

TSMC 2025

Climate and Nature Report



Message from the Executive

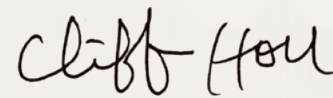
We are approaching a critical juncture in the transition to global sustainability. At TSMC, we believe that technology serves not only as an engine for industrial development but also as a key safeguard for the resilience of Earth's ecosystems. Building on our leadership in semiconductor technology, TSMC integrates sustainability governance directly into its core operations. The Company has aligned its net-zero roadmap with the temperature goals of the Paris Agreement, while incorporating the United Nations' '30 x 30' habitat protection target into its biodiversity strategy. In 2025, TSMC designated biodiversity as a material topic, further advancing its dual-track approach to climate mitigation and adaptation and nature and ecosystem conservation. Through technological innovation, the Company continues to safeguard the planet, moving steadily toward a future where people and nature thrive together.

To support global climate action, TSMC follows the Science Based Targets initiative (SBTi) pathway and has committed to Scope 1, Scope 2, and Scope 3 emissions reduction targets, aiming to achieve its short-term absolute reduction target by 2035. The Company also adopted Water Positive impact as a core indicator of climate resilience, expanding alternative water sources and advancing restoration projects. In 2025, the reclaimed water substitution rate at TSMC's Taiwan fabs increased to 18%. Overseas, construction began on our reclaimed water plant at TSMC Arizona, which plans to adopt Near Zero Liquid Discharge (NZLD) technology and restore local watersheds to improve habitat conditions and support sustainable development.

To protect natural ecosystems, TSMC focuses on two strategies: achieving No Net Loss (NNL) of nature and biodiversity and promoting ecological restoration and education. In 2025, the Company developed its [Nature](#)

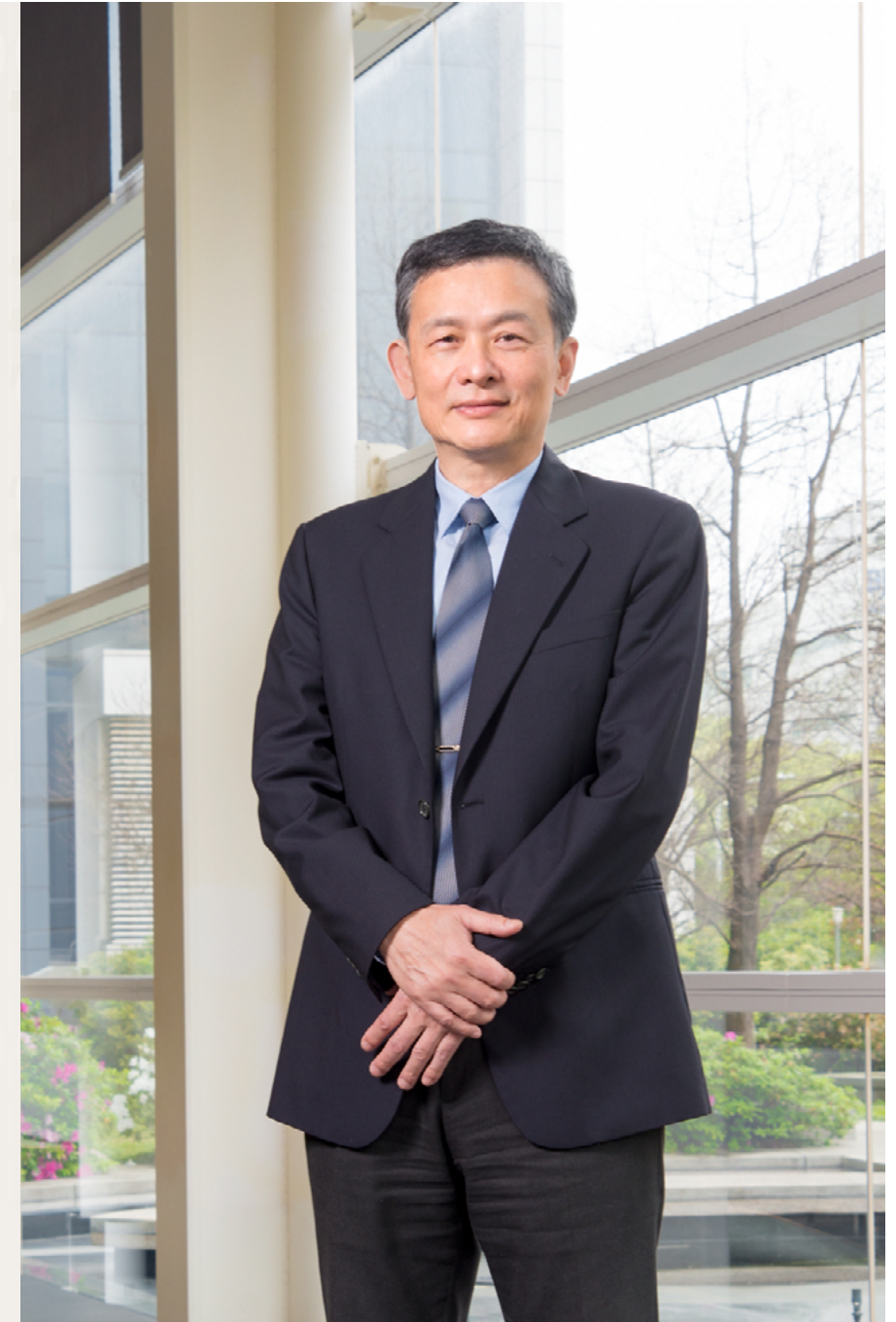
and Biodiversity NNL Action Blueprint and advanced the [Eco Plus! Ecological Harmony Program](#), which centers on three categories: habitats, species, and knowledge to support biodiversity conservation. TSMC also released the Biodiversity Screening Guidelines for Renewable Energy Suppliers in 2025, extending conservation considerations across the supply chain. The guidelines require business partners to align to our standards, committing to zero deforestation and participating in land conservation efforts. The Company plans to launch a series of training courses in 2026 to encourage supply chain partners to issue biodiversity commitment statements and work together to limit potential impacts on the natural environment.

Guided by its long-term commitment to environmental prosperity, TSMC will continue to advance green manufacturing while bringing together the broader industrial ecosystem and stakeholders to create shared value. The Company aims to achieve Net Zero emissions and Net Positive Impact (NPI) by 2050 and contribute new momentum to global climate and ecosystem protection through tangible actions, opening a new chapter of coexistence among technology, humanity, and nature.



Cliff Hou

Senior Vice President and Deputy Co-CEO





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Steadfast Conviction

Commitment to Environmental Co-prosperity

The World Economic Forum's [Global Risks Report 2026](#) has long identified environmental risks as a critical issue. The 2026 report notes that extreme climate events, biodiversity loss, natural resource scarcity, and environmental pollution remain among the top ten long-term global risks over the next decade, underscoring the growing severity of environmental challenges worldwide. To address these risks, TSMC follows its [ESG Policy](#), [Environmental Policy](#), [Climate Change Statement](#), [Water Statement](#), and [Biodiversity Statement](#) as guiding principles, planning and implementing climate mitigation and adaptation measures to reduce potential climate-related risks. The Company also drives ecological conservation efforts both in and beyond its fab sites, conserves natural resources, and works to protect biodiversity and the broader environment.

Since 2018, TSMC has followed the Task Force on Climate-related Financial Disclosures (TCFD) framework. Through cross-functional collaboration and consultation with external experts, the Company identifies climate-related risks and opportunities in its value chain, defines measurable indicators and targets, and ensures execution through management policies and action plans. Starting in 2023, TSMC expanded its focus beyond climate alone to the broader interdependence between business and nature by referencing the Taskforce on Nature-related Financial Disclosures (TNFD) framework and publishing its first Climate and Nature Report in 2024. The Company adopted the IFRS Sustainability Disclosure Standard S2 (Climate-related Disclosures), enhancing information transparency and stakeholder communication while strengthening sustainability governance.

TSMC continues to advance its climate response strategy, focusing on four key areas. Under "Energy Conservation and Carbon Reduction," the Company lowers operational carbon emissions through energy-saving measures, low-carbon technology adoption, and renewable energy use. Under "Climate Disasters Adaptation," TSMC adopts measures based on its [Climate Risk Adaptative Standards](#) and works with external partners to develop diversified water resources and restore watersheds, progressing toward its Water Positive goal. Through industry-leading semiconductor manufacturing technology, the Company also delivers more energy-efficient products and services to customers, advancing "Low-Carbon Product Innovation." Finally, under "Expanding Supply Chain Climate Impact," TSMC works with suppliers to develop pathways for low-carbon transition, strengthening green competitiveness across the value chain.

TSMC also follows its Biodiversity Statement to mitigate natural habitat degradation and species loss, protect aquatic and terrestrial ecosystems, and collaborate with stakeholders to promote ecological restoration and education, demonstrating its commitment to harmony between people and nature.

Roadmap to Net Zero Emissions and Milestone

TSMC aims to achieve net-zero emissions by 2050. Guided by its Energy Saving and Carbon Reduction Committee, the Company carried out energy-saving and carbon reduction actions in 2025, making further progress in expanding renewable energy use and diversifying supply. Annual renewable energy use rose to 5.78 billion kWh, with renewable energy accounting for 11.4% of electricity consumption at Taiwan fabs. Additionally, TSMC adopted offshore wind power, beginning in 2025. To advance green transformation across the supply chain, the Company encouraged suppliers to introduce renewable energy, working together to build low-carbon operating models and improve supply chain decarbonization performance.

On Earth Day 2025, TSMC announced its commitment to the Science Based Targets initiative (SBTi). The Company plans to establish ambitious decarbonization pathways covering Scope 1, 2, and 3 emissions and collaborate with global partners to advance environmental sustainability.



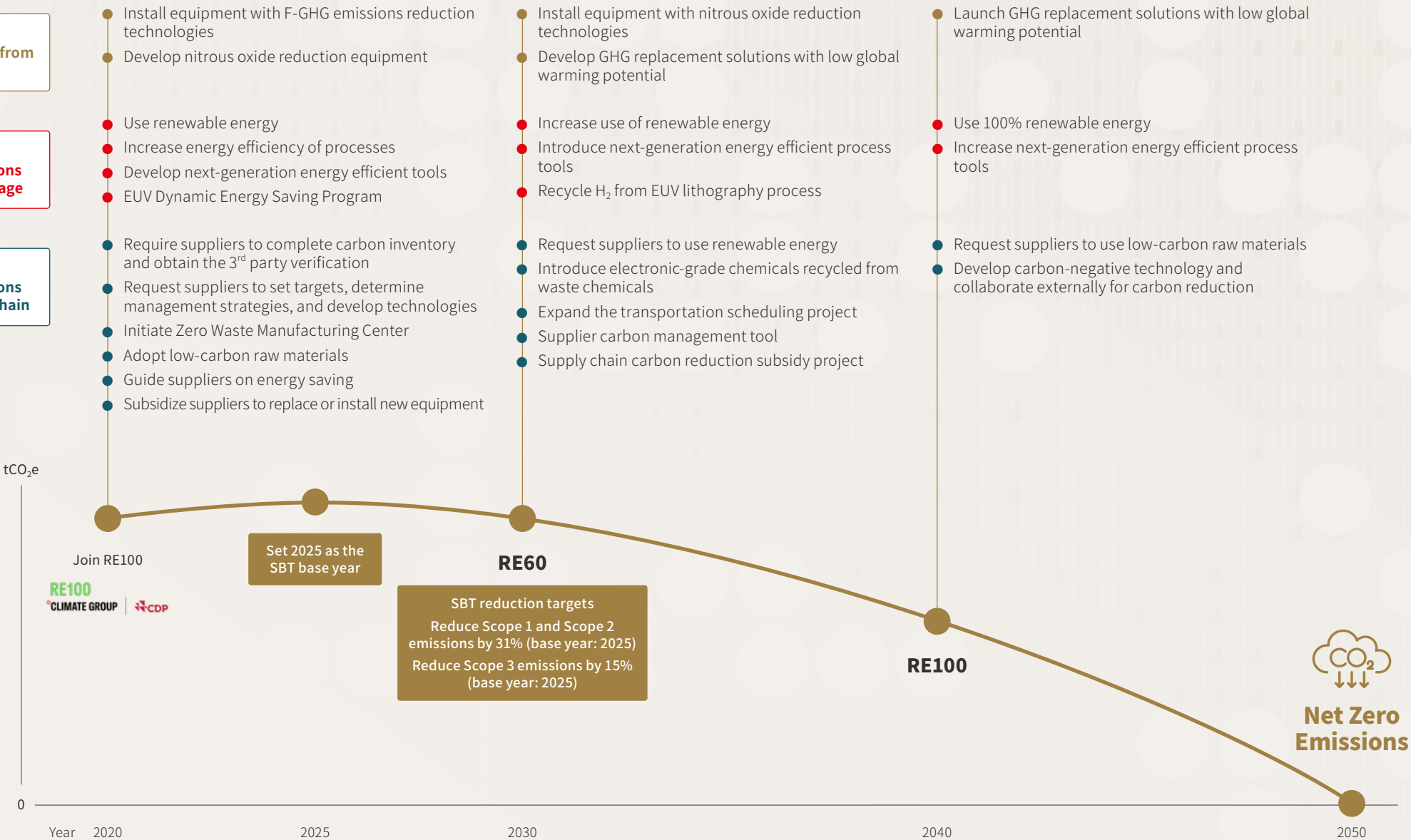
TSMC aligns its carbon reduction pathway with SBTi.

Roadmap to Net Zero Emissions

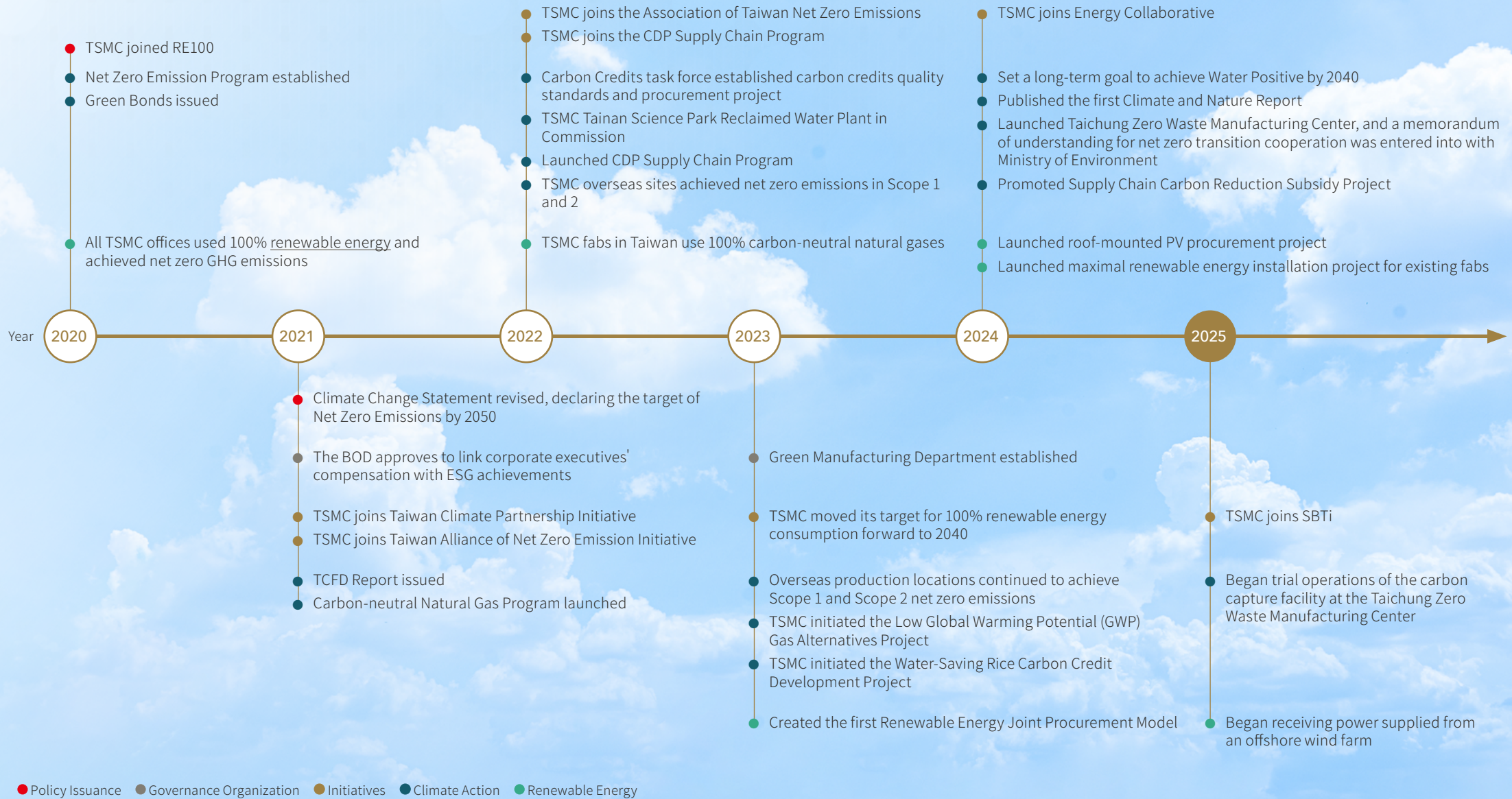
Scope1
Direct Emissions from
Processes

Scope2
Indirect Emissions
from Energy Usage

Scope3
Indirect Emissions
from the Value Chain

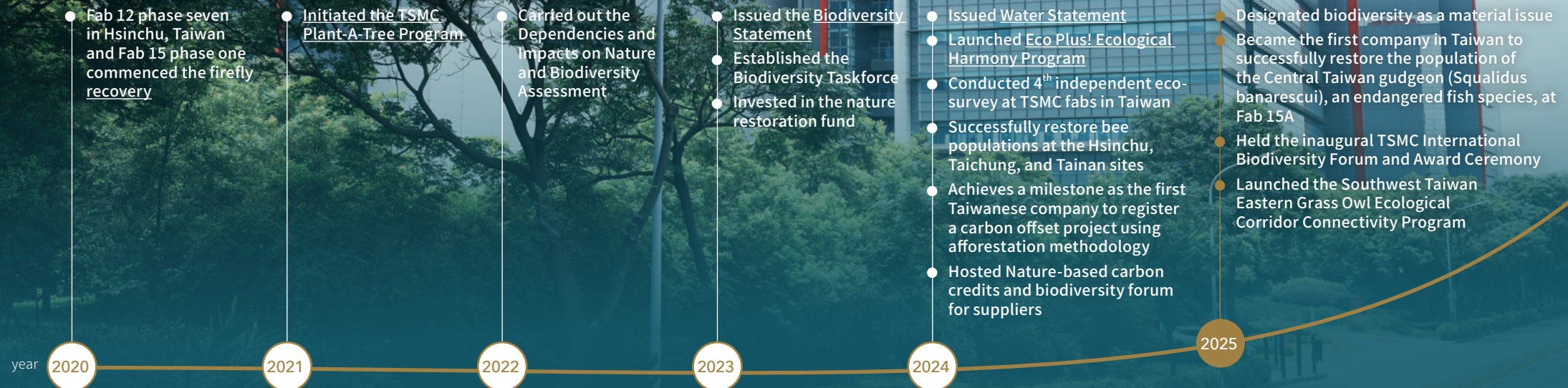


Transformation to Net Zero Milestones



Key Milestones Toward Nature-Positive Impact

In 2025, TSMC officially designated biodiversity as a material issue and worked with stakeholders to develop the [Nature and Biodiversity NNL Action Blueprint](#). The Company established a pathway toward Net Positive Impact (NPI) through short-, medium-, and long-term actions. The blueprint begins with methodology development and ecological restoration at TSMC's Taiwan fabs, expands to strengthen ecological network connectivity at overseas sites in the medium term, and adopts quantitative monitoring to improve ecosystem quality. TSMC aims to achieve Net Zero Deforestation, NNL, and NPI by 2050, fostering a future where nature and society thrive together.



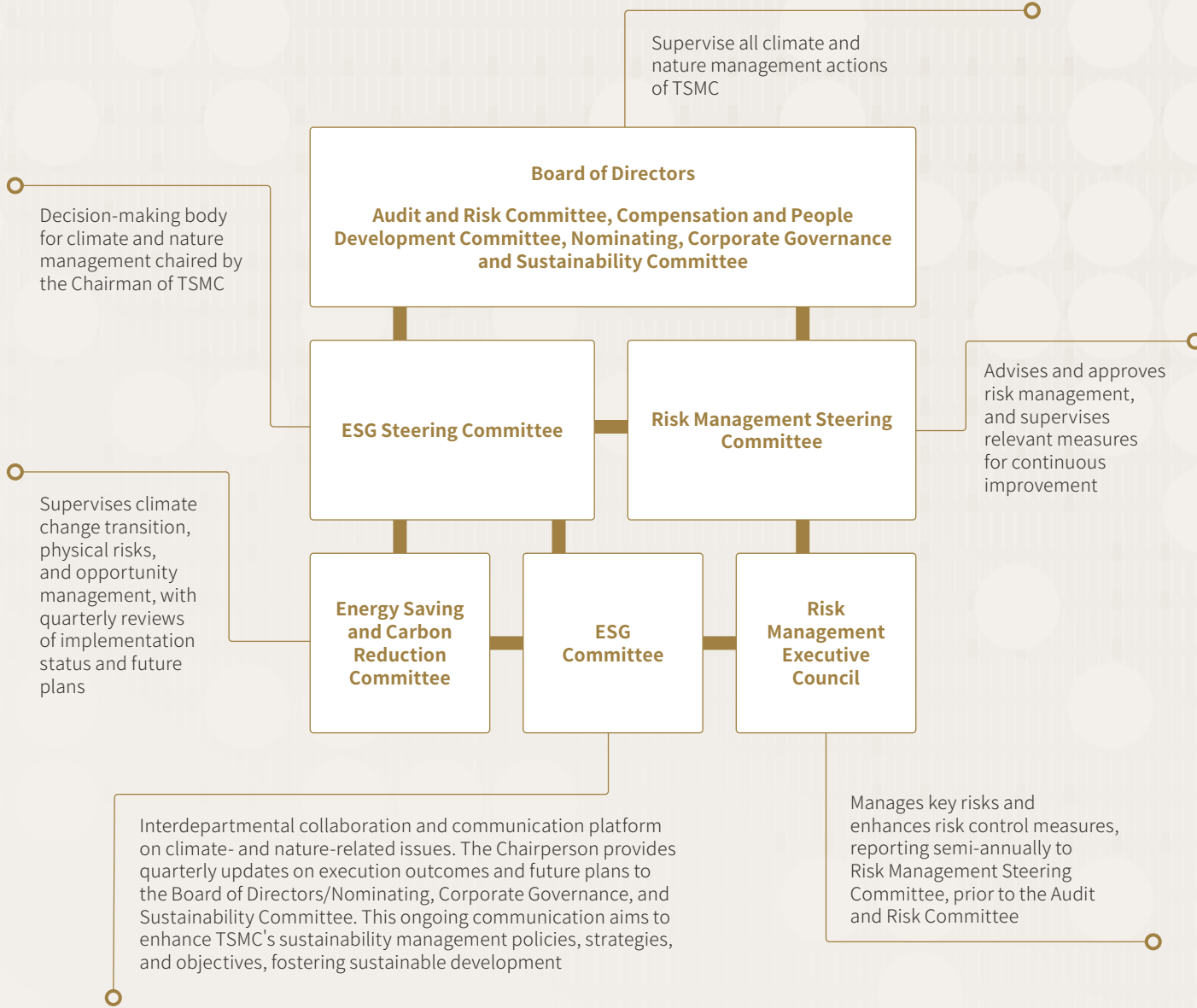
Climate and Nature Governance

Governance and Management Framework

TSMC follows its climate- and nature-related policies and statements as guiding principles, with the Board of Directors overseeing overall risk governance. The Board applies a risk-reward approach to optimize operational performance, a principle that also encompasses environmental, social, and governance (ESG) issues and supports the creation of long-term value for stakeholders. Under the Board's direction, the ESG Steering Committee sets the Company's short-, medium-, and long-term climate and nature management strategies. The ESG Committee serves as a platform for cross-functional resource integration, project collaboration, and communication, regularly reporting related goals, plans, and progress to the Board of Directors and the Nominating, Corporate Governance and Sustainability Committee. The Energy Saving and Carbon Reduction Committee oversees climate change mitigation and adaptation management, reviews progress each quarter, and develops future strategies.

To advance environmental sustainability and risk governance transformation, the Risk Management Executive Council updates progress on climate- and nature-related issues every six months. The Risk Management Steering Committee reports to the Audit and Risk Committee, conducted a comprehensive review of the Company's risk profile, including key risks and control measures as well as monitoring and mitigating risk within its defined risk appetite and tolerance levels. In addition, to enhance sustainability governance, the Board of Directors completed training in 2025 on its role in sustainability risk and crisis management.

Climate and Nature Governance and Management Framework



Enforce Climate and Nature Governance

Board Supervision and Guidance

Sound corporate governance is built on operational transparency, respect for shareholder rights, and an effective Board of Directors. TSMC applies this principle to its climate and nature management strategy, with the Board of Directors serving as the highest level of oversight and guidance. To fulfill this role effectively, the Board delegates responsibilities to the Audit and Risk Committee, the Compensation and People Development Committee, and the Nominating, Corporate Governance and Sustainability Committee. The chairpersons of each committee report to the Board each quarter on related activities and resolutions, ensuring governance effectiveness and transparency in strategy execution. For more information on the Board's expertise and experience, please refer to Section 3.2 "Board of Directors" in the Annual Report.



TSMC builds a robust and effective Board of Directors.

Essentials of Board Oversight on Climate and Nature

Governing Body	Responsibilities	Major Decisions in 2025 Before the Report Published
 Board of Directors	Oversee the Company's sustainable management strategies and actions	- Examined the implementation achievements related to climate and nature-related plans in the preceding year and established the target for the year, including low-carbon manufacturing, the use of renewable energy and reclaimed water, improvements in energy efficiency, resource recycling, water management, biodiversity, and other issues - Approved the issuance of unsecured corporate bonds to support funding needs, including TSMC's green-related expenditures
 Audit and Risk Committee	Oversee the Company's overall enterprise risks	Reviewed key risks and mitigation measures, including operational disruption risks arising from extreme weather, natural disasters, and water or power supply shortages; supply chain disruption risks associated with climate change and nature-related factors; and emerging risks resulting from unsuccessful climate transition efforts
 Compensation and People Development Committee	Evaluate and implement compensation for TSMC management on ESG-related performances	Linked shareholders' interests and ESG achievements to TSMC corporate executives' compensation by introducing the employee restricted stock awards (RSAs) issuance plan approved by the Board's resolutions and the Shareholders' Meetings
 Nominating, Corporate Governance and Sustainability Committee	Review the effectiveness of climate and nature management measures and work plans	Review the achievement of annual goals related to climate and nature, including the proportion of renewable energy usage, the reduction in water consumption per unit of product, the decrease in air pollutant emissions per unit of product, the waste recycling rate, as well as the progress of the net-zero emission pathway and strategies for 2050, along with annual ESG expenses

Management Responsibilities

TSMC's ESG Steering Committee serves as the central body for climate and nature governance and decision-making, chaired by the Chairman, with the ESG Committee Chairperson serving as Executive Secretary. The Committee sets the Company's long-term climate and nature goals and strategies and reviews them on a quarterly basis. The Risk Management Steering Committee, based on its holistic view of the Company's key risks, reports risk assessments and mitigation measures to the Audit and Risk Committee every six months. Under the oversight of the ESG Steering Committee and the Risk Management Steering Committee, TSMC executes and manages action plans related to climate- and nature-related issues through the ESG Committee, the Energy Saving and Carbon Reduction Committee, and the Risk Management Executive Council.



ESG Steering Committee

Chairperson	Chairman
Members	Senior executives from Operations, Research and Development, Corporate Information Technology, Finance, Legal, Materials Management, and Human Resources divisions
Frequency of Meetings	Quarterly
Tasks	The Chairman leads the management team in reviewing and formulating the Company's ESG vision, strategies, and long-term goals, while establishing ESG metrics in the compensation structure for senior management. Collaborating with the ESG Committee, they drive relevant initiatives to create long-term value.



Risk Management Steering Committee

Chairperson	Senior Vice President of Corporate Strategy Development
Members	Formed by Vice Presidents of functional organizations (with the head of internal audit as an observer)
Frequency of Meetings	Semi-annually
Tasks	- Recommend that the Board establish the Company's overall risk appetite, tolerance levels, strategy, and resource allocation, taking into account current and anticipated macroeconomic, technological, regulatory, environmental, and social trends - Conduct a comprehensive review of the Company's key risks, provide recommendations and assurance to the Board, and approve risk mitigation priorities



TSMC implements action plans for climate and nature.

ESG Committee

TSMC's ESG Committee serves as a cross-departmental collaboration and communication platform that integrates vertical and horizontal functions and is chaired by a senior executive appointed by the Chairman. The Committee guides cross-functional task forces in identifying sustainability issues that are relevant to the Company's operations, of concern to stakeholders, and with external impact. It develops corresponding strategies and work guidelines, allocates ESG-related budgets, coordinates resource allocation, and plans and executes annual programs, while tracking performance to ensure ESG strategies are fully embedded in TSMC's daily operations.

Energy Saving and Carbon Reduction Committee

TSMC's Energy Saving and Carbon Reduction Committee is responsible for executing and managing actions related to climate change risks and opportunities. Chaired by a senior executive from the operations organization, the Committee develops management plans on a quarterly basis, reviews implementation progress, and defines future plans to ensure the effective execution of related strategies.

Risk Management Executive Council

The Risk Management Executive Council is composed of fab and division director-level representatives. It is responsible for executing risk management processes and supporting the Risk Management Steering Committee in implementing and strengthening the Company's enterprise risk management framework.



TSMC integrates ESG strategies into daily operations.

	 ESG Committee	 Energy Saving and Carbon Reduction Committee	 Risk Management Executive Council
Chairperson	Senior executive appointed by Chairman	Senior executive from the Operations	Head of Risk Management Division
Members	Management representatives nominated by functional organizations relating to the economy, environment, society, and governance	Representatives were nominated by Operation, Facility, and Corporate ESH Division	Director-level representatives from functional organizations and fabs
Frequency of Meetings	Quarterly	Quarterly	Semi-annually
Tasks	• Identify material sustainability issues, climate risks and opportunities to formulate action plans • Oversee interdepartmental communication and coordinate resource integration • Compile ESG-related budgets • Cultivating Sustainability Literacy, Deepening ESG Culture • Tracking achievements across various categories of sustainability issues and promoting sustainable management through digital transformation • Integrate ESG metrics into employee performance evaluations and compensation to establish accountability and incentive mechanisms	• Discuss the strategies of physical and transition risks and opportunities from climate change • Formulate management plans, review implementation status, and discuss future plans	• Identify, assess, response, monitor and review risks to ensure that critical risks are managed appropriately and effectively • Lead cross-functional Risk Management Taskforces and promote risk management-related activities

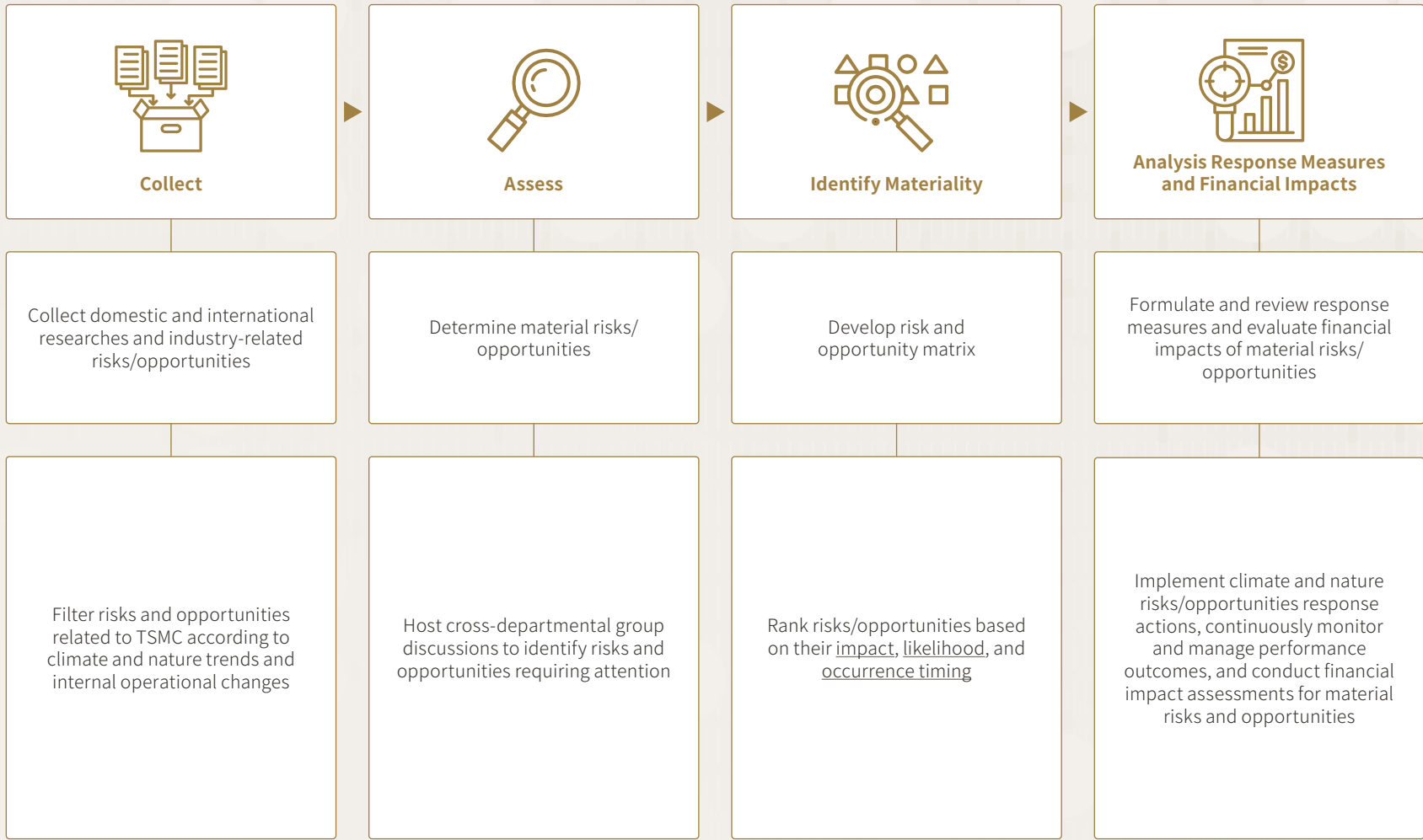
Risk Management

Risk Management Framework

TSMC is focused on long-term sustainable value for itself and its stakeholders. The Board of Directors oversees risk governance and delegates the Audit and Risk Committee to oversee the Enterprise Risk Management (ERM) framework and risk profile. This ensures effective execution of risk identification, assessment, response, monitoring, and review, while keeping key risks within the Company's risk appetite. At the operational level, the Risk Management Division works with the Risk Management Steering Committee, the Risk Management Executive Council, and Risk Management Taskforces to implement risk management frameworks and processes and enhance cross-functional collaboration and management effectiveness, assessing potential risks affecting production and the supply chain, including but not limited to energy shortages or disruptions, natural disasters, and water resource availability.

To address climate and nature-related challenges, TSMC references the TCFD and TNFD frameworks to identify and assess climate- and nature-related risks and opportunities every two years. Through scenario analysis and quantification of financial impacts, the Company develops response strategies, while the Corporate ESH Division reports assessment results to the ESG Committee to continuously strengthen risk management capabilities.

Climate and Nature Risks and Opportunities Identification Process





Major Climate Risks and Opportunities

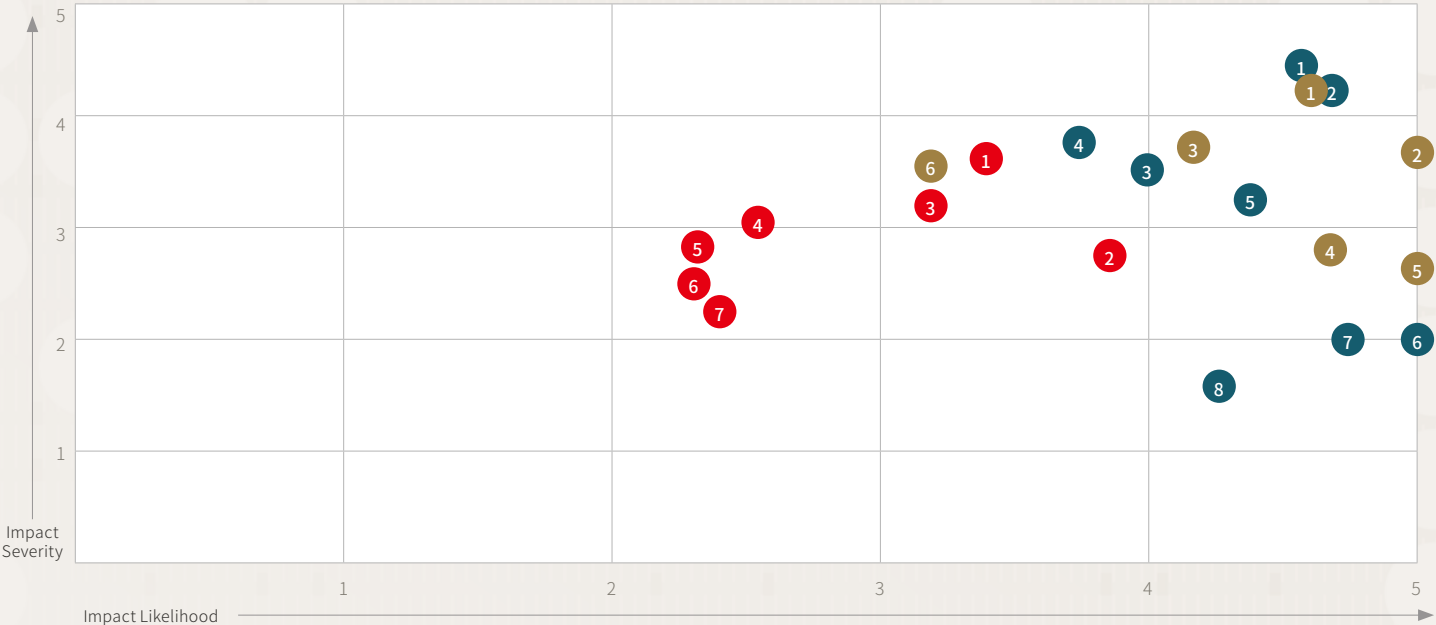
In 2025, TSMC added to the findings of its 2024 Nature and Climate Risk and Opportunity Identification Workshop and confirmed the top three risks as "net zero emissions, Environmental Impact Assessment (EIA) commitments, and uncertainties in the development of new energy-saving and carbon reduction technologies." The top three opportunities were identified as "drive low-carbon manufacturing, develop low-carbon products and services/ increase energy efficiency in customer products, and increase resilience against natural disasters.

TSMC continues to improve its climate management performance. Through its [Zero Waste Manufacturing Center](#), the [Water Positive](#) program, expanded renewable energy use, and the purchase of high-quality carbon credits, the Company works to deliver positive impacts, including carbon removal, ecological conservation, and local job creation. In supply chain management, TSMC follows the Science Based Targets initiative (SBTi) to conduct a comprehensive inventory of upstream and downstream carbon emissions and collaborates with suppliers to set targets and tracking mechanisms that meet SBT requirements. The Company also continues to implement its [T.S.M.C. Supply Chain Carbon Reduction Strategy](#), driving low-carbon transition in the industry and deploying supplier carbon management tools to track the progress of major emission contributors that have signed GHG reduction agreements.

In 2025, TSMC further expanded its Supply Chain Carbon Reduction Subsidy Project, increasing total subsidies from NT\$84 million in 2024 to NT\$160 million in 2025. This funding supports carbon reduction plans at 48 facilities across 31 suppliers, targeted for completion by 2028, with an estimated total reduction of 165,000 metric tons of carbon emissions, of which 80,000 metric tons will be counted toward TSMC's Scope 3 emissions reduction performance.

The top three climate-related risks are net zero emissions, EIA commitments, and uncertainties in the development of new energy saving/carbon reduction technologies.

Climate Risk and Opportunity Matrix



Opportunities

1. ● Drive low-carbon manufacturing
2. ● Develop low-carbon products and services/ Increase energy efficiency in customer products
3. ● Increase resilience against natural disasters
4. ● Improve company reputation
5. ● Improve plant energy efficiency (TSMC operations)
6. ● Participate in renewable energy plans/ Participate in carbon trading market
7. ● Promote water efficiency and diversification
8. ● Receive rewards from the public sector for offsetting carbon

Transition Risks

1. ● Net zero emissions
2. ● EIA commitments
3. ● Uncertainties in the development of new energy saving/carbon reduction technologies
4. ● Renewable energy regulations and procurement
5. ● GHG emissions and carbon taxes/ carbon fee control
6. ● Impact on company reputation

Physical Risks

1. ● Drought (TSMC operations)
2. ● Rising temperatures
3. ● Drought (supply chain)
4. ● Typhoon (supply chain)
5. ● Flood (supply chain)
6. ● Typhoon (TSMC operations)
7. ● Flood (TSMC operations)

● Short-term (within 1 year) ● Mid-term (1-5 years) ● Long-term (>5 years)



Financial Impact Analysis of Climate Change

Scope of Evaluation ● Upstream ● TSMC Operation ● Downstream

Transition
Risks/
Opportunities

Climate Risk	Current/Potential Financial Impacts	Climate Opportunities	Current/Potential Financial Impacts	Counter Measures
Net zero emissions ●●●	- Increased costs associated with the installation and operation of carbon reduction equipment - Higher expenses for procuring renewable energy and carbon credits - Revenue decline due to reduced orders if expectations from key customers are not met	Receive rewards from the public sector for offsetting carbon reductions ●	Implement carbon reduction initiatives or align with government policies to obtain public-sector carbon credit incentives and preferential treatments, thereby lowering operational costs	Current - Chart TSMC's net-zero emissions roadmap, formulate net-zero strategies, and regularly monitor implementation progress - Carry out GHG abatement efforts and engage in government incentive programs to accumulate carbon credits - Establish and execute a carbon credit purchasing strategy - Implement the T.S.M.C. Supply Chain Carbon Reduction Strategy - Deploy supplier carbon management tools, integrating emissions accounting, target setting, medium- to long-term emissions forecasting, and reduction planning - Develop a circular resource system and work with suppliers to recycle electronic-grade isopropanol and reuse biogas generated from anaerobic digestion of organic sludge Future - Invest in low-carbon energy research, including fuel cells, residual hydrogen power generation, and renewable electricity
		- Develop low-carbon products and service ●●● - Increase energy efficiency in customer products ●●●	Meet market expectations and demands for energy efficiency and emissions reduction, driving increased orders and attracting new customers	Current/Future - Continue allocating R&D resources to develop energy-efficient products - Increase the share of revenue from sustainable products that comply with the EU Taxonomy and Taiwan sustainable economic activity standards
EIA commitments ●	EIA regulations for new facility construction will raise operational costs related to electricity use, pollutant treatment, and reclaimed water consumption. Delays in renewable energy and reclaimed water acquisition may hinder advanced process manufacturing	Promote water efficiency and diversification ●●	Integrate internal and external resources to develop reclaimed water technologies, enabling process water savings and reclaimed water use, and ensuring stable operations and the deployment of advanced manufacturing lines	Current - Increase reclaimed water usage - Reinforce water management efforts and expand the number of fabs certified under the <u>AWS</u> standard - Maintain regular communication with EIA groups and review committee members, and track fulfillment of EIA commitments - Advance Water Positive projects, including ongoing groundwater recharge at the JASM site and river ecosystem improvement for the Verde River at TSMC Arizona Future - Develop diverse water sources to improve water resource resilience - Continue to advance Water Positive initiatives
Uncertainties in the development of new energy saving/carbon reduction technologies ●	Uncertainties in the development of carbon reduction/low-carbon power technologies lead to unstable power supply or hinder emission reduction efforts, resulting in increased operational costs	Improve plant energy efficiency ●	Reduce operational utility costs	Current/Future - The Energy Saving and Carbon Reduction Committee continuously promotes relevant actions and conducts quarterly progress reviews across all fabs. The committee uses annual energy conservation target achievement rates and the innovation level of energy-saving ideas as performance metrics to encourage the development and implementation of energy efficiency measures - Construct green buildings, secure green building certifications, and publicly share related experiences





Scope of Evaluation ● Upstream ● TSMC Operation ● Downstream

	Climate Risk	Current/Potential Financial Impacts	Climate Opportunities	Current/Potential Financial Impacts	Counter Measures
Transition Risks/ Opportunities	Renewable energy regulations and procurement ●	– Uncertainties in renewable energy regulations pose risks throughout the development and grid connection process, increasing both operational and compliance costs	– Participate in renewable energy plans ● – Participate in carbon trading markets ●	– Engage in recognized domestic and international carbon reduction/renewable energy development projects and carbon removal programs to obtain carbon credits and renewable energy certificates as valuable assets – Procure renewable energy in advance to ensure capacity expansion	Current – Commit to achieving RE100 by 2040 and net zero emissions across global operations by 2050 – Renewable energy task force collaborate with industry associations and government bodies to expedite renewable energy development and diversify the green electricity strategy – Conduct a diverse carbon credit procurement plan and engage in credit-related collaboration projects Future – Maintain engagement with industry associations, advocate carbon-trading mechanisms to the government, participate in collaborative projects, and broaden carbon offset sources
	GHG emissions and carbon taxes/carbon fee control ●	– Meeting carbon regulatory requirements involves buying carbon credits or paying carbon fees, raising operating costs			
	Impact on company reputation ●●●	– Failure to meet stakeholder expectations damages corporate reputation and results in lower international ratings or evaluations	– Improve company reputation ●●●	– Develop low-carbon products and services and pursue green manufacturing, earning sustainability-related awards and reinforcing stakeholder confidence	Current – Maintain dedication to green manufacturing and innovation, and enhance corporate image through transparent disclosures – Foster strong partnerships with global customers to jointly develop more energy-efficient products Future – Submit an SBTi-aligned absolute emissions reduction plan in 2026, using 2025 as the baseline year, and obtain SBTi validation
Physical Risks/ Opportunities	Flood/Drought/Typhoon (TSMC operations, supply chain) ●●	– Disruptions in production lead to financial losses and a decline in revenue	– Increase resilience against natural disasters ●●●	– Strengthen natural disaster defenses to enhance operational resilience and minimize operational disruptions and potential losses	Current/Future – Assess risks of drought, flooding, and typhoons at fabs, and devise and execute mitigation measures – Require suppliers to evaluate the risks of droughts, floods, and typhoons at their operational facilities and to implement actions to minimize disruption in production and logistics – Continuously monitor global water conditions, refine emergency response procedures, and conduct regular drills – Implement typhoon monitoring mechanisms across fabs and the supply chain, including pre-landfall inspections and emergency response procedures – Develop diversified water resources, such as industrial reclaimed, municipal reclaimed, and desalinated water, to mitigate regional water resource pressure
	Rising temperatures ●●●	– Growing needs for air conditioning and insulation drive up electricity consumption, costs, and carbon emissions	– Drive low-carbon manufacturing ●●●	– Adopt renewable energy sources and upgrade energy-saving technologies and performance to decrease operating costs	Current/Future – The Energy Saving and Carbon Reduction Committee has established five dedicated teams to advance energy efficiency programs and set renewable energy usage targets

Financial Impact Analysis of Climate Risks and Opportunities

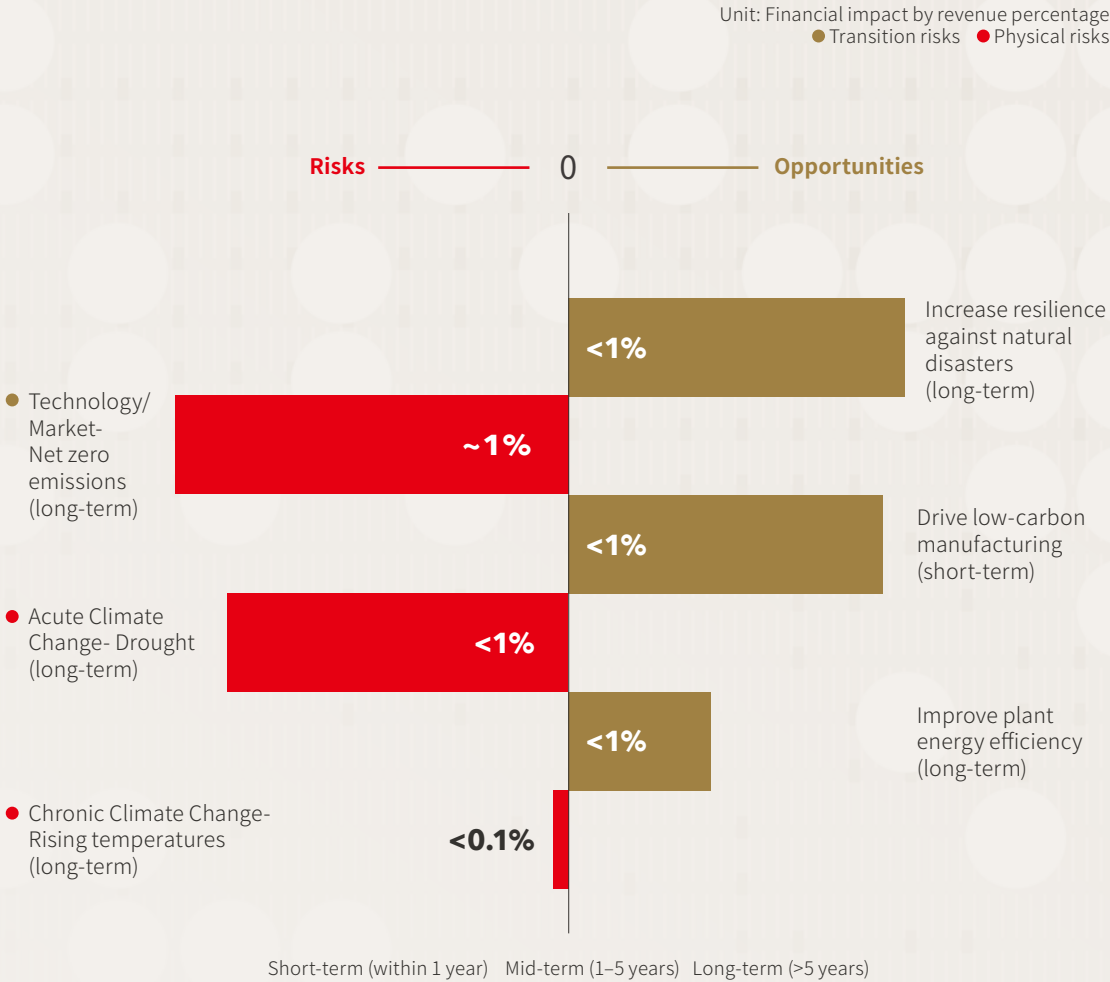
TSMC conducts financial impact assessments on key transition and physical risks and opportunities, providing a basis for strategies to mitigate risk, build resilience, and expand opportunities. The financial impact of transition risk mainly stems from costs related to achieving net-zero emissions by 2050 and meeting SBT greenhouse gas reduction requirements, including the installation and maintenance of energy-saving and carbon reduction facilities, as well as the purchase of renewable electricity, renewable energy certificates, and carbon credits. These costs are estimated at around 1% of the Company's revenue. The financial impact of physical risk derives from higher electricity costs due to rising temperatures and the potential operational impact of droughts, estimated at less than 0.1% and 1% of revenue, respectively.

In addition, the financial impact analysis of climate opportunities covers savings in energy and resource costs from low-carbon manufacturing, benefits from resource circularity, the development of low-carbon products and services, improved energy efficiency of customer products, greater resilience to natural disasters, and enhanced energy efficiency at fabs. These factors support revenue growth and create greater value for TSMC.



TSMC formulates action strategies based on impact assessments.

Financial Impact Analysis of Climate Risks and Opportunities



Note 1: Regarding risks, financial impact disclosures focus primarily on transition and physical risks.

Note 2: Regarding opportunities, financial impact assessments for revenue increases from low-carbon product and service development are not disclosed due to the involvement of financial forecasting.

Climate Scenario Analysis

In alignment with the TCFD framework and international guidance, TSMC analyzes the potential impact of specific transition and physical risks on its global operations and supply chain under different greenhouse gas emission control and climate scenarios. For transition risk, the Company references the International Energy Agency's (IEA) World Energy Outlook 2025 (WEO 2025) and uses projected carbon prices under the Net Zero Emissions by 2050 Scenario (NZE) and the Stated Policies Scenario (STEPS) for impact assessment. For physical risk, TSMC references the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report (AR6) and applies the low-emission scenario (SSP1-2.6) and very high-emission scenario (SSP5-8.5) under the Shared Socioeconomic Pathways (SSPs) to analyze the impact of extreme weather events on global operations and supplier sites.



TSMC analyzes transition and physical risk impacts on operations and supply chains.

Climate Scenarios Description

	Selected Scenario	Scenario Explained & Impacts	Increase in Temperature by End of Century	Source
Transition Risk	NZE Net - Zero Emissions by 2050 scenario	To ensure that global warming is contained below 1.5°C from preindustrial levels by the end of the century, energy bureaus around the world work to achieve net zero emissions by 2050. Countries maximize technical feasibility, cost efficiency, and social acceptance and minimize reliance on negative emission technologies, all the while ensuring economic growth and stable energy supplies	~ 1.5°C	IEA WEO 2025
	STEPS Stated policies scenario	The likely future of energy systems based on trajectories created by existing carbon reduction policies and measures set forth by governments. Under STEPS, carbon emissions in the future will largely be the same as today, and the world will not achieve net zero emissions	~ 2.5°C	
Physical Risk	SSP1-2.6 Low-emission scenarios	Under the mitigated scenario, the global CO ₂ emissions decrease significantly; however, the achievements are less favorable than expected; it is estimated to achieve net zero emissions by approximately 2075	~ 2°C	IPCC AR6
	SSP5-8.5 High-emission scenarios	The rapid growth of the global economy heavily relies on the development of fossil fuels and high-energy-intensive industries, with barely any constraints from climate policies, leading to a doubling of GHG emissions by 2050. Against this backdrop, Taiwan's rainfall may increase by 15% by the end of the century; however, the distribution of rainfall variability is broader and carries higher uncertainty. Rainfall in other regions is also expected to rise due to the increased influence of the East Asian monsoon rain belt	> 4°C	

Transition Risks - Impact Analysis of Regulatory Carbon Pricing

TSMC evaluates the financial impact of carbon pricing mechanisms under current or planned local regulatory frameworks at each of its global operating sites. In the NZE and STEPS climate scenarios, the Company analyzes two pathways: "TSMC does not continue to implement carbon reduction management measures" and "TSMC actively pursues its goal of net-zero emissions by 2050," to assess the potential financial impact of carbon pricing. The results show that the financial impact is higher under the NZE scenario than under STEPS. However, in the NZE scenario, if TSMC actively advances low-carbon manufacturing, renewable energy use, and energy efficiency improvements, the Company can offset carbon pricing risks. The financial impact is projected to decline from 2–3% of revenue to below 0.1% by 2040.

Financial Impact Analysis of Transition Risks

Unit: Financial impact as percentage of revenue (%)

Scenario		Carbon pricing under STEPS		Carbon pricing under NZE	
Year		2030	2040	2030	2040
Reduction Pathway	Pathway 1: TSMC does not continue to implement carbon reduction management measures	0.1~0.5%	0.5~0.1%	1~2%	2~3%
	Pathway 2: TSMC actively reduces emissions and achieves its goal of Net Zero Emissions by 2050	<0.1%	<0.1%	0.1~0.5%	0.01~0.1%

- Note 1: Financial impact only considers the impact from regulatory carbon pricing and does not include associated carbon reduction Costs.
- Note 2: Carbon prices are based on the WEO 2025 by IEA. The STEPS scenario does not provide carbon price estimations for the U.S., using the Announced Pledges Scenario (APS) instead for carbon price estimation. The APS scenario is one of the established policy scenarios, and the difference between APS and STEPS lies in the assumption that all countries will achieve their committed targets as scheduled.
- Note 3: For Taiwan sites, based on the preliminary recommendations from the 5th Carbon Fee Rate Review Committee, announced by the Ministry of Environment on October 7, 2024, it is estimated that starting from 2030, the general rate per metric ton of CO2 equivalent will range from NT\$1,200 to NT\$1,800.
- Note 4: TSMC's operations subject to carbon pricing mechanisms are assumed to comply with current or planned regulations in their respective locations: (1) In Taiwan, the Ministry of Environment will launch a carbon fee collection mechanism starting in 2026 for major emitters with annual carbon emissions exceeding 25,000 metric tons in the previous year. Assuming no preferential rates, carbon fees will be levied based on annual emissions; (2) In Shanghai, industrial enterprises are subject to Shanghai Administrative Measures for Carbon Emissions Trading (Trial Implementation) regulations and are required to purchase carbon credits when their emissions exceed their emissions quota. Any emissions exceeding the allocated quotas need to be offset by purchasing carbon credits. It is assumed that in the years 2030 and 2040, the direct emission quotas will be 99% of the baseline quota; (3) In Washington state, based on The Cap-and-Invest Program, free quotas will be issued based on carbon intensity benchmarks between 2015 and 2019. It is assumed that in the years 2030 and 2040, the free quotas will be 97% and 94% of the baseline, respectively.

Physical Risks - Impact Analysis of Extreme Weather Events

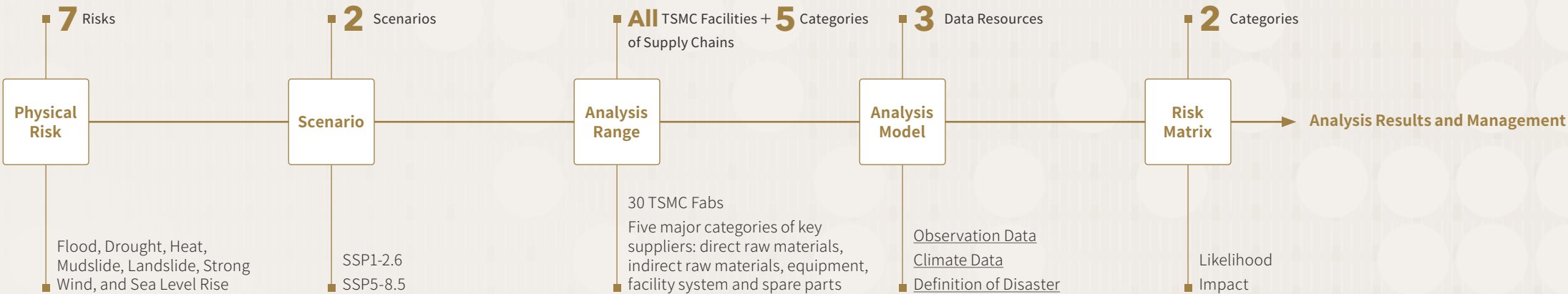
TSMC references the low-emission (SSP1-2.6) and very high-emission (SSP5-8.5) scenarios under the IPCC AR6 SSP framework to conduct short-, medium-, and long-term physical risk assessments across its global fabs and five categories of critical suppliers: direct raw materials, indirect raw materials, equipment, fab facilities, and parts and components. The assessment covers risks such as flooding, drought, extreme heat, typhoon-related strong winds, heavy rainfall-induced debris flows and landslides, and sea level rise. The Company incorporates the results into its Climate Risk Adaptive Standards to enhance operational resilience.

The analysis shows that drought is the most significant physical risk, concentrated in Chiayi, Tainan, Kaohsiung, and Arizona, with indirect raw material suppliers facing the highest exposure. Flood risk is generally low, with only the Nanjing fab and certain direct raw material suppliers located in high-risk areas. Extreme heat risk increases under more severe scenarios and mainly affects TSMC's Arizona fab and certain suppliers. Risks from debris flows, landslides, strong winds, and sea level rise remain limited in the short, medium, and long term, with minimal impact on TSMC and its supply chain.



TSMC incorporates assessment results into climate adaptation guidelines to boost resilience.

Scenario Analysis Methodology and Process



Physical Risk Management of TSMC

TSMC has established Climate Risk Adaptive Standards, which cover power shortages, flooding, water scarcity, strong winds, regulations, customer requirements, and other stakeholder expectations. The Company sets response measures and regularly tracks implementation progress. These standards are also integrated into new fab design specifications, strengthening operational resilience against physical risks across all sites. For details, please refer to the "[Adaptation to Climate Disasters](#)" section.

Physical Risk Management of the Supply Chain

In response to shifts in the semiconductor industry and evolving sustainability regulations, TSMC has built a digital supplier risk management system. Through structured assessment, screening, and audit processes, the Company standardizes risk warning and control mechanisms to ensure suppliers meet sustainability requirements and to mitigate potential risks related to climate, human rights, and other areas. TSMC also works closely with suppliers to set targets and provides training resources to improve sustainability performance and resilience.

To support its global footprint, TSMC pursues material supply diversification and localization strategies. The Company drives risk management at the source by empowering suppliers to enhance their R&D capabilities, product quality, process innovation, supply stability, and carbon reduction capacity.

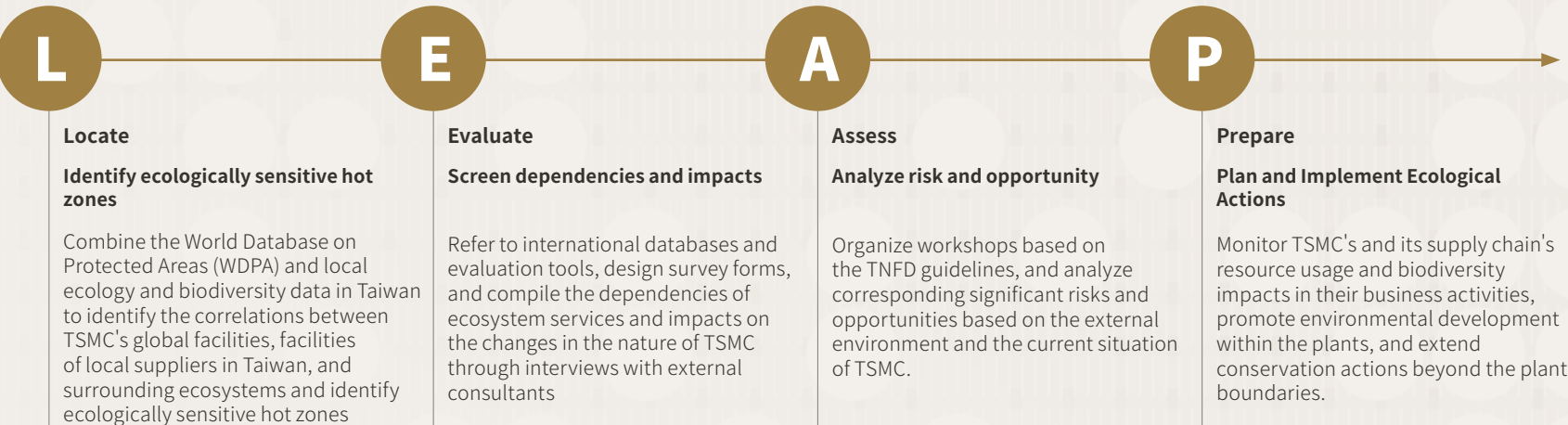


TSMC helps suppliers enhance sustainability performance and resilience.

Natural LEAP Assessment

To integrate technology with nature, TSMC has followed Taskforce on Nature-related Financial Disclosures (TNFD) Locate, Evaluate, Assess, and Prepare (LEAP) guidance since 2023 to develop an overall assessment process for conservation actions. The Company identifies nature dependencies and impacts across its global fabs and Taiwan's local supply chain and converts these findings into strategies to address financial risks and opportunities. Building on this assessment, TSMC referenced the AR³T Action Framework in 2025 to advance ecological actions across four dimensions—Avoid, Reduce, Restore and Regenerate, and Transform—to safeguard biodiversity.

LEAP Process



TSMC drives ecological actions through four dimensions.



Dependencies of TSMC and Supply Chain on Ecosystem Services

Categories	Dependencies	Description of the dependence
Provisioning	Surface Water	Water is a critical resource for semiconductor manufacturing. TSMC's global fabs primarily rely on local surface water or groundwater supplies. Unstable water availability may affect the operational resilience of both the Company's and its value chain
	Groundwater	
	Water Flow Maintenance	
Regulation And Maintenance	Climate Regulation	Imbalances in natural climate regulation may increase the likelihood of extreme weather events, affecting water and electricity supplies at operating sites, increasing employee health risks, and potentially disrupting production due to flooding
	Flood And Storm Protection	
	Water Quality	Process water quality is essential to semiconductor manufacturing. Water quality degradation caused by insufficient water availability during dry seasons, reservoir eutrophication, or elevated particulate concentrations may increase the burden on water treatment systems
	Water Filtration	
	Ventilation	Taiwan is occasionally affected by dust storms and haze. Declining air quality and elevated particulate concentrations may increase the burden on cleanroom air intake systems
	Air Filtration	Poor atmospheric circulation may result in inadequate ventilation, potentially affecting workplace comfort and employee health

Impacts of TSMC and Supply Chain on Changes in Nature

Categories	Dependencies	Description of the dependence
Climate change	GHG Emissions	Unmanaged greenhouse gas emissions from operations may accelerate global warming and exacerbate climate change, increasing the likelihood of extreme weather events and affecting ecosystems
Resource Use/ Replenishment	Other Resource Use	Wafer fabrication relies on specific raw materials. If upstream suppliers extract rare or specialty metals in ways that degrade the environment and ecosystems at mining sites, this may affect the stability of the raw material supply chain
	Water Use	Water is essential to semiconductor manufacturing. Excessive withdrawal or overuse may disrupt regional water supply and demand balance and adversely affect aquatic ecosystems
	Freshwater Ecosystem Use	
Land/Water/ Ocean Change	Marine Ecosystem Use	Seabed piling and construction for offshore wind facilities may alter marine environments and affect marine ecosystems
	Terrestrial Ecosystem Use	New fab construction may change regional land-use patterns, alter landscapes, and limit habitats for terrestrial species
	Water Pollutants	Improperly managed chemicals used in operations may contaminate water bodies and pose risks to freshwater ecosystems and water quality
Pollution/ Pollution Removal	Solid Waste	Improperly managed general and hazardous industrial waste from operations may cause environmental pollution and threaten ecosystem safety
	Non-GHG Air Pollutants	Air pollutants generated from manufacturing processes and high-temperature exhaust gas treatment, as well as particulate emissions from new fab construction, may degrade air quality and affect human health and ecosystems if not properly managed

Potential Impact of the Supply Chain on Natural Ecosystem

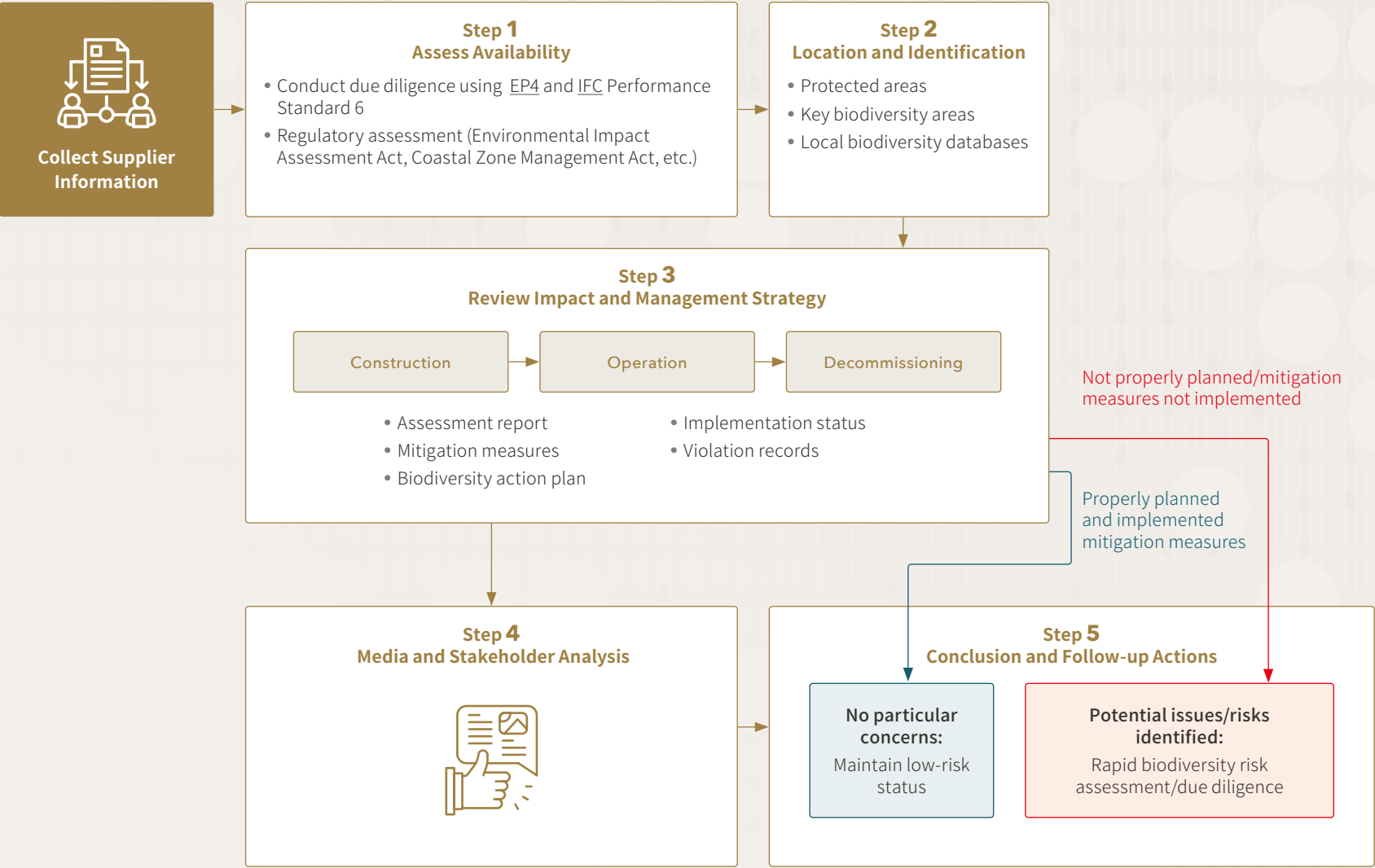
TSMC follows the Sector Actions Towards a Nature-Positive Future jointly issued by the World Economic Forum (WEF) and the World Business Council for Sustainable Development (WBCSD) to conduct ecological hotspot overlay analyses for suppliers in the chemical, energy, and waste management industries, and ensure that ecological monitoring is implemented. The Company also incorporates biodiversity compliance requirements into its Supplier Code of Conduct and enhances supplier awareness through forums and training.

To enhance nature governance across its value chain, TSMC developed the Biodiversity Screening Guidelines for Renewable Energy Suppliers in 2025, introducing a five-step process—Assess, Identify, Measure, Verify, and Act—to manage potential ecological risks and impacts associated with renewable energy development. TSMC plans to incorporate the Guidelines into its procurement evaluation criteria.

To enhance nature governance across its value chain, TSMC developed the Biodiversity Screening Guidelines for Renewable Energy Suppliers in 2025, introducing a five step process—Assess, Identify, Measure, Verify, and Act.

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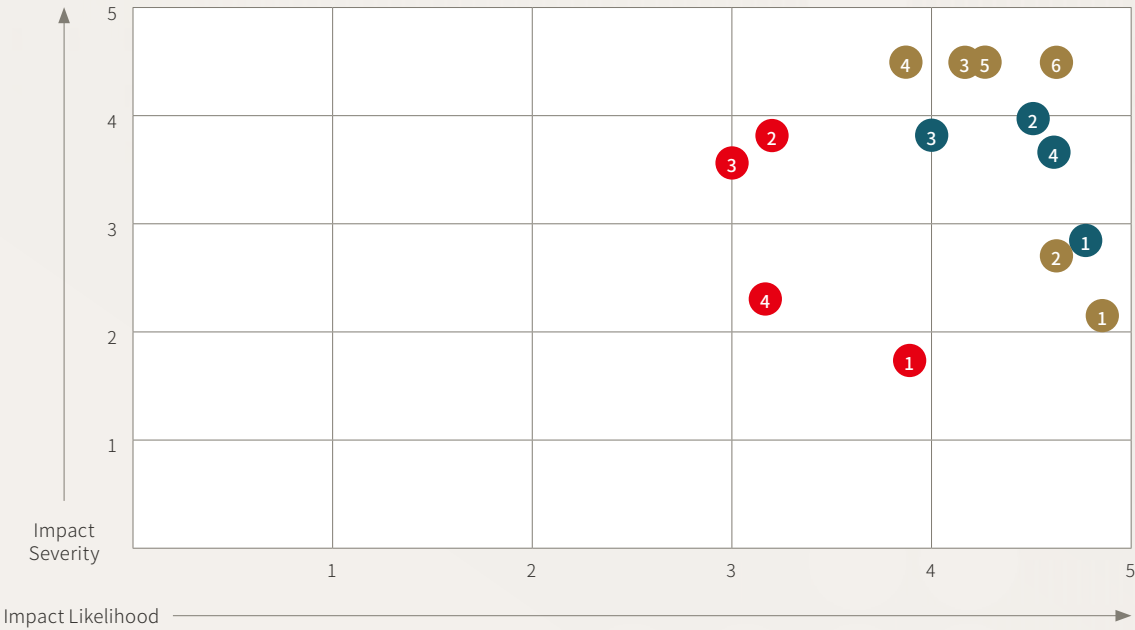
Biodiversity Screening Guidelines for Renewable Energy Suppliers – Five Steps



Analyzing Risk and Opportunity

In 2025, TSMC continued to address three nature-related transition risks: shift toward low-nature-impact technologies/operations, reputational risk due to negative impacts on nature, and increasing customer/investor concerns over nature-related issues. The Company also pursued three opportunities: shifting toward high-efficiency production to reduce nature-related dependencies and impacts, restoration, protection, or conservation of ecosystems or habitats, and nature-positive actions that support ecological restoration and boost brand value. TSMC converts these risks and opportunities into action strategies and takes concrete measures under its Biodiversity Statement.

Nature-related Risk and Opportunity Matrix



Note: In response to the global nature crisis highlighted in the World Wildlife Fund's (WWF) [Living Planet Report](#), which reveals a 73% average decline in monitored wildlife populations over the past 50 years, TSMC focuses its identification of nature-related risks and opportunities on the short and medium term to build a more agile and resilient response mechanism.

and impacts, restoration, protection, or conservation of ecosystems or habitats, and nature-positive actions that support ecological restoration and boost brand value. TSMC converts these risks and opportunities into action strategies and takes concrete measures under its Biodiversity Statement.

	Short-term (within 1 year)	Mid-term (1–5 years)	Long-term (>5 years)
Transition Risks	2 Increasing customer/investor concerns over nature-related issues 3 Reputational risk at the EIA stage due to negative impacts on nature 4 Reputational risk due to suppliers' negative impacts on nature 6 Shift toward low-nature-impact technologies/operations	1 Regulatory revisions and potential nature-related levies 5 Reputational risk from failing to meet nature-related commitments	-
Physical Risks	1 Impact of ambient air composition on facilities	2 Water supply shortage 3 Shortfalls in renewable energy supply 4 Environmental degradation caused by renewable energy supply	-
Opportunities	1 Transitioning to circular operations to reduce nature-related dependencies and impacts 2 Shifting toward high-efficiency production to reduce nature-related dependencies and impacts 3 Nature-positive actions that support ecological restoration and boost brand value 4 Restoration, protection, or conservation of ecosystems or habitats	-	-

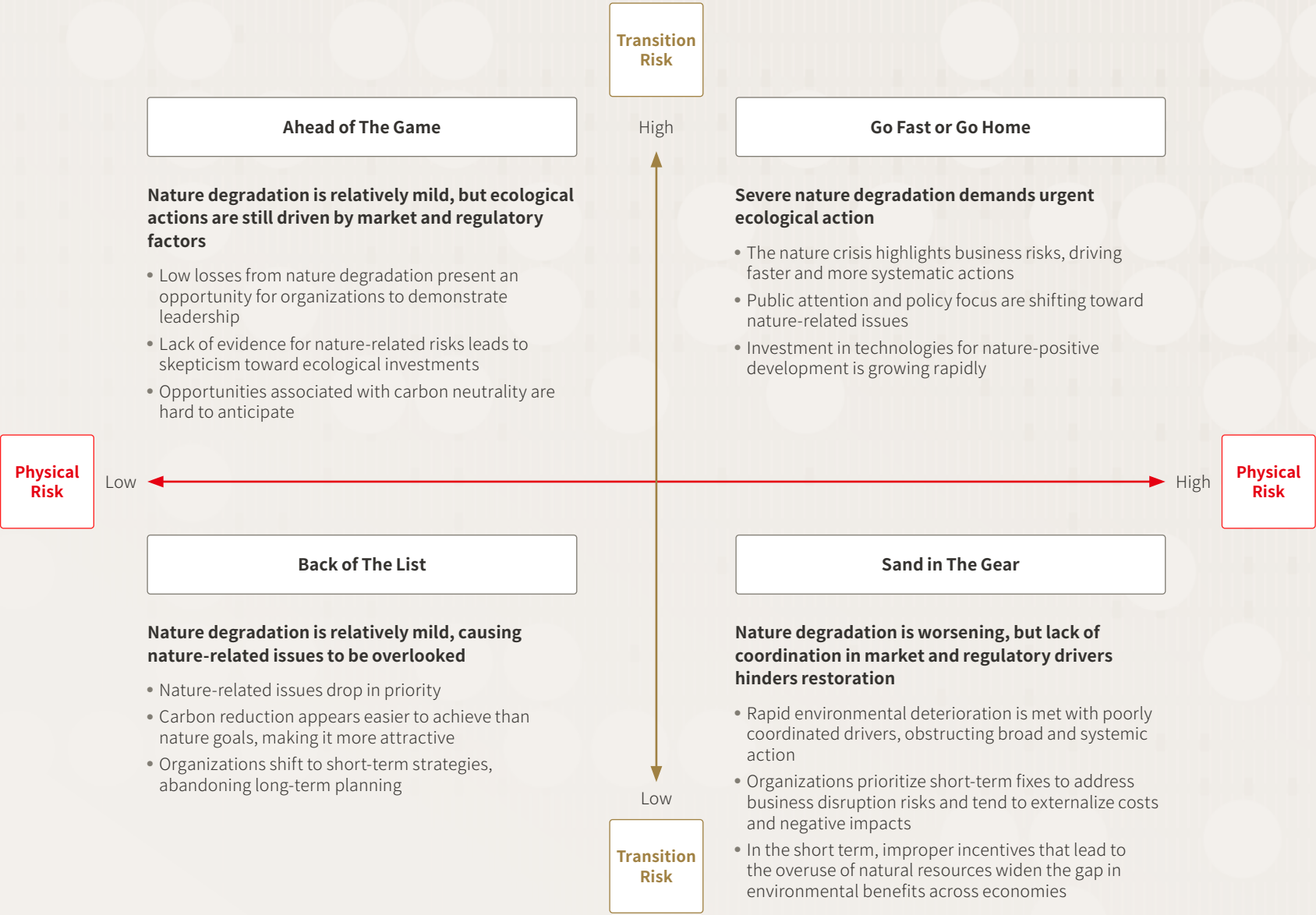
Natural Scenario Analysis

TSMC applies the TNFD framework for scenario analysis and evaluates four scenarios—"Ahead of the Game," "Go Fast or Go Home," "Sand in the Gear," and "Back of the List"—based on the extent of ecosystem service degradation (physical risk) and the alignment of market and non-market drivers (transition risk). As global attention to nature-related issues increases, alignment of market and non-market drivers has gradually improved, while uncertainty remains regarding the degree of ecosystem degradation. TSMC therefore prioritizes the "Ahead of the Game" and "Go Fast or Go Home" scenarios as the basis for nature risk management and ecological action planning.



TSMC conducts nature scenario analysis using the TNFD framework.

The Four Possible Future Scenarios of TNFD





Natural Risks and Opportunities Countermeasures

● Transition Risks / Opportunities ● Physical Risks / Opportunities

Nature-related Risks	Risk Issues and Description		Nature-related Opportunities	Opportunity Issues and Description		Impacts	Dependencies	Countermeasures
Policies and Regulations	Regulatory revisions and potential nature-related levies	The Taiwanese government has incorporated "zero waste through resource circulation" into its 2050 net-zero transition roadmap and is amending the Resource Circulation Promotion Act, which is expected to introduce a resource circulation promotion fee, and may lead to increased operational costs for businesses	Sustainability Performance	Transitioning to circular operations to reduce nature-related dependencies and impacts	In response to international concerns and regulatory trends regarding waste management, develop recycling and reuse technologies to reduce reliance on natural resources and minimize environmental impact	• Solid waste • GHG emissions	-	• Enhance on-site waste reuse and establish the Taichung Zero Waste Manufacturing Center to implement responsible manufacturing and reduce environmental impact. For details, refer to "Energy Conservation and Carbon Reduction" • Promote resource circulation in collaboration with suppliers, such as developing leasing models and exploring waste reuse solutions. For details, refer to "Expanding Supply Chain Climate Impact"
	Increasing customer/investor concerns over nature-related issues	• Sustainability ratings incorporate nature-related issues. A lack of proactive action may result in lower scores and diminished investor confidence • Stakeholders increasingly expect companies to establish nature-related targets. Failure to address these expectations may lead to a loss of stakeholder trust	Sustainability Performance	Restoration, protection, or conservation of ecosystems or habitats	Promote various ecological conservation initiatives, demonstrating strong commitment to nature-related issues and boosting investor confidence	• Water use • Terrestrial ecosystem use • Freshwater system use • Water pollutants • Solid waste • Non-GHG air pollutants • GHG emissions	• Surface water • Groundwater • Climate regulation • Water flow maintenance • Water quality	• Drive ecological restoration by launching initiatives such as the Eco Plus! Ecological Harmony Program, Plant-A-Tree Program, TSMC Honey Project, and ecological surveys. For details, refer to "Promoting Ecological Restoration and Education" • Deliver environmental education through two Ministry of Environment-accredited environmental education facilities: the TSMC Ecological Park in Central Taiwan Science Park and the TSMC Southern Taiwan Science Park Reclaimed Water Plant Environmental Education & Learning Park, benefiting schools and the broader public
Market/ Reputation	Reputational risk at the EIA stage due to negative impacts on nature	New facility construction projects undergoing EIA may draw attention from local stakeholders or groups, with inadequate response likely leading to project delays	Sustainability Performance	Restoration, protection, or conservation of ecosystems or habitats	For new fab sites and surrounding areas, TSMC conducts pre-development assessments and post-construction restoration to reduce negative impacts and improve sustainability performance			
	Reputational risk from failing to meet nature-related commitments	Rapid facility expansion may challenge the Company's ability to fulfill existing commitments, thereby undermining its credibility						
	Reputational risk due to suppliers' negative impacts on nature	Negative environmental impacts from TSMC's suppliers may raise concerns among customers, leading to demands for strengthened supply chain management						





● Transition Risks / Opportunities ● Physical Risks / Opportunities

Nature-related Risks	Risk Issues and Description		Nature-related Opportunities	Opportunity Issues and Description		Impacts	Dependencies	Countermeasures
Technology	Shift toward low-nature-impact technologies/operations	In response to global trends, TSMC may be required to seek technologies or raw materials with reduced ecological impact, such as alternative chemicals	Business Performance	Shifting toward high-efficiency production to reduce nature-related dependencies and impacts	By adopting efficient production technologies or introducing process waste gas treatment technologies that reduce natural impacts, the negative effects on nature during operations can be minimized	• Non-GHG air pollutants • GHG emissions	• Climate regulation	• Reduce GHG emissions by adopting best available technologies, refining energy-saving practices, expanding the use of renewable energy, and collaborating with suppliers on decarbonization. For details, refer to "Energy Conservation and Carbon Reduction" • Issue the Sustainable Raw Material Policy to mitigate the environmental externalities of raw material consumption • Execute the Low Global Warming Potential Gas Substitution project with the expectation of reducing hydrofluorocarbon (HFC) usage by approximately 16% • Develop membrane carbon capture technology and achieve waste-to-green carbon reduction outcomes
	Water supply shortage	Capacity expansion and the water-intensive nature of the semiconductor industry may increase operational water shortage risks during periods of insufficient rainfall and affect agricultural or domestic water use				• Water use • Freshwater system use	• Climate regulation • Surface water • Groundwater • Filtration – air/water • Water flow maintenance	• Integrate water positive into core strategies by increasing reclaimed water usage, partnering with the government to build reclaimed water and desalination plants, and collaborating with industry, government and academia to develop and utilize diversified water sources • Implement ongoing water-saving initiatives, enhance water efficiency, and strengthen research into conservation technologies and water source development to ensure resilience to climate-related disasters. For details, refer to "Adaptation to Climate Disasters"
Acute	Impact of ambient air composition on facilities	Regional climate conditions, air composition, and surrounding industrial activities may affect the Company's cleanroom filtration system setup and response strategies, potentially increasing operational costs						• Assess air quality during site selection and develop air pollution control strategies tailored to local conditions. For details, refer to "Air Pollution Control" in the Sustainability Report • Adopt next-generation Fan Filter Units (FFUs) during operations to improve energy efficiency and reduce environmental impacts
Chronic	Shortfalls in renewable energy supply	Extreme weather events and weather variability may result in lower-than-expected renewable energy generation. Seeking alternative solutions may increase operational costs and delay progress toward renewable energy targets				• Terrestrial ecosystem use • Non-GHG air pollutants • Marine ecosystem use	• Climate regulation	• Support carbon reduction strategies by continuing renewable energy purchases and assessing the feasibility of diversification. For details, refer to "Energy Conservation and Carbon Reduction"
	Environmental impacts of renewable energy supply	The development and operation of renewable energy facilities may impact native species habitats or cause ecological disruption						• Manage the potential ecological risks and impacts of renewable energy development in accordance with the Biodiversity Screening Guidelines for Renewable Energy Suppliers • Monitor sites located in biodiversity hotspots and ensure biodiversity monitoring programs are implemented

Forward-Looking Strategy

Evaluation of Effects on the Value Chain and Countermeasures

Sustainability is foundational to TSMC's business, driving the Company's commitment to green operations. To align with SBT requirements, TSMC reviewed and adjusted its carbon reduction targets. Using 2025 as the baseline year, the Company plans to submit its reduction plan to SBTi for review in 2026. The Company also continues to enhance renewable energy use and energy efficiency, including the adoption of offshore wind power for the first time, while advancing [energy conservation and carbon reduction](#).

To strengthen organizational climate resilience, TSMC has made achieving Water Positive status a core sustainability goal, expanding the use of alternative water sources such as reclaimed water and desalinated seawater, and investing in water restoration initiatives to enhance capacity for [climate disaster adaptation](#). The Company also integrates lifecycle thinking with green manufacturing principles to deliver more advanced, energy-efficient products and services to customers through [low-carbon product innovation](#).

On supply chain management, TSMC uses its Supplier Emission Management Tool to integrate raw material procurement data, factory emissions, and product carbon footprint factors, helping suppliers calculate emissions allocation more accurately while incorporating mid- to long-term demand forecasts. Building on this digital foundation, TSMC works with suppliers to develop carbon reduction pathways aligned with SBT standards and ensures action plans remain on track to meet targets, continuing to [expand supply chain climate impact](#).

In line with its commitment to protecting ecosystems, TSMC uses product environmental footprint analysis, Environmental Profit and Loss (EP&L) assessment, and the identification of ecologically sensitive sites to understand environmental impacts across its value chain. The Company combines energy conservation and carbon reduction, water stewardship, and ecological actions both within and beyond its fabs to create nature-positive value.



TSMC advances its green operations.



Energy Conservation and Carbon Reduction

Climate Mitigation Management Strategy and Benchmark Practice

TSMC views "Drive Low-Carbon Manufacturing, Use Renewable Energy, and Increase Energy Efficiency" as its key strategies for achieving net-zero emissions by 2050. Each year, the Company conducts a third-party verified greenhouse gas inventory to review carbon reduction performance and continuously refine its benchmark practices for greenhouse gas reduction. For Scope 1 direct emissions, TSMC replaced and installed 3,540 local scrubbers at process tools in 2025, reducing fluorinated greenhouse gas and nitrous oxide emissions. The Company also implemented 2,141 energy-saving measures across eight categories, delivering 900 million kWh of annual energy savings, equivalent to a reduction of 420,000 metric tons of carbon emissions. TSMC also built the semiconductor industry's first carbon capture facility at the Taichung Zero Waste Manufacturing Center, which began trial operations at the end of 2025, demonstrating the dual benefits of its leadership in carbon reduction technologies and a "waste-to-green" approach.

For Scope 2 indirect energy emissions, in 2025, TSMC improved energy efficiency in advanced process nodes through its EUV Dynamic Energy Saving Program and expanded renewable energy use, with consumption at Taiwan fabs growing to 2.94 billion kWh. Renewable energy now accounts for 20.1% of the Company's total global electricity consumption. TSMC also added seven new buildings with green building certification, bringing the total number of facilities certified LEED Gold or higher to 57 as of 2025. For Scope 3 reduction progress, TSMC continues to advance low-carbon supply chain management; related initiatives are described in the "Expanding Supply Chain Climate Impact" section.

Main Strategies

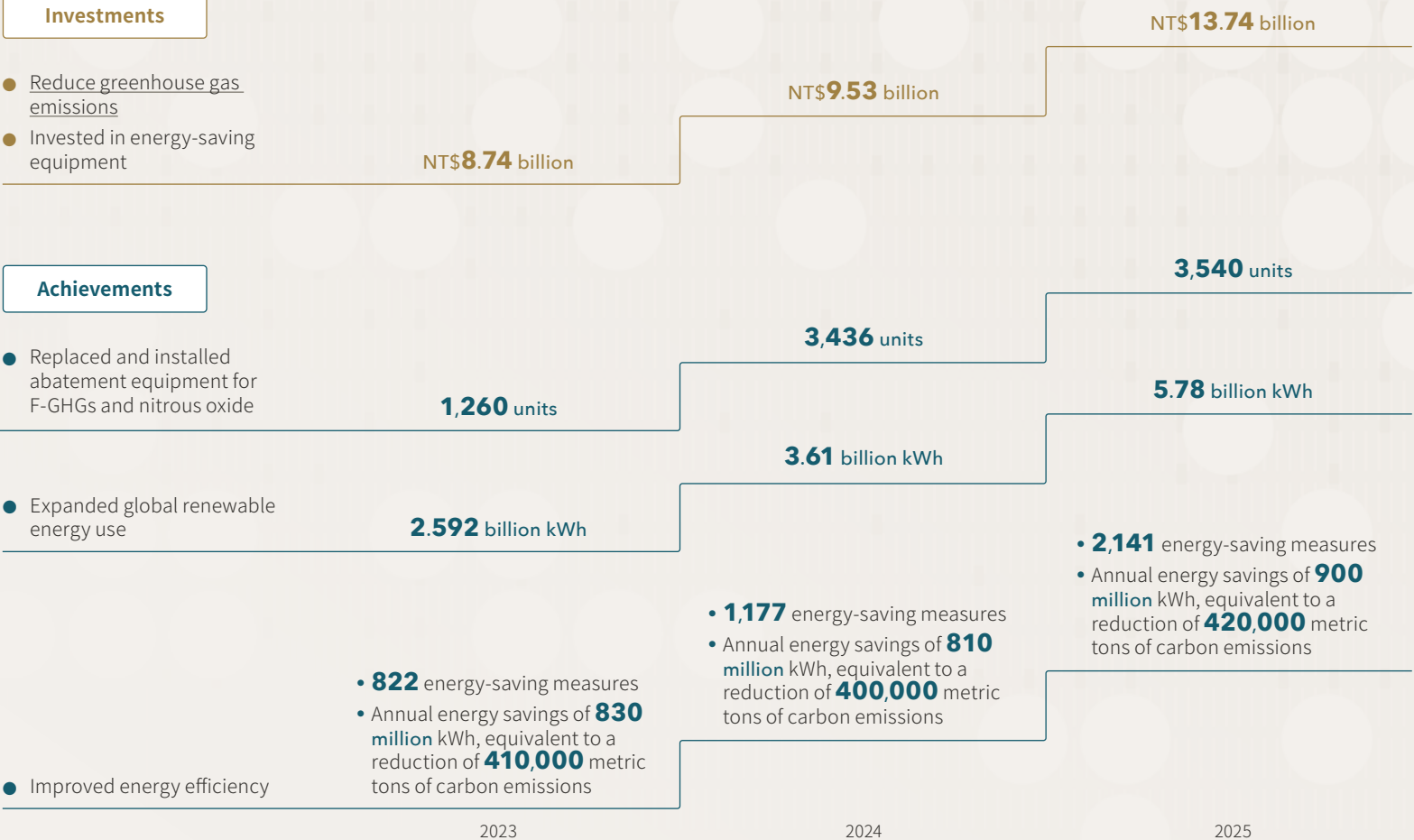
- **Drive Low-Carbon Manufacturing:** Continue to use best available technology to reduce emissions of greenhouse gases (GHG) and become an industry leader in low-carbon manufacturing
- **Use Renewable Energy:** Continue to purchase renewable energy and install solar-energy power systems to achieve target of 100% renewable energy use
- **Increase Energy Efficiency:** Plan and implement new energy-saving measures each year to increase energy efficiency

Investments

- Reduce greenhouse gas emissions
- Invested in energy-saving equipment

Achievements

- Replaced and installed abatement equipment for F-GHGs and nitrous oxide
- Expanded global renewable energy use
- Improved energy efficiency



Adaptation to Climate Disasters

Climate Change Adaptive Management Strategy

TSMC references the IPCC AR6 report and applies the very high emissions scenario (SSP5-8.5) model each year to assess potential extreme climate hazard risks at existing and new fabs. The Company uses these findings to develop adaptation strategies that strengthen operational resilience and support its goal of uninterrupted production. To address the challenges of climate change, TSMC is dedicated to implementing water-saving measures and developing diverse water sources, advancing its vision for sustainable development.



TSMC invests in water recycling facilities.

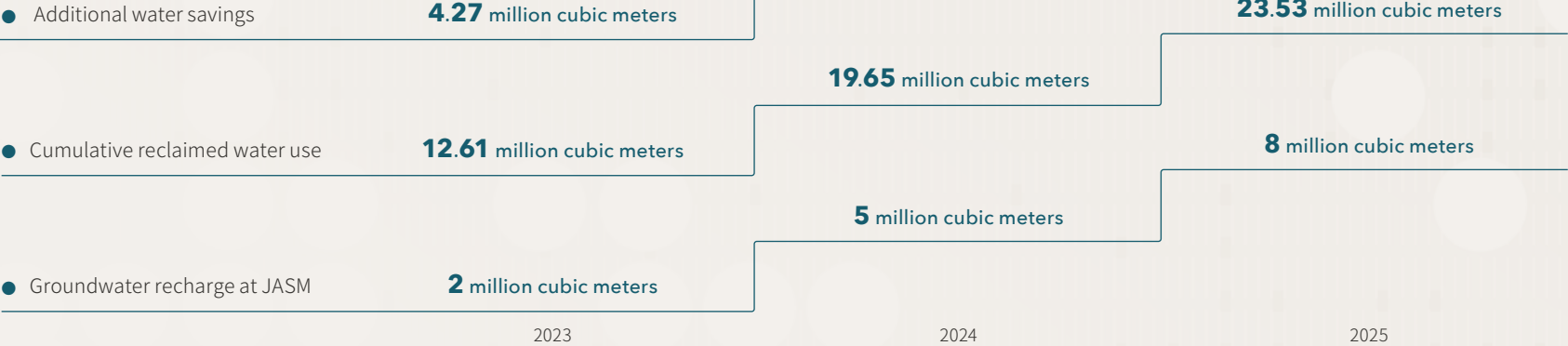
Main Strategies

- **Strengthen Climate Resilience:** Develop climate change response and measure to reduce the impact of climate risks
- **Sustainable Water Stewardship:** Enforce climate risk mitigation policies, implement daily water conservation and water shortage adaptation, develop diversified water sources, and advance restoration initiatives to lower environmental risks

Investments

- Investment in water conservation and reclamation equipment, including operation and maintenance

Achievements



To address the challenges of climate change, TSMC is dedicated to implementing water-saving measures and developing diverse water sources, advancing its vision for sustainable development.



■ Climate Risk Adaptive Standards Climate

Climate Risk	Adaptive Standards	Compliance in 2025
Power Shortage	12-inch wafer fabs are designed in accordance with U.S. LEED green building standards and Taiwan's EEWH energy-saving guidelines	✓
	Establish electricity rationing contingency plans: Equip each fab with emergency generators capable of providing over 30% of total power capacity, ensuring a backup power source that can cover up to 15% of power supply during energy rationing	✓
	Expand renewable energy utilization	✓
Floods	Raise foundation height of newly constructed fabs in the Southern Taiwan Science Park by 2 meters above road level to mitigate flood risk	✓
	Conduct flood risk assessments for external utilities and major suppliers based on flood potential analysis, and promote corresponding improvement measures	✓
	Carry out emergency drills as planned for fabs identified with potential flood risks to enhance disaster preparedness	✓
	Install flood barriers at buildings in existing sites with higher flood exposure to reinforce flood protection	✓
Drought	Implement internal water conservation measures to increase process water recycling rates	✓
	Support government initiatives promoting diversified water sources, including the use of reclaimed water and participation in seawater desalination projects, to ensure regional water balance	✓
	Develop emergency response plans for water shortages: each fab maintains two days' supply in backup water tanks, with water trucks and alternative water sources on standby to provide up to 20% of water supplies during water restrictions	✓
	Actively utilize diversified water resources and restore environmental water to become Water Positive	✓
Winds	Enhance wind resistance for <u>outdoor facilities</u> , with designs based on the ability to withstand gusts up to level 17	✓
Regulations	Engage in regulatory dialogues to help ensure that government measures remain feasible and practical	✓
	Reinforce mitigation actions by developing renewable energy markets to help offset the impact of carbon and energy taxes	✓
Customer Demands	Participate in carbon credit projects initiated by customers to meet their offset goals	✓
Expectations from other Stakeholders	Actively plan and deploy carbon neutrality strategies while maintaining communication with external stakeholders to gain recognition and support	✓

Sustainable Water Stewardship

Sustainable water stewardship is a core TSMC strategy to address climate change and has set a long-term goal of achieving 100% Water Positive status by 2040. The Company aims to replenish local ecosystems with a volume of water equal to or greater than the amount withdrawn for its operations. In 2025, TSMC achieved a Water Positive rate of 21%, exceeding its annual target of 17%.

TSMC assesses risk conditions at its global operating sites each year, drawing on IPCC climate assessment reports and the World Resources Institute's (WRI) water risk assessment tool. The 2025 assessment identified TSMC China and TSMC Arizona as high-risk locations. To address fluctuations in raw water quality at its China fab, TSMC operates water purification systems to ensure a stable supply of process water. Facing regional drought challenges at TSMC Arizona, the Company began construction of a water reclamation plant and adopted Near Zero Liquid Discharge (ZLD) technologies, maximizing recovery rates to reduce reliance on local water resources. At the same time, all AWS-certified fabs located in the Hsinchu, Central Taiwan, and Southern Taiwan Science Parks maintained Platinum-level certification in 2025, demonstrating TSMC's ability to manage complex risks.

On water conservation at its fabs, TSMC achieved an additional 6.73 million cubic meters of water savings in 2025 through four primary measures: Decrease Water Discharge Loss from the System, Reduce Facility System Water

Consumption, Increase Wastewater Recycling of Facilities, and Improve Water Production Rate of the System. Total recycled water volume exceeded 300 million cubic meters. The Company also expanded reclaimed water use, raising the reclaimed water substitution rate at its Taiwan fabs to 18%. To support the government's policy of diversifying water resources, TSMC signed additional desalinated water purchase agreements totaling 136,000 cubic meters per day in 2025, using a rainfall-independent water source to enhance supply stability. The Company also increased regional water use efficiency through a cross-regional reclaimed water exchange model for industrial users at the Rende Reclaimed Water Plant.

TSMC is dedicated to raising sustainability awareness among the public and employees through its environmental education initiatives. In 2025, the Company launched its first public-facing TSMC Environmental Education Website and held 71 events at the TSMC Southern Taiwan Science Park Reclaimed Water Plant Environmental Education & Learning Park, attracting 2,971 participants. Internally, TSMC organized in-person "Understanding Reclaimed Water Plant Tours" events and introduced online courses on "Water Stewardship" and "TSMC Environmental Education: A Comprehensive Analysis of Water Stewardship." More than 1,500 employees completed the in-person activities and online courses, strengthening their understanding and practice of sustainable water management.



TSMC promotes environmental education to raise employee sustainability awareness.



Low-carbon Sustainable Product Innovations

Low-carbon Products and Services Management Strategy

TSMC works with partners across its value chain and drives a holistic product lifecycle approach dedicated to minimizing energy consumption and environmental impacts. Through its industry-leading semiconductor manufacturing technologies, the Company helps customers produce more efficient and lower-carbon products, including chips based on 7-nanometer or better process technologies, high-voltage and power management ICs, and ultra-low-power chips. These advanced technologies not only power sustainable urban infrastructure, energy-efficient transportation, and smart grids, but also optimize energy efficiency across server and data center applications, ultimately creating environmental benefits for stakeholders.

As leading-edge process technologies entered the high-volume production stage, the share of wafer revenue generated by 7-nanometer and more advanced technologies increased from 27% in 2020 to 69% in 2025. By continuing to invest in technology R&D and expanding the share of advanced processes in its total revenue, TSMC aims to fuel steady business growth while delivering long-term value for global sustainability.

In addition, TSMC references the EU Taxonomy to assess the sustainability of its economic activities. Under its Net-Zero Transition Plan,

Main Strategies

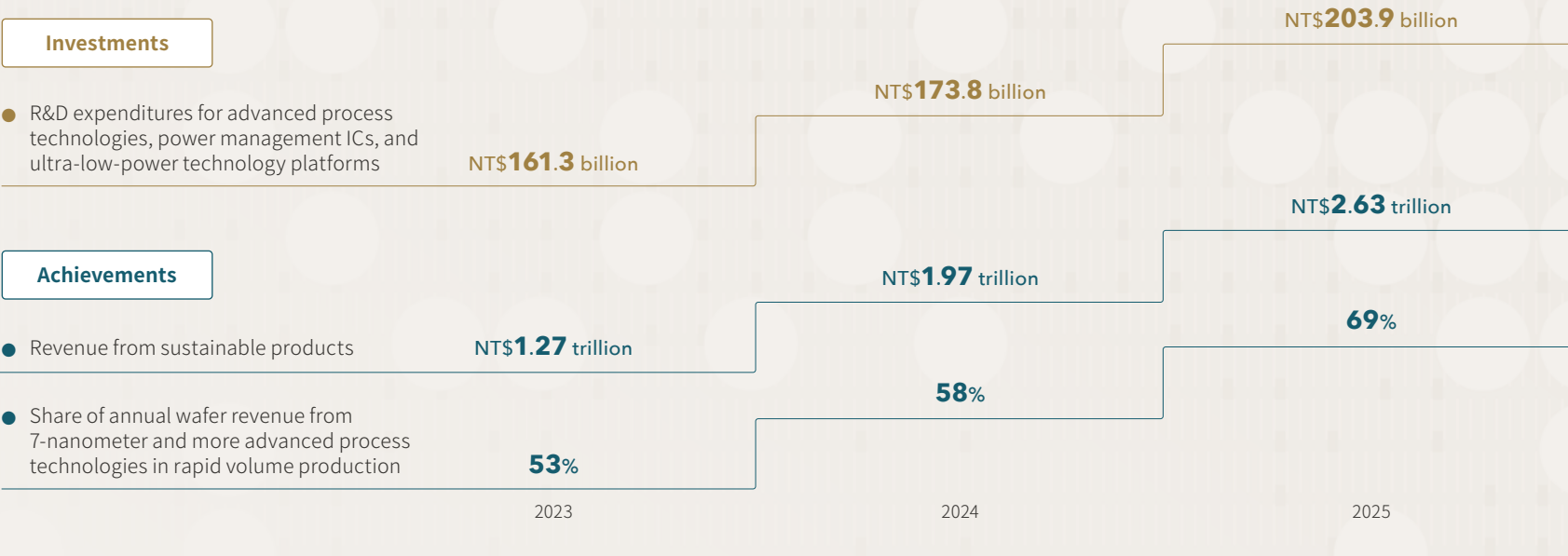
- **Develop Sustainable Products:** Research and develop ULP chips, evaluate a product's environmental and social impacts at each stage of the product life cycle and deliver products with low environmental, carbon, and water footprints to customers

Investments

- R&D expenditures for advanced process technologies, power management ICs, and ultra-low-power technology platforms

Achievements

- Revenue from sustainable products
- Share of annual wafer revenue from 7-nanometer and more advanced process technologies in rapid volume production



Revenue Performance and Share of Sustainable Economic Activities (2023–2025)



the Company has mapped out medium- to long-term decarbonization and energy transition pathways, gradually lowering the greenhouse gas intensity of its operations. As the EU Taxonomy currently has no dedicated standards for the semiconductor industry, TSMC applies Taiwan's Sustainable Economic Activity Reference Guidelines for the semiconductor manufacturing sector, which are aligned with the EU framework, to disclose revenue from sustainable economic activities and its share of total revenue.

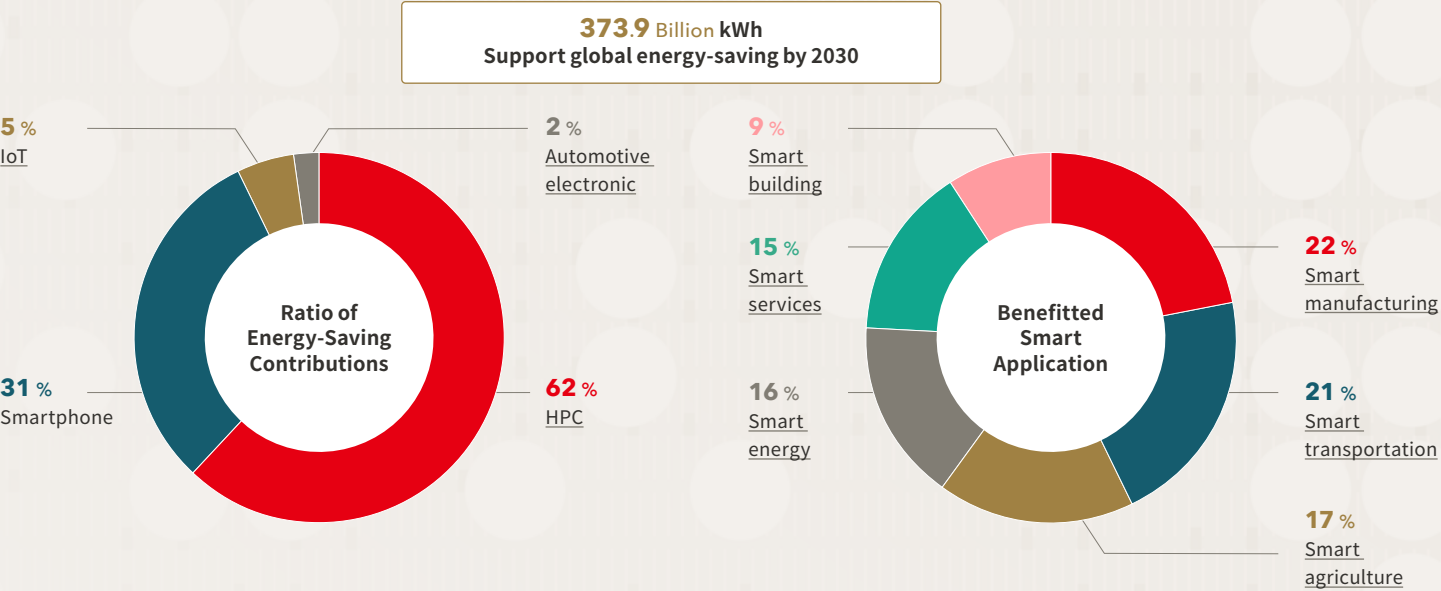
Lead Global Energy Efficiency Through Advanced Technologies

Advancements in semiconductor process technologies continue to shrink transistor categories, enabling electronic products to maintain performance while significantly lowering energy consumption. TSMC continues to advance its leading-edge process technologies, helping customers develop more energy-efficient, low-carbon products across computing, communications, consumer electronics, industrial applications, electric vehicles, servers and data centers, and other end markets, reinforcing the Company's role as a key enabler of the global low-carbon transition.

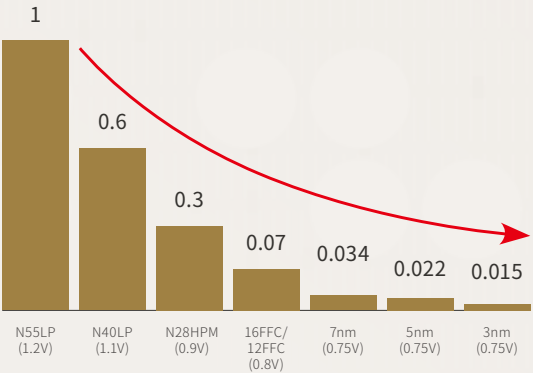
With the rapid growth of information and communication technology (ICT), TSMC focuses its process development on four core technology platforms: High-Performance Computing (HPC), Smartphones, Internet of Things (IoT), and Automotive Electronics. Through six smart application areas—Smart Manufacturing, Smart Transportation, Smart Agriculture, Smart Buildings, Smart Energy, and Smart Services—the Company's technologies enhance the energy efficiency of ICT products while also enabling energy savings for other industries and households.

According to estimates by the Industry, Science and Technology International Strategy Center (ISTI) of the Industrial Technology Research Institute (ITRI), chips produced by TSMC for ICT products across these six smart application areas contributed to global electricity savings of 188 billion kWh in 2025. This is equivalent to 6.8 kWh of global electricity savings for every 1 kWh consumed by TSMC in production. The analysis shows that the HPC platform contributes the largest share of global energy savings, accounting for 36%. Based on TSMC's 2025 electricity consumption, every 1 kWh used to produce HPC-related semiconductor products enables 11.8 kWh of electricity savings worldwide.

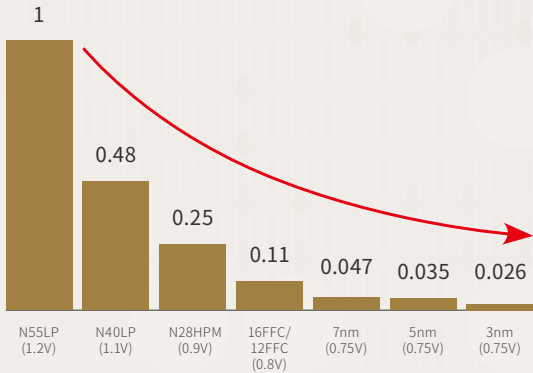
TSMC's Technical Platform Application and Energy Conservation Contribution



Chip Total Power Consumption Cross-technology Comparison: Die Size Reduces as Line Width Shrinks



Chip Die Size Cross-technology Comparison: More Power is Saved as Line Width Shrinks



Note: The logic chip/SRAM/IO (input/output) ratio, which affects die size and power consumption, was re-aligned.



Expanding Supply Chain Climate Impact

Carbon Reduction Management Strategy of the Supply Chain

TSMC executes its "T.S.M.C. Supply Chain Carbon Reduction Strategy" across four categories: Tracking, Support, Motivation, and Creativity. The Company has adopted digital tools to help suppliers calculate emissions, set reduction targets, and develop medium- to long-term decarbonization pathways. TSMC also develops tailored emission reduction plans for major emission contributors each year, and supports suppliers' green transition and operational resilience through a range of courses, forums, and programs, including the "Supplier's New Factory Construction Plan" and the "Maintain the Old as the New" project. For further details, please refer to the [TSMC Sustainability Report](#).

To strengthen suppliers' sustainability capabilities, TSMC continues to expand the Supplier Sustainability Academy curriculum. In addition to greenhouse gas inventory and product carbon footprint topics, the Academy has added [courses on ESG implementation and the United Nations Sustainable Development Goals \(SDGs\)](#). As of 2025, the Academy has offered 116 courses with over 4.8 million participants, driving industry-wide mutual prosperity through knowledge sharing.

Main Strategies

- **Develop and Purchase Energy-efficient Green Tools:** Collaborate with suppliers to develop energy-efficient machines, integrate energy-saving measures across fabs, and introduce procurement standards
- **Promote Green and Low-carbon Supply Chains:** TSMC continues to reduce its environmental impact and external costs, mitigate the effects of climate change and resource depletion by leading suppliers in establishing reduction targets on power and water consumption, waste generation, and carbon emissions, propelling the sustainable development of supply chains

Investments

- Cumulative value of energy-saving components developed (base year: 2018) **NT\$1.67 billion**
- Annual subsidies provided to suppliers for equipment/tool upgrades, replacements, or installations and other carbon reduction actions **-**

Achievements

- New energy-saving initiatives and cumulative electricity savings (base year: 2018)
 - Added **22** new energy-saving measures, bringing the cumulative total of validated measures to **217**, and saved **900 million kWh** of electricity through deployment across fabs
- Total annual electricity savings of suppliers **280 million kWh**
- Annual water savings of suppliers **13.5 million m³**
- Percentage of high-energy-consuming suppliersNote with ISO 14064 GHG emissions verification certificates **84%**

NT\$1.8225 billion

NT\$160 million

NT\$84 million

- Added **19** new energy-saving measures, bringing the cumulative total of validated measures to **236**, and saved **1 billion kWh** of electricity through deployment across fabs

- Expanded the number of equipment partners **from 6 to 11**, accelerating the development of energy-saving equipment components and achieving **460 million kWh** in savings from new tools

338 million kWh

217 million kWh

17.7 million m³

12.28 million m³

93%

90%

2023

2024

2025

Note: High-energy-consuming suppliers are suppliers that use >5 GWh/year in a single facility

Develop and Purchase Energy-Efficient Green Tools

TSMC partners with equipment suppliers to deploy high-efficiency, energy-saving measures across advanced processes. By closely analyzing energy consumption parameters, the Company develops advanced process tools with green benefits, covering parameter optimization, cutting-edge energy-saving components, high-efficiency tool design, and standby power-saving strategies, all aimed at maximizing energy efficiency. In 2025, TSMC expanded the number of partners in its Energy Conservation Action Project for Next-Generation Fab Tools from 6 to 11. This collaboration accelerated the development of energy-saving components, yielding 460 million kWh in electricity savings from new tools during the year. The Company also launched a feasibility study on standby power-saving modes for tools, aiming to improve overall operating efficiency by reducing power consumption during idle periods.

Low-Carbon Supply Chain Management

TSMC works with suppliers toward its net-zero goal by building a transparent and reliable performance tracking system through digital management tools, CDP carbon disclosure participation, and third-party emissions verification. The Company also provides tailored guidance, professional training, and access to government resources to support suppliers' transformation efforts. To maintain this momentum, TSMC continued its carbon reduction subsidy program in 2025 and signed emission reduction agreements with suppliers, setting specific targets while encouraging them to develop innovative carbon reduction solutions. Through tangible incentives and clear goals, TSMC leads the value chain in advancing sustainable development together.

T racking

Monitor supplier carbon emission data and reduction outcomes, and partner with suppliers to consistently elevate the quality and transparency of emission reports

- Invited **135** suppliers to participate in the CDP Supply Chain Project, achieving a **100%** response rate and an average grade of B. Among them, **93%** set emissions reduction targets, **45** suppliers passed SBTi validation, and **18** joined RE100
- Continue the 'Supplier Carbon Reduction Plan Assessment Project,' completed on-site guidance for **30** key emission suppliers, and identified new energy-saving and carbon-reduction opportunities with external consultants
- Applied the "1+N Carbon Management Model" to match suppliers with government-funded resources, guiding **16** supplier facilities through GHG inventory assessments, product carbon footprint calculations and reporting, and energy-saving opportunity diagnostics

S upport

Furnish suppliers with carbon management resources and customized guidance to build their carbon management expertise

- Held **10** carbon management training courses covering topics such as AI applications, advanced energy efficiency, and carbon footprint verification
- Conducted **3** basic and advanced CDP courses, with consultants providing in-depth analysis of key question groups to improve questionnaire quality, training a total of **151** attendee-times
- Offered a course on ISO 50001 Energy Management System Internal Auditor training, strengthening suppliers' knowledge of energy management systems and auditing skills; all **50** participants obtained certification

M otivation

Boost supplier incentives for carbon reduction and broaden the scope of influence

- Provided NT\$**160 million** in subsidies to support suppliers' Scope 1 and Scope 2 emission reductions, enabling **31** suppliers to reduce carbon emissions by **165,000** metric tons
- Engaged over **50** major emission-contributing suppliers to sign the GREEN Agreement, covering nearly **90%** of raw material supply chain carbon emissions, committing them to carbon reduction, renewable energy usage, and third-party verification
- Updated and required suppliers to sign and return the Letter of Assurance on TSMC's Supplier Code of Conduct and Business Ethics Statement, explicitly requiring alignment with TSMC's carbon reduction policies and implementation of energy-saving plans

C reativity

Partner with suppliers to innovate and execute cost-effective emission reduction programs

- Collaborated with suppliers to develop a dual-cycle recycling mechanism for isopropanol (IPA), converting waste liquid into electronic-grade IPA and recovering wastewater, reducing new liquid purchases by approximately **1,400** metric tons and contributing a **290**-metric-ton carbon reduction
- Partnered with suppliers to advance the Blue Ammonia Adoption Project, achieving a quarterly carbon reduction of approximately **250** metric tons; once fully deployed across Taiwan fabs by 2030, the project is expected to deliver annual reductions of **70,000** metric tons
- Worked with **18** suppliers to extend the lifecycle of **15** critical raw materials by **30%-50%**, improving resource efficiency while reducing waste and carbon emissions

Plan and Execute Ecological Actions

TSMC integrates the LEAP methodology and Avoid, Reduce, Restore & Regenerate, and Transform (AR³T) framework into its ecological governance and conducts ecological surveys, habitat creation, near-natural forest restoration, and nectar plant cultivation at its fab sites to mitigate ecological impacts from operations. These conservation efforts also extend beyond the Company's facilities. In addition to launching the Plant-A-Tree Program in 2021, TSMC partnered with industry, government, and academia to launch the [Eco Plus! Ecological Harmony Program](#) in 2024 and achieved initial results in 2025, accelerating biodiversity mainstreaming and expanding Nature Positive outcomes. For details, please refer to the Sustainability Report section, "[Ecological Restoration Actions](#)."

TSMC continues to expand its natural carbon sink portfolio. In Taiwan, the Company has planted nearly 2.5 million trees, shrubs, and ground cover plants through the Plant-A-Tree Program. In January 2025, the [Taichung Da'an Coastal Afforestation Project](#) passed Ministry of Environment review, becoming Taiwan's first successfully registered coastal afforestation carbon sink project. The project is expected to generate approximately 1,011 metric tons of carbon credits, measured in carbon dioxide equivalent (CO₂e), over the next 30 years. Overseas, TSMC supports ecological projects in regions where it operates through investments in nature-based carbon funds and the procurement of high-quality carbon credits. Between 2022 and 2025, the Company accumulated nearly 900,000 metric tons of nature-related carbon credits.



TSMC minimizes ecological impacts from its operations.

TSMC Ecological Actions



Avoid

Prevent negative impacts at their source

- Avoid constructing facilities in relevant national protected areas and schedule construction to avoid local breeding seasons and migration routes, minimizing negative impacts



Reduce

Minimize adverse impacts that cannot be fully eliminated

- Collaborate with ecological consultants to conduct seasonal monitoring and assess operational impacts on ecosystems; independently survey the surrounding environments of fabs in Longtan, Hsinchu, Taichung, and Tainan to systematically evaluate ecological resources in and around fab green belts
- Innovate water pollution control technologies to mitigate environmental impacts while developing diverse water resources to improve water efficiency and reduce water consumption at the source, advancing toward water-positive outcomes. For details, see "[Water Stewardship](#)" in the Sustainability Report



Restore & Regenerate

Restore the extent and integrity of ecosystems in potentially affected areas

- Enhance ecosystem restoration and connectivity by systematically assessing ecosystems surrounding global fabs, including the Central Taiwan Science Park site and overseas subsidiaries, and conducting habitat restoration and species recovery initiatives. For details, see "[Eco Plus! Ecological Harmony Program](#)" and "[Ecological Restoration at Overseas Fabs](#)"
- Continue to advance afforestation and ecological habitat creation in coastal areas and degraded hillside areas affected by overcultivation. For details, see "[Plant-A-Tree Program](#)"
- Collaborate with schools and beekeepers to establish restoration sites at fab locations to protect bee populations and ecological pollination. For details, see "[TSMC Honey Project](#)"
- Implement the Close-to-Nature Forest Management and Rare Species Restoration Program at Fab 15B, focusing on native and rare tree species from Dadu Mountain to support ecosystem sustainability and biodiversity conservation
- Invest in firefly restoration by creating dedicated breeding habitats at fab sites and restore nearby native populations, including the aquatic *Aquatia ficta* and terrestrial *Pyrocoelia analis*, becoming the first semiconductor company in Taiwan to restore firefly populations



Transform

Promote cross-sector collaboration, transform business strategies and models, and address the underlying causes of nature loss

- Establish the [Biodiversity Scholarship and Proposal Grant](#) to encourage universities, master's and doctoral students, and research institutions across Taiwan to engage in conservation research; host the [International Biodiversity Forum and Award Ceremony](#) to recognize award recipients and bring together ecological experts and scholars from Taiwan and abroad for cross-disciplinary exchange. For details, please refer to "[Eco Plus! Ecological Harmony Program](#)"
- Support citizen science and ecological databases by integrating resources from industry, government, academia, and research institutions to expand the [eBird Taiwan database](#), the [Merlin app](#), and the [iNaturalist](#) platform; develop AI-based species identification tools to improve survey efficiency. See "[Eco Plus! Ecological Harmony Program](#)" for details
- Integrate resources from two environmental education sites—the TSMC Central Taiwan Science Park Ecological Park and the TSMC Southern Taiwan Science Park Reclaimed Water Plant Environmental Education Learning Park—to offer themed courses and site tours featuring nature and circular economy concepts, expanding its green impact
- Support the transition to sustainable agriculture by helping farmers apply for the Leopard Cat-Friendly Farming Label, improving habitat quality while enhancing the economic value of agricultural products

Management Performance and Goals

Performance Evaluation and Commitment

TSMC executes its climate response strategy and ecological initiatives using a science-based approach to set and pursue its net-zero pathway. Through improved energy efficiency, smart manufacturing, and expanded renewable energy use, the Company gradually reduces its reliance on fossil fuels. At the same time, TSMC invests in advanced process technologies and low-carbon innovation, working with value chain partners to drive sustainable transformation industry-wide.

TSMC executes its climate response strategy and ecological initiatives using a science-based approach to set and pursue its net-zero pathway by improving energy efficiency, promoting smart manufacturing, and expanding renewable energy use.



TSMC mitigates climate change impacts through target management.

Progress on Climate Management Strategies and Mid- and Long-Term Goals



Note 1: TSMC supports and commits to Science Based Targets (SBT) and, in 2025, reviewed and updated its existing carbon reduction and energy-saving targets to align with Science Based Targets initiative (SBTi) requirements. Updates included defining reduction scopes, adjusting the base year, optimizing energy efficiency planning, and setting more ambitious reduction levels to strengthen the Company's sustainability commitments.

Note 2: Based on SBTi requirements for Scope 3 coverage under Near-Term Targets, TSMC identified key emission sources: Category 1 (purchased goods and services, e.g., raw materials and outsourced packaging services), Category 2 (capital goods, e.g., equipment), Category 3 (fuel- and energy-related activities)

Note 3: In-house recovery involves on-site recycling and reuse, on-site recycling into products, the Zero Waste Manufacturing Center, electronic-grade chemical recycling, and chemical leasing.

Note 4: Due to technical and material limitations in waste recovery, the long-term target of 100% waste recovery has been adjusted to 99.5%.

Note 5: Added as a long-term goal in 2025

Note 6: The suppliers are raw material suppliers, including silicon wafers, bulk gases, bulk chemicals and other chemical suppliers

Note 7: Suppliers invited to participate in CDP in 2025: A total of 135 suppliers of raw materials and equipment met the top 75% of procurement categories and expenditures

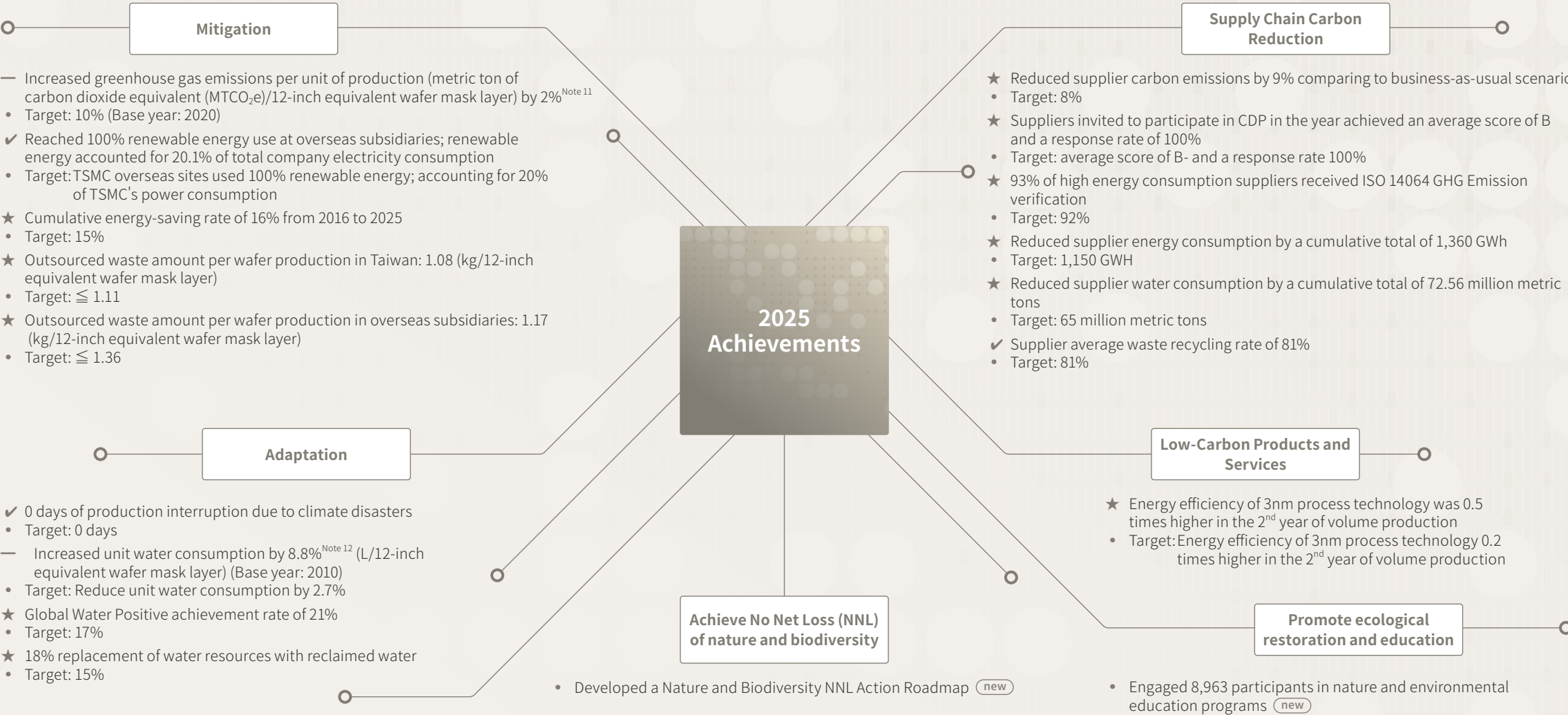
Note 8: High energy consumption suppliers: Suppliers in Taiwan whose energy consumption at a single site >5 GWh/year

Note 9: Mainly involving suppliers in Taiwan

Note 10: Energy efficiency is the product equivalent per kWh of power. (12-inch equivalent wafer mask layer/kWh)

Progress on Climate Management Strategies and Mid- and Long-Term Goals

★ Exceed ✓ Achieved — Missed Target



Note 11: Due to the continuous expansion of advanced process capacity, total greenhouse gas emissions fell short of the annual target. TSMC will continue to promote energy conservation and carbon reduction measures, and increase the proportion of renewable energy use.

Note 12: Driven by strong global wafer demand in recent years, several of TSMC's new facilities are currently in the quality verification stage prior to mass production. Their water usage already accounts for 20% of the total tap water consumption across all global facilities, thereby preventing the water consumption per unit product from decreasing as scheduled.



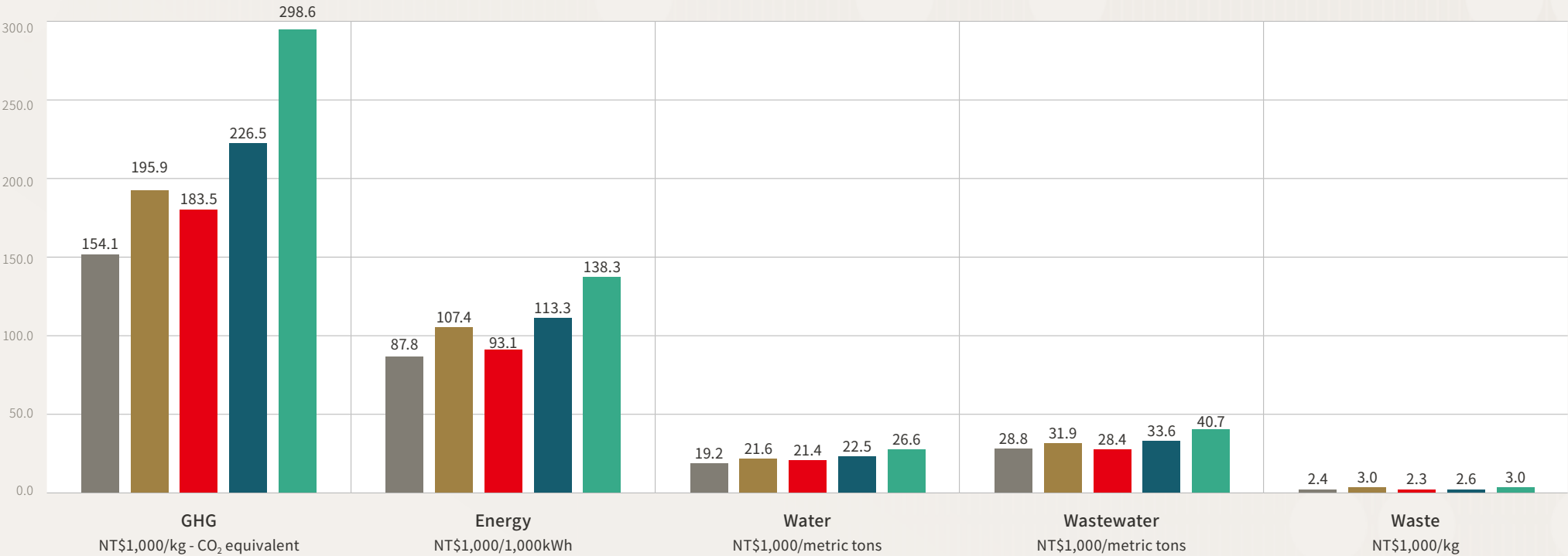
Eco-Efficiency Indicators

TSMC uses five ecological efficiency indicators—GHG, energy, water, wastewater, and waste—as environmental management benchmarks and quantifies the revenue value generated per unit of energy and resource consumption. In 2025, all five indicators improved compared with the previous

year, with ecological efficiency from GHG achieving the highest growth at 32%, followed by energy (22%) and wastewater (21%). TSMC will continue to integrate green manufacturing with technological innovation to advance environmental sustainability.

Eco-Efficiency Indicators

2021 2022 2023 2024 2025





GHG Emissions

Committed to achieving net-zero emissions by 2050, TSMC annually reviews its carbon reduction performance and optimizes mitigation strategies based on greenhouse gas (GHG) inventory results. In 2025, Scope 1 Direct Process Emissions (mainly fluorinated gases and nitrous oxide) accounted for 4% of total emissions, while Scope 2 Emissions from Electricity Use accounted for 23%. Scope 3

Emissions across the Upstream and Downstream Value Chain represented the largest share at 73%, covering raw material production, capital goods, logistics and transportation, and waste treatment, making it the Company's primary emission source.

Climate-Related Management Indicators

Key Indicators	2021	2022	2023	2024	2025
GHG Emissions (MTCO ₂ e) (Scope 1 and Scope 2 market-based)	10,304,344	11,558,554	11,783,418	12,783,269	13,327,060
Scope 1 (MTCO ₂ e)	2,151,937	2,018,789	1,596,031	1,825,872	2,196,493
Taiwan Sites	1,808,427	1,669,770	1,307,966	1,581,312	1,890,106
Subsidiaries	343,510	349,019	288,065	244,560	306,387
Scope 2 (MTCO ₂ e) (market-based)	8,152,497	9,539,765	10,187,387	10,957,397	11,130,568
Taiwan Sites	8,116,440	9,510,082	10,150,252	10,926,644	11,100,903
Subsidiaries	36,057	29,683	37,135	30,753	29,665
Scope 2 (MTCO ₂ e) (location-based)	9,196,964	10,887,145	11,466,118	12,674,921	13,629,844
Scope 3 (MTCO ₂ e)	6,049,256	7,429,158	7,616,655	8,223,173	36,299,005
Carbon Offset (MTCO ₂ e)	241,577	616,271	616,880	626,516	375,320
F-GHG (MTCO ₂ e)	1,369,478	1,102,353	959,642	1,097,070	1,370,315
Percentage of Unit Product GHG Emissions (MTCO ₂ e/12-inch equivalent wafer mask layer) Compared to Base Year (%)	0	6	-31	-19	-2





Key Indicators	2021	2022	2023	2024	2025
Energy Consumption (GWh) (including electricity, natural gas, and diesel) ^{Note 1}	19,192	22,423	24,775	27,477	30,988
Direct Energy Consumption (GWh) (including natural gas and diesel)	1,112	1,336	1,553	1,920	2,220
Indirect Energy Consumption (GWh) (energy exclude non-renewable energy)	16,409	18,895	20,630	21,944	22,987
Indirect Energy Consumption (GWh) (renewable energy)	1,671	2,191	2,592	3,612	5,781
Percentage of Renewable Energy Used at Global TSMC Locations (%)	9.2	10.4	11.2	14.1	20.1
Percentage of Renewable Energy at Overseas Companies (%)	100	100	100	100	100
Total Energy Conserved from New Energy Saving Measures Since 2016 (100 GWh/year)	24	31	39	47	56
Energy Efficiency After Volume Production of 3nm Technology	-	-	-	-	0.5 (2 nd year)
Days of Production Interrupted Due to Climate Disasters	0	0	0	0	0
Water Withdrawal (million m ³) ^{Note 2}	82.8	105.0	113.6	128.7	149.9
Taiwan Sites	76.1	96.8	92.5	94.6	108.9
Subsidiaries ^{Note 3}	6.7	7.8	8.5	13.5	15.6
Reduction Percentage in Unit Water Consumption (liter/12-inch equivalent wafer mask layer) (Base year: 2010) (%)	14.9	2.6	-25.2	-14.3	-8.8
Process Water Recycling Rate (%) ^{Note 4}	85.4	85.7	90.3	88.1	86.2
Total Water Saving (million m ³) ^{Note 4}	186.3	215.7	286.4	284.6	318.9

Note 1: Energy calorific values of various fuels: 1 cubic meter of natural gas = 10.5 kWh; 1 liter of diesel = 8,400 kcal = 35.16 MJ; 1 kWh = 3,600 KJ.

Note 2: Tap Water Consumption

Note 3: Subsidiaries include TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, JASM, and VisEra.

Note 4: The data covers fabs in Taiwan, TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM, and VisEra.

Future Prospect

In response to extreme climate events such as floods, droughts, and severe typhoons, TSMC remains committed to its net-zero goal and works with its supply chain to improve energy efficiency and advance energy transition. In 2026, TSMC expects to secure SBTi validation while concurrently launching a full-scale initiative to reclaim excess hydrogen from EUV processes for power generation. This is expected to push the share of renewable energy at Taiwan fabs above 20% for the first time, marking a new milestone in green energy adoption.

TSMC continues to strengthen supply chain collaboration and drive green transformation through funding, technology, and management support. In addition to expanding the Supply Chain Carbon Reduction Subsidy Program, the Company collaborates with supplier partners to advance forward-looking projects, including recycled electronic-grade isopropyl alcohol (IPA) and Taiwan's first adoption of blue ammonia. TSMC will further assess key chemicals such as hydrogen peroxide and sulfuric acid and invest in the development of low-carbon raw material substitution technologies. Through the Supplier Carbon Reduction Plan Assessment Project, TSMC provides on-site guidance and tracks progress to ensure that carbon reduction actions are effectively executed, creating shared net-zero value.

For nature conservation, TSMC will establish the NNL baseline for its Taiwan fabs in 2026, focusing on developing NNL assessment methodologies while continuing to advance the Eco Plus! Ecological Harmony Program. For habitat creation and species restoration, TSMC will expand ecological corridors, apply for Other Effective Conservation Measures (OECM) certification, and participate in the Southwest Taiwan Eastern Grass Owl Ecological Corridor Connectivity Program. The Company will also complete ex situ care for the Central Taiwan gudgeon (*Squalidus banarensis*) at the Central Taiwan Science Park site and work with regulators and academic institutions to identify suitable release sites, advancing nature-positive outcomes. For knowledge development, TSMC plans to build on citizen science promotion and add the In-Depth Cultivation Award to the TSMC Biodiversity Scholarship and Proposal Grant program to support and guide outstanding ecological research and proposals on local conservation practices. TSMC will continue to develop diverse forward-looking initiatives and uphold its commitment to protecting nature and the environment.



TSMC develops forward-looking actions to fulfill its environmental commitment.



Appendix

About the Report

In alignment with TCFD and TNFD guidelines, TSMC has identified climate- and nature-related risks and opportunities while phasing in IFRS Sustainability Disclosure Standard S2 (Climate-related Disclosures) to enhance reporting transparency, and climate and nature governance. This report covers the period from January 1, 2025 to December 31, 2025, with Chinese and English versions to be published on [TSMC's sustainability website](#) in August 2026. The reporting scope includes Taiwan operations (headquarters, all wafer fabs in Taiwan, and advanced backend fabs), TSMC China, TSMC Nanjing, TSMC Washington, LLC, VisEra, [other subsidiaries](#), and global suppliers. Any deviations from this standard reporting boundary in specific sections will be explicitly annotated.



TSMC implements sustainable management for climate and nature.



TCFD Disclosure Index

Core Elements	Recommended Disclosures	Chapters in This Report	Page
Governance	Board's oversight of climate-related risks and opportunities		09
	Management's role in assessing and managing climate-related risks and opportunities		10
Strategy	The climate-related risks and opportunities the organization has identified over the short, medium, and long-term		13
	The impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning		16
	The Company scenario analysis (including a 2° C or lower scenario)		17
Risk Management	The organization's processes for identifying and assessing climate-related risks		12
	The organization's processes for managing climate-related risks		12
	How processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management		12
Metrics and Targets	The metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process		38
	Scope 1, Scope 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and the related risks		12 42
	Management targets and related performances		38



TCFD Index on Cross-Industry, Climate-Related Metric Categories

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	• Total GHG emissions (MTCO ₂ e)	42
Transition Risks	• Percent of renewable energy used (%)	43
	• Percent of energy consumed from renewable sources at TSMC's production and operations sites (%)	
	• Cumulative energy savings rate of energy conservation measures (%)	
Physical Risks	• Number of production days interrupted by climate disasters	43
	• Unit water consumption (Liter/12-inch equivalent wafer mask layers)	43
Climate-related Opportunities	• Develop low-carbon products and services/Increase energy efficiency in customer products	32-33
Capital Deployment	• Deploy investments for mitigation, adaptation, R&D, and the supply chain, including but not limited to:	28
	- GHG abatement facilities: purchase green energy, carbon credits, and energy-efficient equipment	29
	- Deployment, operations, and maintenance of water-saving and water recycling equipment	29
	- Use of recycled water and other diverse water sources	32
	- R&D of sustainable products	34
	- Green equipment and low-carbon supply chain management	
Internal Carbon Prices	• Transition Risks - Impact Analysis of Regulatory Carbon Pricing	18
Remuneration	• Linked shareholders' interests and ESG (including climate change management) achievements to senior executives' compensation by introducing the employee restricted stock awards (RSAs) issuance plan	09



TNFD Index on the LEAP approach

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Locate	L1	Span of the business model and value chain	Natural LEAP Assessment	20
	L2	Dependency and impact screening	Natural LEAP Assessment	20
	L3	Interface with nature	Natural LEAP Assessment	20
	L4	Interface with sensitive locations	Natural LEAP Assessment	20
Evaluate	E1	Identification of environmental assets, ecosystem services and impact drivers	Natural LEAP Assessment	20
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	E3	Dependency and impact measurement	Natural LEAP Assessment	20
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	A2	Adjustment of existing risk mitigation and risk and opportunity management	Natural LEAP Assessment	20
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			Adaptation to Climate Disasters	29
			Expanding Supply Chain Climate Impact	34
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	P2	Target setting and performance management	Management Performance and Goals	38
	P3	Reporting	About the Report	45
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TNFD Core Metric Index for Nature-Related Impact Factors

Impact Drivers	Impact Factors	Content	Page	Remarks
Climate Change	GHG Emissions	• Total GHG Emissions in Scopes 1, 2, and 3 (metric tons CO₂e)	50	
	Soil Contaminants	• Volume of pollutants released into soil	-	TSMC strictly complies with local regulatory standards at all operational sites; no soil contamination incidents have occurred as a result of business activities
Pollution/Pollution Removal	Wastewater Discharges and Pollutants	• Total wastewater discharge volumes by discharge destination and associated water quality data • Reduction rate of the Comprehensive Water Pollution Index	Please refer to " Water Stewardship " in the Sustainability Report	
	Waste Generation and Disposal	• Total outsourced industrial waste volume (metric tons) • Outsourced general industrial waste volume (metric tons) • Volume of outsourced hazardous industrial waste by treatment method (metric tons) • Outsourced unit waste disposal per wafer (kg / 12-inch equivalent wafer mask layer)	Please refer to " Circular Resources " in the Sustainability Report	
	Non-GHG Air Pollutants	• Air pollutant emissions (metric tons) • Unit air pollutant emissions (metric tons) • Volatile Organic Compounds (VOC) reduction rate (%)	Please refer to " Air Pollution Control " in the Sustainability Report	
	Plastic Pollution	• Recyclable plastics ratio (%) • Plastic consumption (metric tons)	-	TSMC continues to promote plastic recycling and reuse at its fabs; operations have not resulted in plastic pollution





Impact Drivers	Impact Factors	Content	Page	Remarks
Resource Use / Replenishment	Water Consumption	Water withdrawal from areas under high water stress (m³)		Please refer to Global Reporting Initiative
	Other Resource Utilization	Volume and proportion of high-risk materials used (%)	-	TSMC does not use any high-risk materials among its primary raw materials. TSMC adheres to Sustainable Raw Material Policy and Statement on Responsible Sourcing of Minerals, conducting annual reviews and tracking the sources of its primary raw materials.
Land / Freshwater / Marine Use Change	Total Spatial Footprint	- Total area controlled or managed by the Company (m²) - Area of land under the Company's control with operational disturbance (m²) - Area of rehabilitated land (m²)	-	This metric is not material to TSMC's operations; therefore, related information is not disclosed. Nevertheless, the Company remains committed to ecological restoration efforts to foster coexistence with nature
	Extent of Use Change	- Area of marine, freshwater, and terrestrial ecosystems under alterations, restoration, and sustainable management (m²) - Categorized by economic activity, voluntary conservation, or regulatory protection	-	TSMC's operation does not involve changes or restoration related to marine, freshwater, or terrestrial ecosystems. The Company will continue to conduct annual reviews and monitor changes in land areas in the future.
Invasive Alien Species and Others	Measures to Prevent Unintentional Introduction of Invasive Alien Species	Proportion of high-risk activities that have appropriate measures in place to prevent unintentional introduction of invasive species	-	No incidents of unintentional introduction of invasive species have occurred at TSMC's operational sites



TSMC's Reports and Policies on Climate Change and Nature

[Sustainability Report](#)

[ESG Policy](#)

[ESG Procedure](#)

[Climate Change Statement](#)

[Environmental Policy](#)

[Risk Management Policy](#)

[Business Continuity Management and Crisis Management Policy](#)

[Fluorinated Greenhouse Gas \(F-GHGs\) Emissions Reduction Declaration \(IEEE 1680.1\)](#)

[Biodiversity Statement](#)

[Water Statement](#)

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