-R3720

Product recycling

Extended producer responsibility

By incorporating design considerations for easy recycling from the initial product design phase, such as "recyclability, ease of disassembly, low pollution, and energy saving," Advantech has set a target recycling rate of 90% for its eco design products. Adhering to the principle of producer responsibility, we are committed to e-waste recycling management and, through legally required recycling programs, aim to promote the reuse and circularity of electronic products. The calculation of the proportion of recyclable products was carried out based on product category and inventory, and the average reached nearly 97% in 2024, an increase of 3% compared to last year. This is higher than the WEEE directive requirements.

Comply with local waste recycling laws and regulations in various countries, including Europe, the United States, Japan, Korea, Taiwan, and Kunshan. According to Global Transboundary E-waste Flows Monitor 2022 and 2024, the global e-waste reached 62 million tons, and the recycling rate was only 22.3%. In particular, the recycling rates for Asia, the United States, and Europe are 12%, 30%, and 42.8%, respectively. By utilizing these regional recycling rates, the percentage of global actual product recycled can be estimated, providing a basis for calculating realistic recycling data.



Source: Global Transboundary E-waste Flows Monitor 2024

	Global recyclable weight of products (Metric ton)	Total weight of actual product recycled (Metric ton)	Percentage of global actual product recycled (%)
2020	8,705	1,238	12.8%
2021	10,795	1,529	12.7%
2022	10,041	1,460	13.1%
2023	8365	1,026	11.5%
2024	7766	1136	14.2%

Table 4.1.5 Advantech's global actual product recycling ratio

For recycling in Europe, we comply with the WEEE directive. For customers within the EU, when products reach the end of their service life or when customers request the disposal of Advantech products, we can provide information on nearby registered recycling points to ensure proper waste disposal. In addition, customers can also notify us to arrange transportation of waste equipment to contracted recycling organizations for processing.

4.1.3 Eco Label and Self-Declared Environmental Statement

Advantech continues to invest in the R&D of eco products. By establishing internal regulations for product energy saving and green materials, improving product green packaging, and following guidelines such as reducing environmental toxicity hazards, ease of assembly and disassembly, and ease of material resource recycling, we can materialize product designs that are more energy-efficient and provide greater eco benefits. Advantech achieved an eco design Silver medal ratio of 60% for new products in 2024, and the revenue share of eco design Silver medal-certified products/ Advantech Energy Saving Seal products reached 14.04% , implementing eco design thinking in all aspects of the product lifecycle and effectively demonstrating circular economy performance. Additionally, we adhere to the Sustainable Accounting Standards Board (SASB) guidelines, calculating the proportion of our sales from products compliant with Type 1 eco label (such as Energy Star and CE ErP) as a percentage of total corporate revenue. This metric serves as one of the indicators for investors to assess our sustainability performance and demonstrates the green competitiveness of our products.

1. Type 1 of eco-label：

Proportion of revenue from industry certification standard products

Certification standards	2022	2023	2024
Product have obtained CE ErP, or Energy Star certifications	0.75%	2.79%	3.05%
Products comply with EPEAT equivalent standards	3.1%	9.74%	14.04%

Obtained Energy Star energy-saving label and ErP European Energy-related Products Directive certification in the past 3 years.

Certification standards	Product category
Energy star energy-saving label	Certification completed for specific products such as embedded computers/Panel PC equipment, and BOX PCs
CE ErP European Energy-related Products Directive	Newly developed computer products based on the x86 architecture

2. Self-declaration eco declaration: The planning and implementation of Advantech's internal eco design seal and energy saving design seal classification declaration are as follows

Internal declaration label for the four major aspects of eco design

Description	Internally declared eco design product labels
The Gold medal is awarded to products that meet both the mandatory and optional criteria across the four major aspects defined in Advantech's ecological design guidelines and successfully pass the evaluation	
The Silver medal is awarded to products that meet all mandatory criteria across the four major aspects outlined in Advantech's ecological design guidelines and successfully pass the evaluation	

1.For the calculation of the new Eco Friendly Products ratio, please refer to the calculation standards for various environmental indicators
2.For the calculation of the revenue share achieved by eco design Silver medal products/Advantech Energy Saving Seal products, please refer to the calculation standards for various environmental indicators
3.For the calculation of the revenue share of product sales meeting Type 1 eco labeling criteria, please refer to the calculation standards for various environmental indicators
4.Advantech's eco design standard guidelines are formulated based on EPEAT. For more information, please refer to Chapter 4.1.1 Formulation of Eco Product Design Management Standards

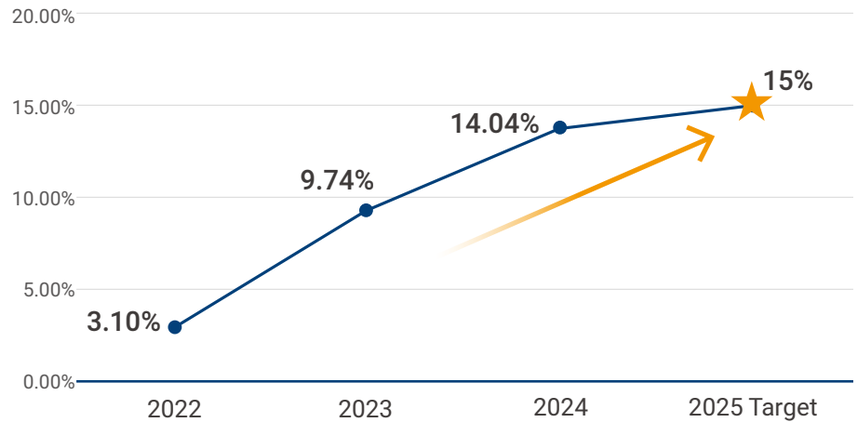
Number of new products eco design Silver medal/Gold medal

Year	2022	2023	2024
Silver medal	20%	37%	60%
Gold medal	-	-	Specific model ARK-1125C

Advantech energy-saving design classification declaration label

Description	Internal energy-saving label
The product's energy efficiency complies with the Energy Star testing standards	
The product's energy efficiency complies with the ErP testing standards	

2024 revenue share achieved by eco products/Advantech Energy Saving Seal products: 14.04%



Advantech's eco design product Silver medal and Gold medal model

Advantech's eco design product Silver

Product categories include digital signage players and mini PCs, medical all-in-one systems, touch panel computers, embedded computers, fan less embedded industrial computers, and others.

Eco Product Design Management Mechanism

Advantech establishes standards from four major aspects of products: (1) green materials, (2) green packaging (3) Product Recycling, (4) product energy saving, to evaluate the environmental impact at all stages from raw material selection, manufacturing, transportation, and use stages until the final disposal, and design innovative green eco design products to comply with international regulations and customer needs.

(1) Green materials _ Substance Management

(If the product contains the following component, it meets the following requirements.)

- Conformance with provisions of European Union RoHS Directive, China RoHS, Taiwan BSMI RoHS, IEC62474, REACH, POPs...etc.
- Conformance with substance restriction requirements of the European Union Battery Directive. (If product contains batteries)
- No mercury is intentionally added to the light source. (If product contains LCD)
- External mechanical plastic parts (homogeneous parts) larger than 25 g do not contain brominated, chlorinated flame retardants, PVC.

(2) Green packaging

- Conformance with EU packaging Directive.
- The chlorine used as a bleaching agent in paper packaging materials is less than 1000 ppm. (Cl < 1000 ppm).
- Corrugated paper contains recycled fibers. (85%~90%)

(3) Product Recycling

- Conformance with EU WEEE Directive.
- External mechanical plastic parts larger than 100g do not contain plating and surface coating (except paint) that are not easy to be recycled and reused.
- All plastic parts larger than 25g are marked according to ISO 11469.
- All External mechanical plastic parts larger than 100g only use a single type of plastic pellets.
- The green products are designed to be recyclable, easy to disassemble, low in pollution, and energy-efficient, with a recycling rate of 90% or higher.
- WEEE Recyclability Assessment

  The actual inventory and calculation of the recyclable proportion of products based on product categories were conducted, reaching approximately 94%, which is higher than the WEEE directive requirements.

(4) product energy saving

- Conformance with ERP Directive. ENERGY

ITA-178

POC-4

TPC-100

TPC-307W

UNO-238 V2

UBX-110K

AIMB-308;IPC-320

UNO-137 V2

AMAX-5086

UBX-210K

ARK-1221L

MIC-770 V3

PPC-415W

Advantech's eco design product Gold

Product category includes fan less embedded computers.

Eco Product Design Management Mechanism

Advantech establishes standards from four major aspects of products: (1) green materials, (2) green packaging (3) Product Recycling, (4) product energy saving, to evaluate the environmental impact at all stages from raw material selection, manufacturing, transportation, and use stages until the final disposal, and design innovative green eco design products to comply with international regulations and customer needs.

(1) Green materials _ Substance Management

(If the product contains the following component, it meets the following requirements.)

- Conformance with provisions of European Union RoHS Directive, China RoHS, Taiwan BSMI RoHS, IEC62474, REACH, POPs...etc.
- Conformance with substance restriction requirements of the European Union Battery Directive. (If product contains batteries)
- No mercury is intentionally added to the light source. (If product contains LCD)
- External mechanical plastic parts (homogeneous parts) larger than 25 g do not contain brominated, chlorinated flame retardants, PVC.
- Printed circuit board (PCB) do not contain brominated or chlorinated flame retardants.
- Cable/Wire do not contain PVC. (except for Power cord and power supply)
- External mechanical plastic parts larger than 100g use >10% recycled materials. (If product contains external mechanical plastic parts)

(2) Green packaging

- Conformance with EU packaging Directive.
- The chlorine used as a bleaching agent in paper packaging materials is less than 1000 ppm. (Cl < 1000 ppm).
- Corrugated paper contains recycled fibers. (85%~90%)
- Lightweight design and reduction in the use of plastic packaging materials.

(3) Product Recycling

- Conformance with EU WEEE Directive.
- External mechanical plastic parts larger than 100g do not contain plating and surface coating (except paint) that are not easy to be recycled and reused.
- All plastic parts larger than 25g are marked according to ISO 11469.
- All External mechanical plastic parts larger than 100g only use a single type of plastic pellets.
- The green products are designed to be recyclable, easy to disassemble, low in pollution, and energy-efficient, with a recycling rate of 90% or higher.
- WEEE Recyclability Assessment
  The actual inventory and calculation of the recyclable proportion of products based on product categories were conducted, reaching approximately 94%, which is higher than the WEEE directive requirements.

(4) product energy saving

- Conformance with ERP Directive.
- Conformance with ENERGY STAR.

ARK-1125

4.2 Climate Change Strategy and Actions

As the world’ s leading provider of industrial computers and business networking technologies and services, Advantech understands its responsibility to the global environment policy statement on climate change is consistent with the goal of Paris Agreement to limit the global temperature rise below 1.5° C. After passing the science-based target (SBT) in 2021 and committing to the SBT, we further joined the RE100 initiative in 2023 and committed to achieving the goal by 2040, considering renewable energy as an important strategy for moving towards net zero, and setting the goal of achieving net zero by 2050. Starting from 2025, to further accelerate our carbon reduction plans, we will adopt the 1.5° C SBT as our carbon reduction goal for the next decade and continue to promote global initiatives such as RE100 across all RBUs.

Advantech has included climate change as one of the major risks in corporate sustainable operation, and manages it according to two key aspects: “mitigation” and “adaptation.” At the same time, we also actively identify risks and build adaptation capabilities, further research and analyze climate change opportunities, accumulate and deepen R&D capacity, continue to invest in green energy, energy-saving products and solutions, and we are integrating them with the core business of energy management to promote energy saving and sustainability.

Advantech's climate change response process

2019
- Initiate the ISO 14064 GHG inventory and verification plan for Taiwan and Kunshan
- Base year for Advantech's SBT
- CDP climate change rating of “B”

2020
- Establishment of the ESG Corporate Sustainable Development Committee and ESG Corporate Sustainability Development Office
- Introduce the green product plan to produce low-carbon products
- CDP climate change rating of “B”

2021
- The SBT adopted to comply with the international below 2°C
- Commit to Task Force on Climate-related Financial Disclosures (TCFD)
- Low-carbon investment in a 10 MW solar power plant for ACL
- CDP climate change rating of “B”

2022
- Establishment of the Sustainable Development Committee (SDC) at the Board level
- Completion of TCFD risks and opportunities assessment
- Initiation of the inventory and verification plan for all categories of ISO 14064 Greenhouse Gas (GHG) Scope 3
- AKMC obtained green factory certification
- CDP climate change rating of “B”

2023
- Commitment to climate change strategy and net-zero vision
- Pass RE100 target commitment and actively promote the use of renewable energy in all RBUs around the world
- Link between the ESG KPI and the performance also approved by the Board
- Initiate the GHG inventory and verification plan of subsidiaries
- Activate iEMS in Taiwan and Kunshan to collect electricity consumption from main business bases
- ACL obtained green factory certification
- Taiwan and Kunshan operating locations obtained ISO 50001 certification
- Obtained the first product carbon footprint ISO 14067 verification
- CDP climate change rating of “B”

2024
- Link senior management compensation to ESG and climate change issues and achievements
- Implement the Internal Carbon Pricing (ICP) plan and define Advantech's carbon pricing
- Promote the GHG inventory and verification plan of subsidiaries in Asia
- Completed the global iEMS to monitor and analyze the electricity consumption of main operating locations around the world
- Increase the use of renewable energy across global RBU locations
- Calculate the representative product’ s carbon footprint of each business group and complete the application of Advantech's methodology
- Develop eco packaging materials, eco materials, and energy-saving design products by incorporating LCA assessments
- CDP climate change rating of “B”

2025
- Increase the coverage of the GHG inventory and verification at major overseas operational sites.
- Apply the latest IPCC assessment report to recalibrate climate scenarios and incorporated new assessments of nature-related risks and opportunities, resulting in the publication of Advantech’ s 2024 Climate- and Nature-related Financial Disclosures (TC(+N)FD) Report.
- Update SBT to align with the 1.5°C pathway and achieve net zero carbon emission.
- Continued to increase renewable energy usage across global RBUs to reach 20%.
- Implement a pilot Internal Carbon Pricing (ICP) program to strengthen carbon reduction efforts and achieve carbon reduction goals.
- Developed and launched the Product Carbon Footprint Calculation System 1.0 using AI technology, supporting the promotion of green products.
- Launch a supply chain carbon management capacity building program to empower key suppliers.

2026
- Complete the global ISO 14064 GHG inventory and verification.

2030
- Achieve Scope 1 and 2 carbon intensity decreased by 60%; Scope 3 product use carbon intensity decreased by 49% of SBT target.
- Achieve 50% renewable energy usage in Taiwan and Kunshan

2040
- Achieve the RE100 goal of 100% global renewable energy use

2050
- Achievement of net zero carbon emission.

4.2.1 The Net-Zero Commitment

Advantech actively aligns with international initiatives and announced the SBT commitment in 2021, aiming to take concrete actions to reduce carbon emissions through scientifically grounded reduction goals. We plan to update our SBT to align with the 1.5° C pathway by 2025.

For our medium- and long-term climate goals, Advantech targets achieving a 50% renewable energy usage rate at our manufacturing centers in Taiwan and Kunshan by 2030, and reaching 100% renewable energy usage across all our global sites by 2040.

By 2050, we aim to achieve net-zero emissions not only through reductions in our Scope 1 and Scope 2 emissions, but also by strengthening Scope 3 reduction planning and execution, advancing green product development and design, collaborating with and empowering our supply chain partners to create low-carbon products and enable their transformation, as well as applying future low-carbon technologies and purchasing carbon credits to reach our long-term net-zero target.

Advantech's net-zero vision

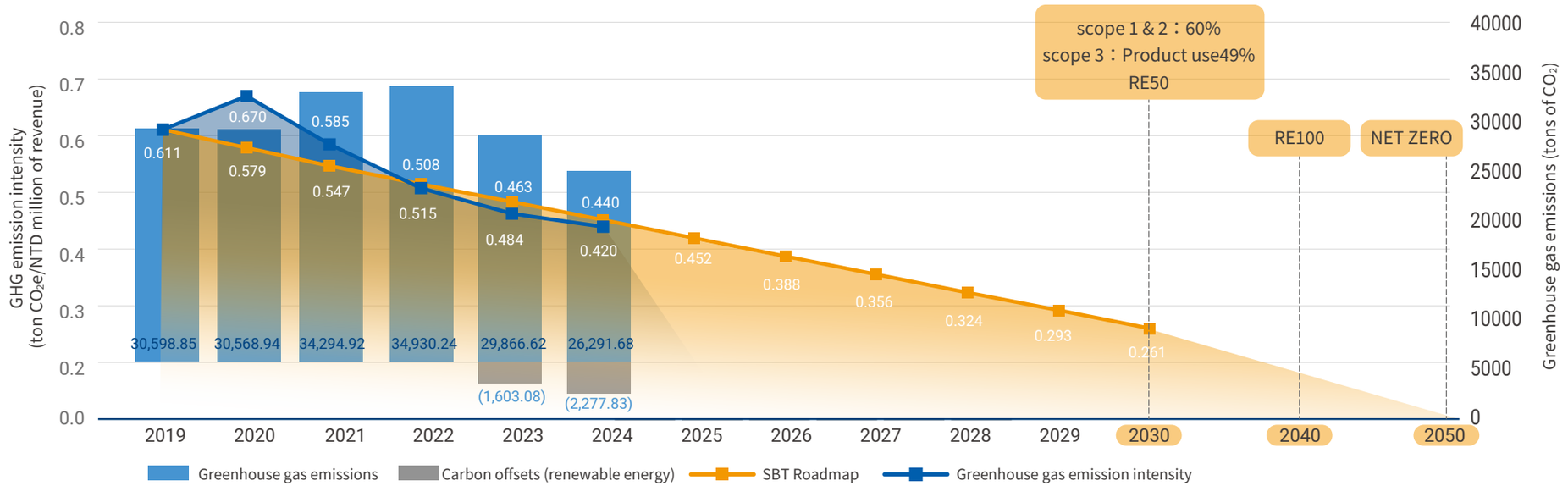
2050
Achieve net-zero carbon emissions

2030
50% renewable energy usage in Taiwan and Kunshan

2040 年
100% global renewable energy usage, achieve RE100 goal

2030
Scope 1 & 2 carbon intensity reduced by 60%
Product use (Scope 3) carbon intensity reduced by 49%

Advantech's net-zero roadmap



GHG reduction & net-zero strategy

Phase one: Advantech continues to expand its manufacturing capacity, leading to an increased energy consumption. We reduce GHG emissions by improving energy efficiency.

Phase two: Core production sites (Linkou AIoT Co-Creation Campus and Kunshan Manufacturing Center) continue to increase the use of renewable energy to reduce carbon emissions

Phase three: Implement greenhouse gas substitution solutions, adopt advanced low-carbon technologies, and obtain carbon credits to achieve net-zero target.

Reinforce internal carbon pricing and low-carbon product promotion strategy

Advantech is accelerating our journey towards net-zero targets by launching an Internal Carbon Pricing (ICP) project in 2024. By calculating and evaluating the cost of carbon emissions, Advantech has introduced an internal carbon price into our organizational cost-benefit assessment mechanisms, setting a shadow price of NT$1,700–3,000 per ton of CO_2e. In 2025, we plan to further integrate ICP into low-carbon production and investment decision-making to strengthen carbon risk management, prepare for future regulations and international carbon trading mechanisms, and enhance our carbon reduction efforts to achieve our reduction goals. Meanwhile, we will also adopt the SBT aligned with the 1.5° C pathway as our carbon reduction goal for the next decade, and continue to advance initiatives such as RE100 across all our global RBUs.

In terms of green products and sustainability responsibility, Advantech is applying AI technology to develop a product carbon footprint calculating system, which will be applied to the overall green product promotion plan. Additionally, a Sustainable Raw Materials Task Force is established to launch experimental projects across our four major business groups, introducing recycled materials and optimizing sustainable packaging. By collaborating with suppliers and the green product team to co-develope low-carbon products, Advantech aims to accelerate the realization of our net-zero targets and promote low-carbon economic growth together with our value chain partners.

4.2.2 TCFD Climate Governance and Management Strategy

Extreme weather events caused by climate change, the growing pressure for low-carbon transitions due to aggressive national carbon reduction goals, and carbon reduction demands from upstream and downstream value chain partners have already begun to pose potential operational challenges for enterprises. In response to the growing global emphasis on linking identified climate risks with financial impacts, Advantech has adopted the TCFD framework. We promote climate change management and disclosure based on the four core elements recommended by the TCFD: governance, strategy, risk management, and metrics and targets. This systematic approach allows Advantech to assess the climate risks and opportunities we face. We conduct in-depth evaluations of climate-related risks identified through our existing risk management processes and map them across our Pan-Operational Risk Map to ensure comprehensive coverage of our overall operational risk landscape. The assessment results and response plan has also been reported to the Senior management of the SDC for confirmation, and the SDC will report the progress of climate management to the Board of Directors on a regular basis to enhance the Company's resilience in responding to climate risks. For more details on our climate risk and opportunity disclosures and management actions, please refer to the "2024 Advantech Task Force on Climate- and Nature-related Financial Disclosures."

Advantech's climate governance framework		
Governance	**Board of Directors**	◆ The highest supervisory unit for risk management (including climate risk) ◆ Oversee climate risk management and strategy implementation results ◆ Review major climate-related goals and implementation budgets
	Chairman	◆ Chairing the Corporate Sustainable Development Committee (SDC) and leading the climate issue management mechanism ◆ Confirm climate-related KPIs and action plans
	Corporate Sustainability Development Committee (SDC)	◆ Responsibilities and and decision-making unit for climate risk management ◆ Regular reporting to the Board on climate management progress ◆ Approve the TC(+N) FD report ◆ Review climate-related risk and opportunity assessment results and response strategies ◆ Monitor the implementation of climate issues and review KPIs
	ESG Corporate Sustainability Development Office	◆ Coordinate the implementation of climate-related risk and opportunity analyses and integrate the disclosure reports ◆ Promote climate-related action plans and report the progress to the Corporate Sustainable Development Committee (SDC) on a quarterly basis ◆ Research and analyze policies on climate issues and scientific research development trends, and monitor climate risk events on a regular basis

Advantech's climate governance framework		
Governance	**Board oversight**	◆ The Corporate Sustainable Development Committee (SDC) regularly reports climate-related management plans and results to the Board of Directors, while the Board of Directors reviews related major goals and budgets ◆ In 2021, the Board of Directors approved Advantech Taiwan's renewable energy goals, renewable energy PPA procurement budget, and the project of setting up solar power plants in collaboration with renewable energy providers ◆ In 2022, consulting companies and external experts were commissioned to attend the Board of Directors' training on topics such as how the ICT industry can help fight climate change, international sustainability trends, emerging trends in risk management, and response sharing. ◆ In 2023, the Board of Directors reviewed the annual comprehensive ESG performance, which included climate change-related aspects such as RE100 global workforce group and local target progress, product carbon footprint progress, annual GHG inventory, and EU carbon tariff response topics, etc. ◆ In 2024, besides reviewing the overall 2023 ESG performance, we also re-identified climate-related risks and opportunities, and selected four material risks and opportunities for scenario analysis. The Company also reported to the Board of Directors its plans to update SBT to keep up with industry benchmarks and international declarations regarding carbon reduction commitments in the coming year, as well as proactively address climate and nature-related risks and opportunities faced by Advantech. We expect to publish the 2024 Advantech Task Force on Climate- and Nature-related Financial Disclosures in 2025.
	Advanced management mechanisms	◆ Led by the Chairman, the SDC Committee holds meetings each quarter The ESG Corporate Sustainability Development Office reports on climate-related issue trends, strategic planning, and implementation progress The SDC supervises the achievement of goals and reviews the assessment results of relevant risks and opportunities and countermeasures.

	Disclosure aspect	Advantech's implementation progress
Strategy	**Short-, medium- and long-term risks and opportunities**	◆ By referencing the risk and opportunity topics and their financial impact case studies outlined in the TCFD guidelines, and integrating analyses of our operational sites and industry landscape, we identified a total of 13 risks and 10 opportunities. Based on the level of impact, Advantech identified 7 significant risks and 3 opportunities. Among these, 4 most significant items were selected for financial impact assessment that aligns with Advantech's future development direction. ◆ The short, medium, and long term are defined as within 3 years, 3 to 5 years, and more than 5 years, respectively. Each identified topic is assessed based on the timeframe in which it is most likely to occur.
	Potential impacts and financial planning	◆ Qualitatively assess the possible financial impacts of various major risks and opportunities, develop preventive and improvement measures, and set KPI targets accordingly.
	Scenario analysis	◆ We analyzed Advantech's carbon reduction and financial impact using the STEPS (Stated Policies Scenario) and the International Energy Agency (IEA)'s 1.5°C Scenario (1.5DS); In addition, we also applied the RCP4.5 (BAU scenario) and RCP8.5 (the most severe warming scenario) to assess the physical impacts on operations as part of our evaluation of adaptation strategy resilience.

	Disclosure aspect	Advantech's implementation progress
Risk management	**Evaluation and Management Process**	◆ ESG Corporate Sustainability Development Officeeach year convenes cross-departmental members to collect and review relevant the Company's climate risks and opportunities, assess material climate issues through the level of impact and likelihood, monitor changes in risk levels, review and develop response strategies, and report them to the SDC for resolution, as well as review relevant disclosures. The SDC regularly reports to the Board of Directors to oversee the progress of climate risk management and review relevant major decisions.
	Overall Risk System Integration	◆ At the beginning of each year, the risk management team evaluates the Company' s overall operational risks according to established risk management procedures, develops a comprehensive operational risk map, and reports the risk management processes and plans to the Board of Directors. ◆ Since 2021, climate change risks have been included in the assessment process, and risk levels are identified by the Auditing Office in conjunction with the ESG Corporate Sustainability Development Office. ◆ In 2022, a comprehensive TCFD assessment process was implemented. The assessment methodology and results have been applied to the climate change risk analysis within the foregoing risk map and consolidated into the overall risk management process. ◆ In 2023, the TCFD assessment process continued to be included in the overall risk management process. In 2024, we expected to adjust climate scenarios based on the latest IPCC assessment report and re-evaluate climate risks and responses. ◆ In 2024, we re-identified our climate-related risks and opportunities, selecting 4 most significant risks and opportunities for scenario analysis. A qualitative assessment of their potential financial impacts was conducted, along with the development of corresponding response measures.

	Disclosure aspect	Advantech's implementation progress
Indicators and targets	**Scope 1, 2, and 3 GHG emissions and targets**	◆ In 2021, we passed the review of SBT for the first time. In 2024, we initiated the recalculation of our SBT targets and plan to set and obtain approval for the 1.5°C target by 2025. ◆ Advantech Taiwan and Kunshan both complete the ISO 14064-1 GHG inventory, verification, and target tracking every year ◆ In 2024, a GHG inventory and verification for AJMC and AKSC was completed for the first time. We will continue to expand the coverage to other significant overseas operational sites in the future.
	Other climate-related management indicators and targets	◆ Commit to joining the RE100 initiative and set the net-zero target by 2050 ◆ We have set targets for power saving, renewable energy usage, water saving, waste reduction, percentage of green products in revenue, and energy efficiency improvement for product power supplies ◆ Already implemented the ISO 50001 energy management system to conduct energy efficiency management, while management indicators and targets will continue to be formulated for relevant strategies ◆ Already implemented life cycle assessment (LCA) and carbon footprint evaluation for our main products, as well as developed an internal product carbon footprint calculation system, which will be applied to our green low-carbon product project.

*Note: According to ISO 14064-1, the GHG scope names correspond to categories as follows: Scope 1 corresponds to Category 1, Scope 2 corresponds to Category 2, and Scope 3 corresponds to Categories 3~6.

4.2.3 Climate-Related Risks and Opportunities and Identification of Financial Impacts

Advantech identifies significant climate-related risks and opportunities by referencing the risk and opportunity definitions outlined in the TCFD framework, combined with multi-dimensional issue collection, cross-departmental discussions, and external consultations Through this process, we concretely identify significant risks and opportunities relevant to Advantech, their potential occurrence scenarios and impact levels, and analyze their possible financial implications.

We focus on operational aspects (reduction, natural disasters), product aspects (including the supply chain), and market aspects based on industry characteristics and international developments. This enables us to comprehensively inventory climate risks and opportunities at the organizational level and develop precise response strategies. Consequently, Advantech's climate risk management covers the entire value chain, including upstream, downstream, and our own operations. Advantech's climate-related risks and opportunities, financial impact evaluation process, items, and materiality assessment results are shown in Figure 4.2.1.

Collection of Risk and Climate Factors

- Refer to TCFD-defined topics and identify local regulations and market trends
- Analysis of international scientific research reports
- Analyze industry peer-related topics

Focus on 13 risks and 10 opportunities

Analysis of Materiality and Financial Impact

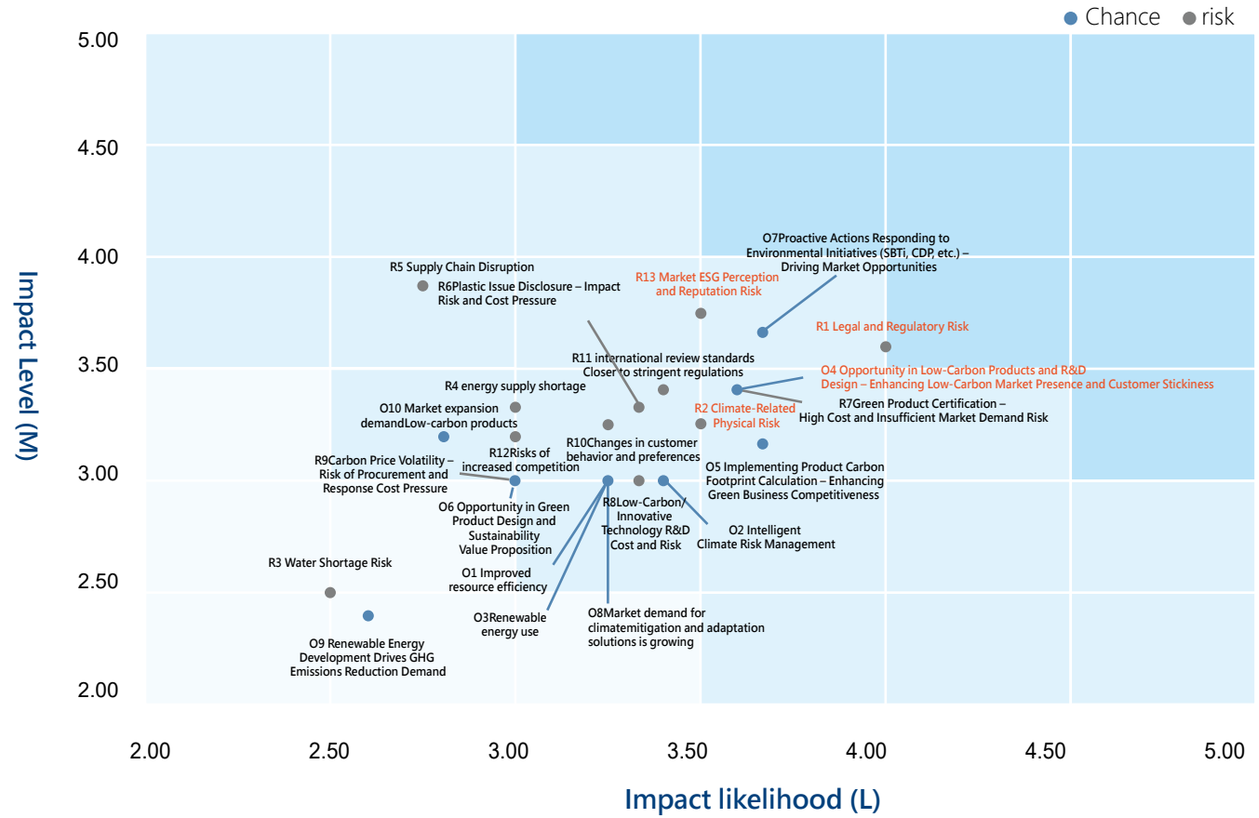
- Organize workshops to discuss the actual situation of various topics and evaluate their operational impact
- Assess the likelihood and extent of impact
- Refer to the views of outside experts

Converge 7 risks, 3 opportunities, and select 4 of them for scenario simulation analysis

Evaluation of Strategic Response and Improvement

- Take stock of measures to address risks or realize opportunities
- Engage in sustainability trend and industry benchmark analysis and adjust response strategies

Evaluate various strategy, oriented improvement programs to effectively manage the associated risks and opportunities



Risk and opportunity description:

1. Very high risk / opportunity: 16 < "Impact likelihood (L) X Impact extent (M)" < 25
2. High risk / opportunity: 9 < "Impact likelihood (L) X Impact extent (M)" < 16
3. Moderate risk / opportunity: 4 < "Impact likelihood (L) X Level of Impact (M)" < 9
4. Low risk / opportunity: 1 < "Impact likelihood(L) X Level of Impact (M)" < 4
5. Extremely low risk / opportunity: "Impact likelihood (L) X Level of Impact (M)" < 1

Figure 4.2.1 Materiality Matrix for Advantech's Climate Risks and Opportunities

Results of a scenario analysis of Climate Change risks

(For detailed explanations on the quantitative financial assessments under the TCFD framework, please refer to the 2024 Advantech Task Force on Climate- and Nature-related Financial Disclosures Report)

Transition risk/opportunity scenario analysis results

Category	Scenario	Impact assessment	Financial impact
Risks	STEPS (Stated Policies Scenario)	Evaluated the potential impact of government regulations on the our overall operations from 2025 and 2035. This includes the tightening of regulations for large power consumers requiring a certain proportion of renewable energy, amendments to the Climate Change Interaction Act, and the implementation of carbon tax/fee-related laws. Failure to comply may require the payment of substitute fees or carbon emission-related charges, leading to an increase in the Company's operating costs.	Payment of renewable energy substitute fees and carbon charges increased operating costs by NTD 5,116,749 in 2025, NTD 68,663,138 in 2030, and NTD 227,265,171 in 2035; the estimated annual management cost is NTD 6,217,526.
	1.5DS (Net zero scenario)	Evaluated the potential impact of government regulations on the our overall operations from 2025 and 2035. This includes the tightening of regulations for large power consumers requiring a certain proportion of renewable energy, amendments to the Climate Change Interaction Act, and the implementation of carbon tax/fee-related laws. Failure to comply may require the payment of substitute fees or carbon emission-related charges, leading to an increase in the Company's operating costs	Payment of renewable energy substitute fees and carbon charges increased operating costs by NTD 184,749 in 2025, NTD 187,564,574 in 2030, and NTD 441,453,013 in 2035; the estimated annual management cost is NTD 6,217,526.
	ESG Image and Reputation Management scenario (Referencing historical scenarios)	Evaluated the impact of Advantech's market ESG image and reputation (including low-carbon or sustainability performance) on revenue and financing costs, including increased bank financing costs and revenue affected by environmental sustainability performance, i, which may lead to higher operational cost of company.	The increase in operating costs resulting from efforts to improve Advantech's ESG image and reputation is NTD 59,907,158; the estimated annual management cost is NTD 11,283,703.
Opportunities	Low-carbon products and market scenarios (Referencing historical scenarios)	Evaluate the revenue generated from our low-carbon product up to 2025 and 2030. as a financial opportunity related to low-carbon initiatives.	Advantech's low-carbon product-related revenue is expected to reach NTD 707,258,810 in 2025 and NTD 791,456,288 in 2030; the estimated annual management cost is NTD 57,792,607.

Physical risk scenario analysis results

Scenario	Impact assessment	Financial impact
RCP4.5 (BAU scenario)	Assessed the financial impact of extreme climate events (typhoons/tropical cyclones) on Advantech's overall operational production up to 2030 and 2050, excluding the impact of other physical risks (such as rising temperatures and droughts)	Damage to factory equipment, production disruptions, delayed attendance of personnel, and inventory losses have resulted in increased operating costs of NTD 21,348,542 in 2030, and NTD 22,692,369 in 2050; the estimated annual management cost is NTD 5,408,167.
RCP8.5 (The most severe warming scenario)	Assessed the financial impact of extreme climate events (typhoons/tropical cyclones) on Advantech's overall operational production up to 2030 and 2050, excluding the impact of other physical risks (such as rising temperatures and droughts)	Damage to factory equipment, production disruptions, delayed attendance of personnel, and inventory losses have resulted in increased operating costs of NTD 21,631,559 in 2030, and NTD 23,510,821 in 2050;the estimated annual management cost is is NTD 5,408,167.

Climate risks and opportunities and response strategies

■ Climate risks ■ Climate opportunities

Category		Risk or opportunity issues	Advantech encounters risk or opportunity	Affect schedule	Impact level	Financial impact	Advantech's response strategy
Operation	Transition risk	R1 Legal and policy risks	◆ Rising operating cost: More rigorous emissions regulations (such as Taiwan's carbon fee and the EU's CBAM) increase costs ◆ Equipment replacement and renewable energy investment pressure: To obtain international certifications and meet customers' sustainability needs, the Company replaces energy-intensive equipment and invests in renewable energy, resulting in increased expenditures ◆ System design and maintenance burden: To meet carbon data collection requirements, we must invest in resources to establish and maintain relevant systems ◆ Product pricing adjustment risk: After the implementation of carbon pricing, Advantech's financial system must be adjusted to reflect Internal Carbon Price. As a result, product prices are increased, and our market competitiveness is diminished.	Short-term	High	◆ Increased operating costs ◆ Increased capital expenditure ◆ Reduced revenue	◆ Introduce energy-saving and carbon reduction measures (energy-efficient equipment, LED lights, automatic temperature and humidity control, and recycling and reuse of consumables) ◆ Establish a systematic approach for collecting Scope 1, 2, and 3 emissions data to lower future carbon taxes through precise monitoring of carbon emissions data ◆ Building on the established shadow price, we will continue to finalize the Internal Carbon Pricing mechanism, integrating carbon emission costs into the Company's financial system to accurately reflect these costs in product pricing and cost structures ◆ Join the RE100 initiative and commit to achieving 100% renewable energy usage by 2040 to lower carbon emissions
	Physical risk	R2 climate-related physical risks	◆ Operational disruptions and production risks: Extreme weather events (such as typhoons and flooding) may lead to factory shutdowns, damage to equipment, increasing costs and delivery risks. ◆ Increased facility and equipment maintenance costs: In response to climate risks, it is necessary to bolster flood control and drainage systems, reinforce building structures, and address the potential acceleration of equipment aging due to high temperatures, all of which will increase costs. ◆ Inventory damage and financial losses: Typhoons and floods can damage inventory, leading to financial losses ◆ Increased expenditure in disaster prevention and insurance: To mitigate the impact of extreme weather, we must invest in disaster prevention equipment, improve our emergency response capabilities, and purchase additional insurance coverage to diversify financial risks ◆ Pressure from seismic construction and maintenance: New plants need to incorporate enhanced seismic design, while existing facilities require seismic retrofitting, leading to increased expenditures	Medium-term	High	◆ Increased operating costs ◆ Increased capital expenditure ◆ Reduced revenue ◆ Reduced assets	◆ Analyze the impact of climate change and develop emergency response plans ◆ Establish business continuity management procedures to respond to and manage major incidents, thereby mitigating and minimizing negative impacts ◆ Maintain emergency power systems through regular maintenance to prevent power outages from affecting operations. ◆ Upgrade emergency response equipment and install additional backup systems, such as standby generators, to improve resilience against unexpected events. ◆ Strengthen disaster prevention facilities, improve drainage systems, and install rainwater infiltration prevention measures to minimize natural disaster-related losses ◆ Risk transfers and diversification, purchase property insurance to transfer potential financial risks and ensure asset safety

Category		Risk or opportunity issues	Advantech encounters risk or opportunity	Affect schedule	Impact level	Financial impact	Advantech's response strategy
Product	Transition risk	R5 Supply chain disruptions	◆ Increased operational and supply chain costs: In response to climate risks and political factors, we must allocate resources to establish alternative supply chains, which can lead to increased costs ◆ Inventory and capital pressure: Supply chain disruptions may result in capital and cash flow pressures and increased storage management costs ◆ Product development delays: Supply chain changes may require redesigning components or switching suppliers, which can extend product development timelines and delay market launch. ◆ Uncertainty in production and delivery: Supply chain disruptions can increase the risk of production plan interruptions and delay the delivery of products	Medium-term	High	◆ Increased operating costs ◆ Operational disruptions ◆ Reduced revenue	◆ Introduce eco packaging materials and eco designs to form a sustainable packaging material supply chain ◆ Develop a network of suppliers across different locations to enhance supply chain resilience ◆ Design backup mechanisms to prevent supply chain disruptions (such as advancing shipments, setting safety stock levels based on material categories, diversifying suppliers, and preparing alternative materials)
	Transition risk	R6 Regulatory penalty risks and increased cost pressure due to EU requirements for plastic content disclosure	◆ Regulatory and penalty risks: European countries require disclosure of plastic content, including the weight of structural components and external packaging. Non-compliance may result in fines ◆ Increased material and supply chain costs: In response to local regulations and sustainability trends, the use of sustainable materials and eco packaging will result in increased procurement and production costs ◆ Increased design and development costs: Regional regulatory compliance requires redesigning product packaging and external components, resulting in longer development timelines and higher costs ◆ Data transparency and management burden: To meet sustainability and compliance requirements, a cross-departmental database need to be established, increasing manpower, technical, and maintenance costs ◆ Risk of diminished market competitiveness: Rising material and design costs may diminish the Company's market competitiveness	Short-term	Medium	◆ Increased operating costs ◆ Increased compliance expenditures	◆ Introduce eco packaging materials and eco designs, and form a sustainable material supply chain ◆ Establish a component recycled material supply chain and regularly review environmental certifications of supply chain materials ◆ Develop dedicated part number classification rules for Cable, Plastic, Sheet Metal, and Metal, to distinguish between sustainable and conventional materials ◆ Establish relevant data, statistical, and statistical analysis platforms.

Category		Risk or opportunity issues	Advantech encounters risk or opportunity	Affect schedule	Impact level	Financial impact	Advantech's response strategy
Product	Transition risk	R7 Risk of increased costs and extended timelines due to testing and certification of eco products	◆ Increased costs due to differences in certification standards and compliance requirements: Meeting green and energy efficiency standards across various regions requires additional investment in testing and design modifications, leading to higher management, design, and material costs ◆ Risks of higher certification fees and delayed product launches: Acquiring green certification requires paying corresponding fees, and the lengthy certification process may have an impact on the product's time-to-market and market share ◆ Risks of delayed time-to-market and revenue concentration: If products fail to meet international energy efficiency standards, such as EU ErP and US Energy Star, they may be unable to enter key markets such like Europe and the United States, resulting in concentrated revenue sources and increasing vulnerability to regional policies and market fluctuations	Short-term	High	◆ Increased operating costs	◆ Establish a component recycled material supply chain and regularly review environmental certifications of supply chain materials ◆ Develop dedicated material number classification rules for Cable, Plastic, Sheet Metal, and Metal, to distinguish between sustainable and conventional materials ◆ Establish a product carbon footprint calculation system, which can be applied to the eco product program ◆ To comply with mandatory regulatory requirements in product design, we have created internal verification resources and implemented a management system to monitor external certification-related expenses
	Opportunities	O4 Low-carbon products shape Advantech's sustainability image, enhance marketing in the low-carbon market, and expand the customer base	◆ Enhance sustainability image and marketing: Develop low-carbon products to strengthen market positioning and showcase our achievements through energy-saving and carbon reduction solutions (e.g., WISE-IoT iEMS), thereby enhancing international buyers' awareness of and trust in Advantech ◆ Expand international customer base: Promote low-carbon products to meet the demands of the international market and thereby increase market share ◆ Market competitive advantages and internal innovation: Center on low-carbon products to strengthen sustainable supply chain partnership and promote cross-departmental collaboration through product design and promotion, creating brand differentiation advantages and enhancing product value	Medium-term	High	◆ Increased revenue ◆ Increased market value	◆ Introduce eco packaging materials and eco designs, and form a sustainable material supply chain ◆ Develop a product carbon footprint calculation system, and implement internal carbon pricing to facilitate the launch of low-carbon products ◆ Continue to invest resources in the R&D of low-carbon technologies in response to market needs. For instance, design products with higher performance and lower energy consumption. Also, establish relevant reward mechanisms to encourage low-carbon innovation and creative thinking. ◆ In addition to the R&D of low-carbon products, Advantech's technical advantages in IIoT and edge computing are combined to provide integrated low-carbon solutions, creating differentiation advantages in low-carbon products. ◆ Highlight the low-carbon products' sustainable values and environmental contributions in marketing activities, such as presenting the products' carbon footprint data and energy-saving effectiveness.

Category		Risk or opportunity issues	Advantech encounters risk or opportunity	Affect schedule	Impact level	Financial impact	Advantech's response strategy
Product	Opportunities	O5 Establish and engage in product carbon footprint calculations to elevate Company's competitiveness in green business opportunities	◆ Enhance market competitiveness and brand image: Meet market demands by establishing a carbon footprint calculation system, strengthen customer trust, enhancing product value, and creating green business opportunities. Moreover, compliance with environmental regulations further bolsters Advantech's sustainability image ◆ Support sustainable supply chain development: Use Advantech's CarbonR solution to simplify carbon footprint calculation process, assist supply chain partners in achieving carbon reduction goals, thereby enhancing the partnership	Short-term	High	◆ Increased revenue ◆ Increased market value	◆ Establish Advantech's product carbon footprint methodology and complete the carbon footprint inventory of various business groups' representative products ◆ Develop an internal product carbon footprint evaluation system and proactively provide customers with relevant information to improve carbon footprint disclosure transparency ◆ Assess material selection through product life cycle (LCA) evaluations to identify key materials contributing to the carbon footprint ◆ Promote Advantech's CarbonR solution, assist supply chain partners in calculating carbon emissions and product carbon footprint, as well as offer relevant training and technical support to reinforce collaborative partnership
Market	Transition risk	R11 Increasingly stringent international review standards and regulations	◆ Regulatory risks: Global regulations are becoming increasingly stringent, such as the CBAM and the CCA in the United States, failure to respond accordingly may lead to legal risks, fines, and even market entry restrictions ◆ Loss of market entry opportunities: If value chain partners are unable to provide solutions in response to relevant regulations, market entry opportunities may be reduced	Short-term	High	◆ Increased operating costs ◆ Reduced revenue ◆ Increased compliance expenditures	◆ Local laws and regulations are considered when procuring raw materials during the product design stage to ensure compliance with all relevant standards. ◆ Relevant regulations are incorporated into the new product development evaluation process to assess suitability in advance. ◆ Regularly audit factories and suppliers to ensure alignment with international trends and customer requirements ◆ Identify suitable existing ESG response solutions from internal BUs or external partners and offer them to strategic partners and invested companies to address carbon emission-related needs across the supply chain
	Transition risk	R13 Market ESG image and reputation risks	◆ Brand value and customer trust: Failure to effectively manage climate risks or demonstrate adequate ESG performance may negatively impact the company' s market reputation and erode stakeholders' trust, including that of customers, shareholders, and investors ◆ Climate risks: Inadequate assessment of climate risks may disrupt factory operations during natural disasters such as typhoons or earthquakes, thereby damaging the company' s reputation	Medium-term	Medium	◆ Increased operating costs ◆ Increased capital expenditure ◆ Reduced revenue	◆ Conduct regularly employee education and training on ESG developments and trends to enhance their ESG awareness and foster a culture of sustainability ◆ Introduce energy-saving and carbon reduction equipment with temperature and humidity regulation functions into hardware facilities ◆ By joining RE100, setting SBT, and participating in sustainability ratings such as DJSI, CDP, and EcoVadis, we aim to disclose our ESG performance and enhance our corporate sustainability value

Category		Risk or opportunity issues	Advantech encounters risk or opportunity	Affect schedule	Impact level	Financial impact	Advantech's response strategy
Market	Opportunities	O7 Market opportunities derived from complying with international environmental initiatives (such as SBTi, CDP, etc.)	◆ Global market deployment: Participation in major evaluations and initiatives, along with voluntary compliance with local environmental regulations, facilitates the introduction of Advantech's ESG-rated products to the market and enhances our brand image ◆ Enhancing sustainability image and attracting sustainable investments: Enhance ESG performance through active engagement in international environmental initiatives, such as SBTi, CDP, and RE100, attract sustainable investment, and strengthens both brand image and supply chain stability	Medium-term	High	◆ Increased revenue ◆ Increased capital ◆ Increased market value	◆ Develop product solutions that comply with international environmental regulations, including energy management, ESG information integration systems, carbon emission inventory, raw material supply chain management, and carbon footprint system implementation, etc. ◆ Strategically invest in ESG-related fields through small equity investments to mitigate risks and explore market opportunities ◆ By joining RE100, setting SBT, and participating in sustainability ratings such as DJSI, CDP, and EcoVadis, we aim to disclose our ESG performance and enhance our corporate sustainability value

Note:
1.Affect schedule: Based on the potential occurrence, affect are categorized as "short-term (< 3 years), mid-term (3 – 5 years), and long-term (> 5 years)."
2.Impact level: An internal evaluation, based on the likelihood of occurrence and level of impact, categorizes the impact level as "high, medium, or low."

4.3 Greenhouse Gas (GHG) Inventory and Energy Management

Name of materiality	Importance of this materiality to Advantech
GHG inventory and energy management	Advantech is committed to reducing greenhouse gas (GHG) emissions and using energy and resources efficiently, striving to achieve our publicly committed carbon reduction targets to ensure the coexistence and shared prosperity of environmental protection and corporate sustainable development.
Management strategy	◆ Implement energy management system to increase energy efficiency ◆ Expand renewable energy usage to reduce GHG emissions ◆ Set more ambitious Science-Based Targets (SBT)
Policy or commitment	◆ We have adopted Science-Based Targets (SBT) and are committed to achieving them by 2030 ◆ Join the RE100 initiative and commit to achieving the goal of using 100% renewable energy by 2040 ◆ Set the goal of achieving net zero by 2050 ◆ We will set a more challenging SBT carbon reduction target (1.5°C pathway) by 2025 to demonstrate our commitment to carbon reduction
Positive impact	◆ Reduce carbon emissions: Gradually identify greenhouse gas emission sources and quantities with precision to establish effective carbon reduction targets. ◆ Reduce operating costs: Achieve reductions in energy consumption and operating costs through energy system introduction, energy policy implementation, target setting, and energy saving project implementation ◆ Reduce energy impact: Deploy renewable energy at various locations of operation, we not only gradually achieve the RE100 goal but also reduce reliance on external renewable energy sources, thereby further controlling and lowering operating costs ◆ Enhance corporate image: Participating in initiatives such as RE100 and CDP, and setting SBT, Advantech not only demonstrates its net-zero commitment but also enhances its international corporate image
Negative impact	◆ Increase in operational and financial costs: The management of GHG emission data, the installation of energy management systems, equipment replacement, and installation and procurement of renewable energy equipment may lead to an increase in operating costs ◆ Energy transition risks: Underestimation of renewable energy procurement may lead to a delay in achieving the RE100 goal, thus prolonging the Company's energy transition timeline ◆ Advantech's actions to address negative impacts are as follows. Please refer to 4.3.2 of this report for detailed information: - Enhancing energy management efficiency: Advantech utilizes internal iEMS (Intelligent Energy Management System) for energy monitoring and analysis to improve energy efficiency. Meanwhile, we have implemented ISO 50001 for comprehensive energy management, with energy-saving plans targeting core energy-consuming equipment such as chillers, laboratory equipment, production equipment, and air conditioning systems, effectively reducing operational costs. - Expanding renewable energy investments: Advantech vigorously invests in renewable energy. Its major production sites have adopted measures such as installing solar panels and promoting aquavoltaics. This is achieved through the purchasing of renewable energy certificates and directly procuring renewable energy from power suppliers, ensuring the attainment of the RE100 goal. At the same time, by formulating specific short-, medium-, and long-term renewable energy investment plans, we can progressively increase the percentage of renewable energy used and advance corporate sustainable development.
2024 goal achievement progress	◆ In 2024, the Company's overall GHG emissions per unit of revenue decreased by 4.9% compared to 2023, and it is 28.0% lower compared to the 2019 SBT baseline year. ◆ In 2024, Advantech received a B List rating in CDP Climate Change Questionnaire assessment. ◆ In 2024, Advantech expanded its GHG inventory and ISO 14064-1 verification were completed at AJMC in Japan and AKSC in South Korea ◆ Advantech Taiwan and the Kunshan plant continued to obtain the ISO50001 verification in 2024 ◆ In 2024, Advantech’ s sites in the United States began using renewable energy

Name of materiality	Importance of this materiality to Advantech
2025 goals	◆ Renewable energy targets: Continue to increase renewable energy usage to 20% across Advantech's global RBUs ◆ GHG goals: Advantech's GHG emission intensity per unit of revenue decrease by 36% compared to 2019 ◆ Energy reduction targets: In 2024, achieve a 3% reduction in per capita office electricity consumption and a 5% reduction in electricity consumption per work hour at production sites
2030 goals	◆ Renewable energy targets: Achieve 50% renewable energy usage in Taiwan and Kunshan ◆ GHG goals: Reduce Scope 1 and Scope 2 carbon intensity by 60%; reduce the carbon intensity of Scope 3 products by 49%
Key action plans or programs in 2024	◆ Except for the Taiwan and Kunshan plants, we are progressively implemented the ISO 50001 energy management system at all operation sites. Energy consumption was lowered by setting energy KPIs and utilizing iEMS for monitoring and improving energy efficiency. ◆ Scope 2 emissions were decreased by increasing the use of renewable energy, thereby gradually achieving the RE100 goals. Regions currently using renewable energy include China, the United States, and Europe. ◆ Enhance the Group's monitoring of carbon data by gradually expanding the GHG inventory and the scope of ISO14064-1 verification. Conducted Scope 1 and 2 GHG inventories and verifications for overseas subsidiaries AJMC and AKSC in 2024 ◆ Implemented more challenging SBT carbon reduction goals (1.5°C pathway) during 2024-2025 to demonstrate our determination in carbon reduction
Effectiveness assessment	◆ Monitor energy usage at various locations of operation by implementing the ISO50001 energy management system, setting energy KPIs, and holding regular energy meetings ◆ Ensure the credibility of GHG emissions data from various locations of operation through ISO 14064-1 verification ◆ Improve the credibility of energy usage data through the AA1000 verification process in the report
Stakeholders impacted by the material topic and actions implemented by Advantech	◆ Employees: Provide GHG inventory personnel with relevant internal and external education and training. Additionally, distribute quarterly Advantech ESG e-newsletters to internal employees to improve their sustainability awareness ◆ Customers: Respond to customer questionnaires and audits, and provide relevant supporting documentations as needed ◆ Suppliers and contractors: Conduct on-site audits for selected suppliers to gain deeper insight into their implementation of GHG management practices. We also hold supplier conferences to communicate Advantech' s expectations for GHG management and provide free GHG inventory resources and channels. Moreover, as of 2025, Advantech plans to provide diverse education, training, and seminar resources based on supplier grading results to help suppliers continue to enhance their sustainable management skills ◆ Shareholder and Investors: Disclose our sustainability performance through our Sustainability Report and Advantech's official website ◆ Business partners: Respond to partners' inquiries and provide supporting records as necessary ◆ Government, public associations, and media: Respond to inquiries from government units and relevant public associations, and provide supporting records as necessary.

Adheres to the original devotion to the idea of being a global citizen. Advantech has completed third-party verification since 2019, in addition to the self-assessment required by ISO 14064-1:2018 and the GHG Protocol. In recent years, we have continued to implement GHG management based on the results of our annual inventory checks. We have also made efforts in product design, product material management, product energy efficiency improvement, and renewable energy use. Starting in 2023, other overseas significant locations of operation engaged in GHG inventory and verification. In the same year, Advantech joined the RE100 initiative, committing to 100% renewable energy by 2040. Currently, our sites in Kunshan, Europe, and the United States are already using renewable energy. This chapter's writing scope covers Advantech's main global operations and production factories, together accounting for 92.6% of total consolidated revenue.

4.3.1 GHG Inventory and Management

To foster a low carbon emission business environment, Advantech has established the "Greenhouse Gas Inventory Promotion Committee." The committee follows the quantification, supervision, reporting, and verification procedures outlined in Taiwan' s Climate Change Response Act and the ISO 14064-1 standard to promote ongoing GHG inventory and reduction efforts, aiming to reduce both direct and indirect emissions year by year. Furthermore, we joined the Carbon Disclosure Project (CDP) since 2015 to disclose the Company's annual carbon reduction plans and performance.

GHG inventory

Beginning in 2024, except for Taiwan and the Kunshan plant, China, Advantech has progressively conducted GHG inventory at its overseas significant locations of operation and production sites. Two new sites, AJMC (Japan) and AKSC (Korea), were included in 2024. In the future, other overseas significant locations of operation and production sites will also be incorporated.

Since 2019, ACL has conducted self-verification according to ISO 14064-1 and the GHG Protocol, and has also undergone third-party on-site verification. The organizational boundary is defined based on operational control, in accordance with the requirements of ISO 14064-1:2018. The inventory scope includes both qualitative and quantitative assessments of Scope 1 (category 1: direct GHG emissions) and Scope 2 (category 2: indirect GHG emissions from energy), and also covers emission sources under Scope 3 (categories 3, 4, and 5: indirect GHG emissions). In 2024, the total emission of Scope 1 emissions from ACL was 804.39 metric tons of CO_2e. The 2024 inventory results for Advantech's Kunshan plant indicate that Scope 1 emissions were 2,531.42 metric tons of CO_2e, and this has been verified by a third party. Also, since 2024, Advantech has included AJMC (Japan) and AKSC (Korea) sites in the scope of ISO 14064-1 GHG inventory and verification for the first time. The Scope 1 emissions for the two sites were 150.32 and 9.77 metric tons of CO_2e, respectively. In addition, the United States and European sites continue to conduct GHG inventories for Scope 1 energy use, and starting in 2025, Advantech plans to progressively complete a comprehensive group-wide Scope 1 and Scope 2 inventory, accompanied by third-party verification. Emissions in each region are shown in Table 4.3.1.

Region \ GHG	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	NF_3	Sum (Metric tons CO_2e)
Taiwan ACL	34.1186	0.0168	0.0273	770.2304	0	0	0	804.3931
China AKMC	1,410.4931	22.4155	3.1197	1,095.3910	0	0	0	2,531.4193
Japan AJMC	24.1837	11.5032	0.1365	114.4943	0	0	0	150.3177
Korea AKSC	2.0678	3.8446	0.0273	4.5306	0	0	0	9.7673
USA ANA	23.7649	0.0004	0	0	0	0	0	23.7654
Europe AEU	45.1591	0.0685	0.1492	0	0	0	0	45.3768
Total	1,539.7871	37.1461	3.4600	1,984.6463	-	-	-	3,565.0395

*Note: For ANA and AEU, only GHG emissions from energy use (natural gas, diesel, gasoline, and liquefied petroleum gas) are measured for Scope 1 emission.

Table 4.3.1 Scope 1 GHG emissions by Advantech's Main Global Operations and Production Factories in 2024

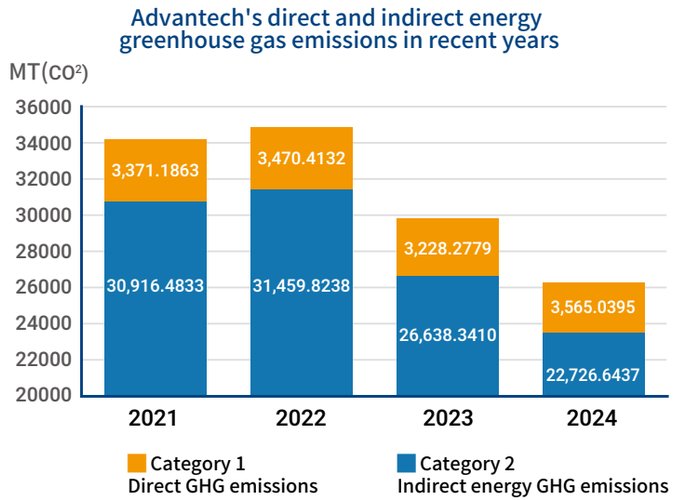
Among Advantech's Taiwan factories (ACL), Scope 2 emissions are solely from purchased electricity. The carbon emissions are calculated using the 2023 Electricity Carbon Emission Factor of 0.494 kg CO_2e announced by the Bureau of Energy, Ministry of Economic Affairs, totaling 9,222.26 metric tons of CO_2e. For Advantech's Kunshan sites(AKMC), Scope 2 emissions include the use of purchased electricity and purchased steam, totaling 11,974.12 metric tons of CO_2e (Market-based). The electricity carbon emissions are calculated using the average national electricity carbon emission factor for 2022 (excluding non-fossil energy electricity from market-based transactions) of 0.5856kg CO_2/kWh, as stated in Table 4 of the "Announcement on the Electricity Carbon Emission Factor for 2022". The carbon emissions from steam are calculated using the emission factor for steam of 110 kg CO_2/GJ, as referenced in the "GHG Emission Accounting and Reporting Guidelines for Industrial and Other Sectors." In addition, AJP, AKR, ANA, AEU Scope 2 use purchased electricity only. Among these, AJP uses the electricity carbon emission factor of 0.4060 kg CO_2e/kWh provided by the manufacturer, Kyushu Electric Power; AKR and ANA use the nationally announced electricity carbon emission factors of 0.4781 kg CO_2e/kWh and 0.2075 kg CO_2e/kWh, respectively; and AEU's electricity carbon emission factor is 0 kg CO_2e/kWh as it uses 100% renewable energy.

The Scope 1 and Scope 2 GHG emissions for Advantech's main operation and production sites are shown in Table 4.3.2. In 2024, the total combined emissions for Scope 1 and Scope 2 were 26,296.8217 metric tons of CO_2e (Market-based). Figure 4.3.2 shows the amount of Scope 1 and Scope 2 GHG emissions by Advantech's main operation and production plants in recent years.

Region	Scope 1 Direct GHG emissions	Scope 2 Indirect GHG emissions from energy		Sum	
		Market-based	Location-based	Market-based	Location-based
Taiwan ACL	804.3931	9,222.2612	9,222.2612	10,026.6543	10,026.6543
China AKMC	2,531.4193	11,974.1196	14,195.6172	14,505.5389	16,727.0365
Japan AJMC	150.3177	1,203.5099	1,203.5099	1,353.8276	1,353.8276
Korea AKSC	9.7673	158.4522	158.4522	168.2195	168.2195
USA ANA	23.7654	168.3008	168.3008	192.0662	192.0662
Europe AEU	45.3768	0	56.3275	45.3768	101.7043
Total (Ton CO_2e)	3,565.0395	22,726.6437	25,004.4689	26,291.6832	28,569.5084

*Note 1: ANA and AEU's GHG inventories have not yet undergone third-party verification.
*Note 2: In the market-based calculation, the GHG emissions from renewable energy sources in AKMC, AEU, and ANA were calculated with the electricity carbon emission factor as 0.

Table 4.3.2 Scope 1 and Scope 2 GHG emissions by Advantech's Main Global Operations and Production Sites in 2024



*Note 1: The scope2 data are GHG emissions from "market-based" sources

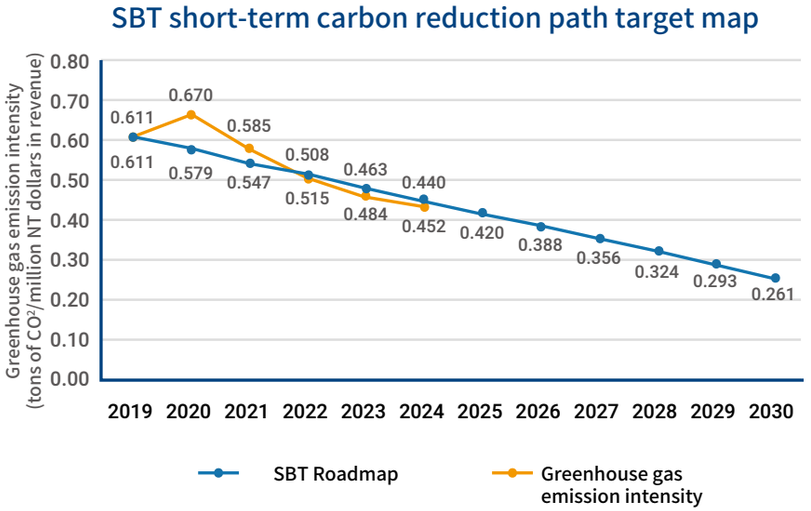
*Note 2: In 2024, the regions using renewable energy included AKMC, AEU, and ANA. AKMC utilized Green Energy Certificates (GEC); AEU sourced 100% renewable energy directly from supplier; and ANA partially used electricity generated by its solar power system.

Figure 4.3.1 Scope 1 and Scope 2 GHG emissions by Advantech' s main global operations and production sites in recent years

In 2024, the average GHG emissions (Scope 1 and Scope 2) per unit of revenue for Advantech's main global operations and production sites were 0.440 metric tons of CO_2e per NTD million, representing a decrease of 28.0% and 4.9% compared to the average GHG emissions per unit of revenue in 2019 and 2023, respectively. This demonstrates our continued progress towards the 2030 SBT of a 60% reduction, as shown in Figure 4.3.2.

In 2024, Advantech not only continued to manage and optimize its energy usage efficiency by following its energy management policy, the ISO 50001 energy management system, and iEMS, but also promoted experience sharing among its facilities, continuously improving energy usage efficiency through regular energy project meetings.

Looking ahead, we will continue to achieve our RE100 and carbon reduction goals through a combination of employee training, carbon reduction and energy-saving projects, energy target setting, increased adoption of renewable energy, setting more ambitious SBT targets aligned with the 1.5 ° C pathway, and the establishment of internal carbon pricing. Furthermore, we also committed to incorporating energy-saving and carbon reduction principles into our corporate culture, encouraging all employees to work together toward a net-zero and sustainable future.



*Note: The scope2 data are GHG emissions from "market-based" sources

Figure 4.3.2 GHG emission intensity and SBT carbon reduction roadmap of Advantech's main operating locations and production sites in recent years

Advantech has six major RBU sites in its global footprint, with Advantech Taiwan and Advantech Kunshan serving as the primary manufacturing bases. In order to identify the key factors for mitigating climate change, we have not only accounted for greenhouse gas emissions from our own operations but also, since 2019, conducted materiality assessments of other indirect emission sources based on the ISO 14064-1 standard. We have established corresponding inventory methodologies with the aim of identifying emission hotspots, setting reduction targets, and gradually implementing mitigation measures. The identification and emissions of Advantech Taiwan and China Kunshan, under Scope 3 for the year 2024 are shown in Table 4.3.3. Historical Scope 3 emissions are detailed in Figure 4.3.3.

Among them, Advantech's Scope 3 GHG emissions per unit of revenue in 2024 decreased by 16.9% compared to 2023. This is mainly attributed to a significant reduction of 22.6% in C11 (product use, which corresponds to a reduction of 202,927.42 metric tons of CO_2e.) In the future, we will continue to promote internal energy-saving labels, product energy-saving design, power efficiency enhancement, and the promotion of internal carbon pricing to further lower our Scope 3 emissions.

Category Item	Verification scope description	Emissions from ACL (Metric tons CO_2e)	Emissions from the AKMC (Metric tons CO_2e)
C1/Category 4	Purchased goods and services	170,478.9531	47,641.4656
C2/Category 4	Capital Goods	4,329.4307	1,281.4052
C3/Category 4	Upstream fuels and energy	1,825.8036	1,084.0499
C4/Category 3	Raw material transportation	35.6019	344.4792
C5/Category 4	Operational waste	40.0910	25.8684
C6/Category 3	Business travel	125.9435	36.2100
C7/Category 3	Employee commuting	466.4475	265.3049
C8/Category 4	Upstream leased assets	52.1071	0
C9/Category 3	Product transportation	1.4836	93.5695
C10/Category 5	Product processing	0	0
C11/Category 5	Product use	513,625.6319	Included in the headquarters in Taiwan
C12/Category 5	Product end-of-life treatment	9.6846	Included in the headquarters in Taiwan
C13/Category 5	Downstream leased assets	0	0
C14/Category 5	Franchises	0	0
C15/Category 5	Investments	9,178.8698	Included in the headquarters in Taiwan
Sum		750,942.4011	

*Note:

1.The GHG Protocol Scope 3 categories 1 to 15 correspond to ISO 14064-1:2018 categories 3 to 6

2.Product use and end-of-life treatment are the scope of the global inspection of Advantech.

Table 4.3.3 Scope 3 identification and emissions of greenhouse gases from Advantech Taiwan and Kunshan

Advantech's Scope 3 emissions statistics over the years

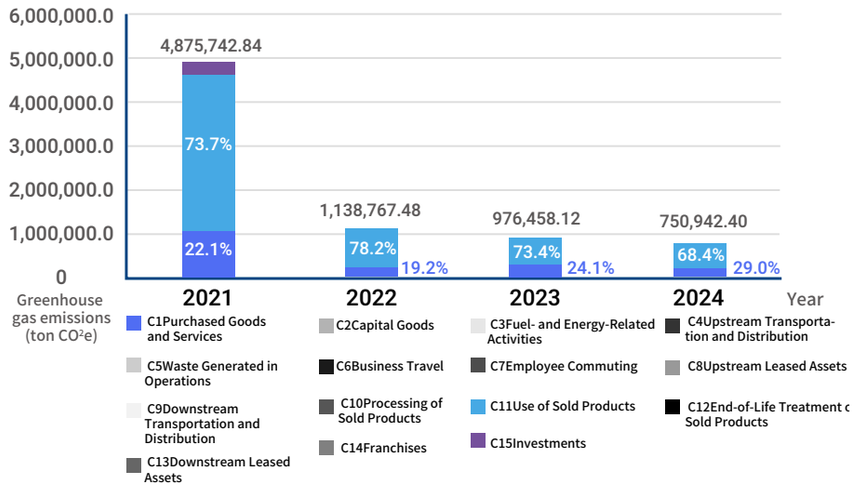


Figure 4.3.3 Advantech's Scope 3 emissions from 2021 to 2024

*Note: Certain 2021 data was assessed using the EEIO methodology through the GHG Protocol Scope 3 Evaluator. The data for 2022 to 2024 was inventoried in compliance with ISO 14064-1 and verified by an independent third party.

Highlighted Projects

Participation in the international Carbon Disclosure Project (CDP) evaluation

Advantech has been cooperating with customers in participating in the Carbon Disclosure Project (CDP) since 2015. CDP is the world' s largest climate change-related database and evaluates the risks and opportunities that climate change presents to companies through a detailed questionnaire every year. This process assesses each company' s response to climate change, including their GHG emissions and reduction efforts. Through the annual CDP information disclosure, Advantech systematically reviews climate regulations, climate disasters, and other climate-related issues and takes effective measures to reduce and eliminate potential risks in operation and management, thereby complying with international customers' requirements on GHG management requirements. In 2024, Advantech received a Level B rating from CDP.

Energy data management

The main source of GHG emissions from Advantech's factories is CO_2 emissions from the generation of purchased electricity necessary for the Company's operations, which accounted for over 80% of the Company's overall emissions in 2024. In 2024, the overall energy consumption (including electricity, steam, gasoline, diesel, and natural gas) at Advantech' s main operating locations and production sites was 197,853.39 GJ, with purchased electricity accounting for 95.92% of total energy consumption (including 9.46% from renewable energy sources), representing a 1.78% reduction compared to 2023.

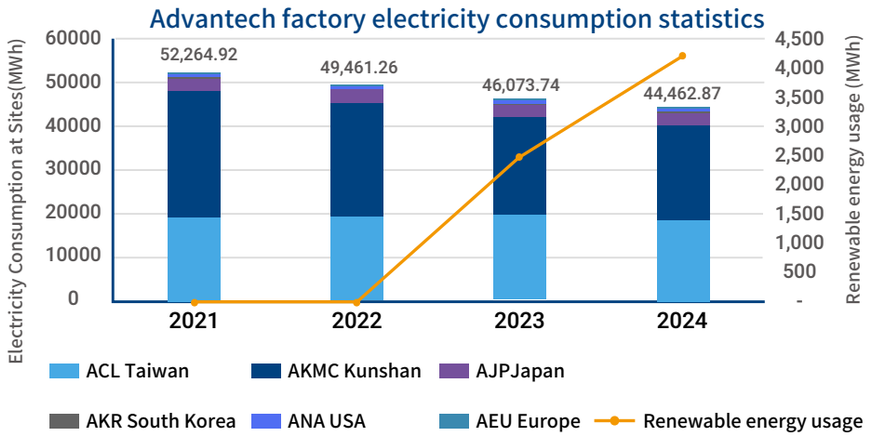
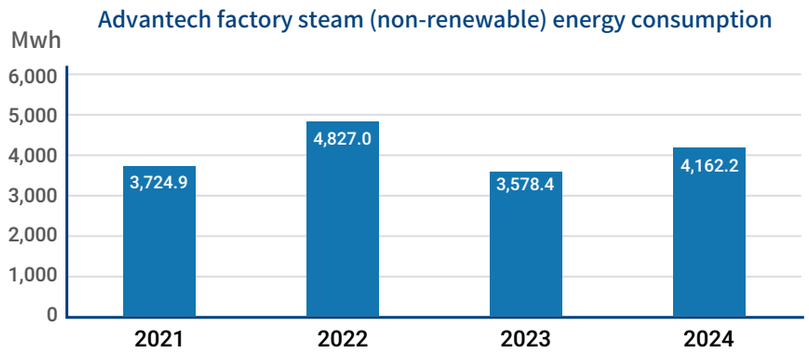


Figure 4.3.4 Electricity Consumption among Advantech's Main Operations and Production Sites in Recent



*Note: The scope covers Advantech's main global operations and production factories, but only the AKMC uses steam.

Figure 4.3.6 Non-renewable energy consumption (purchased steam) by Advantech's main operating locations and production factories in recent years

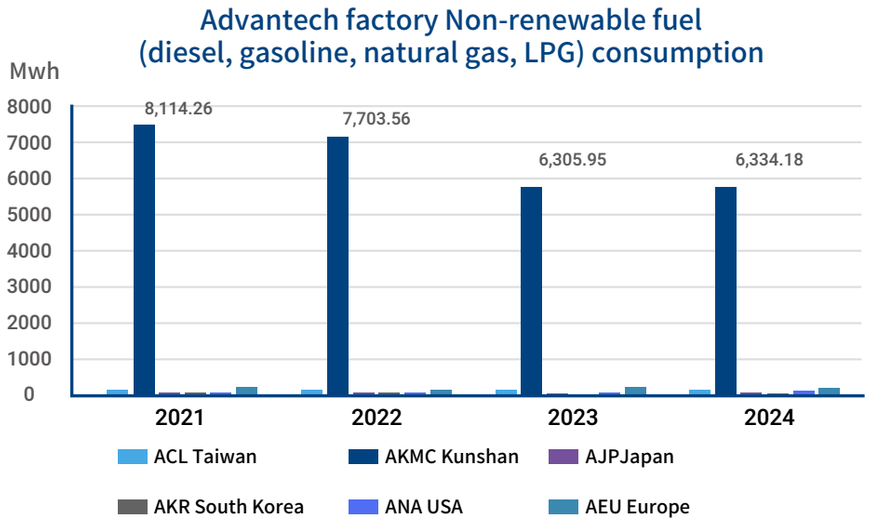


Figure 4.3.5 Non-renewable Fuels Consumption among Advantech's Main Operations and Production Sites in Recent Years

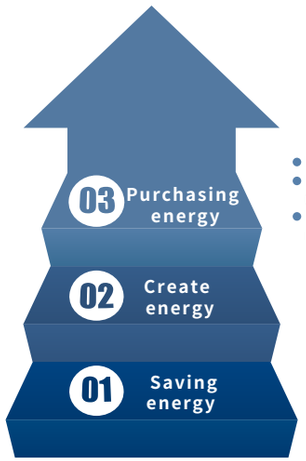
4.3.2 Energy Management Initiatives

Energy use overview

Electricity is Advantech's main energy source. To minimize the environmental impact of its products and production activities, Advantech has established an Energy Management Policy and implemented the ISO 50001 energy management system at its significant locations of operation in Taiwan and Kunshan, China, to systematically manage energy reviews, energy-saving solutions, and benefit analysis processes. Meanwhile, Advantech has established an intelligent energy management system (iEMS) that can monitor energy consumption in real-time, identify energy hotspots, and optimize equipment operation to improve electricity usage efficiency. Additionally, Advantech has established clear energy-saving indicators and targets, and the energy management unit regularly convenes project meetings to monitor implementation progress to continuously increase energy usage efficiency and the percentage of renewable energy used. Furthermore, in 2024, Advantech also monitored electricity consumption management indicators across its six global RBUs to further standardize and improve electricity management in its various operations. At the same time, we continue to launch global renewable energy initiatives, enhance the procurement and usage of renewable energy, and collaborate with all locations of operation to achieve RE100 goals and sustainable energy management.

Energy management strategy

In terms of energy management strategy, Advantech adopts a three-stage approach of energy saving, energy generation, and energy procurement to continue reinforcing energy management, optimizing resource allocation, and gradually achieving the goals of sustainable energy management and renewable energy transition.



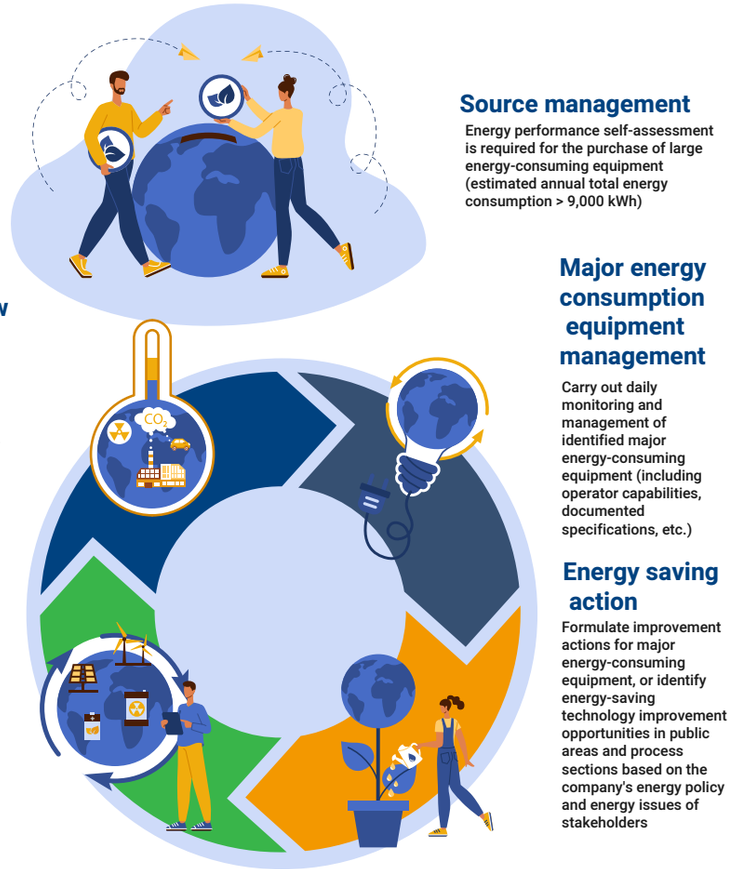
- Procurement of renewable energy certificates
- Direct purchase and resale of renewable energy (Power Purchase Agreement, PPA)
- Investment in renewable energy power plants (for resale and own use)

- Self-built solar energy systems in factories and offices
- Self-built energy storage systems in factories (for peak shaving and valley filling)

- Introducing energy-saving management and monitoring systems
- Improve energy efficiency of machines and utility equipment
- Replace with high-efficiency equipment

Energy management process

Advantech has established an internal energy management mechanism and adopted the ISO 50001 energy management system. Through effective system operation, the Company manages energy from the source, beginning with procurement, and evaluates overall energy consumption through regular energy reviews to identify energy consumption hotspots. This effort is integrated with Advantech' s proprietary iEMS platform, which enables real-time monitoring through an energy dashboard. Significant energy uses (SEUs) equipment is closely managed to ensure optimal efficiency. Additionally, energy-saving solution benefit analyses are conducted as part of a continuous improvement cycle to optimize energy management practices and enhance energy efficiency over time.



Management of significant energy uses (SEUs) equipment at major production sites in 2024

Advantech has six RBUs globally, with Advantech Taiwan and Advantech China-Kunshan serving as the primary production sites. As such, the implementation of the ISO 50001 energy management system is prioritized at these sites to enable systematic energy conservation and management.

Field	Significant energy uses (SEUs) equipment	Management method of significant energy uses (SEUs) equipment
ACL (Taiwan)	Chiller systems	Real-time monitoring of chiller system operations and inlet/outlet water temperature control is conducted using the SCADA system, along with regular maintenance activities specified in the SOP
	Laboratory equipment and process-related equipment	Regulate maintenance and management is carried out by following the SOP, including routine inspections, management, and regular maintenance
AKMC (China-Kunshan)	Production equipment (solder reflow oven, liquid baking line, solder pot)	Based on the qualification requirements of operators at each post, regular monitoring plans are formulated. The plans include monitoring methods, intervals, personnel, and records
	Air conditioning system	The air conditioning equipment is maintained, operated, and managed according to the SOP. The operation process is monitored by an air conditioning automatic control system, which also regulates the chiller's water temperature

Energy-saving management initiatives of various significant locations of operation in 2024

Field	Category	Energy saving topic	Energy saving
Taiwan ACL	Air conditioning system	Energy improvements of the air conditioner chiller system, energy-saving measures for the external air handling unit, air conditioner inverters, and temperature control of floor air-conditioning units	282,588 kWh
	Power systems	Elevator operating time control	2,244 kWh
	Power consumption of outlets	Public facility usage scheduling and management	32,940 kWh
	Lighting systems	Lighting fixture replacement and usage scheduling, and management	227,958 kWh
	Process improvement	Set up an EC automatic shutdown schedule for the production line auxiliary equipment	4,555 kWh
Kunshan, China AKMC	Lighting systems	Replace lights in plants	51,000 kWh
	Process improvement	Product manufacturing process and printing optimization	1,830M³

2024 process energy-saving management project highlights

- **For production electricity consumption (B1F~6F), we have set up an automatic EC shutdown schedule for eSOP computer mainframes**

To enhance energy efficiency in the production areas, an automatic shutdown schedule via EC (Energy Control) will be implemented for the eSOP computer servers on each floor from B1F to 6F. The system will automatically turn off equipment during non-production hours based on production shifts and actual operational needs, thereby reducing idle power consumption and strengthening the overall management of energy usage for production.

- **Implemented verification to shift from printing one product at a time to printing multiple products at once**

The shift from printing one product at a time to printing multiple products reduced the natural gas consumption of the screen printing machine. An evaluation by PE revealed that the number of product SKUs printed simultaneously could be increased to a total of 490 SKUs. This results in a natural gas saving of 0.003 m³ per piece. With a production volume of 610,000 pieces, the projected annual natural gas saving is 1,830 m³. According to statistics, in April 2024, the production of multiple products in one print job reached 72,852 pieces, resulting in an estimated natural gas energy saving of nearly 218.6 M³

◆ **Establish an intelligent energy monitoring system and continue to implement energy-saving projects**

Advantech effectively implemented the proprietary iEMS (Intelligent Energy Management System) across its locations of operation in the United States and Europe in 2023. Through digital professional integration technology, we provide functional solutions such as energy consumption monitoring and management, HVAC energy efficiency management, and air compressor energy efficiency management. These solutions feature advanced energy efficiency management capabilities, enabling organizations to optimize energy use, enhance efficiency, seize energy-saving opportunities, and support carbon trading. The objective is to drive low-carbon transformation through digitalization, thereby empowering businesses to conserve energy and reduce emissions by managing online data to facilitate offline improvements, ultimately assisting the Company to transition toward green operations.

Renewable energy promotion program

Advantech commits to 100% renewable energy by 2040 (RE100)

Since becoming an RE100 member in 2023, Advantech has actively promoted renewable energy development plans for its headquarters and overseas subsidiaries. The electricity consumption of Advantech's Taiwan headquarters and Kunshan, China, accounts for over 90% of Advantech's global electricity consumption. Consequently, Advantech's progress in implementing renewable energy will primarily focus on these two core manufacturing sites.

For the disclosure of renewable energy-related data, please refer to the chapter on energy data management in the report. The implementation timeline and management model are as follows:

Management model	◆ In the same year, Advantech officially established Advantech's global RE100 task force. The ESG Corporate Sustainability Development Office leads the coordination and progress review of renewable energy implementation, while the President of General Management conducts the review during the quarterly ESG regional meeting. ◆ The RBUs under this team span across Advantech headquarters and five countries/regions including China, the United States, Europe, Japan, and Korea. ◆ Each RBU has appointed renewable energy personnel to develop local plans that promote renewable energy compliance in line with local policies, regulations, and electricity price markets. ◆ The progress of achieving renewable energy targets in 2024 has been incorporated into the performance indicators of the Chairman and responsible management, and financial incentive mechanisms were also formulated and implemented.

Renewable energy promotion timeline and goals

Year	Core development progress
2021	Invest in aquavoltaics power plants
2022	Installation of solar photovoltaic panels in the Linkou plant and the Kunshan plant
2023	◆ Each RBU has established its renewable energy usage targets and implementation pathways for 2024-2040 ◆ Officially joined RE100 ◆ Form the RE100 global task force ◆ Include the achievement of renewable energy standards in the KPI review of middle and senior management and plan the financial incentive mechanism
2024	Advantech's headquarters signed a renewable energy procurement contracts with a general energy service provider. It is projected that within the next six years, micro-grid energy will supply approximately 40 million kWh of renewable energy through a long-term power purchase agreement model, assisting Advantech in achieving its future renewable energy usage targets.
2025	Advantech's AASC plant in the United States and AESC office in Europe achieve RE100
2030	Taiwan headquarters and the Kunshan, China manufacturing site achieve 50% renewable energy usage
2040	Achieve RE100 goals

Overseas significant locations of operation renewable energy project highlights

ANA	Installation of solar photovoltaic panels at AASC plants, achieving a renewable energy coverage rate of 14.6%
AKR	Local solar power installation projects have been initiated, and applications for government funding have been submitted
AJP	AJP has complied with the renewable energy policies of its host country and has identified suitable renewable energy suppliers. Procurement is expected to begin in the first quarter of 2025, once the relevant policies are clarified
AKMC	To increase the percentage of renewable energy by 5% annually, renewable energy is sourced from solar panel installations and the purchase of RE100-recognized renewable energy certificates. In 2024, the percentage of renewable electricity reached 17.7%.
AEU	Procure renewable energy directly from local suppliers to achieve the 100% renewable energy goal

Establish an intelligent energy monitoring system and continue to implement energy-saving projects

2In 2024, Advantech's iEMS demonstrated significant progress. Through digital professional integration technology, we provide functional solutions such as energy consumption monitoring and management, HVAC energy efficiency management, and air compressor energy efficiency management. These solutions feature advanced energy efficiency management capabilities, enabling organizations to optimize energy use, enhance efficiency, seize energy-saving opportunities, and support carbon trading. The objective is to drive low-carbon transformation through digitalization, thereby empowering businesses to conserve energy and reduce emissions by managing online data to facilitate offline improvements, ultimately assisting the Company to transition toward green operations. As of 2024, project implementation has been extended to ANA, AJP (Tokyo), AESC, AASC, AKMC, ACL, and ACN (Xian, Shanghai, and Beijing). Implementation in AJP Nogata is expected in 2025.

Training program

To raise awareness of energy conservation and carbon reduction among Advantech' s internal employees, the energy management unit periodically organizes training sessions or encourages external participation in relevant programs. These courses cover topics such as general energy knowledge and professional technical skills. A summary of each course and the participating units is provided below. Through these initiatives, we aim to support the professional development of energy management personnel and facilitate access to domestic and international resources, thereby enhancing knowledge acquisition and practical application in the field of energy management.

Category	Content	Training unit
Knowledge training	Energy knowledge introductory course Based on the P-D-C-A management system, concepts such as energy reviews, energy baselines, energy performance indicators, and energy procurement are explained. These concepts are combined with energy efficiency and management practice case studies to enhance the energy awareness of internal personnel	All employees, new employee hires
	RE100 technical standard training: Analysis of RE100 technical standards, along with an overview of the current conditions of the renewable energy market worldwide, in Europe, the United States, and Taiwan, as well as successful case studies of RE100 benchmark enterprises, and the role of RE100 in achieving net zero.	Energy management unit, investment unit, procurement personnel, ESG Corporate Sustainability Development Office, Product and Corporate Quality and Management Department, Intelligent Energy Management Product Planning and Design Department, overseas significant locations of operation (AKMC, ACN, ANA, AEU)
Technical training	Equipment technical training for significant energy uses (SEUs) equipment: Operating environment temperature and humidity control, equipment operation in the burn-in section, powder and liquid baking operations	Operator, burn-in operator, and spray coating technician
	Specific job technical training: Air compressor operation and maintenance, air conditioner chiller system operation	Engineering, plant facilities, general affairs

4.4 Environmental Management

Performance highlights

- 0 — No violations of environmental laws and regulations occurred, and no fines were incurred over the past 4 years
- NEW — The ISO14001 environmental management system was introduced to AEU, and a certificate was successfully obtained
- ACHIEVED — The new building at Advantech's Linkou plant in Taiwan has been awarded the Intelligent Building Label and the Gold-rated Green Building Label
- ACHIEVED — The Kunshan plant in Mainland China successfully renewed its green factory certificate in 2025

4.4.1 Environmental Responsibility

Advantech is well aware of the environmental impact of its product manufacturing processes. Consequently, in fulfilling our environmental responsibilities, we have adopted the ISO 14001 environmental management system to identify environmental risks and opportunities, and ensure that all our plants comply with local regulations and stakeholder expectations. To this end, we conduct internal audits annually and obtain third-party certification to implement the requirements of the ISO 14001 environmental management system. At the same time, to foster environmental awareness among our colleagues, we have developed training courses on the Company's policies and management measures for water conservation, waste reduction, and resource recycling, providing Advantech employees with environmental responsibility education. This requirement extends beyond new colleagues, as all our current colleagues are required to complete annual on-the-job training to make sure that all employees understand our latest environmental policies. The Company's environmental policy is confirmed and committed to by the Board of Directors before it is announced on the official website.

Environmental promotion procedures and actions

Implementation procedures	Management initiatives
Environmental management operating regulations, environmental management system (ISO 14001), GHG inventory (ISO 14064-1), and energy management system (ISO 50001)	◆ Pollution control and prevention ◆ Environmental responsibility training, such as: water conservation, waste reduction, and resource recycling, etc. ◆ Environmental management system maintenance ◆ GHG management ◆ Supervise and improve energy performance

Environmental promotion goals

Since 2022, aside from its Taiwan headquarters and Kunshan plant in China, Advantech has expanded the collection of environmental data to include facilities in AJP, AKR, ANA, and AEU. In 2023, the Company set environmental management targets for each RBU or production plant. Their achievement status in 2024 and targets for 2025 are outlined in the following table.

	2024 Goals	2024 execution results	2025 Goals
Water consumption (respective RBUs)	Decreased by 2% compared to 2023 (M^3/people)	All RBUs, except for AJP, achieved their targets An average decline of 3.01%	Decreased by 2% compared to 2024 (M^3/people)
Waste volume (respective RBUs)	Decreased by 5% compared to 2023 (ton/million production hours)	All RBUs, except for AJP, achieved their targets An average decline of 15.93%	Decreased by 5% compared to 2024 (ton/million production hours)
VOC emissions (Kunshan plant, China)	Decreased by 5% compared to 2023 (ton/million production hours)	Target achieved, decreased by 55.51%	Decreased by 5% compared to 2024 (ton/million production hours)

To fulfill its commitment to green operations and sustainable development, Advantech has established and follows the ISO environmental management system to develop environmental topics and achieve effective resource utilization. We establish Advantech environmental management framework through the "Environmental Safety and Health Committee" or "Management Review Meetings" at each production plant to promote green operations, implement pollution prevention, waste management, and green procurement, as well as energy saving, emission reduction, sustainable resource utilization, and circular economy. We vigorously seek third-party certification for environmental management systems, GHG inventories, and energy

management systems at our significant locations of operation and production plants worldwide. Locations and plants that have already obtained certification are listed in Table 4.4.1. Notably, AEU has recently obtained environmental management system certification, while AJP and AKR have obtained third-party certification for GHG inventories. The scope of this chapter covers Advantech's significant locations of operation and production plants worldwide, accounting for 92.8% of the total consolidated revenue.

Relevant certified plants / Environment Certification items	ACL	AKMC	AJP	AKR	ANA	AEU
ISO 14001:2015	V	V	V	V	V	V
ISO 14064:2018	V	V	V	V		
ISO 50001:2018	V	V				

Table 4.4.1 Environment at Advantech's significant locations of operation and production plants worldwide

No fines were incurred due to violations of environmental laws and regulations in 2024. The Company has compiled the environmental violations at Advantech's significant locations of operation and production plants worldwide in the past four years, as shown in Table 4.4.2.

Plant / Year	ACL	AKMC	AJP	AKR	ANA	AEU
2024	0	0	0	0	0	0
2023	0	0	0	0	0	0
2022	0	0	0	0	0	0
2021	0	0	0	0	0	0

Table 4.4.2 Environmental violation statistics of Advantech's significant locations of operation and production plants worldwide

Advantech's environmental/resource input/output (covering ACL, AKMC, AJP, AKR, ANA, and AEU)

4.4.2 Energy Resource Use and Waste Management

Water resource risk management and water consumption/sewage management

Advantech utilizes the World Resources Institute (WRI) Water Risk Atlas analysis tool to confirm the water resource risks at its significant locations of operation and production plants (as shown in Figure 4.4.1), and disclose the sources of water withdrawal and the receiving water bodies for discharge in each region, as detailed in Table 4.4.3. According to the analysis results, Advantech's significant locations of operation and production plants generally face low to medium water resource risks, except for the Kunshan plant in China, which faces a high water resource risk. Using the results of the water resource risk analysis, Advantech plans and manages its water resources according to the risk level at its significant locations of operation and production plants, ensuring effective and sustainable water use.

Factory	ACL	ATMC	AKMC	AJP	AKR	ANA	AEU
Water withdrawal source	Xindian River	Shimen Reservoir	Yangtze River	Onga River	Paldang Reservoir	Hetch Hetchy	Brabant Water
Wastewater Treatment Plant	Neihu Sewage Treatment Plant	Guishan Sewage Treatment Plant	North District Sewage Treatment Plant	Septic Tank	Bupyeong Water Purification Plant	San Jose - Santa Clar Regional Wastewater Facility	Connected to the municipal wastewater treatment plant
Receiving water body	Keelung River	Nankan River	Taicang Tang	Onga River	Han Rive	South San Francisco Bay	Municipal sewage system

Table 4.4.3 Water sources for intake and receiving water bodies for discharge at Advantech's significant locations of operation and production plants worldwide

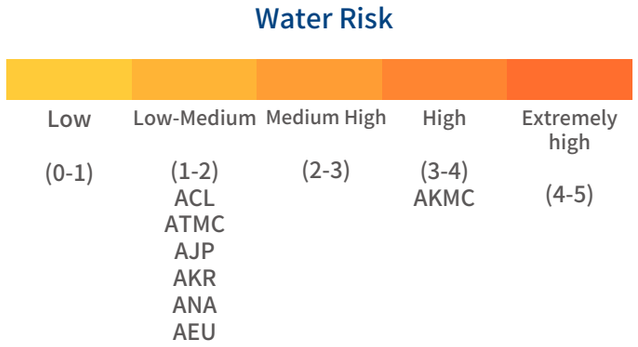


Figure 4.4.1 Water resource risk analysis map for Advantech's significant locations of operation and production plants worldwide

All of Advantech's offices and plants are situated in developed industrial zones or parks within metropolitan areas, utilizing tap water as their primary water source, without relying on groundwater or well water. Their production processes are primarily assembly-based rather than water-intensive, and water consumption is mainly for domestic purposes. As such, overall consumption is low and does not pose a significant environmental impact on water resources. Even so, Advantech still follows the ISO 14001 environmental management system to identify water consumption and sewage treatment processes, explore water conservation opportunities, actively promote water-saving management programs, and strive to reduce water consumption and sewage discharge to ensure the proper management of water resources. The total water consumption of Advantech's significant locations of operation and production plants worldwide for the last four years is shown in Figure 4.4.2.

Advantech's plants continue to explore water conservation possibilities. In employee activity areas, rainwater harvesting systems are installed for toilet flushing and park irrigation, and intelligent irrigation systems are also implemented to save water. In addition to using water-saving faucets and toilets, employees are required to participate annually in environmental responsibility education and awareness training on water efficiency management programs, which are embedded in Advantech’ s corporate culture. Regarding chiller systems used by ACL, intelligent temperature control is implemented to accurately regulate the temperature and humidity of the work areas, avoiding unnecessary water waste. ACL's total water consumption in 2024 decreased by approximately 4,666 m³ compared to 2023. As for the Kunshan plant in China, due to the higher water resource risk it faces compared to other plants, the plant has continued to implement projects such as reclaimed water reuse and overflow water reuse since 2022. The aim is to recycle sewage from the production process back to the plants for reuse as much as possible, thereby reducing the plant's reliance on tap water. In 2024, the Kunshan plant's total water consumption decreased by 14% compared to 2023, amounting to roughly 24,862 m³, while the sewage recycling rate was 30%. The United States AASC plant implemented a water-saving optimization plan for its irrigation system in 2023. To protect plant health, the system was continuously optimized and adjusted, resulting in an additional 15% water savings in 2024, amounting to about 632m³ of water. This goes to demonstrate the United States AASC plant's emphasis on water resource conservation. Water consumption of Advantech's significant locations of operation and production plants worldwide in recent years is summarized in Table 4.4.4.

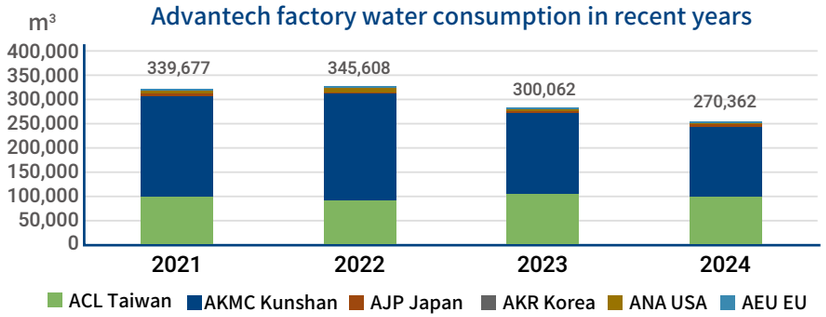
		2021	2022	2023	2024
Water withdrawal (m³)		339,677	345,608	300,062	270,362
Discharge volume	Domestic sewage (m³)	214,949	226,277	198,481	177,397
	Industrial sewage (m³)	22,825	15,649	11,563	11,856
Water consumption (m³)		101,903	103,682	90,019	81,108
Scope covers Advantech's consolidated revenue		92.3%	92.3%	92.6%	92.8%

*Note：

1. Domestic sewage is calculated by multiplying the water withdrawal by 70% and subtracting the industrial sewage.
2. Water consumption is calculated by subtracting water discharge from water withdrawal.
3. A correction has been made to Korea's water consumption data, as the 2021 figures were not recorded, and the 2022–2023 data contained errors.
4. Corrections have been made to the water consumption data between 2021 and 2023.

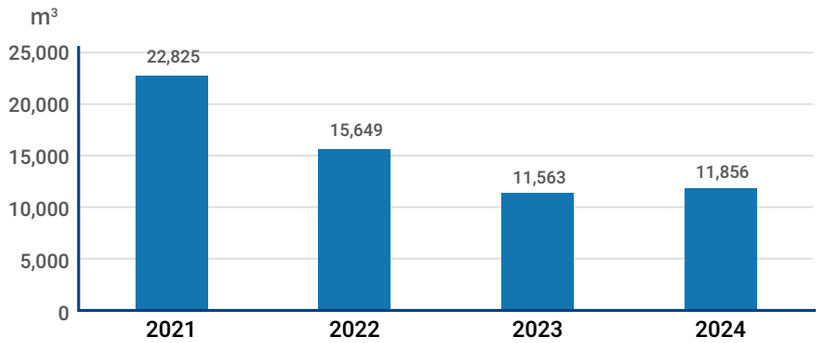
Table 4.4.4 Water consumption of Advantech's significant locations of operation and production plants worldwide in recent years

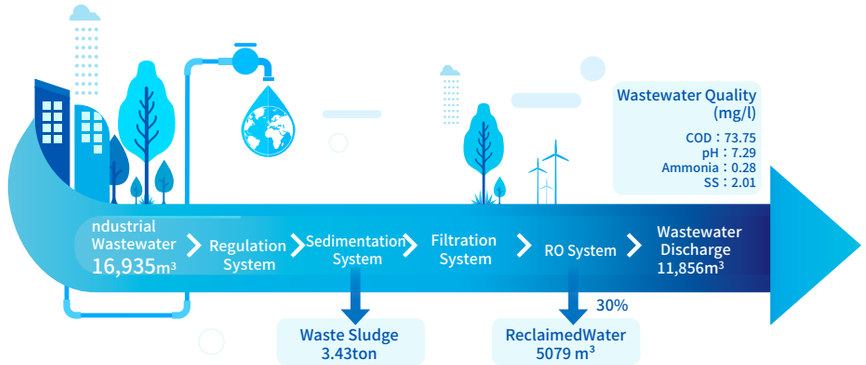
Among all Advantech's production plants, only the Kunshan plant in China discharges industrial sewage. The Kunshan plant in China has an internal sewage treatment system that adopts methods such as acid-base neutralization and biological treatment to pre-treat sewage on-site. It also utilizes the Company's proprietary product, the Advantech Smart Factory Solution-i-factory system, to monitor the quality of discharged sewage in real-time. This ensures that all sewage discharge meets standards before being discharged. The Kunshan plant's sewage treatment process and main water quality metrics are illustrated in Figure 4.4.3. No fines were issued in 2024 for non-compliance with water quality standards.



*Note: No water consumption statistics were recorded for Korea in 2021

Figure 4.4.2 Water consumption by Advantech' s significant locations of operation and production plants worldwide in recent years





*Note: Among all Advantech's significant locations of operation and production plants, only the Kunshan plant in China discharges industrial sewage

Figure 4.4.3 Industrial sewage discharge by Advantech's main production plants worldwide

Waste management and circular economy

Name of materiality	Please describe the importance of this materiality to Advantech
Circular economy	Advantech is driven by the corporate vision of "Enabling an Intelligent Planet", reducing waste and carbon footprint through resource circulation. We also consider how waste can transition from linear processing to a closed-loop sustainable cycle to enhance environmental sustainability and resource utilization efficiency. This approach helps mitigate the environmental impact of product manufacturing while strengthening aspects such as energy efficiency and the use of sustainable materials, ultimately leading to improvements in environmental performance and product competitiveness.
Management strategy	◆ We have established a circular strategy that integrates eco product design and green production processes from the outset of new product development, in a bid to minimize waste generation and carbon footprint. ◆ The Company has introduced the UL 2799 management model for waste management. We prioritize waste reduction initiatives and strive to increase the conversion and recycling rates of disposable waste through methods such as recycling and reuse, thereby maximizing the benefits of resource recovery. Disposal methods such as incineration and landfill are only used as a last resort for waste that cannot be reused.
Policy or commitment	We are committed to making every effort to protect the environment, striving for zero pollution in our production processes, fulfilling our responsibilities as a global corporate citizen, and advancing corporate sustainable development. Advantech strives to promote green operations by implementing eco product design, pollution prevention, waste management, and green procurement. We collaborate with customers, suppliers, and contractors to build a green supply chain spanning design, manufacturing, product delivery, and service through the implementation of energy conservation, emission reduction, resource optimization, and circular economy practices.
Positive impact	Fostering a circular economy can increase product resource utilization efficiency, decrease the use of non-renewable resources, lower production costs, reduce waste, enhance the eco-friendliness and resource utilization efficiency of products, minimize environmental impact and product carbon footprint, as well as improve the environmental benefits and competitiveness of products.
Negative impact	The inability to keep up with the eco product trend will diminish the environmental benefits and competitiveness of products. In the long term, it may lead to panic buying of virgin resources and raw materials, increase procurement volumes and waste disposal expenses, and also directly impact corporate reputation and brand image. Advantech' s countermeasures against negative impacts are outlined as follows: ◆ Vigorously promote the introduction of recycled raw materials into production processes ◆ Prioritize green procurement of products featuring eco-friendly, energy-saving, water-saving, and green construction material labels ◆ Implement the UL2799 waste management model to pursue the sustainability of resources
2024 goal achievement progress	◆ Evaluated the introduction of recycled raw materials into the Company's product design. ◆ Previously incinerated plastic waste is now converted into reuse treatment. At the Linkou plant, the percentage of recycled plastic increased by 15%. ◆ Promote green procurement at the Linkou plant. For instance, the procurement of products featuring an eco label and recycled plastic pellets amounted to NTD 107 million. ◆ In 2024, Advantech's significant locations of operation and production plants achieved a 90% recycling rate for business waste outsourced for treatment. The incineration disposal rate was 10%, with no waste sent to landfills.
2025 goals	◆ The mechanism casings of Gold Medal design products incorporate recycled raw materials, with up to 30% recycled plastic and 10% recycled metal used, depending on the specific material ◆ The waste conversion rate at the Linkou plant and the Kunshan plant in China reaches 90%
2030 goals	◆ The mechanism casings of Gold Medal design products incorporate recycled raw materials, with up to 50% recycled plastic and 20% recycled steel / 80% aluminum used, depending on the specific material ◆ The waste conversion rate across Advantech's global plants reaches 90%
2024 key action plans or programs	◆ Formulate a sustainable raw material policy and promotion plan, and gradually introduce recycled materials to specific models. ◆ Apply the UL2799 management model to assess the waste reduction, recycling, and reuse situation in the Company.

Effectiveness assessment	◆ Present the progress report of the sustainable raw material plan to the Sustainable Development Committee (SDC), and suggestions are provided by the committee members ◆ The waste conversion rate is calculated regularly to verify the effectiveness of waste reduction, recycling, and reuse measures. The progress is reported to the Environmental Safety and Health Management Review Committee.
Stakeholders impacted by the material topic and actions implemented by Advantech	◆ Employee: The policy will be included in employee education and training courses, and HR will be requested to list it as a mandatory online course. Waste classification will also be promoted and audited irregularly. ◆ Customers: Respond to customer questionnaires and audits, and provide relevant supporting records as necessary. ◆ Suppliers and contractors: In 2024, a supplier conference was held for tier 1 suppliers, during which the concepts and goals of sustainable management were communicated. The conference aimed to encourage suppliers to collaborate with Advantech in implementing circular economy-related initiatives. ◆ Shareholders and investment institutions: Achievements are disclosed through the Company's Annual Report and Sustainability Report. ◆ Partners: Respond to partners' inquiries and provide supporting records as necessary. ◆ Government / public associations / media: Respond to inquiries from government units and relevant public associations, and provide supporting records as necessary.

Note: For details on sustainable raw material and recycled material-related chapters, please refer to 4.1 Eco Design and Sustainability Liability ofProduct

Advantech is dedicated to implementing the zero waste to landfill policy and the plant business waste reduction, recycling, and reuse program. As of 2024, Advantech has implemented the UL2799 zero waste to landfill standard management, beginning with our ACL facility. Currently, Advantech no longer uses landfills to dispose of the waste. Furthermore, we are optimizing our waste management, re-evaluating waste categories and flows, and exploring more opportunities for waste recycling to reduce the possibility of waste going directly to incineration plants, in turn improving the waste conversion rate. In 2024, the self-assessed waste conversion rate for Advantech's significant locations of operation and production plants worldwide was 74% (the calculations for ANA, AEU, AJP, and AKR only included the amount of business waste, and certain internally recycled resources were not included). Meanwhile, Advantech also adheres to the ISO 14001 management system standards to ensure that waste disposal contractors and their disposal methods comply with local regulations. To accurately understand the waste disposal situation, Advantech regularly conducts audits of waste disposal contractors according to the law to ensure that all outgoing waste is disposed of legally. During the waste disposal contractor selection process, factors such as whether they have obtained/passed relevant qualifications are included in the evaluation. After waste is transported off-site, the Company verifies its legal disposal through government reporting platforms or by reviewing disposal certificates provided by contractors. If necessary, Advantech also conducts on-site inspections of waste treatment facilities to ensure that waste handling processes and contractor service quality comply with Advantech’ s standards and regulatory requirements. In 2024, there were no major breaches of contract or legal violations by any of Advantech’ s waste contractors.

In terms of waste recycling and reduction, Advantech not only works with end-of-life recyclers to convert waste into recycled raw materials but also collaborates with upstream suppliers. This includes initiatives such as recycling and reusing packaging materials, reusing wooden pallets, and modifying PCB designs to reduce edge scraps. Waste generation is minimized in the plants by reusing solder dross. Through collaboration among the plant, suppliers, and waste disposal contractors, Advantech aims to minimize waste incineration, reduce environmental impact, and achieve sustainable resource circulation. In addition, Advantech's Kunshan plant in China launched a research project in 2023 to transition from liquid painting to powder coating. The project was fully implemented in 2024, resulting in a reduction of approximately 30 tons of lacquer residue waste. The Company's waste management model is shown in Figure 4.4.4.

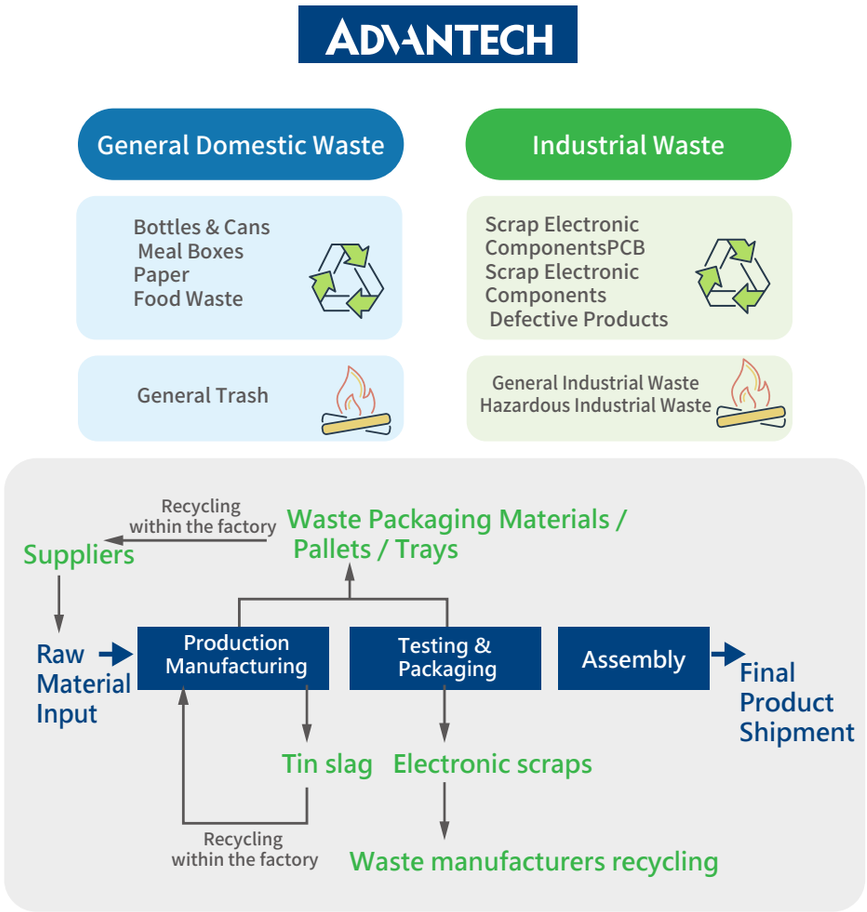


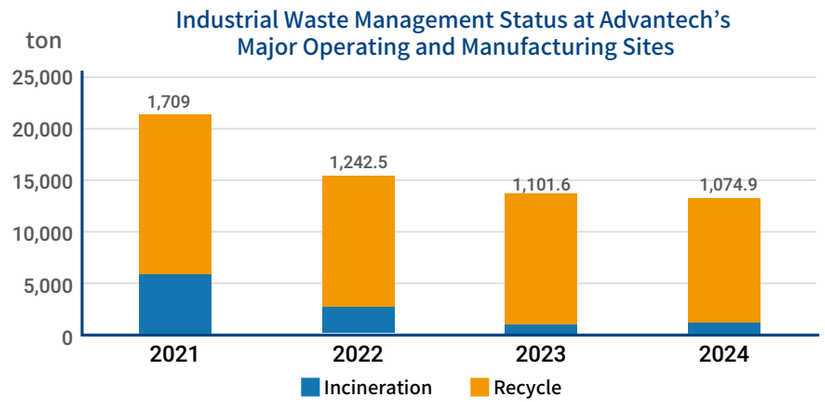
Figure 4.4.4 Advantech's waste management model

Statistics indicate that the total business waste disposal outsourced by Advantech's significant locations of operation and production plants in 2024 was about 1,074.92 metric tons, of which non-hazardous waste amounted to 919.61 metric tons (85.55%), and hazardous waste was 155.31 metric tons (14.45%). For hazardous business waste, the recycling rate was 41% (63.28 metric tons), while 59% (92.03 metric tons) was incinerated. As the weight of domestic waste is estimated based on the cleaning contract and lacks detailed classification of disposal methods, only the disposal information for business waste is disclosed. For waste disposal method, please refer to Table 4.4.5 and Figure 4.4.5.

	Waste generated	Disposal transfer: Recycling	Direct disposal: Incineration	Direct disposal: Landfill
Hazardous business waste (metric tons)	155.31	63.28	92.03	-
Non-hazardous business waste (metric tons)	919.61	899.03	20.58	-

*Note：
1.Waste weight statistics for ACL and AKMC are based on data reported by each plant to the competent authority, while statistics for AJP, ANA, and AEU are based on outsourced disposal data.

Table 4.4.5 Business waste disposal status of Advantech' s significant locations of operation and production plants in recent years



* Note：
1.Waste weight statistics for ACL and AKMC are based on data reported by each plant to the competent authority, while statistics for AJP, ANA, AEU, and AKR are based on outsourced disposal data.
2.No waste generation statistics were recorded for Korea between 2021 and 2023.

Figure 4.4.5 Business waste disposal status of Advantech' s significant locations of operation and production plants in recent years

亮點案例 1：
Circular economy activities at ACL

Introduction to the waste solder recycling project

Recently, ACL plants have embraced circular economy principles by emphasizing resource reuse, waste reduction, and minimization. As part of this initiative, a solder dross reuse project was implemented, utilizing a solder dross separation machine to recycle hazardous solder waste. In 2024, the project successfully recycled 5.01 tons of solder ingots, effectively reducing both the generation of solder dross within the plant and the demand for new tin purchases.

Introduction to the adoption of recycled materials

In addition to promoting the reuse of end-of-life waste as part of the circular economy, Advantech also evaluates the adoption of recycled materials during eco product design to enhance sustainability from the source. For detailed information, please refer to 4.1 Product Eco Design Management and Sustainable Responsibility.

Recycling of packaging materials

Concerning waste management, Advantech not only implements internal recycling but also collaborates with upstream suppliers to promote circular recycling and packaging material reduction. When suppliers deliver goods, they take back the packaging materials from the previous shipment (cardboard boxes, trays, etc.) and reuse them for shipping products to Advantech, thereby achieving the goals of reducing packaging material and promoting circular reuse. In 2024, Advantech worked with its suppliers to achieve the circular use of nearly 24 tons of packaging materials.

亮點案例 2：
AEU environmental activities

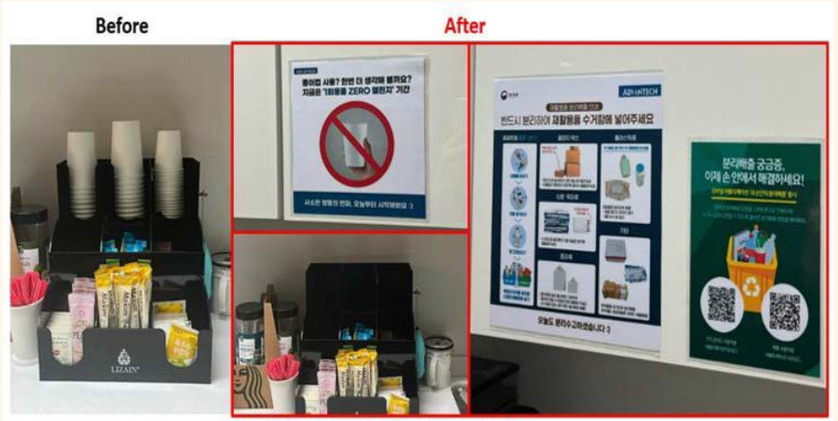
Beginning from November 2024, AEU eliminated non-recyclable cups and promoted the use of reusable cups among employees to reduce single-use waste and implement sustainable environmental policies.

Advantech Europe proactively promotes environmental sustainability initiatives and hosts a cleaning day as part of its Environmental Day activities.

During these activities, to create a suitable environment for beehives and improve the park, the Advantech team repurposed damaged pallets to construct honeycomb planters and joined forces with AESC volunteers to plant flowers, in an effort to promote biodiversity and environmental aesthetics.

亮點案例 3：
AKR environmental activities

Since 2023, AKR has participated in the Korean government's Plastic-Free Day challenge, reducing the supply of single-use items within the plant. In 2024, the procurement volume was lowered by approximately 20% compared to 2023.



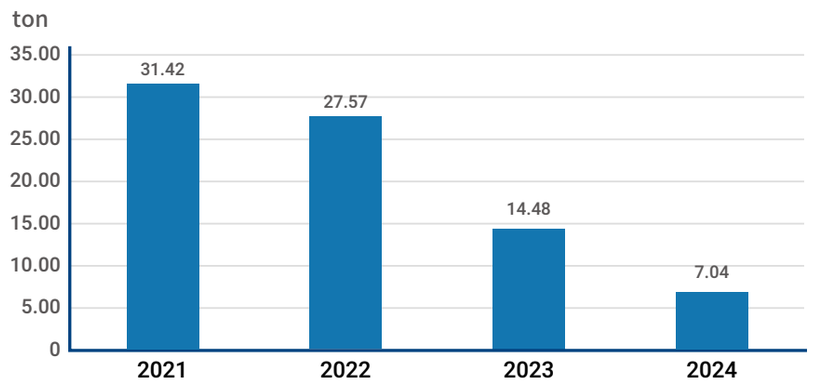
Single-Use Plastic Zero Challenge &
Poster for Proper Recycling Guidelines and Encouragement

Air pollutant management

In terms of air pollution data and information disclosure, the following 3 key points are summarized below:

- Advantech's production process does not produce ozone depleting substances (ODS), and therefore there are no ODS emissions.
- The primary source of VOCs at the Kunshan plant in China is process emissions. The VOC emissions are uploaded to the government environmental reporting website according to local regulations. The annual VOC emissions comply with local regulatory requirements.
- Advantech's other production plants primarily focus on assembly processes, which generate minimal air pollution. As a result, these facilities do not emit significant levels of nitrogen oxides (NOx), sulfur oxides (SOx), or volatile organic compounds (VOCs).

Please refer to Figure 4.4.6 for the VOCs of Advantech's manufacturing plants in recent years.



*Note: Among all Advantech's significant locations of operation and production plants, only the Kunshan plant in China generates VOCs

Table 4.4.6 Emissions of VOCs by Advantech's significant locations of operation and production plants in recent years (unit: metric tons)

To implement environmental reduction targets, Advantech' s Kunshan plant in China has adopted effective VOCs control measures. These include real-time continuous online monitoring, outsourced testing for emission management, and improvements in equipment processing efficiency to lower overall emissions. In recent years, improvement projects have been implemented in succession, including the transformation of process technology, the switch from liquid painting to powder coating to address waste gas, and the enhancement of equipment processing efficiency on production lines, effectively minimizing the generation of energy, waste gas, and VOCs. In 2024, VOC emissions decreased by approximately 50% compared to 2023. The use of organic solvents in the relevant painting production lines was reduced by 81.3 tons, and as can be seen from Figure 4.4.6, VOC emissions from Advantech' s Kunshan plant in China exhibit a year-over-year downward trend.

4.4.3 Biodiversity and forest protection

In 2022, Advantech began focusing on biodiversity and forest protection topics and joined the Taiwan Nature Positive Initiative (TNPI) launched by the Business Council for Sustainable Development of the Republic of China. Advantech is taking more proactive actions on this topic to increase corporate resilience and apply its IoT expertise to foster nature conservation. In 2024, Advantech's headquarters and overseas subsidiaries launched various biodiversity-related activities.

Enhance the performance of the Taskforce on Nature-related Financial Disclosure (TNFD)

Advantech performs biennial biodiversity risk assessments. In 2023, Advantech conducted a biodiversity risk assessment of its locations of operation for the first time, as well as its supply chain (scope: Headquarters and Mainland China), to identify key risk items, affected locations, potential risks, and recommended risk management measures. In 2024, the scope of improvement efforts extended to include downstream customers. An integrated TCNFD (climate- and nature-related financial disclosures) report will be released ahead of schedule on the official website in 2025. Building on the results from the previous year, improvements will continue to be implemented. As publicly committed, the TCNFD report for the 2025 fiscal year will be published in 2026. Advantech' s biodiversity commitment will also be disclosed on the official website.

IoT for Biodiversity: Bird sound monitoring and AI identification solution

Building on the achievements of the previous project, this project combines Passive Acoustic Monitoring (PAM) and AI-powered SILIC (Sound Identification and Labeling Intelligence for Creatures) to enhance the efficiency of wildlife monitoring, reduce labor costs, improve spatiotemporal resolution, and improve the effectiveness of forestry in both monitoring and decision-making. Based on the validation conducted at the NTU Experimental Farm in 2023, the project was extended to the NTU Experimental Forest in 2024. Equipment was deployed in selected locations, including newly afforested areas, flux towers, aerial corridors, and the Guanshan parking lot, to further verify and expand the application of AIoT technologies in environmental monitoring.

In 2025, Advantech will continue addressing challenges in wildlife monitoring, including equipment power supply, data upload, and real-time transmission. Also, we will explore a wider range of smart forestry applications, such as wildfire prevention, soil carbon sequestration, and river hydrology management. Through large-scale deployment and implementation, Advantech aims to establish a comprehensive environmental monitoring framework. Based on this infrastructure, we can enhance predictive and preventive capabilities to minimize the occurrence of natural disasters and mitigate their potential impacts on biodiversity and society.

Besides soundscape ecology research, this project also offers practical application value for forestry:

Application one	The Chinese fir plantations in Xitou have long been affected by bark gnawing from red-bellied squirrels, resulting in widespread areas of trees with reddish or whitish crowns. By using autonomous audio recorders to detect squirrel vocalizations, researchers can monitor population density more effectively and implement targeted control measures in identified hotspot areas.
Application two	Longer audio recordings from autonomous sound recorders allow us to better understand the composition of bird species across various sites. By analyzing these recordings, we can assess variations in bird diversity and abundance in relation to differing levels of tourist disturbances. Such information helps to enhance visitor experiences by providing timely ecological recreational information.

Sustainable forests and green office

Advantech headquarters and major overseas business units have implemented the green office plan. We promote a paperless office environment by encouraging double-sided printing, implementing paper recycling practices, and prioritizing the use of FSC (Forest Stewardship Council)-certified sustainable paper or other recycled paper materials for office and household use. In terms of eco packaging material planning, Advantech utilizes recycled paper for all its shipping cardboard boxes and also provides FSC-certified sustainable forest cardboard boxes as a customer option to meet market requirements.

As part of its forest conservation efforts, Advantech sponsors the "Taichung Dadu Plateau Ecological Afforestation Project" led by the Taiwan Forestry Restoration Association. The project aims to cultivate 6,000 seedlings across 75 species, with over 70% consisting of native tree species from the Taichung coastal and shallow mountain regions. These seedlings will be provided to the Taichung City Government for forest restoration and tree planting purposes. In addition, with public welfare in mind, they will be made available to public agencies for ecological afforestation initiatives. The funding will be used for seed collection for seedlings, growing local native species seedlings, mountain forest ecological education, and seedling growth monitoring. The support project is expected to plant 0.8 hectares of trees and sequester 1.76 metric tons of carbon. The Company has also disclosed no-deforestation commitment on our ESG official website to implement our corporate commitment.

Biodiversity initiatives of Advantech's overseas subsidiaries

- **Advantech China Biodiversity and Plastic Reduction Family Day**: Advantech China (ACN & AKMC) incorporated the theme of biodiversity into its Family Day activities across six locations: Shanghai, Beijing, Shenzhen, Guangzhou, Xian, and Kunshan. The activities featured nature education and family interactions, including popular science education on animals and plants, a "Plastic-free Commitment" environmental creativity challenge, leaf recycling DIY projects, water resource experiments, and bird nest building. These engaging and educational activities helped Advantech employees and their families better appreciate the beauty of nature and the importance of ecology.
- **Advantech Europe created bee hotels for 20,000 bees:** Advantech's the Netherlands subsidiary used its office space to form a micro-ecosystem and installed Advantech monitoring equipment in the beehives to monitor honey production, bee sounds, and bee activities effortlessly. During the honey harvest season, Advantech Europe collaborates with local small farmers to harvest and package honey. The Company also invites employees and their families to design illustrations for the honey jars, fully showcasing local biodiversity engagement.

- **Advantech Europe's involvement in local environmental education:** Advantech's the Netherlands subsidiary is situated adjacent to a public park. The local municipality plans to invite nearby businesses in the science park to collaborate on planning a biodiversity park project, focusing on the construction of insect hotels, to benefit local primary school science education.
- **Advantech Korea** Advantech Korea (AKR) held an "Advantech Volunteer Day" that combined biodiversity education and litter cleanup through the "City and Ecological Park Plogging" initiative, where participants jogged while picking up litter to protect the environment. Additionally, the "Advantech Creators Club (ACC)" led 25 employees in creating "Net-Zero Pop-Up Books" and "Environmental Jigsaw Puzzles," which were donated to local children's centers to embed carbon reduction and ecological awareness in the next generation's growth and development.



Biodiversity volunteer service

Each Advantech employee is entitled to two days of paid volunteer leave per year. In 2024, Advantech headquarters organized biodiversity-themed local volunteer service activities at various subsidiary locations. Allowing employees to experience ecological work-cations achieves public welfare and sustainability benefits.

Activity name	Location	Activity theme	Photos
Plant an Advantech Tree – One-Day Sustainable Forest Volunteering Activity	Pingtung	Collaborated with Yongzai Forestry to conduct on-site forest surveys, tree planting, and the making of FSC-certified growbags. A total of 20 volunteers contributed 160 hours of volunteer service. The volunteers participated in the sustainable forest volunteer activity for the first time, assisting with seedling survival rate surveys and planting. The team also completed 20 sustainable growbags and planted 20 trees on site.	
Gongliao Terraced Field Biodiversity and Beekeeping Experience – One-Day Volunteer Activity	New Taipei City	The activity focused on revitalizing the local community, biodiversity, and the local beekeeping experience, involving hands-on work in the paddy fields to help conserve water sources, prevent land degradation, and maintain the ecological functions of the terraced fields. A total of 48 volunteers contributed 384 hours of volunteer service.	
Forest Restoration and Native Seedling Cultivation One-Day Volunteer Activity	Taichung	Assisted in forest restoration efforts by weeding native seedlings, repotting and dividing them for use in ecological restoration planting in the shallow mountain region of Dadu Mountain. A total of 20 volunteers contributed 60 hours of volunteer service and nurtured 252 potted plants.	

Activity name	Location	Theme	Photos
Marine Conservation One-Day Volunteer Activity	New Taipei City	Promoted marine conservation awareness, participated in beach cleanup activities, and implemented the ICC Marine Debris Monitoring Program.	
Yuanzhonggang Wetland Park Invasive Species Removal Volunteer Day	Kaohsiung	In support of World Environment Day, activities included removing invasive wetland species, conducting guided tours of wetland ecology, and creating natural, rustic charms using locally sourced wetland materials. A total of 12 volunteers contributed 36 hours of volunteer service. Offered NGOs substantial assistance in removing invasive species and enhancing our colleagues' understanding of local biodiversity.	
Guandu Nature Park Invasive Species Removal Volunteer Day	Taipei City	In support of World Environment Day, activities included removing invasive wetland species, weeding, and conducting guided tours of wetland ecology. A total of 40 volunteers contributed 120 hours of volunteer service.	
Fazi River Cleanup Activity	Taichung	In support of World Environment Day, activities included cleaning along the Fazi River, removing weeds, and classifying waste in accordance with ICC waste monitoring standards. Based on the cleanup analysis, the event also promoted the reduction of household waste. A total of 14 volunteers contributed 42 hours of volunteer service and removed 60kg of waste.