winbond

2025 WINBOND

TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES REPORT

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About This Report

This report has been prepared in accordance with the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) issued by the Financial Stability Board (FSB). The report discloses information under the four core elements of Governance, Strategy, Risk Management, and Metrics and Targets. It evaluates the potential climate-related risks and opportunities that may affect operations from a financial perspective and assesses the operational resilience of the Winbond Group in addressing climate-related issues.

Reporting Period, Boundary and Scope

The reporting period covered by this report is from January 1, 2025 to December 31, 2025.

The reporting boundary is consistent with the consolidated financial statements and includes Winbond (Taiwan) fabs and offices (Central Taiwan Science Park Fab, Kaohsiung Fab, Zhubei Building, Taipei Office, and Tainan Office), Winbond subsidiaries, Nuvoton Technology (Taiwan), Nuvoton Technology (Japan), and Nuvoton subsidiaries (collectively, the "Winbond Group"). Any deviation from this scope is disclosed in the relevant sections.

Major Milestones

● Climate Governance and Disclosure ● Climate Initiatives and Commitments ● ESG Ratings and Awards ● Carbon Reduction Actions ● Renewable Energy

2022

- Established a carbon emissions information platform
- Joined the Taiwan Climate Partnership (TCP)
- Participated in the CIX carbon credit auction and acquired voluntary carbon credits from the world's largest blue carbon project
- Offset emissions from "Zero-carbon Family Day" activities using blue carbon credits
- Acquired a 15% equity stake in Chia-Ho Green Energy Corporation

2023

- Issued the first standalone TCFD Report
- Participated in the TSIA Net-Zero Emissions Voluntary Reduction Initiative
- Achieved B list in "Climate Change" and "Water Security" in Carbon Disclosure Project (CDP)
- CTSP Fab received the Taichung Low Carbon Sustainable City Outstanding Contribution Award
- Collaborated with 13 suppliers to apply for and receive full funding under the Ministry of Economic Affairs low-carbon transformation subsidy program
- Joined the Taiwan Carbon Solution Exchange and acquired international voluntary carbon credits
- Participated in the Forestry and Nature Conservation Agency tree adoption program
- Obtained the first Renewable Energy Certificate through green electricity procurement

2024

- Established a carbon accounting system
- Achieved A- list in "Climate Change" and B list in "Water Security" in CDP
- The Board approved procurement plans for 75 MW of solar power, 9.24 MW of onshore wind power, and 25 MW of offshore wind power
- Signed Taiwan's first-ever deal for an offshore wind power purchase agreement between a renewable energy provider and a domestic enterprise
- Participated in the establishment of Kai-Hong Energy Co., Ltd.
- Officially launched products manufactured using renewable energy

2025

- Submitted greenhouse gas reduction targets to the Science Based Targets initiative (SBTi) for validation
- Achieved A list in "Climate Change" and "Water Security" in CDP, while also achieving Leadership Level A in Supplier Engagement
- Completed the Winbond supplier low-carbon transformation subsidy project, exceeding the reduction target by 240% and achieving 19,995 tCO_2e of emissions reductions
- Increased committed investment in Kai-Hong Energy Co., Ltd. by NT$ 245 million

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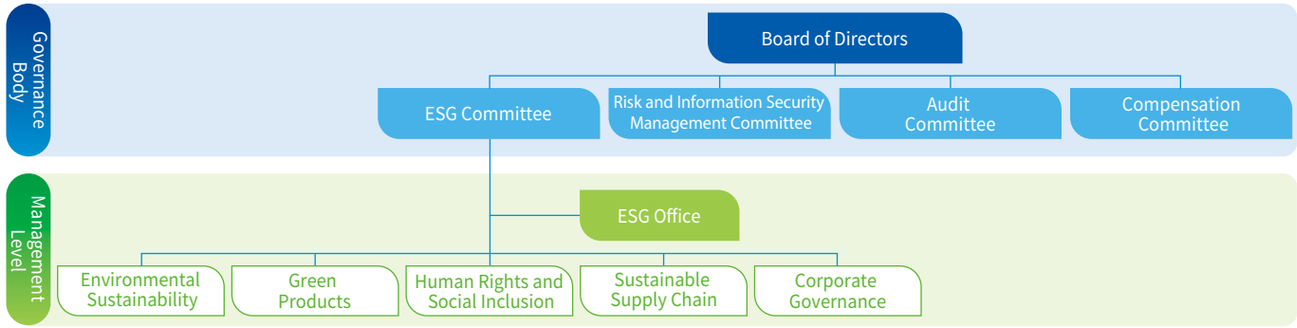
Governance

1.1 Governance Structure

The Board of Directors serves as the highest governance body for climate change, providing oversight and direction for climate-related responses and decision-making. To strengthen the Board' s oversight function and enhance management effectiveness, the Board has established the ESG Committee, the Risk and Information Security Management Committee, the Audit Committee, and the Compensation Committee. Each committee is accountable to the Board within its defined scope of responsibilities and submits proposals to the Board for resolution.

The ESG Committee is chaired by the Chairman and convenes at least twice annually. Under the ESG Committee, an ESG Office has been established, together with five functional teams covering environmental sustainability, green products, human rights and social inclusion, sustainable supply chain, and corporate governance. Execution outcomes are reported regularly to the Board to ensure effective implementation and continuous advancement of sustainability initiatives.



1.2 Governance Roles of the Board of Directors and Functional Committees

Responsibilities and Oversight of the Board of Directors and Functional Committees

Governance Body	Members	Responsibilities	Meeting Frequency	Oversight of Climate-related Matters
Board of Directors	• Composed of 11 directors • Chaired by Mr. Arthur Yu-Cheng Chiao	Reviews and approves corporate policies, management systems, and implementation plans, and oversees execution performance	At least once per quarter	In 2025, the Board approved multiple major climate-related proposals and reports, including renewable energy planning updates, the proposal to increase committed investment in Kai-Hong Energy Co., Ltd., and greenhouse gas inventory implementation reports, demonstrating proactive responses to climate change-related risks and challenges.
ESG Committee	• Composed of the Chairman and all Independent Directors	• Formulate corporate sustainability policies and related management guidelines • Develop short-term, mid-term, and long-term sustainability strategies and goals • Review, track, and amend the implementation and performance of corporate sustainability • Report the committee's execution results to the board annually • Supervise the disclosure of IFRS sustainability information	At least twice annually	Key topics reported and communicated in 2025 included greenhouse gas inventory implementation, renewable energy investments and procurement, and progress on IFRS S1/S2 implementation

Governance Body	Members	Responsibilities	Meeting Frequency	Oversight of Climate-related Matters
Risk and Information Security Management Committee	• Composed of the Chairman and all Independent Directors	• Responsible for the overall risk management of the company, formulating risk management policies, frameworks, establishing qualitative and quantitative management standards, and adjusting them according to the company's actual development needs or changes in the objective environment • Implement the risk management decisions of the board of directors and review the development, establishment, and execution effectiveness of the company's overall risk management mechanism • Set risk appetite, and review and manage the company's overall risk • Assist and supervise various units in conducting risk management activities and coordinate cross-unit interaction and communication of risk management functions. • Adjust risk categories and undertaking methods according to environmental changes • Execute other matters related to responsibilities as required by the board of directors	At least twice annually	Integrates climate change risks into the Company's overall risk management framework and oversees the implementation of related management activities
Audit Committee	• Composed of all Independent Directors	• Adoption or amendment of the internal control system pursuant to Article 14-1 of the Securities and Exchange Act • Assessment of the effectiveness of the internal control system • Adoption or amendment of procedures for handling financial or business activities of a material nature, such as acquisition or disposal of assets, derivatives trading, loaning of funds to others, and endorsements or guarantees for others, pursuant to Article 36-1 of the Securities and Exchange Act • Matters in which a director is an interested party • Asset transactions or derivatives trading of a material nature • Loans of funds, endorsements, or provision of guarantees of a material nature • Offering, issuance, or private placement of equity-type securities • Hiring or dismissal of a certified public accountant, or their compensation • Appointment or discharge of a financial, accounting, or internal audit officer. • Annual and interim financial reports signed or sealed by the chairman, manager, and an accounting chief. • Other material matters as may be required by the Company or by the competent authority.	At least once per quarter	Reviews sustainability-related capital expenditures, including investments in energy conservation and carbon reduction initiatives
Compensation Committee	• Composed of all Independent Directors	• Periodically reviewing this Charter and making recommendations for amendments. • Prescribing and periodically reviewing the annual performance assessments and remuneration policy, system, standards, and structure for directors and managerial officers. • Periodically assessing the degree to which performance goals for the directors and managerial officers have been achieved, setting the types and amounts of their individual compensation	At least twice annually	Has approved linking ESG performance indicators to the compensation of vice president-level and above executives of Winbond (Taiwan), including ESG material topic targets such as cumulative carbon reduction and electricity savings.

1.3 Roles of Management

Responsibilities of Management

Winbond (Taiwan) has appointed a Chief Sustainability Officer (CSO), at the Vice President level, to oversee and manage the Company' s sustainability development and climate-related matters. Under the ESG Committee, the Company has established an ESG Office together with five management-level functional teams covering Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. Each functional team is responsible for planning and implementing climate-related strategies within its area of responsibility and reports its execution results to the ESG Committee at least twice annually.

The Corporate Governance Team is responsible for coordinating climate-related matters across the Company and conducting annual identification and consolidation of climate-related risks and opportunities. After review by the CSO, the assessment results are submitted to the ESG Committee and the Board of Directors as a key basis for the Board' s oversight of climate-related risks and opportunities.

Winbond has incorporated climate risk assessment into its existing risk management framework. The Risk Management Team implements risk control plans in accordance with the Company' s Risk Management Policy and Procedures, establishes qualitative and quantitative management standards, improves risk control practices, and regularly reports risk management results to the Risk and Information Security Management Committee.

To strengthen management oversight of climate-related issues, climate-related key performance indicators (KPIs) have been incorporated into the performance evaluation and compensation mechanisms of executives at the Vice President level and above, ensuring that climate-related considerations are continuously reflected in business decisions and management actions.

Linkage Between Management Performance and Compensation Policies

Winbond (Taiwan) has incorporated climate-related issues into the performance evaluation framework for senior management. In 2025, ESG performance indicators accounted for 5% of the overall performance evaluation score for executives at the Vice President level and above. Beginning in 2026, the weighting of ESG performance indicators will increase to 10%. In addition, all ESG material topic targets will be incorporated into ESG performance indicators for executives at the Vice President level and above, including areas such as business integrity and corporate governance, regulatory compliance, risk management (including climate change response and prevention measures), research and innovation, energy and greenhouse gas management, supply chain management, green products, and talent management. The evaluation results of ESG performance indicators will serve as a reference for employee profit-sharing allocations.

Fixed compensation	determined based on executive responsibilities and differentiated performance.
Variable compensation	measured by financial metrics (e.g., gross profit and gross margin, operating profit and operating margin, profit before tax, return on equity) and ESG-related metrics (e.g., cumulative carbon reductions, electricity savings), and determined based on strategy execution and sustainability outcomes.

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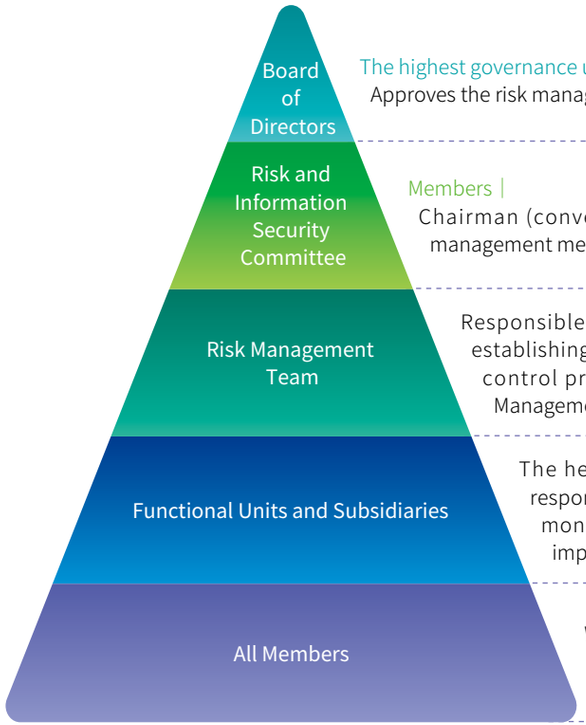
Risk Management

2.1 Winbond's Risk Management System

The Board of Directors serves as the Company's highest risk governance and decision-making body. Under the Board, the Risk and Information Security Management Committee has been established. Through existing organizational departments and designated risk management functions, the Company formulates sound internal management policies and operating procedures within each unit's scope of responsibilities to implement risk management.

Risk Management Organization Structure



Board of Directors — The highest governance unit |
Approves the risk management mechanism and ensures its effective operation.

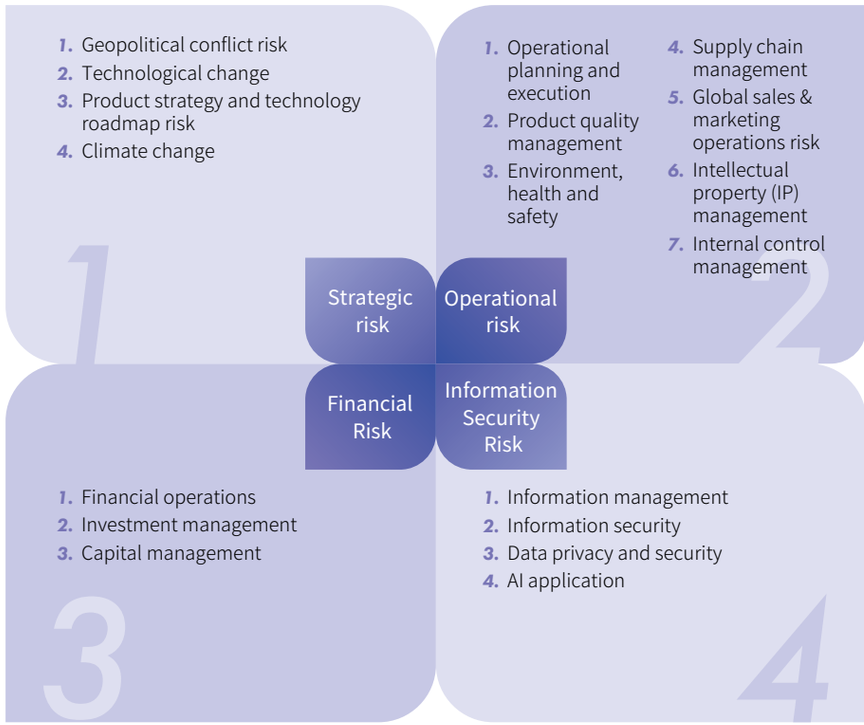
Risk and Information Security Committee — Members |
Chairman (convener) and all independent directors comprehensively review the risk management mechanisms and other matters.

Risk Management Team
Responsible for identifying and evaluating risks, implementing risk control plans, establishing qualitative and quantitative management standards and improving risk control practices, and regularly reporting risk management results to the Risk Management Committee.

Functional Units and Subsidiaries
The heads of various functional units and subsidiaries of our company are responsible for risk management. They are tasked with identifying, assessing, and monitoring relevant risks within their respective units to ensure the effective implementation of risk control mechanisms and procedures.

All Members
Winbond emphasizes comprehensive risk control for all employees and daily implements layer by layer prevention.

4 Scopes of Risk Management



Risk management process

Winbond' s risk management process comprises five key elements: risk identification, risk analysis, risk assessment, risk response, and supervision and review mechanisms. Each department and subsidiary identifies risks according to their short-, medium-, and long-term operational objectives and business responsibilities, and evaluates the likelihood and severity of impacts of risk events. The results serve as the basis for subsequent risk response and management activities.

Climate change risks have been integrated into the Company's overall risk management framework and are identified, assessed, and managed alongside other categories of risks through existing risk management processes. Each year, in accordance with the Task Force on Climate-related Financial Disclosures (TCFD) framework, the Company identifies and discloses the financial impacts of climate-related risks and opportunities, including both qualitative and quantitative assessments, and develops corresponding review and management strategies to strengthen operational resilience.

2.2 Climate-related Risk and Opportunity Identification Process

In 2025, Winbond convened senior executives from the parent company and subsidiaries to identify key climate-related risks and opportunities. In accordance with the TCFD risk classification framework, climate-related risks were categorized into transition risks and physical risks. These risks and opportunities were evaluated based on impact severity, likelihood of occurrence, and time horizon, resulting in the development of climate risk and opportunity matrices. The assessment results were approved by the CSO and reported to both the ESG Committee and the Board of Directors.

Climate risk management process

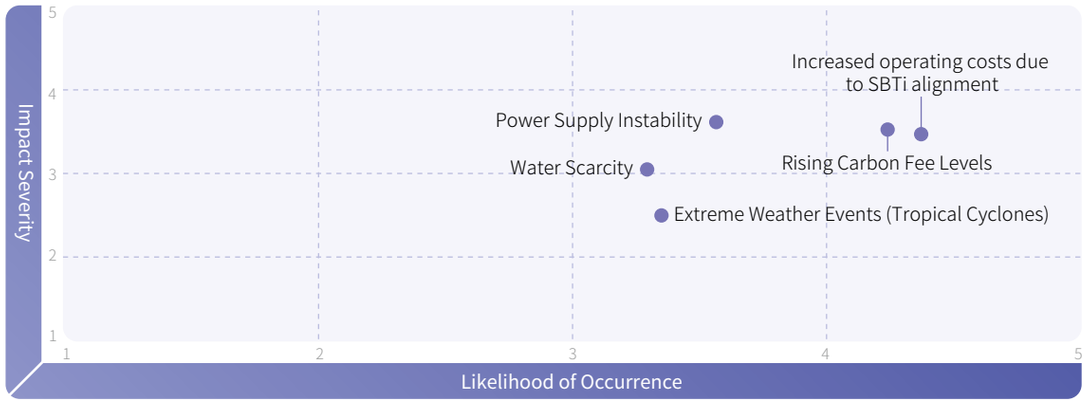
1 Establish a list of climate risks and opportunities	Climate risks and opportunities were identified with reference to the TCFD framework and SASB disclosure topics, in conjunction with domestic and international regulatory trends and industry developments.
2 Define assessment criteria	Risks and opportunities were evaluated based on impact severity, likelihood of occurrence, and time horizon.
3 Identify climate risks and opportunities at the company level	Each company identified material short term (within 1 year), medium term (2–5 years), and long term (over 5 years) risks and opportunities based on the impact severity[1] and likelihood of occurrence[2], while considering business relevance and existing response measures.
4 Develop consolidated risk and opportunity matrices	Aggregate company level results and consolidate them into group level climate risk and opportunity matrices.
5 Assess financial and operational impacts	The financial and operational impacts of key risks and opportunities were assessed qualitatively or quantitatively across own operations and the upstream and downstream value chain.
6 Discuss response measures	Relevant units reviewed and developed mitigation and adaptation measures for material risks and opportunities.

Note 1: Impact severity is classified into five levels, ranging from high to low, based on the potential effects on the company in terms of financial performance, production capacity, employee health and safety, regulatory compliance, and reputation.
Note 2: Likelihood of occurrence is classified into five levels based on probability, ranging from "Very Likely" to "Very Unlikely."

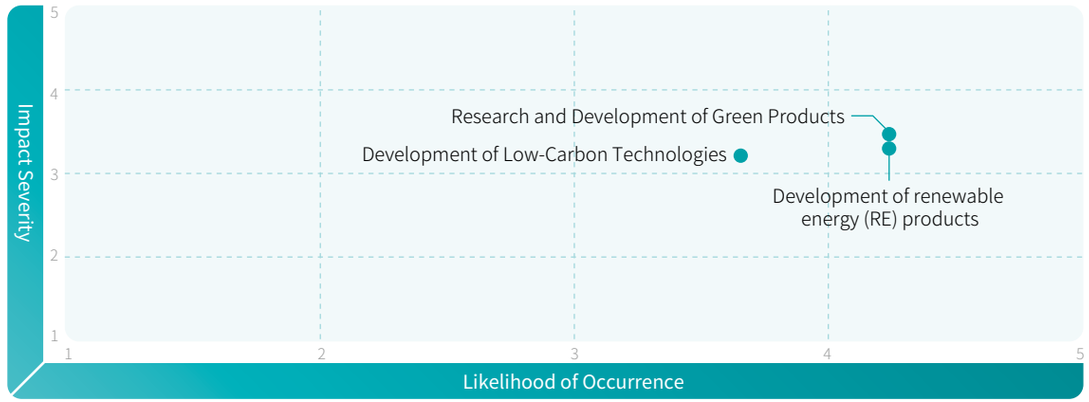
Climate Risk and Opportunity Matrices

Winbond assessed and prioritized climate-related risks and opportunities based on their impact and likelihood, identifying five major climate risks and three major opportunities.

Climate Risk Matrix



Climate Opportunity Matrix



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Strategy

3.1 Climate Risks and Opportunities

Climate risk issues

	Climate risk	Timeframe of impact	Impact boundary	2025 / potential financial or operational impacts	Response measures
Transition risk	Increased operating costs due to SBTi alignment	Short-term / Medium-term / Long-term	• Own operations	• Increased operating expenses and capital expenditures associated with decarbonization actions[2]	• Implement decarbonization measures, including process improvements, replacement of energy-efficient components, and energy-saving projects • Procure and invest in renewable energy • Install on-site renewable energy generation systems • Actively develop low-carbon and energy-efficient products to reduce use-phase emissions • Collaborate with key suppliers on carbon inventories, target setting, and improvement actions
	Rising carbon fee levels	Short-term / Medium-term / Long-term	• Upstream • Own operations • Downstream	• Increased carbon fees and operating costs[1] • Additional operating expenses and capital expenditures for decarbonization actions[2] undertaken in response to rising carbon fees • Increased procurement costs due to cost pass-through from upstream suppliers	• Establish a carbon accounting system to effectively manage emissions data • Apply for and implement voluntary reduction programs to lower applicable rates • Implement decarbonization measures and energy-saving projects • Procure and invest in renewable energy • Install on-site renewable energy generation systems • Participate in carbon credit markets and monitor offset mechanism developments
Physical risk	Power supply instability	Short-term	• Upstream • Own operations • Downstream	• Production losses or equipment downtime due to power disruptions • Increased operating costs for maintaining backup power systems[3]	• Install emergency generators and uninterruptible power supply systems, with regular maintenance
	Water scarcity	Short-term	• Upstream • Own operations • Downstream	• Capacity constraints due to restricted water intake during prolonged shortages • Increased water procurement costs due to the adoption of alternative water sources during water shortages • Increased operating and capital expenditures for water management and backup systems[4]	• Maintain backup water reservoirs • Identify alternative water sources or deploy water trucks during rationing periods • Implement water conservation and recycling measures to enhance efficiency
	Tropical cyclones	Short-term	• Upstream • Own operations • Downstream	• Increased labor costs due to overtime payments required to maintain production operations during typhoon leaves[5] • Potential asset damage and operational disruptions at company and supplier facilities • Potential long-term increases in catastrophe insurance premiums	• Increase production automation to reduce manual operations • Use digital tools to enhance remote working efficiency • Promote disaster preparedness measures among suppliers, including facility reinforcement and drainage improvements • Establish 24-hour emergency response teams and monitor supplier locations for disaster impacts

Financial impacts and management costs arising from the climate risks in 2025:

1. Estimated carbon fees: NT$17 million
2. Greenhouse gas emission reduction initiatives
   - Capital expenditures on energy-saving and carbon reduction equipment: NT$332 million, resulting in depreciation expenses of NT$20 million
   - Energy-saving and carbon reduction expenses: NT$151 million
   - Additional costs for renewable energy procurement and supply chain green electricity promotion: NT$125 million
   - New renewable energy investments: NT$69 million
   - Capital expenditures for on-site renewable energy generation systems: NT$4 million
   - Maintenance costs for on-site renewable energy generation systems: NT$1 million
   - Expenses for supplier decarbonization guidance and activities: NT$0.4 million
3. Maintenance costs for emergency generators and uninterruptible power systems: NT$54 million, with depreciation expenses of NT$66 million
4. Water resource system maintenance costs: NT$228 million, with depreciation expenses of NT$250 million
5. Increased labor costs due to typhoon leaves: NT$11 million

Climate opportunity issues

Climate opportunity	Timeframe of impact	Impact boundary	2025 / potential financial or operational impacts	Response measures
Research and development of green products	Medium-term / Long-term	• Upstream • Own operations • Downstream	• Enhanced product competitiveness and expanded market with sustainability and low-carbon requirements • Continued R&D investment requirements	• Continue developing high-performance, low-energy-consumption green products to meet market demand
Development of renewable energy (RE) products	Short-term / Medium-term / Long-term	• Upstream • Own operations • Downstream	• Meeting customer demand for RE products supports order retention and revenue growth [1] • Increased operating costs from using green electricity during manufacturing, packaging and testing [3]	• Procure and invest in renewable energy • Install on-site renewable energy generation systems • Promote RE products and develop new customers with demand for RE products
Development of low-carbon technologies	Medium-term / Long-term	• Upstream • Own operations • Downstream	• Reduced carbon intensity in manufacturing to meet low-carbon supply chain requirements [2] • Process optimization improves production efficiency and reduces operating costs • Ongoing process R&D investment requirements	• Develop low-carbon-footprint process technologies • Collaborate with the supply chain to reduce emissions during packaging and assembly stages

Financial impacts and management costs arising from the climate opportunities in 2025:

1. Revenue from RE products: NT$3,906 million
2. Revenue from Sustainable Economic Activities: NT$59,317 million
3. Management costs related to additional costs for renewable energy procurement and supply chain green electricity promotion, renewable energy investments, and the construction and maintenance of on-site renewable energy generation systems are detailed in P.10.

3.2 Scenario Analysis

Transition risk scenario analysis

Winbond applied three scenarios to simulate transition risks. In addition to assessing risks arising from current domestic regulations, the analysis incorporated the potential impacts of international decarbonization trends. Climate change may affect Winbond' s financial performance through regulatory, technological, market, and reputational channels. Among these factors, carbon taxes / carbon fees and the use of renewable electricity were estimated to result in financial impacts of approximately NT$ 0.3–3.7 billion by 2030, equivalent to approximately 0.4%–4% of 2025 revenue.

Scenario Descriptions

External scenario	Descriptions	Assessed emission sources [1]
Government net-zero pathway	Based on Taiwan' s 2050 Net-zero Emissions Pathway, assuming the government guides industries toward long-term national climate targets through climate regulations, carbon pricing mechanisms, and energy management policies.	Scope 1 + Scope 2
SSP1-1.9	Referencing the IPCC AR6 1.5° C pathway, assuming a high level of global cooperation to accelerate the low-carbon transition, with increased market requirements for green and low-carbon products and value-chain decarbonization.	
SBT-NZ	Based on the Science Based Targets initiative (SBTi) Net-zero Standard, assuming global companies follow rigorous science-based decarbonization pathways and continuously strengthen emissions management across operations and value chains.	

Carbon Tax Imposition

External scenario [2]	Assumptions	Estimated financial impact in 2030[3]
SSP1-1.9	Carbon price parameters aligned with the SSP1-1.9 pathway, reaching US$ 651/tCO_2e by 2050	> NT$ 2.5 billion
SBT-NZ		

Carbon Fee Imposition

External scenario [2]	Assumptions	Estimated financial impact in 2030
Government net-zero pathway	General rate of NT$ 300/tCO_2e; single-fab exemption of 25,000 tCO_2e/year	< NT$ 0.2 billion
	Preferential Rate A of NT$ 50/tCO_2e; single-fab exemption of 25,000 tCO_2e/year	< NT$ 0.05 billion

Use of Renewable Energy

External scenario	Assumptions	Estimated financial impact in 2030
Government net-zero pathway	Procurement costs estimated based on Taipower' s average wholesale price for renewable electricity plus supply costs; O&M costs for solar PV installations estimated using average values reported by IRENA	≈ NT$ 0.3 billion
SSP1-1.9		
SBT-NZ		

Note 1: Scope 1 and Scope 2 carbon emissions from 2026 onward are estimated figures. These estimates were calculated based on a comprehensive assessment of parameters including actual emissions in 2025, projected medium-to-long-term average emission growth trends, and projected electricity emission factors.
Note 2: In light of Taiwan' s official announcement and implementation of a carbon fee mechanism, and considering that carbon taxes are the predominant carbon pricing instrument globally, different scenario sources were applied for the analysis of carbon fees and carbon taxes. Carbon fee scenarios were assessed based on the Taiwan government' s net-zero transition pathway, while carbon tax scenarios were evaluated using the internationally recognized SSP1-1.9 and SBT Net-Zero (NZ) scenarios.
Note 3: The financial impact for 2030 was calculated by applying the projected carbon emissions under each scenario for 2030 and estimating the corresponding carbon tax levels based on the applicable carbon price pathways.

Physical climate risk scenario analysis

Physical risk scenario analysis for global fabs, offices, and suppliers

Extreme weather events driven by climate change have posed tangible challenges to the semiconductor industry, which relies heavily on stable electricity supply, water availability, and global supply chain operations. These challenges may affect business continuity and long-term competitiveness. To assess operational resilience under different climate scenarios, Winbond followed IPCC AR6 SSP pathways to evaluate potential physical climate risks faced by global self-owned sites and supplier locations across four emissions scenarios (SSP1-2.6, SSP2-4.5, SSP3-7.0, and SSP5-8.5)[1] and four time horizons (short term, medium term, medium-to-long term, and long term).[2] The results serve as key inputs for resilience assessment, long-term planning, and the strengthening of supply chain risk management.

For domestic operating sites and key suppliers, Winbond conducted physical climate risk assessments based on Taiwan' s climatic characteristics and the availability of high-resolution data, covering critical hazards such as extreme rainfall, drought, and extreme heat. Extreme rainfall risks were evaluated using rainfall return period data, combined with publicly available flood potential and geological hazard maps to assess site vulnerability. Overall risk levels were determined using the hazard-exposure-vulnerability framework. Drought risks were assessed using the Standardized Precipitation Index (SPI), comparing historical baseline observations with projected future trends to identify water scarcity risk levels. Extreme heat risks were evaluated based on definitions issued by the Central Weather Administration, assessing event frequency and potential impacts. The aforementioned climate hazards were further assessed by integrating the geographical exposure of each operational site to identify potential impacts on operational stability.

For global operating sites and key suppliers, Winbond systematically assessed water-related physical risks to ensure cross-country data consistency and comparability. Baseline analyses applied the WRI Aqueduct Overall Water Risk[3] indicator, covering water quantity, water quality, regulatory, and reputational risks. Future analyses assessed changes in water stress[4] levels under SSP1-2.6, SSP3-7.0, and SSP5-8.5 scenarios to identify potential impacts on operational sites and global supply chain stability under different warming pathways.

Note 1: SSP1-2.6：Low emissions scenario, with an estimated global temperature increase of approximately 1.8° C by the end of this century.
SSP2-4.5：Medium emissions scenario, with an estimated global temperature increase of approximately 2.7° C by the end of this century.
SSP3-7.0：High emissions scenario, with an estimated global temperature increase of approximately 3.6° C by the end of this century.
SSP5-8.5：Very high emissions scenario, with an estimated global temperature increase of approximately 4.4° C by the end of this century.

Note 2: Short term: 2021–2040; Medium term: 2041–2060; Medium to long term: 2061–2080; Long term: 2081–2100.

Note 3: Overall Water Risk is a composite indicator developed under the Aqueduct platform of the World Resources Institute (WRI). The indicator integrates 13 water-related risk metrics across three dimensions—water quantity, water quality, and regulatory and reputational risks—to reflect the overall level of water risk faced by operational sites or the supply chain.

Note 4: Baseline Water Stress measures the ratio of total annual water withdrawals to available renewable surface water and groundwater supply within a specific region. This indicator reflects the degree of tension between water supply and demand. Higher baseline water stress indicates more intense competition among users for limited water resources and a correspondingly higher risk of water scarcity or supply disruption in the region.

Scenario analysis results

Physical risk scenario analysis results for domestic self-owned sites and suppliers

The results indicate that water scarcity and extreme heat represent the primary physical climate risks for domestic self-owned sites and suppliers. Risk levels increase significantly with higher emissions scenarios and over longer time horizons. In contrast, disaster risks associated with extreme rainfall—such as flooding, landslides, and debris flows—pose relatively limited impacts on overall operations.

Assessment scope: Winbond Group – Taiwan self-owned sites

Climate risk		Extreme rainfall	Water scarcity	Extreme heat
Assessment results [1]	SSP1-2.6	Scenario analysis results indicate that the Kaohsiung site is exposed to potential flooding risk. Under the SSP1-2.6 scenario, the site is assessed as low risk. Under SSP5-8.5, the risk is assessed as low in the short and medium-to-long term, increasing to medium risk in the long term. For the remaining six self-owned sites, the risk levels for flooding, debris flow, and landslides are assessed as no risk across all time horizons under both SSP1-2.6 and SSP5-8.5 scenarios.	Water-scarcity risks were concentrated at the Tainan and Kaohsiung sites, remaining at medium-high to high risk from short- to-long term. Taipei, Hsinchu, and Taichung sites remained at low risk across all horizons.	Overall, among the seven self-owned sites, only one site in Taipei City presented a medium risk in the medium-to-long term, while the remaining sites maintained low risk from the short to the long term.
	SSP5-8.5		Water-scarcity risks remained concentrated at Tainan and Kaohsiung at medium-high to high risk. Taipei, Hsinchu, and Taichung sites increased from low-to-medium risk in the short-to-medium term to medium risk in the medium-to-long term and beyond.	In the short and medium term, all sites were predominantly assessed as low risk; in the medium-to-long term, the risk level of the Taipei site increased to high risk, while the Hsinchu, Tainan, and Kaohsiung sites increased to medium risk; in the long term, all sites were assessed as high risk.

Climate adaptation measures and strategies

- Drainage facilities, flood barriers, and pumping systems were installed during fab construction
- Water recycling and reuse rates were continuously increased
- Multiple alternative water sources were developed
- On-site water storage reservoirs were constructed to maintain fab operations during water shortages and supply restrictions

Note 1: The assessment presented only the representative low-emissions scenario (SSP1-2.6) and the very high-emissions scenario (SSP5-8.5) to illustrate the range of risk impacts under different climate pathways. The analysis results of the remaining scenarios were incorporated as reference inputs to the overall risk assessment.

SSP5-8.5 long-term scenario –
overall risk assessment results for extreme rainfall

●High risk ●Medium risk ●Low risk ●No risk

SSP5-8.5 long-term scenario –
water scarcity risk assessment results

●High risk ●Medium-high risk ●Medium risk ●Low risk

SSP5-8.5 long-term scenario –
extreme heat risk assessment results

●High risk ●Medium risk ●Low risk

Assessment scope: Winbond Group – Taiwan supplier sites

Climate risk		Extreme rainfall	Water scarcity	Extreme heat
Assessment results	SSP1-2.6	Across short-to-long-term time horizons, high-risk supplier sites account for less than 1%. The high-risk sites mainly concentrated in Hsinchu, Kaohsiung, and Taichung, with flooding identified as the primary risk factor.	In the short term, water scarcity risks were mainly concentrated in Taoyuan and Kaohsiung, with high-risk suppliers accounting for approximately 13% of the total. In the long term, the risk levels of Taoyuan and Kaohsiung sites decreased to medium-high risk and were categorized together with Miaoli and Tainan sites as medium-high risk; the remaining sites were mostly assessed as low risk, with medium-high-risk supplier sites accounting for approximately 20% overall.	In the short term, all supplier sites were assessed as low risk; in the medium to long term, approximately 15% of sites increased to medium risk, all of which were concentrated in the Greater Taipei area.
	SSP5-8.5	Across short- to long-term time horizons, high-risk supplier sites account for less than 2%. The high-risk sites mainly concentrated in Hsinchu and Kaohsiung, and Taichung, with flooding identified as the primary risk factor.	In the short term, water scarcity risks were mainly concentrated in Taoyuan and Kaohsiung, with high-risk suppliers accounting for approximately 13% of the total; in the long term, the risk level of the Miaoli site increased from medium-high risk to high risk, with high-risk supplier sites accounting for approximately 16% overall.	In the short term, all supplier sites were assessed as low risk; in the long term, approximately 99% of sites increased to high risk.

Climate adaptation measures and strategies

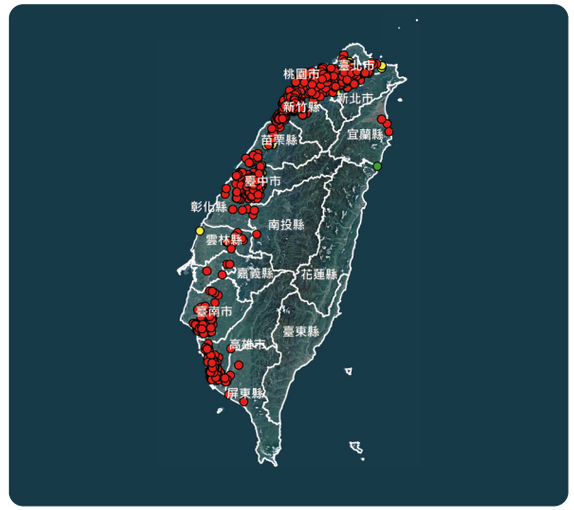
- Flood-related response measures were communicated to suppliers, including strengthening fab foundation structures and drainage facilities, as well as conducting routine emergency drills
- An around-the-clock emergency response task force was established, with continuous monitoring of flood conditions in supplier locations

SSP5-8.5 long-term scenario –
overall risk assessment results for extreme rainfall

●High risk ●Medium risk ●Low risk ●No risk

SSP5-8.5 long-term scenario –
water scarcity risk assessment results

●High risk ●Medium-high risk ●Medium risk ●Low risk



SSP5-8.5 long-term scenario –
extreme heat risk assessment results

●High risk ●Medium risk ●Low risk

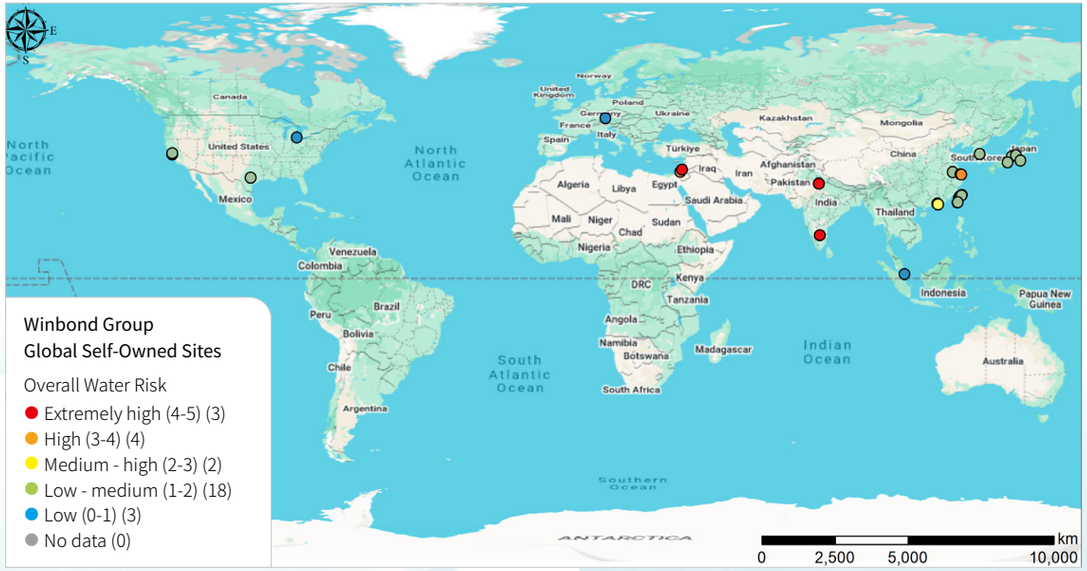
Physical risk scenario analysis results for global self-owned sites and suppliers

- Baseline: overall water risk analysis

Based on WRI Aqueduct baseline results, Winbond identified global water risk hotspots across its operations. Sites located in China, India, Israel, and the United States were assessed as having high to extremely high overall water risk, reflecting intense competition for water resources, seasonal supply variability, or elevated flood risk. These results inform future global operational planning and supply chain resilience management.

Assessment scope: Winbond Group – global self-owned sites

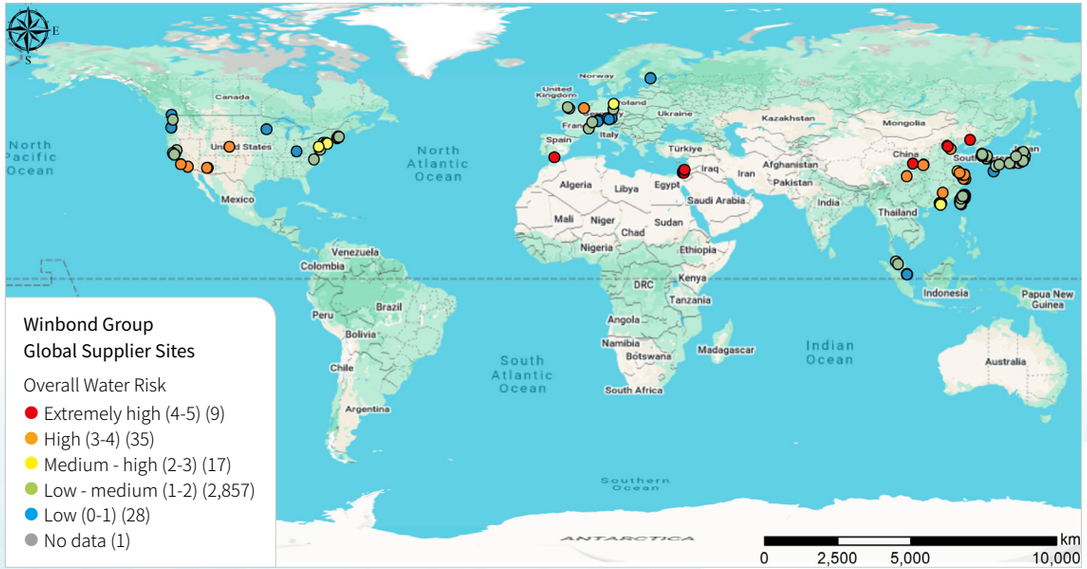
Climate risk	Baseline overall water risk
Assessment results	Water risk hotspots were concentrated in China, India, and Israel. Among 30 self-owned sites, three in India and Israel were classified as extremely high risk, while four sites in China and Israel were classified as high risk.



Baseline overall water risk assessment results for self-owned sites

Assessment scope: Winbond Group – global supplier sites

Climate risk	Baseline overall water risk
Assessment results	Water risk hotspots were concentrated in China, the United States, and Israel. A total of 44 supplier sites (approximately 1%) were assessed as high to extremely high risk. Approximately 98% of supplier sites were assessed as low to medium risk or lower.



Baseline overall water risk assessment results for supplier sites

- Future scenarios: water stress analysis

Scenario analysis indicates that as emissions pathways intensify and time horizons extend, the number of global operating sites and supplier locations classified as medium-high, high, and extremely high water stress increases, while the number of low and low-medium water stress sites declines. Elevated water stress indicates tighter local supply demand conditions and may expose operations to unstable water access, withdrawal restrictions, or rising water costs under both normal and extreme climate conditions. Overall, the results suggest that climate change may further exacerbate global water stress and pose long-term challenges to operational and supply chain water security.

Assessment scope: Winbond Group – global self-owned sites

Climate risk		Water stress risk under climate change
Assessment results[1]	SSP1-2.6	Under both SSP1-2.6 and SSP5-8.5 scenarios, water stress risks were concentrated in China, India, Israel, and the United States. Across short-, medium-, and long-term horizons, eight sites were assessed as high to extremely high risk, while most sites in Taiwan and Japan were assessed as low-to-medium risk.
	SSP5-8.5	

SSP1-2.6 long-term scenario – Water stress assessment results for self-owned sites

SSP5-8.5 long-term scenario – Water stress assessment results for self-owned sites

Note 1: The assessment presented only the representative low-emissions scenario (SSP1-2.6) and the very high-emissions scenario (SSP5-8.5) to illustrate the range of risk impacts under different climate pathways. The analysis results of the remaining scenarios were incorporated as reference inputs to the overall risk assessment.

Assessment scope: Winbond Group – global supplier sites

Climate risk		Water stress risk under climate change
Assessment results	SSP1-2.6	Under both SSP1-2.6 and SSP5-8.5 scenarios, water stress risks were concentrated in China, Israel, and the United States. Across short-, medium-, and long-term horizons, approximately 50 supplier sites (about 2%) were assessed as high to extremely high risk. Nearly 96% of supplier sites were assessed as low-to-medium risk or lower, primarily located in Asia.
	SSP5-8.5	

SSP1-2.6 long-term scenario – Water stress assessment results for supplier sites:

SSP5-8.5 long-term scenario – Water stress assessment results for supplier sites:

3.3 Climate Change Mitigation and Adaptation Strategies

Winbond has established net-zero emissions by 2050 as its long-term goal and has developed climate response strategies from two key perspectives: mitigation and adaptation. On the mitigation side, the Company focuses on improving energy efficiency, increasing renewable energy adoption, enhancing greenhouse gas management, and promoting low-carbon product and process design to reduce emissions throughout operations and product life cycles. On the adaptation side, the Company strengthens water resource management and operational resilience by implementing preparedness and contingency measures to address the uncertainties associated with climate change.
In addition, Winbond extends its climate strategy throughout the value chain by collaborating with partners to accelerate the low-carbon transition and strengthen supply chain resilience. The Company also actively monitors product and market opportunities arising from the low-carbon transition and integrates climate strategy into business development to enhance its overall sustainability competitiveness.

Strategic Focus	Key Actions
Energy and Greenhouse Gas Management	• Implement process improvement measures • Replace energy-efficient equipment and execute energy-saving projects • Increase renewable energy usage through procurement, investment, and on-site renewable energy generation systems • Implement greenhouse gas management mechanisms and regular inventories • Establish a carbon emissions information platform to improve emissions data management efficiency
Operational Resilience and Physical Risk Adaptation	• Promote water conservation measures and increase water recycling rates • Establish backup water supply mechanisms • Install and maintain emergency generators and uninterruptible power supply systems • Promote automation and digital tools to reduce dependence on manual operations during extreme weather events • Strengthen suppliers' response capabilities for extreme weather events
Green Products	• Continue developing compact, high-performance, low-power green products • Reduce carbon footprints during manufacturing and packaging processes • Develop and promote RE products.
Sustainable Supply Chain	• Lead Scope 3 emissions reduction initiatives, including packaging optimization, transportation improvements, and backend assembly and testing services • Promote low-carbon supply chain governance » Enhance supplier disclosure mechanisms » Strengthen supplier decarbonization capabilities through guidance, training, and collaboration » Continuously track supplier emissions reduction performance

3.3.1 Energy and Greenhouse Gas Management

As climate regulations become increasingly stringent and the semiconductor industry remains highly dependent on reliable energy supplies, energy costs, power supply stability, and greenhouse gas management have become critical determinants of Winbond's long-term cost structure and competitiveness. Therefore, Winbond regards energy efficiency improvement and greenhouse gas reduction as core climate strategies and implements a range of initiatives to enhance resilience under different policy and energy transition scenarios.

1. **Process Improvement Measures**

To reduce energy consumption and greenhouse gas emissions per unit of production, Winbond continuously improves manufacturing processes to enhance energy efficiency. These efforts include reducing greenhouse gas consumption during production while simultaneously decreasing the use of process gases and chemical raw materials in response to rising energy costs and increasingly stringent carbon regulations.

2. **Replacement of Energy-Efficient Equipment and Energy-Saving Projects**

Guided by its vision of becoming an "Invisible Champion Enriching Human Life through Green Semiconductor Technologies," Winbond systematically promotes energy conservation initiatives. In 2025, the Company implemented 214 energy-saving projects across six categories, including equipment replacement, equipment modification, efficiency improvement, consumption reduction, process optimization, and intelligent energy-saving technologies. Major initiatives included:

- Cooling tower system optimization
- Compressed air system efficiency enhancement
- Replacement of high-efficiency pumps

3. **Increasing Renewable Energy Usage (Procurement, Investment, and Self-Generation)**

To address energy transition requirements and power supply risks, Winbond views renewable energy adoption as a key strategy for reducing Scope 2 emissions and strengthening energy resilience.

- Renewable Energy Procurement:
  Since 2023, Winbond has procured onshore wind power, providing nearly 10 million kWh of renewable electricity annually, sufficient to meet the annual electricity demand of Winbond (Taiwan)' s non-production facilities.
- Long-term Renewable Energy Investments and Procurement Agreements:
  In November 2024, the Board approved a long-term renewable energy power purchase agreement with Sustainable Energy Solution Co., Ltd. (SES), a renewable power retailer under the Sino-American Silicon Products Group. Upon completion of the R3-1 offshore wind farm project, offshore wind and solar power will be supplied to Winbond under a 30-year agreement with a total contracted electricity volume of approximately 4.8 billion kWh. The project is expected to reduce carbon emissions by approximately 80,000 tons annually and by approximately 2.4 million tons over the contract period.
  In addition, beginning January 1, 2026, Winbond plans to receive an early supply of 24 MW of solar power under the agreement to strengthen the low-carbon transition of its electricity mix.
- On-site Renewable Energy Generation Systems:
  Winbond (Taiwan) installed a 0.499 MW rooftop solar photovoltaic system in 2019 and converted its electricity output to self-consumption in 2024 to support facility operations and green manufacturing. Nuvoton (Taiwan) also completed installation of a 0.819 MW self-consumption solar photovoltaic system in 2023.
  Winbond Group will continue evaluating opportunities to expand renewable energy capacity as part of its overall climate and energy risk management strategy.

4. Implement Greenhouse Gas Management Mechanisms through Regular Inventory and Emissions Reduction Initiatives

Winbond conducts regular greenhouse gas (GHG) inventories to continuously review its emissions profile and evaluate the effectiveness of reduction measures. The Company's primary GHG emissions originate from fluorinated greenhouse gases (FCs) used in manufacturing processes and purchased electricity, which together account for more than 90% of Scope 1 and Scope 2 emissions. Based on this emissions profile, Winbond's GHG management strategy focuses on:

- Directly reducing FC emissions from manufacturing processes
- Promoting energy conservation and electricity efficiency
- Increasing the use of renewable energy

5. Establish a Carbon Information Platform to Enhance Emissions Data Management Efficiency

To accurately monitor GHG emissions and identify emission hotspots throughout manufacturing processes, Winbond has independently developed a Carbon Accounting System. Through three core modules—GHG Inventory, Product Carbon Footprint, and Emissions Management—the system comprehensively monitors Scope 1, Scope 2, and Scope 3 GHG emissions. The system systematically collects carbon emissions data from manufacturing operations, helping to analyze major emission sources and reduce GHG emissions throughout the production process.

3.3.2 Operational Resilience and Physical Risk Adaptation

1. Water Conservation Measures and Water Reuse

To address changing precipitation patterns and increasing drought risks resulting from climate change, Winbond continues to strengthen its water-use efficiency and water recycling capabilities, reducing dependence on a single water source and enhancing operational resilience to water-resource uncertainties.

Winbond (Taiwan) has established improvement of water recycling rates as a core management objective and has set a target of achieving an average plant-wide water recycling rate of over 80% by 2030. In 2025, the overall water recycling rate reached 82.7%, while the process water recycling rate reached 90.3%, meeting the environmental impact assessment commitments required by science parks and demonstrating the effective implementation of water-saving and recycling measures.

Ultrapure water is the primary water-consuming resource in semiconductor manufacturing. Through process improvements and technological enhancements, Winbond continuously reduces its ultrapure water consumption intensity year by year. In 2025, ultrapure water consumption totaled 4,345 million liters, and the ultrapure water intensity indicator was 0.141 m^3 per 12-inch equivalent wafer mask layer. These efforts help mitigate the potential impact of water-related risks on operating costs and production stability.

Winbond (Taiwan) promotes water conservation initiatives through four key approaches: reducing water withdrawal and consumption, adopting water-efficient designs, optimizing production processes, and improving facility water-use efficiency. In 2025, a total of 11 water-saving projects were implemented, covering water recycling, operational optimization, and process improvements, resulting in total water savings of 52.99 million liters and further strengthening water resilience under extreme climate scenarios.

Category	Action Plan	Water Savings (megaliters)
Recycling and reuse	Recycle process wastewater from wet etching equipment	28.50
Process optimization	Optimize and adjust utility system procedures	19.35
Process improvement	Adjust process water use and optimize parameters	5.14

2. Establishing Backup Water Supply Mechanisms

To address drought periods and potential water rationing risks, Winbond has established the "Major Disaster or Incident Crisis Management Procedures." Water storage facilities have been installed at manufacturing sites, and alternative stable water sources are continually explored to support essential operational needs under water-constrained scenarios.

In addition, regular maintenance of water treatment facilities is conducted to ensure treatment system performance and maintain reliable water supply capabilities under extreme climate conditions, thereby reducing the risk of production disruptions.

3. Establishing and Maintaining Emergency Generators and Uninterruptible Power Supply Systems

To address the risk of power instability caused by extreme weather events, Winbond has established and maintained emergency generators and uninterruptible power supply (UPS) systems to ensure that critical manufacturing processes can continue operating during unexpected incidents. These measures reduce the impacts of power interruptions on production yield and delivery schedules while strengthening overall operational resilience.

4. Promoting Automated Manufacturing and Digital Tool Applications

Winbond continues to advance automated manufacturing and the application of digital tools to reduce reliance on manual on-site operations during extreme weather events, thereby enhancing the stability and flexibility of production processes. In addition, remote working mechanisms have been implemented to strengthen business continuity under extreme weather scenarios.

5. Strengthening Suppliers' Response Capabilities to Extreme Weather Events

In addition to its own operations, Winbond pays close attention to the potential impacts of climate-related physical risks on supply chain stability and incorporates suppliers into its operational resilience and adaptation strategies.

The Company promotes awareness among suppliers regarding response measures for extreme weather events, including strengthening facility infrastructure and drainage systems, as well as conducting emergency response drills to enhance the resilience of the overall supply chain against climate-related disasters.

Furthermore, a 24-hour emergency response team has been established to continuously monitor disaster events in supplier locations. When necessary, the team promptly assesses supply risks to minimize disruptions to critical material supplies and delivery schedules caused by extreme weather events.

3.3.3 Green Products

1. Continuous Development of Small-Size, High-Performance, and Energy-Efficient Green Products

Guided by its green semiconductor design philosophy, Winbond continues to invest in research and development, technology, and talent cultivation to develop memory products featuring high performance, compact size, and low power consumption. These efforts cover key product lines including Code Storage Flash Memory, Secure Flash Memory, and customized memory solutions.

In the Flash memory product segment, Winbond introduced the world's first 64 Mb QSPI NOR Flash supporting a 1.2V operating voltage. Compared with conventional 1.8V NOR Flash products, it can reduce power consumption by approximately 50% while maintaining comparable performance, meeting the low-power requirements of wearable devices, wireless earbuds, smartwatches, and other battery-powered applications. Subsequently, Winbond introduced a second-generation architecture featuring circuit optimization and leakage detection technology, further reducing overall power consumption by approximately 40% compared with the previous generation. The product portfolio now spans capacities ranging from 8 Mb to 256 Mb. These next-generation products not only meet global customer demand for long battery life, high performance, and low-carbon storage solutions but also help customers achieve emissions reduction goals in end-use applications.

For customized solutions, Winbond launched a new 8 Gb DDR4 DRAM utilizing its proprietary 16 nm advanced process technology. The product features a smaller chip size, higher wafer output, and improved power efficiency while supporting an industry-leading data transfer rate of 3,600 Mbps to meet the requirements of high-performance computing applications.

For edge AI applications, Winbond has developed CUBE (Customized Ultra-Bandwidth Elements) high-bandwidth memory technology. By utilizing Through-Silicon Via (TSV) and 3D stacking technologies, CUBE delivers bandwidth exceeding that of conventional memory solutions. Leveraging its 3D stacking architecture and compact design, CUBE optimizes packaging and integration technologies to reduce SoC chip area, providing enhanced cost efficiency and smaller product dimensions, making it ideal for portable and space-constrained devices. In addition, TSV technology improves signal integrity and power integrity while enhancing overall system efficiency. CUBE also demonstrates outstanding energy efficiency, making it particularly suitable for power-sensitive applications.

2. Reducing the Carbon Footprint of Product Manufacturing and Packaging

In addition to improving energy efficiency during product use, Winbond continues to focus on reducing the carbon footprint associated with product manufacturing and packaging stages through process innovation, packaging optimization, and manufacturing energy-efficiency improvements. With respect to process technology, as NAND Flash technology has evolved from 46 nm to 24 nm nodes, die size has been significantly reduced while maintaining the same capacity and packaging configuration. As a result, the manufacturing carbon footprint per unit product has decreased compared with previous-generation products.

Regarding packaging and material utilization, Winbond has accumulated extensive expertise in Known Good Die (KGD) technology and collaborated with customers and industry partners to deploy memory KGD solutions in System in Package (SiP) applications. This approach reduces packaging material usage while enhancing performance, lowering power consumption, and minimizing chip area.

In addition, Winbond has introduced memory products compatible with Low-Temperature Soldering (LTS) processes, reducing Surface Mount Technology (SMT) temperatures from the conventional lead-free process range of 220–260 ° C to approximately 190° C. This effectively reduces carbon dioxide emissions during production. Winbond products comply with JEDEC standards and have successfully passed relevant reliability verification procedures, reducing energy consumption and emissions during manufacturing while maintaining product quality.

3. Developing and Promoting RE Products

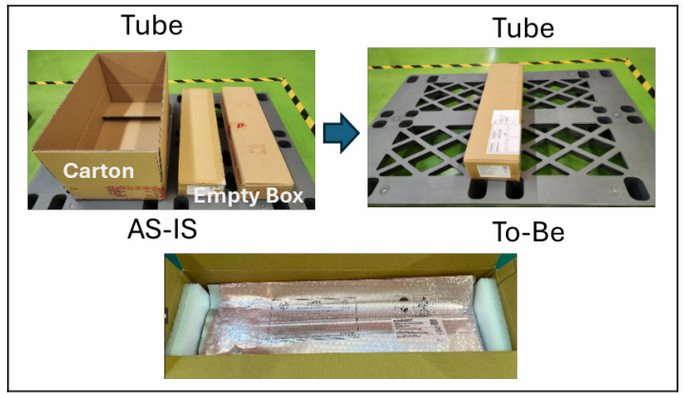
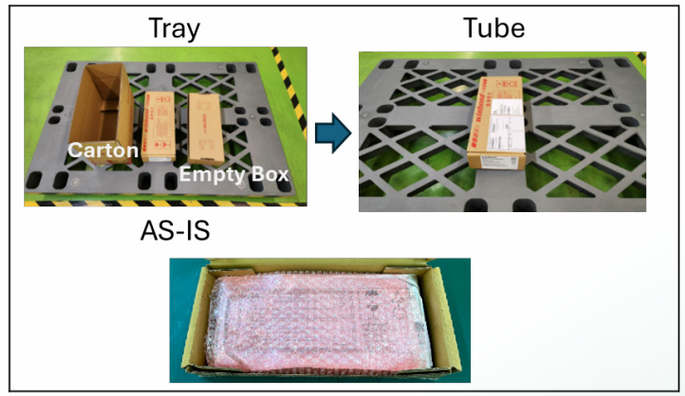
Since 2024, Winbond has begun incorporating renewable energy into product manufacturing and has extended the use of renewable energy to downstream outsourced assembly and testing (OSAT) partners. Products manufactured using renewable energy are defined as those whose wafer fabrication, packaging, and testing processes are all powered by renewable electricity and are identified by the letter "G" in the 13th digit of the product part number.

Beginning in December 2024, Winbond commenced large-scale shipments of RE products to key customers with a strong ESG focus, responding to growing market demand for low-carbon products. Compared with products manufactured using conventional energy sources, products manufactured with renewable energy achieve at least a 60% reduction in product carbon emissions. By the end of 2025, Winbond had shipped a total of 451 million RE products, reducing product carbon emissions by approximately 35,044 tCO_2e and demonstrating tangible achievements in the commercialization of RE products.

3.3.4 Sustainable Supply Chain

To effectively advance toward its 2050 net-zero emissions goal, Winbond systematically promotes low-carbon transformation across its supply chain through two key pillars: " Lead by example — Internal scope 3 emission reduction" and " Expansion and impact — Low-carbon supply chain governance."

Lead by example — Internal scope 3 emission reduction

Category	Key Initiatives and Carbon Reduction Performance
Raw materials decarbonization	In 2025, coached significant suppliers to complete product carbon inventories; annual reductions in upstream value chain (Scope 3, Category 1) reached 4,625.8 tCO_2e.
Upstream transportation	*1.* Completed multi-source traceability for 9 significant materials; six were shifted to Local Procurement, reducing emissions by 725.0 tCO_2e. *2.* Introduced a shared logistics mechanism and engaged two suppliers in shared-transport models, reducing 0.3 tCO_2e annually. *3.* Implemented Packaging Optimization 2.0 and paperless low-carbon import/export operations; for sample shipments, adopted safe minimal packaging to avoid over-packaging, reducing packaging and transportation emissions by 251.6 tCO_2e annually. • Packaging optimization 2.0  
Backend packaging and testing services	*1.* Conducted regular product carbon footprint inventories; the third inventory will be conducted in 2026 to track changes across seven major OSAT suppliers and set hotspot reduction targets. *2.* Continued packaging material decarbonization projects (anti-static boxes replacing paper cartons, Reel material reduction, Carrier Tape recycling and reuse, Tube material recycling and reuse, removal of duplicate labels), reducing 285.9 tCO_2e. *3.* Introduced energy-efficient test production equipment, reducing 3,702.0 tCO_2e.
Waste disposal	*1.* Reduced the incineration treatment ratio for IPA waste liquid (CTSP Fab: 30% → 15%; Kaohsiung Fab: 20% → 10%), reducing 391.2 tCO_2e in 2025. *2.* Shifted spent waste expanded polystyrene (EPS), corrugated plastic board, and ultrapure water (UPW) filter cores from incineration to recycling treatment, reducing 3.9 tCO_2e in 2025.

Expansion and impact — Low-carbon supply chain governance

Decarbonization and reduction commitment

- By 2030, the supply chain will achieve a 10% carbon reduction. **10** %
- Annual electricity consumption reduction target **1** %
- Annual waterconservation target **5** %
- Annual waste reduction target **1** %

Energy and resource disclosure

In 2025, Winbond (Taiwan) surveyed 250 suppliers directly related to Winbond Scope 3 emissions to review annual electricity savings, water usage, waste generation, and GHG reduction performance. For details, please refer to the ESG website.

Training and open discussion

Winbond (Taiwan) conducted a total of 5 supplier ESG co-learning workshops, one Sustainable Supply Chain Management Forum, and one Environmental Forum. Through thematic co-learning sessions and engagement with suppliers, the scope of learning covered the promotion of sustainability across second-tier semiconductor supply chains, corporate low-carbon transition, product carbon footprint and supply chain traceability, practical sharing of international sustainability ratings, and the transition from responsibility to implementation.

Integrate resources from industry, government, and academia to collaboratively drive carbon reduction

Winbond held 1 briefing session on the low carbon and smart transformation project, with a special invitation extended to suppliers with smaller procurement volumes and limited transformation resources. A total of 220 participants attended.

Winbond' s low-carbon transformation collaboration project within the sustainable supply chain was successfully concluded, completing over 30 carbon reduction initiatives and achieving total reductions of 19,995 tCO_2e—exceeding the target by 240%. The project was selected as an annual low-carbon achievement demonstration case by the Industrial Development Administration, Ministry of Economic Affairs.

- Final review meeting for the Large Leads Small project, with all 13 partner suppliers in attendance.

- Selected as a 2025 Low-Carbon Achievement Demonstration Enterprise by the Industrial Development Administration, Ministry of Economic Affairs.

In 2025, Winbond facilitated collaboration with the Chung-Hua Institution for Economic Research and partnered with ChipMOS Technologies Inc. and Walton Advanced Engineering, Inc. to conduct expert interviews on carbon fee policies. This initiative enhanced Taiwanese enterprises' engagement with carbon pricing policies and supported government think tanks in formulating industry-aligned policies, achieving public–private collaboration and sustainable win–win outcomes.

- Carbon fee and voluntary reduction consensus interview – OSAT supplier (ChipMOS Technologies Inc.)

- Carbon fee and voluntary reduction consensus interview – OSAT supplier (Walton Advanced Engineering, Inc.)

04

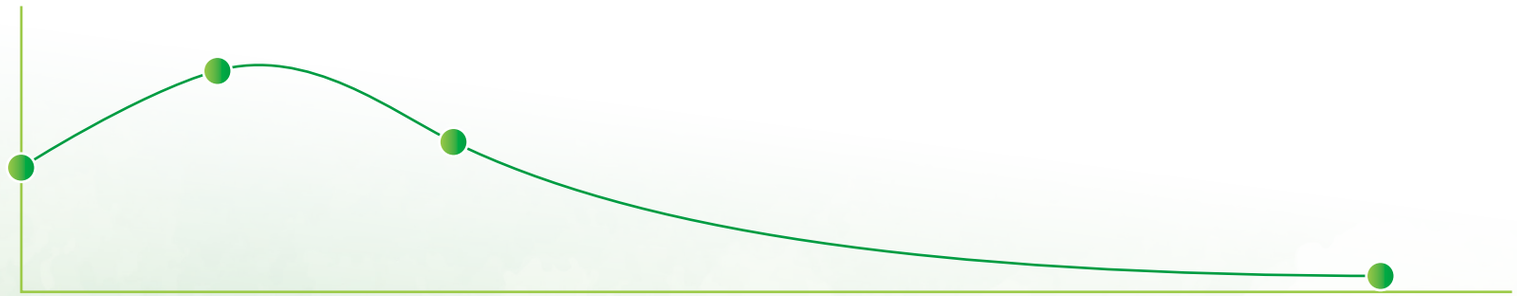
Metrics and Targets

4.1 2050 Net-Zero Commitment

The Winbond Group's greenhouse gas reduction targets were officially validated by the Science Based Targets initiative (SBTi) on January 8, 2026, marking an important milestone in the establishment of the Group's greenhouse gas-related metrics and targets.

Using 2023 as the base year, the Group has established greenhouse gas reduction targets covering its entire value chain and has developed short-, medium-, and long-term decarbonization pathways. These include interim reduction targets for 2030 and a long-term commitment to achieve net-zero emissions by 2050. The Group's decarbonization pathway is aligned with the Paris Agreement objective of limiting global warming to 1.5° C.

Short-Term Targets (2030)	Long-Term Targets (2050)
• Reduce absolute greenhouse gas emissions from process direct emissions (Scope 1) and energy indirect emissions (Scope 2) by 42% compared with the base year • Reduce emissions from purchased goods and services and from the use phase of sold products (Scope 3) by 25% compared with the base year	• Reduce absolute greenhouse gas emissions from Scope 1 and Scope 2 by 90% compared with the base year • Achieve a 90% reduction for Scope 3 emissions within the same scope as the short-term target, progressively advancing net-zero transformation across the value chain



2021
- Committed to 2050 net-zero emissions

2023
- Set SBT targets with 2023 as the base year

2030
- Reduce GHG Scope 1 + 2 emissions by 42%
- Reduce GHG Scope 3 emissions by 25%
- Winbond Taiwan manufacturing sites to reach RE 50

2050
- Moving toward net zero

Winbond Group passed the SBT target review

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

THE NET ZERO STANDARD
APPROVED NET-ZERO TARGETS

2050 Net-Zero Action Plan

Systematic implementation
Reducing process gases
- carbon emissions management (GHG inventory, product carbon footprint), water resource management system, energy management system, circular economy
- process gas reduction (higher utilization), fluorinated gas substitution technologies

Improving energy efficiency
Using renewable energy
Driving a low-carbon value chain
- replacement of energy-consuming equipment, usage management, AI-enabled intelligent energy monitoring
- renewable energy (wind and solar PV)
- low-carbon transportation, low-carbon raw materials, carbon-neutral natural gas

Carbon removal
- research and practice of nature-based solutions; research of technology-based solutions

4.2 Climate Metrics and Targets

The Group has established the following climate-related metrics and targets as the basis for tracking and managing climate-related risks and opportunities:

Categories	Metrics	2025 Targets	2025 Results		2026 Targets	2030 Targets
Green Products	• Carbon reduction ratio of customer use-phase energy ／ product lifecycle	• 25nm 1.2V ／ 128Mb HyperRAM customer use-phase energy and carbon reduction ＞ 33%	• 25nm 1.2V ／ 128Mb HyperRAM customer use-phase energy and carbon reduction 37%	Target Achieved	• 25nm 1.2V ／ 128Mb HyperRAM customer use-phase energy and carbon reduction ＞ 33%	• Lifecycle carbon reduction for the full DRAM product portfolio 20%
	• Annual cradle-to-gate carbon reduction of the full Flash memory portfolio	• 35,000 tCO_2e	• 63,000 tCO_2e	Target Achieved	• 35,000 tCO_2e	• 110,000 tCO_2e
Sustainable Supply Chain	• localization ratio of critical raw materials procurement	• ≥ 39.5%	• 37.3%	Target Not Achieved[1]	• 40.0%	• 42.0%
	• Disclosure ratio of major suppliers'[2] energy and resource use and savings	• ≥ 95%	• 95%	Target Achieved	• 95%	• 100%
Environmental Sustainability	• Scope 1 and Scope 2 GHG emissions reduction ratio (based on 2023 emissions)	• Scope 1 and Scope 2 GHG emissions reduced by 2.5%	• Scope 1 and Scope 2 GHG emissions reduced by 15%	Target Achieved	• Scope 1 and Scope 2 GHG emissions reduced by 7.5%	• Scope 1 and Scope 2 GHG emissions reduced by 42% • Scope 3 GHG emissions reduced by 25%
	• Electricity savings	• Annual electricity savings 2-3%	• Annual electricity savings 3.4%	Target Achieved	• Annual electricity savings 2-3%	• Cumulative electricity savings ≥ 15%
	• Renewable energy usage ratio	-	• 8.7%	-	-	• 50%
	• Site-wide water recycling rate	• ≥ 80%	• 82.7%	Target Achieved	• ≥ 80%	• ≥ 80%
Adaptation of Climate Risks	• Production interruption days caused by climate-related disasters	• 0 days	• 0 days	Target Achieved	• 0 days	• 0 days

Note 1: GHG emissions reduction targets apply to the Winbond Group; all other climate-related metrics and targets apply to Winbond (Taiwan).
Note 2: Local procurement volume increased significantly; however, due to the price advantages of local materials, the overall procurement spend ratio declined slightly.
Note 3: Major suppliers are suppliers directly related to Winbond' s Scope 3 emissions.

4.3 IFRS S2 Cross-industry Metrics

4.3.1 Greenhouse Gas Related Metrics

In 2025, Winbond expanded the scope of its greenhouse gas management program by including all global operations within the ISO 14064-1 greenhouse gas inventory and verification boundary. Greenhouse gas inventories are conducted annually to monitor emissions and evaluate the effectiveness of emissions reduction initiatives.

| Winbond Group Greenhouse Gas Emissions in 2025 |

Unit: tCO_2e

Boundary	Winbond (Taiwan)		Subsidiaries	
Items	Emissions (tCO_2e)	Share	Emissions (tCO_2e)	Share
Scope 1	48,536	1.3%	27,771	0.4%
Scope 2	314,430	8.1%	81,374	1.2%
Scope 3	3,496,569	90.6%	6,622,893	98.4%

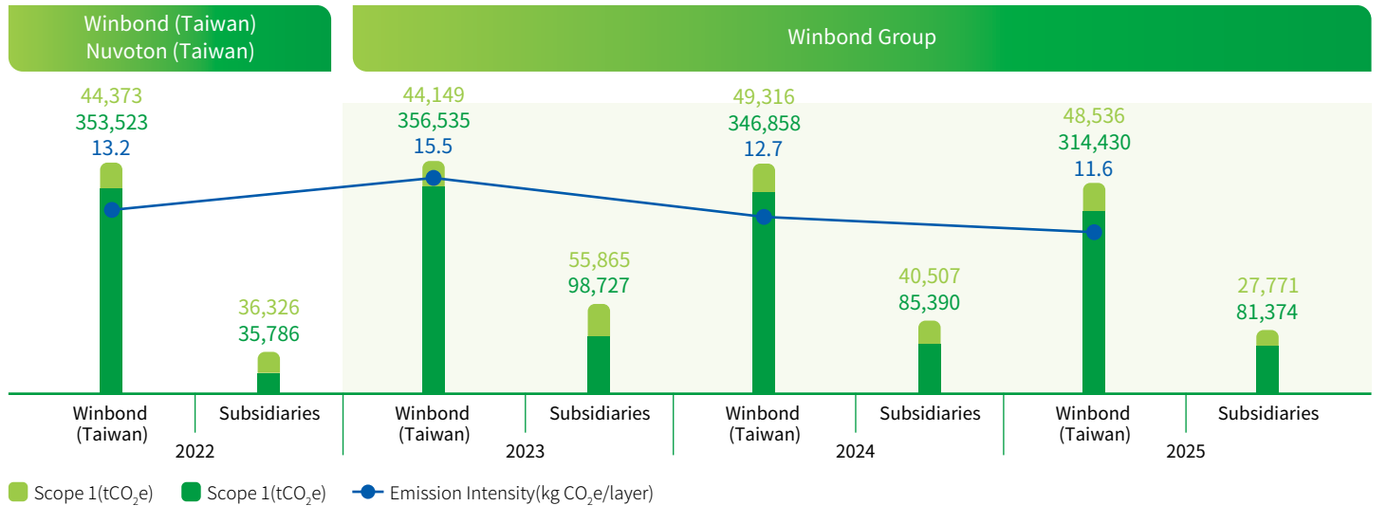
Categories (Scope 3)	Winbond (Taiwan)	Subsidiaries
Purchased goods and services	321,870	247,430
Fuel- and energy-related activities	86,106	26,328
Upstream transportation and distribution	1,254	849
Waste generated in operations	2,288	108
Business travel	768	1,261
Employee commuting	2,905	613
Use of sold products	3,081,379	6,346,304

Note: Primary emission factors for each category referenced the Ministry of Environment Greenhouse Gas Emission Factor Management Table, the Ministry of Environment Carbon Footprint Information Network, supplier inventory factors, and the SimaPro database, among others.

| Winbond Group GHG Emissions over the Past 4 Years |

Unit: tCO_2e

Item	Indicators	Unit	2022		2023		2024		2025	
			Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries
Greenhouse gases	Scope 1	tCO_2e	44,373	36,326	44,149	55,865	49,316	40,507	48,536	27,771
	Scope 2	tCO_2e	353,523	35,786	356,535	98,727	346,858	85,390	314,430	81,374
	Scope 3	tCO_2e	443,204	90,433	2,718,493	8,313,820	3,305,840	8,041,584	3,496,569	6,622,893



Note 1: In response to greenhouse gas reduction and control requirements, the reporting boundary expanded in 2023 to include consolidated-financial-statement subsidiaries, providing more complete emissions information. Accordingly, 2023 serves as the base year for the greenhouse gas inventory.
Note 2: Global warming potential (GWP) references included IPCC AR4 (2007) for 2022. For Winbond (Taiwan), IPCC AR5 (2019) was applied in 2023–2025. For subsidiaries, IPCC AR6 (2021) was applied in 2023–2025.
Note 3: Greenhouse gas types included nitrous oxide (N_2O), methane (CH_4), carbon dioxide (CO_2), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and others.
Note 4: Uncertainty data for emission factors referenced the latest version published by the Climate Change Administration. Uncertainty assessment for activity data referenced technical specifications for instrument metrology verification and inspection.
Note 5: 2022 covered Winbond (Taiwan) and Nuvoton (Taiwan). 2023–2025 covered the Winbond Group.

4.3.2 Climate-related Transition Risks

The primary business activities exposed to climate-related transition risks include regulatory compliance costs associated with greenhouse gas emissions and operating costs resulting from changes in energy consumption structures.

- The amount and percentage of the Group' s assets or business activities vulnerable to climate-related transition risks is as follows:

Assets ／ Business Activities	Metrics	2025 Amount(NT$ Million)	Percentage of Consolidated COGS
Regulatory compliance associated with greenhouse gas emissions	Carbon fee	17	0.03%
Green electricity adoption	Green Electricity costs	376	0.65%

4.3.3 Climate-related Physical Risks

According to the results of physical climate risk scenario analysis, the Group's Kaohsiung fab may face flood risk before the end of the 21st century. The overall risk level remains low and only increases to medium under long-term SSP3-7.0 and SSP5-8.5 scenarios. All other facilities and offices in Taiwan were assessed as having no risk of flooding, landslides, or debris flows under SSP1-2.6, SSP2-4.5, SSP3-7.0, and SSP5-8.5 scenarios.

- The amount and percentage of the Group' s assets or business activities vulnerable to climate-related physical risks is as follows:

Assets ／ Business Activities	Metrics	Number of Affected Facilities	% of Asset Value of Affected Facilities
Taiwan manufacturing sites	Asset value exposed to regions with high extreme-weather risk	0	0%

4.3.4 Climate-related Opportunities

To reduce environmental impacts associated with manufacturing, Winbond has incorporated renewable energy into product manufacturing and extended renewable electricity usage to outsourced packaging and testing processes. Since December 2024, products manufactured using renewable energy have been shipped in volume to key customers focused on ESG issues, marking an important milestone in responding to ESG market trends and growing demand for green and energy-efficient products. In addition to RE products, the Group's semiconductor manufacturing business also satisfies the eligibility criteria set forth in the second edition of the FSC's Reference Guidelines for Sustainable Economic Activities[1].

- The amount and percentage of the Group' s assets or business activities aligned with climate-related opportunities is as follows:

Assets ／ Business Activities	Metrics	2025 Amount(NT$ Million)	Percentage of Consolidated Revenue
Sales of RE products	RE product revenue	3,906	4.4%
Sustainable Economic Activities	Sustainable Economic Activities revenue	59,317	66.3%

Note: Greenhouse gas emissions per unit of product (Scope 1 + Scope 2) in the most recent year meet the following criteria:
(1) Mature process of 12-inch wafer (10 nm and above) ≤ 1.31 $kgCO_2e/cm^2$
(2) Wafer of 6 inches and below ≤ 2.18 $kgCO_2e/cm^2$

4.3.5 Capital Deployment

The Winbond Group incorporates identified climate-related transition risks, physical risks, and opportunities such as low-carbon technologies and green products into capital deployment decisions.

- The amount of the Group' s capital expenditure, financing or investment deployed towards climate-related risks and opportunities is as follows:

Metrics	Capital Expenditure and Related Costs (NT$ million)
Capital expenditures on energy-saving and carbon reduction equipment	332
Capital expenditures on on-site renewable energy generation systems	4

4.3.6 Internal Carbon Prices

The Group did not use internal carbon prices as a planning tool during the reporting year.

4.3.7 Remuneration

Winbond (Taiwan) has incorporated climate-related issues into the performance evaluation framework for senior management and linked them to remuneration. In 2025, ESG performance indicators accounted for 5% of the total performance assessment score of senior executives. Beginning in 2026, this weighting will increase to 10%. For additional information, please refer to 1.3 Roles of Management.

4.4 IFRS S2 Industry-based Metrics

The Group applies the disclosure topics and industry-based metrics specified in IFRS S2 Industry-based Implementation Guidance Volume 57 – Semiconductors.

4.4.1 Sustainability Disclosure Topics & Metrics

Topic	Code	Metric	Category	2025 Amount/Descriptions
Greenhouse Gas Emissions	TC-SC-110a.1	(1) Gross global Scope 1 emissions	Quantitative	• Taiwan fabs: 48,536 tCO_2e • Subsidiaries: 27,771 tCO_2e
		(2) Perfluorinated compound (PFC) emissions	Quantitative	• Taiwan fabs: 11,014 tCO_2e • Subsidiaries: 5,592 tCO_2e
	TC-SC-110a.2	Discussion of long-term and short-term strategies for managing Scope 1 GHG emissions, including emission-reduction targets, and performance against those targets	Discussion and Analysis	Key measures included reductions in FCs through process improvements and the installation of abatement systems, electricity-saving initiatives through process optimization and efficiency enhancement, and increased use of renewable energy. In response to the SBTi, Winbond set targets to achieve 50% renewable electricity use at Taiwan fabs by 2030, reduce Scope 1 and Scope 2 emissions by 42% from the 2023 baseline, and reach net-zero emissions across all operations by 2050. In 2025, Scope 1 and Scope 2 emissions declined by 15% compared with the 2023 baseline, while Scope 3 emissions (within the SBTi boundary) decreased by 8.5%. GHG emissions intensity in 2025 was 11.6 $kgCO_2e$, compared with 12.7 $kgCO_2e$ in 2024, representing a year-on-year reduction of approximately 8.7%.
Energy Management in Manufacturing	TC-SC-130a.1	(1) Total energy consumed	Quantitative	• Taiwan fabs: approximately 3,006,534 GJ • Subsidiaries: approximately 866,198 GJ
		(2) Percentage of grid electricity	Quantitative	• Taiwan fabs: 86.9% • Subsidiaries: 77.7%
		(3) Percentage of renewable energy	Quantitative	• Taiwan fabs: 7.6% • Subsidiaries: 1.0%
Water Management	TC-SC-140a.1	(1) Total water withdrawn, percentage of each in regions with high or extremely high baseline water stress	Quantitative	• Taiwan fabs: 4,432 thousand cubic metres • Subsidiaries: 3,501 thousand cubic metres All operating sites were located in areas with low water-stress risk.
		(2) Total water consumed, percentage of each in regions with high or extremely high baseline water stress	Quantitative	• Taiwan fabs: 1,328 thousand cubic metres • Subsidiaries: 431 thousand cubic metres All operating sites were located in areas with low water-stress risk.
Product Lifecycle Management	TC-SC-410a.1	Percentage of products by revenue that contain IEC 62474 declarable substances	Quantitative	0%
	TC-SC-410a.2	Processor energy efficiency at a system-level for: (1) servers,(2) desktops and (3) laptops	Quantitative	Not applicable. The Group does not manufacture servers, desktops, or laptops.

4.4.2 Activity Metrics

Code	Activity Metric	Category	2025 Amount/Descriptions
TC-SC-000.A	Total production	Quantitative	• Total wafer output: 390 thousand wafers • Total die output: 7,704,517 thousand units
TC-SC-000.B	Percentage of production from owned facilities	Quantitative	Winbond: 100%; Nuvoton: 26.9%; Nuvoton (Japan): 0%

Appendix

TCFD Recommended Disclosures Index

Core Element	TCFD Recommended Disclosure	Corresponding Chapter in this Report	Page
Governance	Describe the Board' s oversight of climate-related risks and opportunities.	1.2 Governance Roles of the Board of Directors and Functional Committees	3~4
	Describe management' s role in assessing and managing climate-related risks and opportunities.	1.3 Roles of Management	5
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	3.1 Climate Risks and Opportunities	10~11
	Describe the impacts of climate-related risks and opportunities on the organization' s businesses, strategy, and financial planning.	3.1 Climate Risks and Opportunities	10~11
		3.2 Scenario Analysis	12~18
	Describe the resilience of the organization' s strategy, taking into consideration different climate-related scenarios, including a 2° C or lower scenario.	3.2 Scenario Analysis	12~18
Risk Management	Describe the organization' s processes for identifying and assessing climate-related risks.	2.2 Climate-related Risk and Opportunity Identification Process	8
	Describe the organization' s processes for managing climate-related risks.	2.1 Winbond's Risk Management System	7
		2.2 Climate-related Risk and Opportunity Identification Process	8
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization' s overall risk management framework.	2.1 Winbond's Risk Management System	7
Metrics and Targets	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	4.2 Climate Metrics and Targets	26
	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas emissions and the related risks.	3.1 Climate Risks and Opportunities	10~11
		4.3.1 Greenhouse Gases Related Metrics	27
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against those targets.	4.1 2050 Net-Zero Commitment	25
		4.2 Climate Metrics and Targets	26