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Green Operations

- 4.1 Green Eco Design and sustainability Liability of Product
- 4.2 Climate Change Strategy and Management
- 4.3 GHG Inventory and Energy Management Actions
- 4.4 Environmental Management

Green Eco Design and Sustainability Liability of Product 🐼 🚱

4.1

Item	Explanation
Policy or commitment	 Advantech has responded to the SDG 9 (Industry, Innovation, and Infrastructure) and SDG 12 (Responsible Consumption and Production) of the global sustainable development goals, gradually setting goals and introducing various standards from raw materials, product design, manufacturing, to environmental management. We are willing to do our best to improve the environment, reduce environmental impact, and produce environmentally friendly products.
Impact description	 Advantech regards green eco design and sustainability liability of product as important risks and opportunities. The possible impacts include the increasing concern of stakeholders such as customers, and the response to carbon reduction and resource cycle laws and regulations in various countries (e.g. product energy consumption design, use of recycled materials and packaging materials), enterprises will be more regulated, so more R&D resources and expenses will need to be invested in the short term, and there will be barriers in R&D and design that need to be broken through. However, the investment in green eco design product and fulfillment of corporate responsibility for environmental sustainability have a positive impact on the overall environment and economy in the medium to long term. Besides driving sustainable transformation for our internal R&D team and supplier s, it also enhances Advantech's overall sustainability competitiveness. Potential negative impacts include: If the low-carbon product requirements of stakeholders such as customers cannot be met, the competitiveness of the product in the market may be reduced, and the carbon reduction plan with the supply chain will be delayed as a result, resulting in the inability between the Company and the supply chain to achieve sustainable development.
2023 goal achievement status	 Ensure that 100% of raw materials comply with international environmental protection regulations and Advantech regulated substance standards. 37% of the new green eco design products achieved the silver medal (a slight difference from the set target). Mass-produced products achieved the silver medal for green eco design products/Advantech energy saving seal; accounting for 10% of annual revenue. All standard products new models are 100% compliant with the ErP energy-saving design code.
2024 Goals	 Continuously ensure that 100% of raw materials comply with international environmental protection regulations and Advantech regulated substance standards. Reaching more than 60% of the silver medals for new green eco design products. Mass-produced products achieving the silver medal for green eco design products/Advantech energy saving seal; accounting for 12% of annual revenue. All standard products new models are 100% comply with Advantech's internal energy-saving design guidelines.
2025 Goals	 Continuously ensure that 100% of raw materials comply with international environmental protection regulations and Advantech regulated substance standards. Reaching more than 80% of the silver medals for new green eco design products. Mass-produced products achieving the silver medal for green eco design products/Advantech energy saving seal; accounting for 15% of annual revenue. New products of a specific product line (suitable fields) meeting Energy Star requirements/obtaining the internal energy saving gold medal label for up to 20%.
Key actions or programs	 Advantech's silver medal for green eco design guidelines was introduced to form internal regulations: Advantech has established internal regulations for energy-saving design and green materials (halogen-free requirements) to effectively increase the coverage rate of Advantech's green eco design products. Energy Star goal setting: In response to Advantech's industry characteristics and the Energy Star voluntary energy-saving design adjustment goal, we set up suitable products for design. Development of energy saving SW Utility: Assist hardware energy-saving through investment in energy-saving software development. Re-optimization of green eco design products: Continue to standardize the silver medal for green eco design products into a mandatory requirement for new Advantech models, and actively design and develop Advantech gold medal models compliant with green eco design products.
Effectiveness assessment	 Establish a cross-departmental green eco design committee, and the project process management department convenes relevant departments to jointly formulate standards, implement, manage, review, and revise Advantech's green and ecological design guidelines according to international trends. Regular internal meetings to review the goal achievement status and action effectiveness: Based on the management guidelines set above, the ESG-environment team will review the goal progress every two weeks and adjust the implementation direction in real time to ensure compliance with the strategy. External resource assistance and experience learning: External consultants and lecturers are invited in a timely manner to provide guidance for the establishment of internal processes or the promotion of new policies and regulations, and to verify whether the status and direction of internal promotion are consistent with the goals.
Stakeholder engagement	• Advantech discloses information through multiple communication channels, collects and analyzes stakeholders' opinions; at the same time, assesses the impact and risk level of various sustainability issues on the Company's operations, identifies material issues, and gives priority to responding and coping, in order to meet the expectations of stakeholders. In addition, we issue the sustainability report every year and accept verification from external certification agencies. Through continuous internal and external communication, we strengthen the efforts and achievements in green eco design products and sustainable responsibility.

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٨ Vision and Commitment

Advantech has responded to the SDG 9 (Industry, Innovation, and Infrastructure) and SDG 12 (Responsible Consumption and Production) of the global sustainable development goals, gradually setting goals and introducing various standards from raw materials, product design, manufacturing, to environmental management. We are willing to do our best to improve the environment, reduce environmental impact, and produce environmentally friendly products.

٨ Annual Green Eco Design Actions, Performances, and Future Goals

Actions in 2024

Advantech's silver medal for green eco design guidelines was introduced to form internal regulations

Advantech has established internal regulations for energy-saving design and eco materials (halogen-free requirements) to effectively increase the coverage rate of Advantech's green eco design products.

Energy Star goal setting

In response to Advantech's industry characteristics and the Energy Star voluntary energysaving design adjustment goal, we set up suitable products for design.

Development of energy saving SW Utility

Assist energy-saving design not only from hardware but also through investment in energy-saving software development.

Re-optimization of green eco design products

Continue to standardize the silver medal for green eco design products into a mandatory requirement for new Advantech models, and actively design and develop Advantech gold medal models compliant with green eco design products.

2023 performance



37% of new products Percentage of green eco design system products won the silver medal with the internal self-

Completion of SPC-815, the

footprint inventories.

first product carbon footprint

verification, and 2 product carbon

Percentage of halogen-free plastic

parts sold by product organizations

declaration mark.

100%

87 %

in the year.





9.74% Percentage of annual revenue of mass-produced products achieved the silver medal of green eco design products/Advantech energy saving seal.



11.5 % Proportion of global waste recycling.



79 %

Achievement rate of the EPE replaced with paper/plastic for products under 5kg.

A Green Eco Product Achievements by Phase and Future Goals

Item	Achievements in 2023	2024 Goals	2025 Goals
Compliance with international environmental regulations (Management of hazardous substances)	All raw materials comply with international environmental protection regulations and Advantech regulated substance standards, reaching 100%.	All raw materials comply with international environmental protection regulations and Advantech regulated substance standards, reaching 100%.	All raw materials comply with international environmental protection regulations and Advantech regulated substance standards, reaching 100%.
Compliance with internal green eco design	Reaching more than 37% of the silver medals for new green eco design products. ¹ (target more than 50%)	Reaching more than 60% of the silver medals for new green eco design products.	Reaching more than 80% of the silver medals for new green eco design products.
guidelines	The silver medal for mass-produced green eco design products/Advantech energy saving seal reached 9.74% of the revenue (target 10%).	The silver medal for mass-produced green eco design products/Advantech energy saving seal reached 12% of the revenue.	The silver medal for mass-produced green eco design products/Advantech energy saving seal reached 15% of the revenue.
Energy-saving design Compliance	All standard products new models energy-saving design compliant models/ratio reached 100%.	All standard products new models are 100% comply with Advantech's internal energy-saving design guidelines. ²	New products of a specific product line (suitable fields) meeting Energy Star requirements/obtaining the internal energy saving gold medal label for up to 20%.

¹ Reasons for non-compliance: In the first half of 2023, we will continue to promote green eco design through a voluntary incentive mechanism. For the improvement plan in 2024, see Section 4.1.1 Future action plans. ² Advantech energy saving design guidelines: Harmonize CEC regulations based on ErP, establish internal energy saving regulations, and enhance the green value of products.

4.1.1 Eco-design

A Green Eco Design Products Follow the Life Cycle Assessment (LCA)

Advantech always upholds the philosophy of products follow the life cycle and uses LCA and product carbon footprint to quantify the environmental impact of Advantech products. The assessment items cover the carbon emissions from the upstream raw material selection, manufacturing, transportation, and use stages until the final disposal. The Company will further set carbon reduction goals and take actions to implement the reduction, which is included in the Company's operational management goals.

Raw material selection	Manage from the source and formulate Advantech's ecological design standards and guidelines for products from four major aspects: (1) green materials, (2) green eco packaging materials, (3) product recycling, and (4) product energy saving. Assess the environmental impact of products at each stage from production, manufacturing, transportation, consumer use, and recycling, to waste disposal. Furthermore, make sure to comply with international regulations and customer requirements. In particular, there are relevant regulations for "eco materials and eco packaging materials", such as the use of recycled fibers and recycled plastics, the selection of energy-saving and high conversion efficiency power modules to improve energy efficiency, and the design of innovative green eco design products that reduce environmental toxicity and harm.
Product manufacturing process	Advantech develops energy-efficient, ecologically designed, and innovative green eco design products that reduce environmental toxicity and hazards following Advantech's ecological design standards and guidelines to achieve environmental performance. Green Eco Design dashboard management regularly evaluates the implementation status of the four major aspects and converts them into carbon reduction performance. The Company will expand the introduction of low-energy design, setting future goals to realize a 50% reduction by 2023 and an 80% reduction by 2025. Furthermore, during the product manufacturing process, the generation of waste and pollution is minimized, and harmful chemical substances are prohibited.
Product distribution and transportation	According to the guidelines outlined in Advantech's ecological design standards for eco-packaging materials, the Company will use at least 90% recycled fiber materials. The advanced goal is to lower packaging material usage, improve packaging design, and optimize packaging dimensions to minimize environmental impacts during transportation. Long-range targets are combined with the product carbon footprint project to formulate a product transportation planning and management system to enhance transportation and storage safety as well as decrease environmental impact.
Usage stage	Based on Advantech's product energy-saving criteria in the ecological design standards and guidelines, the R&D Technical Committee has launched a horizontal high-efficiency energy-saving design across business groups. Introduce a high-efficiency power module strategy, and select energy-saving and high conversion efficiency power modules to make improvements from the source. Advantech has planned an improvement and replacement strategy for power modules in the next three years. Develop a standardized, modular energy-saving circuit design: Starting from material selection, software and hardware design optimization (by referring to international regulations on energy efficiency optimization such as ERP & Energy Star to accelerate energy-saving design internalization).
Product disposal management	Product recycling standards are formulated according to Advantech's ecological design standards and guidelines. This involves managing from the source, designing products that are easy to recycle and disassemble, and affixing labels according to WEEE recycling requirements. Product disposal management: In response to WEEE specifications, the Europe collaborates with product recyclers to reuse resources and prevent improper disposal 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.

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In the second quarter of 2023, Advantech obtained the SPC-815 carbon footprint ISO 14067 certification for its first product, which allows us to assess the depth of product material selection through LCA and identify the top five key materials with carbon footprints, and complete Advantech's product carbon footprint inventory. The inventory methodology has been established to lay the foundation for the internal development of LCA. Advantech will launch the establishment of Advantech's internal carbon footprint query system in 2024. We will complete the product carbon footprint inventory of representative products of each business group to serve as the material selection mechanism for the initiation of low-carbon products.

In addition, Advantech develops its own eco product design mechanism and integrates the product life cycle process to develop Advantech's green eco product design guidelines to guide the product design department in eco product design.

A Eco Product Design Management Mechanism

Advantech establishes standards from four major aspects of products: (1) green materials, (2) green packaging materials, (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.



Figure 4.1.2: Four major aspects of eco product design

Figure 4.1.3: Product life cycle and Advantech's eco product design aspects

Standard Setting

Based on international environmental regulations or international assessment tools (such as the U.S. Electronic Product Environmental Assessment Tool, EPEAT³ and our experience in serving brand customers, Advantech's eco-design guidelines and guidelines is formulated to improve energy efficiency, eco-design, and reduce environmental toxicity and hazards; as well as provide inspection standards and tools, and gold/silver medal will be awarded to applicants who pass the review. Please refer to <u>Appendix 7 for information</u> on the models that passed the silver medal verification.

Environmental design focus	Design content
	Conformance with provisions of European Union RoHS Directive, China RoHS, Taiwan BSMI RoHS, IEC62474
	Conformance with substance restriction requirements of the European Union Battery Directive
	Reduction of Bromine and Chlorine content of plastic parts >25 grams
	Conformance with supply chain communication provisions of European Union REACH Regulation
	Elimination of added heavy metals in packaging
	Restriction on the use of elemental chlorine as a bleaching agent in paper-based packaging material
Enhance energy efficiency	Enhancing recyclability of packaging materials
Reduce environmental	Recycled fiber in corrugated packaging
	Design for repair, reuse and recycling
	Design for plastics recycling
	Product recyclability calculation and minimum 90% recyclability rate
	Information and reporting in preparation for reuse and recycling
	Replacement components availability
	Energy efficiency

Table 4.1.1: Examples of eco product design content planning

³ EPEAT (Electronic Product Environmental Assessment Tool): It is a tool for assessing the environmental performance of electronic products jointly launched by the U.S. Environmental Protection Agency (EPA) and the Institute of Electrical and Electronics Engineers (IEEE). It complies with the ISO14024 framework and is a global ecological mark representative of the IT industry.

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A New Product Development Stage Inspection

For all system standard products, in 2023, we introduced the four major aspects of green eco design criteria into all stages of design and development, and set up relevant departments to conduct inspection during product mass production to ensure that the products meet the green eco design goals. In 2024, Advantech will more actively introduce the silver medal standard as an internal regulations to effectively increase the coverage rate of green eco design products and provide customers with green eco design products of greater value.



Figure 4.1.4: 2024 Product management mechanism: Review of the green eco design and development process of new products

A Green Eco Design Product Performance Description and Future Action Plans

In 2023, we continued to re-optimize green eco design products: Introduce the silver medal standard criteria for green eco design products into products whose energy consumption must comply with the ErP international norms, and gradually promote the internal requirements of green eco design from voluntary to the introduction of the standards, some performance results have been achieved. In 2024, in addition to introducing the silver medal standard as an internal regulations in the development process, we will actively design and develop gold medal models that meet the green eco design product criteria, and evaluate the introduction of other recycled materials, such as using recycled plastic and recycled metals for the mechanism casings, and transitioning from EPE foam plastic to paper-based materials for packaging. The reduction in packaging material and the selection of environmentally friendly materials for the first and second generation models are currently undergoing evaluation and implementation. The following is a description of performance and action plans for eco materials, product energy saving, eco recycling, and eco packaging materials.

Green Materials



Product energy saving

In addition to establishing Advantech's energy-saving internal regulations and introducing standardization, each business group also nominates products to meet the Energy Star design goal, and expects to develop energy-saving management software to improve carbon reduction performance: Carbon reduction performance is enhanced by developing the Energy Star technology, which is more carbon reduction efficient, and supporting software and hardware that can be quickly deployed in Advantech products.

	New	products	Software energy-saving modules
2024 green eco	Eco design silver medal specification	Strive to achieve Energy Star Ready	Development of the Power Suite energy-saving utility
Strategic objectives	 Internal regulations were introduced for low-halogen plastic parts Internal regulations were introduced for energy-saving designs 	Panel PC/Box PC product nomination	Energy-saving module and utility is planned to include in Power Suite development roadmap and it is planned to Introduced to x86 computer products firstly.

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Green packaging materials

Action Performance

2023

The packaging material design team has invested resources in optimizing the eco packaging design in 2023, replacing the buffer material EPE with honeycomb design partitions.

- 1. Priority is given to replacing EPE with paper plastic for products weighing less than 5 kg, achieving 100% replacement for mass-produced PCB products. For all other products, the replacement rate was 79%.
- 2. Achieved using recycled materials, with packaging materials sourced from pulp consisting of over 90% recycled fibers and reaching 100% target.
- 3. Since raw materials are easy to obtain, Kunshan has taken the initiative to use 30% EPE Foam. Currently, Advantech is in the process of obtaining certification from suppliers.

2024

Future Plans

Expand eco packaging material design capabilities while meeting product safety requirements. Some of the improvement details made to the packaging design include:

Weight reduction design

• Designs involving modifying the stacking of packaging materials to increase shipment quantity

Change of material

- Substitute paper for plastic and introduce EPE buffer material into the plan.
- Use recycled materials



Product Recycling

Action performance

- 2020-2021: In the early stages of green product design, considerations such as "recyclable, easy to disassemble, low pollution, and energy-saving" were integrated into the design. The recycling rate reached 90%.
- 2022-2023: From 2022 to 2023, 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.

4.1.2. Product Liability

In order to reduce our impact on the environment and ecology, to fulfill our corporate responsibility for environmental sustainability, to meet the expectations of stakeholders, and to continuously comply with international regulatory requirements, Advantech annually complies with international regulations, the electronics industry standard IEC 62474, customer requirements, and environmental trends. After reviewing the management status of hazardous substances, we have established Advantech's green policy (hazardous substances reduction plan), surpassing the international mandatory regulations. By 2023, there were more than 500 controlled chemical substances. Furthermore, we regularly update Advantech's hazardous substance management regulations for green eco design products and manage them with the green supplier relationship management system (GPMS). Advantech's main plants have introduced the IECQ QC 080000.



Figure 4.1.5: Advantech green policy - hazardous substances reduction plan

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Conflict minerals survey (Expanded)

.

✓ Conflict minerals form in response to RBA

 Real-time updating of the smelter list, prompt launching of surveys, and issuance of qualification reports.

Figure 4.1.6: Green Supply Chain Management Platform (GPMS)

Generate product reports .

assessment

Advantech RoHS & REACH Compliance statement

Assessment of other regulations

 $\langle \checkmark \rangle$

Green Management Suppliers **Raw material** Supplier suppliers Management Compliance Survey (GP documents) Sourcer Customer Green QA Team GPMS PM Green Product RD Approval Report .].] ^^ _^ @ **Compliance Analysis**

Since 2010, Advantech has implemented a Green supplier relationship management system. Within this platform, suppliers must commit to and ensure that their products do not contain the Company's regulated harmful substances, as well as provide supporting documentation for reference. The platform is optimized annually to rejuvenate the database, resulting in an efficient green supply chain. Advantech has introduced the hazardous substance management system since 2010. We uphold the spirit of rigorous quality management and continue to control every aspect of product liability. Advantech's products comply with relevant regulatory requirements.



Highlight case: Sony Green Partner

Since 2012, Advantech has become a Sony Green Partner, enabling everyone from parts partners to OEM partners to challenge many barriers. In recent years, only document reviews are required and certificates can be extended directly. Becoming a Sony Green Partner shows that Advantech has been recognized by customers for its green management performance.

*Note: Sony Green Partner certification is eco product management system that ensures systematic control of all aspects of products from procurement to production and delivery, thus minimize the risk of introducing various environmentally friendly substances into products, and enhance customer products to continuously meet the requirements of environmentally friendly substance standards. It is the best partner for upholding Advantech's environmental requirements and commitments to products and meeting more environmental concerns.

Figure 4.1.7: Green supply chain management process

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A End-of-life Liabilities: Product Recycling

The recyclable design of "recyclability, easy disassembly, low pollution, and energy saving" is injected into the early stage of product design. Advantech's green eco design products have a recycling rate of up to 90%; additionally, through recycling schemes required by regulations, the company promotes the reuse and recycling of electronic products. Commit to e-waste recycling and management in the spirit of producer responsibility.

Comply with local waste recycling laws and regulations in various countries, including Europe, the United States, Japan, Korea, Taiwan, and Kunshan. According to the "Global Transboundary E-waste Flows Monitor 2020 and 2022", the global e-waste reaches 53.6 million tons, and the recycling rate is only 17.4%. Including the recycling rate of 12% in Asia, 9% in the United States, and 42% in Europe. Use this reported recycling rate to convert Advantech's actual global product recycling percentage, and backtracked to calculate the data from 2020 to 2023.



Source: Global Transboundary E-waste Flows Monitor 2022

In particular, in Europe, in response to the EU WEEE Directive and sustainable product design and development, we re-examined product recyclers we cooperated with. At the end of 2020, we changed product recyclers in Europe and expanded the inventory in 2022 (recycling countries expanded from 8 to 20 countries) product shipments and recycling. In addition to the annual expenses for the disposal of electronic product waste in Finland, we also received about EUR 1223 in rewards in 2023.

	Global recyclable weight of products (tons)	Total weight of actual product recycled (tons)	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	8,009	1,026	11.5%

Table 4.1.2: Advantech's global actual product recycling ratio

4.1.3 Green Eco Design Internal Label Exemplification

Advantech continues to invest in the research and development of green eco design products. By setting internal product standards for energy saving and green materials, improving green packaging product, and adhering to policies such as minimizing environmental hazards, making assembly and disassembly easier, and making material resources easy to recycle. We strive to achieve more energy efficient and eco benefits on product design. Advantech achieved a new green eco design product silver medal ratio of 37%⁴ in 2023, and reaching a silver medal for green eco design product/Advantech energy saving seal accounted for 9.74%⁵ of the total revenue. This accomplishment demonstrates the implementation of green eco design product lifecycle, effectively showcasing the company's performance in the circular economy. 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 revenue⁶. This metric serves as one of the indicators for investors to assess our sustainability performance and demonstrates the green competitiveness of our products.

▲ Type 1 Eco-labels

Proportion of revenue from industry certification standard products

Certification standards	2022	2023
Product have obtained CE, ErP, or Energy Star certifications	0.75%	2.79%
Products comply with EPEAT equivalent standards ⁷	3.1%	9.74%

⁴ For calculation of the new product's green eco design Products ratio, please refer to the appendix: Calculation standards for various environmental indicators (Appendix 7)

⁵ Please refer to the appendix for the calculation of the percentage of revenue with silver medal for green eco design product/Advantech energy saving seal: Calculation standards for various environmental indicators (Appendix 7)

⁶ Please refer to the appendix for the calculation of the ratio of the sales of products meeting the Type 1 important eco label to the Company's revenue: Calculation standards for various environmental indicators (Appendix 7)

⁷ Advantech's green eco design guidelines and guidelines are formulated based on EPEAT. For more information, please refer to Chapter 4.1.1 Formulation of green eco design guidelines.

▲ Type 2 Self-declared Environmental Claims: The Implementation of Advantech's Internal Declaration Green Eco Design Label and Energy Saving Design Label Classification is as Follows

Internal declaration label for the four major aspects of green eco design



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Number of new products comply with green eco design silver medal

Year	2022	2023	2024
Rate	20%	37%	Target 60%

Advantech energy saving design classification declaration label

Description	Internal energy consumption label
The energy efficiency of products meets the Energy Star test standard.	ENERGY
The energy efficiency of products meets the ErP and CEC test standards.	ENERGY

Percentage of revenue from products achieving the silver medal for green eco design products/Advantech energy saving label in 2023: 9.74%

Eco product revenue percentage (%)







4.2

Climate Change Strategy and Management



Item	Explanation
Policy or commitment	 Adopted the Science-Based Targets (SBT) and committed to achieving SBT by 2030. Joined the RE100 initiative and committing to achieve the goal of using 100% renewable energy by 2040. Achieving net-zero carbon emission by 2050.
Impact description	Advantech regards climate change as an important risk and opportunity, and manages it according to two major aspects: "mitigation" and "adaptation." The potential impacts on the company include stakeholders such as customers' low-carbon design requirements for products (including the organization's use of renewable energy). Therefore, we have introduced and committed to the use of renewable energy through green eco design products, continue to invest in green energy, energy-saving products and energy-saving solutions, combined with the core business of energy management, promote energy conservation and sustainability, and turn risks into future business opportunities and competitiveness.
2023 achievement status	 No target was set for 2023, but the following achievements were made: Commitment to climate change strategy and net zero vision. Links to Advantech's internal climate information disclosure according to the TCFD framework. The Board of Directors approved the linkage of senior supervisor compensation to ESG and climate change issues and achievements. Officially became a RE100 member, publicly committed to reach the RE100 goal until 2040, and actively promoted the use of renewable energy in all RBUs around the world. Initiate the GHG inventory and verification programs at significant overseas operation locations. Obtained ISO 50001 certification of Taiwan and Kunshan operating bases. Obtained the first product carbon footprint ISO 14067 certification.
2024 Goals	 Continue to identify climate risks and manage them through mitigation and adaptation. Apply the latest IPCC assessment report, readjust climate scenarios, and links to Advantech's internal climate information disclosure according to the TCFD framework. Optimize the ESG KPI incentive mechanism, incorporate the KPI mechanism into the consideration of operations management development and risk management, and strengthen the linkage of senior managements compensation to ESG and climate change issues and achievements. Activate the power conversion of Fishery and electricity symbiosis power plant in Taiwan and increase the use of renewable energy in the global RBU to 10%. Completed the global iEMS to monitor and analyze the electricity consumption of main operating locations around the world. Implement the internal carbon pricing (ICP) program and define Advantech's carbon pricing. Calculate the representative product's carbon footprint of each business group and complete the application of Advantech's methodology.
2025 Goals	 Mitigate climate risks and expand business opportunities in the low-carbon market. Continue to align with international climate change and sustainability commitments. Continue to link senior managements compensation to ESG and climate change issues and achievements. Continue to increase renewable energy usage in global RBUs, and Advantech Taiwan uses renewable energy to reach 25% of the total electricity consumption. Increase the quantification of the GHG inventory and verification ratio at significant overseas operation locations. Advantech's GHG emission intensity per unit of revenue decreased by 36% compared to 2019.

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Key actions or programs	 Announce policy and goals on climate change discussed at the annual kick-off meeting. Establish KPIs of the linkage of senior managements compensation to ESG and climate change issues. Launch Advantech's global renewable energy promotion plan, deployed global RE100 teams, and set targets for individual RBUs. Conduct annual GHG inventory and verification (Scopes 1, 2, and 3). Promote energy management and product life cycle assessment methodologies through external ISO certification (ISO 50001, ISO 14067).
Effectiveness	 Regularly report the management plans and results to the Board of Directors on material climate risk issues through the Sustainable Development Committee (SDC). Report to the Board of Directors for KPI execution by senior managements; report the year's sustainability performance and the achievement of goals in the fourth quarter of each year, and distribute incentives in the first quarter of the following year. (Refer to the description of "ESG performance and incentive mechanism" in 2.1.2 corporate governance for details). Obtained external certifications such as ISO 14064 GHG inventory, ISO 50001 Energy management, ISO 14067 Product carbon footprint, etc. Refer to the climate risk management practices of DJSI, CDP, and benchmark peers, and invite external consultants to provide the latest sustainability trends at the quarterly Corporate Sustainability Development Committee (SDC), proposing improvement plans based on Advantech's actual conditions and risk management
Stakeholder engagement	 Advantech discloses its sustainability report annually to fully explain the climate change strategy and management issues, so that stakeholders can fully understand. Advantech's ESG Corporate Sustainability Development Office participates in ESG-themed meetings at investors' request. In these meetings, the office explains how Advantech identifies and addresses climate risks, complies with sustainable regulations in Europe and America, and manages carbon issues. Additionally, they relay investors' future expectations and feedback to the corporate sustainability development committee and relevant personnel to drive operational improvements. The ESG Corporate Sustainability Development Office attends ESG conferences at the client's request and discusses Advantech's renewable energy policy, GHG inventory progress, carbon reduction progress, and Advantech's product carbon footprint; the demands are turned into internal driving forces to accelerate internal carbon reduction.

As the world's largest provider of industrial computers and business networking technologies and services, Advantech understands its responsibility to the global environment. The Company's policy statement on climate change is consistent with the goal of the Paris Agreement to keep the global temperature rise below 1.5°C. After passing the science-based targets (SBT) in 2021 and committing to the science-based targets (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.

Advantech has included climate change as one of the major risks in corporate sustainable operation, and manages it according to two major aspects: "mitigation" and "adaptation." At the same time, we also actively identify risks, build adaptation capabilities, further research and analyze climate change opportunities, accumulate and deepen R&D momentum, 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.

A Overview of Advantech's Participation in Climate Change Initiative and Advocacy

For the management of climate change-related initiative and public associations, the ESG Corporate Sustainability Development Office will screen and identify public associations or nonprofit organizations that align with the meaning of sustainability and the goals and spirit of the Paris Agreement. We also report and plan the investment of resources through the Sustainability Committee at the Board of Directors Level, and attend climate change-related seminars, workshops, and lectures as planned. If the association's and the Company's positions on climate change are found to be inconsistent with the goals and spirit of the Paris Agreement, Advantech will either (1) cease any form of support and participation; or (2) make a public statement and communicate with it in a clear timeframe that it is consistent with the goals and spirit of the Paris Agreement. The scope of this mechanism covers Advantech worldwide. Please refer to Appendix 5 List of public associations participated and description of investing in resources for Advantech's participation in climate change-related associations. By participating in educational training, forums, workshops, and other activities organized by climate change organizations, we can gain new knowledge and communicate with benchmarking companies to empower Advantech's commitment to support the Paris Agreement. For more information, please refer to: Statement on Advantech's participation in climate change-related public associations management mechanism.

At present, Advantech actively participates in the following climate change-related initiative organizations:

Name of organization	Organization profile	Advantech's participation process
SBTi	The SBTi is a scientific approach that enables companies to formulate reasonable carbon reduction goals under the global carbon budget scenario of 1.5°C to control global warming trends and that can be certified by a third party.	 In 2021, Advantech has committed to meet SBTi's scientific reduction goals and follow a reduction path of 2 °C, committed to reducing the carbon intensity of Scope 1 and Scope 2 emissions by 60% by 2030 using 2019 as the baseline year, and accomplished the goal of a 49% reduction in the carbon intensity of the Scope 3 products used. Furthermore, Advantech is also the third technology industry company in Taiwan to pass the audit, and we continue to move forward in pursuit of these goals. Advantech expects to prepare to align with the SBTi's scientific reduction path of 1.5 °C in 2024 and update the application target in 2025.
RE100	RE100 is a global renewable energy initiative led by the Climate Group and the Carbon Disclosure Project (CDP). From the perspective of the demand side, working together to improve the environment-friendly use of green electricity.	 In 2023, we joined the RE100 initiative and made a commitment to achieve the goal of using 100% renewable energy by 2040. Advantech has committed to achieve 50% renewable energy use in Taiwan and Kunshan, China by 2030, and achieve the goal globally by 2040. Advantech sponsors the publication of RE100, the content of which focuses on Taiwan's renewable energy market and renewable energy policies, which will help to promote corporate-friendly renewable energy policies and progress. Advantech attended the RE100 member conference and renewable energy policy discussion workshop. The contents included: Taiwan renewable energy market policy initiative, stakeholder of green power policy and policy agenda inventory discussion, and discussion of challenges and dilemmas of Taiwan's renewable energy market.
Taiwan Climate Partnership	The Taiwan Climate Partnership was founded as a joint initiative of eight major technology companies. The purpose of this partnership is to leverage the power of partners to assist the industry's net-zero transformation.	 Advantech became a member of the Taiwan Climate Partnership in 2022, pledging to decrease carbon emission through energy efficiency improving and low-carbon manufacturing in collaboration with the supply chain. (Refer to 2.3.4 Enhancing supplier sustainability for details.) Fulfill member obligations by regularly participating in member conferences and climate roundtable action meetings, with topics including but not limited to carbon pricing, analysis of the EU's latest sustainability regulations, carbon data, climate law, natural carbon sinks, and other issues.

Advantech's Net Zero Vision

Achievement of net zero emissions

> Enhance energy

2050

Achievement of net zero carbon emissions

Expand 2030 the use of renewable energy

Taiwan and Kunshan use 50% renewable energy

2040

The global use of renewable energy reaches 100%, reaching the RE100 goal

2030

efficiency

Reduce Scope 1 and Scope 2 carbon intensity by 60%Reduce the carbon intensity of Scope 3 product use 49%



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Advantech's Climate Change Development History

2019

- Initiate the ISO 14064 GHG inventory and
- verification plan for Taiwan and Kunshan
- Base year for Advantech's Science- Based Target (SBT)

· Establishment of the ESG Corporate

Sustainable Development Committee and ESG

Corporate Sustainability Development Office

Introduce the green product plan to produce

• CDP climate change rating of "B"

low-carbon products

2020

2023

- 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 certification

2026

Complete the global ISO 14064 GHG inventory and verification

2030

- Achieved 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

2022

CDP climate change rating of "B"

- Establishment of the Sustainability Committee at the Board
- Level (SDC)
- Completion of Task Force on Climate-Related Financial
- Disclosures (TCFD) risks and opportunities assessment
- Initiation of the inventory and verification plan for all categories of ISO 14064 Greenhouse Gas Scope 3 (Scope 3)
- AKMC obtained green factory certification
- CDP climate change rating of "B"

2024

- The linkage of senior managements compensation to ESG and climate change issues and achievements
- Implement the internal carbon pricing (ICP) program and define carbon pricing
- Promote the GHG inventory and verification program of subsidiaries in Asia
- Completed the global iEMS to monitor and analyze the electricity consumption of main operating locations around the world
- The low-carbon investment solar power plant in ACL was put into operation and the use of renewable energy was increased at all RBUs around the world
- Calculate the representative product's carbon footprint of each business group
 and complete the application of Advantach's methodology
- and complete the application of Advantech's methodology
- Develop green packaging materials, green materials and energy-saving design
- products by incorporating LCA assessments

2021

- The Science-Based Target (SBT) adopted to comply with the international below 2°C
- Commit to Task Force on Climate-related Financial Disclosures (TCFD)
- À 10 MW solar power plant with low-carbon investment for ACL
- CDP climate change rating of "B"



in decreased by decreased by intensity decre • Achieve 50% r and Kunshan

- 2050 • Achievement of
 - net zero carbon emissions

2040

 Achieve the RE100 goal of 100% global renewable energy use

Advantech's Net-Zero Roadmap



Advantech's Internal Carbon Pricing Strategy

Advantech launched the internal carbon pricing (ICP) project in 2023, hoping to introduce an internal price through the calculation and assessment of carbon emissions costs and incorporate it into the organizational cost-benefit assessment mechanism to guide low-carbon investments and promote the implementation of low-carbon production in all departments, thereby elevating Advantech carbon management performance and achieve the SBT carbon reduction goals. The project will give priority to calculation and evaluation through the shadow price method, and set prices by referring to the relevant laws and regulations of carbon trading in various countries and market prices. The internal carbon price is expected to be completed in 2024 to strengthen the carbon reduction investment decisions of business units.

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4.2.1 TCFD Governance Structure and Climate Management Strategy

Extreme weather events caused by climate change, the pressure for low-carbon transition brought about by the aggressive carbon reduction goals of various countries, and the carbon reduction requirements imposed upon the upstream and downstream of the value chain have already caused enterprises to face potential operational impacts. In response to the global demand for a stronger linkage between the identification of climate risks and financial impacts, Advantech has integrated cross-departmental resources from the ESG Corporate Sustainability Development Office and introduced the Task Force on Climate-related Financial Disclosures (TCFD) under the promotion of the Corporate Sustainable Development Committee (SDC). It has followed the TCFD guidelines and recommendations to systematically measure the Company's climate risks and opportunities, deeply assess the existing risk management procedures which focused on climate change in the Pan-Operational Risk Map. 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.

Advantech's Climate Governance Framework					
	Board of Directors	 The highest supervisory unit for risk management (including climate risk) Review major climate-related goals and implementation budgets 	 Oversee climate risk management and strategy implementation results 		
	Chairman	 Chairing the Corporate Sustainable Development Committee (SDC) and leading the climate issue management mechanism 	Confirm climate-related KPIs and action plans		
	SDC Corporate Sustainability Development Committee	 Responsibilities and decision-making units for climate risk management Regular reporting to the Board on climate management progress Review climate-related risk and opportunity assessment results and response strategies 	 Approve TCFD report Monitor the implementation of climate issues and review KPIs 		
Governance	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 		
	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 assigned to attend Board of Directors' training on topics such as how the ICT industry can help fight climate change, international sustainability trends, new trends in risk management, and response 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. 		
	Advanced management mechanisms	 Led by the Chairman, the SDC Committee holds meetings each quarter issue trends, strategic planning, and implementation progress. The SDC assessment results and countermeasures. 	r The ESG Corporate Sustainability Development Office reports on climate-related C supervises the achievement of goals and reviews relevant risks and opportunities		

	Disclosure aspect	Advantech's Implementation Status			
کری Strategy	Short-, medium- and long-term risks and opportunities	 Identifying six major risks and five opportunities for Advantech based on the level of impact by referring to the climate-related risks and opportunities and their financial impacts in the TCFD guidelines, integrating operations and industry analysis. Define the short-, medium- and long-term as within 3 years, 3 to 5 years, and more than 5 years, and assess when each issue is 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 accordingly.			
	Scenario Analysis	• The carbon reductions and the financial impact on the Company are analyzed using the International Energy Agency (IEA) Beyond 2°C scenario (B2DS) and 1.5°C scenario (1.5DS); the IPCC SSP2-4.5 Intermediate GHG emissions scenario and SSP5-8.5 Very high GHG emissions scenario, and the physical impact on operations to include in the assessment of adjustment strategy resilience is also analyzed.			
	Disclosure aspect	Advantech's Implementation Status			
<u>^</u> -	Evaluation and Management Process	• ESG Corporate Sustainability Development Office each year convenes cross-departmental members to collect and review relevant climate risk and opportunity factors of the Company, assess major climate issues through the level of impact and likelihood, monitor changes in risk levels, review develop response strategies, and report to the SDC for resolution, as well as review related disclosures, and the SDC regularly reports to the Board Directors to supervise the progress of climate risk management and review major relevant decisions.			
Risk management	Overall Risk System Integration	 At the beginning of each year, the Risk Management Task Force assesses the Company's overall operational risks according to the risk management procedures, draws a Pan-Operational Risk Map, and reports the risk management process and plan to the Board of Directors. Since 2021, climate change risks have been included in the assessment process, and the risk level is identified through the main investigation of the Audit Office and in cooperation with the ESG Corporate Sustainability Development Office. In 2022, we introduced the complete TCFD assessment process. The assessment methods and results will be applied to the climate change risk analysis shown in the risk map and included in the overall risk management process. In 2023, the TCFD evaluation process will continue to be included in the overall risk management process. In 2024, we expect to adjust climate scenarios based on the latest IPCC assessment report, climate risks and responses will be reassessed. 			
	Disclosure aspect	Advantech's Implementation Status			
6	Scope 1, 2 and 3 GHG emissions and targets	 Passed the review of SBT science-based carbon reduction targets. Advantech Taiwan and Kunshan both complete the ISO 14064-1 GHG inventory, verification, and target tracking every year. Initiate the GHG inventory and verification for overseas significant locations of operation in 2023. 			
Metrics and Targets	Other climate-related management indicators and targets	 Commit to joining the RE100 initiative and set the net-zero goal by 2050. We have set goals for power saving, renewable energy use, water saving, waste reduction, percentage of green products in revenue, and energy efficiency improvement for product power supplies. Introduce the ISO 50001 Energy Management System, assess the LCA carbon footprint of major products, and continue to set management indicators and goals for related strategies. 			

*Note: The scope names of greenhouse gas under the ISO14064-1:2006 in responding to ISO14064-1 are divided into: Scope 1, corresponding to Category 1; Scope 2, corresponding to Category 2; and Scope 3, corresponding to Categories 3 to 6.

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

Advantech ESG Corporate Sustainability Development Office convenes cross-departmental members to define risks and opportunities according to the TCFD guidelines. Through the collection of multi-faceted issues, cross-departmental discussions, and external consultations to specifically identify Advantech's major risk and opportunity issues and their corresponding potential issues and impact levels, and analyze the possible financial impact. The three major aspects with industry characteristics and international contexts as the focus: operations (reduction, natural disasters), products/supply chain, and markets, in order to inventory the company's overall climate risks and opportunities, and accurately propose relevant countermeasures. Therefore, the Company's climate risk management covers the entire value chain (upstream, downstream, and own operations).



▲ Results of a scenario analysis of Climate Change risks (F

(For TCFD financial quantification status report, please refer to Appendix)

Results of a scenario analysis of transformation risks

Scenario	Impact assessment	Financial impact
WB2DS (SBT voluntary reduction scenario)	Evaluate the financial impact of voluntary carbon reduction across all operations in 2030 through the purchase of all renewable energy sources, regardless of the cost of carbon credits purchased.	NT\$57,706,595 for an increase in the purchase cost of Power Purchase Agreements(PPA) and I-REC
1.5DS (Net zero scenario) 	Evaluate the financial impact of voluntary carbon reduction across all operations in 2030 through the purchase of all renewable energy sources, regardless of the cost of carbon credits purchased.	NT\$58,764,963 for an increase in the purchase cost of Power Purchase Agreements(PPA) and I-REC
Control implementation scenario (Refer to historical scenarios)	Assess the interruption of water and power supply caused by China's energy transition/power curtailment policy, as well as the loss of revenue caused by the interruption of operation and production, as well as equipment damage and UPS maintenance costs.	NT\$315,557,546 in costs increased due to the interruption of operational production
STEPS (Implementation of Stated Policies Scenario)	Assess the time period for 2025-2030 that Advantech Taiwan may be subject to the government's regulations, including the tightening of regulations for large power consumers requiring a certain proportion of renewable energy, and amendments to the Climate Change Interaction Act. The Company's operating costs will increase due to payment of monetary substitution or carbon fees if it fails to meet the regulations.	NT\$8,868,638 of operating cost increased due to renewable energy deposit payment and carbon fee

Results of a scenario analysis of physical risks

Scenario	Impact assessment	Financial impact
SSP5-8.5 (Very high GHG emissions scenario)	Assess the financial impact on operations and production caused by extreme weather events (heavy rainfall or flooding) that occur in Taiwan as a whole until the middle of the century (2050) / every 5 to 10 years, excluding other physical risks (such as temperature rise, drought).	NT\$379,400 in operating costs due to damaged equipment and absent or delayed attendance of personnel in the factory.
SSP2-4.5 (Intermediate GHG emissions scenario)	Assess the financial impact on operations and production caused by extreme weather events (heavy rainfall or flooding) that occur in Taiwan as a whole until the middle of the century (2050) / every 5 to 10 years, excluding other physical risks (such as temperature rise, drought).	NT\$189,700 in operating costs due to damaged equipment and absent or delayed attendance of personnel in the factory.

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A Climate-related risk and opportunity assessment results and response strategies

							Climate risk	
Cate	gory	Risk or opportunity issues	Advantech encounters risk or opportunity.	Level of Impact	Affected schedule	Financial impact	Advantech's response strategy	
	Risk	Cap and carbon trading, carbon tax, and carbon fee system	When regulations related to greenhouse gases are implemented, emission credits may be purchased or carbon-related fees may be imposed.	Medium	Mid-term	Increase operating cost	 High energy-consuming equipment was replaced and building energy management system (iEMS) was established 	
	Transition	Regulations related to energy curtailment	Splitting of power usage and policy on power limits caused interruption of water supply and power supply, resulting in increases in equipment damage and uninterruptible power system maintenance cost.	Medium	Short-term	 Increase operating cost Increase capital expenditures Operational disruptions are caused to decrease operating revenue 	 Investment in green energy equipment in factories and offices The maintenance and testing of the uninterruptible power system are strengthened, and contingency measures for power cuts are established. 	
peration	Opportunity	Emission reduction measures to improve production efficiency	Emission reduction measures such as the replacement of old machines and the adjustment of the operating mode of reflow ovens are used to improve the efficiency of energy and resource use and the resilience of operations	Medium	Short-term	Operational costs reduction	 Carbon reduction KPI were set up for each department Plan to introduce the ISO 50001 energy management system 	
0	Physical risk	Heavy rainfall / flooding of strong typhoon	The situation of interruption in operation includes heavy rainfall exceeding the maximum capacity of the drainage system and flooding causing power failure in the computer room.	Medium	Short-term	 Increase capital expenditures decrease in asset value Operational disruptions are caused to decrease operating revenue 	 Business Continuity Plan (BCP) and exception handling procedures are established and regularly exercised. The maintenance and testing of drainage facilities and anti-flooding operations are strengthened to evaluate the configuration of power generation facilities and the addition of energy storage equipment. The risk assessment of the operating sites is planned to formulate warning levels and response measures based on external data and scenarios for climate flooding potential. 	
Chain	×	Low-carbon technology introduction cost of products	Additional costs include increased demand for low-carbon products, design and development introduced by derivative low-carbon technologies, replacement of environmentally friendly materials, safety certification fees, etc.	High	Short-term	Increase operating cost	• The Green Design Management Committee was established to target four product standpoints: green materials, green packaging materials, product recycling, product energy saving, and refer to the	
Product/ Supply Chai Transition Risk	Transition Ris	Customers' requirements for suppliers to save energy and reduce carbon emissions	Requests from customers to investigate Advantech's greenhouse gas emissions, carbon reduction goals and measures have increased, thus deriving the pressure of carbon reduction and related costs.	High	Short-term	 Increase operating cost Impact on orders to decrease operating revenue 	 standard guidelines for green design formulated by international standards New product or material designs are incorporated into energy efficiency standards, and existing product designs are changed to achieve energy efficiency goals. Environmentally-friendly materials and product designs with extended service life are enhanced. 	

Cate	egory	Risk or opportunity issues	Advantech encounters risk or opportunity.	Level of Impact	Affected schedule	Financial impact	Advantech's response strategy	
Product/ Supply Chain	Transition Risk	Low carbon products or product energy efficiency requirements	The EU ErP Energy Efficiency Directive has expanded its regulatory scope. Those that don't meet energy efficiency requirements could face a drop in sales. In response to demands for low- carbon products, the US Energy Star standard was voluntarily introduced to expand competitive advantages.	Medium	Short-term	 Increase operating cost Impact on shipment to decrease operating revenue 	 The weight and size of the packaging materials are adjusted to reduce the use of materials and the carbon emissions of transportation. The communication between suppliers and customers has been strengthened to facilitate the promotion of green material procurement and compliant products. Investigate, assess, and coach improvement on ESG risks of suppliers. It is planned to require key/high energy-consuming suppliers to be subject to carbon inventory. The introduction of the assessment of the carbon footprint of the product life cycle of the main product LCA is planned. 	
		Participate in investment in the renewable energy supply market	We invest in the green energy industry, such as cooperating with Micropower Energy to set up solar power plants to comply with the increasingly stringent renewable energy regulations and the trend of RE100, in order to develop related market opportunities.	Medium	Short-term	 Increase operating revenue 	• We invest in renewable energy companies or cooperate with them in technology to	
.et	unity	Expand climate mitigation market demand	The world is accelerating the expansion of the goal of net zero emissions and the policy- derived demand for carbon control. Advantech's IoT hardware and software products just cut into the application market that can mitigate climate change, including energy information management systems and so on.	Medium	Short-term	Increase operating revenue	 ensure the future supply of renewable electricity and improve the cloud management platform technology related to new energy cases. The products, solutions and technical services that integrate the Internet of Things are expanded to be used in client- side operation management renewable 	
Mark	Opport	Participate in the construction of relevant renewable energy infrastructure	In response to the needs of renewable energy development, intelligent maintenance and monitoring solutions related to the development of energy and energy storage equipment can increase the market share of new energy industries, such as communication gateways for renewable energy.	High	Short-term	 Increase operating revenue 	 energy and energy storage equipment, and environmental monitoring. Regional Business Units and Emerging Business Opportunities Department shall keep abreast of new business opportunities in climate-related markets to formulate business development plans. 	
		Expanding demand for climate adaptation solutions	The intensification of climate change brings about the need for adaptation. Advantech integrates IoT technologies to provide solutions such as monitoring of landslides and flood control, sponge cities, and smart agriculture to tap into emerging and adaptive business opportunities.	Low	Mid-term	Increase operating revenue	 Green operating revenue brought by the planning of quantified low-carbon/climate- related solutions 	

*Note:

1. The degree of impact: Internal assessment is conducted and classified into "high, medium, and low" according to the possibility of occurrence and the degree of impact. 2. The duration of the impact: The consideration of the possible timing of occurrence is divided into "short-term (<3 years), medium-term (3-5 years), and long-term (>5 years)".

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4.3 **Greenhouse Gas Inventory and Energy Resource Management**

A Highlight Projects



-9.0%

Advantech's overall* GHG emissions per unit of revenue decreased by 9.0% compared to 2022, and decreased by 24.3% compared to 2019 in 2023

B List

2023 CDP Climate Change Questionnaire was ranked B List

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RE 100

Advantech joined the RE100 initiative in 2023, announcing to fully use renewable electricity by 2040

ISO 50001

In 2023, the ISO50001 certification for the factories in Taiwan and Kunshan was completed

*Note: Main operating bases and manufacturing factories.

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 from 2023, in addition to completing the ISO 50001 certification in 2023 for Taiwan and Kunshan Factories, Advantech joined the RE100 initiative on the same year, announcing to fully use renewable energy by 2040. Currently, Kunshan and Europe are both 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.

A Phased Achievements and Future Goals of GHG Management

Item	Achievements in 2023 Achieved 100% of the target set in 2023	2024 Goals	2025 Goals
GHG management	 In 2023, the Company's overall GHG emissions per unit of revenue will decrease by 9.0% compared to 2022. Initiate the GHG inventory and verification of subsidiaries Taiwan and Kunshan operating locations obtained ISO 50001 certification 	 Initiate the GHG inventory and verification for overseas significant locations of operation Formulate and trial internal carbon pricing 	 Advantech's GHG emission intensity per unit of revenue decreased by 36% compared to 2019
Energy management	• Join RE100 and actively engage in low-carbon investments	 The Taiwan factory starts using renewable energy Per capita office electricity consumption by 3% compared to 2023 Reduce electricity consumption per working hour at production sites by 5% compared to 2023 	 Advantech Taiwan uses renewable energy to reach 25% of its total electricity consumption Per capita office electricity consumption is reduced by 6% compared to 2023 Reduced electricity consumption per working hour at production sites by 10% compared to 2023

4.3.1 GHG Inventory and Management

In order to create a low-carbon emission business environment, Advantech has established the "Greenhouse Gas Inventory Promotion Committee" based on the quantification, monitoring, reporting, and verification procedures for GHG inventory provided by Taiwan's Climate Change Response Act and the ISO 14064-1 standards to promote GHG inventory and reduction work in order to reduce direct and indirect GHG emissions year by year. And joined the Carbon Disclosure Project (CDP) since 2015 to disclose the Company's carbon reduction plans and performance annually.

▲ GHG Inventory Check

Advantech's verified main operating locations and production factories in the GHG inventory verification process in recent years are ACL and AKMC. Starting from 2024, these will be included in the main overseas operating locations and production areas.

ACL refers to ISO 14064-1 and the GHG protocol, in addition to requiring self inventory, and had also undergone third-party on-site verification by a third-party verification agency since 2019. Organizational boundaries are based on the requirements of ISO 14064-1:2018. The boundaries of the organization are set based on operational control, and the Company's GHG inventory management procedures, inventory report, and emission source inventory are established. The organizational boundary includes Rueiguang Headquarters, Taipei Sunny Building, Donghu factory, and Linkou Campus. In addition to the qualitative and quantitative inventory of Scope 1 (Category 1 direct GHG emissions) and Scope 2 (Category 2 indirect GHG emission sources of

Scope 3 (Categories 3, 4 and 5 indirect GHG emissions). In 2023, the total emission of Scope 1 emissions from ACL was 615.4740 metric tons of CO2e.

In 2015, AKMC conducted its first ISO14064-1 GHG emissions inventory for 2014, which was verified on-site by the China Quality Certification Center (CQC), a third party. The results of the 2023 inventory showed that AKMC generated a total of 2,530.75 metric tons of CO2e. In addition, this year, we strengthened the inventory of GHG emissions from Scope 1 energy use at our sites in Japan, Korea, the U.S., and Europe. The emissions in each region are shown in Table 4.3.1, and we will continue to expand the scope of the inventory in the future.

Greenhouse Region gases	Carbon dioxide (CO ₂)	Methane (CH ₄)	Nitrous oxide (N ₂ O)	Hydrofluorocarbons (HFCs)	Perfluorocarbons (PFCs)	Sulfur hexafluoride (SF ₆)	Nitrogen trifluoride (NF₃)	Total (Metric tons CO ₂ e)
ACL, Taiwan	35.0930	0.0224	0.0265	580.3320	0	0	0	615.4740
AKMC, China	1,411.6620	22.3166	2.9664	1,093.8077	0	0	0	2,530.7526
AJP, Japan	12.1982	0.0333	0.3314	0	0	0	0	12.5629
AKR, Korea	0	0	0	0	0	0	0	0
ANA, USA	14.1478	0.0003	0.0000	0	0	0	0	14.1481
AEU, European	55.0948	0.0773	0.1682	0	0	0	0	55.3403
Total	1,528.1958	22.4499	3.4925	1,674.1397	-	-	-	3,228.2779

Table 4.3.1: Scope 1 GHG emissions by Advantech's Main Global Operations and Production Factories in 2023

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

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Among Advantech's Taiwan factories(ACL), Scope 2 only involve the use of purchased electricity. Carbon emissions are calculated based on the 2022 electricity carbon emission factor of 0.495 kg CO₂e announced by the Bureau of Energy, Ministry of Economic Affairs, which amounts to 9,723.0184 metric tons of CO₂e. For Advantech's Kunshan factories(AKMC), Scope 2 includes the use of purchased electricity and purchased steam, a total of 15,399.91 metric tons of CO₂e (market-based). The carbon emission calculation of electricity refers to the emission factor of "The average carbon dioxide emission factor of China's regional power grid in 2011 and 2012." The emission factor for East China Regional Power Grid in 2012 was 0.7035 kgCO₂e; the carbon emissions from steam were calculated based on the "Guidelines for Accounting Methods and Reporting of Greenhouse Gas Emissions of Enterprises in Other Industries"; the emission factor for steam was 110 kg CO₂/GJ. In addition, factories in Japan(AJP), Korea(AKR), USA(ANA) and European(AEU) use purchased electricity only among scope 2 GHG emission. The electricity emission factors for AJP, AKR, and ANA are derived from the electricity emission factors announced by their respective countries, and are 0.3650 kgCO₂e/kWh, 0.4781 kgCO₂e/kWh, and 0.2079 kgCO₂e/kWh, respectively; the emission factor for AEU is 0 kg CO2e/kWh, as AEU relies entirely on renewable energy sources.

Table 4.3.2 shows the amount of Scope 1 and Scope 2 GHG emissions from Advantech's main operating and production factories. The total Scope 1 and Scope 2 emissions in 2023 were 29,866.6190 metric tons of CO₂e (Market-based). Figure 4.3.2 shows the amount of Scope 1 and Scope 2 GHG emissions by Advantech's main operating locations and production factories in recent years.

Pogion	Scope 1	Sco Indirect GHG emis	pe 2 sions from energy	Total (Metric tons CO₂e)		
Region	Direct GHG emissions	Market-based	Location-based	Market-based	Location-based	
ACL, Taiwan	615.4740	9,723.0184	9,723.0184	10,338.4924	10,338.4924	
AKMC, China	2,530.7526	15,399.9083	16,948.2759	17,930.6609	19,479.0285	
AJP, Japan	12.5629	1,201.1242	1,201.1242	1,213.6871	1,213.6871	
AKR, Korea	0	136.4239	136.4239	136.4239	136.4239	
ANA, USA	14.1481	177.8662	177.8662	192.0144	192.0144	
AEU, European	55.3403	0	54.7120	55.3403	110.0523	
Total	3,228.2779	26,638.3410	28,241.4206	29,866.6190	31,649.6986	

Table 4.3.2: Scope 1 and Scope 2 GHG emissions by Advantech's Main Global Operations and Production Factories in 2023

*Note:

1. The GHG inventory check of AJP, AKR, ANA, AEU has not been verified by third party.

2. In the market-based calculation, the GHG emissions from renewable energy sources in AKMC and AEU were calculated with the electricity emission factor as 0.



Figure 4.3.1: Scope 1 and Scope 2 greenhouse gas emissions of Advantech's main global operations and production factories in recent years

*Note:

1. The 2020 GHG emissions from electricity use was not available in Korea and the United States, while emissions from other energy sources were not available in the United States.

2. In 2023, statistics for Scope 1 GHG emissions from AJP, AKR, ANA, AEU were added. and the scope 2 emissions in AJP and AKR have been updated due to the emission factors changed.

3. The scope 2 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 factories in recent years



*Note:The second category of statistics refers to "market-based" GHG emissions

In 2023, the average amount of GHG emissions per unit of revenue (Scope 1 and Scope 2) of Advantech's main operating locations and production factories was 0.463 tons CO₂e/NT\$ million revenue, reduced by 24.3% and 9.0% respectively compared with 2019 and 2022, and continue to move towards the SBT goal of 60% reduction by 2030, as shown in Figure 4.3.2. In 2023, in addition to establishing an energy management policy and adopting the ISO 50001 energy management system, Advantech uses its iEMS intelligent energy management platform to monitor energy consumption in real time, optimize equipment operation and improve power consumption efficiency. It also holds energy project meetings regularly. We share and interact to continuously improve energy efficiency. In the future, we will continue to set the goal of GHG reduction per unit of sales per year. In addition to achieving the goals set by the SBT announcement, this will also deeply embed the concept of energy saving in the hearts of colleagues and help it become an important part of the Company's culture.



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In order to find out the key factors for climate change, in addition to the GHG emissions from its own operations, Advantech Taiwan has also started to identify the significance of other indirect emission sources according to the ISO14064-1 inventory method since 2019, and has established related inventory methodologies to identify emission hotspots, set reduction targets, and gradually implement reduction measures. Advantech's Scope 3 identification and emissions in 2023 for Taiwan and Kunshan, China are shown in Table 4.3.3. Among them, Advantech's Scope 3 GHG emissions per unit of revenue in 2023 decreased by 8.71% compared to 2022, which is mainly due to the 14.31% reduction in C11 (product use) (carbon reduction: 173,769.64 tons CO₂e). The Scope 3 emissions reduction will continue in the future through internal energy-saving label, energy-saving product designs, power efficiency improvement, and the promotion of internal carbon pricing.

Category Item	Verification scope description	Emissions from ACL (tons CO₂e)	Emissions from AKMC (tons CO2e)
C1/Category 4	Procurement of goods and services	213,927.8894	21,036.8456
C2/Category 4	Capital goods	5,357.6987	1,612.4929
C3/Category 4	Upstream fuels and energy	1,921.0098	6,629.5758
C4/Category 3	Raw material transportation	46.0543	199.3373
C5/Category 4	Operational waste	41.5930	22.5382
C6/Category 3	Business travel	119.5119	30.1799
C7/Category 3	Employee commute	476.0058	300.7053
C8/Category 4	Upstream leased assets	73.1892	52.6521
C9/Category 3	Product transportation	2.0403	87.4167
C10/Category 5	Product processing	0	0
C11/Category 5	Product use	716,553.0502	Included in the Taiwan headquarter office
C12/Category 5	Product end-of-life treatment	17.0716	Included in the Taiwan headquarter office
C13/Category 5	Downstream leased assets	0	426.3576
C14/Category 5	Franchise	0	0
C15/Category 5	Investment	7,524.9078	Included in the Taiwan headquarter office

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

*Note:

1. Scope 3 C1-C15 correspond to ISO14064-1:2018 Categories 3-6

2. The use of products and the disposal of products are the scope of the global inspection of Advantech.

A 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 largest database of climate change-related data in the world. They also assess the risks and opportunities brought by climate change to these companies through questionnaire every year to investigate companies' response to climate change and GHG emissions and reductions. Through the annual CDP information disclosure, Advantech reviews climate regulations, climate disasters, and other climate-related issuesone by one to uncover hidden risks in our operations and management, further takes effective measures to reduce and eliminate potential risks in operation and management, thereby complying with international customers' requirements on GHG management requirements. Selected as B List by Advantech in 2023.



A Energy Data Management

The main source of GHG emissions from Advantech's factories is the carbon dioxide generated during the generation of purchased electricity required for the Company's operations. This source of emissions accounted for over 80% of the Company's overall emissions in 2023. In 2023, the overall energy (electricity, steam, gasoline, diesel, natural gas) consumption of Advantech's main operating locations and production factories was 201,449.24 GJ, of which purchased electricity accounted for 82.34% of the energy consumption (including 5.34% of the renewable energy use), and the total consumption is 9.73% lower than in 2022.



Figure 4.3.3: Electricity Consumption among Advantech's Main Operations and Production Factories in Recent Years

*Note:

1. No statistics on consumption in 2020 for AKR and the ANA.

2. The 2022 electricity consumption data for AJP and AKR has been revised, so the total data has been revised from 49,509.69 MWh to 49,461.26 MWh.

Figure 4.3.4: Non-renewable Fuels Consumption among Advantech's Main Operations and Production Factories in Recent Years



5,000.0 4,826.9891



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



*Note:

1. No statistics for 2020 was reported for the ANA.

2. The 2022 natural gas data for ANA has been revised, so the total data has been revised from 7,702.30 MWh to 7,703.56 MWh.

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4.3.2 Energy Management Actions

A Energy Use Overview

Electricity is Advantech's main energy source. Therefore, in order to reduce the environmental impact of products and production activities, and improve energy efficiency and renewable energy ratio, Advantech has established an <u>energy management policy</u> and implemented ISO 50001 Energy management systems at main production factories (ACL and AKMC). The management system systematizes the processes of energy review, energy-saving solutions, and benefit analysis; we have also established the iEMS intelligent energy management platform to enable real-time monitoring of energy consumption, optimize equipment operations, and enhance power efficiency. Since 2023, Advantech has become a member of RE100 and committed to the global RE100 goal and launched global projects. Advantech's energy management team also regularly holds energy project meetings to follow up on the implementation progress, and continues to improve energy efficiency and the use of renewable energy through sharing and interaction among factories.

A Energy Management Strategy



A Energy Efficiency Management Mechanism

Advantech has established an internal energy management mechanism and introduced the ISO 50001 Energy management systems. Through the effective operation of the management system, Advantech implements source management from the procurement side, evaluates the organization's energy consumption through energy review, and identifies energy consumption hot spots. This is combined with the self-developed iEMS. We implement real-time monitoring using the system's energy dashboard to manage major energy-consuming equipment to ensure optimal energy efficiency. We also formulate energy-saving solution benefit analysis processes in a series for continuous improvement, constantly optimize energy management processes and measures, and continuously improve energy efficiency.



▲ Management of Significant Energy Uses (SEUs) Equipment at Major Production Sites in 2023

Advantech has six RBUs in the global layout, among which Advantech Taiwan and Advantech Kunshan are the main production sites. Therefore, the implementation of the ISO 50001 Energy management system is a priority for systematic energy conservation management.

$\widehat{\frown}$	Significant energy use	Significant energy uses (SEUs) equipment				
ACI	Water chiller	Temperature & Humidity Chamber				
	Real-time monitoring of the operation of the water chiller and temperature control of the inlet and outlet water using the SCADA system, and regular maintenance matters specified with the SOP.	Regulate maintenance and management through SOP, including daily spot check management and regular maintenance.				

Significant energy	uses ((SEUs)	equipment
--------------------	--------	--------	-----------

Manufacturing equipment (Solder Reflow Oven, Liquid baking line, Solder pot, etc.)	Air conditioner
Based on the qualification requirements of operators at each position, regular monitoring plans are formulated. The plans include monitoring methods, frequency, personnel, and record- keeping.	The air conditioning equipment is maintained, operated, and managed according to the SOP. The operation process is monitored with the air conditioning automatic control system, and the water temperature of the main machine is controlled.

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A Energy Saving Management Actions at Each Operating Sites in 2023



Energy saving topics

- Adjust the operating hours of the air conditioner and water chiller
- Inverter transformation of air conditioners
- Replacement of VAV equipment

Air conditioning system

Energy saving 138,875 kWh

☆ Process Energy Saving Management Project **Highlight in 2023**



Process - Burn-in Intelligentization and Energy Saving Savings of 15,826.16 kWh in 2023

In addition to detecting the status of the test object, we have automated the start and stop of the main engine through the digitization of the test machine commands. Energy conservation and consumption reduction are achieved by actively disabling the test machine's power after the testing process is concluded. This results in a 29.5-minute reduction in the average wait time for the subsequent operation.





The original high-temperature ink baking temperature was 190 degrees, and the lowtemperature ink baking temperature was 130 degrees to replace the high temperature ink to reduce the natural gas energy consumption. By comparing the energy costs before and after optimization, the baking temperature was reduced by 31.6%, and the natural gas consumption was reduced by 20% (19,500 cubic meters/ year)



Lighting system

Energy saving topics

- Manufacturing line work table LED tube replacement
- Optimization of fluorescent lighting occupancy and lighting scheduling control
- Replacement of lighting fixtures with LED lights (parking lot, office lighting)
- Office scheduling control

Energy saving 105,100 kWh



Energy saving topics

- Digitization of instructions in the manufacturing process testing section
- Introduce Advantech's program control to optimize the burn-in process.
- · Replacement and upgrade of air compressor equipment

improvement



*Note: Since 2022, relevant energy-saving projects have been enhanced with the activation of projects, therefore 2022 is used as the base year.

Establish the Intelligent Energy Monitoring Platform -Continue to Promote Energy Saving Projects

Advantech effectively implemented the iEMS (Intelligent Energy Management System) intelligent energy management solution across its operating locations in the United States and Europe in 2023. Through digital professional integration technology, we provide energy consumption monitoring and management, HVAC energy efficiency management, air compressor energy efficiency management and other functional solutions. This solution featured energy efficiency management capabilities, which assisted organizations in optimizing energy consumption, enhancing energy efficiency, capitalizing on energy-saving opportunities, and facilitating carbon trading. The objective is to facilitate low-carbonization via digitalization, enable businesses to conserve energy and decrease emissions through the management of online data in order to drive offline improvement, and aid the Company in transitioning to environmentally sustainable operation.



Renewable Energy Promotion Program

Since becoming a RE100 member in 2023, Advantech has been actively taking the following measures to ensure that Advantech achieves 100% renewable energy use globally by 2040.

Management model In the same year, Advantech officially established Advantech's global RE100 working group. The ESG Corporate Sustainability Development Office will drive and coordinate the implementation of Advantech's RE100 task force and review the progress of renewable energy use. 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: China, the U.S., Europe, Japan, and Korea. Each RBUs has appointed renewable energy responsible personnel to make local planning to promote renewable energy compliance depending on local policies, regulations, and electricity price markets.

The progress of achieving renewable energy in 2023 is included in the performance indicators of the chairpersons and responsible supervisors, and a long-term incentive mechanism (employee stock options).

Renewable energy promotion process

2021	2022	2023
Started investment in fish-electricity symbiosis solar power plant transfer	Installation of solar photovoltaic panels in Linkou plant and Kunshan plant	 Each RBUs set the target and practice path for renewable energy use for 2024-2040. Officially joined RE100 Form the RE100 Global Task Force Integrate the achievements of meeting renewable energy targets into the KPI assessment for middle and senior executives, and plan financial incentive mechanisms accordingly.



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Renewable energy promotion practices

Advantech prioritizes self-generation and self-consumption, and encourages local factories to install solar photovoltaic panels for self-generation and self-use. Examples include the installation of solar photovoltaic panels at the Linkou campus of the Headquarters, the Kunshan factory of China, and the New HQ phase-I facility (AASC-II) in the United States. The investment in the fish-electricity symbiosis solar power plant (located in Tainan, Taiwan), which started in 2021, is expected to open at the end of 2024. In the future, we hope to supply 5% of Taiwan's renewable energy in the first year. Secondly, purchase renewable energy directly from local areas. For example, Advantech's operating location in the Netherlands adopted direct purchase of local renewable energy generated from solar power and wind power. And, purchase renewable energy certificates based on local assessment needs. For example, Advantech Japan is actively negotiating matters such as the purchase of renewable energy certificates and renewable energy.

M Training Program

To enhance the awareness of Advantech's internal colleagues on energy conservation and carbon reduction, the energy management team organizes energy management-related training courses or external participation from time to time. The types of courses include energy knowledge courses and professional technology courses. The summary content of each course and the participating units are shown below. We hope that energy management professionals can improve their careers in the field of energy management and gain access to relevant information at home and abroad to enhance the acquisition and application of knowledge.

Category	Contents	Training unit
Knowledge training	ISO 50001 Management system training: Through the PDCA management system, concepts such as energy review, energy baseline, energy performance indicators, and energy procurement are added to provide organizations with a framework for integrating energy efficiency and management practices. The clauses are explained one by one, each correspond to the audit items and concept learning of auditing skills.	Energy management team
	RE100 Technical standard training: Analyze the RE100 technical standards, explain the current status of the global and Taiwan renewable energy market, and the role of RE100 in net-zero roadmap.	Energy management team, investment team, procurement personnel, ESG Corporate Sustainability Development Office, product and corporate quality and management department, intelligent energy management product planning and design department
Technical training	Equipment technical training for processes with significant energy consumption: Operating environment temperature and humidity control, equipment operation in the burn-in section, powder and liquid baking operations.	Operator, burn-in operator, and spraying all technicians
rechnicartraining	Specific job technical training: Air compressor operation and maintenance, air conditioning & water chiller system operation.	Engineering, Facility, General affairs



4.4 Environmental Management

A Performance Highlights



No violation of environmental laws and regulations, as well as fines in the past 3 years.



The ANA's AASC factory promoted the smart irrigation system water-saving solution, reduced water consumption by half, and achieved an important milestone in water saving.



The new building of ACL in Taiwan obtained the Taiwan Green Building Labeling (EEWH).

4.4.1 Environmental Responsibility

In terms of environmental management, in addition to implementing wastewater and waste-related environmental protection work in accordance with relevant laws and regulations, Advantech has formulated the "ESH management system manual" as the guiding principle for the operation of the management system, and regularly inspects and implements management. The wastewater meets the discharge standards and has been declared according to the regulations, and the industrial waste is also cleared and treated by qualified firms. The Company's environmental policy has been confirmed by the Board of Directors upon commitment and announced on the official website.

A Environmental Promotion Procedures and Actions

Promotion procedures	Management actions				
Environmental management operating regulations, environmental management system (ISO 14001), GHG inventory system (ISO 14064-1), energy management system (ISO 50001)	 Pollution control and prevention Environmental responsibility training for employees, such as water conservation, water efficiency management programs, waste reduction, etc. Environmental management system maintenance 	 GHG management Monitor and improve energy performance 			

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A Environmental Promotion Targets

Since last year, Advantech has expanded the collection of environmental data to include data of AJP, AKR, ANA, and AEU. Therefore, in 2023, we set corporate environmental management objectives for each RBU or production factory, as shown in the table below.

	2024	2025
Water execution	Compared to Y2023 ↓ 2% (M3/people)	Compared to Y2024 ↓ 2% (M3/people)
water consumption	Each RBU	Each RBU
Westsvolume	Compared to Y2023 ↓ 5% (ton/million production hours)	Compared to Y2024 🌷 5% (ton/million production hours)
waste volume	Each RBU	Each RBU
VOC omissions	Compared to Y2023 🌲 5% (ton/million production hours)	Compared to Y2024 🌷 5% (ton/million production hours)
VOC emissions	Kunshan, China (AKMC)	Kunshan, China (AKMC)

To fulfill our commitment to green management and sustainable development, the Company has established an environmental management system since 1996 to further implement the planning of environmental protection issues and achieve the effective use of resources. At the same time, through the "Environmental Safety and Health Committee" or "management review meeting" of each production factory, we establish Advantech's EHS concept, advocate energy conservation, and improve energy efficiency. We also list energy cost reduction as one of the key annual audit items. In addition, we review the performance of our environmental management system, GHG inventory, and energy management system on a regular basis. Table 4.4.1 shows the certifications of Advantech's environmental management system, GHG inventory, and energy management system at each factory. AEU that have not vet obtained ISO14001 certification will have regular internal audits planned by the headquarters in the future to ensure that the plant systematically implement environmental management. This chapter covers Advantech's main operating locations and production factories around the world, which account for 92.6% of the total consolidated revenue.

In 2023, there was no fine imposed for violating environmental laws and regulations. Table 4.4.2 shows the environmental violations committed by Advantech's global main operating locations and production factory in the past four years.

factory Environmental Certification items	ACL	AKMC	AJP	AKR	ANA	AEU
ISO 14001:2015	\bigcirc	\checkmark	\checkmark	\checkmark	\bigcirc	_
ISO 14064-1:2018	\bigcirc	\checkmark	_	_	_	_
ISO 50001:2018	\checkmark	\checkmark	_	_	_	_

Table 4.4.1: Environmental certifications of Advantech's global main operating locations and production factories

factory Year	ACL	АКМС	AJP	AKR	ANA	AEU
2023	0	0	0	0	0	0
2022	0	0	0	0	0	0
2021	0	0	0	0	0	0
2020	0	0	0	0	0	0

Table 4.4.2: Environmental violations by Advantech's global main operating locations and production factories

Advantech's Environmental/Resource Input/Output (Covering ACL, AKMC, AJP, AKR, ANA, and AEU)

Energy and resources consumption

Output



Domestic sewage **212,672** m³

Industrial wastewater **11,563.0** m³

Industrial waste 1,101.56 ton

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4.4.2 Resource Use and Waste Management

Mater Use and Management

Advantech has implemented the ISO 14001 environmental management system to assess water resources and wastewater treatment processes, identify water-saving opportunities, and actively implement water-saving management factories to reduce the water consumption and wastewater discharge. All factories and offices are located in developed industrial areas or parks in the metro area, and water is supplied using tap water without any groundwater or well water extraction. Figure 4.4.1 shows the total water consumption of Advantech 's global main operating locations and production factories in the past four years.

Except for the process water used in AKMC factory in China, the rest of the factories uses water for domestic use or irrigation. However, we still regularly conducts water efficiency management programs promotion and awareness training for employees, and each factory also continues to implement water-reduction improvement plans. In Taiwan, rainwater recycle for daily use, smart water saving, and smart air conditioning cooling water and ice water system monitoring and control, etc., continue successfully. In terms of process, AKMC, applies a water recycling project to save about 8,000 tons in 2023, and a smart water efficiency management project implements automatic monitoring and early warning of firefighting water, saving about 180 tons in 2023. In 2023, ANA's AASC factory implemented an irrigation system optimization and water-saving plan. It



*Note:

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- 1. Water usage for 2020 and 2021 was not recorded in South Korea; water usage for 2020 was not recorded in the United States.
- 2. The water consumption data for Korea in 2022 was revised, so the total data was revised from 361,640 m^3 to 365,330 m^3

Figure 4.4.1: Water consumption of Advantech's main operating locations and production factories in recent years intelligently adjusts the operation time of the irrigation system under the condition of ensuring plant health to significantly reduce water consumption. In 2023, a total of 4,000 tons of water was saved, or about 50% of water consumption. An important milestone in water conservation in the AASC factory area. In the future, each plant will continue to plan more management factories to conserve water resources.

Except for AKMC that discharges industrial wastewater, Advantech's other factories do not discharge industrial wastewater. The wastewater discharge volume of AKMC in the past four years is shown in Figure 4.4.2. AKMC has a wastewater treatment system. The acid-base neutralization and biological treatment are used to treat wastewater in the factory. And the quality of the wastewater discharged is also monitored regularly to ensure that all wastewater meets the standards before it can be discharged. In 2023, no fines were imposed due to non-compliance with wastewater quality standards. In terms of reducing wastewater discharge, in 2023, the Kunshan factory launched a process wastewater recycle solution to recycle wastewater from the manufacturing process to reduce wastewater discharge. The wastewater volume is reduced by about 4,000 tons compared to 2022. The table 4.4.3 summarizes the recent annual water usage of Advantech's global main operating locations and production factories.





Figure 4.4.2: Discharge of industrial wastewater by Advantech's main operating locations and production factories in recent years

		2020	2021	2022	2023
Water wi	thdrawal	246,833	339,677	365,330	320,335
Discharge	Domestic sewage	169,780	232,973	240,082	212,672
volume	Industrial sewage	13,386	22,825	15,649	11,563
Water con	sumption	63,667	83,879	109,599	96,101
Scope covers Advantech's consolidated revenue		92.3%	92.3%	92.3%	92.6%

*Note:

1. Domestic sewage is calculated by multiplying the water withdrawal by 70% and minus the industrial sewage.

2. Water consumption is calculated by subtracting water discharge from water withdrawal.

3. Water usage for 2020 and 2021 was not recorded in South Korea.

4. Water usage for 2020 was not recorded in the United States.

Table 4.4.3: Water consumption of Advantech's main operating locations and production factories in recent years

M Waste Management and Recycling Management

Advantech's waste management strategy is to reduce the total amount of waste and turn waste into resources. We regularly promote and training employees on waste reduction management, and the production factory also holds regular meetings to track the waste reduction plans and performance of each unit. In addition to reducing waste output through source management measures such as the reduction of raw materials, Advantech also monitors waste types and disposal methods to identify opportunities for improvement, and actively promote process improvement or waste resource utilization, such as replacing the existing tube disposal model through recycling of reusable packaging materials, in order to turn waste into useful resources, not only a true recycling and reduce the resource consumption and cost of waste disposal. Advantech monitors waste disposal contractors every year. If contractors are in breach of contract or violate government regulations, we will take corresponding disposal, guidance, or replacement measures. In 2023, Advantech did not have any major breach of contract or violation of law by any of its waste contractors. The Company's <u>waste management model</u>.

Regarding the final amount of business waste disposal at Advantech's main operating locations and production factories, as the weight of domestic waste is the estimated quantity for clearance and transportation contracted for, and further information on the weight of disposal and classification is not available, only the information on industrial waste is disclosed, see Table 4.4.3 and Figure 4.4.3.



*Note:

1. Statistics on the waste weight of ACL and AKMC are the data reported by each plant to the competent authority; statistics on waste of AJP, ANA and AEU are the data from outsourcing.

2. The waste weight in South Korea was not calculated from 2020 to 2023.

3. The waste weight for ANA and AEU were not calculated in 2020.

Figure 4.4.3: Amount of industrial waste disposal by Advantech's main operating locations and production factories in recent years

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Highlight case AKR "No Plastic Day" challenge



In November, AKR responded to the Korean government's "No Plastic Day" challenge by reducing the amount of single-use items purchased at the factory by about 20%.



Highlight case AEU Clean -Up for Environmental Day



Advantech organized a Clean-up for Environmental Day at its European AESC plant in Eindhoven, Netherlands, and held garbage disposal activities in the suburbs near the AESC plant.



Highlight case

Introduction to the project of waste tin recycling and reuse



In recent years, Advantech's Taiwan factory has begun to introduce the thinking of circular economy. Principles are valued and introduced into the project of tin slag reuse, such as resource reuse, waste reduction, waste reduction, etc. Therefore, harmful waste tin slag is successfully recycled and reused by using a solder spatter separator. The amount of tin dross waste was reduced by 68%, resulting in a reduction in the output of hazardous waste.



Advantech's European APSC plant in Kazimierz Dolny, Poland held a cleanup operation in the Wąwóz Hałajowy canyon on 12th, September. Forty-four Advantech's employees brought 100 garbage bags to restore its natural beauty.



According to statistics, the total waste disposal volume of Advantech's main operating locations and production areas outsourced in 2023 was 1,101.56 metric tons, of which nonhazardous waste was 914.09 metric tons (83.0 %) and hazardous waste was 187.47metric tons (17.0%). For waste disposal and its percentage, see Table 4.4.4 and Figure 4.4.4. In order to reduce the amount of hazardous industrial waste, AKMC developed and implemented a project to replace the liquid coating process with the powder coating process to reduce the amount of lacquer residue. In 2023, a total of 47 metric tons was reduced compared to 2022.

	Incineration	Landfill	Recycle
Hazardous business waste (metric tons)	95.49	0	91.98
Non-hazardous business waste (metric tons)	0.23	0	913.86
Percentage of disposal method	8.69%	0%	91.31%



*Note:

1. Statistics on the waste weight of ACL and AKMC are the data reported by each factory to the competent authority; statistics on waste of AJP, ANA and AEU are the data from outsourcing.

2. The waste weight in South Korea was not calculated in 2023.

*Note:

1. Statistics on the waste weight of ACL and AKMC are the data reported by each factory to the competent authority; statistics on waste of AJP, ANA and AEU are the data from outsourcing.

2. The waste weight in South Korea was not calculated from 2020 to 2023.

3. The waste weight for ANA and AEU were not calculated in 2020.

4. According to the waste disposal code reported by the AKMC to the competent authority, the data for the waste disposed of by AKMC in landfills from 2020 to 2022 should be disposed of for recycling and reuse, hence this is revised.

Table 4.4.4: Waste disposal methods of Advantech's main operating locations and production factories in 2023

Figure 4.4.4: Industrial waste disposal status of Advantech's main operating locations and production factories in recent years

Air Pollutant Management

Advantech compiled air pollution data and information disclosure into three key points:

- Advantech's production process does not produce ozone depleting substances (ODS), and therefore there are no ODS emissions.
- Advantech's manufacturing processes in Taiwan and Japan are mainly assembly processes. Since these processes have low air pollution load, they do not emit nitrogen oxides, sulfur oxides, or volatile organic compounds (VOCs).
- Advantech Kunshan Plant, China has liquid coating and powder coating processes, and the emitted VOCs are in compliance with local regulations.

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The VOCs of Advantech's manufacturing factories in recent years are shown in Table 4.4.5. The significant increase in VOCs in 2021 is due to the increase in production capacity.

factory Year	ACL	АКМС	AJP	AKR	ANA	AEU
2023	-	14.48	—	—	-	_
2022	-	27.57	-	-	-	_
2021	_	31.42	_	_	_	_
2020	_	8.94	_	_	_	_

*Note: Only AKMC produces VOC emissions among Advantech's main operating locations and production factories.

Table 4.4.5: Emissions of VOCs by Advantech's main operating locations and production factories in recent years (unit: metric tons)

To implement environmental reduction targets, Advantech Kunshan adopts effective control of VOCs, installs activated carbon control equipment to treat exhaust gas, and manages emissions through online real-time continuous monitoring and outsourced testing. There are improvement projects to reduce exhaust gas emissions, such as the transformation of process technology. In 2023, we will continue to expand the use of powder coating to liquid coating and improve the equipment processing efficiency of the production line to effectively reduce the generation of energy, exhaust gas, and VOCs. The amount of VOCs generated in 2023 is 47% lower than that in 2022.

4.4.3 Biodiversity and Forest Protection

Starting in 2022, Advantech has begun focusing on biodiversity and forest protection issues. The company has joined the "Taiwan Nature Positive Initiative (TNPI)", initiated by the Business Council for Sustainable Development of the Republic of China. Advantech is taking more proactive steps towards this initiative to enhance the company's resilience and apply its IoT expertise to empower natural conservation efforts.

A Performance of Taskforce on Nature-related Financial Disclosure (TNFD)

In 2023, Advantech investigated its own operation locations and the biodiversity risk assessment in the supply chain (Scope: headquarters and Mainland China) to identify major risk items, affected sites, potential risks, and risk management recommendations. Relevant information and Advantech's biodiversity commitments are disclosed on <u>AdvaAdvantech's ESG official website</u>. We are committed to publishing the 2025 fiscal year TNFD report in 2026, and the abbreviated version of the disclosure in 2023 can be found on <u>AdvaAdvantech's ESG official website</u>. In the future, we will gradually improve the disclosure.





▲ Sustainable Forests and Green Office

Advantech headquarters and major overseas business units have implemented the green office plan. Encourage and promote a paperless office, the use of double-sided office paper for printing, paper recycling, and the use of FSC (Forest Stewardship Council)-certified sustainable forest paper or other recycled paper materials for office and household paper.

In its forest conservation efforts, Advantech has sponsored the Taiwan Forestry Restoration Association's "Taichung Mt. DaDu Ecological Reforestation Project." The project aims to rehabilitate ecological tree islands and firebreaks in two designated areas, with plans to restore 52 species and 500 native seedlings in one area, and 125 species and 1,000 native seedlings in another. The estimated benefits are as follows:

- Environmental education: The ecological green space has been increased by 0.81 hectares through the ecological afforestation plan to enhance the public's understanding and knowledge of forest restoration in Mt. DaDu.
- Impact on forest fires prevention: The reference research of this restoration project indicates that in the sampling area with an arbor layer and guinea grass coverage rate of less than 30%, fires cannot be extinguished and cannot be prolonged. In the demonstration area of the plan, firebreaks are planned at the boundaries prone to fires to reduce the probability of flashovers and prolonged fires and to achieve fire protection.
- Impact on carbon sequestration: The estimated total area designated for ecological afforestation in two locations is 0.81 hectares. As the seedlings grow strong, it is expected to sequester about 1.78 metric tons of carbon per year in the future.

AloT for Biodiversity: Bird Sound Monitoring and Al Automatic Identification Solution

There is currently a US\$700 billion shortfall in nature positive investments. Biodiversity Credit will play a key role in how to effectively invest capital where it is most needed and show its "nature positive" impacts on the income statement. The World Economic Forum (WEF) believes that the development of effective, trustworthy, and diverse measurement methods is the most urgent need for biodiversity credit, and scientific and automated AloT monitors are one of the solutions. Bio-acoustic monitoring is up due to its low cost and low power consumption, making it more suitable for monitoring biological activities in a large area than imaging.

Therefore, in addition to its own efforts in biodiversity management, Advantech cooperates with external industry, academia and experts to apply its core AloT capabilities to develop soundscape monitoring and Al automatic identification solutions with the experimental forest indicator site of National Taiwan University as the first experimental base, expects to effectively improve the efficiency of ecological monitoring and the quality of biodiversity databases. In 2023, the prototype of this solution was completed and verified on the National Taiwan University farm. In 2024, the introduction of the National Taiwan University experimental forest will be completed.



Message from the Leaders	Sustainability Vision and Goals	Corporate Management and Governance	Innovation and Services	Green Operations	Talent and Employee Relations	Altruism and Socia Welfare	l Appendix
✓ Development alarm monito	of solutions for sound ring and Al automated		4	Goals	2024	2025	2026
recognition ✓ Effectively en ecological mo biodiversity d	hance the efficiency of onitoring and the quality of atabases		Smart forestry	Bio-credit study smart forestry efficiency	Bird sound monitoring and automated identification	Monitoring of other biological soundscape Illegal logging and hunting surveillance	Integrated image recognition Smart forestry situation room
✓ Completed so ✓ Introduced th Taiwan Unive 2024	olution verification in 2023 e solution to National rsity's experimental forest in		Biodiversit	ty Completeness and accuracy of bird database	Benefit analysis of Al recognition and survey Biodiversity, network detection, and species identification process	Phenological survey Al bird sound recognition Establish long-term monitoring by integrating external bird databases	
<u>120</u> threatene species <u>5</u> threatened s	d bird Reduce bird survey pecies costs by <u>56%</u>	Produce a document of the print implementation process for bio monitoring and automatic speci- identification	ciples and diversity es of IoT solutions	Framework and feasibility of the implementation plan	Automatic scheduling Air recognition Renewable energy supply Experience in National Taiwan University's experimental forest and Advantech's Linkou site	Expand domestic application fields Form a replicable product framework Integrate with external databases and models	Expand overseas application fields

▲ Biodiversity Volunteer Service

Starting in 2023, each Advantech employee is entitled to 2 days of paid volunteer leave per year. To encourage employees to participate in social welfare activities, Advantech has launched the following volunteer service activities. The goal is to allow employees to experience the ecological working holiday and benefits the sustainability.

Activity name	Main activity
Xiaocukeng eco-trail restoration volunteer day	Under the leadership of the community association and professional trail experts, we built the ancient Raknus Selu Trail using the ecological trail construction method.
Waimushan beach cleanup volunteer day	Organized marine education orientation before departure, participated in beach cleaning activities at Waimusan beach, and sorted and weighed marine waste according to ICC marine monitoring principles.
Alibang wetland maintenance volunteer day	Organize wetland ecology education and awareness activities of native ecology plants, and assist in the removal of powerful invasive species from the wetland.
Great wall at sea•century-old stone weir restoration volunteer day	Before leaving, the participants listened to a course that explained the topography of stone weir and Taiwan's biodiversity, and they collaborated with the community association and restorers to restore an ancient fishing method and preserve local coastal biodiversity.