2023

Climate and Environmental Report

ASE HOLDINGS

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Contents

About Our Reporting

ASEH released its Climate and Environment Report in 2024, integrating the Task Force on Climate-related Financial Disclosures (TCFD) and the Taskforce on Nature-related Financial Disclosures (TNFD). The ASEH Corporate CSR Division is in charge of data gathering, compiling and editing. This report is available in both Chinese and English, the complete document can be downloaded from our website.

https://www.aseglobal.com/download/

Reporting period

From January 1, 2023 to December 31, 2023, same as the financial annual report.

Current release version: June, 2024

Previous release version: June, 2022

Next release version: June, 2026

Scope and Boundary

This report provides climate and environment related disclosures of ASE (Advanced Semiconductor Engineering, Inc. and its subsidiaries), SPIL (Siliconware Precision Industries Co., Ltd. and its subsidiaries), and USI (USI Inc. and its subsidiaries).

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External Assurance

Climate-related content in this report has been verified by the Taiwan branch of the British Standards Institution (BSI) in accordance with the Task Force on Climate-related Financial Disclosures (TCFD) framework, to have met compliance standards, and maturity model assessments. A Conformity Statement has been included in the appendix of this report.

Letter from the Chairman

The challenges presented by climate change are matters businesses must address head-on. As a global leader in semiconductor packaging and testing, ASE Technology Holding Co., Ltd., ("the Company") recognizes the importance of collaborating across pertinent industry chains, and with various stakeholders to manage risks. The Company is vigorously advancing towards a net-zero transformation, bolstering operational resilience and adapting to change, to remain competitive and fulfill its corporate social responsibility objectives. We will address related impacts and challenges by adhering resolutely to high ESG standards and taking concrete actions to demonstrate our commitment and goals. Since 2018, we have adopted the Task Force on Climate-Related Financial Disclosures (TCFD) framework for disclosing climate-related information and releasing our first TCFD Report in 2022. In 2024, we began referencing the newly established Taskforce on Nature-related Financial Disclosures (TNFD) framework (officially launched in September 2023), as a guidance to report our findings and strategic plans concerning climate and nature-related dependencies, impacts, risks, and opportunities. Our goal is to equitably address the global trends in climate change and biodiversity losses, underscoring our dedication to mitigating climate change and nature-related challenges.

This report provides a comprehensive overview of the Company's Governance, Strategy, Risk Management, and Metrics and Targets in addressing nature and climate-related issues. We have established a high-level management team that includes the Sustainable Management Committee and the Risk Management Committee, to oversee climate and nature-related governance. The Company's Board of Directors conducts quarterly reviews of the overall corporate strategy and objectives, guiding each subsidiary to achieve them with the right balance of flexibility, operational growth and sustainability goals.

ASEH has consistently achieved top rankings on the Dow Jones Sustainability Indices (DJSI) in the "Semiconductor and Semiconductor Equipment Industry" sector for eight consecutive years since 2016. In 2023, the company earned a CDP double A rating for its efforts in climate change and water security, as well as the prestigious Taiwan Corporate Sustainability Award. In the same year, ASE's bumping facility in Kaohsiung was also inducted into the World Economic Forum Global Lighthouse Network (WEF GLN), a community of manufacturing sites and value chains that are leaders in the adoption of Fourth Industrial Revolution (4IR) cutting edge technologies. The international and domestic recognitions are powerful affirmations for the ASEH team's sustainability achievements and Net Zero pathway, and help to further embed sustainability across the workplace and our supply chain. Moving forward, we remain committed to advancing our ESG vision, encompassing initiatives such as greenhouse gas emissions reduction, renewable energy utilization, energy conservation and transformation, and the progression towards a circular economy. Concurrently, we strive to strengthen our core competitiveness through innovative thinking.

We are proactively engaged in the SBTi Net Zero initiative, implementing internal carbon pricing and adopting five comprehensive action plans: carbon credits, renewable energy, low-carbon logistics, low-carbon products, and supply chain engagement. As part of our concerted effort toward a low-carbon energy transition, we established a renewable energy platform in 2021 to streamline renewable energy procurement across all subsidiaries, and devise long-term procurement strategies in alignment with the open energy market in the regions where we operate. In addition to transitioning key manufacturing sites to renewable energy sources, we have set an ambitious goal to utilize at least 1.5 billion kilowatt-hours of renewable energy annually starting from 2030. This consumption level will be progressively increased each year. We will be strategically leveraging heterogeneous integration technologies and other smart manufacturing processes to shorten the distance between chips, resulting in a reduction in power usage and signal transmission latency, and thus enabling chips to operate with less power, increased efficiency and improved functionality. These advancements are in line with our net zero targets through green innovation and energy conservation.

Supply chain collaboration is a crucial extension of our commercial value chain as we strive to achieve net zero emissions. While we continue our ongoing efforts to support and guide suppliers in conducting carbon inventories, we are also actively partnering with the supply chain to address carbon emission reduction plans. In 2023, "Collaborating with the Supply Chain - Towards Net Zero, Creating Value Together" was the central theme for the Supplier Sustainability Awards. We brought our supply chain partners together to commit to reducing carbon emissions by 20% by 2030, with the ultimate aim of reaching net zero emissions by 2050. We will work closely with our partners to continuously review and stay on track to achieve our goals, thereby strengthening the overall competitive advantage of the industry chain.

ASEH is fully committed to 'creating social value through a culture of innovation and green transformation'. Our actions demonstrate our commitment to fulfill our roles as corporate citizens building a better future. More importantly, we strictly comply with both domestic and international net zero standards to meet our customers' need for low-carbon products. Our goal is to enhance the well-being and quality of smart living for humanity while prioritizing environmental sustainability in line with our corporate sustainability principles.

Climate Leadership Awards and Recognition

8 consecutive years
CDP Climate Change A Leadership Rating
Climate Change Leadership

4 consecutive years
CDP Water Security A List
Water Security A List

5 consecutive years
CDP Supplier Engagement Rating leaderboard
SER Leaderboard

Science-based targets validated by SBTi[1]
SBTi

4 consecutive years
Received Taiwan Corporate Sustainability Awards Executive Committee (TCSA) “Leadership” Award for four consecutive years
Climate Leader

100% Greenhouse gas inventory

100% Identification and assessment of climate and natural risks

48% Percentage of facilities that have achieved RE100

60% Internal carbon pricing implementation

46% Conducting product life cycle assessment (LCA)[2]

1. The recent (2030) emissions reduction target of ASEH has been approved by SBTi, while the long-term (2050) net-zero target is currently under SBTi review.
2. The coverage rate of product life cycle assessment (LCA) is calculated based on revenue. Others are calculated based on the quantity executed at the plant level.

01

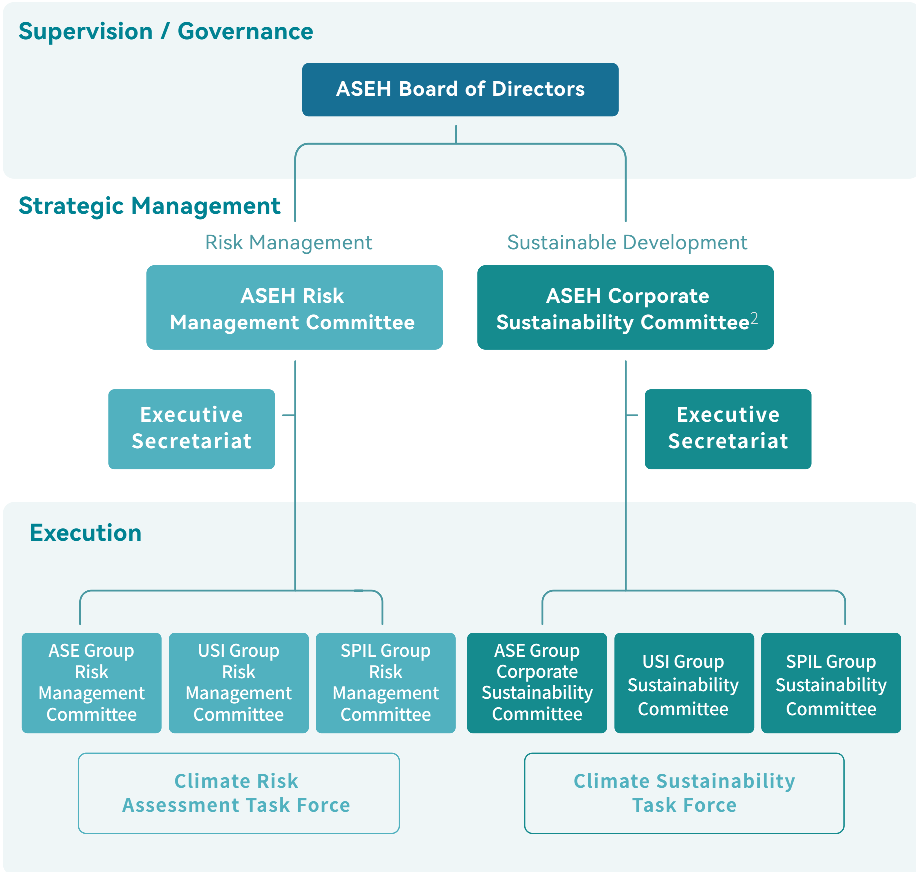
Accountability and Responsibility

1-1 Accountability and Responsibility
Climate and Natural Resource Governance and Management

Supervision at Management Level

To strengthen governance and respond to the impacts of climate change, ASEH adopted a top down, bottom up management approach. The Board of Directors has direct oversight on climate-related issues while at the execution level, the Corporate Sustainability Committee (CSC) manages sustainability issues related to climate and nature, while the Risk Management Committee (RMC) addresses corresponding risks. The ASEH CSC executive secretariat coordinates with the respective CSC and the RMC branches of the three subsidiaries[1] to identify climate and nature-related issues and propose corresponding actions in line with the company's policy and sustainability goals. The RMC consists of two independent board directors and the Chief Risk Officer, with an independent director serving as the Chairman of the RMC. The CSC consists of four board directors and the Board Chairman serving as the Chairman of the CSC. The committees report regularly to the Board to ensure that board members are aware of the impacts, and associated risks of climate change and nature-related issues on the Company's operations, as well as response strategies. To that end, the Board of Directors and the top management can effectively incorporate climate and nature-related risks and opportunity factors into the decision-making process, as well as evaluate the overall financial impact across the business operation.

The ASEH Corporate CSR Division serves as the executive secretariat of the CSC, and helps integrate the resources and expertise of all three subsidiaries to formulate vertical and horizontal climate and nature-related strategies. Within each subsidiary (ASE, SPIL and USI), a CSC with multiple taskforces is established. Each taskforce is headed by a senior executive, and is responsible for conducting meetings to discuss and present performance and results annually, as well as to review the progress of various short, medium and long-term sustainability objectives. Additionally, the ASEH CAO Office serves as the executive secretariat of the RMC, and helps to coordinate the climate and nature risk assessments provided by the RMCs of each subsidiary, and prepares the reports accordingly.



1. The three subsidiaries are Advanced Semiconductor Engineering, Inc. (ASE), Siliconware Precision Industries Co., Ltd. (SPIL), and USI Inc. (USI) and its subsidiaries.
2. The ASEH Corporate Sustainability Committee is comprised entirely of board members.

High-Level Assessment and Management

The CSC assigned ASEH's Chief Sustainability Officer as the supervisor of matters related to the company's overall climate and environmental risks and opportunities. The CSO concurrently serves as a member of the Risk Management Committee and ASEH's Chief Risk Officer. He is responsible for regularly reviewing and adjusting the company's internal sustainability promotion strategies and policies, monitoring changes in the external environment, and coordinating initiatives related to the managing of renewable energy, carbon risk and opportunity, water risk and opportunity, natural ecology and biodiversity issues. The progress and goal achievements are reported annually[1] to the CSC, RMC and the Board of Directors, demonstrating effective integration of ASEH and its subsidiaries' environmental (E), social (S), and governance (G) risk management.

Incentives and Performance Management System

The Company has established compensation policies for the board of directors and senior management to support sustainable business strategies. The Compensation Committee regularly evaluates the compensation of directors and executives based on the assessment of corporate governance trends and competitive market data pertaining to board and executive compensation. Compensation is determined not only by the individual executive's management performance, but also by the overall financial performance and other financial-related indicators[2] of the company. We also engage external compensation consultants to provide independent, objective, and professional advice based on global research data to assist the Compensation Committee in developing and managing compensation plans.

The company has issued restricted stock awards as variable compensation for senior management. Targets for measurement include company's 2022 to 2024 financial indicators (consolidated revenues, consolidated gross profit and margin, consolidated operating profit and margin) as well as environmental, social and governance performance indicators, including greenhouse gas emission intensity and water withdrawal intensity[3] . Restricted stocks are approved and issued to executives[4] after third party verification of target achievements in alignment with the company's business and sustainability goals. The regular shareholders' meeting has approved the issuance of new restricted stock awards in June 2024. In addition, each subsidiary sets their own detailed targets based on the management indicators of ASEH, and incorporates achievement rates into performance evaluations. They may also organize internal and external competitions related to carbon reduction, water conservation, and other relevant areas, rewarding teams or individual employee who excel in these competitions.

1. Climate reporting is conducted on a quarterly basis to the CSC, RMC and the Board of Directors. Nature-related issues are reported on an annual basis to the CSC and the RMC.
2. Other financial-related indicators include business growth rate, etc.
3. Setting a continuous reduction target of 1% per year in intensity compared to the baseline year of 2015.
4. Regular (full-time) employees of the Company, or a company controlled by the Company that is not listed domestically or abroad or an affiliate, who are already employed on the date that the restricted stock awards are awarded and meet certain performance requirements shall be eligible to participate in the restricted stock awards plan. The stock awards will only be available to employees who are: (a) highly related to the Company's future strategy and development, (b) critical to the Company's business operation or (c) key technical talent. The current issue is gratuitous. The total amount of issuance is NT$150 million.

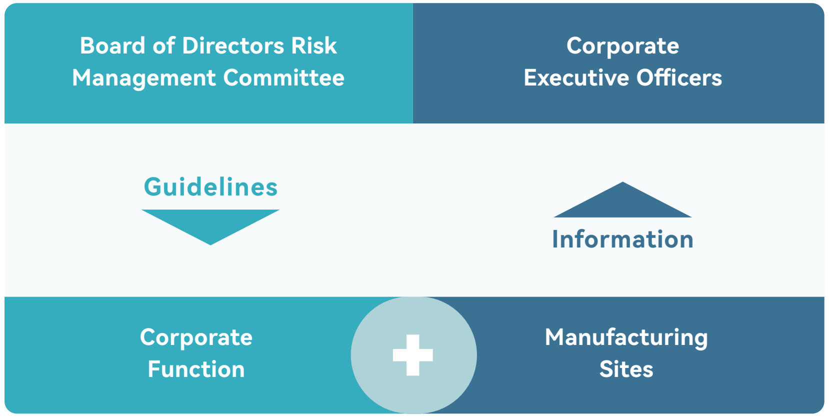
1-2 Accountability and Responsibility
Risk and Opportunity Management

Risk Management Organization Overview

The ASEH "Risk Management Policies and Procedures" was adopted by the Board of Directors in 2020, as the ultimate guiding principle for risk management. The management of climate, water, forest, and biodiversity-related risks is integrated and conducted in accordance with the guiding spirit and principles of the policies and procedures. Risk management is an integral part of corporate management at ASEH, and is therefore firmly embedded into the company's business strategies and organizational culture. We conduct risk assessments on an annual basis, and formulate specific plans for major risks, covering management goals, organizational structures and division of authority and responsibilities, and risk management procedures. Consequently, we will be better prepared to identify, examine, monitor and control various risk exposures effectively and control risks that arise from the company's business activities within an acceptable range.

ASEH manages risks through designated departments and functional units ("risk functions") across all of our organizations and adopts a top-down bottom-up approach to enterprise risk management. Every year, regular risk identification meetings are conducted by the senior management and identified risks are further assessed from the bottom-up through the Enterprise Risk Management mechanisms (ERM) of ASEH and its subsidiaries. The process involves various departments within the organization taking stock of different risk scenarios to identify risks and opportunities that may impact business objectives. For significant risks and opportunities, further risk mitigation plans and management practices are developed to reduce related risks and pursue opportunities, thereby enhancing overall decision-making control within the organization. Timely reports on the response plans and status to the senior management provide an indepth understanding of the impact of climate change, natural environmental issues, and biodiversity on the business operations, as well as the risks and response strategies involved. The top-down, bottom-up approach strengthens the link between senior executives and various departments. We have thus established a strong mechanism for the prevention, early warning, emergency response, crisis management, and a comprehensive business continuity plan that help the company mitigate, transfer or avoid risks. The robustness of ASEH's risk management organization has effectively kept the respective climate, nature and biodiversity risk scenarios under control.

Rick Management Organization Overview



1. This table includes an overall description of the risks, risk characteristics (scenarios and impacts), and existing risk management activities (including mitigation strategies/control measures).
2. The risk level is determined by the frequency of occurrence and severity of the impact.

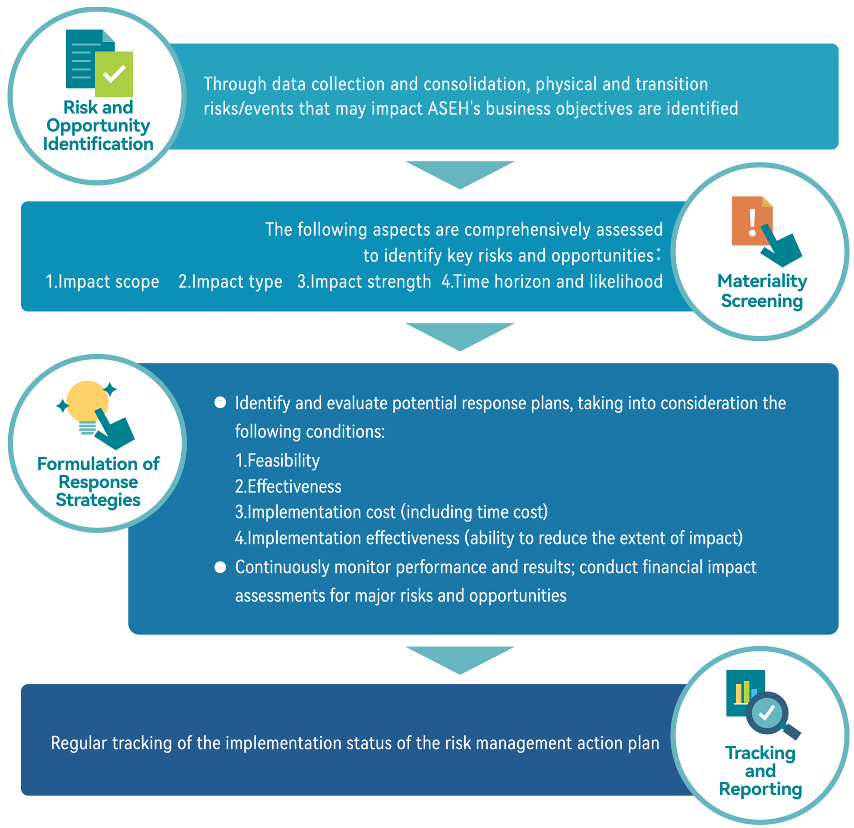
Integrated Risk Management Process

Climate and nature risks are managed by the secretariat of the RMC whose role is to coordinate the implementation of climate and natural risk assessments by the RMC branches of each subsidiary. Data collection, dependency/impact/risk/opportunity identification and materiality analysis, financial impact assessment, development of response strategies, establishment and tracking of management indicators and goals are steps taken towards achieving total control of climate and nature risks and opportunities.

In regard to the physical risks, dependencies and impacts relating to climate and nature, ASEH employs data gathered from government and international databases according to the geographical locations of its global manufacturing sites. These include datasets such as flood risk data from Taiwan Water Resources Agency, MOEA, the Aqueduct Water Risk Atlas developed by the World Resources Institute (WRI), the World Database on Protected Areas (WDPA) developed by the International Union for Conservation of Nature (IUCN), and biodiversity mapping data in Taiwan (including natural reserves under the Cultural Heritage Preservation Act, national parks under the National Park Law, nature reserves under the Forestry Act, important wetlands under the Wetland Conservation Act, wildlife protection areas under the Wildlife Conservation Act, coastal protection areas under the Coastal Zone Management Act, and the non-regulated Taiwan Ecological Network Conservation Axis). These databases help identify the different scenarios of climate-related physical risks (such as water stress, flooding, landslides, and debris flows) that manufacturing sites may face, and determine whether the sites are located near sensitive biodiversity areas. The information then serves as the basis for subsequent risk and opportunity analysis and strategy formulation.

In accordance with the timing of potential climate change risks and opportunities and the existing target management schedules, we define short-term as within 3 years, medium-term as 4-5 years, and long-term as more than 6 years. The scope of identification includes self-owned operations, upstream and downstream boundaries of the value chain.

Risk Management Process



Regarding climate change and water issues, we explore both physical and transition risks, including immediate and long-term physical factors, regulations, litigation, technology, market, and reputational factors. We also analyze the resource efficiency, energy sources, products and services, market and resilience of the opportunities one by one, in order to classify each risk according to its impact range, type, intensity, time of occurrence and probability. We will subsequently rank[1] the risks and opportunities according to the severity of impact and probability of occurrence, effectively classifying all exposures to climate risks and opportunities affecting ASEH's business operations.

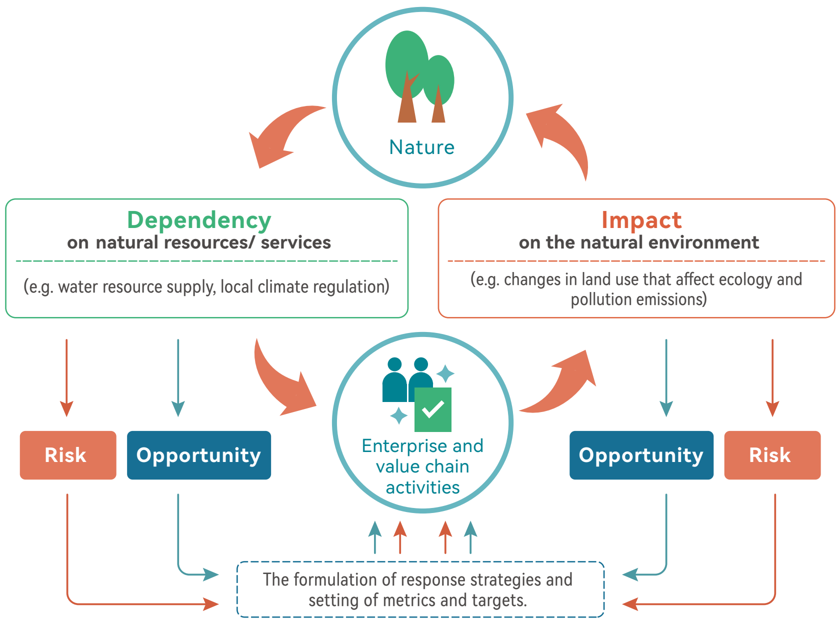
Identification of Climate Risks and Opportunities

Risk	
Physical risks	• Acute Risk [2] • Chronic Risk [3]
Transition risks	• Policy risks • Legal risks • Technology Risk • Market risks • Reputational risks

Opportunity	
Resource efficiency	• Transportation modes • Recycled materials • Water resource utilization • Production processes • Energy-efficient buildings
Energy source	• Low-carbon energy • Adoption of new technology • Regional microgrid • Policy incentives • Participation in the carbon market
Products and services	• Low-carbon products • Adjustments and solutions • Customer behavior transformation • Research and development innovation • Diversification of operations
Markets	• Finding new business opportunities • Participation in building public infrastructure • Obtaining government cooperation • Expansion of funding sources
Resilience	• Participation in renewable energy projects • Alternative or diversifying resources • Energy efficiency improvements

We have adopted the TNFD-LEAP guidance for nature-related issues. The steps involved using data collected to locate the interface between our subsidiaries' global locations with biodiversity-sensitive areas (Locate). Next, we evaluate the dependencies and impacts of our subsidiaries' operational activities on nature (Evaluate) and, analyze corresponding risks and opportunities based on dependencies and impact pathways. Key risks and opportunities are properly assessed (Assess) and response strategies, monitoring indicators and management objectives are devised for priority risks and opportunities. Lastly, we continuously improve on our preparation to respond to nature-related risks and opportunities, and to publicly report on the company's material nature-related issues (Prepare).

Dependency, impact, risk, opportunity pathway



1. The impact strength which has the following five levels "minor, low, medium, high, and catastrophic" is divided into the following 8 levels on likelihood "<5% will happen, <10% will happen, <33% will happen, 33-50% will happen, >50% will happen, >66% will happen, >90% will happen, and >99% will happen". Scores are given from minor to catastrophic, with impact strength ranking from 1 to 5 and likelihood ranking from 1 to 8. The ranking of the significance of each risk and opportunity is based on the top three scores obtained by multiplying the scores on impact strength and the likelihood, arranging in order.
2. Immediate risk: e.g., Extreme weather events (tropical cyclones, heavy rainfall, and droughts, etc.)
3. Long-term risks: e.g., Changes in average temperature or rainfall, as well as uncertainty in physical risks, etc.

Material Climate and Water related Risks and Opportunities

According to the results of risk identification and weighted calculations in 2023, renewable energy regulations emerged as the most significant climate risk, followed by uncertainties of new regulations and fuel or energy taxes. Conversely, notable climate-related opportunities include alternative or diversified resources, transportation modes, adaptations and solutions. In addressing water-related challenges, significant risks were identified in water control regulations, mandatory water efficiency, conservation, recycling or process standards, as well as low-impact technologies and products. Among these, wastewater recycling stands out as the most significant opportunity for our facilities, and other important opportunities for development lie in areas such as green buildings and regulatory resilience.

Risk			Time scale	Scenario description	Position in the value chain where the risk occurs	Potential impact on finances	Explanation on potential impact	Management approaches
Climate change	1	Renewable energy regulations	Short term	International and domestic regulations on renewable energy may affect current and future energy sources, composition, and prices, etc.	• Directly operated by the company • Upstream or supply chain • Downstream or end-user	• Increased direct costs • Rising energy prices	1. According to regulations, users whose electricity consumption exceeds a certain threshold must build green power capacity through various means .[1] 2. Renewable energy prices and demand markets are experiencing continued growth in the short to medium term, and this upward trend may persist until renewable energy capacity can adequately meet market demand.	1. Continue to monitor regulatory developments. 2. Actively purchase renewable energy: Our Taiwan facilities have achieved the management target for large electricity users through the purchase of renewable energy capacity, while our overseas facilities are also purchasing renewable energy certificates. 3. Mandate the implementation of the ISO 50001 energy management system across our subsidiaries to continually improve energy efficiency and reduce energy dependence.
Climate change	2	Uncertainty over new regulations	Medium term	New legislation on greenhouse gas control, and climate change mitigation and adaptation will soon be enacted at both international and domestic levels, although they are still in the discussion stage.	• Directly operated by the company	• Increased direct costs • Increased R&D costs • Increased capital expenditures	1. Currently, countries across the globe are regulating greenhouse gases through various means, such as conducting greenhouse gas inventory and imposing carbon tariffs and fees, which might lead to an increase in operating costs. 2. To ensure compliance with regulations, customer requirements or voluntary initiatives, we must implement carbon reduction projects, increase costs or expenses	1. Adjust relevant practices promptly in response to regulatory changes. 2. Provide guidance on greenhouse gases and conduct greenhouse gas inventories for all subsidiaries, establish a platform for exchanging technologies, set GHGs[2] limits, and regularly review their carbon reduction performance. 3. Set short-, medium-, and long-term net-zero targets. Develop five net-zero approaches: prioritize the use of low-carbon products, initiate action plans that link investments in carbon credits, renewable energy, low-carbon transportation, and supplier engagement.
Climate change	3	Fuel tax/ energy tax	Medium term	Governments are enacting regulations on fuel or energy taxation and control at both international and domestic levels.	• Directly operated by the company	• Increased indirect costs • Rising energy prices	1. Energy system transformation, transitioning away from fossil fuels and phasing out inefficient fossil fuel subsidies are key global development trends. 2. In the future, companies may not only face mandates from laws and regulations to boost renewable energy utilization, but there is also a likelihood of reducing the share of fossil fuel in energy consumption, through measures such as hiking fuel taxes or imposing energy taxes, ultimately leading to increased energy costs.	1. Remain attentive to the global trends of limiting the utilization of fossil fuels. 2. Initiate a review of fossil fuels and renewable energy sources within our subsidiaries, and strategize for the utilization of renewable energy sources.

1. The obligation of users whose electricity consumption exceeds a certain capacity threshold including installing renewable energy power generation equipment or energy storage equipment, or purchasing a designated capacity of renewable energy power and certificates. Users who fail to comply with the regulations are required to pay monetary substitution.
2. Greenhouse Gases, GHGs

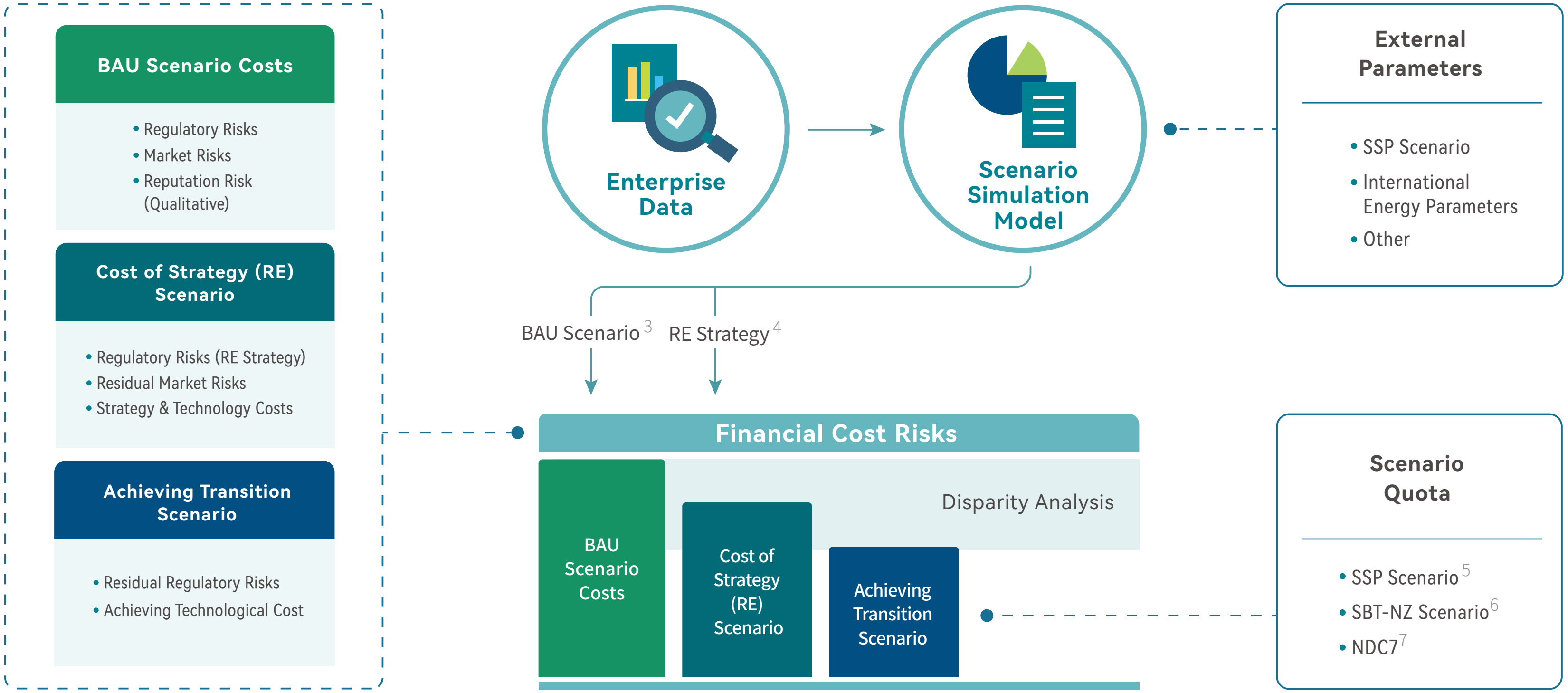
Opportunity		Time scale	Scenario description	Position in the value chain where the Opportunity occurs	Potential impact on finaness	Explanation on potential impact	Management approaches
Climate change	1 Alternative or diversified resources	Long term	Improve the robustness of the supply chain under different conditions.	• Directly operated by the company • Upstream or supply chain	• Stable supply chains • Value chain collaboration • Climate change adaptation	Epidemics and extreme weather events heightened the probability of supply chain disruptions (including but not limited to material shortages, transportation constraints, etc.).	1. Expand sources of material supply and develop alternative materials. 2. Foster value chain collaboration and offer guidance to suppliers on establishing climate change adaptation and response mechanisms to bolster supply chain resilience. 3. Develop supply chains capable of producing low-carbon products.
Climate change	2 Mode of transportation	Long term	Routes and operations are being optimized by adopting highly efficient transportation methods or using high-efficiency or low-emission modes of transportation or vehicles.	• Directly operated by the company	• Reduced fuel costs • Increased capital expenditures • Reduced cost of carbon pricing	Replacing high-emission equipment requires increased capital expenditure, but can reduce fuel expenditure and lower carbon emission costs.	1. Replace high-emission vehicles with low-emission alternatives on an annual basis. 2. Develop regional supply chains and design optimized transportation routes to achieve low-carbon transportation and reduced carbon costs. 3. Initiate value chain collaboration, encourage suppliers to invest in technological innovations, automation and low-carbon vehicles.
Climate change	3 Adaptations and solutions	Medium term	The introduction of new products or services can help lower or facilitate adaptations to the global impacts of climate change risks.	• Directly operated by the company • Upstream or supply chain • Downstream or end-user	• Climate change adaptation • Increased R&D costs • Improved competitiveness	Investing in the development of green products, services or technologies may incur higher R&D costs, but it can bolster the resilience and competitiveness of the company's operations in response to climate change.	1. Foster value chain collaboration and promote green product management, invest in R&D and manufacturing of low-carbon products and technologies, while introducing resource recycling and material flow management mechanisms. 2. Allocate funds towards actively developing and optimizing process technologies to penetrate and expand within the low-carbon market.

Risk		Time scale	Scenario description	Position in the value chain where the risk occurs	Potential impact on finaness	Explanation on potential impact	Management approaches
Water	1 Water control regulations	Medium term	Governments are enacting water-related regulations to reduce water consumption, minimize pollution or bolster water reuse and recycling.	• Directly operated by the company	• Increased indirect costs • Increased capital expenditures • Lawsuits or fines	To increase water recycling rates and reduce effluent discharge, it may be necessary to construct new water treatment systems or modify and expand existing ones to increase the recycling rate of water from manufacturing processes. Failure to comply with regulatory requirements could result in fines or lawsuits.	1. Maintain vigilance over regulatory developments. 2. Ensure our subsidiaries incorporate water efficiency management systems (ISO 46001) and establish water resource management targets. 3. Initiate and implement water conservation and wastewater recycling programs, and conduct regular program reviews to continually enhance water efficiency. 4. Install water pollution control equipment and effluent quality monitoring and reporting systems to ensure compliance with pertinent laws and regulations.
	2 Mandatory water efficiency, conservation, recycling or process standards	Short term	Mandatory standards are being developed or updated at both international and domestic levels, to enhance water efficiency, water conservation, and recycling in manufacturing processes.	• Directly operated by the company	• Increased indirect costs • Increased capital expenditures • Lawsuits or fines	To comply with mandatory standards for water efficiency, water conservation, recycling or process, it may be necessary to construct new water treatment systems or modify and expand existing ones to increase the recycling rate of water from manufacturing processes. Failure to comply with regulatory requirements could result in fines or lawsuits.	1. Ensure our subsidiaries incorporate water efficiency management systems (ISO 46001) and establish water resource management targets. 2. Develop and introduce low-water consumption and low-impact manufacturing processes, technologies and materials; as well as continuously enhance the efficiency of water resources utilization. 3. Align the performance management incentive mechanism for top-level executives with water conservation targets and incorporate water safety considerations into the company's decision-making and corporate culture.
	3 Low-impact technologies and products	Medium term	Water-related issues has necessitated investments in new technologies focusing on water efficiency and development of products with low water intensity to prevent market share erosion.	• Directly operated by the company • Upstream or supply chain • Downstream or end-user	• Increased R&D costs • Increased capital expenditures • Improved competitiveness	To align with market needs, it is necessary to invest in new technologies, or enhance R&D capabilities to develop low-water consumption products, and extend coverage to include manufacturing processes, equipment to materials used. This may require replacing equipment, increasing R&D resource allocation, or collaborating with suppliers and academic research institutions, all of which incur costs. Successful development of such products could inject growth momentum into the company operations and boost industry competitiveness.	1. Expand low-carbon products by investing in technology that considers the complete life cycle of products and services, continue to expand the coverage of the ISO 14067 product carbon footprint inventory, analyze carbon reduction hotspots, and initiate carbon reduction actions. 2. Develop low-carbon products and services in tandem with investment in carbon credits, renewable energy, low-carbon transportation, and value chain collaboration.

Opportunity		Time scale	Scenario description	Position in the value chain where the Opportunity occurs	Potential impact on finances	Explanation on potential impact	Management approaches
Water	1 Water efficiency - Wastewater recycling	Short term	Water from manufacturing processes or domestic wastewater is being recycled and reused.	• Directly operated by the company	• Climate change adaptation • Reduced operating costs • Enhanced brand value	Improving process and domestic wastewater recycling rates can help the company to mitigate the impact of climate change phenomena such as water shortages, droughts, etc. on our production capacity and operations. It also enhances our ability to manage droughts and allocate water resources efficiently. Additionally, it lowers the amount of water withdrawn and discharged, reduces resources usage and the cost of wastewater treatment.	1. Mandate that each facility continuously implement process wastewater and water recycling projects to reduce raw water usage, improve water resource efficiency, enhance drought resilience, and lower adaptation costs. 2. Introduce water recycling technologies alongside environmental education to solidify the foundation of sustainability education and enhance social capital. 3. Explore and develop other potential sources of recycled water.
	2 Water efficiency - Green buildings	Medium term	Enhancing water efficiency in existing buildings, while incorporating water conservation concepts into the design of new operating locations or facilities.	• Directly operated by the company	• Climate change adaptation • Reduced operating costs • Enhanced brand value	Upgrading the capacity of water treatment systems in existing manufacturing plants is essential to meeting water conservation targets. New manufacturing facilities can evaluate the incorporation of green building designs that reduce the water intake and drainage, while improving water efficiency and resilience to droughts.	1. Optimize water treatment systems and equipment to increase process wastewater recycling rates, reduce the use of raw water, and enhance water resource efficiency. 2. Incorporate green building requirements into factory construction assessments to build green factories that conserve energy and water, reduce consumption, enhance the efficiency of water resource utilization and obtain the relevant certifications when necessary.
	3 Resilience - Regulatory resilience	Medium term	Resilience to regulatory changes in the future is being enhanced.	• Directly operated by the Company • Upstream or supply chain • Downstream or end-user	• Climate change adaptation • Improved competitiveness Seized • Investment opportunities	Continuous monitoring of development trends concerning regulations as well as international initiatives allow for advance planning to respond to regulations and customer requirements. This will increase our competitiveness, and create revenue and investment opportunities.	1. Remain attentive to legislative trends in the European Union and other developed countries. 2. Adopt water resource management measures that exceeds current legal requirements, and bolster resilience and the ability to adapt to future regulatory changes, ensuring faster and more resource-efficient compliance to gain a competitive edge.

Analysis of Climate Transition Risks and Financial Impacts

ASEH divides its operational boundaries into Taiwan and overseas plants, and assesses climate transition risks associated with policy and legal, market, technology, and reputation. Applying the transition scenario requirements of the International Financial Reporting Standards (IFRS) S2, whereby business continues to grow[1] , the financial impact[6] of BAU (Business As Usual) and RE100 strategies under different scenarios of well-below 2℃ and even 1.5℃ pathways, as well as the management costs of meeting external pressures are evaluated accordingly. Additionally, ASEH conducts potential financial estimations[2] for strategies that have been implemented or are to be implemented, and compares the discrepancies between the two.



1. ASEH's Taiwan plants have simulated the average growth rate of electricity consumption over the past four years (8%) to estimate GHG emissions. And suppose the average electricity consumption growth rate for overseas facilities is 0%.
2. Reference parameters include: Intergovernmental Panel on Climate Change (IPCC) AR6-SSP scenarios, internationally credible reports including IRENA, IEA, publicly available climate policies from various governments; parameters cited also those from the Energy Administration, Taipower energy parameters, as well as self-defined parameters including basic emission parameters,existing and long-term mitigation transition strategies.
3. BAU Scenario: No GHG reduction requirements have been implemented. Taiwan: Using the 2050 Net-zero path as the electricity carbon emission coefficient. Overseas: Using the SSP2-4.5 as the electricity carbon emission coefficient.
4. RE strategy: Scenarios for ASEH's planning to purchase renewable energy, Specifically, the targets of Taiwan facilities are to achieve RE25 by 2025, RE42 by 2030, RE72 by 2040, and ultimately achieve RE100 by 2050. The overseas targets are to achieve RE66 by 2025, RE71 by 2030, RE89 by 2040, and achieve RE100 by 2050.
5. SSP Scenario: Shared Socioeconomic Pathways (SSPs) are various alternative models of socioeconomic development.
6. SBT-NZ Scenario: In response to the 1.5 ℃ low-carbon transition scenario, the most stringent carbon tax requirements and short-term carbon reduction targets are implemented, with reference to the current SBTi to achieve the 1.5° C pathway.
7. The Nationally Determined Contribution (NDC) is a plan proposed by governments to collectively reduce and manage GHG emissions and address global climate change.

Assessment Framework for the Climate-Related Transition Risks of ASE Holdings

Transition Scenario	Financial Calculation	
	Financial Impact Prior to Taking Action	Management Cost After Taking Action
BAU RE100	• Regulations (Carbon tax/fee) • Market risks	• Additional costs of green energy [1] • Cost of beyond value chain mitigation (BVCM)[2]

Regulatory Risks	Financial Factors	Cost Category
Carbon tax/fee	• Carbon fee:US$10/t$CO_2$e • SBT(NZ)_SSP1-1.9 carbon price: Approximately US$651/t$CO_2$e by 2050.	Operating costs
Cost of procuring renewable energy	• Solar photovoltaics:0.048-0.176 US$/kWh • Offshore wind power:0.075-0.163 US$/kWh • Onshore wind power:0.033-0.147 US$/kWh	Operating costs
Carbon removal cost	Conservative use of direct air capture technology:85-345 US$/t$CO_2$e • Technical immaturity:340 US$/t$CO_2$e • Average price:235 US$/tCO_2e • Technical maturity:130 US$/t$CO_2$e	

1. Subtract the cost of gray energy from the cost of green energy.
2. Companies can mitigate carbon emissions by reducing the costs of actions outside the value chain, which include supporting carbon reduction and removal technologies within the value chain, as well as purchasing carbon offsets.

(I) Analysis of transition risks under the BAU scenario

Results from the assumption of a BAU scenario at ASEH demonstrated that under the Nationally Determined Contributions (NDC) of local governments , the financial impact of regulatory requirements on our Taiwan and overseas facilities is less than 0.1% of revenue. Furthermore, with the relatively stable electricity consumption of overseas factories, and the global increase in the use of renewable energy, the carbon emission coefficient of power generation has gradually decreased. Consequently, if no action is taken, the impact of carbon taxes on overseas sites will continue to decrease.

BAU		Regulatory Risk-Derived Carbon Tax/Fee cost[1] (US$ million)	Financial Impact Level[2]
Taiwan	2030	24.37	Low
	2040	27.36	Low
	2050	26.40	Low
Overseas	2030	3.72	Low
	2040	3.10	Low
	2050	2.45	Low

(II) Analysis of transition risks associated with the RE 100 scenario

ASEH is actively promoting the transition to low-carbon energy. As renewable energy markets gradually open up in various countries, plans are being made to increase the proportion of renewable energy usage at each site. Compared to the BAU strategy, the impact of future carbon taxes or carbon fees is significantly reduced under the RE 100 strategy.

RE 100		Regulatory Risk-Derived Carbon Tax/Fee cost[1] (US$ million)	Financial Impact Level[2]
Taiwan	2030	14.47	Low
	2040	8.11	Low
	2050	0.43	Low
Overseas	2030	1.23	Low
	2040	0.47	Low
	2050	0.12	Low

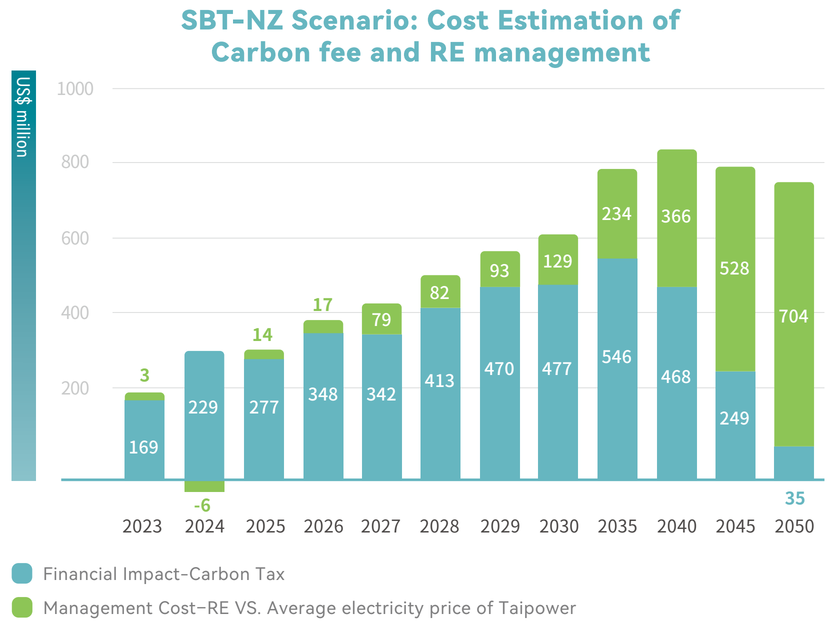
1. The Carbon Tax/Fee Parameters: 10 US$/t$CO_2$e
2. Financial Impact Level: The financial impact level is divided into five levels, Level 1 (Low) indicates an impact of less than 0.1% of annual revenue; Level 2 (Medium-low) indicates an impact of 0.1-1% of annual revenue; Level 3 (Medium) indicates an impact of 1-5% of annual revenue; Level 4 (Medium-high) indicates an impact of 5-10% of annual revenue, and Level 5 (High) indicates a significant impact of more than 10% of annual revenue.

(III) Analysis of market risks with the global net zero transition

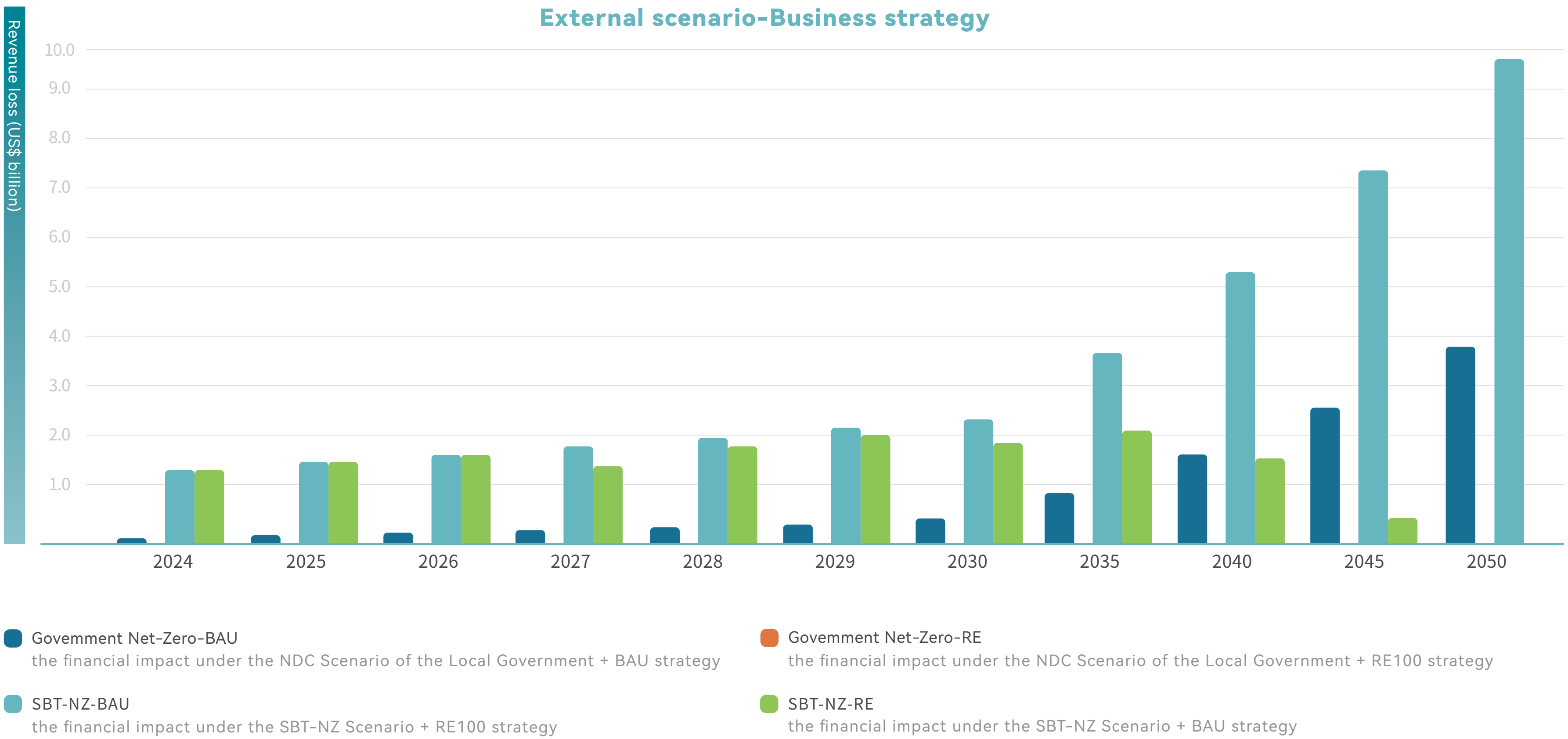
Within the global context of achieving net-zero emissions, it is important to analyze the potential financial impact that ASEH may face between 2030-2040. There are moderate risks, assuming BAU and RE100, as the carbon emission coefficient of power is expected to decrease in accordance with governments energy transition strategies. Consequently, the carbon fee or carbon tax costs incurred by the factories will also decrease. Further analysis shows that under the SBT-NZ scenario for ASEH, the main management costs come from carbon fees/taxes. After 2040, as the proportion of renewable energy usage increases, our main costs will come from the procurement of renewable energy, while the remaining carbon fee/tax costs will primarily come from the carbon fees/taxes generated by remaining Scope 1 emissions.

Analysis results revealed two types of financial impacts in different scenarios, namely the NDC scenario of the local governments and the more stringent global net-zero (SBT-NZ) scenario. In comparison to the BAU strategy, the RE100 strategy presents a lower financial impact risk. ASEH has formulated distinct short/medium/long-term targets for the use of renewable energy, with the goal of increasing the proportion of renewable energy usage by 3% annually (using 2016 as the base year). Specifically, the targets are to achieve RE25 by 2025, RE72 by 2040, and ultimately achieve RE100 by 2050. In regard to renewable energy plans for overseas facilities, the medium-term goal is RE100. As for Taiwan, market supply conditions will be considered for adjusting targets and initiating large-scale renewable energy procurement programs in phases.

SBT-NZ Scenario		The Carbon Fee Parameters (US$/t$CO_2$e)	Cost of Regulatory Risk-Derived Carbon Fee (US$ million)	Financial Impact
BAU	2030	303.67	852.93	medium
	2040	546.21	1,663.86	medium
	2050	651.03	1,878.28	medium
RE 100	2030	303.67	476.72	medium
	2040	546.21	468.36	medium
	2050	651.03	35.40	low



Failure to meet customer's low-carbon requirements in the market will also lead to revenue loss[1] and hinder cost management. A commitment to the RE100 allows us to achieve the government's net-zero target, thereby eliminating market risks. However, there are considerable market risks associated with RE100 under the SBT-NZ scenario. After 2035, the gap will narrow, resulting in a reduction of overall risks and we expect the market risks to be eliminated by 2050.



1. The revenue loss in different scenarios: In the NDC Scenario of the Local Government, assuming the revenue loss was 0% in 2023, and increasing by 1% every 2-3 years, until 10% in 2050. In the SBT-NZ Scenario, assuming the revenue loss was 10% in 2023, and increasing by 1% every 2 years, until 25% in 2050.

Physical Risk Analysis

(I) Earthflow, Landslide and Flood Analysis at Taiwan Facilities

Climate change is causing extreme weather patterns including heavy rainfall which may lead to floods, earthflows, landslides or other natural disasters that potentially impact and disrupt our operations. As such, we adopted the IPCC's hazard × vulnerability × exposure framework to conduct an analysis of the physical risk values generated by climate change across all our facilities. In the analysis, extreme rainfall from climate change is classified as a hazard; floods, landslides, and earthflows are classified as a vulnerability[1], and facility location is classified as an exposure[2]. We identified 4 scenarios - SSP1-RCP2.6, SSP2-RCP4.5, SSP3-RCP7.0, and SSP5-RCP8.5[3], from the Shared Socioeconomic Pathways (SSP) and Representative Concentration Pathways (RCP), and simulated them on different time scales[4] for analysis. The risks are then classified into three levels[5] for effective management.

A risk simulation analysis is carried out on different time scales, i.e., short term, medium term, and long term, under various climate change scenarios at our key manufacturing facilities. According to the analysis results, none of our Taiwan facilities are located in sensitive areas prone to earthflows or landslides, and most of these facilities are not at risk of flooding; with the exception of facilities in central Taiwan. We implement relevant adaptation measures in these facilities, such as considering flood susceptibility during factory construction, raising foundations, reinforcing drainage, setting up permeable pavements or installing waterproof gates and other preventive infrastructure. We further minimize the impact of such risks with a robust business continuity plan and regular emergency drills.

Number of risks by risk level, climate change scenarios and time scales across all Taiwan facilities

Risk level	SSP1-RCP2.6				SSP2-RCP4.5				SSP3-RCP7.0				SSP5-RCP8.5			
	Short	Medium	Medium-to-long	Long	Short	Medium	Medium-to-long	Long	Short	Medium	Medium-to-long	Long	Short	Medium	Medium-to-long	Long
No risk	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Low	2	2	2	2	2	2	1	2	2	2	2	1	2	2	2	1
Medium	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1	2
High	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total	10				10				10				10			

1. Vulnerability is determined by analyzing the scope and extent of disaster based on the data on the disaster map published by the Taiwan government.
2. Exposure is determined by analyzing the geographical location of the facility.
3. RCP stands for Representative Concentration Pathways. A paired scenario takes into account socioeconomic considerations in the event of changes in greenhouse gases. Specifically, SSP1-RCP2.6 represents a low-emissions mitigation scenario; SSP2-RCP4.5 represents a moderate-emissions scenario; SSP3-RCP7.0 represents a high-emissions scenario; and SSP5-RCP8.5 represents an extremely high-emissions scenario.
4. Short term: 2021 to 2040; Medium term: 2041 to 2060; Medium-to-long term: 2061 to 2080; Long-term: 2081 to 2100.
5. Risk levels are divided into no risk (0), low risk (1 to 4), moderate risk (5 to 10), and high risk (11 to 25) based on a grading matrix.

(II) Water Scarcity Risk Analysis of the Taiwan Facilities

As most of ASEH facilities are located in Taiwan, it is crucial to closely monitor water scarcity risk in the region. Studies have shown that rising interannual rainfall and flow variability in Taiwan will affect the interannual allocation of water resources. We have divided our Taiwan facilities into 15 areas based on the availability of water supply reservoirs before assessing the historical frequency of water scarcity events at each reservoir and the frequency of water scarcity risks under different climate change scenarios. A historical water scarcity event is defined as an event in which reservoir capacity < lower limit; whereas the probability of water scarcity from climate change is measured using the Standardized Precipitation Index (SPI)[1] as a reference indicator. As observed from the historical data, SPI is definitely less than 1 when a water scarcity event occurs (where reservoir capacity < lower limit). Therefore, the SPI of cumulative rainfall for three consecutive months (SPI-3) is employed as the water scarcity indicator to analyze the probability of water scarcity under different climate scenarios.

We analyze the historical frequency of water scarcity events and the probability of water scarcity from different climate change scenarios at each facility's water supply sources. According to the analysis results, the historical frequency of water scarcity events is lower in Hsinchu, Taichung, and Changhua areas, followed by Taoyuan and Nantou areas, and higher in the Kaohsiung area. Under the SSP1-RCP2.6 and SSP2-4.5 scenarios, there is no significant difference between the rainfall at all our Taiwan facilities and the historical average. However, under the SSP3-RCP7.0 and SSP5-RCP8.5 scenarios, the probability of water scarcity over the medium term (2040 to 2100) and beyond increases in north and central Taiwan, but does not change significantly in the Kaohsiung area.

Historical frequency of water scarcity and changes in rainfall patterns in various areas

Area (Number of facilities)	Water supply	Number of water scarcity events in historical observations (Reservoir capacity < Rule curve)	Estimated probability of water scarcity in the future [2]															
			SSP1-2.6				SSP2-4.5				SSP3-7.0				SSP5-8.5			
			Short term	Medium term	Medium-to-long term	Long term	Short term	Medium term	Medium-to-long term	Long term	Short term	Medium term	Medium-to-long term	Long term	Short term	Medium term	Medium-to-long term	Long term
Taoyuan (1)	Shihmen Reservoir	Moderate	Unchanged	Unchanged	Unchanged	Decrease	Unchanged	Unchanged	Increase	Increase	Unchanged	Significant increase	Increase	Significant increase	Unchanged	Unchanged	Significant increase	Significant increase
Hsinchu (1)	Baoshan Reservoir and Second Baoshan Reservoir	Low	Unchanged	Increase	Unchanged	Decrease	Unchanged	Unchanged	Unchanged	Unchanged	Increase	Significant increase	Significant increase	Significant increase	Increase	Unchanged	Significant increase	Significant increase
Taichung (4)	Liuyutan Reservoir	Low	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Significant increase	Increase	Significant increase	Increase	Unchanged	Increase	Significant increase
Changhua (2)	Groundwater and support from Taichung	Low	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Significant increase	Increase	Significant increase	Increase	Unchanged	Increase	Significant increase
Nantou (1)	Groundwater and Sun Moon Lake Reservoir	Moderate	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Significant increase	Increase	Significant increase	Unchanged	Increase	Increase	Significant increase
Kaohsiung (1)	Gaoping River Weir and Cheng Ching Lake Reservoir	High	Unchanged	Unchanged	Decrease	Decrease	Unchanged	Decrease	Unchanged	Unchanged	Unchanged	Increase	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged	Unchanged

Decrease Unchanged Increase Significant increase

1. Standardized Precipitation Index (SPI): It is an indicator used to assess the extent of meteorological drought over a period of time. SPI > 0 indicates less water scarcity risk, whereas SPI < 0 indicates a drier scenario with a higher risk of water scarcity.
2. Estimated probability of water scarcity in the future (SPI-3<-1)：Compare the rainfall under scenarios and the average value in historical observations, -10% or less indicates a decrease, <10% indicates no change, 10-20% indicates an increase, and anything over 20% indicates a significant increase.

Next, we identify water scarcity risk in each area while considering both the number of water scarcity events based on historical observations and the probability of water scarcity in the future. In principle, areas with a high number of water scarcity events based on historical observations and a high estimated probability of water scarcity in the future are regarded as high-risk areas, whereas areas with a low probability of water scarcity in the future but a high number of water scarcity events based on historical observations should be given attention to at least at a moderate-risk level. We assess the water scarcity risk at each Taiwan facility under each scenario using a combination of historical observations and the water scarcity probability, and water scarcity risk measurement matrices under different scenarios: High-risk facilities will be given priority attention and adaptation measures such as continuously enhancing water efficiency, adding water storage facilities, and establishing emergency backup water sources will be implemented to address drought risks and water shortages. Identification, analysis and putting in place appropriate response plans enable us to bolster the resilience of our operations across different scenarios.

Water scarcity risk measurement matrix

Historical observation	Future (the probability of water scarcity)			
	Decrease (<-10%)	Unchanged (<10%)	Increase (10-20%)	Significant increase (>20%)
Low	■	■	■	▲
Moderate	■	■	▲	★
High	▲	▲	★	★

Water scarcity risks of the Taiwan facilities under various scenarios

Area (Number of facilities)	SSP1-RCP2.6				SSP2-RCP4.5				SSP3-RCP7.0				SSP5-RCP8.5			
	Short term	Medium term	Medium-to-long term	Long term	Short term	Medium term	Medium-to-long term	Long term	Short term	Medium term	Medium-to-long term	Long term	Short term	Medium term	Medium-to-long term	Long term
Taoyuan (1)	■	■	■	■	■	■	▲	▲	■	★	▲	★	■	■	★	★
Hsinchu (1)	■	■	■	■	■	■	■	■	■	▲	▲	▲	■	▲	▲	▲
Taichung (4)	■	■	■	■	■	■	■	■	■	▲	■	▲	■	■	■	▲
Changhua (2)	■	■	■	■	■	■	■	■	■	▲	■	▲	■	■	■	▲
Nantou (1)	■	■	■	■	■	■	■	■	■	★	▲	★	■	▲	▲	★
Kaohsiung (1)	▲	▲	▲	▲	▲	▲	▲	▲	▲	★	▲	▲	▲	▲	▲	▲

■ Maintain：The impact on water resources is low and current management procedures can be maintained.

▲ Alert：For areas with historically high water shortage incidents, more attention on management procedures is needed.

★ Priority alert： Areas with a history of high water shortage incidents and a high probability of water scarcity in the future will receive priority attention and implement adaptation measures.

(III) Global Water Risk Analysis

ASEH adopts the Aqueduct indicators established by the World Resources Institute (WRI) to conduct water risk analysis. In 2023, WRI launched Aqueduct 4.0, the latest version of its water risk analysis framework, with the aim of translating complex hydrological data into intuitive indicators of water-related risks. We analyzed a total of 25 facilities worldwide, primarily in Taiwan, China, Japan, South Korea, Malaysia, Singapore, Vietnam, the U.S. and Mexico.

Baseline water stress risk analysis [1]

- 19.2%「Extremely high」: East China
- 7.7%「High」: East China, Mexico
- 3.8%「Medium - High」: East China
- 57.7%「Low - Medium」: Taiwan, South China, USA, Japan, Vietnam
- 11.5%「Low」: South Korea, Singapore, Malaysia

1. Baseline water stress：Measuring the ratio of total water demand to available renewable surface and groundwater supplies. A high baseline water stress indicates greater competition for water among users.

Baseline overall water risk [1]

Rate the level of water stress to determine the extent of water scarcity risk at ASEH's facilities worldwide. The higher the level of water stress, the greater the competition for water. On the same spectrum, the higher the level of water stress in dry climates and densely populated areas, the greater the risk of water scarcity. Developed countries with better water resource management face relatively lower water risks, while developing countries face higher water risks. Most ASEH facilities experience medium-to-low or low water risks. Facilities with medium-to-high water risks are mainly situated in South China, Vietnam, and Mexico, while facilities with high water risks are mainly situated in East China.

- 30.8%「High」: East China
- 7.7%「Medium - high」: South China, Mexico, Vietnam
- 53.8%「Low - Medium」: Taiwan, USA, Japan, and Malaysia
- 7.7%「Low」: South Korea, Singapore

1. Baseline overall water risk is composed of 13 water risks, including baseline water stress, baseline water consumption, interannual variability, seasonal variability, groundwater table decline, riverine flood risk, coastal flood risk, drought risk, untreated connected wastewater, coastal eutrophication potential, unimproved/no drinking water, unimproved/no sanitation, and peak RepRisk country ESG risk index. Scores are aggregated by category (i.e., physical risk quantity, physical risk quality, and regulatory and reputational risk) and weighted according to the importance of the watershed to obtain a national-level water security score.

We apply the WRI Aqueduct tools to assess the water stress levels under three climate change scenarios (i.e., BAU, OPT, and PES[1]) over different time scales (i.e., short term, medium term, and long term), yielding nine sets of water stress assessment outcomes. Short term denotes the year 2030, where assessment results on this time scale represent overall weighted values for the period from 2015 to 2045; medium term denotes the year 2050, where assessment results on this time scale represent overall weighted values for the period from 2035 to 2065; long term denotes the year 2080, where assessment results on this time scale represent overall weighted values for the period from 2065 to 2085.

Observed from the number of water stress levels under different climate change scenarios and different time scales, the number of ASEH facilities worldwide with an "extremely high" water stress level is on a downward trend compared to the baseline. However, the number of ASEH facilities worldwide with a "high" water stress level exhibits an upward trend. Meanwhile, the number of ASEH facilities around the world with a "medium-to-high," "low-to-medium," or "low" water stress level remains unchanged.

Number of ASEH's facilities worldwide under different climate change scenarios, time scales and water stress levels

Level	Baseline	Scenario								
		BAU			OPT			PES		
		2030	2050	2080	2030	2050	2080	2030	2050	2080
Extremely high	5	0	0	6	5	0	1	0	0	1
High	2	7	7	1	2	7	6	7	7	6
Medium-to-high	1	2	1	1	3	2	1	4	2	1
Low-to-medium	15	14	15	15	13	14	15	12	14	15
Low	3	3	3	3	3	3	3	3	3	3

(IV) Global Drought Risk Analysis

Given the semiconductor industry's heavy reliance on water resources for its operations, it is crucial to monitor drought risks at various ASEH facilities worldwide. 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).

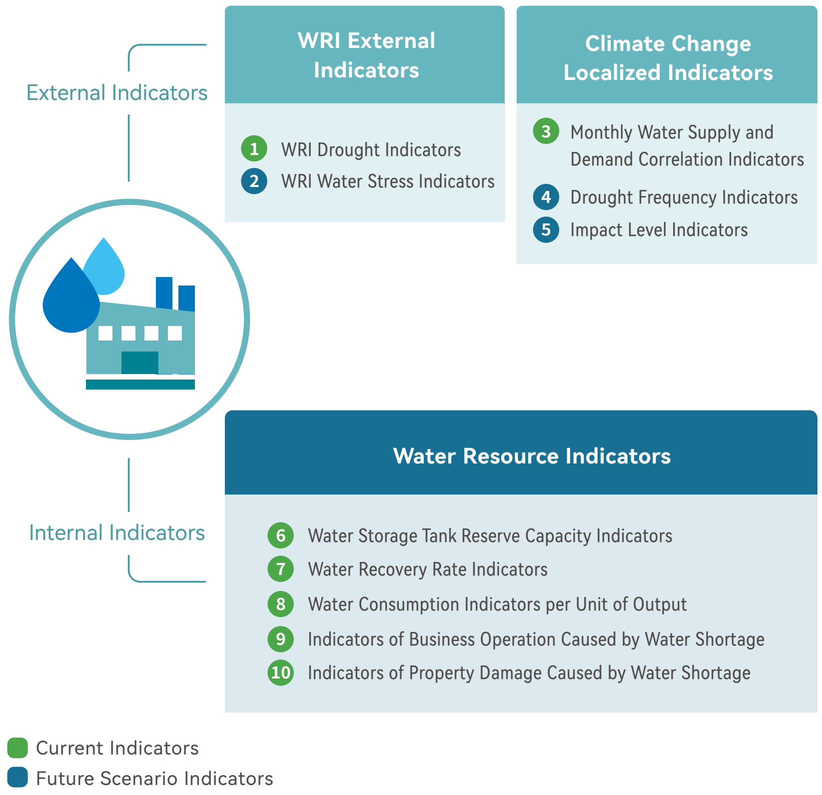
Climate scenario	Time Scale	WRI	NASA
OPT	2015-2045, 2035-2065	SSP1 RCP2.6	SSP1 RCP2.6
BAU	2015-2045, 2035-2065	SSP3 RCP7.0	SSP3 RCP7.0
PES	2015-2045, 2035-2065	SSP5 RCP8.5	SP5 RCP8.5

1. Business As Usual (BAU) is the SSP3-RCP7.0 scenario, which is relatively free of climate policy intervention. It not only represents a medium-to-high forcing path as SSP3 combines relatively high social vulnerability and radiative forcing, but also has strong land use changes and high NTCF emissions. Meanwhile, Optimistic (OPT) is the SSP1-RCP2.6 optimistic scenario, which represents a low forcing path. Its simulation results show that the multi-modal average will fall below 2° C in 2100. Pessimistic (PES) is the SSP5-RCP8.5 pessimistic scenario, which exhibits strong reliance on fossil fuel development and represents a high forcing path.

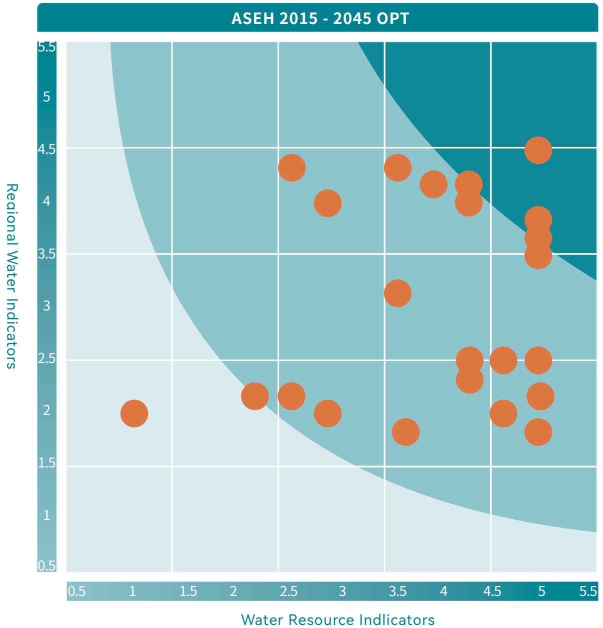
We then collect and integrate the water usage information of each facility, and incorporate the "Facility Water Resource Indicators" to reflect the level of vulnerability. On this indicator, information such as "Water Storage Tank Reserve Capacity Indicators", "Water Recovery Rate Indicators", "Water 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.

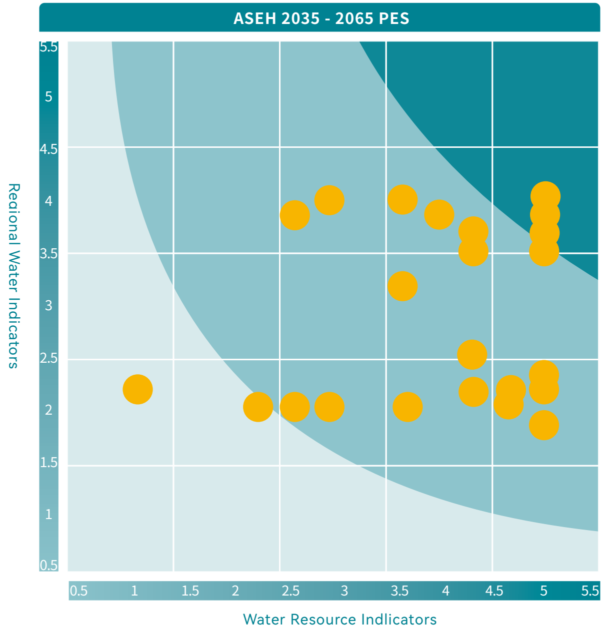
Lastly, we integrated the Regional Water Shortage Indicators and the Facility Water Resource Indicators to reflect IPCC's hazard × vulnerability × exposure framework. The drought risk of each facility is presented as a two-dimensional matrix, where the vertical axis represents the Regional Water Shortage 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.

ASEH Water Rick Assessment



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 arise 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.





Physical Risk Adaptation

ASEH Holdings has implemented enterprise risk management and Business Continuity Management (BCM) in 100% of its key production sites to ensure that both existing and new facilities can continue operations when faced with climate risks. In particular, under the global risks of rising temperatures and drought, a series of drills have been established in addition to the launch of BCM plans to implement ASEH's operational risk management. Furthermore, ASEH consistently invests in and expands green factory-related facilities, which include: accounting for heavy rainfall/flood potential during construction and installing infrastructure damage prevention mechanisms (including flood gates); laying highly permeable sidewalks around the premises; building water supply support systems for factory-adjacent areas; investing in biodiversity, and launching biodiversity restoration actions.

Adaptation plans implemented in ASEH's water supply system in the past 5 years:

- Installed water storage facilities in ASEH factories
- Enhanced wastewater treatment capacity and recovery rate
- Installed water support systems in factory-adjacent areas
- Installed a rainwater recovery system
- Improved the efficiency of the water recovery process

Overlay Analysis of Natural and Biodiversity Hotspots

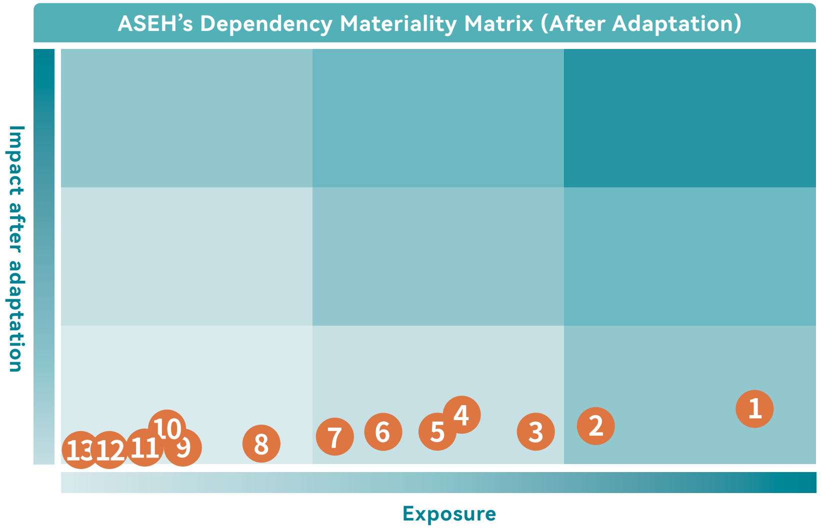
In nature-related risk analysis, we first identify the existence of any biodiversity sensitive locations surrounding our facilities based on the geographic locations of our 25 facilities worldwide using the International Union for the Conservation of Nature (IUCN) World Database on Protected Areas (WDPA) and Taiwan's biodiversity values map(including Taiwan's relevant ecological conservation laws and regulations and the scope of protected areas designated by non-governmental organizations, e.g. "Coastal Conservation Zone" designated by Ministry of the Interior and "Taiwan Ecological Network Conservation Corridors" designated by Ministry of Agriculture), whereupon a two-kilometer radius is drawn around the center of a facility site as its potential impact area. According to the findings of the overlay analysis, two facilities are adjacent to protected areas listed in the IUCN Category IV - Habitat or species management area and one facility is adjacent to a protected area listed in other IUCN categories, while four Taiwan sites are adjacent to the non-regulated Taiwan Ecological Network Conservation Corridors. As the facilities on these sites operate in compliance with local laws and regulations, no apparent ecological impact have been observed. We will continue to monitor these facilities and present any adverse impact of our facilities on the ecosystem.

Region (Number of facilities)	IUCN Ia - Strict nature reserve	IUCN Ib - Wilderness area	IUCN II - National park	IUCN III - Natural monument or feature	IUCN IV - Habitat or species management area	IUCN V - Protected landscape or seascape	IUCN VI - Protected area with sustainable use of natural resources	Others
Taiwan (10)	-	-	-	-	-	-	-	4[1]
Mainland China (8)	-	-	-	-	-	-	-	-
North America (2)	-	-	-	-	1	-	-	1
Northeast Asia (2)	-	-	-	-	1	-	-	-
Southeast Asia (3)	-	-	-	-	-	-	-	-

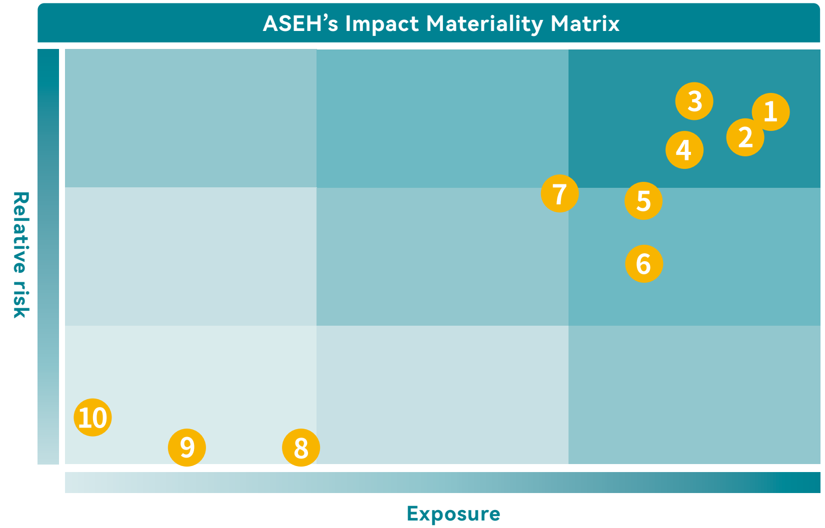
1. These four facilities are adjacent to the Taiwan Ecological Network Conservation Corridor.

Evaluating Nature-related Dependencies and Impacts

Each of our 25 facilities worldwide conduct individual evaluation of the dependencies and impacts on nature from their operations. The facilities are required to select natural disasters or natural resource shortages of concern to them, and assess the extent of these disasters and issues and their current state of adaptation, thereby identifying the ecosystem services on which their operations depend upon. We investigate whether these facilities engage in activities that cause ecological damage, depletion of resources, environmental pollution, and interference with the ecosystem, as well as whether these facilities have put in place management measures for the said activities or pollution, thereby identifying the impact of activities in these facilities on nature. From the compilation of all facilities' data, the number of facilities that are concerned about a particular issue is used as a measure of exposure, and the impact of the issue on the facilities after adaptation represents relative risk. The survey results are presented in the following matrix, where the top five issues are selected as priority topics for the purpose of risk and opportunity analysis based on the materiality principle.



1. Extreme heat
2. Uneven rainfall
3. Extreme rainfall
4. The occurrence of large-scale epidemic diseases
5. The occurrence of storm disasters (e.g., sandstorms and typhoons)
6. Insufficient water resources
7. Drought occurrences
8. Large-scale noise and vibration occurrences (including earthquakes)
9. Flood occurrences
10. Shortage in the supply of fossil fuels
11. Degradation of air quality
12. Deterioration in the quality of water
13. Eutrophication occurrences



1. Waste
2. Greenhouse gas emissions
3. Indirect energy utilization
4. Emissions of non-Greenhouse gas air pollutants
5. Water resource utilization
6. Fossil Fuel Utilization
7. Process wastewater
8. Mineral utilization
9. Soil pollution
10. Proximity to biodiversity sensitive locations

Major Nature-related Risk and Opportunity Metrics

We set corresponding indicators to monitor the status of the top five dependencies and impacts identified through materiality screening. We then analyzed the dependency and impact pathways to determine the corresponding risks and opportunities, allowing us to further conduct financial impact assessments and draw up response strategies. To fulfill our vision of coexisting with nature in harmony, we apply risk mitigation measures on an ongoing basis, and seize the right opportunities that will not only ensure the company's profitability, but also limit our impact on the environment.

Dependencies and impacts on nature				Risks		Opportunities		Response strategies
Items		Explanation	Metrics	Explanation	Financial impacts	Explanation	Financial impacts	
Dependencies	1	Relying on local climate regulation services to avoid high scorching temperatures	Temperature	High scorching temperatures could affect the efficiency of air-conditioning equipment, which in turn leads to the need for additional air-conditioning equipment or higher electricity bills.	Capital expenditure Operating cost	Enhancing efficiency in the use of energy resources	Reduced operating costs	1. Improve ventilation and step up the use of air conditioning across manufacturing facilities while optimizing the efficiency of chillers.
Dependencies	2	Relying on precipitation characteristics regulation services to avoid disasters such as droughts or uneven rainfall	Rainfall data from the Weather Bureau	Droughts cause water shortages, which in turn leads to the need to replenish water using water trucks; whereas heavy rains result in floods at manufacturing facilities, which not only causes damage to equipment, but also disrupts traffic and thus prevents employees from getting to work.	Capital expenditure Operating cost	Bolstering resilience to floods and droughts	Reduced financial losses in the event of a flood or drought	1. Improve water recycling efficiency and reduce the need for water withdrawal. 2. Develop a backup mechanism for water tankers to enhance resilience to droughts. 3. Put in place flood prevention measures and conduct flood prevention emergency response drills to enhance resilience to floods.
Dependencies	3	Relying on biological control services to avoid or mitigate the impact of large-scale communicable diseases	Statistics on communicable diseases from the Center for Disease Control	The epidemic could potentially result in work stoppages.	Revenue	Enhancing resilience to large-scale communicable diseases	Reduced financial losses in the event of a large-scale communicable disease	1. Establish an emergency response or control mechanism within manufacturing facilities. 2. Build our own face mask factory to ensure the available of epidemic prevention supplies to support normal operations in the event of an outbreak.
Dependencies	4	Relying on storm mitigation services to avoid storm damage	Weather data from the Weather Bureau	Frequent or stronger typhoons may cause damage to equipment (i.e., being blown away or water damage), higher risk for employees when getting to work, and increased cost of attendance due to typhoon leave.	Capital expenditure Operating cost	Enhancing resilience to wind disasters	Reduced financial losses in the event of a wind disaster	1. Establish a typhoon warning system across manufacturing facilities, which includes making announcements on typhoon warnings, conducting pre-typhoon inspections to bolster typhoon prevention measures, and setting up a typhoon response team.

Dependencies and impacts on nature				Risks		Opportunities		Response strategies
Items		Explanation	Metrics	Explanation	Financial impacts	Explanation	Financial impacts	
Impacts	1	Business waste produced in the company's production process will have an impact on the environment.	1. Total waste recycling rate 2. Hazardous waste disposal capacity	The amount of business waste produced is reduced, and/or the proportion of recycled waste is raised in response to sustainability trends, laws and regulations, or customer requirements.	Compliance cost	1. Enhancing company goodwill 2. Commoditizing waste	1. Enhanced company goodwill, which in turn leads to customer recognition and opportunities to increase revenue 2. Revenue from the commoditization of waste and reduced waste disposal costs	1. Enhance source management to reduce waste generation. 2. Adopt a circular economy model with the implementation of waste recycling and commoditization to increase recycling rate. 3. Carry out our own R&D initiatives or engage in industry-academia collaboration to develop waste recycling technologies.
	2	Direct and indirect greenhouse gas emissions from the company's operations will have an impact on the climate.	Greenhouse gas emissions	1. Greenhouse gas emissions are being reduced in response to the trend of sustainability transition, laws and regulations or customer requirements. Or the government has imposed carbon tax/fee forcibly aimed at compelling companies to reduce carbon. 2. Climate change causes extreme weather. Floods, droughts and other climate disasters affect the normal operations of enterprises.	Compliance cost Capital expenditure Revenue	1. Enhancing company goodwill 2. Low carbon products	1. Enhanced company goodwill, which in turn leads to customer recognition and opportunities to increase revenue 2. Revenue from the low carbon products	1. Reduce greenhouse gas emissions by using renewable energy to replace fossil energy 2. Carry out our own R&D initiatives or engage in industry-academia collaboration to develop product manufacturing processes with low carbon emissions or carbon capture technology
	3	The process of acquiring indirect energy sources (i.e., electricity, heat, steam, and cooling), which are used in large quantities throughout the company's operations, will have an impact on the environment.	Electricity consumption	The cost of producing energy increases in response to environmental protection requirements, which increases the cost of purchasing energy resources.	Operating cost	Enhancing efficiency in the use of energy resources to reduce operating costs	Reduced energy costs	1. Increase energy efficiency by introducing ISO 50001 energy management system. 2. Carry out our own R&D initiatives or engage in industry-academia collaboration to develop product manufacturing processes with low energy consumption.
	4	Emission of general air pollutants (i.e., NOx, SOx, PM2.5 and VOCs) from the company's operations will have an impact on the environment.	VOC emissions	Air pollutant emissions are being reduced in response to the trend of sustainability transition, laws and regulations or customer requirements.	Compliance cost	Enhancing company goodwill	Enhanced company goodwill, which in turn leads to customer recognition and opportunities to increase revenue	1. Enhance the efficiency of air pollution reduction facilities. 2. Adopt new air pollution reduction technologies and equipment. 3. Carry out our own R&D initiatives or engage in industry-academia collaboration to develop product manufacturing processes that cause low levels of air pollution or high-efficiency air pollution reduction technologies.
	5	The process of acquiring water resources, which are used in large quantities in the company's operations will have an impact on the environment.	Water withdrawal	1. Owing to increasing water stress levels from growing water consumption among companies, the government has imposed water conservation charges or forcibly raised the water recycling ratio aimed at compelling companies to save water. 2. In line with global sustainability transition tremds, customers are requesting a reduction in water withdrawal.	Compliance cost Operating cost	1. Enhancing company goodwill 2. Enhancing efficiency in the use of water resources to reduce operating costs	1. Enhanced company goodwill, which in turn leads to customer recognition and opportunities to increase revenue 2. Reduced water withdrawal costs	1. Increase water recycling efficiency to reduce the need for water withdrawal. 2. Carry out our own R&D initiatives or engage in industry-academia collaboration to develop product manufacturing processes with low water consumption.

In response to the company's "Biodiversity and No Deforestation Policy" and in support of the historic Kunming-Montreal Global Biodiversity Framework, our subsidiary SPIL, has taken active measures to limit its environmental impact in the acquisition of land in the CTSP Huwei Park to build a new factory. We followed the commitment in our policy on the mitigation hierarchy, where we not only comply with regulatory requirements during the construction process, but will also do our best to reduce impacts on the environment. As it is not possible to avoid or mitigate all impacts from the land use, SPIL has consequently decided to enhance and restore neighboring parklands as a form of off-site biodiversity gain to compensate for the environmental impacts and achieving net positive impact (NPI) targets.

ASEH has worked with the CTSP Administration Bureau and ecological experts to adopt Huwei Science Park - park No. 5 to restore it with native plants and turning it into a model ecological park that provides greater cultural and social value to the community, and helps the company to achieve NPI targets. We have since completed the collection of the history of flora and fauna surveys and environmental impact assessment monitoring information and reconstructed information on the history of the local ecosystem as the foundation for the corresponding ecological restoration strategy. 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. (1) Site adjustment, including land and water management, to lay a foundation for enriching ecological restoration; (2) Reforestation and afforestation, including establishing penetrative afforestation, environmental buffering and sound-insulating forests, and rest corridors that connect the circulation of the park area; (3) Ecological monitoring, which includes conducting bird and insect surveys to establish an ecological baseline for future ecological benefit assessment, and continuously monitoring microclimate changes in the site and measuring the effectiveness of environmental improvements by deploying Internet of Things (IoT) sensors. The ecological restoration plan has been approved by the CTSP, and the construction of the park is scheduled to commence in 2024. As part of our commitment to no deforestation, we have engaged in reforestation initiatives in Taiwan. Newly planted trees for afforestation can help conserve water sources as well as prevent soil and sand flow to minimize the social costs of natural disasters while improving the habitat of wild animals and plants and restoring biodiversity. We have also been working hand in hand with the Forestry and Nature Conservation Agency, Ministry of Agriculture since 2017 to plant 103,608 saplings that protect and nurture over 59.62 hectares of land in Kaohsiung, Hualien, New Taipei City, Pingtung, Luodong, Nantou, Hsinchu, and Taitung. On the selection of tree species for afforestation, efforts are made to maintain the characteristics of various tree species. As such, multi-storied forests are constructed with various tree species such as liquidambar, acacia, and Castanopsis indica, in hopes of absorbing carbon dioxide effectively, mitigating the greenhouse effect, and purifying air quality while conserving water sources, creating a good habitat for wildlife, and realizing ecological restoration. In 2024, we will begin establishing a carbon sink methodology in forest management, in order to enhance the added value of forest land while achieving net-zero carbon reduction that generates both ecological and economic benefits.

Supply Chain Environmental Risk Analysis

Rapid climate change is causing more natural disasters, and these climate induced events have the potential to disrupt our operations and expose our supply chain to significant risks that further impact our business continuity. To mitigate such risks, ASEH works hand-in-hand with suppliers to implement mitigation and adaptation actions, ensuring operational stability and enhancing climate resilience. We have initiated climate, natural and biodiversity risk assessments on our supply chain, and conducted a comprehensive examination to determine potential disaster risks over short, medium, and long-term periods.

(I) Physical Risk Analysis

• Global Water Risk Analysis

Baseline Water Stress Simulation

Using the WRI database, the Company conducted an analysis of water stress for 646 supplier locations worldwide. The baseline water stress analysis results[1] (shown in the figure below) revealed that approximately 12.8% of suppliers are situated in areas with extremely high stress, primarily in Mainland China and the United States. Another 4.6% of suppliers are located in areas with high stress, mainly in Mainland China, South Korea, and the United States.

1. Baseline water stress: Measures the ratio of total water demand to available renewable surface and groundwater supplies. A high baseline water stress indicates greater competition for water among users.

Simulation of Water Stress at Different Time Periods under Different Climate Scenarios

Under three climate change scenarios (BAU, OPT, PES) and at various timescales, the total number of areas with extremely high and high baseline water stress levels generally remain stable or decreased. Notably, in Asia, most areas with extremely high water stress have been downgraded to high stress under these scenarios. These indicators suggest that suppliers' current risk mitigation measures are sufficient to address baseline conditions and adapt to future changes. However, in the Americas, there are regions where the baseline water stress levels have been elevated to extremely high levels in the PES scenario. As such, suppliers in those regions will need to implement more proactive risk mitigation strategies to address future pessimistic climate scenarios.

Number of suppliers for analyzing water stress levels under different climate change scenarios and on different time scales

Region (Number of suppliers)	Level	Baseline	Scenario: BAU 2030	BAU 2050	BAU 2080	OPT 2030	OPT 2050	OPT 2080	PES 2030	PES 2050	PES 2080
Asia (557)	Extremely high	62	6	5	63	62	6	5	5	5	5
	High	19	76	71	13	13	70	71	70	71	71
	Medium-to-high	107	116	107	72	120	87	64	123	110	64
	Low-to-medium	313	330	345	354	333	340	361	330	342	387
	Low	56	29	29	55	29	54	56	29	29	30
Americas (69)	Extremely high	20	21	21	21	21	24	29	21	23	29
	High	9	9	14	10	15	13	12	16	15	12
	Medium-to-high	13	16	12	13	22	21	18	19	21	18
	Low-to-medium	17	13	12	16	1	3	4	5	2	5
	Low	10	10	10	9	10	8	6	8	8	5
Europe (17)	Extremely high	1	2	1	1	1	2	2	1	3	3
	High	2	1	2	2	2	2	1	2	1	1
	Medium-to-high	1	2	1	1	2	1	2	2	2	2
	Low-to-medium	2	1	2	2	1	5	2	2	1	8
	Low	11	11	11	11	11	7	10	10	10	3
Australia (1)	Low	1	1	1	1	1	1	1	1	1	1
Africa (2)	No data	2	2	2	2	2	2	2	2	2	2

• Analysis of Climate Disaster Risks for Taiwanese Suppliers

Debris Flow, Landslide, and Flood Risk

Using the same methodology for the ASEH facilities in Taiwan, we conducted risk simulation analysis for different climate change scenarios in the short, medium, and long term for 246 suppliers in Taiwan. The results indicated that none of the suppliers are located in debris flow-sensitive areas, and 193 suppliers demonstrated no risk at all. The table below illustrates the number of suppliers in each risk level based on extreme rainfall conditions, flooding, and landslide potential. Under different scenarios, the number of high-risk suppliers accounts for 1.6-2.4%, and the number of medium-risk suppliers accounts for 4.5-9.8%.

Risk Levels of Suppliers Under Different Time Periods and Climate Scenarios

Risk level	SSP1-RCP2.6				SSP2-RCP4.5				SSP3-RCP7.0				SSP5-RCP8.5			
	Short	Medium	Medium-to-long	Long	Short	Medium	Medium-to-long	Long	Short	Medium	Medium-to-long	Long	Short	Medium	Medium-to-long	Long
No risk	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193	193
Low	34	29	34	38	24	35	35	33	34	31	27	25	31	30	34	26
Medium	15	18	13	11	24	14	13	15	14	17	20	22	16	18	14	21
High	4	6	6	4	5	4	5	5	5	5	6	6	6	5	5	6

While taking into account the most optimistic and most pessimistic climate scenarios, we will be paying special attention to medium/high-risk suppliers under different disaster category (as shown in the table below). In the future, these suppliers will be required to initiate risk management and implement disaster mitigation measures, such as enhancing the water resistance of building structures or preparing evacuation plans, etc., to avoid impacts on ASEH operations in the event of a disaster.

Number of Mid-to-Long-Term High / Medium Risks for Suppliers Exposed to Various Disasters Under the Most Optimistic and Pessimistic Scenarios

Region (Number of suppliers)	Scenario	Flood		Landslide		Debris flow	
		High risk	Medium risk	High risk	Medium risk	High risk	Medium risk
Northern Taiwan (177)	SSP1-RCP2.6	0	5	2	0	0	0
	SSP5-RCP8.5	0	7	2	0	0	0
Central Taiwan (32)	SSP1-RCP2.6	0	1	0	0	0	0
	SSP5-RCP8.5	0	1	0	0	0	0
Southern Taiwan (37)	SSP1-RCP2.6	4	7	0	0	0	0
	SSP5-RCP8.5	3	6	0	0	0	0

Water Scarcity Risk Analysis

Based on the locations of Taiwanese supplier sites within the water supply areas of various reservoirs, we referenced historical data of water shortages at different reservoirs, and projected the probability of water shortages under the climate change scenario to assign different levels of attention (maintain, monitor, priority monitoring) to supplier sites in each region, using the water shortage risk matrix as illustrated below. Selected suppliers must consistently enhance water resource efficiency, expand water storage facilities, and establish emergency backup water sources. This will improve operational resilience in various situations and prevent disruptions to company operations in the event of a disaster. We will continue to monitor the other suppliers and adjust our level of attention where necessary, in order to effectively manage the risk of water shortage.

Risk Alert Level for Supplier Water Shortage

Region (Number of suppliers)	Water supply	SSP1-RCP2.6				SSP2-RCP4.5				SSP3-RCP7.0				SSP5-RCP8.5			
		Short-term	Medium-term	Medium-to- long term	Long-term	Short-term	Medium-term	Medium-to- long term	Long-term	Short-term	Medium-term	Medium-to- long term	Long-term	Short-term	Medium-term	Medium-to- long term	Long-term
Keelung City, New Taipei City (1)	Xinshan Reservoir, Xishi Reservoir, and Shuangxi	■	■	■	■	■	■	■	■	■	■	■	▲	■	■	▲	▲
Taipei, New Taipei (77)	Nanshi River and Feitsui Reservoir	■	■	■	■	■	■	■	■	■	▲	■	▲	■	■	▲	▲
Taoyuan, New Taipei (63)	Shihmen Reservoir	▲	▲	▲	▲	▲	▲	★	★	▲	★	★	★	▲	▲	★	★
Hsinchu (36)	Baoshan Reservoir, Bao-Er Reservoir, and Yongheshan Reservoir	■	■	■	■	■	■	■	■	■	▲	▲	▲	■	▲	▲	▲
Miaoli (4)	Yongheshan Reservoir, Liyutan Reservoir, and Mingde Reservoir	▲	▲	▲	▲	▲	▲	▲	▲	▲	★	★	★	★	▲	★	★
Taichung (21)	Liyutan Reservoir and Shigang Dam (Deji Reservoir)	■	■	■	■	■	■	■	■	■	▲	■	▲	■	■	■	▲

■ Maintain：Impact on water resources is relatively low, and current management status can be maintained.

▲ Monitor：In areas with frequent water shortage incidents, management measures should be closely monitored.

★ Priority alert：If the probability of water shortage events increases due to climate change, discussions on improvement should be prioritized.

Region (Number of suppliers)	Water supply	SSP1-RCP2.6				SSP2-RCP4.5				SSP3-RCP7.0				SSP5-RCP8.5			
		Short-term	Medium-term	Medium-to- long term	Long-term	Short-term	Medium-term	Medium-to- long term	Long-term	Short-term	Medium-term	Medium-to- long term	Long-term	Short-term	Medium-term	Medium-to- long term	Long-term
Changhua (3)	Groundwater, Hushan Reservoir, and Shigang Dam (Deji Reservoir)	■	■	■	■	■	■	■	■	■	▲	■	▲	■	■	■	▲
Nantou (3)	Surface water and Groundwater	■	■	■	■	■	■	■	■	■	★	▲	★	■	▲	▲	★
Yunlin (1)	Hushan Reservoir and JiJi Weir	■	■	■	■	■	■	■	■	■	▲	■	▲	■	■	■	■
Chiayi (2)	Lantan-Renyitan Reservoir and Tsengwen-Wusanto Reservoir	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Tainan (7)	Tsengwen-Wusanto Reservoir and Nanhua Reservoir	■	■	■	■	■	■	■	■	■	▲	■	▲	■	■	■	▲
Kaohsiung (28)	Gaoping River Weir (including seepage flow) + Fongshan Reservoir	▲	▲	▲	▲	▲	▲	▲	▲	▲	★	▲	▲	▲	▲	▲	▲

■ Maintain：Impact on water resources is relatively low, and current management status can be maintained.

▲ Monitor：In areas with frequent water shortage incidents, management measures should be closely monitored.

★ Priority alert：If the probability of water shortage events increases due to climate change, discussions on improvement should be prioritized.

(II) Biodiversity Analysis

For ASEH's 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, the number of biodiversity-sensitive locations near our global suppliers is shown in the following table, with some suppliers being close to at least one sensitive location, For those suppliers that are close to at least one sensitive location, 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.

Region (Number of suppliers)	IUCN Ia Strict nature reserve	IUCN Ib Wilderness area	IUCN II National park	IUCN III Natural monument or feature	IUCN IV Habitat or species management area	IUCN V Protected landscape or seascape	IUCN VI Protected area with sustainable use of natural resources	Other
Taiwan (246)	1	-	-	-	9	-	-	-
Mainland China (180)	-	-	-	-	-	6	-	5
Northeast Asia (110)	-	-	-	-	46	4	4	2
Southeast Asia (19)	-	1	-	-	-	-	-	-
West Asia (2)	-	-	-	-	1	-	-	1
Europe (17)	-	-	-	2	6	4	-	8
North America (68)	-	-	-	2	2	14	1	3
Central America (1)	-	-	1	-	-	-	-	-
Other (3)	-	-	-	-	-	-	-	-

In addition, given the availability of a rich and diverse biodiversity mapping in Taiwan, and the significance of the local semiconductor ecosystem, particular attention was given to 246 suppliers based in Taiwan. We identified the existence of any biodiversity sensitive locations surrounding these suppliers' operations using Taiwan's biodiversity mapping, 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, the number of biodiversity-sensitive locations near the suppliers in Taiwan, classified according to IUCN protected area categories, is compiled in the table below. Similar to the global risk analysis, we prioritized our attention on those suppliers that are close to at least one sensitive location, requiring them to develop corresponding strategies to ensure the stability and resilience of company operations.

Region (Number of suppliers)	Ia Cultural Heritage Preservation Act - natural reserves	II National Park Act - National Parks	III Forestry Act - Nature Reserve	IV Wildlife Conservation Act - Wildlife Refuges /Major Wildlife Habitats	IV Wetland Conservation Act - Wetlands of Importance	V Coastal Zone Management Act - Coastal conservation zone	Other Conservation Corridor/Key Biodiversity Area
Northern Taiwan (177)	1	-	-	22	62	2	76
Central Taiwan (32)	-	-	-	-	-	-	21
Southern Taiwan (37)	-	-	-	-	4	-	12

1-3 Accountability and Responsibility
Resilience Strategy

At ASEH, we are focused on establishing a clear low-carbon strategy that incorporates an international management framework to strengthen our internal systems, improve production models through responsible actions, co-create green values with our value chain partners, and track and review our performance. We are also tapping on various opportunities arising from climate challenges to demonstrate our leadership in sustainability and meet stakeholder expectations through the sharing of our low-carbon solutions with the global market.

Low-Carbon Sustainability Mission

Low-carbon transition is one of our four sustainability strategies. Results of the annual risk assessment show that within the next 3 to 5 years, operating costs of the energy used in our operations may increase due to the process of driving such transition, as well as regulatory and market changes. To improve energy efficiency, we aim for all ASEH facilities to fully adopt energy management systems and be certified by 2025. At the same time, all facilities are required to implement energy saving measures, targeting at least 2% of annual electricity demand. We have also established a renewable energy platform to consolidate the renewable energy needs of ASEH facilities in order to optimize the benefits of collective energy purchase and reduce operating costs in our transition journey.

To enhance climate resilience and accelerate towards net zero emissions, ASEH has initiated targets and action plans by focusing on 5 key areas; low-carbon products, renewable energy, low-carbon transportation, supply chain engagement, and carbon credits. In an effort to further encourage employees' net zero commitment from top to bottom, we have established a compensation program that links the performance of key employees (including senior executives)[1] to pre-set 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)[2]. A third-party unit is engaged to audit the employees' performance for the issuing of employee restricted stock[3] in the same year of the assessment. To that end, we hope to enhance the connection with our global sites, and partner with the industry value chain to surpass technical barriers, expand climate opportunities and achieve global net-zero targets.

Vision for Environmental Stewardship

Biodiversity and forest conservation are 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:

- Preventing our operations and value chain activities from affecting hotspots in biodiversity-important and sensitive areas.
- Applying the mitigation hierarchy based on the sequential steps of avoidance, minimization, restoration, and offset to minimize the impact of our operations or value chain activities on biodiversity.
- Carrying out periodic assessments of nature-related dependencies, impacts, risks, and opportunities; drawing up corresponding action strategies, indicators, and targets; and regularly disclosing report progress and results.
- Requiring our operations and value chain activities to adhere to a strict no deforestation policy.

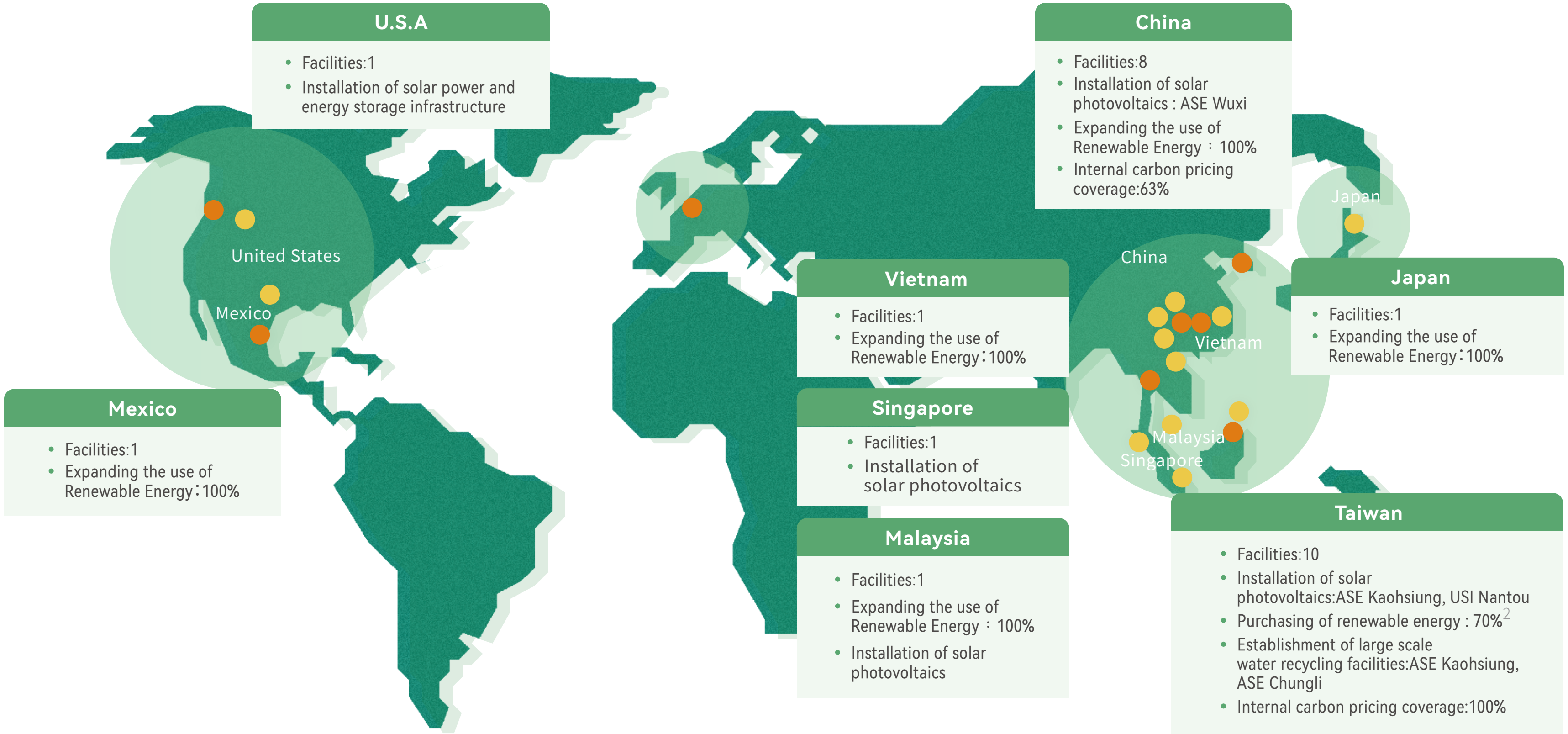
1. Key employees that are involved in long-term business strategy and future developments, influence business operations, and core technical talents.
2. A continuous reduction of 1% in intensity per year with 2015 as the baseline year.
3. New shares will be issued to employees at no cost, with a total issuance amount of NTD 150 million.

Net Zero Emissions

02

As a leading semiconductor packaging and test service provider, ASEH has established global operations in Taiwan, China, Japan, South Korea, Singapore, Malaysia, the U.S., Mexico, and Vietnam. We work closely with our partners and stakeholders, and connect with external forces to take concrete steps towards a low-carbon transition. Our goal is to play a leadership role in guiding the industry value chain to create a positive global impact.

Carbon emissions from our operations come primarily from purchased electricity. At present, 84% of our facilities[3] have already begun purchasing renewable energy or certifications, out of which 12 facilities (representing 48% of our total facilities) are RE100[1] compliant. In addition, some of our facilities have installed renewable energy systems that augment our low-carbon energy transition. Internal carbon pricing has been introduced in phases across our facilities from 2021. At present, the scope of coverage is 100% for Taiwan and 60% for China, representing 63% of our facilities worldwide. We will continue to expand the adoption of internal carbon pricing to better manage carbon risks in our operations.



1. RE100：ASE Shanghai (Material), ISE Labs China, ASE Wuxi, ASE Japan, ASE Malaysia, SPIL Suzhou, USI Zhangjiang, USI Kunshan, USI Jinqiao, USI Huizhou, USI Mexico, USI Vietnam
2. Purchasing of renewable energy in Taiwan: ASE Kaohsiung, ASE Chungli, SPIL Da Fong, SPIL Chung Shan, SPIL Zhong Ke, SPIL Hsinchu, SPIL Changhua
3. 76.37% of total revenues from facilities using renewable energy or RECs.

2-1 Net Zero emissions

Net Zero Transition

Our near-term reduction targets have been successfully submitted for review by the Science Based Target Initiative (SBTi) in 2021, and this was then followed by our net zero targets in 2023. We have not only set clear short, medium, and long-term carbon reduction targets, but have also clearly defined greenhouse gas emission thresholds for our subsidiaries. We have already introduced internal carbon pricing in phases based on the operation characteristics of each subsidiary to better quantify and valorize greenhouse gas emissions. These moves bolster the drive to reduce carbon emissions and help the company to effectively manage any external impact from regulatory policies. Commitment from ASEH's top management is crucial to drive the necessary changes in the company's net zero transition. As such, we have designed our compensation policy to link executive performance to greenhouse gas emission intensity and water use efficiency.

2020

- 100% Greenhouse gas inventory
- Commitment to Science Based Targets

2021

- Near-term reduction targets approved by SBTi
- Established the Renewable Energy Platform to consolidate energy planning; completed Phase 1 RE procurement

2022

- Formulated long-term Net zero pathways and reduction policy
- Implementing carbon pricing to facilitate internal action plans

2023

- 100% Identification and assessment of climate and natural risks.
- Established and submitted Net Zero targets to SBTi for review.

2024

- Complete Phase 2 RE procurement
- Execute strategic carbon reduction in 5 key areas toward Net Zero

2025

- Complete ISO 50001 energy management systems certification for all facilities
- Apply internal carbon pricing at all facilities

2030

- Fulfill near-term Science Based Targets
- Complete GHGs inventories and verification among key suppliers.

2040

- Invest in carbon credits. Acquire different types of carbon credit (e.g., carbon sink, capture or storage).

2050

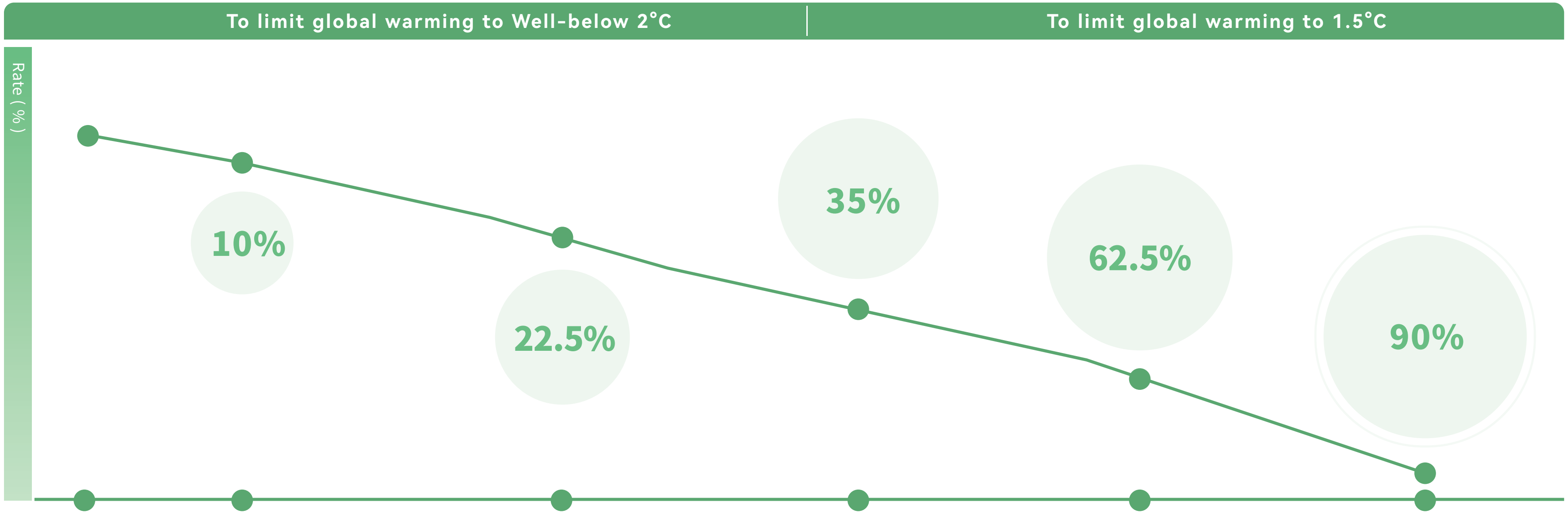
Achieve Net Zero emissions.

Net Zero

2-2 Net Zero emissions
Targets and Net Zero Emission Pathway

ASEH has completed the validation of its 2030 near-term reduction targets with the Science Based Targets initiative (SBTi). Using 2016 as the baseline year, a 35% absolute reduction by 2030 target, under the well-below 2℃ scenario, was established for Scope 1 and 2 emissions. For Scope 3 emissions, a target of 15% absolute reduction by 2020 under the 2℃ scenario was established, with 2030 as the baseline year.

Reduction Pathways Scope1+2



2016

Base year

2023

- The use of Renewable Energy or certificate achieves 21%
- Introducing the concept of circular economy and developing low-carbon products
- 46% conducting product life cycle assessment (LCA)
- Engaging in forest carbon sinks and carbon credit

2025

- 100% of RE use in offices within key facilities
- 27% RE use at production facilities worldwide
- the carbon footprint of key products was reduced by 2% per year

2030

- 42% RE use at production facilities worldwide
- Carbon capture technology cooperation and application
- 20% low carbonization of business vehicles

2040

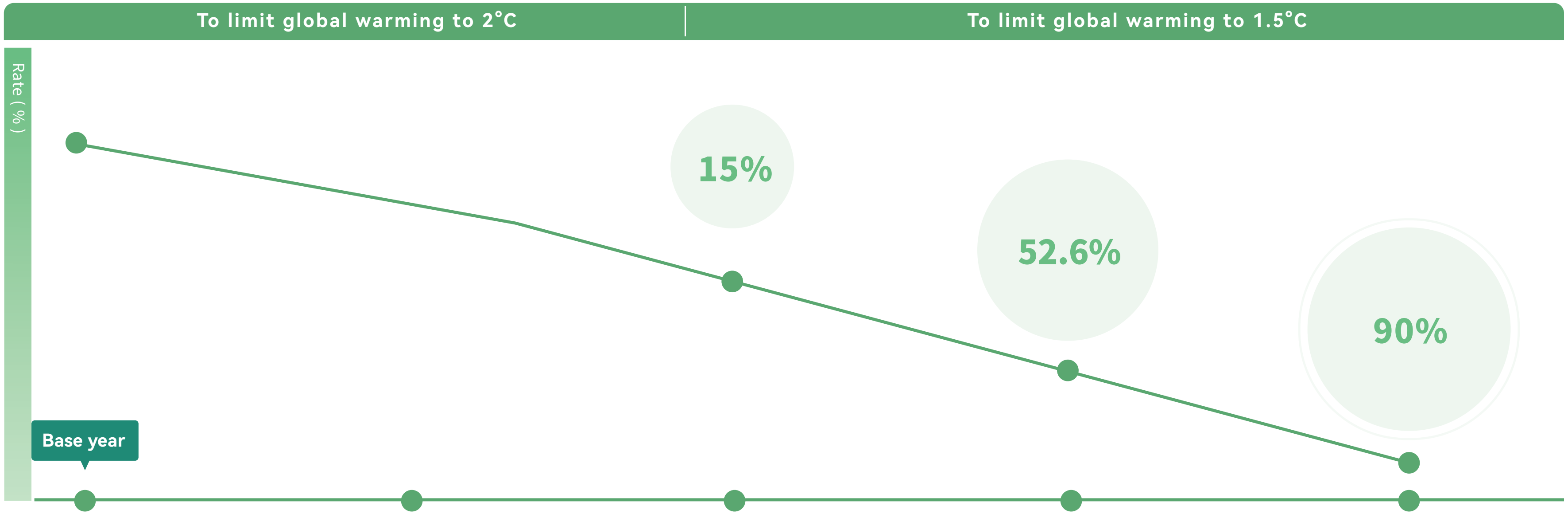
- 72% RE use at production facilities worldwide
- 100% conducting product life cycle assessment (LCA)
- 100% low carbonization of business vehicles and forklifts

2050

- Achieving net zero target of residual carbon emissions through carbon credit or related methodologies

Net Zero

Reduction Pathways Scope3



2020
- Conducting comprehensive inventory and passing third-party verification
- Implementing low-carbon logistics
- Guiding key suppliers on greenhouse gas and product carbon footprint inventories and passing third-party verification

2025
- Rate of supply chain engagement: 30%
- Using low-carbon materials

2030
- Rate of supply chain engagement: 70%
- Engaging in carbon trading

2040
- Rate of supply chain engagement: 100%

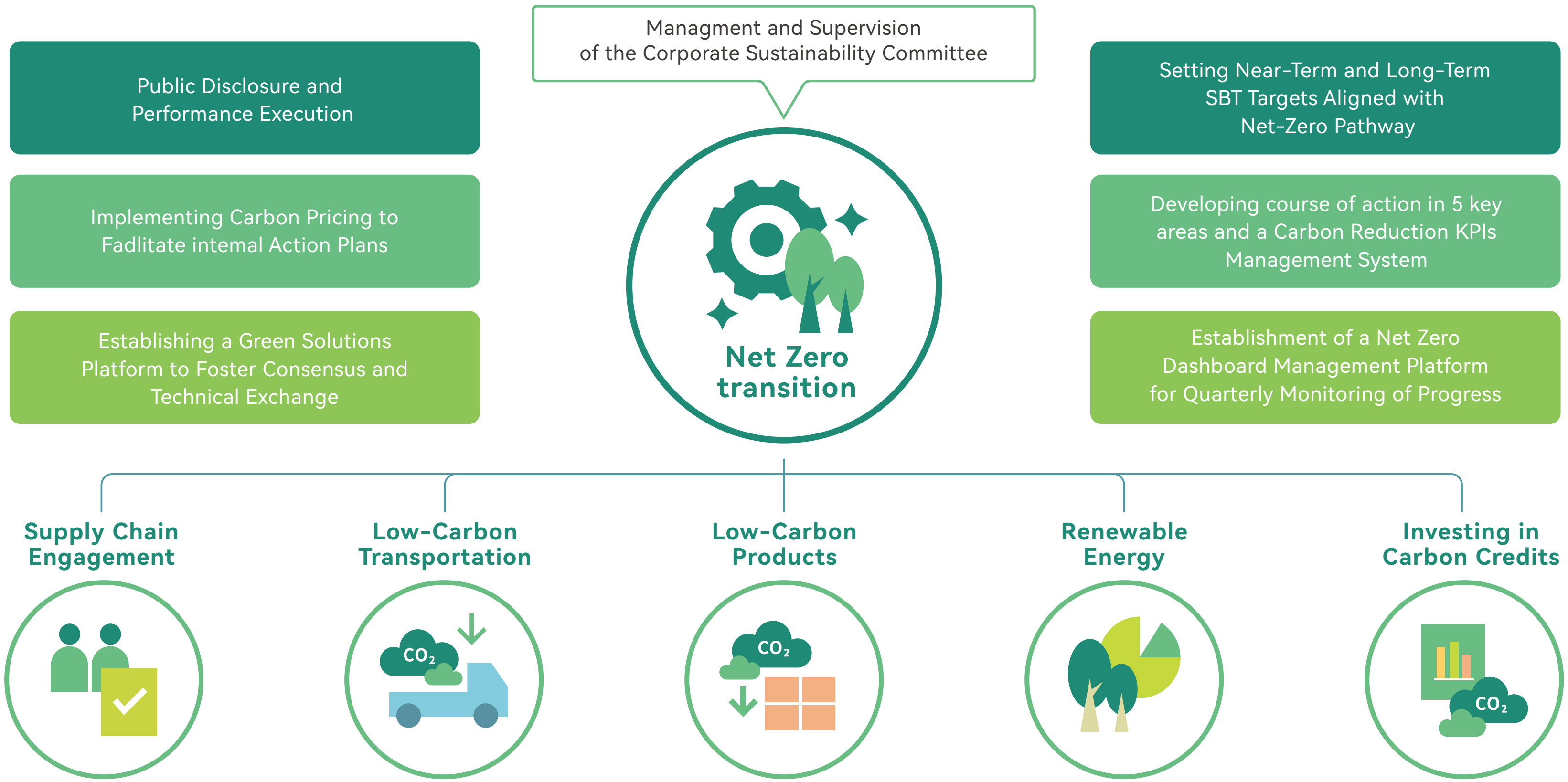
2050
- Achieving net zero target of residual carbon emissions through carbon credit or related methodologies (BVCM [1])

Net Zero

1. Beyond Value Chain Mitigation (BVCM), these actions include support for the value chain to decrease carbon emissions, carbon removal technical, purchasing carbon credits, etc.

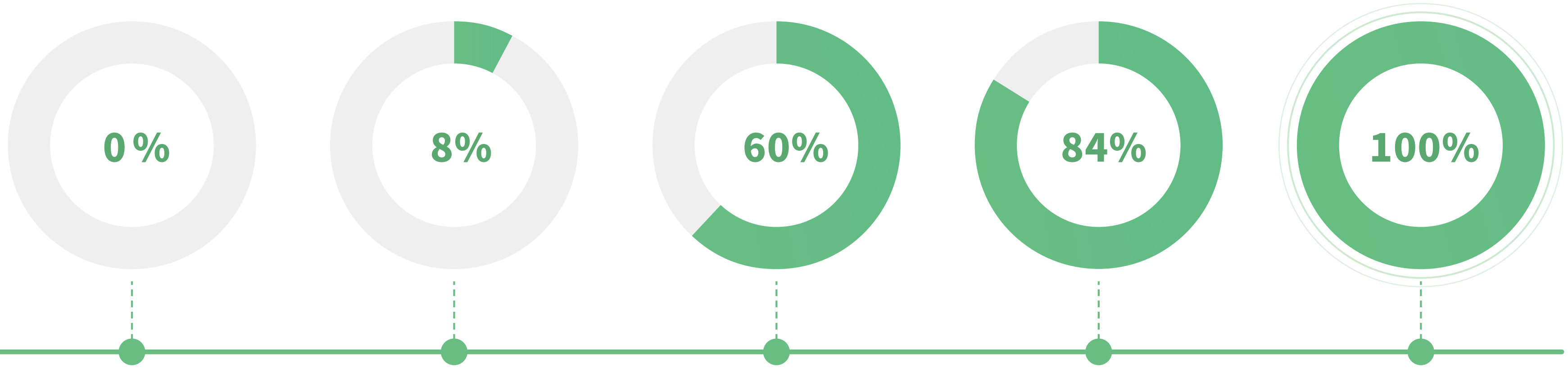
2-3 Net Zero emissions
Management Actions

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.



2-4 Net Zero emissions
Internal Carbon Pricing

Today, governments around the world are imposing carbon taxes or fees to facilitate efforts in reaching net zero globally. Expenses incurred on carbon reduction is no longer considered as costs, but as investments on intangible assets. ASEH began introducing internal carbon pricing in phases since 2021, with implementation across 60% of our facilities in 2023. Each facility sets its own internal carbon pricing and reviews its rationality based on external costs of carbon emissions, as well as calculates the minimum budget for the carbon reduction projects it has to set aside on an annual basis in support of the company's five strategic carbon reduction actions.



2021

Established plans to roll out internal carbon pricing in phases across all our facilities.

2022

Completed
- ASE Kaohsiung
- ASE Shanghai Material

2023

Completed
- ASE Chungli
- SPIL Taiwan
- USI Taiwan facilities
- USI China facilities

2024

Plan
- ASE Malaysia
- ASE South Korea
- ASE Japan
- SPIL Suzhou
- USI Vietnam
- USI Mexico

2025

Plan
- ASE Singapore
- ASE China facilities
- ISE Labs

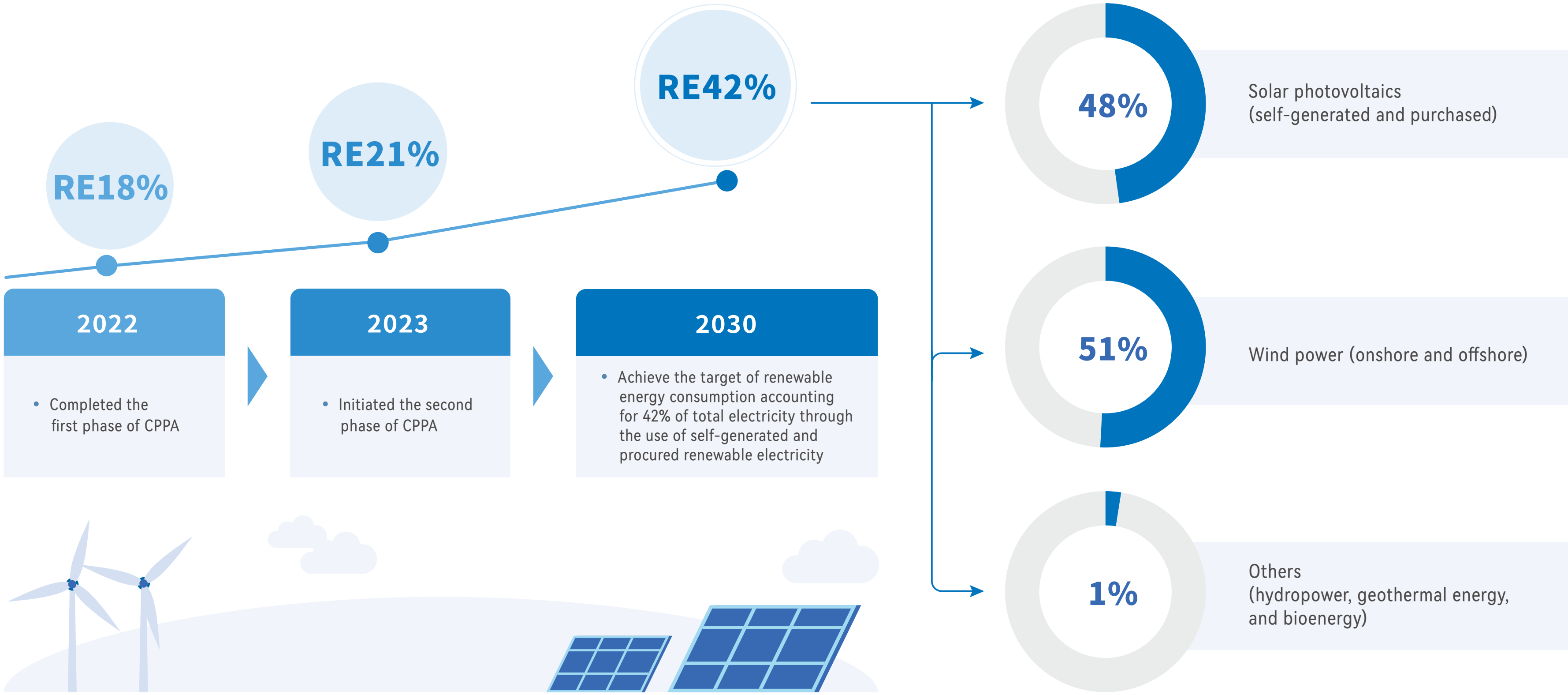
03

Decarbonization Practices

3-1 Decarbonization Practices

Renewable Energy

In 2021, ASEH established the "Renewable Energy Platform" in response to global energy transition. We plan to continuously increase the proportion of renewable energy use through various means including the consumption of self-generated electricity, corporate power purchase agreements (CPPA), and purchase of unbundled energy attribute certificates (EACs). In addition, we are also integrating the approaches of different regions' energy markets into our action plans to help the company reach its 2030 goal whereby 42% of total electricity consumption is from renewable energy sources. Throughout 2023, we have been keeping taps on our renewable energy use and anticipating any shortfall through a comprehensive response plan. In 2023, 84% of our facilities worldwide are already using renewable energy or RECs, with 12 facilities achieving 100% renewable energy use.



3-2 Decarbonization Practices
Investment in Carbon Credits

The use of carbon credits form the last mile in ASEH's journey to net-zero emissions. In compliance with the SBTi's framework, we anticipate to utilize carbon credits to offset our remaining carbon emissions beyond 2040 with priority placed on carbon removal credits. ASEH participated in the first batch of carbon credit trading at the launch of the Taiwan Carbon Solution Exchange in 2023, which also represented our first carbon credit trading from the Voluntary Carbon Market (VCM). The carbon credits are associated with a Chilean landfill gas (LFG) capture project. This project aligns closely with our commitment to six of the United Nations Sustainable Development Goals (SDGs)[1] , that allows us to drive environmental sustainability and the sustainable development of the local community and economy.

ASEH is commited to acquiring carbon credits of the highest quality in the voluntary carbon market, and at this stage, we are focusing on forest carbon sinks. While Afforestation and Reforestation (AR) are the only ways to acquire forest carbon credits in Taiwan at present, there are other carbon credit types available for consideration at the international level, such as the Improved Forest Management (IFM) and Avoid Deforestation (AD). In an effort to develop more diverse types of forest carbon credit projects that are in line with international standards, the ASE Environmental Protection and Sustainability Foundation joined forces with the International Climate Development Institute to develop an innovative carbon offset project involving forests in Taiwan. The 'Project of Increasing carbon sink from the low stock forests' has been submitted to the Ministry of Environment for review and approval. The project adopts the Verified Carbon Standard (VCS) as its primary reference, but also applies methodologies from international organizations like the Climate Action Reserve (CAR), the America Carbon Registry (ACR), and the J-Credit Scheme. The aim of the project is to formulate a comprehensive and localized carbon offset program for forest management that meets international standards of measurement, reporting, and verification (MRV). Upon approval from the ministry, we will expand the application of this methodology and help local forest farmers undertake activities for the sustainable management of forest land, and consequently be eligible for forest carbon credits.

1. These SDGs include SDG 4 Quality Education, SDG 7 Affordable and Clean Energy, SDG 8 Decent Work and Economic Growth, SDG 11 Sustainable Cities and Communities, SDG 13 Climate Action, and SDG 17 Partnerships for the Goals.

3-3 Decarbonization Practices
Low-Carbon Products

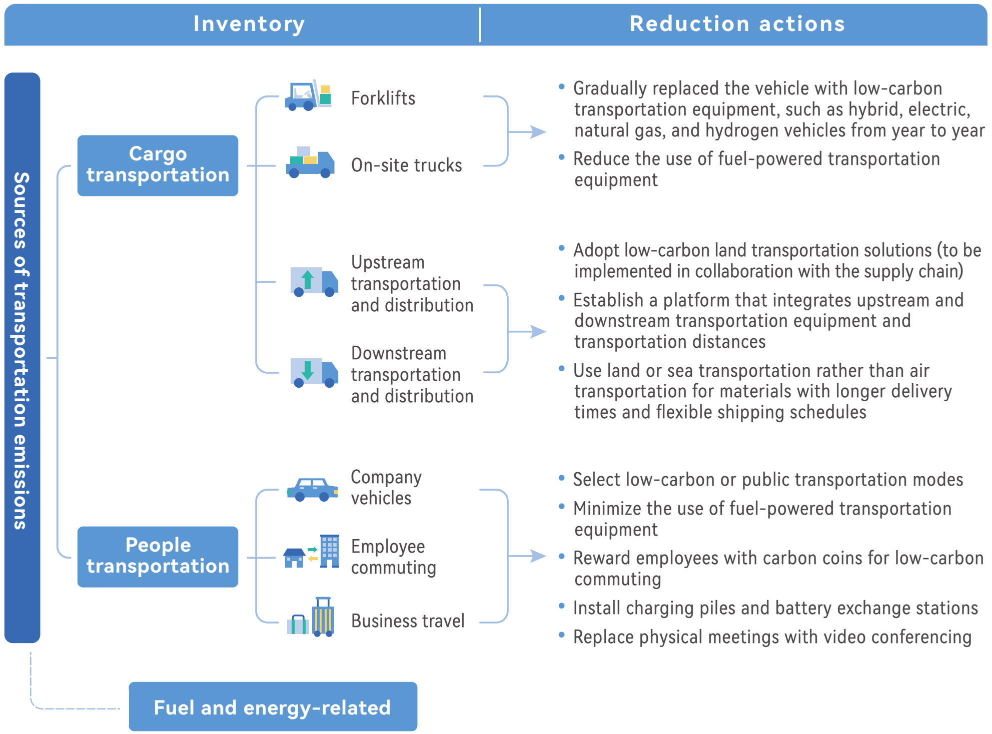
The first step in our low-carbon product action plan is to establish a carbon inventory of products as a baseline for performance measurement. ASEH has directed our three key subsidiaries to take concrete actions in reducing the product carbon footprint and accelerating our goal of carbon neutrality. To that end, our subsidiaries have conducted ISO 14067 carbon footprint and ISO 14045 eco-efficiency assessment of their respective products, identifying raw materials in greenhouse gas emission hotspots throughout the manufacturing process, engaged with suppliers to facilitate the development of low-carbon materials and switch to low-carbon materials, and increased the use of renewable energy in the manufacturing process. These actions closely resonate with ASEH's philosophy of "producing more with less" and the principle of sustainable manufacturing by integrating key sustainability considerations throughout the product life cycle from the design stage, through manufacturing and distribution. Low-carbon products ultimately help to reduce greenhouse gas emissions and minimize their impact on the environment.ASEH targets to achieve 100% coverage of product carbon inventory by 2040. In 2023, we recorded a 46.24% coverage of product carbon inventory[1].

Product life cycle	Key Sustainability Considerations
Raw materials	• Select materials with low carbon emissions • Use recycled materials • Adopt high-density packaging design to reduce the amount of materials required
Manufacturing	• Enhance production efficiency in manufacturing processes • Minimize the use of energy resources • Promote the recycling of energy resources • Use renewable energy
Distribution	• Minimize the use of product packaging materials • Use recyclable packaging materials • Optimize distribution routes • Use green energy vehicles
Usage	• Reduce power consumption of products • Prolong the durability of products
Waste	• Adopt an end-of-life recyclable component design

1. Coverage is calculated based on product revenue.

3-4 Decarbonization Practices
Low-Carbon Transportation

The use of low-carbon transportation is a key link in our journey towards net-zero emissions. We have categorized the field of transportation into cargo transportation, people transportation, and fuel and energy-related activities when inventorying land, sea, and air transportation. In 2023, we have already achieved 40% low-carbonization[1] across all transportation modes. We have plans to fully low-carbonize the transport modes within the factories as well as upstream and downstream land transportation by 2050. First, we will concentrate on implementing the use of low-carbon company vehicles and forklifts, as well as trucks, with a target of reaching 100% low-carbonization by 2040 and 2045, respectively, while driving logistics companies to reduce transportation-related emissions across the entire supply chain. Specifically, 85% of electric forklifts are already in use at the company, which is ahead of ASEH's low-carbon transportation plan. Each facility is also required to propose low-carbon transportation plans for the future, and formulate different carbon reduction strategies according to the type of transportation (as shown in the diagram below), to reduce greenhouse gas emissions from transportation.



Low-Carbon Transportation Plan

	Upstream and downstream land transportation	On-site trucks	Company vehicles	Forklifts
2023	-	-	10%	85%
2030	10%	10%	20%	>85%
2035	30%	30%	50%	>90%
2040	60%	60%	**100%**	**100%**
2045	**100%**	**100%**	-	-

1. The low-carbonization of vehicles is the percentage of the total number of low-carbon vehicles to the total number of vehicles in each factory, where the low-carbon transportation includes electric or hybrid electric forklifts, trucks, and company vehicles, and the total vehicles include all forklifts, trucks, and company vehicles.

3-5 Decarbonization Practices
Supply Chain Engagement

Low Carbon Management in the Supply Chain

Ensuring the accuracy of supply chain carbon emissions data and implementing carbon reduction measures are crucial to achieving ASEH's goal net zero emission goals. In order to manage the carbon emissions effectively across our supply chain, we have established a management plan that is based on five key dimensions of "strategy and goal setting", "data inventory", "carbon reduction actions", "performance verification", and "establishing a low-carbon value chain ecosystem".

Strategy and Goal Setting

1.Establish a low-carbon supplier selection and retention mechanism, and set quantitative carbon reduction targets.

- Include supplier carbon emissions (emission intensity or absolute emissions) in the selection and retention mechanism. Continuously replace high carbon-emission suppliers with low carbon-emission suppliers to to achieve supply chain carbon reduction.

2.Establish a tiered supplier management system, prioritizing large-scale and high-carbon emission material and equipment suppliers to set short, medium, and long-term carbon reduction goals and actions.

Data Inventory

Establish comprehensive supply chain carbon emission data, by requiring suppliers to conduct greenhouse gas and product carbon footprint inventories. High carbon emission and high procurement volume suppliers must obtain third-party certification for greenhouse gas (ISO 14064-1) and product carbon footprint (ISO 14067); reported carbon emission data is integrated into ASEH's sustainability platform.

- Conduct greenhouse gas emissions inventories of key suppliers and ensure data integrity through third-party verification.
- Ensure carbon inventory awareness and capabilities of first-tier suppliers to improve the quality of their carbon emission data.
- Assist key raw material suppliers to complete product carbon footprint inventory, allowing ASEH to understand the actual emissions across the supply chain.

Carbon Reduction Action

1.Provide adequate resources such as in-person training and online courses to help suppliers establish their carbon inventory and develop carbon reduction capabilities.

- Green Supply Chain: Collaborate with external consulting organizations on medium and long-term supply chain carbon inventory guidance programs. Assist suppliers, through on-site and online training, in establishing greenhouse gas and product carbon footprint inventory capabilities and obtaining external verification for ISO 14064-1 and ISO 14067 to improve the data integrity.
- Low-Carbon Action: Request suppliers to set carbon reduction and water conservation targets, and guide them in implementing reduction programs. In 2023, our supply chain achieved a 4.3% annual carbon reduction of 227,655 tCO_2e, and 4.8% annual water saving of 3,297,905 tons.
- Energy Transition: Collaborate with suppliers on the " Sustainability Plan for a Green Energy and Low Carbon Environment", providing guidance on the installation of renewable energy facilities and circular economy initiatives. The provision of a professional technical team has helped our suppliers in enhancing the operational efficiency of their renewable energy equipment, and maximizing energy recovery. In 2023, we achieved a total savings of 2.27 million kWh in electricity, and a carbon emissions reduction of approximately 1,338 tons.

2.The ASEH Environmental Protection and Sustainability Foundation has established the「Environmental Sustainability Verification Center」to offer guidance to suppliers on carbon inventory and third-party verification, as well as energy-saving and carbon reduction counseling.

- Analyze supplier emissions hotspots, conduct on-site visits, and provide guidance through the「Environmental Sustainability Verification Center」to identify carbon reduction opportunities and improve supplier energy efficiency.

Performance Verification

1.Continuously monitor the supply chain performance of the action plans to ensure progress towards achieving set goals.

2.Include carbon management initiatives requiring suppliers to improve their carbon management practices and performance in the supplier evaluation.

Establishing a Low-Carbon Value Chain Ecosystem

Collaborate with suppliers to advance sustainability initiatives. Leverage on the influence of the company in leading and guiding the supply chain to adopt a more proactive sustainability stance.

- Energy-saving machinery upgrade project.
- The ASEH Supplier Sustainability Award program is an incentive mechanism that actively supports suppliers in their carbon reduction transition.

Appendix

4-1 Appendix
Third Party Conformity Statement

bsi.

By Royal Charter

Conformity Statement

Climate related Financial Disclosure

This is to conform that

ASE Technology Holding Co., Ltd.
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Holds Statement No: CFD 801994

As a result of carrying out conformity check process based on TCFD requirement, BSI declares that:

- ASE Technology Holding Co., Ltd. follows the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) Guidance to disclose climate-related financial information which is clear, comparable and consistent against its organizational risks and opportunities as well as its financial impacts. The disclosure covers the four core elements of the TCFD and is prepared based on the seven guiding principles for effective disclosures.
- The maturity model for the Climate-related Financial Disclosures is **Level-5+: Excellence** grade.
- 與氣候相關的財務揭露的成熟度模型為**[第五級 Plus：優秀]**等級。

For and on behalf of BSI:

Managing Director BSI Taiwan, Peter Pu

Latest issue: 2024-06-25 Expiry date: 2025-06-24

Page: 1 of 2

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Statement number: CFD 801994

Location	Conformity Check Overall Result
ASE Technology Holding Co., Ltd. No. 26, Chin 3rd Rd. Nanzih Dist. Kaohsiung 811641 Taiwan 日月光投資控股股份有限公司 臺灣 高雄市 楠梓區 經三路 26 號 811641	The maturity model for the Climate-related Financial Disclosures is **Level-5+: Excellence** grade. 與氣候相關的財務揭露的成熟度模型為**[第五級 Plus：優秀]**等級。

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4-2 Appendix
TCFD Index

Dimension	General industry index (2021 edition)	Comparing Section	Page No.
Governance	(A) The board's oversight of climate-related risks and opportunities.	• Letter from the Chairman • Supervision at Management Level	04 07
	(B) Management's role in assessing and managing climate-related risks and opportunities.	• High-Level Assessment and Management	08
Strategy	(A) The climate-related risks and opportunities the organization has identified over the short, medium, and long term.	• Integrated Risk Management Process • Material Climate- and Water-related Risks and Opportunities	10 12
	(B) The impact of climate related risks and opportunities on the organization's businesses, strategy, and financial planning.	• Material Climate- and Water-related Risks and Opportunities	12
	(C) The resilience of the organization's strategy, taking into consideration different climate-related scenarios,including a 2° C or lower scenario.	• Analysis of Climate Transition Risks and Financial Impacts • Physical Risk Analysis	16 21
Risk Management	(A) The organization's processes for identifying and assessing climate-related risks.	• Integrated Risk Management Process	10
	(B) The organization's processes for managing climate-related risks.	• Integrated Risk Management Process	10
	(C) How processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	• Risk Management Organization Overview	09
Metrics and Targets	(A) The metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	• Integrated Risk Management Process	10
	(B) Scope 1, Scope 2 , and if appropriate, scope 3 greenhouse gas (GHG) emissions and the related risks.	• Refer to ASEH Sustainability Report (https://www.aseglobal.com/csr/csr-download/)	
	(C) The targets used by the organization to manage climate-related risks and opportunities and performance against targets.	• Net-zero Transition • Targets and Net-zero Emission Pathways • Net zero emissions • Decarbonization Practices	45 46 43 50

4-3 Appendix

TNFD Index

Dimension	General industry index (2023)	Comparing Section	Page No.
Governance	(A) The board's oversight of nature-related dependencies, impacts, risks and opportunities.	• Supervision at Management Level	07
	(B) Management's role in assessing and managing nature-related dependencies, impacts, risks and opportunities.	• High-Level Assessment and Management	08
	(C) Describe the organisation's human rights policies and engagement activities, and oversight by the board and management, with respect to Indigenous Peoples, Local Communities, affected and other stakeholders, in the organisation's assessment of, and response to, nature-related dependencies, impacts, risks and opportunities.	• NA	
Strategy	(A) The nature-related dependencies, impacts, risks and opportunities the organisation has identified over the short, medium and long term.	• Evaluating Nature-related Dependencies and Impacts • Major Nature-related Risk and Opportunity Metrics	30 31
	(B) The effect nature-related risks and opportunities have had on the organisation's business model, strategy and financial planning, as well as any transition plans or analysis in place.	• Major Nature-related Risk and Opportunity Metrics	31
	(C) Describe the resilience of the organisation's strategy to nature-related risks and opportunities, taking into consideration different scenarios.	• NA	
	(D) Disclose the locations of assets and/or activities in the organisation's direct operations and, where possible, upstream and downstream value chain(s) that meet the criteria for priority locations.	• Overlay Analysis of Natural and Biodiversity Hotspots • Supply Chain Environmental Risk Analysis	29 34
Risk and impact Management	(A)(1) Describe the organisation's processes for identifying, assessing and prioritising nature-related dependencies, impacts, risks and opportunities in its direct operations. (A)(2) Describe the organisation's processes for identifying, assessing and prioritising nature-related dependencies, impacts, risks and opportunities in its upstream and downstream value chain(s).	• Integrated Risk Management Process	10
	(B) Describe the organisation's processes for managing nature-related dependencies, impacts, risks and opportunities.	• Integrated Risk Management Process	10
	(C) Describe how processes for identifying, assessing, prioritising and monitoring nature-related risks are integrated into and inform the organisation's overall risk management processes.	• Risk Management Organization Overview	09
Metrics and Targets	(A) The metrics used by the organisation to assess and manage material nature-related risks and opportunities in line with its strategy and risk management process.	• Major Nature-related Risk and Opportunity Metrics	31
	(B) The metrics used by the organisation to assess and manage dependencies and impacts on nature.	• Major Nature-related Risk and Opportunity Metrics	31
	(C) Describe the targets and goals used by the organization to manage nature-related dependencies, impacts, risks and opportunities and its performance	• Major Nature-related Risk and Opportunity Metrics • Environmental Safeguarding Vision	31 42

4-4 Appendix
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20F
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