5.1 Climate Leadership

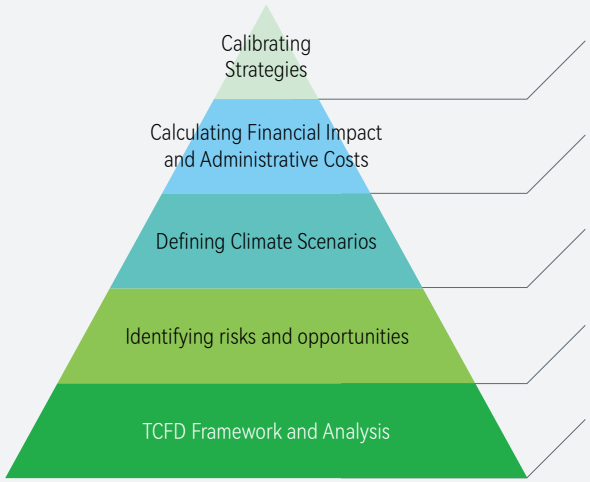
Building Low-Carbon Resilience through Transformation

In order to limit global warming to 1.5℃, ASEH is fully committed to achieving net zero emissions across the value chain by formulating (1) low-carbon strategies, (2) a comprehensive management framework, (3) socially responsible actions, and (4) performance-oriented results. Our near-term targets are approved by the Science Based Targets initiative (SBTi). We are also in the process of submitting our net-zero 2050 pathway to SBTi. Adopting international management frameworks into our low carbon strategy has enabled us to strengthen our internal systems. We are also improving our production models by adopting prudent actions, co-creating green value with our value chain partners, and consistently evaluating our performance to build resilience in the face of climate change.

To encourage employee action on climate change mitigation, we have included greenhouse gas intensity targets (measured as greenhouse gas emissions per unit of revenue) and water intensity targets (measured as water consumption per unit of revenue) as part of the KPI[1] for specific employees (including senior executives)[2] from 2021 to 2023. Each year, a third party organization is appointed to verify the achievement of these targets, and employees who meet the goals are eligible for restricted stock as incentives[3].

Climate change is complex, and presents a plethora of challenges and opportunities for ASEH that underscores the physical and transformational impacts to the company. Government legislation, new technology developments, evolving market demands, customer expectations, and natural disasters are some key factors that contribute to our gradual transformation into an operation focused on decarbonization. Over the years, we have successfully managed crises and transformed risks into opportunities. It is our hope to continuously expand ASEH's low carbon footprint through our development of low-carbon solutions for the global market. In addition to our sustainability reports, we will publish the Climate and Environment Report[4] in 2024 (integrating ASEH's TCFD[5] report with TNFD[6] disclosures) that will allow more stakeholders to learn about our plans, milestones, and strategies towards net zero and preserving biodiversity.

[1] A continuous reduction of 1% in intensity per year with 2015 as the baseline year
[2] Key employees that are involved in long-term business strategy and future developments, influence business operations, and core technical talents
[3] New shares will be issued to employees at no cost, with a total issuance amount of NTD 150 million
[4] For the complete content of ASE Technology Holdings Climate and Environment Report, please refer to our official website
[5] Task Force on Climate-Related Financial Disclosures, TCFD
[6] Taskforce on Nature-related Financial Disclosures, TNFD

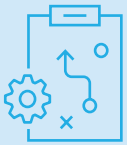
4 Strategic Approaches	Principal Methodology
1 **Low-carbon strategies**	• **Low-Carbon Products:** Continuous expansion of our product carbon footprint inventory and carbon reduction. Collaboration with the value chain to offer viable low-carbon solutions for the global market. • **Renewable Energy:** Creation of a diverse low-carbon emission energy framework. • **Low-Carbon Transportation:** Use of low-carbon vehicles to reduce our carbon footprint. • **Supply Chain Engagement:** Close collaboration with suppliers to improve their carbon inventory capabilities and to implement carbon reduction programs. • **Investment in Carbon Credits:** Investment in carbon sink and capture technologies to lower environmental and social costs.
2 **Comprehensive management framework**	ASEH's Enterprise Risk Management (ERM) takes guidance from the TCFD framework to integrate the management of climate change and environmental risks and opportunities. Our comprehensive management framework enables us to undertake annual risk tracking that include scenario analysis and simulation to ascertain possible risks, and control such risks within acceptable ranges, maximizing and protecting the company's interests.
3 **Socially responsible actions**	 For risks that have significant impacts to the company's strategy and financial position, the company's top management is responsible for evaluating those risks and identifying opportunities, and providing appropriate response plans and financial strategies. Appropriate data estimation methods were selected according to parameters defined through scenario analysis, and used to calculate the actual scale of risks, opportunities and financial impacts. This will further identify the key factors influencing the possible impacts. Employing a climate change scenario analysis methodology to determine the probability of operational and financial impacts by simulating the changes in various parameters from future timelines and different geographic locations. Identifying potential climate risks and opportunities based on international trends and industry characteristics. Incorporating the perspectives of internal and external stakeholders to identify key risks and opportunities that could affect the company's operations and finances. Analyzing the TCFD framework and recommendations to develop corresponding short, medium, and long-term strategies.
4 **Performance-oriented results**	**Adaptation:** ✓ Maintaining 100% oversight of the risk analysis and adaptation planning of facilities worldwide. ✓ Deploying a Business Continuity Management (BCM) plan to strengthen the analysis of potential risks and emergency response mechanisms. ✓ Building intelligent energy management systems to mitigate losses from supply disruption. ✓ Conducting risk assessments, green procurement and material recycling through sustainable supply chain engagement.
	Mitigation: ✓ Building green factories and adopting renewable energy. ✓ Committing to Science Based Targets and net-zero emission targets. ✓ Increasing energy efficiency, promoting circular economy and expanding water reuse. ✓ Coordinating the support and promotion of supplier carbon inventory management (ISO14064 and ISO14067).
	Strategic and Financial Planning: ✓ Evaluating the financial impacts of climate risks and opportunities, publishing Climate and Environmental Reports, and participating in S&P CSA and CDP surveys. ✓ Committing to Net Zero targets through low-carbon products, renewable energy, low-carbon transportation, supply chain engagements and carbon credits. ✓ Launching two green bonds and sustainability-linked loans with proceeds used on green projects. ✓ Developing a long-term value chain partnership blueprint.

Task Force on Climate-related Financial Disclosures (TCFD) Framework

Governance

a. The Board of Directors at ASEH is the governing body for climate-related issues; approving risk policies, supervising related risks and making high level decisions. At the operational level, the Risk Management Committee (RMC) and Corporate Sustainability Committee (CSC) manage climate-related risks and opportunities. The committees report the status to the Board on a quarterly basis, allowing board members to understand the broad impact of climate change on the business operations and to decide on response strategies.

b. To effectively address climate risks and opportunities, the CSC and RMC have appointed ASEH's CAO to serve as CSO and CRO. In addition to reviewing and calibrating the Company's internal sustainability strategies and policies on a regular basis, his role is to continuously monitor changes in the external environment and report to the CSC, the RMC, and the Board of Directors progress and goal achievements of climate risks and opportunities, providing them a consolidated overview of ASEH and the subsidiary companies' overall ESG performance.



Strategy

a. According to our internal goal management timeline, short-term is defined as less than three years; mid-term, three to five years; and long-term, more than five years. Short-term or immediate risks arise from energy efficiency, raw material costs, climate and product-related regulations and extreme weather events, including extreme temperature changes, tropical cyclones, droughts etc. Mid-term risks include voluntary agreements, GHG emission costs, low-carbon technology transitions, changes in customer preferences, and low-carbon and green facilities. Lastly, carbon taxes, low-carbon energy or market demands, and incremental changes in climate parameters, including average temperature or rainfall changes, high ecosystem vulnerability, and land use, etc are classified as long-term risks.

b. We conduct climate risk simulation studies using the IPCC AR6 transformation and physical scenarios. In terms of physical risks, we take into consideration the impacts of extreme weather on our operations at our various global locations. We strive to lessen the impact of risks and increase disaster resilience through a variety of means, from risk identification to response strategies and implementation.

c. Impacts on operations include products, services, supply chain, customers, research and development, and adaptation and mitigation measures. Impacts on strategy include using limited resources and searching for strategic sustainability partners to create optimum semiconductor industry value. Financial impacts include revenues, management costs, capital acquisitions, and assets and liabilities.

Risk Management

a. We adopt a top-down and bottom-up enterprise risk management approach. We conduct annual high-level management team risk identification meetings where the senior management teams are tasked with identifying key risks. These risks are then managed from the bottom up through the respective enterprise risk management (ERM) process at ASEH and its subsidiary companies .

b. The process entails each department taking stock of every risk scenario, and assessing the scope, type, intensity, timing, and likelihood of impacts, identifying significant risks and opportunities that may impact business, and formulating risk mitigation plans, management practices, and financial impact analyses. Quarterly reports are submitted to the Corporate Sustainability Committee, Risk Management Committee, and the Board of Directors, for appropriate decision making. Please refer to Chapter 3.4: Risk Management of this report.

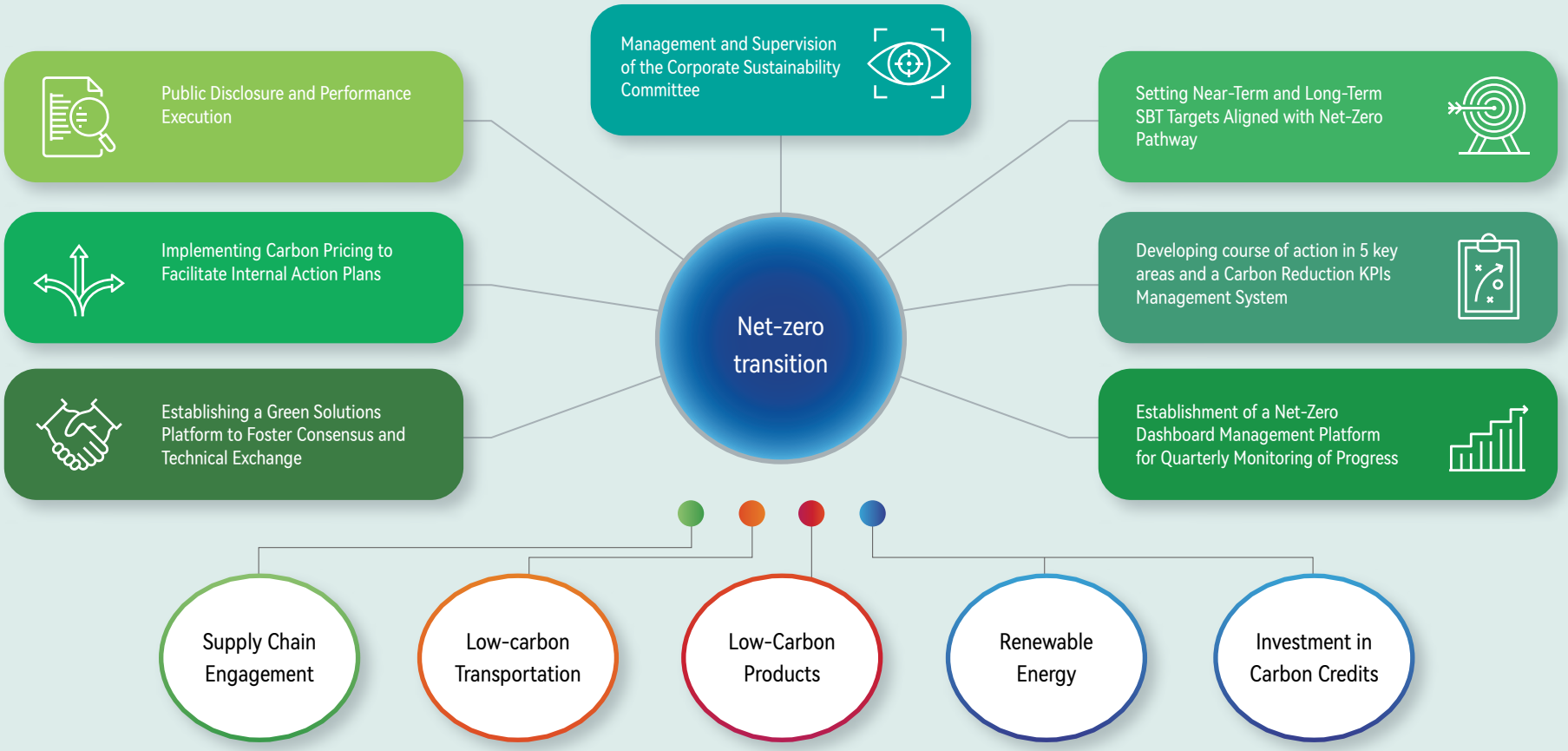
Metrics and Targets

a. Calculating greenhouse gas emissions, energy sources used, and waste produced per unit of revenue generated to help the company assess risks and impacts. Implementing carbon pricing to facilitate internal action plan.

b. We have set five key areas namely to achieve Net Zero: Low-Carbon Products, Renewable Energy, Low-Carbon Transportation, Supply Chain Engagement and Carbon Credits, and have developed short, medium, and long-term management indicators

c. We have set reduction targets for greenhouse gases (both absolute reduction and emissions intensity per unit of revenue), energy resource usage (proportion of renewable energy use, water intake intensity), and waste, while also developing more efficient low-carbon products (please see this chapter for greenhouse gas emissions and management, water withdrawal and as well as section Chapter 4.2: Sustainable Manufacturing of this report.

To achieve our Science Based targets, we have proactively expanded the coverage of the product life cycle inventory with a primary focus on low-carbon products to identify carbon reduction hotspots while facilitating the use of renewable energy at the front-end of manufacturing, and requiring suppliers to provide low-carbon materials and energy efficient equipment. We have also taken the initiative to expand collaboration with the value chain to promote low carbon transport modes through technology sharing, cross-industry cooperation, and subsidies for sustainability projects. We also monitor the progress of our subsidiaries in achieving the reduction goals on a quarterly basis through an online management platform, and quarterly technical exchange meetings. Wherever necessary, we make meaningful adjustments to our phased targets on a rolling basis, and actively push beyond the status quo to achieve our reduction target plans together with our subsidiaries and the value chain.

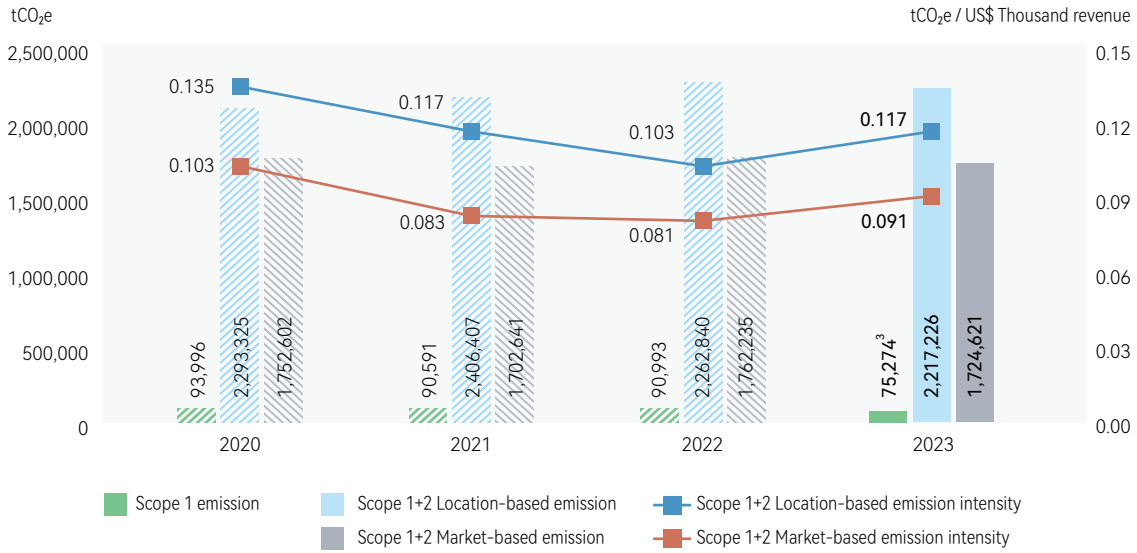


Greenhouse Gas Emissions Management

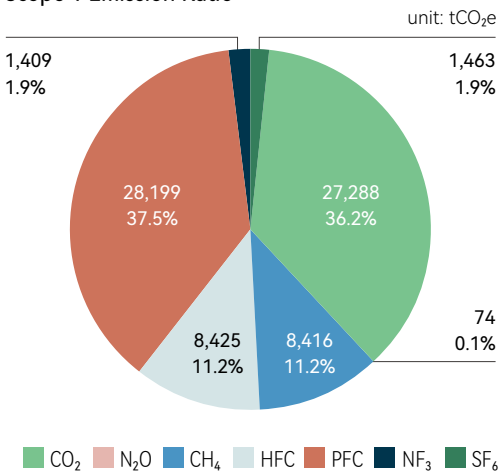
ASEH has achieved 100% control over greenhouse gas emissions in all of its global sites, following ISO 14064-1 standards. In 2023, the Scope 1 and Scope 2 emissions[1], calculated based on market-based approaches, amounted to approximately 1.72 million[2] tCO_2e , with a 45% reduction in greenhouse gas intensity per unit of revenue compared to the baseline year 2015. Since the main source of emissions in the industry is electricity usage, continuous efforts have been made to improve energy efficiency. In 2023, 16 sites obtained the ISO 50001 certification, covering 64% of the total sites. Additionally, a phased approach has been adopted to procure renewable energy or certificates, gradually increasing the proportion of renewable energy usage based on market maturity in various operating locations worldwide, to attain the reduction targets in 2030 and progressively Net-zero. In 2023, 84% of the global facilities of ASEH have used renewable energy or certificates, 12 of which achieve RE100. The major emission category in Scope 3, accounting for 76% of the total emissions, is procurement of goods and services. In response to this, we have taken proactive measures to collaborate across the value chain and initiate greenhouse gas and product carbon footprint assessments for suppliers. We provide guidance and support in assessing suppliers' greenhouse gas emissions and product carbon footprints. We also actively engage in various aspects of emissions reduction through technical sharing, cross-industry cooperation, and incentive programs. In recent years, we have also invested in subsidiary companies to assist in greenhouse gas assessments and share emission reduction technologies. Our goal is to enhance the industry's ability to assess emissions across the supply chain, analyze carbon reduction hotspots, and foster collaborations in implementing carbon reduction actions by sharing carbon reduction technologies.

GHG emission		Emission (tCO_2e)	Ratio
Scope 1	Land use, land use change and forestry (LULUCF)	-16	0.65%
	Stationary Combustion	24,255	
	Mobile Combustion	2,317	
	Fugitive Emissions	16,423	
	Process Emissions	32,279	
Scope 2 (Market-based)	Electricity	1,636,932	14.20%
	Heating/Cooling/Steam/ Compressed air	12,415	
Scope 3		9,891,845	85.15%

Greenhouse Gas Emissions and Intensities



Scope 1 Emission Ratio



[1] The electricity carbon emission factor is calculated based on that of local sites
[2] Greenhouse gas inventory reveals emission scope with operational control and the Global Warming Potential derived from the IPCC Sixth Assessment Report
[3] Not include the Land-use Remove
[4] In 2023, the GHGs Scope 1+2(market) emissions is 1,724,621 tCO_2e. Additionally, the GHG reservoir by reforestation was down 16 tCO_2e, the net emissions is 1,724,605 tCO_2e

Scope 3 Emission Source	Emission(tCO_2e)	Emission factor	Reduction Courses of Action
Purchased goods and services	7,531,806	SimaPro 9.5.0.0 / EF Database 3.1	• Prioritize the purchase of low-carbon materials/ recycled materials • Encourage the use of renewable energy
Capital goods	772,306	SimaPro 9.5.0.0 / EXIOBASE	• Prioritize the purchase of low-carbon equipment and build low carbon facilities
Fuel- and energy-related activities	413,968	SimaPro 9.5.0.0 / EXIOBASE/USLCI	• Progressively increase the use of renewable energies
Upstream transportation and distribution	115,336	SimaPro 9.5.0.0 / USLCI / Agri-footprint	• Replace current plan with low-carbon transportation solutions • Minimize the use of product packaging materials • Establish a platform that integrates upstream and downstream transportation equipment and transportation distances
Downstream transportation and distribution	48,111	SimaPro 9.5.0.0 / USLCI / Agri-footprint	
Waste generated in operations	11,086	SimaPro 9.5.0.0 /USLCI /Carbon Footprint Information Platform	• Promote circular economy and adopt an end-of-life recyclable component design
Business travel	2,655	GOV.UK-Conversion factors: full set	• Rationalize business travels • Replace physical meetings with video conferencing
Employee commuting	33,535	SimaPro 9.5.0.0 / USLCI	• Offer carbon coins to encourage low-carbon commuting • Promote public transportation
Upstream leased assets	3,335	SimaPro 9.5.0.0 / EXIOBASE / EU & DK Input Output Database	• Improve energy efficiency
Downstream leased assets	27,541	Carbon Footprint Information Platform	
Investments	932,166	EXIOBASE / EU & DK Input Output Database	• Providing Guidance on Greenhouse Gas Inventory and Promoting Emission Reduction
Total	9,891,845		

Energy Saving and Carbon Reduction Projects

ASEH adopts 3 key approaches in its carbon reduction management; carbon reduction in manufacturing processes, carbon reduction in buildings and low-carbon energy development projects. In 2023, we invested a total of approximately US$34 million on 574 projects, resulting in an emission reduction of 603,327 tCO_2e. To reduce our Scope 1 emissions, process optimization and the electrification of transportation are our primary methods. For Scope 2, we focused on improving process efficiency as well as increasing the energy efficiency of equipment and systems through parameter adjustments and regular maintenance. We are also focused on developing innovative smart energy management systems that optimizes energy efficiency, establishing channels for inhouse technology sharing and organizing various energy saving competitions. At the same time, we continue to integrate low carbon building concepts across all our operations to further reduce the carbon footprint of our business activities.

Category	Energy Saving (MWh)	Energy Saving (GJ)	Carbon Reduction (tCO_2e)	Reduction Scope
Carbon reduction in manufacturing processes[1]	145,876	525,153	81,280	Scope 1+2
Carbon reduction in buildings[2]	32,356	116,482	16,418	Scope 2
Low-carbon energy[3]			505,629	Scope 2

[1] Carbon reduction in manufacturing processes includes enhanced performance and decarbonization in the manufacturing process, pneumatic system, pure/waste water systems, equipment replacement, motors and drives, automation and smart control system, waste heat and cold recovery
[2] Carbon reduction in buildings includes saving energy in lighting and air conditioning systems
[3] Low-carbon energy includes self-generated renewable energy, purchasing renewable energy and purchasing renewable energy certificates

Carbon Reduction Project

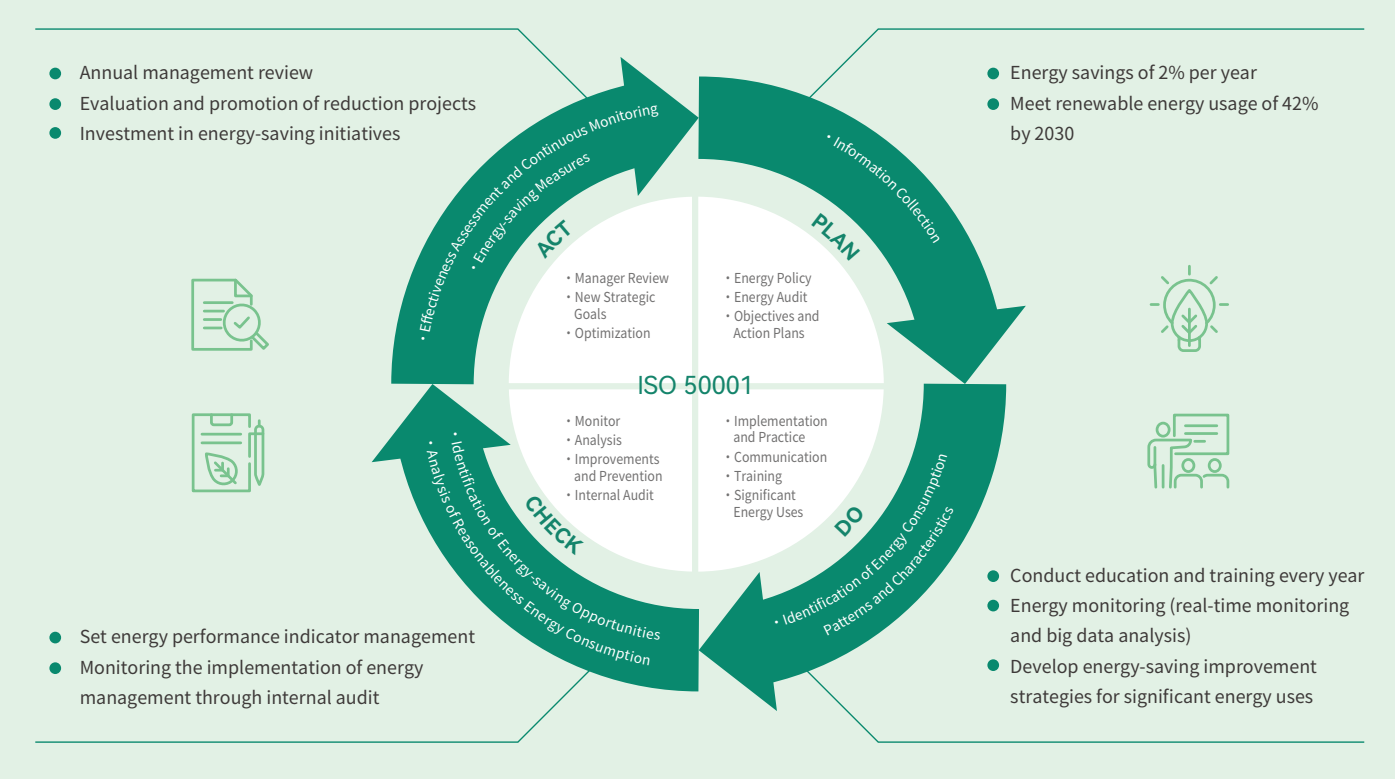
Scope 1 Carbon reduction project			Investment	Performance
Category	Number	Content	Total investment fees (US$)	Carbon Reduction (tCO_2e/year)
Decarbonization in the manufacturing process	2	• Installation of point-of-use abatement systems for processes using Fluorinated GHG • Substituting PFCs with low global warming potential gases • Substituting CF_4 with O_2 in the plasma etching process	192,471	6,925

Scope 2 Carbon reduction project			Investment	Performance	
Category	Number	Content	Total investment fees (US$)	Energy Saving (MWh/year)	Carbon Reduction (tCO_2e/year)
Lighting System	27	• Implementing Smart Controls • Using High-efficiency LED	220,056	1,744	863
Air Conditioning System	114	• Parameters Adjustment • Replacing Low-efficiency equipment	6,581,123	30,603	15,550
Pneumatic System	37	• Parameters Adjustment • Replacing Low-efficiency equipment	1,042,645	18,759	9,222
Enhanced Performance	259	• Optimizing Parameters • Refinement of Operational Processes • Optimization of Machine Idle Time	633,497	91,030	46,672
Pure/waste Water Systems	21	• Optimizing Parameters • Machine and Equipment Maintenance • Water Recycling	90,320	5,416	2,823
Equipment Replacement	60	• Process Machine Equipment Replacement • Replacement of Old Parts and Materials	17,422,200	14,055	7,091
Motors and Drives	26	• Replacement of Low-efficiency Motors • Installation of Variable Frequency Drives	673,743	3,393	1,680
Automation and Smart Control System	13	• Installation of Automatic Controllers • Implementation of Smart Management in Manufacturing Process	241,789	4,659	2,306
Waste Heat and Cold Recovery	14	• Heat Recovery • Recycling of Waste Cold	784,882	8,573	4,566
Low-carbon Energy	1	• Self-generated Solar Power • Purchasing Renewable Energy / RECs	6,257,328	-	505,629

Energy Resource Management[1]

Energy Management

To effectively manage internal energy usage and increase energy efficiency, ASEH is progressively implementing the ISO 50001 Energy Management System to meet its planned goal of achieving 100% certification by 2025. The PDCA (Plan-Do-Check-Act) management model is used to control energy costs and reduce unnecessary energy consumption. We have taken a proactive approach to inculcating an energy saving culture amongst our employees by conducting essential education annually, and holding events or competitions to sow the seeds of sustainable development to support our business growth.

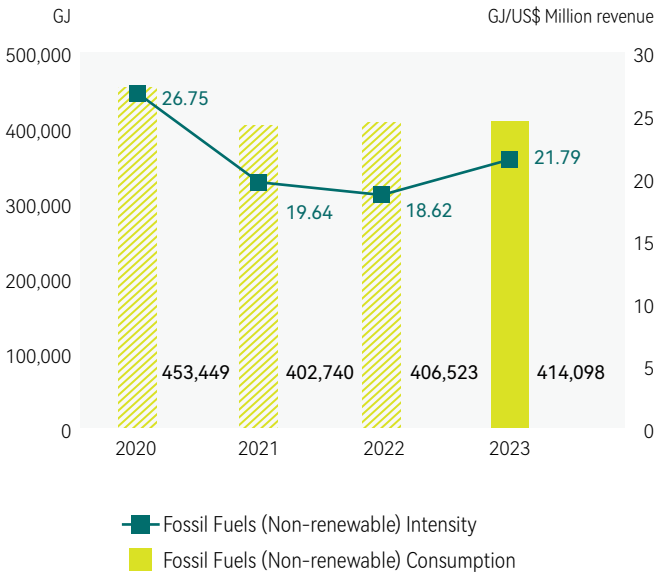


[1] Total energy consumption within the organization = (non-renewable fuel/electricity consumption) + (renewable fuel (electricity) consumption)+(purchased electricity, heating, cooling and steam)

Fossil Fuels (Non-renewable)

Petroleum gas, natural liquefied gas(LNG), gasoline, diesel, and heavy oil are the main fossil fuels used[1] at ASEH, accounting for a total consumption of 414,098 GJ[2] in 2023. Of which, LNG used in stackers and emergency power generators accounted for the highest proportion at 81.09%, followed by heavy oil for generating steam. In recent years, our dependency on fossil fuels have been reduced through the gradual introduction of transportation modes and the use of substitute fuels and clean energies.

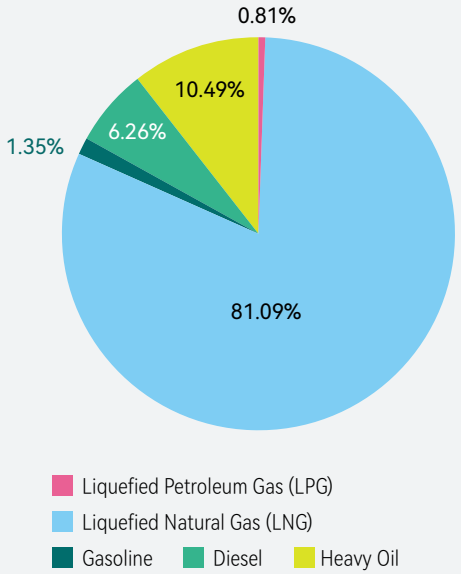
Fossil Fuels (Non-renewable) Consumption and Intensity



[1] Fossil Fuels (Non-renewable fuels) are used in: (a) Facilities: Emergency power generators, boilers, (b) Transport: Stackers, company vehicles, (c) Air pollution preventive equipment

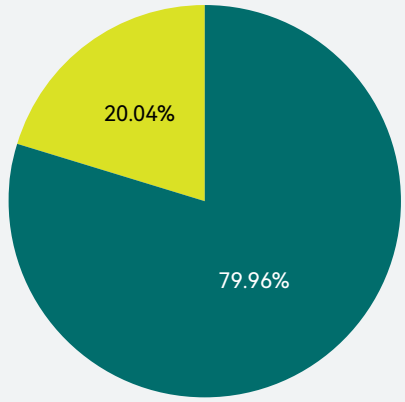
[2] The calorific value of fuel refers to the unit calorific value table of energy products

Fossil Fuels 115,027 MWh



Fossil Fuels (Non-renewable fuels)	GJ	MWh
Liquefied Petroleum Gas (LPG)	3,340	928
Liquefied Natural Gas (LNG)	335,803	93,279
Gasoline	5,570	1,547
Diesel	25,925	7,201
Heavy Oil	43,460	12,072
Total	**414,098**	**115,027**

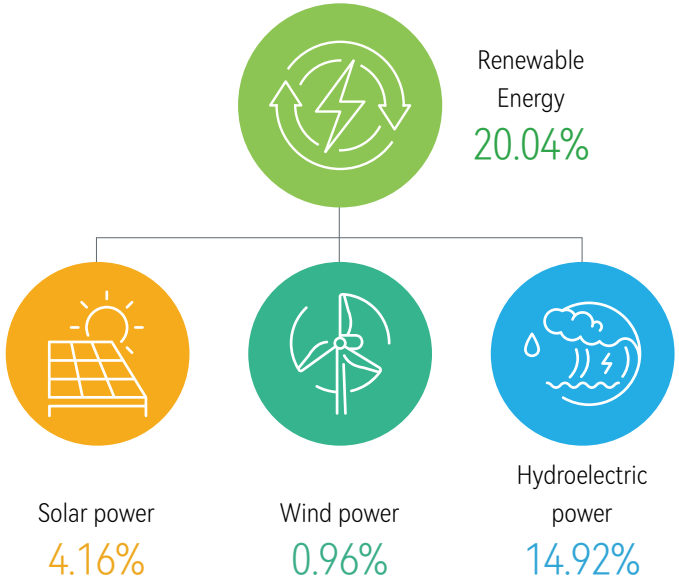
Electricity 4,211,006 MWh



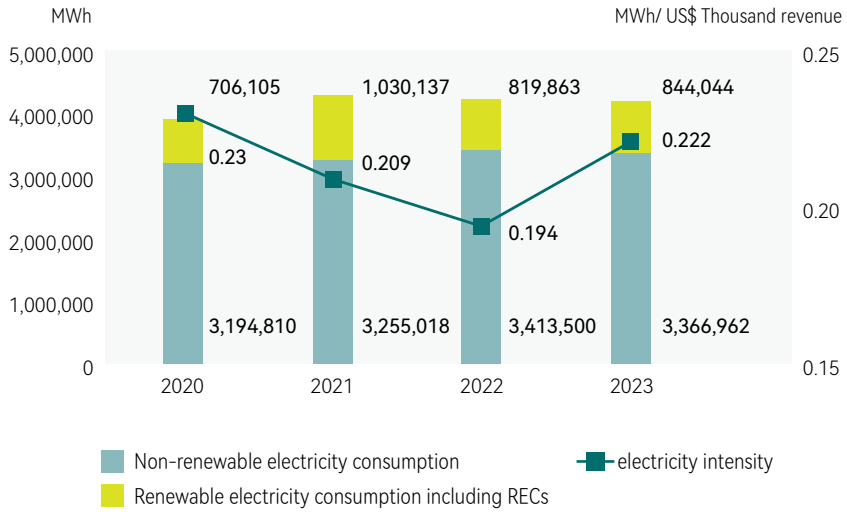
Electricity	MWh
Non-renewable Electricity	3,366,962
Renewable Electricity or REC	844,044
Total	**4,211,006**

Electricity and Renewable Energy Consumption

ASEH is increasing the use of renewable energy and developing a diversified power supply portfolio to strengthen its climate resilience. In 2021, we established the "Renewable Energy Platform" to consolidate the energy procurement of all our three subsidiaries. In addition, we managed to work with the value chain on the collective procurement of renewable energy, which not only increased the proportion of renewable energy used by our partners but also indirectly reduced greenhouse gas emissions overall. In 2023, our total electricity consumption to talled 4,211,006 MWh, while electricity consumption decrease by 0.53% compared with 2022. The electricity intensity per unit of revenue recorded a increase of approximately 14.27%. In line with ASEH's commitment to the SBTi net-zero by 2050, we are progressively increasing the use of renewable energy through solar power (installed at our facilities), external procurement of renewable energy, and acquisition of RECs. 84% of our global facilities used electricity from renewable sources including RECs. Our renewable electricity usage totaled 844,044 MWh and accounted for 20.04% of total energy consumption. 12 of our global facilities[1] obtained 100% of their electricity from renewable energy sources including RECs.



Electricity Consumption and Intensity



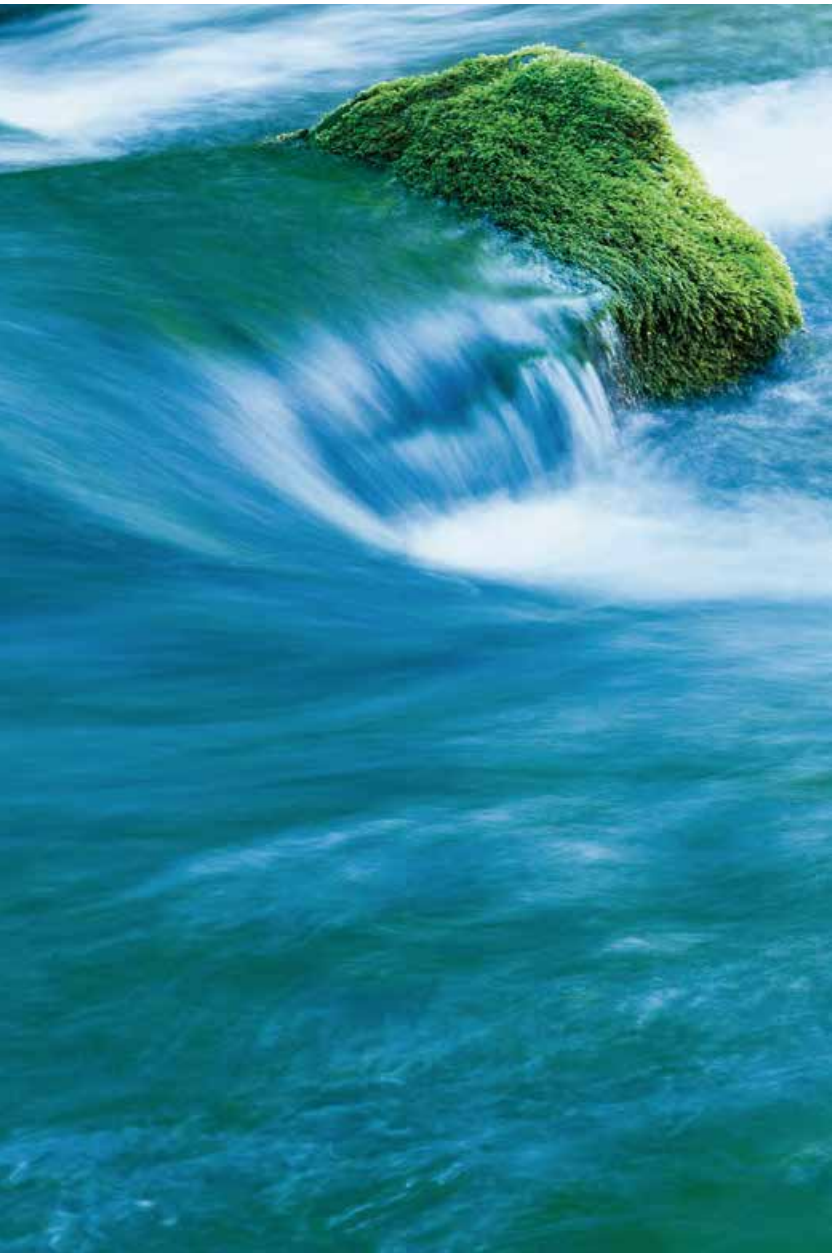
Renewable Energy (MWh)	Self-generated	Purchasing	RECs
Solar power	4,389	21,589	149,458
Wind Power	-	13,913	26,433
Hydroelectric Power	-	-	628,262
Total	**4,389**	**35,502**	**804,153**

[1] 100% of electricity from renewable energy sources including RECs: (1)ASE:SH(M), WX, ISESH, JP, M (2)USI: ZJ, KS, JQ, HZ, MX, HPH (3) SPIL: SZ

Smart Energy Monitoring and Management

To better manage our energy efficiency, we have established a minimum threshold of a 2% electricity savings relative to the annual power demand at our manufacturing facilities. We are also closely monitoring the energy intensity from non-renewable energy sources and high-energy consuming equipment at our facilities, with the goal of reducing energy usage. In recent years, we are aggressively expanding the adoption of intelligent energy management systems with ASE's Kaohsiung Facility leading the charge. Over the period of 2023, we actively analyzed the factory's real-time electricity usage patterns to determine optimal electricity allocation during peak and semi-peak hours, enhancing energy efficiency while lowering electricity bills. For energy-consuming air conditioning systems, AI tools were used to forecast air conditioning consumption for each upcoming 12-hour period. The data is then used to calculate and control the operation of chillers and fan filter units (FFU) in each area to maximize energy savings.

- **Real-time energy management platform:** Analyzing real-time power consumption to optimize power loading efficiently across different timings, thus achieving peak shaving and valley filling benefits.
- **AI intelligent control for the air conditioning system:** Using real-time computing, analysis, and energy-saving modules to determine the best control logic and timing for energy usage, accelerating energy savings and automation.
- **Energy-consuming process equipment control:** Installing independent power meters to detect and automatically turn on low-power mode in real time.



5.2 Water Resource

Water Resource Management

Managing our water resources is a top priority at ASEH, and we aim to continuously improve and optimize the use of water resources efficiently. From establishing management objectives to assessing major areas of water usage, the adoption of ISO 46001 Water Efficiency Management Systems enables us to identify risks and opportunities, and develop water-saving measures, risk mitigation strategies and various action plans. ASE Kaohsiung became the first semiconductor assembling and testing facility in Taiwan to obtain the ISO 46001 certification in 2021, followed by ASE Chungli in 2022 and SPIL Zhong Ke in 2023. The various sites have also developed action plans for certification in the future.

- Eatablish water resource management objectives.
- Collect water usage/reuse data from each facility.
- Identify water risks and opportunities.
- Develop water conservation projects for facilities and improvement/adaptation plans for high-risk facilities

- Implement water conservation projects and improvement/adaptation plans in each facility.

- Manage and review the effectiveness of water resource management in each facility, continuously improving water resource efficiency.

- Monitor the effectiveness of water resource management in each facility to ensure alignment with management objectives.

Risk Management

To assess water resource risks across our global facilities accurately, ASEH continues to use WRI Aqueduct's "Drought Indicators" and "Water Stress Indicators" combined with the "Drought Frequency Indicators" and "Impact Level Indicators" from NASA's climate change information, and the "Monthly Water Supply and Demand Correlation Indicators" from each facility to estimate the frequency and impact level of droughts in the regions where ASEH facilities are located, based on the daily rainfall under various climate change scenarios. In addition, we created the monthly correlation between water supply and demand by using WRI's monthly water stress indicator and the monthly amount of water withdrawn at each facility. We use these customized climate change information to synthesize the "Regional Water Shortage Indicators" to reflect both hazard and exposure. During scenario selection, we use assessments on favorable and unfavorable future water risk scenarios. We use three climate scenarios, namely OPT, BAU, and PES to simulate six combinations of Regional Water Shortage Indicators for two target time periods (i.e., 2015 to 2045 and 2035 to 2065).

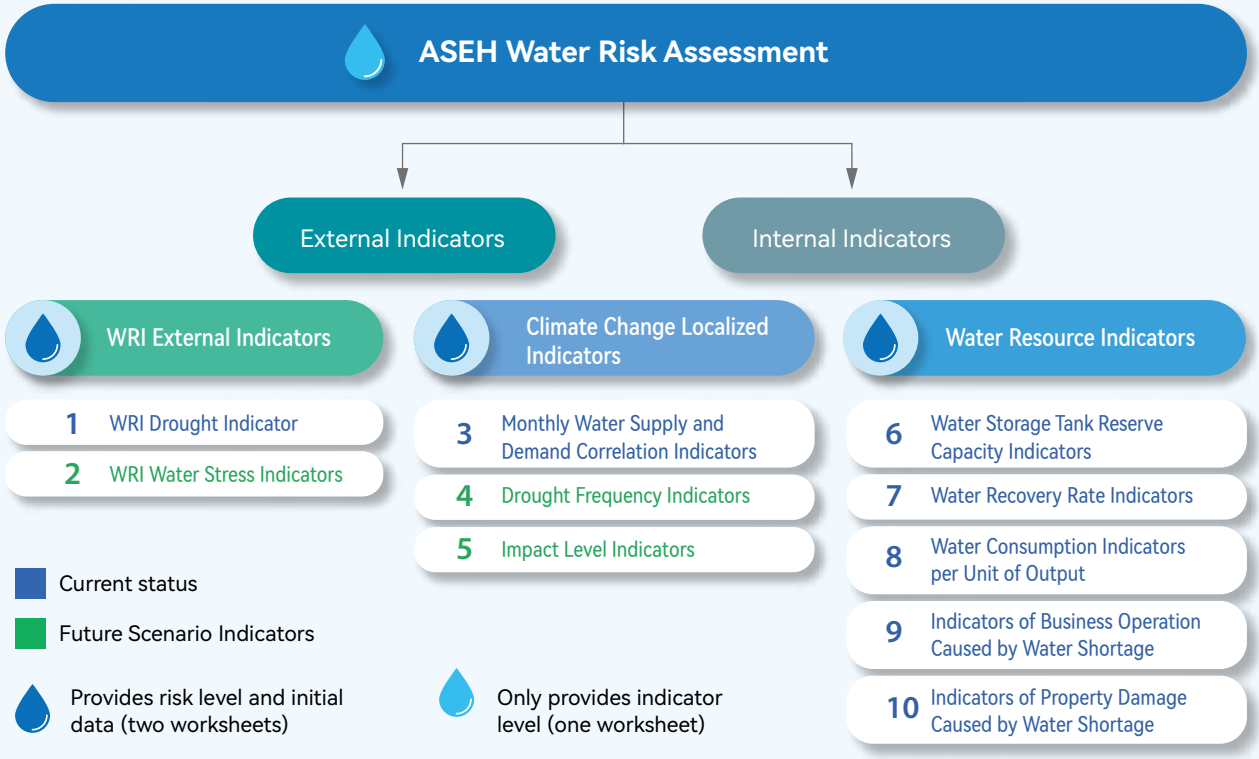
Climate scenario	Time Scale	WRI	NASA
OPT[1]	2015-2045, 2035-2065	SSP1 RCP2.6	SSP1 RCP2.6
BAU[2]	2015-2045, 2035-2065	SSP3 RCP7.0	SSP3 RCP7.0
PES[3]	2015-2045, 2035-2065	SSP5 RCP8.5	SSP5 RCP8.5

1. Optimistic Scenario (OPT): The increase in global average surface temperature in 2100 will be limited to 1.3℃ to 2.4℃ compared with pre-industrial times (1850-1900). SSP1 is characterized by sustainable socioeconomic growth: strict environmental regulations and effective institutions, rapid technological change and improved water efficiency, and low population growth.
2. Business as usual (BAU): Representing a middle-of-the-road future, temperatures will rise by 2.8℃ to 4.6℃ by 2100 relative to pre-industrial levels. SSP3 is a socioeconomic scenario characterized by regional competition and inequality, including slow economic growth, weak governance and institutions, low investment in the environment and technology, and high population growth, especially in developing countries.
3. Pessimistic Scenario (PES): Represents a future where temperatures will rise by 3.3℃ to 5.7℃ by 2100. SSP5 describes fossil fuel development: rapid economic growth and globalization driven by carbon-intensive energy, strong institutions investing heavily in education and technology but lacking global environmental concern, and a decline in population after peaking in the 21st century.

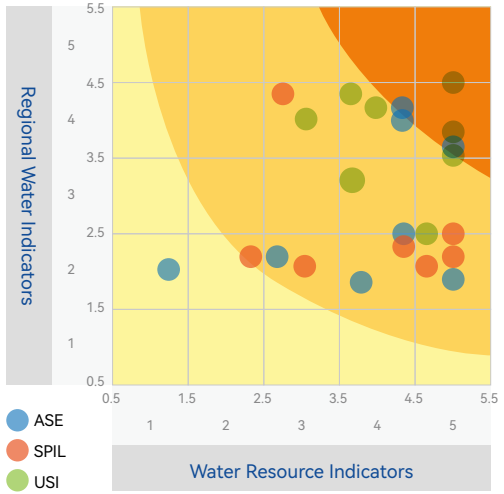
We then collect and integrate the water usage information of each facility, and incorporate the "Facility Water Resource Indicators" to reflect the level of vulnerability. On this indicator, information such as "Water Storage Tank Reserve Capacity Indicators", "Water Recovery Rate Indicators", "Water Consumption Indicators per Unit of Output", "the wastewater reclamation recycling systems" and past historical experience are considered to evaluate the water vulnerability of each facility. The study also considers the additive coefficients, including the business process and response mechanisms, as well as the actual ranking of the regional water supply capacity and the corrected results to present the specific climate risk of the facility. In addition, we have also incorporated groundwater sources in the total water risk assessment to address the uncertainty of groundwater availability under the climate change scenario, and the potential of tighter regulatory control of groundwater access in the future.

Lastly, we integrated the Regional Water Shortage Indicators and the Facility Water Resource Indicators to reflect IPCC's hazard × vulnerability × exposure framework. The drought risk of each facility is presented as a two-dimensional matrix, where the vertical axis represents the Regional Water Shortage Indicators, reflecting the hazard and the exposure of the facility to drought risk, while the horizontal axis represents the Facility Water Resource Indicators, reflecting the vulnerability of the facility to drought risk. The Regional Water Shortage Indicators and Facility Water Resource Indicators for all ASEH facilities are divided into five levels, where the product of the regional water scarcity indicator and the facility water consumption indicator is greater than or equal to 18 for high-risk areas, less than 18 and greater than 5 for medium-risk areas, and less than or equal to 5 for low-risk areas.

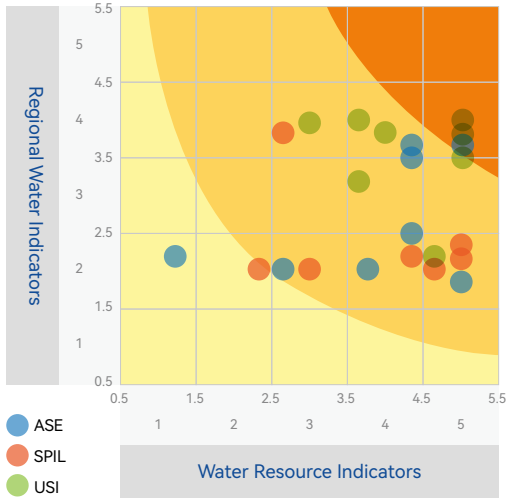
Based on the results of the analysis using the optimistic short-term scenario (2015-2045 OPT) and the pessimistic long-term scenario (2035-2065 PES) as examples, the Regional Water Shortage Indicators for all ASEH facilities are roughly distributed between Level 2 and Level 4. Notably, some facilities experience lower water stress levels in the pessimistic scenario than in the optimistic scenario. This discrepancy arises because our analysis only focuses on the drought indicator. The pessimistic scenario reflects severe climate changes on the whole. For instance, under this scenario, dry and wet seasons will be more pronounced, but rainfall is on the rise throughout the year. Meanwhile, there are significant differences in the Facility Water Resource Indicators, which is distributed between Level 1 and Level 5. As observed from the overall results, most of ASEH facilities are located in low-to-medium-risk areas. Facilities located in high-risk areas will continue to implement various adaptation measures, such as increasing water recovery rates, establishing wastewater recycling systems, increasing reserve water capacity, or reducing reliance on groundwater sources, with a view to not only minimizing the impact of water scarcity in the future, but also bolstering resilience to wet and dry seasons across all ASEH facilities.



ASEH 2015-2045 OPT



ASEH 2035-2065 PES

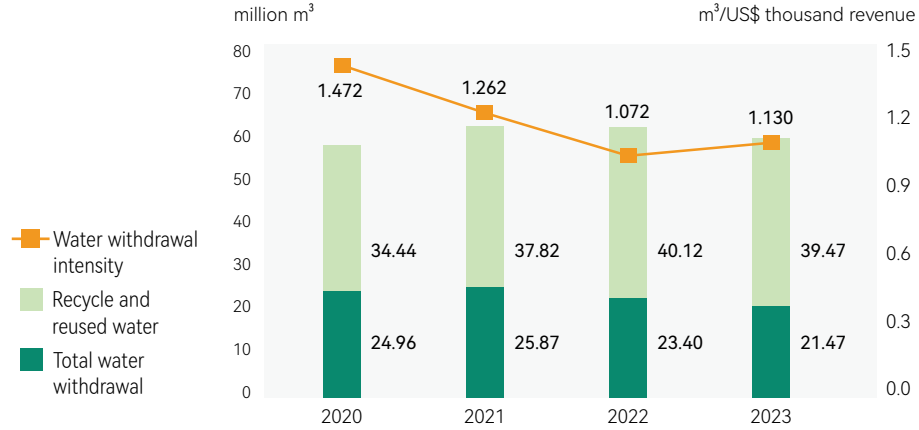


Water Withdrawal and Reuse

ASEH adopts three water use strategies: reduce, reuse, and recycle. The main source of water-use is tap water. Total water withdrawals in 2023 amounted to 21.47 million tons, while water withdrawal decreased by 8% compared to the previous year. The water use intensity per unit revenue (including rainwater) was affected by the revenue decrease to increase by 5% compared with the previous year, but reaching our goal of a 46% decrease compared to the baseline in 2015.

The wastewater reclamation recycling systems were established in ASE Kaohsiung, Chungli, Malaysia, and Singapore facilities to support wastewater treatment that meets local regulations. The wastewater reclamation recycling rate of ASE Kaohsiung and Chungli are 70%, ASE Malaysia is 50%, and ASE Singapore is 37%. The robust recycling methodology at the facility result in a 12% reduction in effluent discharge, and significantly alleviated the manufacturing sites' pressure on water consumption and wastewater discharge.

Water Resource and Water Withdrawal Intensity



Diverse Water Resources

Total water withdrawals 21,467,999 m³/year

- Municipal water 77.67%
- Third-party water 2.46%
- Groundwater 19.82%
- Rainwater 0.04%

Water Management

Total water withdrawals 39,474,668 m³/year

- Domestic water usage 7%
- Manufacturing process usage[1] 68%
- Process recycling rate 78%
- Public facilities water usage[2] 21%
- Irrigation

Recycling and Processing Wastewater

Wastewater treatment system → Water recycle and reclamation plant[3] → Qualied waste water euent

36,844,784 m³/year

Discharge to a third party without treatment	10%
Primary treatment	13%
Secondary treatment	58%
Tertiary treatment	19%

Total wastewater discharge 15,386,252 m³/year

to the surface water	95%
to the seawater	5%

Water consumption

Total water consumption 6,081,747 m³/year

Description:
1. Manufacturing process water use includes manufacturing water use cycle, cleaning/grinding water, electroplating water recycling, and other reuse.
2. Public water use includes washing tower discharge, cooling tower discharge, purified/wastewater systems recycling and reuse.
3. Water reclamation includes recycling and renewal of processed water that meets guidelines, supplying the manufacturing water usage cycle.

In 2023, our successful launch of 16 conservation projects involved 42 million USD in capital expenditures and operating expenses, which saved a remarkable 1.28 million tons per year. To improve employees' awareness, knowledge, and skills, we generally provide water resource efficiency-related training for employees, a total of training lessons for 3,743 hours, 5,318 people. That will assist employees in discovering water-saving opportunities in daily operations and propose and implement improvement projects. Incentive mechanisms were implemented to encourage employees to propose feasible solutions to save water that resulted in, an increase of 2% year-on-year recycling rate to 78%. We remain committed to promoting and investing in water management capabilities taking concrete actions to advance circular economic benefits derived from sustainable water use.

Water Saving Projects			Investment	Performance
Project Type	Number	Description	Investment fees (US$)	Performance (tons/year)
Process recycling rate 	7	• Add a recycling system to process and recycle machine wastewater	1,234,907	805,797
Water recycle and reclamation plant 	1	• Wastewater reclaim efficiency improvement	710,680	93
Wastewater recycling 	6	• Strip grind wastewater reuse • New construction project for organic wastewater recycling	40,140,036	472,421
Public facilities water usage 	1	• Water spray for garden	800	965
Domestic water usage 	1	• Toilet tap and flush water altered to water saver	896	1,080
Total	16		42,087,319	1,280,356

Wastewater Management

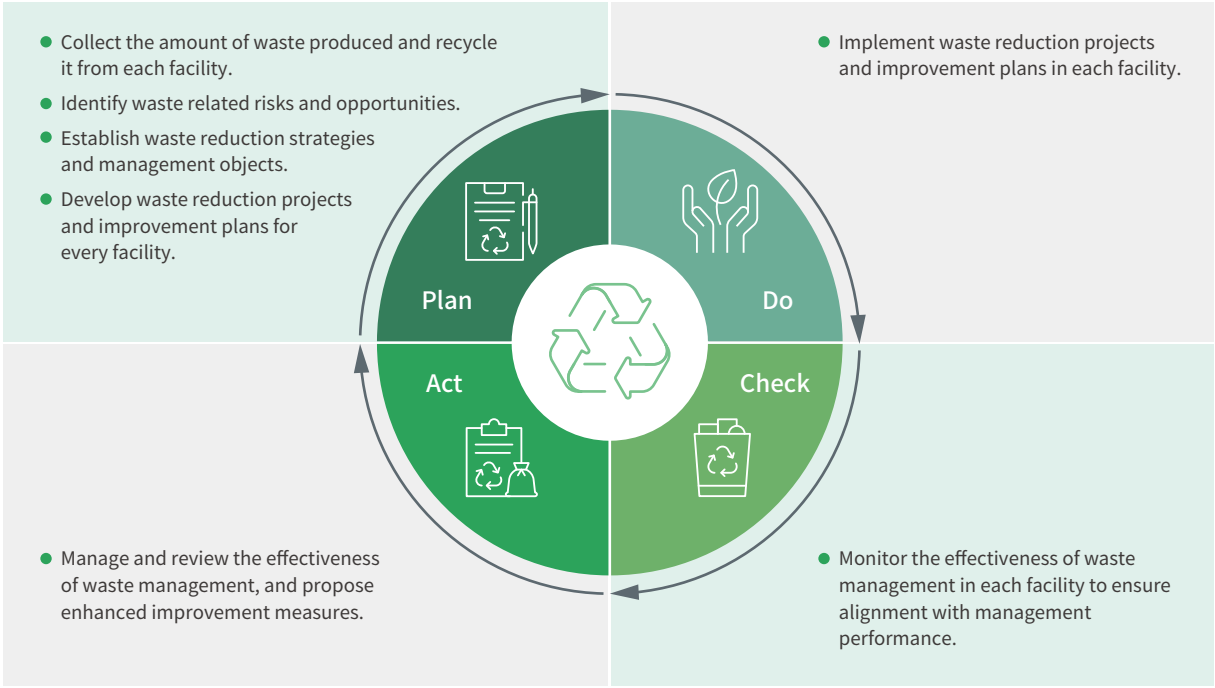
In 2023, 15,386,252 tons[1] of effluent was discharged, and our total water consumption was 6,081,747 tons. We conduct internal water quality tests, while also outsourcing offline sampling and water quality analysis to ensure strict control and ecology management of the aquatic environment. In addition, our effluent management adheres to local regulations and discharge water standards. A number of our facilities have set internal goals that are higher than regulatory requirements by consistently monitoring the effluent quality, and employing AI algorithms to optimize and increase the amount of recycled water and reduce water withdrawal. Currently, there are 15 facilities that collect and classify chemicals used in the manufacturing process, so that each type can be treated independently based on its effluent characteristics, and hence, improving the efficiency of our effluent treatment processes. In order to provide employees with clean water and proper sanitation across our operations, we have adopted the WASH (Water, Sanitation, and Hygiene) approach as well as established wastewater treatment facilities. We will continue to conduct regular health and environmental education to further enhance employees' awareness of water security.

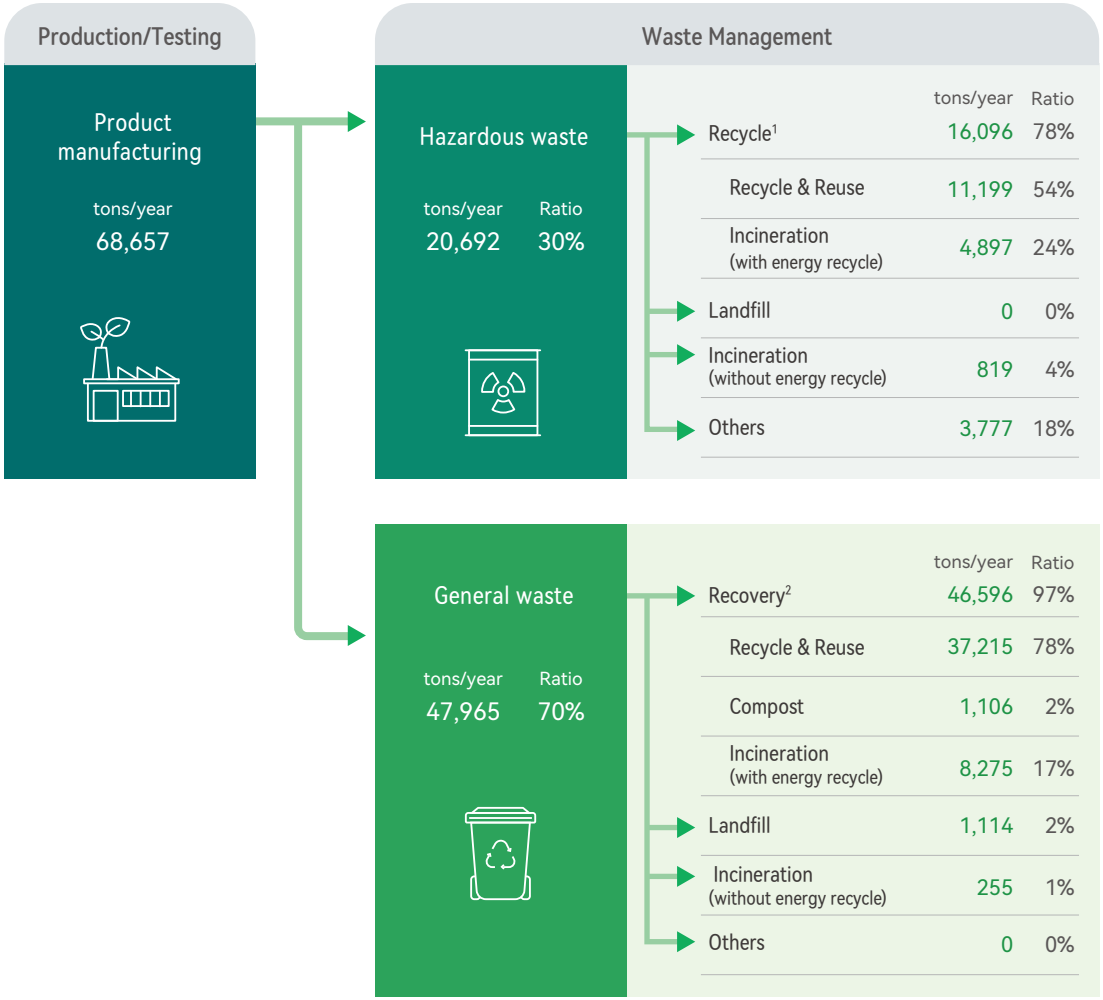
[1] Three electronic manufacturing services facilities (USI Kunshan, Shenzhen, and Mexico) do not have on-site wastewater treatment facility, so the amount of wastewater discharge is estimated. Others' data is recorded from water meters

5.3 Waste

Waste Management

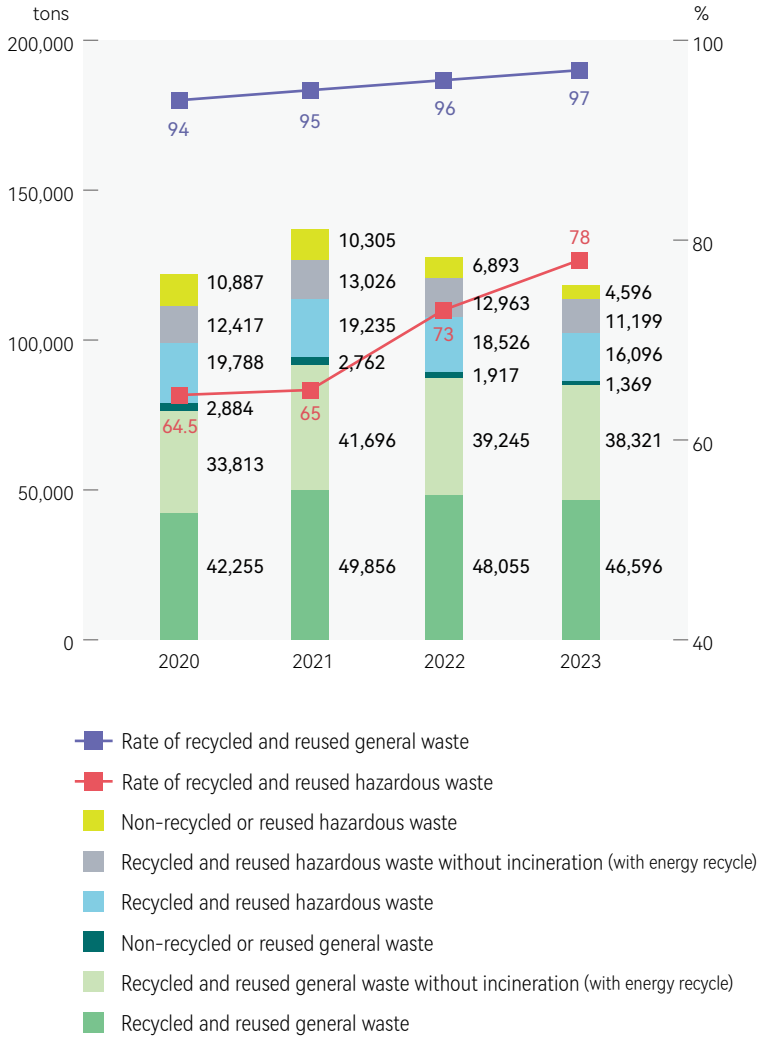
ASEH adopts source reduction measures and prioritizes the use of eco-friendly materials to minimize waste generation and reduce environmental pollution. We require all facilities to complete ISO14001 certification, and collect and track each facility's environmental-related data from the environmental management platform on a quarterly basis. Facilities that have not achieved the targets will need to propose improvement plans to reduce their waste output and increase their recycling rate. In 2023, a total of 68,657 tons of waste was generated; a positive progress towards our goal of zero landfill. At some locations, local government regulations mandate a close to zero landfill for hazardous waste. As such, there still remains approximately 2% of general waste that must be disposed of in landfills. The USI Shanghai-Shengxia and Zhangjiang Facilities have each obtained UL Solutions Environmental Claim Validation (UL ECV), Gold certification for achieving zero waste to landfill. To ensure that waste removal is environmentally friendly and conducted responsibly, we have commissioned qualified local vendors to recycle and process 100% of the generated waste within the border. We also use AI tools to monitor the operations of waste transport vehicles. Each facility conducts waste vendor audits in various forms including annual online, paper-based, and on-site audits, as well as random audits. These audits aim to ensure compliance with environmental regulations and the company's policies, and ultimately to prevent environmental pollution incidents. To improve waste resource utilization, we have adopted the circularity model with a goal of 90% recycling rate for non-hazardous waste. In 2023, the hazardous waste intensity (hazardous waste generated per revenue) decreased by 58% compared with 2015, resulting in a 91% general and hazardous waste recycling rate which is a 3% increase from the previous year. We also provided employees with education and training on environmental issues, totaling approximately 38,235 training hours for 42,361 participants. This training initiative effectively boosts employees' awareness and understanding of waste reduction, enabling the company to integrate the ethos of waste reduction into its operations and achieving its ultimate goal of zero waste to landfill.





Description:
1. Rrecycled hazardous waste includes incineration (with energy recycle)
2. Recycled general waste includes compost and incineration (with energy recycle)

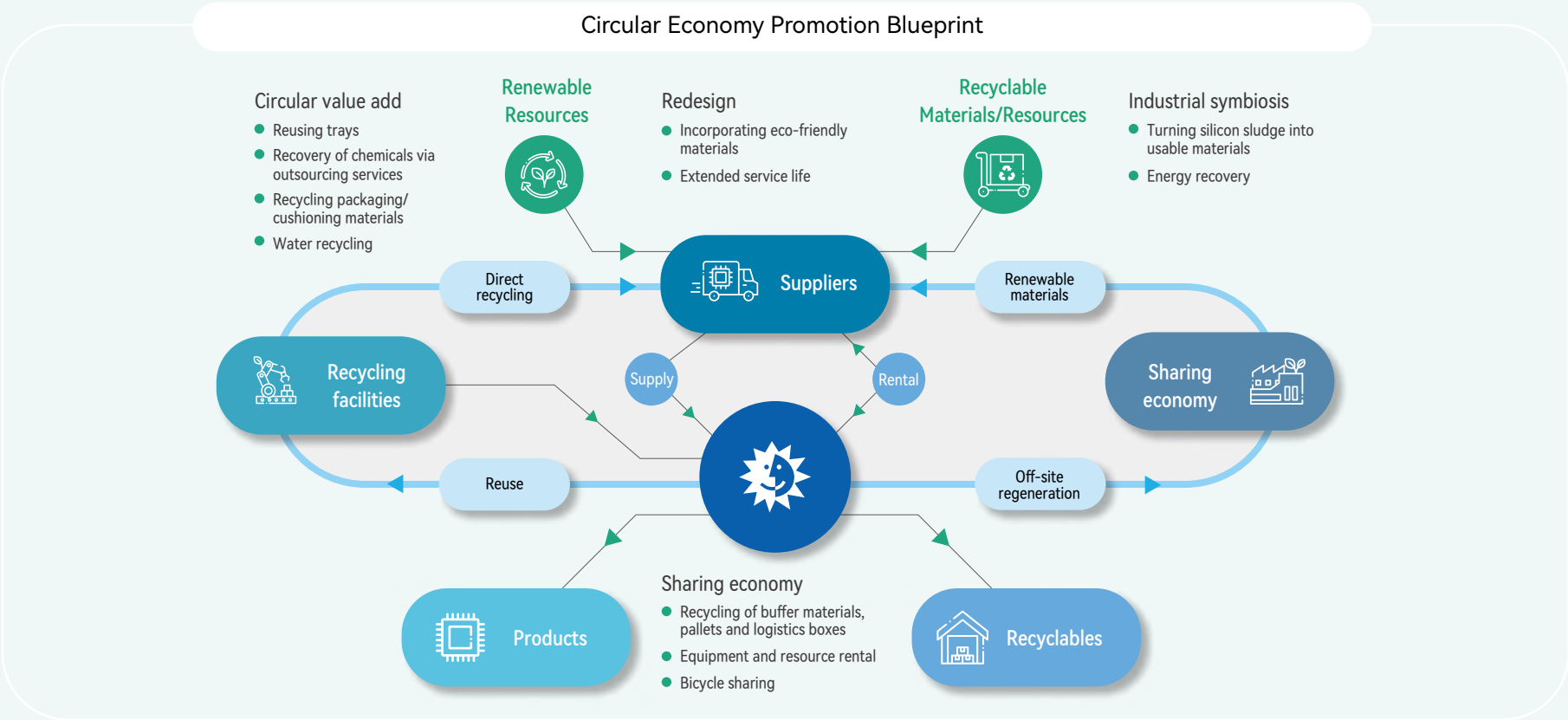
Waste Output and Recovery Rate



Description:
(1) Rate of recycled general waste reached 97% > target recycling rate (90%)
(2) Rate of recycled hazardous waste in 2023 (78%) was 73% higher than the previous year (5%)
(3) Rate of recycling of hazardous waste (excluding incineration with recycled energy) was 22%

Striving Toward a Circular Economy

The concept of the circular economy has garnered greater global attention in recent years as concerns with the continuous depletion of natural resources grow. To optimize the use of Earth's resources, the application of relevant expertise and the weighing of economic benefits are prime factors in implementing a circular economy. At ASEH, we are putting the circular economy in action by adopting five key approaches direct recycling, reuse, off-site regeneration, renewable materials and supply and leasing. We collaborate actively with suppliers and business partners across the industry chain to build a semiconductor circular economy through practical actions such as redesign, value-added circularity, recycling and recovery, shared economy, circular agriculture, and industrial symbiosis. In addition, we have formed alliances with organizations in our industry and from other sectors to examine the life cycles of resources and identify areas where resources can be reduced, recycled, and reused to prolong their lifespan, and maximize resource efficiency. In 2023, we spent approximately USD 16.3 million and launched a total of 53 circular economy projects, resulting in approximately USD 42.62 million cost saving, and the consumption of about 33,000 tons of resource material per year.



Non-hazardous Waste Project and Beneficial Result				Investment	Performance	
	Project Type	Number of projects	Description	Total investment fees (US$)	Total annual cost (US$)	Total substance weight (tons/year)
	Energy recycling	3	Incinerate mixed waste such as household garbage, waste plastic (non-chemical properties), waste wooden pallets, and combustible materials for energy recovery abd reuse	597	3,173	3,656
	Packaging material recycle	5	Recycle and reuse packaging materials such as trays, pallets, and cardboard boxes	234,654	2,580,514	564
	Packaging material reduction	4	Reduce the use of single-use packaging materials	2,988,961	8,951,401	1,121
	Packaging material reuse	12	Recycle and reuse wafer packaging materials	6,789,399	28,265,994	4,441
	Other	10	1. Crush waste plastic packaging materials and remanufacture them into plastic pellets 2. Use sintering to process waste compression-molded plastic and replace virgin materials (natural aggregate) with it for the production of eco-friendly bricks	413,072	371,523	12,015
	Total	34		10,426,683	40,172,605	21,780

Hazardous Waste Project and Beneficial Result				Investment	Performance	
	Project Type	Number of projects	Description	Total investment fees (US$)	Total annual cost (US$)	Total substance weight (tons/year)
	Energy recycling	5	High-concentration organic waste liquid, organic wipig cloths, and filter cartridges are processed through incineration and distillation, and then reprocessed into fuel boiler combustion to generate thermal energy	1,045,218	481,991	3,926
	Packaging material recycle	1	Empty chemical containers are recycled, cleaned, and reused	16,368	39,254	30
	Other	13	Alkaline copper-containing waste liquid and organic solvents are recovered through distillation	4,810,024	1,927,175	7,272
	Total	19		5,871,610	2,448,420	11,227

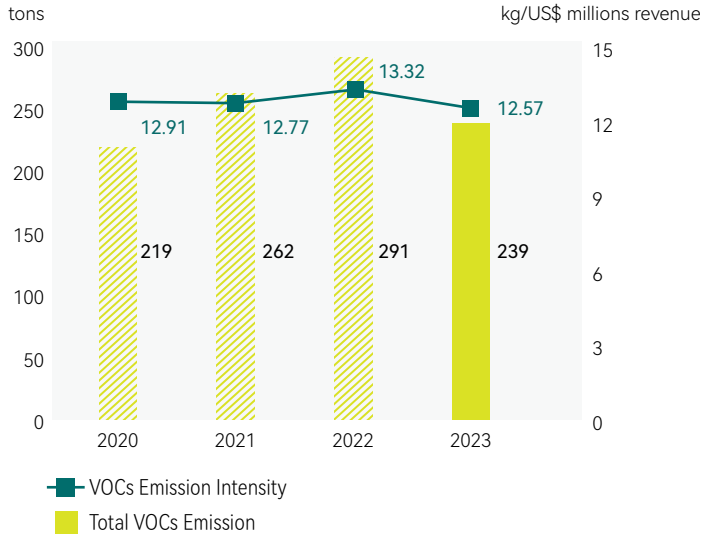
ASE Social Enterprise – The sustainable value of disposable beverage cups

In Taiwan, the popularity of hand-shake beverages has led to a marked increase in the use of disposable plastic cups that resulted in plastic waste that pose a huge environmental impact. To ensure the circular use of resources, the ASE Social Enterprise embarked on plastic cup recycling project with Da Fon Environmental Technology, a Kaohsiung-based recycling company. The used plastic cups are recycled into raw materials for manufacturing trendy crossbody bags. Each bag uses material recycled from 3 plastic cups, and we recycle approximately 8,400 plastic cups annually. A cumulative total of 11,400 cups have been recycled as of December 31, 2023, which enabled us to produce 3,800 eco-friendly crossbody bags. We will continue to drive actions to generate new, circular and sustainable value from waste and transform them into products that are practical and commercially viable.

5.4 Air Emissions Control

Air pollutants emitted in 2023 include VOCs[1], SO_x[2], NO_x[3], and particulate pollutants[4]. We adopted the use of wet scrubbers, activated carbon adsorption equipment, condensation equipment, chemical scrubbing, biological scrubbing, UV photolysis, zeolite concentration rotor incineration systems, and other preventive equipment to manage process gases and control the concentration of air pollutant emissions. In 2023, the number of VOCs emissions decreased 18% compared with the previous year. In addition to the original treatment and prevention equipment, we will strengthen our emission management to focus on source emissions and facility upgrades and improvements to reduce the environmental impact caused by the concentration of air pollution emissions.

VOCs Emission and Intensity



[1] VOCs are calculated using public coefficients, and are either directly measured or calculated using mass balance
[2] SO_x are calculated using public coefficients or converted through the concentration ratio
[3] NO_x are calculated using public coefficients or directly measured
[4] Particulate pollutants are calculated using public coefficients or directly measured

Operational Manufacturing

Source Management

- Replace existing high VOC concentration materials with clean, low/no VOC content materials
- Strengthen sealed negative-pressure environments
- Academic collaborations to optimize treatment efficiency

Preventive Equipment

High-efficiency Treatment Equipment

- Web scrubbers
- Activated carbon adsorption equipment
- Condensation equipment
- Chemical scrubbing
- UV photolysis oxidation
- Zeolite concentration rotor incineration

Emissions Monitoring

	tons
VOCs	239
SO_x	23
NO_x	50
PM_{10} / $PM_{2.5}$	15
Ozone deplenting substances	0

ASE Kaohsiung – Energy-Saving and Carbon-Reduction Action Alliance

ASE Kaohsiung's facility team has had a tradition of organizing energy-saving competitions since 2013. On the tenth anniversary, ASE Kaohsiung expanded the scope to include environmental protection, energy, water resources, and circular economy by forming the Energy-Saving and Carbon-Reduction Action Alliance. We engaged external experts as judges, and handed out awards for outstanding projects as well as commending excellence in general day-to-day operation. Company-wide recognition of winning teams serve to enhance employees' awareness of environmental protection and spur them to explore and grasp every opportunity to save energy and water, and reduce waste. We are committed to playing our part for mother earth through the building of a sustainable operation that improves the efficiency of resource use and strengthens our overall resilience.

5.5 Green Facility

Low Carbon Buildings and Green Factories

Reducing the carbon emissions of buildings is a critical step to slowing down climate change. Since 2012, we have transformed existing facilities and built new facilities and offices that comply with international low carbon building standards. Through quantifying and analyzing the entire lifecycle of building carbon emissions, carbon reduction was driven from the design stage and promoted along the value chain to build a sustainable campus. We have also integrated the evaluation of clean production in the manufacturing process, with green buildings to achieve Green Factory Certification, meeting low carbon goals at both hardware and software levels. In the future, we will continue to work towards obtaining certification for 100% of our new facilities, and demonstrate our firm commitment to green transformation.

Green Building Performance[5]

Energy Saving (MWh/year)	Carbon Reduction (tCO_2e/year)	Water Reuse (t/year)
248,647	124,242	3,829,880

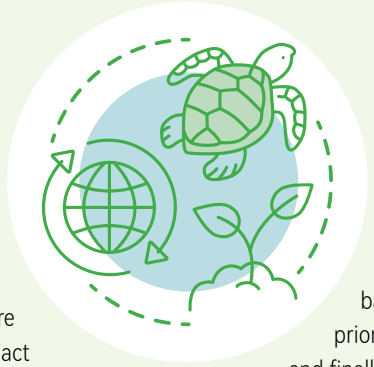
Clean Production Performance[6]

Energy Saving (MWh/year)	Carbon Reduction (tCO_2e/year)	Water Reuse (t/year)
253,062	131,173	2,411,893

[1] EEWH Certification: K3/K4/K5/K7/K11/K12/K14B/K15/K16/K21/K22/K26/KH-dom/CL-A/ CL-K&L/CL-B/CL-M/SPIL Zhong Ke /USI-NK
[2] LEED Certification: K12/K21/K22/K26/CL-K&L/ K23/CN-HQ/CN-SH
[3] Low-Carbon Building Diamond Grade: K24
[4] Green Factory: K3/K5/K7/K11/K12/K15/K21/K22/CL-A/CL-K&L/CL-B/CL-M/SPIL-ZK /USI-NK
[5] The energy saving performance of green buildings only takes Taiwan EEWH into account, and it is calculated based on the energy saving efficiency assessed by each facility when applying for the green building label
[6] The energy saving performance of clean production is calculated based on the energy saving efficiency assessed by each facility when applying for clean production certification

5.6 Biodiversity

Towards the Future of Living in Harmony with Nature



Biodiversity is fundamental to protecting the ecosystem, promoting the well-being of humans, safeguarding our planet, and maintaining economic prosperity. In June 2023, the Board of Directors endorsed the incorporation of the "Biodiversity and No Deforestation Policy" to actively engage with stakeholders and promote biodiversity and responsible environmental activities. We are committed to meeting the established targets of No Net Loss (NNL) and achieving Net Positive Impact (NPI) on biodiversity and No Deforestation by 2030. We endeavor to collaborate across our value chain to achieve the UN Convention on Biological Diversity's vision of "a world that is living in harmony with nature." ASEH is committed to the following:

- Ensure that our business operations and value chain activities are not located in globally or nationally designated biodiversity hotspots, or near the surroundings of hotspots and ecotones, to prevent negative impacts on protected species.
- If any of our business operations or value chain activities produce any negative impacts on the biodiversity or ecosystems, we will apply the mitigation hierarchy of Avoidance, Minimization, Restoration and Offsetting to mitigate the impacts and work towards the No Net Loss (NNL) target.
- Adopt an approach with regional characteristics to periodically assess the dependency and impact on the provision, regulation, support and cultural services of the ecosystems. Regularly monitor and disclose the biodiversity and ecosystem risks from our business operations and activities. Establish strategies for the corresponding actions, targets and goals, and regularly publish reports on the progress and achievements.
- Ensure that no deforestation is part of our business operations and activities across the value chain by establishing a system to monitor and strictly comply with international and national forest conservation regulations. Engage actively with suppliers and/or partners on future reforestation to compensate current forest loss (no net deforestation) and work towards the target of ending all deforestation (no gross deforestation) by 2030.

In compliance with applicable policy requirements and in response to the Taskforce on Nature-related Financial Disclosures (TNFD) initiative, ASEH directed its subsidiaries to conduct nature-related risk assessments at its 26 major manufacturing facilities worldwide. Based on the TNFD-LEAP guidance, we have identified the relationship between our major global manufacturing facilities and sensitive biodiversity areas (Locate); assessed the dependence and impact of each facility's operations on nature (Evaluate); analyzed the corresponding risks and opportunities based on the dependence and impact path assessment and determined priority risks and opportunities through materiality analysis (Assess); and finally, formulated response strategies, set monitoring indicators and management goals, and published a Climate and Environmental Report (Prepare). The results of the natural risk assessment revealed that one facility in North America and one in Northeast Asia are located next to Category IV habitat/species management areas designated by the International Union for Conservation of Nature (IUCN). However, these facilities are operating in line with local regulations and no significant ecological impact has been observed. Furthermore, it should be noted that the majority of our facilities depend on natural climate regulation to mitigate potential disasters such as extreme temperatures or irregular rainfall, and that waste treatment and greenhouse gas emissions are the main environmental impacts of our factory operations. To manage the aforementioned physical/transition risks and opportunities, each of our facilities has taken action to mitigate risks and seize opportunities through strategies such as improving energy use efficiency, optimizing water resource management, increasing waste recycling, and striving for net-zero greenhouse gas emissions. These efforts enable the company to generate profits from its operations while taking into account their impact on the environment, thereby realizing its vision of achieving harmony and coexistence with nature.

For ASEH's supplier biodiversity risk analysis, we identify the existence of any biodiversity sensitive locations surrounding the geographic locations of our 646 suppliers worldwide using the International Union for the Conservation of Nature (IUCN) World Database on Protected Areas (WDPA), where a two-kilometer radius is drawn around the center of a supplier as its potential impact area. According to the findings from the overlay analysis, there are 123 biodiversity-sensitive locations near our global suppliers. For those suppliers that are close to at least one sensitive locations, we prioritize our attention on them and ensure that they establish or enhance their

strategies for biodiversity, no-deforestation, and/or land conservation. These strategies must at a minimum, include commitments to monitor, prevent, mitigate, and address local ecosystem impacts to ensure the stability and resilience of company operations.

For ASEH's customer biodiversity risk analysis, we assess the nature-related dependencies and impacts of our customers using the tool of Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE). We figure out the economic sectors or production processes of our customers, i.e. "Communications Equipment", "Electronic Components", "Electronic Equipment & Instruments", "Electronic Manufacturing Services", "Technology Hardware, Storage & Peripherals" and "Semiconductor Equipment". Then we input these sectors into ENCORE to explore natural capital risks. We find the dependencies are Ground water, Surface water and Dilution by atmosphere and ecosystems and the impacts are Water pollutants, Soil pollutants, Disturbances, Solid waste, GHG emissions, Water use (sort by rating). We will consider this information when we develop business strategy.

(For more information, see the 2023 Climate and Environment Report[1])

[1] 2023 Climate and Environmental Report complete electronic version can be downloaded from our website. https://www.aseglobal.com/en/pdf/2023-climate-and-environmental-report-en.pdf

ASE Kaohsiung's TNFD-LEAP Biodiversity Risk Assessment

To enhance the company's management of biodiversity risks, external experts were commissioned to develop natural risk assessments designed for the semiconductor industry, and position ASE Kaohsiung as an industry benchmark for biodiversity. The program consists of basic knowledge and skill training in natural risk assessment, and understanding international conservation trends. Participants were also provided introductory education on the TNFD-LEAP approach. A total of 166 participants joined the program. Next, workshops were conducted to facilitate exchanges and discussions between the internal team (practical perspective) and external consultants (academic perspective). In accordance with the LEAP model, the teams located the interface between the Kaohsiung Facilities and nature (Locate), evaluated its dependencies and impacts on nature (Evaluate), assessed nature-related risks and opportunities (Assess), and prepare strategies and goals to respond to nature-related issues (Prepare). To that end, the company has developed standard operating procedures that other ASEH facilities can adopt to manage future natural risks. These procedures may also serve as a reference for our peers in the semiconductor industry, stimulating them to address and mitigate the environmental impact of its operations and promote ecological restoration.

Results from the assessment revealed that the Kaohsiung facilities relies mainly on natural water resources, and the main environmental impacts come from copper and nickel ions in water discharge and volatile organic compounds (VOC) in exhaust fumes. Using Youchang Forest Park as a baseline, we discovered that the habitat surrounding the facilities have a low bird species richness, but high species evenness. Despite the fact that no protected bird species have been identified, the discovery of a Taiwan Barbet nest on a blackboard tree in the Kaohsiung campus is encouraging. Another notable discovery was that the discharge water quality of the Kaohsiung facilities is better than that of the Houjin River in terms of pH value, chemical oxygen demand, and suspended particles. These indicators point to a positive environmental impact. The Kaohsiung facilities' dependence and impact assessment identified eight significant opportunities and twelve material risks. After consideration of cost, justification, feasibility, and urgency, ASEH developed five primary strategies to achieve its policy objectives: water resource management, environmental management, reporting and disclosure, plant management, and eco-friendliness.

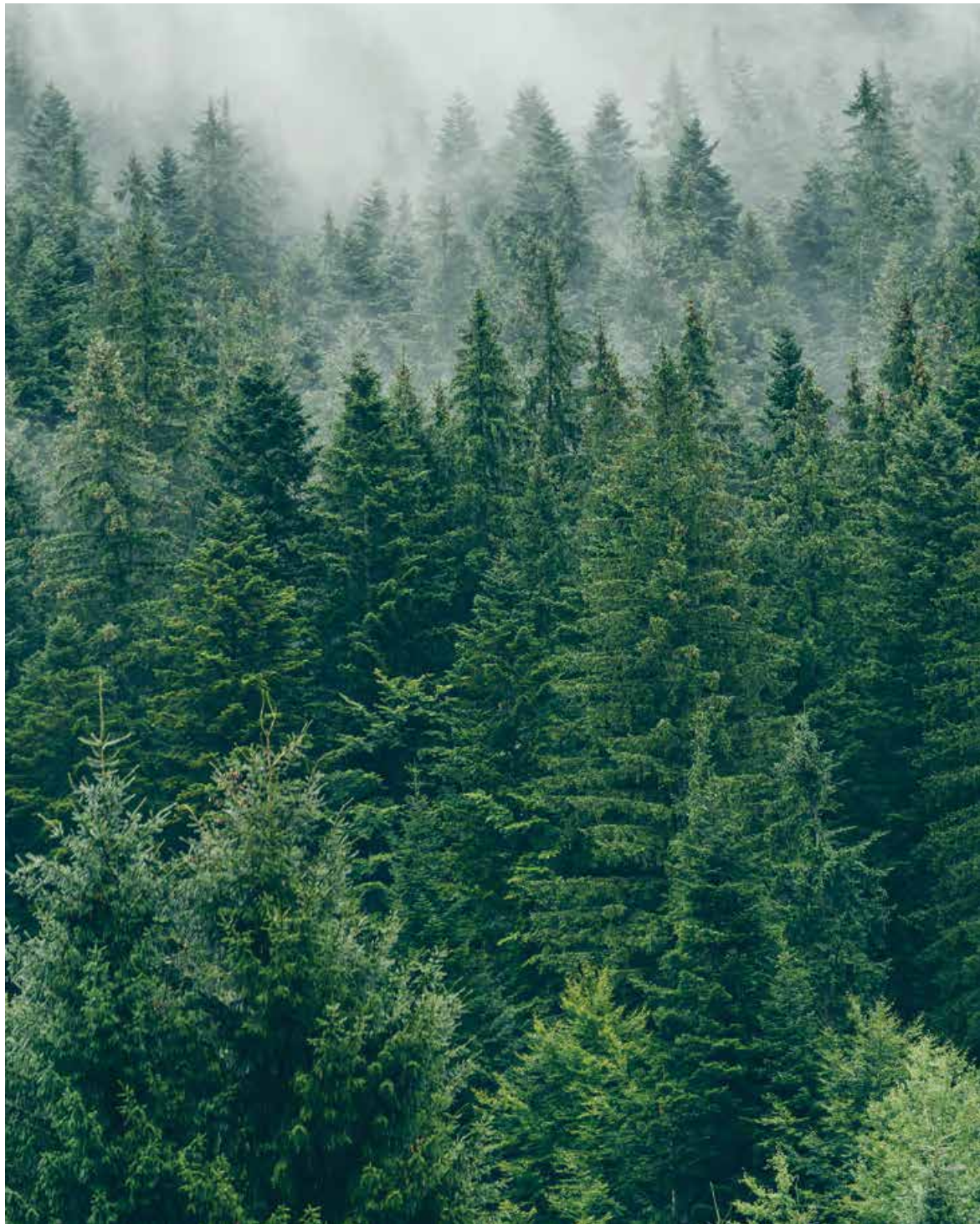
Locate	Evaluate			Assess		Preare
		Dependency	Impact	Risk	Opportunity	Strategy
Assessing the potential impact of the semiconductor industry on natural resources via ENCORE	Resource	• Tap water	• Cu • Ni • VOC • Noise	• Physical risk	• Business performance	1. Water resources management 2. Environmental management 3. Report Disclosure 4. Planting management 5. Eco-friendly
	Ecological		• Bird's investigation • Plant management	• Transition risk	• Sustainability performance	

Forest Ecology Sustainable Restoration Project at CTSP's Huwei Science Park

In alignment with the the Kunming-Montreal Global Biodiversity Framework of restoring a minimum of 30% of the terrestrial ecology and local regulations, SPIL (an ASEH subsidiary) has implemented measures to mitigate environmental impacts throughout the construction of its new facility in the Central Taiwan Science Park (CTSP) - Huwei Science Park. Inevitably, there are unavoidable environmental impacts from land use. As such, ASEH has worked with the CTSP Administration Bureau and ecological experts to adopt Huwei Science Park - park No. 5. Biodiversity restoration plans were drawn up to develop the area into a green and healthy environment for residents by planting indigenous plants. To achieve our NPI (Net Positive Impact) goals, the Huwei Science Park will be restored into a model ecological park that provides greater cultural and social value to the community, and helps mitigate the environmental impacts from the site development.

From the beginning of the project, we studied historical data on the flora and fauna, and the environmental impact assessments of the Huwei Science Park. Reconstruction of the ecological historical data was completed to provide a foundation for ecological restoration. In addition, a multi-disciplinary expert task force was formed to formulate strategic plans for the ecological restoration of the park, centered on three themes: site adjustment, reforestation, and ecological monitoring. Site adjustment involves the management of land and water resources. Reforestation refers to the creation of penetrative afforestation, environmental buffers and soundproofing forests as well as recreational corridors connected to the park. Ecological monitoring includes conducting surveys of bird and insect populations to establish an ecosystem baseline for future ecological benefit assessments, while utilizing IoT to constantly monitor microclimate fluctuations on the premises and assess the effects of the environmental enhancement measures. The ecological restoration plan has been approved by the CTSP, and the construction of the park is scheduled to commence in 2024.





5.7 Environmental Expenditures and Investments

ASEH adopted the "Industry Guidelines for Environmental Accounting" published by Environmental Protection Administration of Taiwan. We combined our existing accounting systems with environmental control coding to classify our environmental expenditures into categories in accordance with the nature of costs incurred. Our environmental expenditure is calculated and analyzed quarterly to ensure data accuracy and facilitate effective assessment.

Environmental Costs

ASEH's total environmental costs for 2023 amounted to US$ 148.9 million, with capital expenditure and expense accounting for 54.95% and 45.05% respectively.

Unit:US$ million

Category		Description	2020		2021		2022		2023	
			Capital Investments	Operating Expenses	Capital Investments	Operating Expenses	Capital Investments	Operating Expenses	Capital Investments	Operating Expenses
Operating Cost	Pollution Prevention Cost	Air, water, other pollution prevention, etc.	43.0	14.6	33.5	18.9	41.7	22	73.9	20.9
	Resource Circulation Cost	Efficient utilization of resources, waste reducing, recycling, and disposal, etc.	7.7	25.5	7.0	41.8	16.2	39.5	7.5	29.3
Upstream/Downstream Cost		Green procurement, recycling of used products, etc.	0.1	3.0	0.7	5.7	3.4	7.1	0.1	2.0
Administration Cost		Manpower engaged in environmental improvement activities and environmental education, acquisition of external environment licenses/certification, government environmental fees, etc.	0.1	10.2	0.1	11.2	0.5	11.5	0.2	11.3
Social Activity Cost		Donations to, and support for, environmental groups or activities, etc.	-	4.0	-	3.7	-	4.0	-	3.6
Environmental Remediation Cost		Fines, recovery of the environmental degradation, degradation suits, and insurance fees, etc.	-	0.01	-	0.01	-	0.0002	-	0.01[1]
Others		Global environmental conservation cost and cost to develop products to curtail environmental impact at the product manufacturing stage, etc.	-	0.04	0.01	0.04	-	0.1	-	0.03
Total			50.9	57.3	41.3	81.4	61.8	84.2	81.8	67.1

[1] We were not subjected to any major non-financial penalty or litigation that results in facility shutdown. For more details on major (greater than US$10,000) environmental-related fines or penalties, please refer to Appendix: Environmental Data- D. Environmental Violations.2023

Environmental Benefits

ASEH records environmental benefits generated from activities that reduce impacts on the environment. Our total environmental benefits for 2023 amounted to US$ 90.51 million.

Unit:US$ million

Category	Description	2020		2021		2022		2023	
		Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits	Environmental Benefits	Economic Benefits
Cost Savings	Reduction in costs due to energy saving and carbon reduction projects	787,095 MWh[1]	71.1	1,107,145 MWh[1]	62.8	938,236 MWh[1]	50.1	1,022,276 MWh[1]	60.38
	Reduction in water costs due to water saving projects	34,437,950 metric tons	11.0	37,817,390 metric tons	16.7	45,880,154 metric tons	19.3	47,214,933 metric tons	18.81
	Reduction in waste disposal costs due to waste recycling	62,043 metric tons	16.2	69,091 metric tons	18.7	52,207 metric tons	13.5	49,520 metric tons	11.32
Total		-	98.3	-	98.2	-	82.9	-	90.51

[1] The reduction in electricity by using renewable energy and purchasing I-REC is included.

Our estimated environmental capital expenditures for 2024 will be approximately US$29.4 million. The board of directors has resolved in 2023 to contribute around US$3.7 million (NT$100.0 million) through the ASE Environmental Protection and Sustainability Foundation to fund various environmental projects in 2024.

Sustainable Finance

At ASEH, sustainable financing is a strategic approach for us to advance our low carbon commitment and drive business transformation to mitigate climate change. To demonstrate our ambition, we have issued two Green Bonds since 2014 with UOP of increasing renewable energy usage, energy related technology development, increasing energy efficiency, promoting energy conservation, reducing greenhouse gas emissions, recycling and reusing waste materials, and water conservation/purification/recycling. In 2021, we structured Sustainability-Linked Loans that incorporatevariable interest rates linked to the achievement of pre-set ESG targets. This forms an additional incentive for the company to strengthen our developments in GHG emission reductions, renewable energy usage, waste processing, as well as to achieve a listing on the Dow Jones Sustainability Indices.

Going forward, we will continue to evaluate and develop meaningful green investment projects. As an early adopter of sustainable financing user in Taiwan, through our demonstration, we expect to motivate more companies touse green financial instruments as their leverage.Moreover, to lead the industry to accelerate the creation of a low-carbonsustainable development..

- **2014:** Advanced Semiconductor Engineering, Inc. issued a 3-year Green Bond with a total value of US$300 million via indirect shareholding of its subsidiary, Anstock II Limited.
- **2019:** ASEH issuedGreen Bonds with 3 (type A)and 5 year (type B) terms respectively at a total value of US$300 million.
- **2021 to present:** ASEH in contract Sustainability-linked Loans with multiple banks.

INCLUSIVE WORKPLACE

At ASEH, the concept of People-First is fundamental to our corporate philosophy of creating diversity and inclusion. The company respects the differences and values of each individual that help shape a diverse labor force, and commits to providing our employees a safe, healthy and high-quality work environment as well as protecting their human rights.

We are also committed to creating an environment for employees to achieve meaningful and valuable career developments within the organization. To that end, investing in talent management is the lynchpin of our human capital strategy to maintain a skilled and experienced workforce that fuels innovation and provides the company a leading edge.

ASEH Human Capital Development

Education
Training Effectiveness
Competency Development

Retention
Equal Respet and Communication
Safety Workplace

Recruitment
Organization Planning
Recruitment and Selection

Utilization
Career Planning
Performance Appraisals

2023 Key Performance

343 million	14,055	29%	14.8%	30,884
Employees Bonus[1] (US$)	New Hires	Percentage of Females in Management Positions	Percentage of Females in Top Management Positions	Regular Employees in Labor Unions

SDGs	Business Actions	2023 Material Aspects	KPI	2023 Target	Status	2023 Performance	2024 Target	2030 Target
4 QUALITY EDUCATION	Ensure that all employees have access to vocational training and lifelong learning opportunities	Talent Attraction and Retention	Employee Engagement Survey Coverage (%)	>85%	Achieved	95.1%	>87%	>95%
			Turnover Rate (%)	<20%	Achieved	14.2%	<20%	<20%
		Diversity and Inclusion	Female Employee in Top Management Positions (%)	13.8%	Achieved	14.8%	14.6%	>15%
		Talent Development	Management Positions through Internal Promotions (%)	>75%	Achieved	83.2%	>75%	>75%
			Rate of Open Positions Filled by Internal Candidates (%)	>50%	Achieved	73.1%	>50%	>55%
8 DECENT WORK AND ECONOMIC GROWTH	Formulate and support a comprehensive workplace safety framework to ensure decent working conditions for all employees across the industry	Occupational Health and Safety	Cases of Major Injury[2] and Occupational Disease	0	Not Achieved	Major Injury: 0 Occupational Disease: 28	0	0
			Disabling Injury Frequency Rate (FR)	<0.5	Not Achieved	0.72	<0.5	<0.5
			Disabling Injury Severity Rate (SR)	<9	Not Achieved	19.35	<9	<9
			Employee Absenteeism Rate (%)	<2.3%	Achieved	2.2%	<2.3%	<2.3%

[1] Employee Bonus includes: Monthly Incentive Bonuses + Annual Profit-sharing Bonuses
[2] The definition of major Injury: occupational fatality