winbond

Winbond
2024 Sustainability Report

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About This Report

About This Report

Winbond Electronics Corporation (as "Winbond") 2024 Sustainability Report (as "this report") transparently and comprehensively presents the impacts and sustainability-related actions of Winbond's operations in the three ESG dimensions: Environmental, Social, and Governance. Through the promotion and implementation of related measures in operational activities, Winbond addresses the expectations and needs of stakeholders regarding the company's sustainable development and operations.

Editorial Principles and Guidelines

This report is compiled in accordance with the GRI Standards issued by the Global Reporting Initiative (GRI), the industry standards of the Sustainability Accounting Standards Board (SASB), and the TCFD framework released by the Task Force on Climate-related Financial Disclosures (TCFD) established by the Financial Stability Board (FSB).

Management Process

1 Annual performance review

2 Identify the key focus areas
Collaborate with each unit to understand their execution, then highlight each major issue

3 Collect the information

4 Compile the report
Compile the report
The contents of this report were reviewed and approved by the heads of departments, Winbond ESG Committee, the general manager and the chairman of the board

5 Verify by third-party
Independent verification of this report was conducted by BSI Taiwan in April 2025 in accordance with the AA 1000 Av3 Type II moderate Assurance Standard. Please refer to the independent assurance declaration included in the appendix of this report for more details on the results

6 Review by ESG committee
All chapter content is reviewed and approved by the ESG Committee, the President, and the Chairman.

7 Report to the Board of Directors
Being raised to the level of the Board of Directors, the ESG Committee established the ESG Office and five functional teams, including Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. The committee reported the execution results to the Board of Directors at least twice annually, with the Chairman also serving as the Committee Chair.

8 ESG website
Launch on Company Website

Reporting Scope

The reporting period for this report is from January 1, 2024, to December 31, 2024. The scope of information disclosure in this report aligns with the boundaries of the consolidated financial statements, including Winbond (Taiwan) fab and offices (Central Taiwan Science Park), Kaohsiung Fab, Zhubei Building, Taipei Office, Tainan Office), Nuvoton (Taiwan), Nuvoton (Japan), and other subsidiaries. These entities are collectively referred to as the "Winbond Group." If the scope of disclosure differs from above, it will be noted in the respective section. Compared to the previous year's "2023 Sustainability Report," there is no restatement of information in this year's "2024 Sustainability Report".

External Audit

- This report was independently verified by BSI Taiwan, a branch of the British Standards Institution, in April 2025, in accordance with the AA 1000 Accountability Principles 2018 Type II assurance standard. For detailed results, please refer to the Independent Assurance Statement in the Appendix of this report.

Internal Audit

- The contents of this report were reviewed and approved by the heads of departments, Winbond ESG Committee, the general manager and the chairman of the board.
- Being raised to the level of the Board of Directors, the ESG Committee established the ESG Office and five functional teams , including Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. The committee reported the execution results to the Board of Directors at least twice annually, with the Chairman also serving as the Committee Chair.

Publication Date

This report is published annually, and this is the 11th report. Paperless operations are promoted by Winbond to save energy, reduce carbon emissions, protect the environment, and care for planet Earth. This report therefore continues the tradition of being published in an electronic format on the Winbond website for all stakeholders to read.

- Current Version: Published in July 2025
- Previous Version: Published in July 2024
- Next Version: To be published in July 2026

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- ESG website: esg.winbond.com

Message from Our Chairman

Rooted in our core business, Winbond Group adopts a holistic ESG mindset and implements diverse actions to address corporate sustainability risks. From a risk management perspective, the company identifies operational opportunities and leverages the integration of digital technologies and AI to enhance organizational resilience.

Over the past year, the scope of sustainability management has become increasingly nuanced and complex amid rapidly evolving global dynamics and frequent black swan events. Agile response capabilities have become essential for companies to mitigate operational risks.

In response to these challenges, Winbond is not only strengthening its resilience but also actively advancing digital transformation and green product development. We have established five major digital platforms—including the iMX system, monitoring system, data platform, business intelligence platform, and AIP smart application platform—to enhance manufacturing efficiency and optimize processes. To build internal capabilities, Winbond provides AI and data science training programs to improve employees' data analysis and machine learning skills. At the Central Taiwan Science Park (CTSP) Fab, ESG carbon reduction initiatives are integrated with factory equipment. Looking ahead, Winbond plans to source 50% of the electricity used in its Taiwan fabs from renewable energy by 2030. In 2024, we launched the first renewable energy product, marking a significant milestone in sustainable product innovation. Winbond will continue to adopt new technologies, share energy-saving practices with industry peers, and jointly promote sustainable development.

Winbond is also deeply committed to biodiversity conservation. Through a tripartite collaboration with industry, government, and academia, the company partnered with National Chung Hsing University to plant five native tree species at its Kaohsiung Fab as part of a 30-year afforestation initiative. Additionally, Winbond participates in the Forestry and Nature Conservation Agency's tree adoption program, taking responsibility for national forest lands in Tainan City and Chiayi County. These efforts aim to restore slope vegetation and support long-term ecological stewardship. The company also engages in environmental activities such as mountain, stream, and beach cleanups. Subsidiary Nuvoton collaborates with the Wilderness Conservation Association to protect the endangered Sauters brown frog habitat. Moving forward, Winbond will continue to promote biodiversity initiatives, forest carbon sequestration programs, and community-based forest management and conservation.

Winbond has successfully established a carbon accounting system to assess product carbon footprints and conduct greenhouse gas inventories, covering the entire lifecycle from raw materials to production and shipment. To improve energy efficiency, we have implemented the ISO 50001 energy management system and procured renewable energy. Winbond is committed to enhancing the transparency and traceability of carbon data through continuous improvement of its carbon accounting system. By 2025, we aim to achieve 8–10% renewable energy usage across all operations. Furthermore, Winbond plans to initiate a 30-year renewable energy purchase agreement totaling approximately 4.8 billion kWh, starting from the completion of the first phase of the third-stage offshore wind power development.

These efforts reflect our comprehensive commitment to biodiversity, digital transformation, carbon accounting, and green product innovation. Looking ahead, Winbond will continue to prioritize innovation and responsibility, striving to lead sustainable development, set a benchmark in the global market, and create a better living environment for future generations. Through continuous progress and dedication, Winbond will remain at the forefront of industry advancement, achieving a harmonious balance between enterprise growth and environmental stewardship.

Arthur Yu-Cheng Chiao
Chairman and Chief Executive Officer

Message from Our President

Winbond focuses on its core business while adjusting its sustainable development strategies, goals, and actions in response to international trends. This approach enhances organizational resilience in sustainability and proactively strengthens long-term corporate value to meet the expectations of diverse stakeholders. In 2024, Winbond received multiple sustainability accolades, including the National Sustainable Development Award, a CDP Climate Change A-rating, and inclusion in the S&P Global Sustainability Yearbook.

On the environmental front, Winbond (Taiwan) reduced Scope 1 and 2 greenhouse gas emissions by 1.1% compared to the previous year and established a unique carbon accounting system, enabling more transparent management of carbon emissions. Products manufactured using renewable energy have also been officially launched. In the social dimension, Winbond values talent development and has continued its sponsorship of the Semiconductor Academy at National Cheng Kung University. The company also emphasizes the enhancement of employees' digital capabilities and AI skills. In 2024, Winbond was honored with the Ministry of Labor's Family-Friendly Workplace Award for its efforts in promoting work-life balance.

In terms of governance, both Winbond and Nuvoton ranked in the top 20% in corporate governance evaluations and received the highest platinum certification under the RBA Validated Assessment Program (VAP).

The dual engines of digital transformation and the transition to net-zero emissions are key to the company's future development. Winbond Group will continue to deepen its ESG practices, uphold the principles of sustainable development, and pursue continuous innovation and growth amid challenges. These efforts aim to enhance operational resilience, maintain market competitiveness, and create long-term value. Winbond Group actively plays a pivotal role in the semiconductor industry chain, contributing to a smarter, more sustainable, and convenient way of life.

James Pei-Ming Chen
President

Driving sustainable manufacturing by diverse carbon reduction measures
Create new value by low-carbon energy-saving products

E

Winbond is committed to green production by leveraging cross-functional teams to integrate resources and promote low-carbon, eco-friendly operations. These initiatives address climate action, energy efficiency, water resource management, resource recycling, and air pollution control, while also advancing carbon reduction goals in collaboration with the semiconductor supply chain.

With core innovative technologies and a focus on energy efficiency and carbon reduction in product design, Winbond continues to develop a range of low-power memory products, including the HYPERRAM and CUBE product lines. HYPERRAM reduces operating power consumption by 70% compared to conventional SDRAM. The CUBE series, designed for edge AI computing, offers ultra-low power consumption and exceptional performance. Additionally, Winbond has launched the industry's first NOR Flash supporting a 1.2V operating voltage, reducing power consumption by 50% compared to 1.8V solutions.

Implementing energy strategies and carbon reduction measures, Winbond has developed a proprietary carbon accounting system for comprehensive carbon inventory and product carbon footprint calculations. The company has introduced renewable energy into its manufacturing processes and extended its use to downstream packaging and testing facilities. In 2024, products made with renewable energy began shipping to ESG-conscious customers, achieving approximately 60% lower carbon emissions than standard products.

In greenhouse gas management, all of Winbond's manufacturing sites, including subsidiaries, have obtained ISO 14064-1 verification. The company is also committed to achieving a net positive water impact, with both the Kaohsiung and CTSP fabs certified under the ISO 46001 water efficiency management system in 2024.

From 2022 to 2024, Winbond signed power purchase agreements (PPAs) totaling 27MW of solar and 12.84MW of wind energy. By 2025, the company expects renewable energy to account for 8–10% of its total electricity usage. In supply chain management, embracing a mutually beneficial approach to sustainability, Winbond actively promotes carbon reduction by guiding suppliers to track their usage of electricity, energy, water, waste, and greenhouse gases, set reduction targets, and undergo regular evaluations. Through collaboration with supply chain partners, over NT$200 million has been invested in initiatives to reduce process gas emissions, conserve electricity, and save water.

Promoting corporate human rights mindset
Establishing friendly workplace concepts

S

Winbond integrates human rights principles into its corporate culture, striving to create a work environment that respects employee rights, embraces diversity, and fosters sustainable development.

In 2024, both Winbond and its subsidiary Nuvoton received the highest platinum certification in the RBA VAP (Validated Assessment Program) audit. Together, they jointly formulated human rights policies, completed human rights due diligence, and extended these principles across the supply chain. This included conducting human rights risk education for suppliers, requiring them to sign the codes of conduct, and integrating due diligence into supplier management processes.

To build a friendly and inclusive workplace, Winbond offers childcare subsidies, wellness leave, paid volunteer leave, and a variety of family-friendly benefits that exceed industry standards. The company is committed to diversity and inclusion, raising the proportion of female board members to 27%, and actively safeguarding the rights of underrepresented and vulnerable groups, with the employment rate of people with disabilities far surpassing legal requirements.

In talent development, Winbond systematically cultivates AI expertise internally and offers cross-functional rotation programs. In 2024, the group invested NT$42.87 million in training, with employees averaging 70 hours of training. Winbond also upholds fair and equitable compensation policies, earning both Winbond and Nuvoton a place in the 2024 High Salary 100 Index. Externally, the company continues to support youth talent development through ongoing collaboration with National Cheng Kung University's Semiconductor Program and sponsorship of the Chair Professor Research Fund at National Yang Ming Chiao Tung University, actively fostering platforms for technological innovation and collaboration in the semiconductor industry.

Winbond also leads employees in social engagement, with a focus on environmental and biodiversity conservation. The company introduced the "Winbond Biodiversity Commitment" to demonstrate its resolve in minimizing environmental impact. Initiatives include organizing beach and stream cleanups, restoring the habitat of the Great Purple Emperor butterfly (Sasakia charonda), protecting the endangered Rana sauteri frog, cultivating species from the Theaceae family, and preserving the rare Habenaria radiata (Egret Flower). Committed to nature-based solutions, Winbond has carried out afforestation projects across national forest lands in Chiayi, Tainan, and Yilan, covering nearly 25 hectares, in support of Taiwan's 2050 net-zero emissions strategy through natural carbon sequestration.

Enhancing sustainable governance
Building climate resilience

G

Winbond maintains close communication with stakeholders and proactively addresses their concerns, integrating sustainability principles into its governance framework and continuously refining its processes accordingly.

Operational risk and information security controls are fundamental to corporate governance. Winbond has established a comprehensive risk management mechanism and standard procedures for responding to information security incidents, with clearly defined processes and measures. We also actively contribute to the development of wafer equipment cybersecurity standards (SEMI E187), continually enhancing the security standards of its wafer equipment.

Winbond incorporates climate change risks into its long-term corporate operations and evaluates them using the Task Force on Climate-related Financial Disclosures (TCFD) framework. To address transitional risks such as low-carbon technology shifts, carbon pricing mechanisms like carbon fees and taxes, and international agreements—as well as physical risks like tropical cyclones—Winbond has implemented various measures. These include adopting energy management systems, utilizing renewable energy, establishing carbon accounting systems, and fully implementing intelligent energy-saving production solutions.

Sustainability-driven innovation is a core part of Winbond's organizational culture. The company encourages employees to propose creative ideas related to green products and integrates these ideas into process design and testing workflows to ensure alignment with its ESG-driven development strategy. In 2024, Winbond received the National Sustainable Development Award, and the Winbond Group was selected in the Clarivate Top 100 Global Innovators list for the third consecutive year, demonstrating its strong R&D capabilities and earning recognition from international professional evaluations.

Winbond Group Overview

About Winbond Group

Winbond Electronics Corporation (referred to as "Winbond") is dedicated to providing comprehensive niche memory solutions to customers worldwide. Its main products include Code Storage Flash Memory, TrustME® Secure Flash, and Customized Memory Solutions (CMS). Its subsidiary, Nuvoton Technology Corporation (referred to as "Nuvoton"), was established by spinning off Winbond's logic IC product line and focuses on microcontrollers (MCUs) and logic ICs. Collectively referred to as the "Winbond Group," Winbond and Nuvoton are committed to the development of green semiconductor technology. The Winbond Group is one of the few global companies that combine memory and logic businesses and is the only company in Taiwan with capabilities in process development, product design, and marketing for CMS, Flash, and Logic technologies.

We leverage product synergies to provide customers with more comprehensive and diverse solutions, strengthening the foundation for stable company operations. The Winbond Group's memory business focuses on the design, manufacturing, service, and sales of niche memory solutions, offering customers memory solutions with special specifications. The logic business encompasses microcontroller/voice applications, cloud security, image sensing, battery monitoring, IoT applications, semiconductor components, and wafer foundry services

Corporate Culture

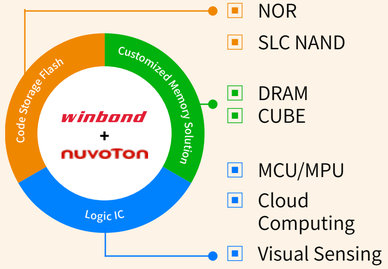
Be a hidden champion in providing sustainable semiconductors to enrich human life

Industry Status

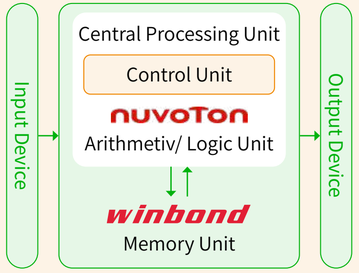
Winbond

Serial NOR Flash	Market Share TOP 1	SLC NAND	Market Share TOP 3

Solutions Across Memory and Logic

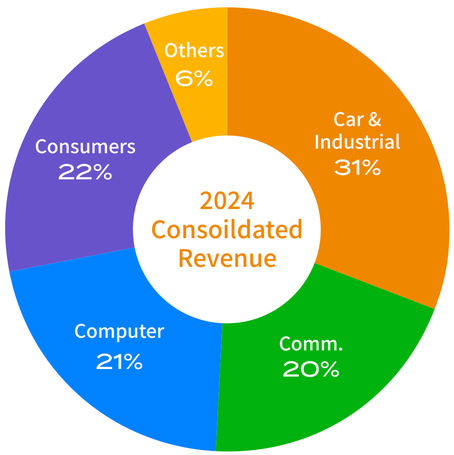


Coutinuous Innovation

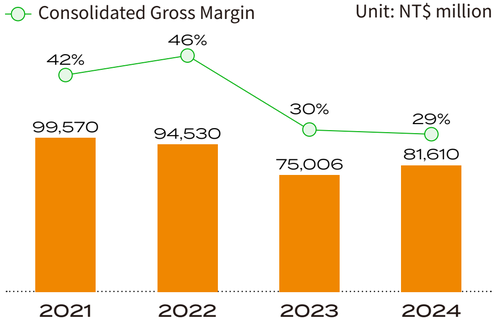


Board Range of End-Use Application

Proportion of 2024 Consolidated Revenue by Application Category

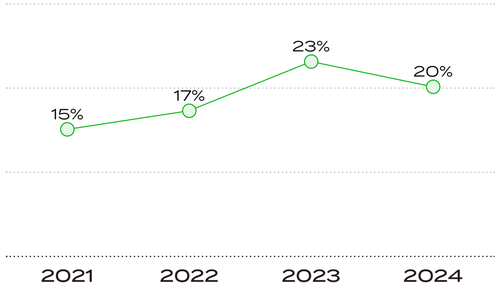


Operational Performance of Logic and Memory Products



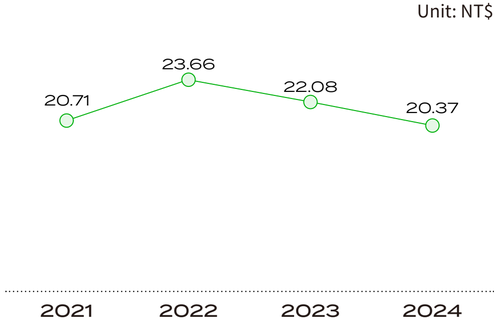
Investment in Technology Research and Development

Winbond Group's R&D Expenditure and Its Proportion of Total Revenue



Value

BVPS

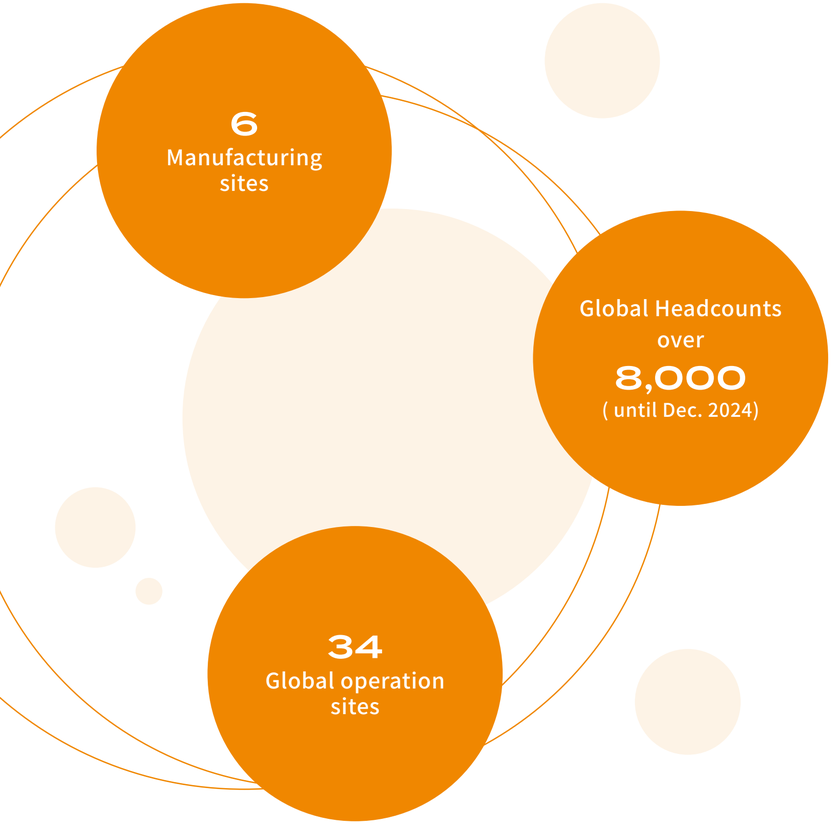


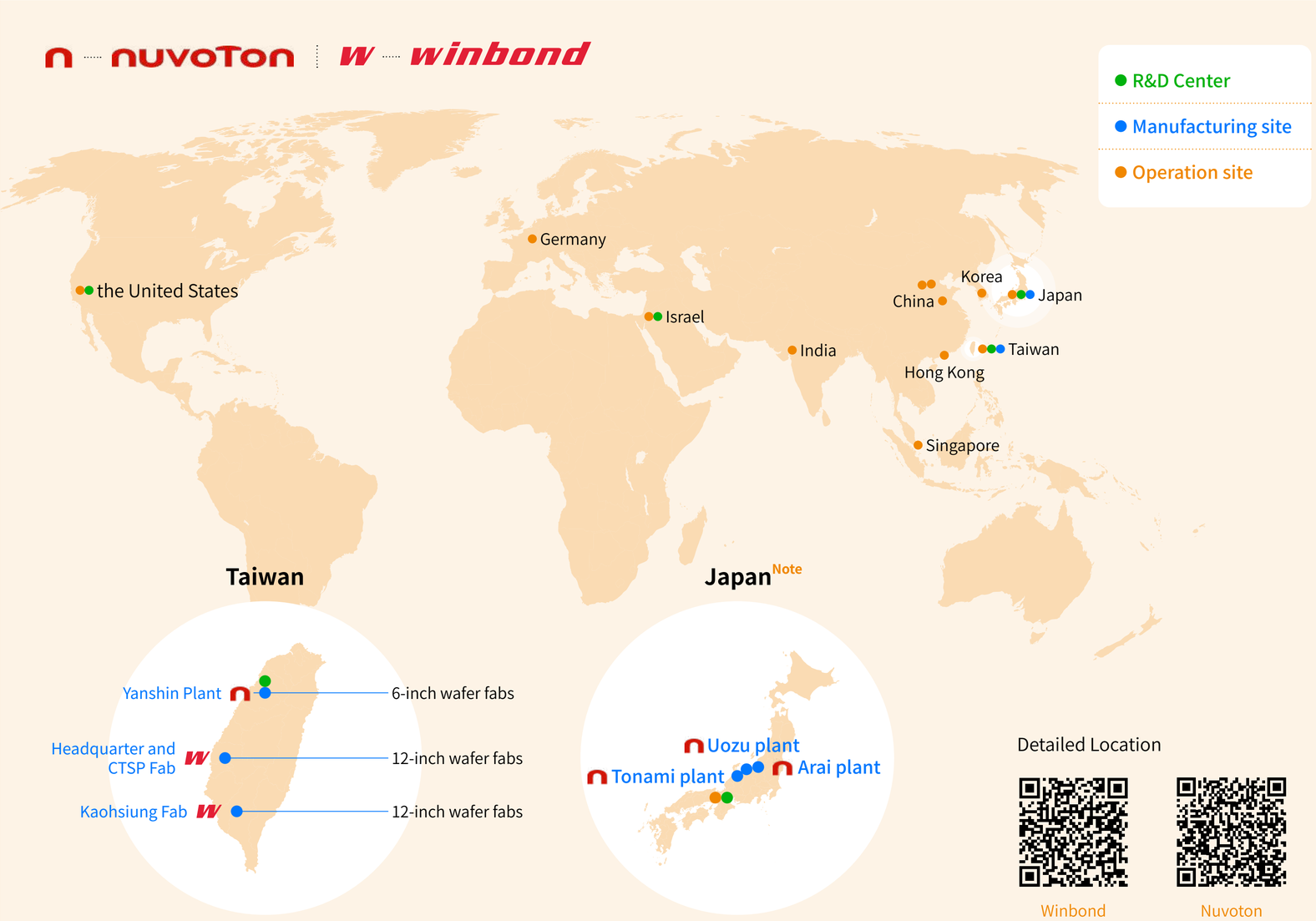
Manufacturing Site

Winbond Group has 4 manufacturing sites, including two 12-inch wafer fabs and one 6-inch wafer fab.

Global Operation

Headquarter is located in Taiwan, with global operations in Taiwan, China/Hong Kong, Japan, Singapore, South Korea, India, the United States, Germany, and Israel.





Detailed Location

Winbond | Nuvoton

Note Held by Tower Partners Semiconductor Co., LTD. ("TPSCo."); TPSCo. is a joint venture between Nuvoton(Japan) and Tower Semiconductor, with Nuvoton(Japan) holding 49% equity in TPSCo.

Milestone

1987
Established in Hsinchu Science Park

2008
- Spun off the Logic Product Business Unit to establish Nuvoton Technology

2010
Launched WLCSP (Wafer Leve Chip Scale Packaging) for serial NOR

2014
- Became the world's number 1 supplier of Serial NOR Flash
- The SpiStack product line has been launched to bolster data storage capabilities. In addition, Winbond's SPI products feature encoding-based storage, Over-The-Air (OTA) software update applications, and small- form-factor packaging

2018
- Became the world's number 1 supplier of NOR Flash
- Launched the high-performance QspiNAND to support the automotive industry

2024
Winbond Group was selected as one of Clarivate's Top 100 Global Innovators for two consecutive years

1995
Listed on Taiwan Stock Exchange (TWSE: 2344)

2006
Launched Multi I/ OSpiFlash (Dual 2006, Quad 2007), achieving the highest performance in the industry

2009
The mass production of the industry's first 16Mb Serial Flash using advanced 90-nanometer technology

2013
Launched QspiNAND with continuous read, embedded ECC, and bad block management capabilities

2017
Introduced the world' s first ultra-low voltage 1.2V 8Mb Serial NOR Flash product

2020
Acquired Japan's Panasonic Semiconductor Business and renamed it to Nuvoton Technology Corporation Japan

Scope: Unless otherwise noted, the scope refers to Winbond; Nuvoton Technology is presented as .

Winbond Group Value

Foresight In Trends, Value in Practice

With a deep understanding of market trends for next-generation products, Winbond continually invests resources in semiconductor design, production technology, and sustainable product innovation. We provide customers with low-carbon and low-power green products, enhancing our competitive advantage and market share in green business opportunities. Also, we continuously improve our ESG performance to enhance Winbond's sustainable competitiveness.

Design and Development Focus

- ✓ Minimize the generation and emissions of hazardous substances in the manufacturing process
- ✓ Shorten manufacturing lead time
- ✓ Reduce manufacturing costs

Products Innovation Advantages

- ✓ Utilize low-carbon raw materials
- ✓ Reduce production energy consumption
- ✓ Enhance product performance
- ✓ Achieve smaller size
- ✓ Increase product energy efficiency

Technology catalyzes innovation and enhances the quality of life		Applications and Products	
Automotive Electronics	From vehicle body, power systems, information and entertainment systems, to intelligent driving and advanced safety systems, our technology is used in emerging electric vehicles to achieve a safer, smarter, and more environmentally friendly transportation environment.	▪ Vehicle-to-Everything (V2X) ▪ Advanced driver-assistance systems (ADAS) ▪ Vehicle dashboards ▪ In-Vehicle Infotainment (IVI)	▪ Telematics ▪ Automotive sensing components ▪ Automotive gateways
Industrial Electronics	For industrial systems, Winbond brings higher performance, information security, and advanced safety in intelligent networking, remote monitoring, human-machine interaction, and on-site machine learning.	▪ Real-time sales information devices ▪ Smart factories ▪ Smart dashboards ▪ Programmable logic controllers ▪ Graphical user interfaces	▪ Industrial gateways ▪ Industrial machine vision ▪ Industrial computers ▪ Unmanned Aerial Vehicles (UAVs) ▪ Surveillance cameras
5G Communications	With higher data transmission speeds, Winbond provides a foundational platform for the Internet of Things, enabling efficient communication that transcends time and location, enhancing productivity, entertainment, and learning.	▪ Network digital video converters ▪ High-speed Ethernet switches ▪ Wireless terminal access equipment and customer premises equipment (CPE)	▪ Long-Term Evolution (LTE) technology ▪ LTE/5G base stations
IoT	In the world of interconnected devices, Winbond accelerates digital transformation while ensuring information security and functional safety, achieving energy efficiency, convenience, and a higher level of safety protection for everyday life.	▪ Smart cities ▪ Smart transportation systems ▪ Self-driving cars ▪ Smart factories	▪ Telehealth ▪ Smart home ▪ Smart meter
Consumer electronics	For consumer products, Winbond delivers more powerful, energy-efficient, and feature-rich solutions, offering an enhanced product experience.	▪ Smartphones ▪ Smartwatches ▪ AR smart glasses ▪ Tablet computers ▪ Smart TV	▪ Smart home ▪ Satellite navigation ▪ Digital cameras ▪ True wireless earphones ▪ Set-top boxes

Winbond Group Value

The product development goals of Winbond Group focus on enhancing product performance and quality. Our strategies include reducing chip size to lower production energy consumption and costs, and strictly controlling pollution and hazardous substance emissions to achieve low-carbon production.

Additionally, our product designs also strengthen information security, enhance patent and intellectual property protection, and realize a more energy-efficient, convenient, and higher level of security in daily life.

Product Development Focus

1 Enhancing Product Performance

Manufacturing IC products with higher computational efficiency and enhanced performance.

2 Improving Quality

Continuously improving product quality in three major aspects: quality control, reliability assurance, and failure analysis.

3 Controlling Pollution

Reducing consumables generated during the manufacturing process, lowering carbon footprint emissions. Establishing a system for managing hazardous substances in products, reducing or eliminating harmful substances included in products in a "process-oriented" manner.

4 Layout of Patents and Intellectual Property Protection

Adopting international standards in the internal proposal stage of patent applications to enhance patent quality and application success rates. Improving the protection of intellectual property rights through internal education and training, signing confidentiality agreements, etc.

5 Ensuring Information Security and Confidentiality

Strengthening information security technologies, continuously providing advanced security function designs in products.

6 Achieving Smaller Size

Continuously developing technologies to shrink wafer chip area compared to the previous generation of products.

7 Reducing Production Energy Consumption

By reducing wafer chip area and shortening production time, more products are produced with the same process, reducing energy consumption per wafer.

nuvoTon

Product types	Areas of application	
Microcontroller	▪ 5G ▪ energy management ▪ smart IoT ▪ industrial control ▪ edge AI ▪ IoT security ▪ base stations ▪ servers ▪ Smart Home	▪ Communication Devices ▪ Electric Vehicle Electronics ▪ Consumer Electronics ▪ Audiovisual Equipment ▪ Gaming Devices
Audio	▪ Smart industry ▪ smart robots ▪ conference systems ▪ Smart Appliances ▪ Smart Speakers	▪ Smart Home Entertainment ▪ Smart Cars ▪ Smart Interactive Toys
Cloud Computing	▪ Edge computing ▪ remote management forserver-specific purposes ▪ power management	▪ computer hardware monitoring ▪ Communication Devices (Mobile Phones and Laptops) ▪ Remote Work
Semiconductor Components	▪ Industrial equipment ▪ fiber optics communication	▪ Wearable Devices ▪ Smartphones ▪ Tablets
Image Sensing Technology	▪ Autonomous mobile robots (AMR) ▪ human behavior recognition	▪ Photographic Equipment ▪ Medical Endoscopes
Battery Monitoring	▪ Electric vehicles ▪ Home Appliances ▪ Fan Motors	

[1] This includes products from Nuvoton's Microcontroller Business Group and IoT with Security Business Group.

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Product types	Diverse Product	Solution	
Customized Memory Products	▪ CUBE ▪ SDRAM & DDR 2/3/4 ▪ Pseudo SRAM (HYPERRAM™) ▪ Lower Power SDR/ DDR 2/3/4/4X	**Automotive** ▪ ADAS ▪ Instrument Clusters ▪ Infotainment ▪ V2X application **Industrial** ▪ Point of Sales (PoS) systems ▪ Human Machine Interface (HMI) ▪ Programmable Logic Controller (PLC) ▪ Smart Meter ▪ Industrial Networking **Consumer** ▪ Wearable Electronics ▪ GPS ▪ Digital Cameras ▪ Bluetooth and WiFi Modules	**Communication** ▪ Set-Top Box (STB) ▪ Switches ▪ Routers ▪ Passive Optical Networks (PON) ▪ xDSL ▪ Wireless Access Point ▪ Mobile Phones ▪ Base Stations **Computer** ▪ Notebooks ▪ Servers ▪ Gaming Notebooks ▪ Ultrabooks ▪ Tablets ▪ HDD/SSD
Flash Memory	▪ Serial NOROctal NOR ▪ Qspi NAND ▪ Octal NAND ▪ NAND BASE MCP ▪ Secure Memory		

Awards and Recognition

Sustainability Recognition

Selected for the S&P Global Sustainability Year Book
- Listed on the 2025 S&P Global Sustainability Yearbook for the first time

National Sustainable Development Awards
- Awarded by the National Development Council

ECOVADIS – Gold
- Recognized by the Global Supply Chain Sustainability Evaluation Platform

CDP
- Climate Change: A-
- Water Security: B

Taiwan Corporate Sustainability Award
- Taiwan's Top 100 Sustainable Companies Award
- Corporate Sustainability Reporting Awards - Platinum Level
- Talent Development Leadership Award
- Human Rights Practice and Development Leadership Award
- Water Resource Management Leadership Award
- Sustainable Supply Chain Leadership Award
- Innovation Growth Leadership Award
- Workplace Well-being Leadership Award

Nuvoton
- Corporate Sustainability Reporting Awards - Platinum Level
- Workplace Well-being Leadership Award

FTSE4Good
- FTSE4Good Emerging Index
- FTSE4Good TIP Taiwan ESG Index

British Standard Institution (BSI)
- 2024 BSI ESG Sustainability Practice Award

1111 Job Bank
- 2024 Happy Enterprise: Gold

Outstanding Enterprise for Promoting Workplace Equality
- the Southern Taiwan Science Park

Southern Taiwan Science Park Bureau
- Kaohsiung fab was awarded the 113th Southern Taiwan Science Park Outstanding Environmental Protection Unit.

Responsible Business Alliance (RBA)
- Winbond and Nuvoton both received the highest Platinum level certification from the VAP

Ministry of Labor Work-Life Balance Award: Family-Friendly

Top 100 Carbon Competitiveness
- Nuvoton selected as one of the Top 100 Carbon Competitiveness Enterprises by Business Weekly

Corporate Governance

11th Corporate Governance Evaluation
- Ranked in the top 6% to 20% among listed companies

Taiwan Index Plus
- Winbond and Nuvoton both selected as TWSE Corporate Governance 100 Index
- TWSE RAFI® Taiwan High Compensation 100 Index
- TWSE RA Taiwan Employment Creation 99 Index

Taiwan FINI 100
- Nuvoton awarded as "2024 Taiwan FINI 100 Companies"

Product Innovation

Clarivate
- Selected as one of the Top 100 Global Innovators for 3 consecutive years

Intellectual Property Office, MOEA (TIPO)
Top 100 Patent Applicants in 2024:
- 13th Place among the Applicants of the Taiwanese Juridical Persons
- 17th Place among the Patentees of the Taiwanese Juridical Persons

Industrial Development Administration, MOEA
- Passed TIPS A-level certification for 2 consecutive years

Taiwan Continuous Improvement Awards
- 2 Golden Tower Awards
- 2 Silver Tower Award

Best MCU/ Driver IC of the Year
Nuvoton received the 2024 EE Awards Asia - Taiwan Product Award.

Scope: the scope refers to Winbond; Nuvoton is presented with a gray background.

International Standards Compliance and Verification

Certification/Facilities	Winbond		Nuvoton	
	CTSP Fab	Kaohsiung Fab	Yanshin Plant	Nuvoton (Japan)
ISO 9001 Quality Management System	✓	✓	✓	✓
QC 080000 Hazardous Substance Process Management System	✓	✓	✓	
IATF 16949 Automotive Quality Management System	✓	✓	✓	
ISO 26262 Functional Safety for Road Vehicles	✓	✓		
ISO 21434 Cybersecurity for Road Vehicles	✓	✓		✓
ISO/IEC 27001 Information Security Management System	✓	✓	✓	✓
ISO 50001 Energy Management System	✓	✓	✓	✓
ISO 46001 Water Efficiency Management System	✓	✓		
ISO 14064-1 Greenhouse Gas Emissions Quantification and Reporting	✓	✓	✓	✓
ISO 14001 Environmental Management System	✓	✓	✓	✓
ISO 45001 Occupational Health and Safety Management System	✓	✓	✓	✓

Sustainability Highlights

Environment

Received an A-rating in the CDP
Winbond's Fabs follow the GHG protocol standard for measuring greenhouse gas emissions and has obtained ISO 14064-1 verification

Officially launched products made by renewable energy
Products reduce 60% of carbon emissions compared to standard products

Launched the world's first NOR Flash supporting a working voltage of 1.2V
Saves 50% power consumption than 1.8V NOR Flash

Winbond's procurement and self-use of renewable energy
Reached 43.96 million kWh

Obtained ISO 46001 Water Efficiency Management System
- All Winbond fabs have obtained ISO 460001
- Winbond (Taiwan) achieved an overall water recycling rate of 81.9% and a process water recycling rate of 89.3%

Average volatile organic compound removal rate is **99%** in Winbond(Taiwan)

Announced the《Winbond Biodiversity Commitment》
- Restoration of the Great Purple Emperor butterfly habitat
- Habitat conservation for the Sauter's Brown Frog
- Collection and cultivation of Camellia species
- Protection of the endangered wild plant, *Spiranthes* sinensis

Social

Winbond received the Ministry of Labor's
Work-Life Balance Award : Family-Friendly

From 2011 to 2024, the cumulative employee childcare subsidies
amounted to NT$390 million
Winbond Group provides employees with "Workplace Childcare Allowance"

Full-time employee salary of non-management of Winbond (Taiwan).
Average - NT$1.73 million

Total training expenses amounted to
NT$42.87 million

37 digital transformation promotion activities and training sessions
Winbond Group established an AI learning map and certification system, promoting data analysis tools

Social welfare investment of
NT$23.7 million

"Winbond Semiconductor Talent Cultivation Program"
Sponsored NT$10 million to the Semiconductor Academy

Governance

First time selected for the S&P Global Sustainability Yearbook
Winbond has been selected for the 2025 S&P Global Sustainability Yearbook

Top 20% of Corporate Governance Evaluation
Top 20% in Corporate Governance Evaluation of Listed Companies

Selected as one of the Top 100 Global Innovators for 3 consecutive years
Winbond Group has accumulated around **10,000** approved patents worldwide until 2024

Received TIPS A-level certification
Winbond has received Taiwan's Intellectual Property Management Standards for 2 consecutive years

RBA VAP certification rating - Platinum
Winbond group obtained VAP (Validated Assessment Program)

Established carbon accounting system
Winbond Group integrated ERP to achieve carbon inventory and carbon footprint transparent management

Accumulated hours of supply chain ecosystem co-learning
reached 38,646 hours

Winbond Story

Value Creation and Six Capitals 16

Value Creation and Six Capitals

Winbond Group fully recognizes that while striving for business and financial growth, as well as improving societal well-being, our actions may also have adverse effects on society and the environment. Therefore, we adopt an impact-oriented approach, taking into account broader and long-term impacts in our decision-making, and identifying the risks and opportunities that sustainability management may pose for the company's future. We are committed to continuous innovation through core technologies and stakeholder collaboration, fostering a mutually beneficial and sustainable partnership between the company and society.

Winbond discloses its capital inputs, outputs, and sustainability management practices. Through the strategic allocation and utilization of various forms of sustainable capital, we gain insights into the outcomes generated through our operations

Value Creation Process:

1. Input

Winbond Group draws upon six forms of capital—financial, manufacturing, intellectual, human, social, and natural—as the foundation for sustainable development.

2. Creating Value

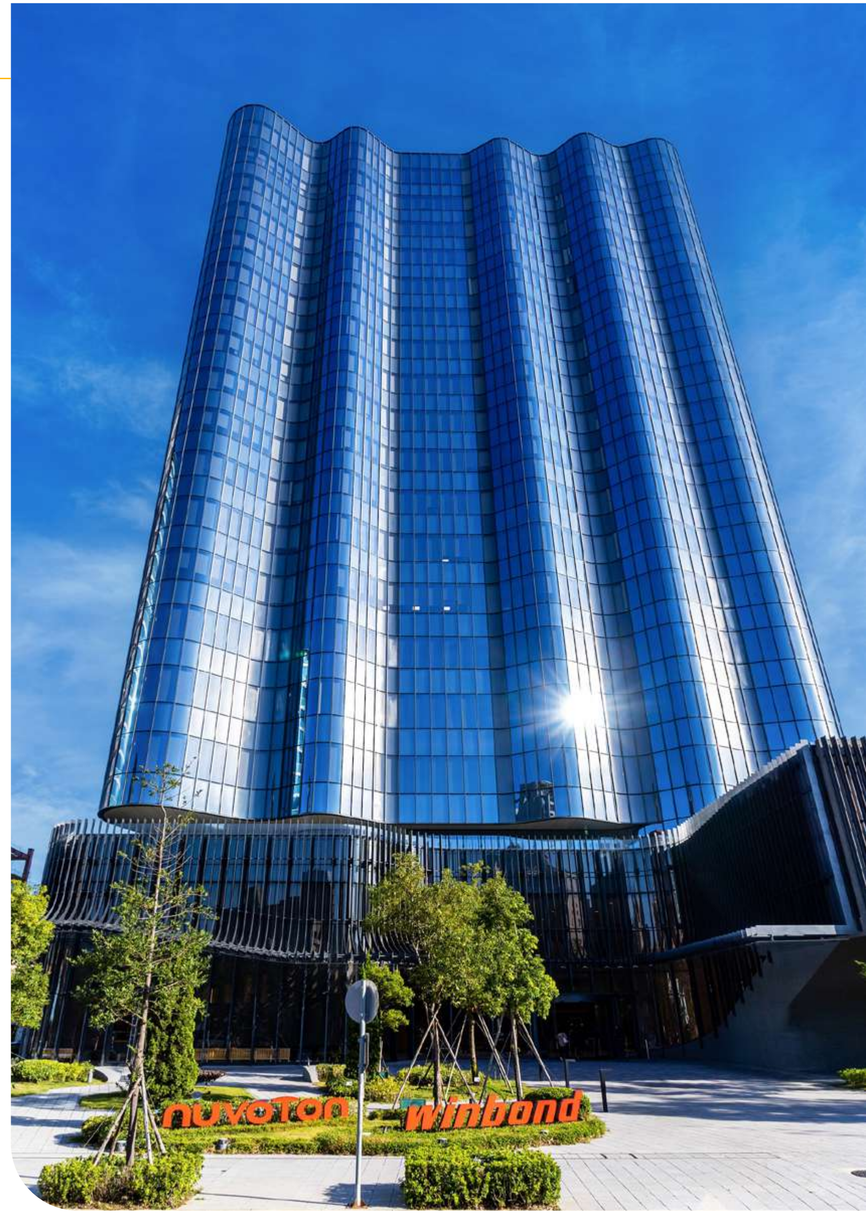
We uphold the core philosophy of sustainable development, emphasizing stakeholder engagement and transparent communication, while demonstrating both financial and non-financial performance. We pursue the vision of becoming a hidden champion in providing sustainable semiconductors that enrich human life. In our operations, Winbond Group grows and thrives alongside over 8,000 colleagues worldwide, continuously driving technological advancement through R&D; capabilities and contributing to economic development.

Supply chain partners and their employees play a vital role in fostering innovation across the semiconductor industry by providing essential resources such as equipment, raw materials, and talent—helping to realize a sustainable semiconductor supply chain.

As advanced process technologies evolve, Winbond continues to diversify its process technologies and product portfolio, delivering memory and logic products to global customers and reaffirming our commitment to enhancing human well-being.

3. Output

Winbond Group's sustainability management framework guides our efforts across key pillars: corporate governance, environmental sustainability, green product, sustainable supply chain, human rights, and social inclusion. Each pillar is aligned with our core competencies and is supported by clearly defined strategies, goals, and action plans. We hold quarterly review meetings to monitor progress and execution, ensuring that ESG strategies are fully embedded in our daily operations.



Value Creation and Six Capitals

Categories of the Capitals	Key Investment Projects	Corresponding Sustainable Outputs	Value Creation
Financial Capital	▪ Strengthen financial structure, expand cost-competitive capacity, and adjust product mix ▪ Consolidated operating expenses for 2024 amount to NT$23.5 billion	▪ Consolidated revenue for 2024 amounted to NT$81.61 billion ▪ Consolidated net profit after tax for 2024 was NT$710 million	Conduct financial management, which forms the foundation for product research and development, production, and related services.
Manufacturing Capital	▪ Purchase of production machinery and CMS process R&D equipment Related capital expenditure: NT$17.1 billion	2024 Capacity Information ▪ 12-inch wafers: 799,000 pieces ▪ 6-inch wafers: approximately 531,000 pieces	Including the investment and maintenance of wafer manufacturing integrated factories, production and R&D equipment, and providing products that meet customer needs
Intellectual Capital	▪ Invested 20% of revenue in R&D expenses ▪ Promoted smart manufacturing digital platforms using four major digital transformation systems with industrial AI (artificial intelligence) technology	▪ In 2024, more than 10,000 patents were approved globally ▪ Project development includes themes such as "Data Analysis Efficiency," "Quality Improvement," "Production Increase," and "Energy-saving Analysis" ▪ Completed 37 digital transformation activities and training sessions in 2024	Knowledge-based intangible assets owned by company. Enhance digitalization to provide more convenient and secure services based on innovative technology
Natural Capital	▪ Implemented afforestation projects ▪ Winbond's Fabs have fully obtained the Water Efficiency Management System (ISO 46001) and Energy Management System (ISO 50001) ▪ Process improvements, including replacing energy-saving equipment and installing exhaust gas treatment equipment, executing energy-saving projects, and using renewable energy	▪ Winbond has carried out afforestation and conservation projects on state-owned forest land in Chiayi, Tainan, and Yilan, with a cumulative area exceeding 25 hectares, estimated to remove approximately 10,000 tons of CO_2 equivalent over 30 years. W ▪ In 2024, Winbond's overall water recycling rate was 81.9%.W ▪ In 2024, Winbond's energy savings amounted to approximately 3.5%.W	Committed to minimizing the negative impact of operations on the environment
Human Capital	▪ Employee education and training expenses for 2024 amounted to NT$42.87 million ▪ Employee compensation and benefits expenses amounted to NT$16,668.457 million	▪ In 2024, the average training hours for Winbond (Taiwan) employees were 70 hours, primarily focusing on core, professional, data science, and management training.W ▪ The global employee retention rate in 2024 reached 91%.	Support employees by enhancing competitiveness, workplace diversity and inclusion, and improving quality of life
Social and Relationship Capital	▪ Winbond's total social welfare investment amounted to NT$23.7 million ▪ Cumulative employee childcare subsidies exceeded NT$390 million ▪ Conducted customer satisfaction surveys ▪ Collaborated with 13 supply chain partners, investing over NT$200 million	▪ In 2024, Winbond's public welfare activities implemented three core strategies: "Talent Cultivation," "Nature-Based Solutions," and "Social Welfare and Environmental Protection."W ▪ From 2011 to 2024, a total of 2,137 children of Winbond (Taiwan) and Nuvoton (Taiwan) employees benefited from childcare subsidies. ▪ In 2024, Winbond (Taiwan) customer satisfaction was 90%, and Nuvoton (Taiwan) customer satisfaction was 87%. ▪ Winbond promoted supply chain greenhouse gas inventory, with an estimated cumulative reduction of 9,500 tons of CO_2 equivalent by 2025.W	Relationships with communities and other stakeholder groups, as well as investment and planning related to social participation

ESG Strategy Framework

"Be a hidden champion in providing sustainable semiconductors to enrich human life."

Scope: Unless otherwise noted, the scope covers Winbond Group；W Winbond

Manufactured Capital

Dual-Drive for Low-Carbon and Intelligent Wafer Fabs

Facing the opportunities and challenges of achieving net-zero carbon emissions, we understand that low-carbon manufacturing is not only a chance for corporate transformation but also a key to enhancing corporate competitiveness. Winbond Group's wafer fabs are jointly creating an intelligent green manufacturing ecosystem that helps save electricity and water, reduce energy consumption, and significantly improve production efficiency.

All of the manufacturing sites have passed the ISO 50001 Energy Management System certification. Through equipment upgrades and AI data prediction models, we enhance energy efficiency and reduce carbon emissions, aiming to use 50% green electricity by 2030 and reduce greenhouse gas emissions in Scope 1 and Scope 2 by 42% compared to the baseline year[Note].

In terms of water resource management, Winbond and Nuvoton have passed the ISO 46001 Water Efficiency Management System certification, improving water resource efficiency and reducing water consumption to minimize environmental impact. In digital transformation and AI applications, AI technology is applied to the chiller system and hydrofluoric acid wastewater system to optimize system operations and reduce energy and chemical consumption.

Winbond's wafer fabs focus on strengthening digital infrastructure and data platforms, cultivating data talent, and promoting AI technology applications. We concentrate on project innovation and integrating large language models with CIM (Computer-Integrated Manufacturing) systems and other AI applications to achieve data empowerment, enhance production efficiency, and standardize manufacturing. We have established various digital platforms (including the iMX system platform, system monitoring platform, data platform, business intelligence platform, and AIP application intelligence platform) to accelerate digital transformation. Over the past four years, we have successfully executed more than 100 digital transformation projects, responding to global customer needs more precisely.

Winbond's Kaohsiung fab officially began operations in 2022, focusing on the establishment of intelligent manufacturing systems, including automated material handling systems (such as AMHS and ASRS) and error detection, classification, and recipe management software systems (such as MES, FDC, and RMS). To enhance efficiency, the Kaohsiung Fab and the CTSP Fab collaborate through standardized management (CIM Committee, Central Code, DevOps), aiming to replicate the intelligent production experience of the CTSP Fab to the Kaohsiung fab, further leveraging the synergy of flexible capacity allocation.

Nuvoton's 6-inch wafer foundry's intelligent manufacturing strategy initially focuses on infrastructure, emphasizing the digitization of production information. After 2020, a dedicated team was established, and related projects were included in KPIs, with regular progress tracking to ensure the effective implementation of the intelligent manufacturing strategy. Nuvoton's 2024 project goals include improving efficiency and saving labor costs through automation and AI technology, such as updating automated machine functions, establishing a Cryo-Pump health monitoring system, optimizing defect image recognition technology, and introducing an AI chiller management system. These efforts aim to save employee work hours annually, reduce electricity consumption, and enhance employees' digital literacy.

As technology demands continue to rise, and customer expectations for quality, efficiency, and delivery times increase, digital transformation becomes the key to seizing opportunities in this volatile market. Every colleague at Winbond Group will actively embrace AI opportunities, striving to achieve the company's vision of "Be[ing] a hidden champion in providing sustainable semiconductors to enrich human life."

Note Please refer to 3. Environmental Sustainability section for target descriptions.

CTSP (12-inch)

Kaohsiung Fab (12-inch)

Yanshin Plant (6-inch)

- Energy and Carbon Emission Reduction Measures
- High-Efficiency Digital Factory
- Enhanced Waste and Emission Management

Automated Equipment
Including AMHS and ASRS Automated Equipment

Software Systems
Including MES, FDC, and RMS Software Systems

Standardized Management
Implementing ISO 46001 to Improve Water Resource Efficiency

Energy Management
Implementing ISO 50001 to Improve Energy Efficiency

Water Resource Management
Implementing ISO 46001 to Improve Water Resource Efficiency

Digital Transformation
Applying AI Technology to Optimize System Operations and Reduce Consumption

Intelligent Manufacturing Strategy
Focusing on Infrastructure and Digitization of Production Information

Automation and AI Technology
Project Goals to Improve Efficiency and Save Labor Costs

Intellectual Capital

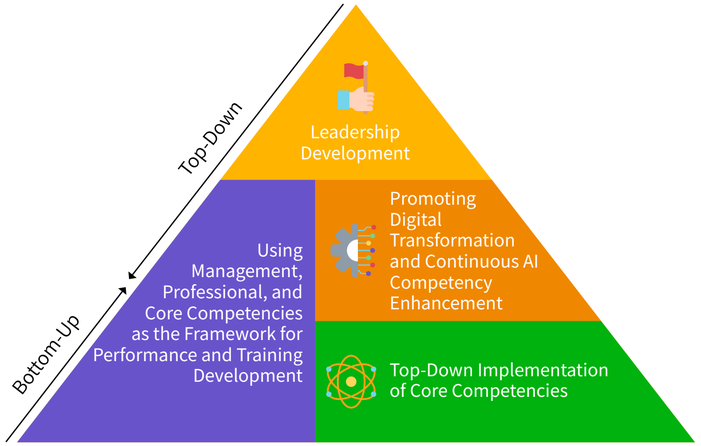
Building an Advanced Intelligent Platform to Enhance Corporate Productivity and Agility

Winbond Group actively embraces AI trends and has formulated a clear AI implementation strategy. Winbond established a Digital Transformation Committee to drive and accelerate digital transformation across all units from the top down, viewing AI capabilities as a core professional competency. The goal is to optimize existing business processes and reshape corporate culture through AI training, enabling employees to actively engage and create value during the transformation process.

Establishing AI Digital Platforms to Accelerate and Expand Digital Transformation

Winbond Group utilizes generative AI-assisted development tools and developed its first internal generative AI application tool, Albert, encouraging employees to use it. In 2024, the tool was used 123,266 times, with one in three employees incorporating it into their daily work.

To advance the digital transformation strategy, Winbond has also established various digital platforms with different functions, including the user experience-oriented iMX system platform, a system monitoring platform for real-time system health monitoring, a data platform providing a single source of truth, a business intelligence platform for easy report publishing and management, and the Application Intelligence Platform (AIP) for rapid application deployment and management. These digital platforms aim to enhance efficiency, promote collaboration across departments, and solve complex problems through data science. Modular development shortens development time and simplifies application deployment, achieving digital empowerment.



Focusing on Employee Training and Guiding Employees to Adapt to AI-Era Work Models

Winbond Group actively promotes generative AI tools such as ChatGPT, GitHub Copilot, and Microsoft 365 Copilot, providing relevant training courses for employees. In 2024, Winbond Group held its first Digital and AI Carnival to foster a culture of passionate learning and active innovation, empowering employees to use digital and AI tools and apply them in work scenarios to enhance productivity.

Additionally, Winbond has built an AI learning certification system (CCAI) website, combining internally developed courses, open courses from top universities, and practical guidance from experts and scholars. The website offers online courses in data science, data engineering, Python, and AI practical classes, allowing all employees to hone and improve their AI skills together. Before participating in project implementation, AI practical class students are required to complete over 10 hours of online courses. A total of 1,667 Winbond employees have completed at least one of these prerequisite courses. Practical class students further participate in a 9-hour practical course taught by academic experts and scholars, culminating in a practical presentation evaluated by senior executives.

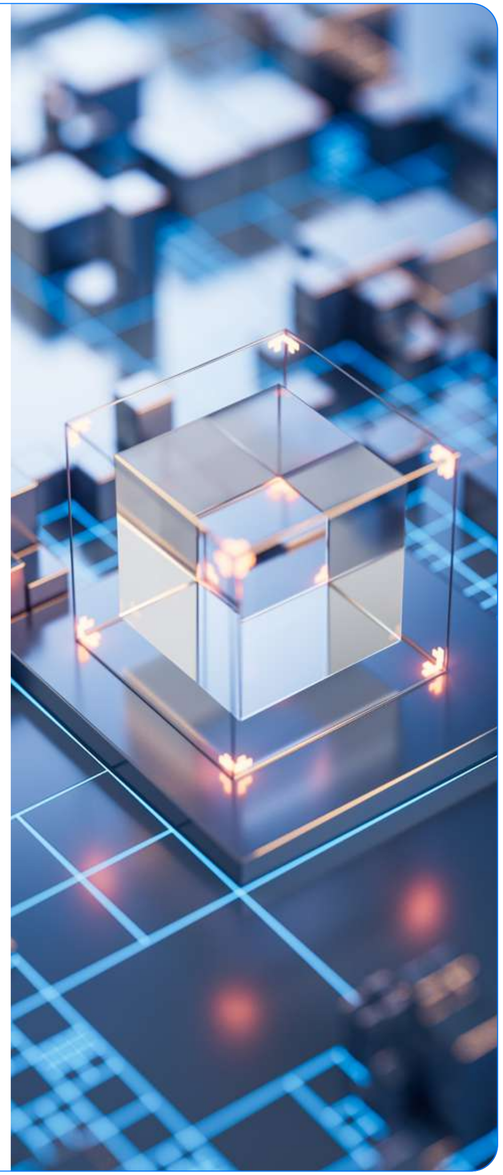
In terms of application to production lines and process optimization, we aim to enhance employees' data analysis, programming, and AI application capabilities. The training courses provided include basic Python programming (both online and in-person), data engineering (focusing on data querying and BI report creation), and data science programs (covering data analysis, machine learning, and AI implementation, including projects in collaboration with university professors).

Digital Platform
Establish a strong data and cloud platform

Talent Development
Train employees to utilize data science and AI

Innovative Projects
Implement projects to enhance efficiency and quality

For more information, please refer to 1.3.2 Factory Digital Transformation Promotion Strategy



Intellectual Capital

TIPS Taiwan Intellectual Property Management System A-Level Certification

Winbond places great importance on Corporate Governance and the implementation of intellectual property management. Since 2022, we have established an intellectual property protection management system, formulated intellectual property policies and objectives, and implemented them accordingly. By introducing the Taiwan Intellectual Property Management System (TIPS), we have strengthened our existing intellectual property management mechanisms.

In 2023 and 2024, Winbond passed the "Taiwan Intellectual Property Management System (TIPS) A-Level Re-certification," demonstrating our commitment to using TIPS principles as a foundation. This approach helps us identify potential risks or opportunities related to the acquisition, protection, maintenance, and utilization of intellectual property rights at various stages of our operations. We aim to develop concrete and feasible intellectual property management policies and objectives, ensuring that Winbond can integrate the expertise of various departments, facilitate internal communication, and make informed business decisions. This integration links intellectual property management with corporate sustainability (ESG) development.

Winbond Group Ranks Among the Top 100 Global Innovators for the Third Time

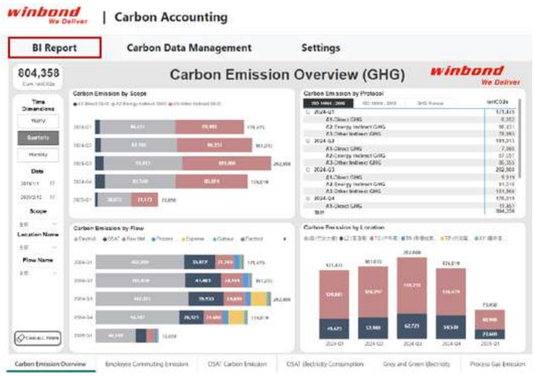
Winbond Group integrates the research and development capabilities of its global colleagues, actively investing in technology development and establishing R&D centers worldwide. By protecting innovative achievements through both patents and trade secrets, Winbond's R&D spans markets including IoT, smart industry, medical, automotive, computer communications, and consumer products. It is the only group company in Taiwan with the capabilities of DRAM, Flash, and Logic process development, product design, and marketing.

In 2024, Winbond Group's R&D expenditure accounted for approximately 20% of total revenue, with over 10,000 certified patents globally, demonstrating Winbond's strong emphasis on R&D resource investment. In 2025, Winbond was once again selected as one of Clarivate's Top 100 Global Innovators, highlighting Winbond's proactive patent deployment across multiple countries and its balanced performance in patent quality and quantity, earning international professional recognition.

Carbon Accounting Platform: Achieving Automated and Standardized Carbon Emission Data Collection

To achieve precise monitoring and management of carbon emissions, Winbond Group has established a carbon information system, the "Carbon Accounting System," based on the standards of organizational greenhouse gas inventory (ISO 14064-1:2018) and product carbon footprint (ISO 14067). This system utilizes existing carbon emission databases to develop product carbon footprint calculation methodologies, introduces a carbon coefficient database, and employs big data technology to analyze hotspots and identify carbon reduction opportunities. Artificial intelligence is used to predict future carbon emission trends and provide optimization suggestions, aiding in the formulation of corporate carbon reduction strategies.

Leveraging this data science foundation, we accelerate the reduction of product carbon footprints through measures such as Green Product development and design, energy efficiency improvement, low-carbon supply chain collaboration, energy-saving and renewable energy operations, and waste management. Additionally, we collaborate with value chain partners to manage in real-time, formulate carbon reduction plans and pricing strategies, thereby enhancing customer trust and increasing product competitiveness.



For more information on the carbon accounting platform, please refer to the chapter page introduction

Scope: Unless otherwise noted, the scope covers the Winbond Group; Winbond

Natural Capital

Winbond Group's Nature Positive goal, in collaboration with affiliated enterprises and academic institutions, initiated several long-term projects such as conservation breeding, afforestation, and preservation to promote environmental biodiversity and species restoration, aiming to care for and protect Taiwan's local ecology. In 2024, the Chairman signed the "Winbond Biodiversity Commitment," where the company pledged to reduce the impact of operations and value chain on the environment and support sustainable technologies. The goal is to achieve net positive impact and zero deforestation, ensuring the integrity of ecosystems.

Conservation Plan
Focus on protecting endangered species

Systematic Afforestation
Conduct afforestation based on expert recommendations

Native Tree Planting
Plant local tree species to promote ecological balance

Ecosystem Services
Provide benefits of natural ecosystems

Community Collaboration
Collaborate with academic institutions

Carbon Storage Goals
Plan to reduce carbon dioxide emissions

Biodiversity

In 2024, Nuvoton participated in the Purple Crow Butterfly Ecological Restoration Project in Wufeng Township, Hsinchu. This project, in collaboration with the Forestry Bureau, Taiwan Butterfly Conservation Society, and National Yunlin University of Science and Technology, aims to restore the Purple Crow Butterfly population by providing a stable food source for larvae through habitat surveys and forest monitoring. The project combines technological conservation, community participation, and environmental education to enhance the population of the Purple Crow Butterfly. Whilst also strengthening ecosystem resilience, and deepening communication and connections with community stakeholders. Additionally, Nuvoton assisted amphibian conservation volunteers in habitat conservation actions for the endangered Sauter's frog in the Dashanbei area of Hengshan Township, Hsinchu County, achieving the goal of biodiversity environmental education.

Winbond is committed to the conservation of Taiwan's native plants. Since 2021, Winbond has initiated a species conservation and breeding program, focusing on the collection and cultivation of Theaceae plants. Currently, 33 species of Theaceae plants have been collected and cultivated. Furthermore, Winbond protects endangered wild plants, focusing on the conservation of the Habenaria plant by delaying mowing times to ensure seed propagation opportunities, thereby protecting its population. Winbond aims to maintain biodiversity and ecological health through the conservation of endangered wild plants and Taiwan's native plants.

Conservation and Breeding Operations for Theaceae Plants

Protecting the Beautiful Habitat of *Sasakia charonda*

Endangered Wild Plant
- *Spiranthes sinensis*

Natural Capital

Afforestation

Winbond Group plans to implement natural carbon sequestration pathways in the field of forest carbon sinks. By leveraging its carbon-negative capabilities and collaborating with government, industry, academia, and the public, the primary goals are to enhance biodiversity, restore ecosystems, promote forestry economy, and improve people's quality of life and health. Carbon sequestration is a secondary goal, contributing significantly to the national net-zero emissions target and responding to Taiwan's 2050 net-zero emissions pathway's "natural carbon sequestration" key strategy.

Since 2021, we have actively promoted domestic afforestation and conservation projects. In collaboration with the Forestry Bureau of the Ministry of Agriculture and the National Property Administration of the Ministry of Finance, we have carried out afforestation and conservation on state-owned forest lands in Chiayi, Tainan, and Yilan, covering a cumulative area of over 25 hectares and planning to plant more than 40,000 trees.

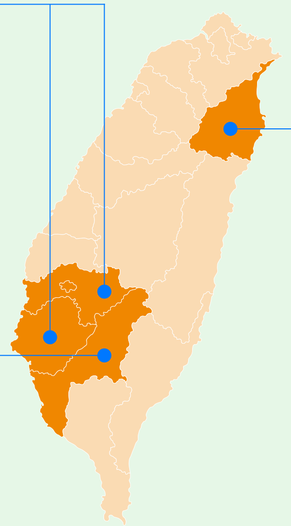
For more information on biodiversity and afforestation, please refer to section 3.6 Biodiversity.

Tree Adoption Plan in Chiayi: planting approximately 7,700 trees

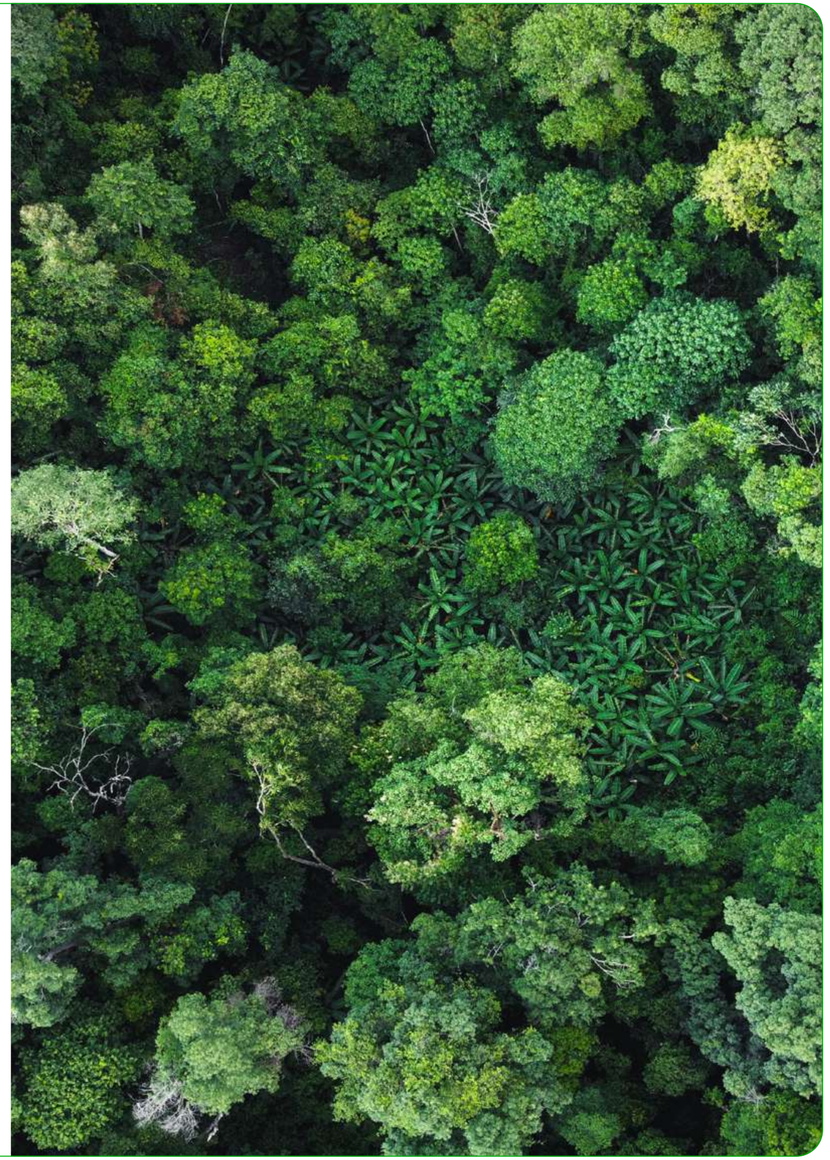
Winbond actively participated in the tree adoption plan of the Forestry Bureau and the Nature Conservation Agency of the Ministry of Agriculture, adopting national forest land located in Tainan City and Chiayi County, planting 4 native tree species including Taiwan cherry, maple, acacia, and neem on 29,400 square meters of land, with an estimated total carbon sequestration of 990 metric tons of CO_2 equivalent.

Afforestation Plan in Kaohsiung: planting approximately 1,300 trees

Winbond planted 5 native tree species including Cinnamomum camphora, large-leaved mountain olive, neem, and Ligustrum lucidum at the Kaohsiung Fab, in collaboration with National Chung Hsing University, conducting a 30-year continuous afforestation plan, with an estimated carbon sequestration of 390 metric tons of CO_2 equivalent.



A joint venture between Walsin Lihwa and Winbond, won the first national land Yilan Sanxing natural carbon sink project in 2023 (21.66 hectares), and is expected to plant 33,000 trees to generate carbon sink from new afforestation.



Human Capital

Implementing Human Rights Due Diligence in subsidiaries

Demonstrating commitment to human rights

Winbond Group regards human rights as the cornerstone of sustainable corporate development. Our business philosophy has evolved from merely complying with labor laws and reducing the risk of legal penalties to enhancing talent value and human rights management awareness, achieving the goal of "talent sustainability." Winbond actively invests in human rights management by supporting and safeguarding human rights, providing a safe and ethical working environment, and achieving the objectives of integrity and sustainable operations.

To optimize human rights risk management, Winbond updated its human rights policy in 2022, referencing relevant regulations and human rights development trends. We commissioned a third party to conduct human rights due diligence activities for all employees in Taiwan. Through regular human rights risk reviews, we continuously improve our human rights management mechanisms and enhance stakeholders' awareness and importance of human rights.

In 2024, Winbond, together with its subsidiary Nuvoton, actively implemented human rights policies, including formulating human rights policies, conducting due diligence, and completing human rights education and training for global employees. Winbond is also committed to creating a diverse and inclusive work environment, increasing the proportion of female employees and the employment rate of people with disabilities, and protecting employee rights through various channels.

Winbond also extends human rights to the supply chain, requiring suppliers to sign a code of conduct and conduct conflict minerals investigations and human rights risk assessments, aiming to establish a sustainable corporate culture that respects human rights.

Winbond Group adheres to the "people-oriented" philosophy, striving to create a diverse, equal, and inclusive work environment.

Winbond Group attracts global talent by offering competitive compensation packages and childcare support, promoting AI applications and data science in digital transformation to address the impacts and challenges of labor shortages, and fostering sustainable talent development in Taiwan.

Providing Competitive Compensation to Attract and Retain Talent

To attract and retain the best talent, Winbond Group offers competitive total compensation, including base salary, allowances, and employee cash bonuses and rewards. In 2024, both Winbond and Nuvoton were listed in the High Salary 100 Index, demonstrating our competitiveness in compensation. Employee engagement surveys showed that 97% of employees are willing to fully commit to their work and stay with Winbond for the next five years, reflecting the effectiveness of Winbond's policies and measures in retaining employees.

listed in the 2024 **High Compensation 100 Index**

Providing Childcare Subsidies to Support a Childcare-Friendly Environment

Emphasizing family-friendly workplace measures, Winbond (Taiwan) and Nuvoton (Taiwan) provide monthly childcare subsidies of NT$6,000 and NT$5,000 respectively for employees' newborn children until they reach the age of four. Approximately 120 to 170 employees apply for this subsidy each year. Winbond Group believes that establishing a workplace environment that supports childcare resources helps mitigate the risk of declining birth rates and aims to alleviate employees' childcare burdens, thereby supporting their career development.

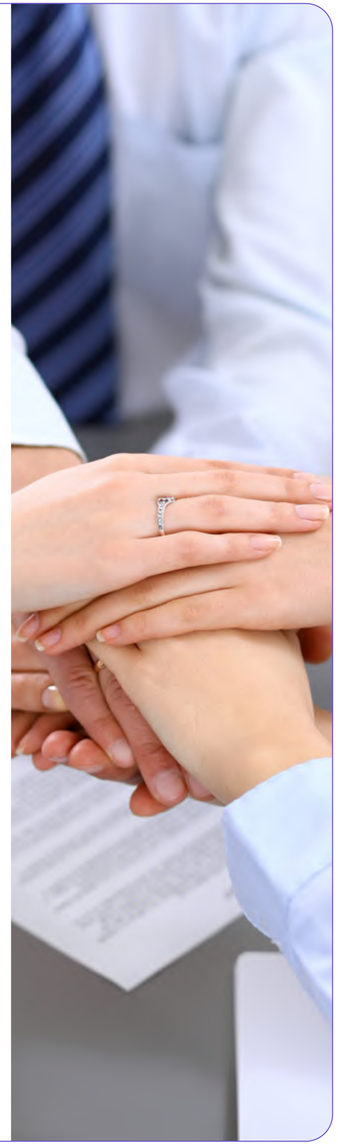
Childcare Subsidies

Winbond (Taiwan) provides **NT$6,000** per month

Nuvoton (Taiwan) provides **NT$5,000** per month

Promoting Passionate Learning and AI Applications to Address Labor Shortage Challenges

Winbond Group continues to maintain competitiveness through digital transformation, utilizing AI and data science to enhance manufacturing processes and capacity. Employees continuously learn through basic Python, data engineering, and data science courses, becoming familiar with development environments and improving data application capabilities. Winbond has also established an AI learning map and certification system, promoting data analysis tools. Over 4,000 employees have completed AI course training, showcasing Winbond's ongoing investment in digital learning resources.



Social and Relationship Capital

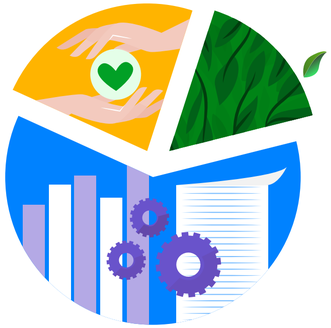
Winbond collaborates with suppliers to participate in the "Carbon Data Electronic Exchange Standard" to enhance the supply chain's carbon reduction capabilities through digital measures.

Winbond has joined the Pathfinder Framework project established by the Institute for Information Industry's Digital Transformation Research Institute under the Partnership for Carbon Transparency (PACT) framework, becoming the first semiconductor company in the country to lead a supply chain transparency initiative.

Based on the continuous enhancement of green and low-carbon manufacturing concepts with suppliers, Winbond targets suppliers who are committed to shaping a carbon reduction culture, have practical experience in carbon inventory, and have long-term management consensus on carbon data digitization to participate in the pilot project.

In 2024, the project not only achieved 100% response from OSAT Suppliers in the backend packaging and testing sectors, but the entire early-stage pilot also became an annual industry achievement of the Industrial Development Bureau of the Ministry of Economic Affairs.

Executing substantial carbon reduction actions with the supply chain as the operational unit has not only become a key performance indicator for international brand manufacturers to evaluate suppliers but also one of the key industrial development strategies for governments worldwide to demonstrate national competitiveness. In the future, Winbond hopes to continue to set an example for the industry with substantial sustainable actions, leading more suppliers to gradually and practically achieve the 2050 net-zero sustainability goal.



Scope: Unless otherwise noted, the scope covers the Winbond Group; W Winbond

Social and Relationship Capital

Take actions to protect the ocean and ecology, raising public awareness on environmental issues.

In 2024, Winbond Group's employees and their families in Taiwan participated in numerous environmental conservation activities, while Nuvoton Japan focused on community volunteer cleaning activities.

We collaborated with the Society of Wilderness to conduct mountain and stream cleaning activities in the Dashanbei area of Hsinchu, focusing on protecting the habitat of the Sauter's frog. Additionally, we organized employees and their families to participate in stream cleaning in Fazi River in Taichung, wetland park cleaning and restoration in Yuanzhonggang, Kaohsiung, and beach cleaning in Nanliao, Hsinchu. A total of 210 participants cleaned 658 kilograms of garbage, demonstrating corporate social responsibility and enhancing employees' environmental awareness.

Accumulated
210 people
service

Total Cleaned
658 kg
Of garbage

Focus on Environmental Protection and Ecology

Winbond Group volunteers participated in beach cleaning, stream cleaning, and wetland conservation activities, removing a significant amount of garbage. Through these activities, we aim to raise public awareness on Environmental Sustainability issues and take concrete actions to protect the ocean. Nuvoton participated in the Touqian River cleaning activity in response to World Rivers Day and collaborated with the Society of Wilderness for mountain and stream cleaning and ecological conservation actions in the Dashanbei area. Nuvoton Japan focused on cleaning activities around Winbond neighborhood and participated in volunteer cleaning activities organized by the local community committee of Obatagawa, Kyoto.

Biodiversity Conservation

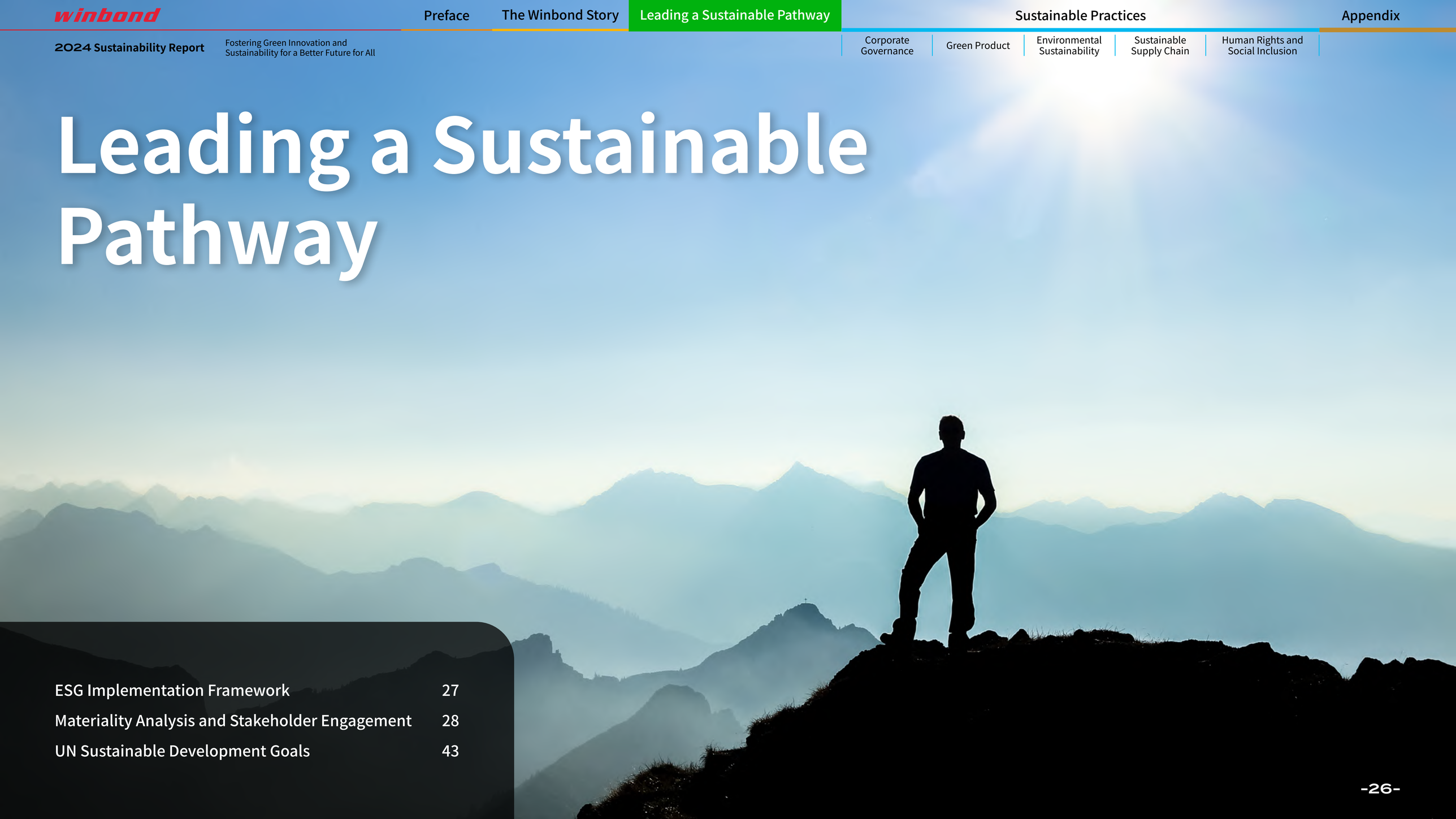
In 2024, Nuvoton collaborated with environmental protection groups to assist amphibian conservation volunteers in habitat conservation actions for the endangered Sauter's frog in the Dashanbei area of Hengshan Township, Hsinchu County, achieving the goal of biodiversity environmental education. Winbond, in collaboration with the Society of Wilderness, invested resources in environmental education actions such as understanding the environment, bird surveys, and stream cleaning, inviting employees and their families to protect the rich ecology of Fazi River together.

Protecting the habitat of the Sauter's frog

Environmental Protection Action in Nuvoton(Japan)

Clean-up of Fazi River in Taichung

Leading a Sustainable Pathway



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ESG Implementation Framework

Winbond strives to "be a hidden champion in providing sustainable semiconductors to enrich human life." With the ESG vision personally outlined by the Chairman, Winbond has established an ESG committee within the Board of Directors. The Board of Directors provides the strategic framework for sustainable development. Winbond upholds values such as integrity, ethical behavior, innovation, and enthusiasm, continuously enhancing corporate value. Simultaneously, Winbond remains attuned to global trends, addresses social issues, and responds to stakeholder expectations. By aligning its actions with the United Nations Sustainable Development Goals (SDGs) and integrating sustainability principles into its core operations, Winbond contributes to a better future for society.

Winbond ESG Strategy Framework

Vision

- E: Measure innovative contributions with carbon footprint.
- S: To be kind, righteous, proper, wise and trustworthy in everything we do. We would treat others as ourselves and extend that to all people and even everything.
- G: Conduct business with integrity and ethical behavior.

Strategy

Green Product
- Energy-efficient product planning and promotion.
- Development of green manufacturing process.

Environmental Sustainability
- Formulate energy conservation and carbon reduction strategies, and disclose information in accordance with regulations.
- Plan and promote energy management and resource tilization enhancement schemes. health.
- Promote environmentally friendly actions.

Human Rights and Social Inclusion
- Ensure human rights protection.
- Recruit, develop, and retain diverse talents.
- Establish a friendly and harmonious workplace.
- Ensure occupational safety and health.
- Care for society and participate in community development.

Sustainable Supply Chain
- Continuously drive the transforma-tion of supply chain relationships.
- Implement sustainable procurement strategies and initiatives.
- Implement sustainable supply chain risk assessment and management.
- Promote the digitalization of sustainable supply chain management.

Corporate Governance
- Identify climate change risks and opportunities.
- Plan and procure green energy.
- Implement corporate governance in compliance with relevant laws and regulations.
- Innovate and manage intellectual property.
- Manage information and ensure security.

Talents

- E S G Awareness Building
- E S G Sustainability Capacities Building

Processes

- G Risk Management Process
- G Sustainable Governance Process
- G Compliance Disclosure
- E S G Sustainable Innovation Culture

Technology

- E S G Digital Transformation
- E S G Sustainable Data Establishment and Application
- G Carbon Accounting System

Materiality Analysis and Stakeholder Engagement

Winbond is committed to communicating with stakeholders in a transparent and open manner in order to identify all sustainability topics of concern and incorporate these topics into our corporate sustainability framework. Winbond published Materiality Analysis Report, disclosing the material issues Winbond had identified and its approach to managing these issues. Based on the GRI Standards published by the Global Sustainability Standards Board on October 2021 (GRI 3: Material Topics 2021), Winbond has conducted a materiality analysis, and defined Winbond' s material topics assessment principles as: "issues of significant impact to major stakeholders that also have a noticeable impact on Winbond operations, while staying consistent with Winbond' s sustainable development goals". In line with our philosophy for managing material issues, after merging the relevant issues, Winbond has identified 9 material issues after consolidation of similar issues. Materiality assessments are conducted annually to ensure that the most relevant and significant sustainability issues are identified and addressed.

Note The list of material issues in the 2024 Sustainability Report remains unchanged compared to the 2023's.

Winbond's Criteria for Assessing Material Issues

- ✓ High stakeholder concern
- ✓ Significant impact on company operation
- ✓ Priority of Winbond's sustainable management development goals

*Scope of this chapter: Winbond (Taiwan)

Collecting sustainability issues

Understanding organizational background

List of sustainability issues

Sources of data collection

- GRI reporting standards
- SASB (Sustainability Accounting Standards Board)
- Task Force on Climate-related Financial Disclosures (TCFD)
- UN Sustainable Development Goals (SDGs)
- Semiconductor industry-benchmarks
- Disclosures by competitors and industry development trends

Tabulating sustainability issues

19 ESG issues were selected by senior executives for the materiality survey.

Tabulating issues of concerns ▶ Identifying actual and potential impacts

Stakeholders' topics of concern survey
Positive/negative impact assessment survey

Stakeholders' topics of concern survey

Response from 418 stakeholders

Questionnaires were distributed to stakeholders by the responsible department to understand how much importance they attach to each of the 19 ESG issues.

+

Positive/negative impact assessment survey

Response from 22 senior executives

Winbond's senior executives evaluated the degree of each ESG issue's positive/negative impacts on the economy, society, humanity, and human rights.

Assessing issue-specific impacts

Topics of concerns among stakeholders

Topics of concerns among stakeholders

- Risk Management
- Regulatory Compliance
- Information Security and Personal
- Information Protection
- Occupational Health and Safety
- Manufacturing Capacity and Operations Performance
- Product and Services Quality
- Business Integrity and Corporate Governance
- Research, Development and Innovation
- Green Products
- Equality and Human Rights

Positive impacts and likelihood matrix

Negative impacts and likelihood matrix

Finalizing the list of material issues

List of material issues

Finalizing material issues

9 final material issues selected by senior executives based on their importance to sustainable development.

Finalizing material issues

Verifying that the 9 issues are 100% compliant with sustainability and comprehensive disclosure requirements

Formulating management guidelines

Management guidelines formulated by senior executives

Material issues approved by ESG Committee

Preparation of sustainability report

Matrix of Level of Potential Positive and Negative Impact and Likelihood of Occurrence

Winbond followed the GRI Standards (2021) definition of materiality. Senior management assessed the impact through a questionnaire, considering the principle of Double Materiality to evaluate the positive and negative impacts of Winbond on 19 sustainability issues related to the economy, environment, and people (including human rights). Each issue was scored based on its likelihood (actual/potential impact) and the degree of impact.

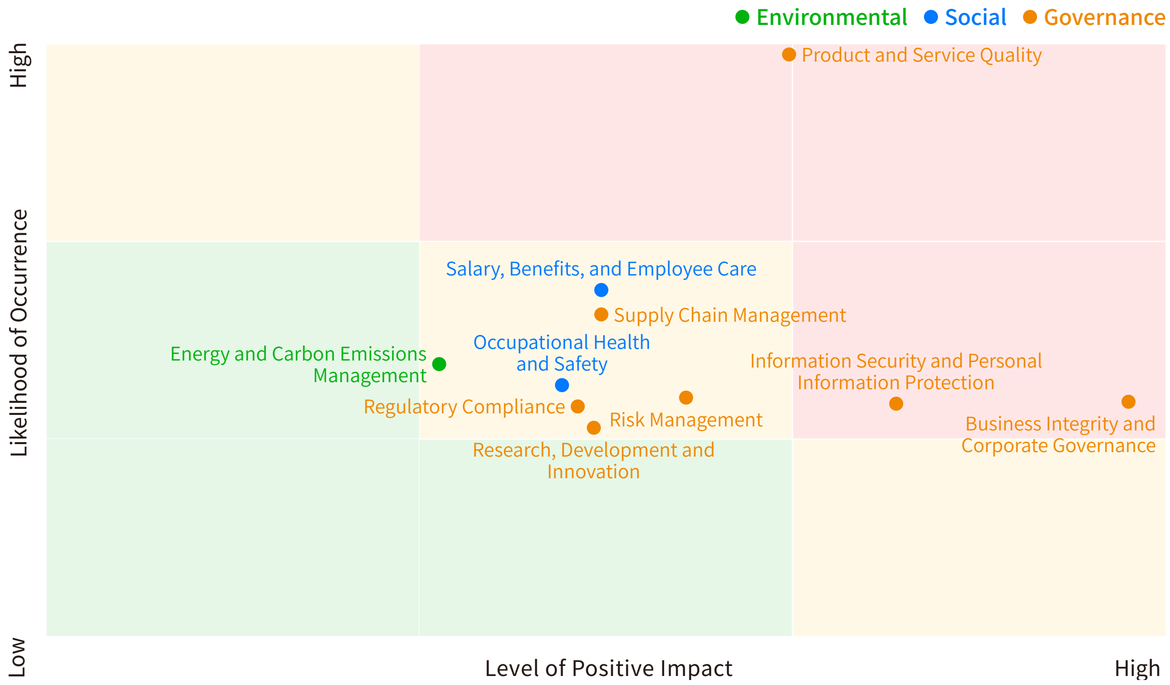
Definition of positive impact

Refers to positive or noticeable results generated by Winbond implementing measures in response to the topic, leading to a positive economic, environmental, or social (including human rights) impact on sustainable development.

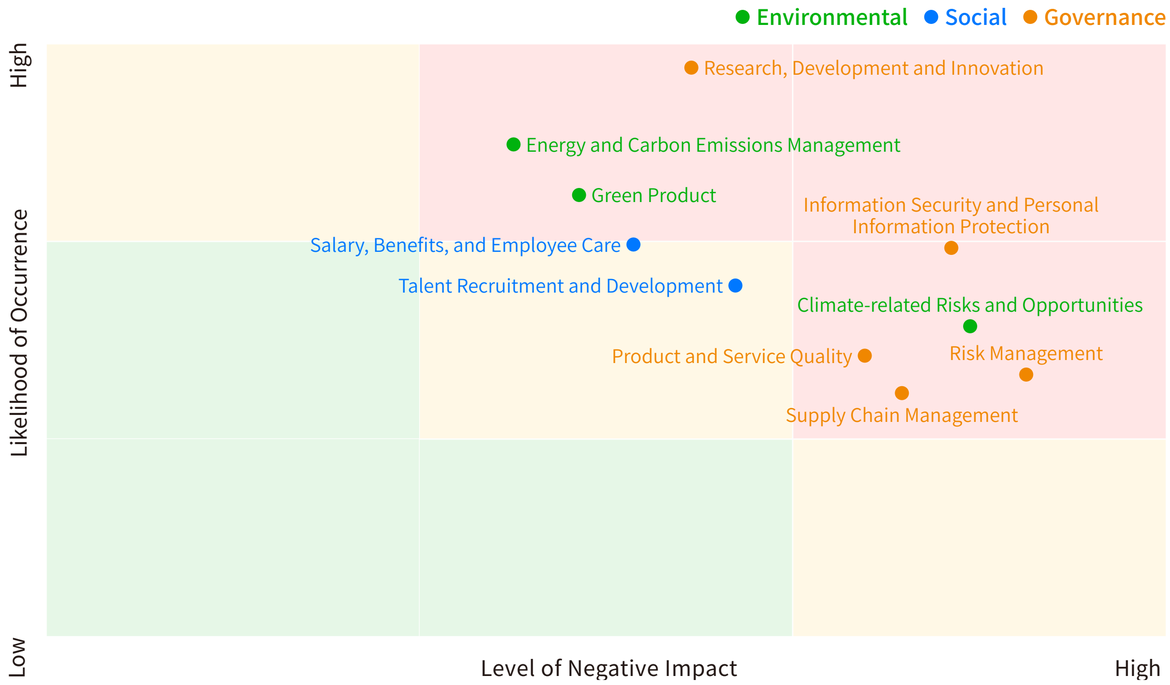
Definition of negative impact

Refers to the negative economic, environmental, or social (including human rights) impact caused by Winbond's overall business operations due to Winbond failing to implement or poorly implementing measures in response to the topic.

Matrix of Level of Potential Positive Impact and Likelihood of Occurrence



Matrix of Potential Negative Impact and Likelihood of Occurrence



Top 10 Sustainability Issues Matrix by Positive and Negative Impact Degree and Likelihood

Validation of Material Issues

We submitted the identified material issues to the Sustainable Development Committee for review. Based on the priority of Winbond's sustainable management development goals, the impact of each issue on internal development, and the impact of Winbond's operational activities on the external economy, environment, and people (including human rights), we consolidated issues with similar content to establish 9 annual material issues. Finally, the Sustainable Development Committee reviewed the identification results of the material issues to ensure compliance with sustainability context and completeness disclosure requirements. Management guidelines for each material issue were formulated and submitted to the Board of Directors for approval.

Aspect	Sustainability Issues	Validation Principles			Material Issues
		Stakeholder Concerns	Impact on Operations	Impact on Sustainability	
Governance	Business Integrity and Corporate Governance	✓	✓	✓	Business Integrity and Corporate Governance
	Regulatory Compliance	✓	✓	✓	Regulatory Compliance
	Risk Management	✓	✓	✓	Risk Management
	Information Security and Personal Information Protection	✓	✓	✓	
	Research, Development and Innovation	✓	✓	✓	Research, Development and Innovation
	Productivity and Business Performance	✓		✓	Productivity and Business Performance
	Supply Chain Management		✓	✓	Supply Chain Management
	Product and Service Quality	✓	✓		Green Product

Aspect	Sustainability Issues	Validation Principles			Material Issues
		Stakeholder Concerns	Impact on Operations	Impact on Sustainability	
Environment	Green Product	✓	✓	✓	Green Product
	Energy and Greenhouse Gas Management		✓	✓	Energy and Greenhouse Gas Management
	Climate-related Risks and Opportunities		✓	✓	
	Waste Management				
	Water Resources Management				
Social	Salary, benefits, and Employee Care		✓	✓	Talent Management
	Talent Recruitment and Development		✓	✓	
	Equality and Human Rights	✓		✓	
	Employer-employee Relations			✓	
	Occupational Health and Safety	✓	✓	✓	
	Social Engagement				

Material Issues and Their Relationship with Winbond Value Chain

Winbond places high importance on material issues, describing both positive and negative impacts associated with the 9 identified material issues. It links these material issues to Winbond's value chain, determining the impact boundaries on the value chain, including Winbond itself, customers, and the supply chain. Winbond tracks specific outcomes regularly each year.

● Direct impact ▲ Indirect impact through business relationship

Material Issues	Type of Impact（⇧ as positive impact, ⬇ as negative impact）	Description (How to impact economic, environment, and people (including human rights))	Scope of Impact			Referring Section
			Winbond	Customer	Supply Chain	
Business Integrity and Corporate Governance	⬆ Strengthening the trust of customers, suppliers, and investors in Winbond helps attract more cooperation opportunities and business expansion. ⬇ If integrity management and Corporate Governance are not effectively implemented, it may lead to a decrease in trust from customers, suppliers, and investors in Winbond, potentially resulting in business loss, revenue impact, or reduced investment.	▣ Corporate Governance was well-managed, compliant with regulations, and increased investment. ▣ Avoiding illegal activities that could lead to financial and rights losses for Winbond and certain groups.	●	▲	▲	1.1 Corporate governance 1.2 Business integrity
Regulatory Compliance	⬆ Winbond complies with regulations, maintains and promotes a good corporate image, enhances customer trust, gains stakeholder support, and achieves long-term value creation and sustainable development. ⬇ Avoiding loss of goodwill and causing economic risks.	▣ Implementing regulatory compliance, enhancing customer trust, and gaining stakeholder support. While creating long-term value and sustainable development, it also avoids loss of goodwill and potential economic risks.	●	▲	▲	1.2 Business integrity 3 Environmental sustainability 5.1 Human rights governance 5.4 Occupational safety and health
Risk Management	⬆ Increasing corporate resilience, improving risk response capabilities, and maintaining operational stability. ⬇ If risks are not effectively managed, it may negatively impact business operations, financial status, and market competitiveness.	▣ Natural disasters, changes in international political and economic situations, and the emergence of new technologies can affect Winbond's stable supply, long-term competitiveness, and corporate profitability. Good Risk Management allows Winbond to foresee potential risk factors early, plan response strategies and action plans, reduce the impact of risk factors on company operations, customers, and profitability, and turn risks into opportunities.	●	▲	▲	1.4 Risk management
Research, Develoment and Innovation	⬆ Actively introducing artificial intelligence, robotics, and digital transformation to significantly improve employee productivity, producing more and higher quality results in a shorter time. ⬆ Innovating and interacting with customers to reduce inefficient work such as rework, providing 24/7 global error-free service to customers. ⬇ Introducing new technologies (such as artificial intelligence) requires on-the-job retraining for existing employees. There will be an increase in short-term expenses initially. ⬇ Different customers have varying progress in adopting new technologies, requiring Winbond to customize for each important customer. ⬇ New technologies may sometimes increase operating costs, and the company needs to ensure that the benefits brought by innovation far exceed the increased costs.	▣ Introducing artificial intelligence and digital transformation to improve productivity and service quality, reducing inefficient and erroneous work. ▣ Re-educating employees and providing customized services to customers, increasing short-term expenses but achieving higher long-term benefits.	●	●	▲	2.1 Research, development, and innovation

Material Issues	Type of Impact（⇧ as positive impact, ⬇ as negative impact）	Description (How to impact economic, environment, and people (including human rights))	Scope of Impact			Referring Section
			Winbond	Customer	Supply Chain	
Productivity and Business Perfor- mance	⬆ Improving productivity can reduce product costs, provide more competitive prices, thereby increasing market share and revenue. ⬆ Digital transformation and technological innovation can also improve product quality and production efficiency, further enhancing customer satisfaction and brand loyalty. ⬇ Automation and digital transformation may lead to the loss of some traditional positions, and excessive reliance on technology may increase the risk of employee unemployment, affecting social stability and corporate image. ⬇ Rapid technological changes may bring uncertainty and financial risks, especially during the initial investment and technology adaptation stages.	▣ Improving productivity can reduce costs, increase operational efficiency and capacity. ▣ Automation and digital transformation may lead to the loss of traditional positions, and rapid technological changes may bring uncertainty and financial risks.	●	▲	▲	1.3 Productivity and business performance
Supply Chain Management	⬆ Suppliers actively meet customer needs by injecting sustainability factors into product/service development, enhancing the sustainable development of the supply chain. ⬇ Suppliers considering sustainable development face challenges such as operational transformation, financial resource gaps, and hiring sustainable talent.	▣ Suppliers considering sustainable development face challenges such as operational transformation, financial resource gaps, and hiring sustainable talent.	●	▲	●	4 Sustainable supply chain
Green Product	⬆ Developing friendly green products with advanced process capabilities, providing low-power, high-performance, and small-sized products, helping consumers reduce energy consumption and carbon emissions during product use, increasing product friendliness to the environment, and reducing the environmental impact of products. ⬆ Establishing a comprehensive quality management, zero-defect, and quality-first corporate culture to provide satisfactory products and services to customers. ⬇ High carbon emission products will incur high carbon taxes, not be adopted by customers, affecting product market competitiveness.	▣ Self-developed green-friendly products can reduce energy consumption and carbon emissions, avoiding the risk of high carbon emission products facing high carbon taxes and declining market competitiveness. ▣ Providing high-quality products and services, conducting comprehensive testing, evaluation, and improvement of product quality to meet customer needs and expectations.	●	●	▲	2.2 Quality management for products and services 2.3 customer relationship management
Energy and Greenhouse Gas Management	⬆ A good energy management system can effectively reduce electricity prices, carbon fees, and enhance the company's image. ⬇ If energy and greenhouse gas management are not properly done, it may negatively impact the community environment, increase product production costs, and reduce gross profit.	▣ Managing Winbond's energy and greenhouse gas emissions effectively reduces costs. ▣ Mitigating the potential impact of extreme weather on operations.	●	▲	▲	3.1 Energy and greenhouse gas management
Talent Management	⬆ The booming development of AI tools provides opportunities for significant improvement in employee productivity. ⬇ The trend of declining birth rates and Taiwan gradually becoming a global center for AI and semiconductors results in a long-term shortage of labor supply.	▣ The role of employees will undergo significant changes with the intervention of AI. It is necessary to achieve a win-win outcome for employees and the company through empowerment and repositioning of employees, allowing employees to share in the company's growth. ▣ Through global recruitment, the implementation of DEI concepts, and internal diversity education and training, enhance and maintain employee employability, and implement occupational safety and health management to promote employee physical and mental health.	●	▲	▲	5.1 Human rights 5.2 Talent attraction and development 5.3 Employee communication and relations 5.4 Occupational safety and health

Alignment of Major Issues with GRI, SASB, UN Global Compact, SDGs, and Winbond Commitments

Winbond aligns nine major issues with international standards, including the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), the United Nations Global Compact (UNGC), and the United Nations Sustainable Development Goals (SDGs).

Material Issues	Material Significance to Winbond	Business Strategies	Commitment	GRI	SASB	UNGC	SDGs
Business Integrity and Corporate Governance	Business Integrity is the foundation of sustainable corporate operations and one of Winbond's five corporate cultures. Implementing Business Integrity and Corporate Governance avoids violations of corruption and competition, thereby reducing legal and other related risks and financial losses faced by the company.	Through the establishment of regulations, continuous improvement, supervision and control, and education and training, employees become familiar with the connotation of Business Integrity and effectively implement it in their work.	Compliance with laws and regulations is the most basic threshold, and "Business Integrity" is the highest ethical standard of Winbond, based on which Winbond pursues mutual prosperity with society.	▣ GRI 205 Anti-Corruption ▣ GRI 206 Anti-competitive Behavior	▣ TC-SC-520a.1 Intellectual Property Protection & Competitive Behaviour	▣ Businesses should work against corruption in all its forms, including extortion and bribery.	
Regulatory Compliance	Winbond adheres to the corporate spirit of sustainable development, prioritizes regulatory compliance, ensures operations align with company policy principles and risk control, strengthens corporate resilience, and demonstrates social responsibility commitments.	Through regular review of operational processes, system control of regulatory updates, and education and training, compliance management is achieved, potential legal risks are reduced, ensuring stable corporate operations and maintaining sustainable competitiveness.	The regulations and norms involved in operations, including Corporate Governance, finance, trade, environmental protection, occupational safety and health, information security, intellectual property, labor rights, internal control, and Risk Management, will be fully complied with.	▣ Regulatory compliance (self-defined topic)			
Risk Management	Winbond is customer-centric. Natural disasters, changes in international political and economic situations, the emergence of new technologies, and changes in policies and regulations can disrupt customer service or affect technical competitiveness and operational profitability. Therefore, a good Risk Management system is the foundation of Winbond's sustainable operations and quality customer service.	Establishing "Risk Management policies and procedures," actively managing the four major risk types faced by contemporary enterprises: "strategic," "operational," "financial," and "information security," and developing comprehensive plans and processes for pre-assessment, risk avoidance, loss prevention, and crisis handling of various operational activities, regularly reporting to management and governance units to ensure the achievement of all corporate risk control objectives. The Risk Management team should always pay attention to international and domestic Risk Management mechanisms.	Adhering to the goal of sustainable corporate operations, a Risk Management mechanism is established to integrate and manage various potential risks that may affect operations and profitability, including but not limited to financial, environmental, information security, operational, and climate risks.	▣ GRI 418 Customer Privacy, Risk management (self-defined topic)			13 CLIMATE ACTION 17 PARTNERSHIPS FOR THE GOALS

Material Issues	Material Significance to Winbond	Business Strategies	Commitment	GRI	SASB	UNGC	SDGs
Research, Development and Innovation	The innovation in product, technology, and business model development is the source of Winbond's competitiveness. It is also the most efficient way to provide the best value to customers, shareholders, and employees, as well as to achieve sustainable operations and energy conservation and carbon reduction.	Actively introducing artificial intelligence and digital transformation to accelerate employee productivity improvement, reducing the demand for tangible/intangible resources; and providing customers with more efficient transaction models in real-time, eliminating human delays or errors.	Committed to providing the most competitive products and services, and making good use of innovative technology to develop the most energy-saving and low-carbon emission technologies and products.	▣ Research & Development and Innovation (Self-defined topics)			9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Productivity and Business Performance	Productivity and operational performance are the cornerstones of Winbond's development, especially in cost control. Improving productivity means producing more products with the same resource input, which can directly reduce unit production costs. Enhancing operational performance can more effectively utilize resources, reduce management costs and operating expenses. These cost reductions will directly enhance Winbond's profitability and strengthen market competitiveness.	Through continuous promotion of digital transformation, introducing advanced technology and AI applications to reduce costs, improve efficiency, and achieve greater operational benefits. Specific strategies include optimizing production processes, introducing automated equipment, improving yield rates, lean management, process optimization, and reducing inventory. However, Winbond also needs to pay attention to potential risks, such as initial investment in automated equipment, technology update costs, and employee transformation costs, and carefully weigh the relationship between cost reduction and risks to ensure the sustainability of cost optimization strategies.	Improving productivity and operational performance, and with the goal of sustainable development and enhancing corporate value, promoting digital transformation, introducing advanced technology, popularizing data and AI applications, continuously optimizing business strategies and management models, enhancing corporate competitiveness and market share, and strengthening employee training and incentives.	▣ GRI 201 Economic Performance			8 DECENT WORK AND ECONOMIC GROWTH
Supply Chain Management	Collaborate with customers and suppliers to promote and enhance sustainable development capabilities, strengthen overall supply chain resilience, and reduce operational risks.	Winbond has established a sustainable and resilient supply chain ecosystem with supplier partners through responsible procurement practices, continuous enhancement of supply chain resilience, and promotion of a low-carbon supply chain.	Ensure supply chain stability and enhance supply chain information transparency through close cooperation with suppliers, jointly formulating and implementing policies on environmental protection and social responsibility, and improving sustainability while ensuring compliance across the entire supply chain.	▣ GRI 204-1 Proportion of spending on local suppliers ▣ GRI 308 Supplier Environmental Assessment ▣ GRI 414 Supplier Social Assessment	▣ TC-SC-440.a.1 Material sourcing	▣ Make sure that they are not complicit in human rights abuses.	6 CLEAN WATER AND SANITATION 7 AFFORDABLE AND CLEAN ENERGY 8 DECENT WORK AND ECONOMIC GROWTH 12 RESPONSIBLE CONSUMPTION AND PRODUCTION 13 CLIMATE ACTION 17 PARTNERSHIPS FOR THE GOALS

Material Issues	Material Significance to Winbond	Business Strategies	Commitment	GRI	SASB	UNGC	SDGs
Green Product	Create long-term value, reduce operational risks, and aim to ensure information security, energy conservation, carbon reduction, and support the development of artificial intelligence to establish a green and forward-looking technological life, achieving sustainable technology and products.	Developing green-friendly products independently, complemented by advanced manufacturing capabilities, providing low-power, high-performance, and small-sized products, enabling customers to produce more advanced, energy-saving, and environmentally friendly products, reducing the environmental impact of products.	With the vision of "Being a hidden champion in providing sustainable semiconductors to enrich human life." We are committed to developing high-performance, small-sized, low-power, and high-quality green memory products and green manufacturing processes.	▪ GRI 417 Marketing and Labeling	▪ TC-SC-410a.1 TC-SC-410a.2 Product lifecycle management	▪ Encourage the development and diffusion of environmentally friendly technologies.	7 AFFORDABLE AND CLEAN ENERGY 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Energy and Greenhouse Gas Management	Improving energy management can effectively reduce carbon footprint, mitigate global warming, and reduce operational costs.	Combining professional knowledge and data science to find ways to improve energy efficiency, formulate specific implementation plans for energy conservation and carbon reduction, and regularly review the effectiveness.	Combining data science and professional knowledge, and collaborating with fab system vendors and equipment suppliers, we continuously improve energy efficiency, increase the proportion of green electricity year by year, and reduce greenhouse gas emissions.	▪ GRI 302 Energy ▪ GRI 305 Emission	▪ TC-SC-110a.1 ▪ TCSC-110a.2 Greenhouse Gas Emissions ▪ TC-SC-130a.1 Energy emission	▪ Businesses should support a precautionary approach to environmental challenges. ▪ Undertake initiatives to promote greater environmental responsibility.	6 CLEAN WATER AND SANITATION 7 AFFORDABLE AND CLEAN ENERGY 12 RESPONSIBLE CONSUMPTION AND PRODUCTION 13 CLIMATE ACTION 1 NO POVERTY
Talent Management	▪ Establish new collaboration models between enterprises, employees, and AI tools. ▪ Strengthen employee recruitment outcomes and employability through expanded recruitment and internal training.	▪ Enhancing employees' ability to use AI to improve productivity from an empowerment perspective and share Winbond's operational results. ▪ Implement DEI concepts and achieve alignment between employee and corporate needs through educational training.	We are dedicated to providing a high-quality work environment and competitive salary benefits to attract, cultivate, and retain outstanding talents, thereby enhancing employee engagement.	▪ GRI 401 Employment ▪ GRI 403 Occupational Health and Safety ▪ GRI 404 Training and Education GRI 405 Diversity and Equal Opportunity ▪ GRI 406 Non-discrimination ▪ GRI 408 Child Labor	▪ TC-SC 320a.1 ▪ TCSC-320a.2 Workforce Health & Safety ▪ TC-SC-330a.1 Recruiting & Managing a Global & Skilled Workforce	▪ Businesses should support and respect the protection of internationally proclaimed human rights. Make sure that they are not complicit in human rights abuses. ▪ Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining. ▪ The elimination of all forms of forced and compulsory labour. ▪ The effective abolition of child labour. ▪ The elimination of discrimination in respect of employment and occupation.	3 GOOD HEALTH AND WELL-BEING 4 QUALITY EDUCATION 8 DECENT WORK AND ECONOMIC GROWTH 17 PARTNERSHIPS FOR THE GOALS

Goals and Performance for Material Issues

Material Issues	2024 Target	2024 Progress (✓Achieved)	2025 Short-term Goal	2030 Mid- & Long-term Goal
Business Integrity and Corporate Governance	Attain top 20% ranking in TWSE Corporate Governance Evaluation.	✓ listed in top 6 -20%	listed in top 20%	listed in top 20%
	Continuously increasing the participation of female board members.	✓ 3 female directors, accounting for 27%	Continuously increasing the participation of female board members	Continuously increasing the participation of female board members
Regulatory Compliance	Implement and conduct 12 regulatory compliance-related courses/year.	✓ 13 courses	>12 course/year	>15 course/year
Risk Management	Ensure strict compliance with relevant domestic and foreign laws and regulations, with no major violations.	✓ 0 violation	0 violation	0 violation
	Strengthen climate resilience and formulate measures climate change adaptation and prevention to minimize the impact of climate risks and production disruptions caused by climate disasters.	✓ 0 day	0 day	0 day
	All employees received information security training.	✓ Completion rate 100%	Completion rate 100%	Completion rate 100%
	No information security incidents affecting company operations occurred.	✓ 0 incidents	0 incidents	0 incidents
Research, Development and Innovation	Obtain approval for 350 patents worldwide.	✓ 380 patents	>350 patents	>350 patents
Productivity and Business Performance	Digital transformation activities ≥ 24 sessions.	✓ 37 sessions	Digital transformation activities ≥ 24 sessions.	72 sessions
Supply Chain Management	Tier-1 significant suppliers signed Winbond's Supplier Code of Conduct[Note 1].	✓ 100%	100%	100%
	Tier-1 significant suppliers 100% signed the Conflict-Free Minerals declaration.	✓ 100%	100%	100%
	Tier-1 significant suppliers 100% underwent sustainable due diligence SAQ[Note2].	✓ 100%	100%	100%
	High-risk suppliers underwent on-site sustainable audits and guidance (cumulative number).	✓ 4	9	34

Note 1 Tier-1 significant suppliers refer to those who directly trade with Winbond, providing products/services/technologies directly related to production and manufacturing, with an annual procurement amount exceeding NT$10 million.
Note 2 High-risk suppliers refer to those comprehensively determined through sustainable due diligence and sustainable written audits to require on-site audits and guidance to reduce sustainability risks.

Material Issues	2024 Target	2024 Progress (✓Achieved)	2025 Short-term Goal	2030 Mid- & Long-term Goal
Supply Chain Management	Major suppliers disclosed the proportion of resource usage and savings ≥ 95% Note1	✓ 95%	95%	100%
	Increased the localization ratio of key raw material procurement ≥ 38%	✓ 39%	39.5%	42%
Green Product	Customer application energy-saving and carbon reduction >33%	✓ 33%	Customer application energy-saving and carbon reduction >33% Note 2	Product lifecycle carbon emission reduction 20% Note 3
	35,000 tCO_2e carbon reduction	✓ 5.6 tons	35,000 tCO_2e carbon reduction Note 4	110,000 tCO_2e carbon reduction Note 4
	Achieve over 80% customer satisfaction	✓ 90%	>80%	>80%
Energy and Greenhouse Gas Management	Total power saving: 2~3%	✓ 3.5%	2~3%	Accumulated power savings reached over 15%
	YoY reduction in electricity consumption per unit product: ≥ 1%	✓ Reduce 14.8%	≥ 1%	≥ 1%
	YoY reduction in GHG emission intensity (in Scope 1&2): ≥ 5%	✓ Reduce 18.1%	≥ 5%	≥ 5%
	Fab-wide water recovery rate ≥ 80%	✓ 81.9%	≥ 80%	≥ 80%
	Overall waste recycling rate: ≥ 90%	✓ 91.9%	≥ 90%	≥ 90%
	Reduction rate of volatile organic compounds (VOCs): ≥ 93%	✓ 99%	≥ 93%	≥ 93%
Talent Management	100% Achieve 100% attendance rate of "Global human rights and labor ethics" training course	✓ 100%	100%	100%
	Continuing investing in social inclusion	✓ N$ 23,700,000	Continue	Continue
	Maintain total compensation within the top 25% of the industry	✓ Top 25%	Top 25%	Top 25%
	Attain ≥ 95% employee retention and willingness to contribute at Winbond for the next 5 years, based on the 2023 Employee Core Values and Engagement Survey results	✓ ≥ 97% Note5	≥ 95%	≥ 95%
	The average annual learning hours per employee in Taiwan reached 50 hours	✓ 70 hours per person	50 hours per person	65 hours per person

Note 1 Major suppliers refer to those directly related to Winbond's Scope 3 emission category 4 (inventory standards based on ISO 14064:2018).
Note 2 This calculation is based on the 25nm 1.2V/128Mb HyperRAM product.
Note 3 This calculation is based on the entire series of dynamic random-access memory (DRAM) products, including process evolution.
Note 4 This calculation is based on the entire series of flash memory products, including process evolution.
Note 5 The employee core values and engagement survey analysis is conducted biennially. These are the figures for 2023, and another employee opinion survey will be conducted in 2025.

Stakeholder Engagement

Winbond identified the relevance and precedence of stakeholders using the five principles of the AA1000 Stakeholder Engagement Standard (SES) 2015: Dependency, Responsibility, Influence, Tension, and Diverse Perspectives.

In 2023, 22 senior management members at Winbond participated in a stakeholder identification survey (please refer to the 2022 Materiality Analysis Report). They identified the following major stakeholders based on the extent of each stakeholder's relationship with Winbond: government agencies, customers, employees, investors/shareholders, media, suppliers/contractors, and community groups.

A dedicated stakeholder section has been established on the Winbond website, providing various communication channels for stakeholders. Stakeholders can raise questions or suggestions related to sustainability topics, with specific contacts designated to respond to different types of stakeholders. This structure ensures effective communication between Winbond and its stakeholders. The 2024 report utilized the stakeholder identification results mentioned above.

Employee

- Employees are one of the most important assets.
- Serving as key stakeholders in our continued breakthroughs and innovations.

100% Human rights due diligence survey

78% Attendance Rate 4 supervisor management discussion sessions

23 Cases Total number of internal communication cases handled

Material Issues

- Business Integrity and Corporate Governance
- Talent Management
- Regulatory Compliance
- Productivity and Business Performance

Channel and Frequency of Communication

immediate

- Internal Hotline 75234 Employee Complaints Hotline
- "Care" Employee Suggestions Box
- Illegal Employment Infringement Appeals and Arbitration Committee
- Health Consultation

ad hoc

- Health Promotion Activities
- Employee Welfare Committee
- Internal Bulletin Board

regular

- Published articles on corporate philosophy on the employee homepage (weekly)
- Employer-Employee Meetings and Supervisor Communication Meetings (quarterly)
- Functional Communications Meetings (regular)
- Articles on Winbond Philosophy Published on the Employee Homepage (weekly)
- Monthly Labor Safety Meetings (monthly)
- Environmental Safety and Health Committee (quarterly)
- ESG questionnaire (annual)

2024 Communication

- 6 cases of internal complaints in total (excluding the sexual harassment)
- 0 cases of sexual harassment
- 18 reports of everyday issues received through the suggestion box
- 4 quarterly supervisor management discussion sessions were held. These sessions were attended by 1,881 people, achieving an attendance rate of 78%.
- 12 labor-management meetings were held (in Zhubei Building, CTSP Fab, Kaohsiung Fab).

Testimonial

Tzu-Yu Chen
The company is people-oriented, understanding the high pressure of this industry and therefore providing corresponding measures for both mental and physical well-being, creating a sense of being cared for by this big family.

Ting-Lin Ko
Winbond is a good company that cares about its employees. The supervisors also take good care of the employees, providing a balance between life and work.

Hung-Chin Lin
Achieving a balance between life and work, along with childcare subsidies to reduce the financial pressure of raising children, and wellness leave to spend more time with family, makes it a happy workplace.

Winbond offers superior benefits compared to the industry, taking care of employees' physical and mental health

In 2024, Winbond host a Zero Carbon Family Day, offsetting the event's carbon footprint with carbon credits

Customers

- Customers are the primary source of economic value creation for Winbond.
- They are key stakeholders concerned with Winbond's ESG performance.

90%
Customer satisfaction

7,470
Customer interaction

Material Issues

- Business Integrity and Corporate Governance
- Energy and Greenhouse Gas Management
- Green Product
- Regulatory Compliance
- Productivity and Business Performance
- Research, Development and Innovation
- Risk Management
- Supply Chain Management

Channel and Frequency of Communication

immediate
- Winbond official website, telephone, and e-mail

regular
- Sales meetings (regular)
- ESG questionnaire (annual)
- Technical seminars (annual)
- Internal Audit (annual)

ad hoc
- Customer audits
- Customer interaction

2024 Communication

- Exhibition: Electronica 2024：Discussing current market conditions, product development directions, and potential solutions
- Supplier Conference: Qisda, Inventec
- Visits: Customers such as Syntrend, Amazon, and Dell visiting CTSP and Kaohsiung fab
- Meetings: Holding multiple conferences to share market dynamics, future trends, and related strategic directions of Winbond (including India Sales conference ∘ Taiwan , Korea, Japan distributor conference)
- Daily visit and communication

Testimonial

Sales Conference India

A lot of useful inputs from presentation.

We are happy to learn about global market situation/trend and technical information by application

Electronica

Good feedback from demo boards on display, prepared by Winbond, customer and partners

Suppliers/ Contractors

- Suppliers/Contractors provide supplies and services required for Winbond's production operations.
- They help maintain Winbond's continuous and sustainable operations, making them also important stakeholders and partners of Winbond's sustainable development.

100% Signing rate
of Code of ethics and integrity and RBA statement

21,681 Hours
Total learning hours for the supply chain ecosystem

38 Sessions
Number of ESG ecosystem meetings held

Material Issues

- Business Integrity and Corporate Governance
- Green Product
- Regulatory Compliance
- Research, Development and Innovation
- Supply Chain Management

Channel and Frequency of Communication

immediate

- External complaints channels
- Supplier ESG Interaction Platform

regular

- Winbond Ethics and Integrity Policy and complaint channel (Semi-annual)
- Evaluations of major suppliers (Semi-annual)
- Supplier audits (annual)
- Sustainability Due Diligence SAQ for Suppliers (annual)
- Conducted face-to-face communication with contractors through safety protocol organizations (monthly)

2024 Communication

- 100% of suppliers signed the Integrity Commitment and RBA Declaration
- 100% of Tier-1 significant suppliers signed the declaration of not using conflict minerals
- 100% of Tier-1 significant suppliers signed the declaration of not using hazardous substances
- 0 supplier complaints
- 100% pass rate for new suppliers meeting economic, environmental, and social sustainability standards
- 100% coverage of Tier-1 significant suppliers undergoing economic, environmental, and social sustainable due diligence SAQ
- 21,681 hours of total ESG ecosystem meeting hours, 38 ESG ecosystem meetings held (including regular supplier and sustainable due diligence SAQ training, CSR activity cooperation, internal colleague ESG training hours, and external public association advocacy)
- 1,358 professional certifications for special operation personnel of contracting construction companies
- 3,320 participants in hazard notification courses for contracting construction companies

Testimonial

Evon Tsai, Manager from ESH office, ChipMOS Technologies

Winbond Electronics leads the carbon data exchange pilot project, with ChipMOS joining. This initiative reduces the burden of carbon footprint data entry, lowers labor costs, and promotes transparency and comparability of carbon data. It aims to resolve supplier data collection issues in Scope 3 inventories and achieve net-zero emissions.

Government Agencies

- Focused on Winbond's compliance with various environmental, social, and governance (ESG) regulations, as an important stakeholder influencing industry development and policy promotion

8 Public Association

68 Meetings Occupational safety and health meeting with authorities

Material Issues

- Business Integrity and Corporate Governance
- Talent Management
- Energy and Greenhouse Gas Management
- Regulatory Compliance
- Risk Management

Channel and Frequency of Communication

immediate

- ESG questionnaire (annual)

ad hoc

- Official documents correspondence
- Regulatory and conferences
- Public hearings
- Policy information sessions
- Participation in relevant organizations
- Inspections by competent authority

2024 Communication

- Participated in 68 meetings with Occupational safety and health management entities.
- Conducted 53 on-site audits and inspections with Occupational safety and health management entities
- Engaged in 8 public association
- 4 Policy Information Sessions on Sustainability Issues

In 2024, Winbond was awarded the "Work-Life Balance Award - Family-Friendly" by the Ministry of Labor

Shareholders/ Investors

- Shareholders/Investors are Winbond's main source of capital.
- They are mainly concerned with Winbond's operating performance and sustainable development.

41 Meetings Shareholders/investors communication meetings

Material Issues

- Green Product
- Risk Management
- Regulatory Compliance
- Productivity and Business Performance
- Business Integrity and Corporate Governance
- Research Development and Innovation

Channel and Frequency of Communication

immediate

- Telephone and e-mail

regular

- Investor conference (biannual, or whenever necessary due to special circumstances)
- One-on-one meetings with institutional investors (8-10 times/quarter)
- Shareholders' Meeting (annual)
- ESG questionnaire (annual)

ad hoc

- Winbond official website
- The Taiwan Stock Exchange Market Observation Post System

2024 Communication

- 12 disclosures of revenue
- 1 annual shareholders' meeting
- 2 institutional investor conferences
- 38 Corporate communication meetings
- 4 disclosures of financial reports

Dialogue and Engagement with Investors

Winbond 2024 Investor Conference

Winbond 2024 Annual Shareholders' Meeting

Community/ Society

- Their proximity to Winbond's operating locations means they bear the brunt of the impact from our operations. Their welfare is therefore of high importance to Winbond.

NT$23.7 million	1,089 People	385 People
Total amount of charitable donations	Total number of donors	Serve as a volunteer and lecturer

Material Issues

- Business Integrity and Corporate Governance
- Regulatory Compliance
- Talent Management

Channel and Frequency of Communication

ad hoc

- Volunteer activities
- Collaborative projects and visits

Conserving and nurturing 33 species of Theaceae to protect Taiwan's native plants and preserve Theaceae germplasm

2024 Communication

- We have cultivated 33 Theaceae species, including 1 species that is classified as critically endangered, 1 as endangered, 7 as vulnerable, and 3 as near threatened, as listed in the IUCN Red List of Threatened Species.
- Happy Breakfast Program for School Children in Rural Areas which benefits 80 students
- Fundraising for Impoverished Students Education Financial Aid which benefits 1,062 students
- In 2024, seven blood donation events were held, with a total of 458 participants and 685 bags of blood donated.
- Activities such as protecting Fazih River, cleaning up Nanliao Beach, and clearing Kaohsiung Yuanzhonggang Wetland were conducted, collecting approximately 658 kilograms of trash.
- Total amount of charitable donations NT$23.7 million

Media

- The media serves as a bridge between Winbond and stakeholders. With immediate access to information released by Winbond, they can assist Winbond with the disclosure of positive sustainability information.

2 Times	25
Press Conference	Press releases

Material Issues

- Business Integrity and Corporate Governance
- Talent Management
- Green Product
- Productivity and Business Performance
- Research, Development and Innovation

Channel and Frequency of Communication

immediate

- Telephone and e-mail

regular

- Press release (regular)
- Media interviews (annual)
- ESG questionnaire (annual)

2024 Communication

- 34 telephone and e-mail communications
- 25 press releases
- Winbond operating report provided 2 times
- 2 press conferences held

UN Sustainable Development Goals

Winbond references the Sustainable Development Goals (SDGs) released by the United Nations and the Taiwan Sustainable Development Goals announced by the Taiwanese government, integrating SDGs relevant to its business into its corporate social responsibility policies and oper- ational directions. Following the Practical Guide for Business Reporting on SDGs jointly issued by the Global Reporting Initiative (GRI) and the United Nations, Winbond identifies SDGs relevant to its operations through three steps and nine actions, establishing sustainable development goals and initiating sustainable actions.

Winbond first identifies priority areas of SDGs, sets sustainable goals after measuring and evaluating performance, and integrates and reports on sustainable action plans. We will continueto track our progress in the future. Winbond released its first action report, defining SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 15 (Life on Land), and SDG 17 (Partnerships for the Goals) as priority areas, setting 24 specific goals. By 2023, Winbond had initiated and undertaken over 15 sustainable actions, fulfilling its corporate citizenship responsibilities and expanding its positive impact on society by aligning with its commitment to SDGs and demonstrating a clear dedication to their implementation.

*Scope of this chapter: Winbond (Taiwan)

Winbond's Sustainable Development Strategy

Develop five strategies from the three-dimensional vision of ESG

Green Product	Sustainable Supply Chain	Environmental Sustainability	Human Rights and Social Inclusion	Corporate Governance
Developing safe, efficient, and low-energy green products continuously	Strengthening supply chain cooperation and enhancing sustainable competitiveness	Improving energy efficiency and achieving net-zero goal	Cultivating talent, encourage innovation, and creating a friendly and harmonious workplace	Enhancing corporate governance functions and realizing sustainable value

SDGs Item Identification

Through 3 steps and 9 actions, we identify the SDGs related to Winbond and establish sustainable development goals

Winbond Stakeholders

- employees
- customers
- suppliers/contractors
- government agencies
- shareholders/investors
- community/society
- media

Step 1 Identify priorities for the SDGs

10 priorities

1. Learn about the SDGs and their sub-goals
2. Sort the SDGs sub-goals
3. Decide on the content of SDG-related coverage

Step 2 Measurement & Performance Evaluation

22 goals

4. Setting goals
5. Select the Disclosure Project
6. Collect and analyze data

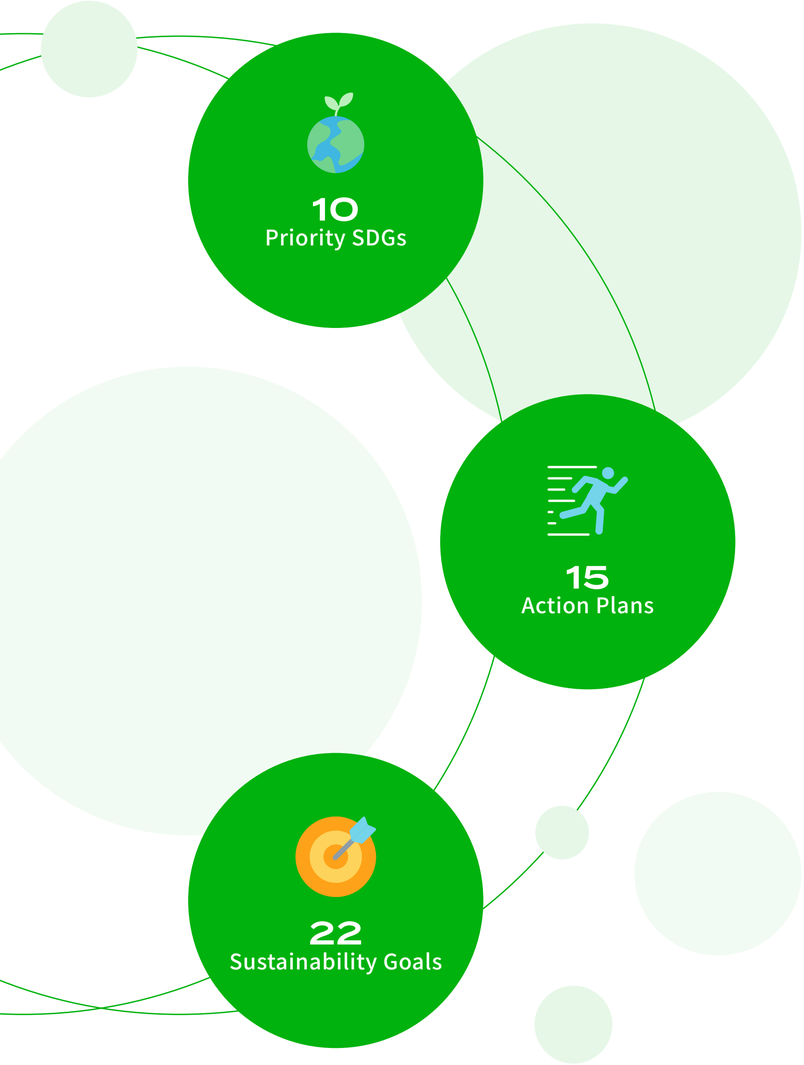
Step 3 Report, integrate, and react

15 Action plans

7. Benchmarking examples when reporting on the SDGs
8. Consider the needs of information users
9. Reporting and action

Practice of Sustainable Action Plan

Actions, disclosures and reports



SDG 3
Good Wealth and Well-being

Indicators

3.7 Ensure universal access to sexual and reproductive health-care services, including family planning, information, and education

3.8 Achieve universal health coverage, including financial risk protection and access to quality essential health-care services and medicines

Employee health management

1. >1,000 employees benefit from health promotion programs
2. >1,000 employees receive free vaccines

Encourage childbearing

1. NT$6,000 monthly employee childcare stipend (until the kid reaches the age of 4)
2. Pregnant Employee Care Program coverage: 100%

2024 Highlights

- Employee health examination follow-up completion rate: 100%
- 38,438 employees participated in sports promotion campaigns (12,526,500 Kcal burned)
- 1,760 employees received free flu shots
- Employees of Winbond(Taiwan) and Nuvoton(Taiwan) receive monthly childcare subsidies of NT$6,000 and NT$5,000 for their newborn children. From 2011 to 2024, the subsidiaries have cumulatively distributed approximately NT$390 million in subsidies.
- 53 pregnant employees received female counseling services and information

SDG 4
Quality Education

Indicators

4.3 Ensure equal access to affordable and quality technical, vocational, and higher education.

4.4 Increase the number of people with relevant skills for financial success.

Youth Education

1. Investing in cultivating semiconductor talent

Educational resources for the disadvantaged

1. Annual scholarships for disadvantaged students (benefiting > 1,000 students)

2024 Highlights

- Invested NT$10 million in and appointed 18 lecturers to the NCKU Semiconductor Program, benefiting 542 students
- 1,062 students benefiting from Financial Aid for the Education of Students from Economically Disadvantaged Families

SDG 6 Clean Water and Sanitation

Indicators

6.5 implement integrated water resources management at all levels

Minimize water risk

1 Water recovery rate of every fab ≥ 80%

2024 Highlights

- Fab-wide water recovery rate: 81.9%、Process water recycling rate 89.3%
- Since 2019, the cumulative water savings have reached approximately 4,880 megaliters.
- Fully obtained the ISO 46001 water efficiency management systems.

SDG 7 Affordable and Clean Energy

Indicators

7.2 Increase the global share of renewable energy.

7.3 Double the global rate of improvement in energy efficiency

Energy conservation

1 Accumulated power savings reached over 15%

Use of renewable energy

1 Renewable energy accounted for 90% by 2030 at the CTSB Fab

2024 Highlights

- Renewable electricity investment: As of the end of 2024, the board-approved renewable energy-related investments reached NT$955 million.
- Renewable electricity procurement: Accumulated 27 MW of solar power; accumulated 12.84 MW of wind power.
- CTSP fab's 499 KW rooftop renewable energy generation equipment was converted for self-use.
- Renewable energy usage rate: 5.9%.

SDG 8 Decent Work and Economic Growth

Indicators

8.3 Promote policies that support job creation and business growth

8.5 Achieve full employment and equal pay for work of equal value

Competitive employee remuneration

1 Salary level ranks in the top 25% among our competitors

Local procurement

1 Increase the proportion of localized procurement of key raw materials
2025 short-term goal: 39.5%
2030 Mid-to-long-term goal: 42%

2024 Highlights

- Remuneration for full-time non-management employees ranked in the top 25% in the industry
- 39% of key materials sourced locally

SDG 9 Industry, Innovation and Infrastructure

Indicators

9.5 Enhance research and upgrade industrial technologies

Encouraging innovation

1 The number of global patent approvals reached 350

2024 Highlights

- Over 6,900 patents have been applied for globally, with more than 5,300 patents granted
- R&D expenses accounted for 20% of operating income
- Selected as the Top 100 Global Innovator by Clarivate in 3 conservative years

SDG 12 Responsible Consumption and Production

Indicators

12.7 Promote sustainable public procurement practices1

12.8 Promote universal understanding of sustainable lifestyles

Responsible procurement

1. Declaration of Non-Use of Conflict Minerals signing rate: 100%
2. Winbond Supplier Code of Conduct Commitment Letter signing rate: 100%

Promotion of sustainable awareness

1. By 2030, suppliers are required to conduct sustainability meetings and training (including management/technical forums, regular training, ESG-themed co-learning, external public associations, and industry advocacy).

2024 Highlights

- Tier-1 significant suppliers use zero prohibited substances and zero conflict minerals
- 100% of Tier-1 significant suppliers signed the Winbond Supplier Integrity Commitment
- 100% of suppliers were educated on the Winbond Supplier Code of Conduct
- The number of sustainability meetings and training sessions for suppliers has accumulated to 73 sessions.

SDG 13 Climate Action

Indicators

13.1 Strengthen resilience and adaptive capacity to climate-related hazards

13.3 Improve education, awareness, and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning

Minimize weather risks

1. Zero days of production interruptions due to weather-related hazards
2. Greenhouse gas emission intensity (Scope 1&2) YoY reduction ≥ 5%

Promote climate change education

1. Promoting sustainable education
2. Promoting suppliers co-learning initiative
3. Establish cross-functional TCFD project team

2024 Highlights

- Zero days of production interruptions due to weather-related hazards
- The unit greenhouse gas emission intensity indicator is 12.7 kg CO_2 equivalent, a YoY decrease of approximately 18.1%
- Establish sustainable training platform to promote sustainable education
- Total learning hours for the supply chain ecosystem: 21,681 hours
- Established the TCFD platform to provide a convenient management tool for climate change issues

SDG 15 Life on Land

Indicators

15.5 Protect biodiversity and natural habitats

Nature-based solutions

1. 30-year afforestation project
2. > Preservation of 25 species of Theaceae

2024 Highlights

- Afforestation Plan in Kaohsiung: calculated using the biomass expansion factor method, combined with the unit area volume formula of different tree species' forest age, the estimated carbon sequestration during the execution period is 390 metric tons of CO_2 equivalent
- Tree Adoption Plan in Chiayi : calculated using the biomass expansion factor method, combined with the unit area volume formula of different tree species' forest age, the estimated total carbon sequestration is 990
- 33 out of 42 native Taiwanese Theaceae species conserved
- Conservation of *Spiranthes sinensis* (the Lady's Tresses orchid), an endangered wild plant species

SDG 17 Partnerships for the Goals

Winbond starts with its own operations, engages employees, customers, suppliers, government agencies, stakeholders/investors, and the community/society, and collaborates with stakeholders to respond to the SDGs and create sustainable value.

Corporate Governance

1.1 Corporate Governance* 49
1.2 Business Integrity 56
1.3 Productivity and Business Performance 58
1.4 Risk Management* 62
1.5 Green Investment & Sustainability-Linked Loan* 73
1.6 Climate Change Management 75

Scope: Unless otherwise noted, the scope covers the Winbond Group; * Winbond

"Business integrity" is the foundation of the sustainable operation of the enterprise, and it is the highest corporate culture and spirit of Winbond. Winbond is committed to formulating comprehensive corporate governance regulations and management processes, and continuously monitoring and improving processes. With the efforts of all colleagues, Winbond has been ranked in the top 20% since the first TWSE Corporate Governance Evaluation. Moving forward, we will continue to embrace a corporate culture founded on business integrity, establishing a trustworthy and reputable company.

"Integrity in business" is our core value, driving us to implement corporate governance, operate steadily, pursue sustainable development, and actively respond to the needs and expectations of stakeholders, working together to create a better life for humanity.

Yen-Chieh Tai

Director, Finance Division

2024 Performance Highlights

Selected in the 2025 S&P Global Sustainability Yearbook

Awarded the 2024 National Sustainable Development Award

Driving digital transformation to enhance productivity

- Platform: Building digital infrastructure to strengthen efficiency and standardization.
- People Empowerment: Cultivating data talent and promoting AI technology applications.
- Project: Innovating projects and deepening AI applications.

FTSE4Good Sustainability Index

- Emerging Markets Index constituent stocks.
- Taiwan Sustainability Index constituent stocks.

Renewable Energy Procurement

Procurement decided by the Board

- 75MW for Solar power
- 9.24MW for onshore wind
- 25MW for offshore wind

Zero Carbon Family Day

Held Zero Carbon Family Day for three consecutive years

Promoted carbon reduction awareness among all employees, extending the impact to the next generation, with a cumulative offset of over 500 tCO_2e.

Strengthening the CEO and Senior Executive Succession Plan

Continued promotion of the Manager Training Committee, with Board members serving as mentors.

Ranked in the top 20% for the 10 consecutive years in Corporate Governance Evaluation

1.1 Corporate Governance

1.1.1 Board of Director

The operation of the Board followed relevant regulations and resolutions of the shareholders' meeting to exercise its authority. Directors upheld the principle of sustainable management to create the greatest benefits for shareholders. Winbond established procedures related to corporate governance, including the "Conflict of Interest Declaration and Avoidance Measures," "Insider Trading Prevention Management Procedures," "Private Financial Transactions Reporting Measures for Specific Positions and Business-Related Personnel," "Gift Reception or Provision Guidelines," "Technical and Confidential Information Management Measures," and "Antitrust Compliance Code of Conduct" to prevent dishonest behavior. Additionally, Winbond established the "Handling Measures for Violations of Integrity Management Cases," specifying complaint methods and channels, implementing advocacy and execution, and regularly reviewing and revising the aforementioned measures. In case of violations, actions were taken according to the reward and punishment measures.

Composition of the Board

- The 13th Board was composed of 11 directors (including 4 independent directors and 3 female directors).
- More than two-thirds of the directors were not managers of Winbond or its subsidiaries.
- Three directors had spousal or second-degree kinship relationships, which did not exceed half of the board seats, complying with Article 26-3 of the Securities and Exchange Act.
- The Chairman concurrently served as the CEO to lead the management team in efficiently executing the board's decisions. In response to this situation, the number of independent directors on Winbond's board was four.

2024 Attendance

- The Board held seven meetings with a 100% attendance rate (including 92% actual attendance and 8% proxy attendance).

Major Stakeholders

- The corporate directors Walsin Lihwa Corporation and Jinxin Investment Corporation were the major shareholders of Winbond.
- Among them, Walsin Lihwa Corporation was the founding shareholder of the company and has been the largest shareholder since its establishment, continuously serving as a director of Winbond.

Election of the Board

The composition of the Board of Directors of Winbond was characterized by independence and diversity. The nomination of board members followed a rigorous selection process, adopting a candidate nomination system and voting at the shareholders' meeting, allowing shareholders to fully exercise their selection rights.

- Board members possessed extensive industry management experience, academic knowledge, and professional backgrounds covering various fields. They included elites from different generations and domains, continuously innovating and advancing towards diversity goals.
- 75% of independent directors had served for less than three terms.
- The participation of female directors was continuously increased.

In 2024, the board held **7** meetings, reporting on **16** sustainability topics, including:

- Risk Management
- Promotion of Business Integrity
- Procurement of Energy-saving Equipment
- Plan and Progress of Intellectual Property Management
- Plan and Process of Renewable Energy Procurement
- Remuneration and Development of Management-level
- Status of Greenhouse Gas Inventory Implementation
- Status of IFRS Sustainability Disclosure Standards Implementation
- Progress of Sustainability Development Promotion

The board also fulfilled its supervisory and guidance responsibilities, promptly asking questions and providing feedback to urge the management team to make adjustments.

For all topic categories, please refer to 2024 Annual Report.

Note: When the board and committee proposals involved the interests of the directors themselves, the directors explained the reasons for avoidance at the meeting and avoided the discussion and voting on the proposals to ensure the avoidance and mitigation of conflict of interest-related information. Please refer to our 2024 Annual Report.

13th Board Members(2023/6 - 2026/5)

Title	Name	Gender	Age	Background					Area			Proportion of Independent Directors	Proportion of Concurrently Serving Managers
				Business management	Leadership & Decision Making	Knowledge of the Industry	Finance & Accounting	IT	Environment	Economics	Social		
Chairman	Arthur Yu-Cheng Chiao	Male	61-70	●	●	●	●	●	▲	▲	▲	36%	18%
Vice Chairman	Chin-Xin Investment Co., Ltd (Representative: Tung-Yi Chan)	Male	61-70	●	●	●		●	▲	▲	▲		
Independent Director	Allen Hsu	Male	71-80	●	●	●	●			▲	▲		
Independent Director	Stephen T. Tso	Male	71-80	●	●	●		●	▲		▲		
Independent Director	Chung-Ming Kuan	Male	61-70	●	●		●		▲	▲	▲		
Independent Director	Jong-Peir Li	Male	61-70	●	●	●	●	●	▲	▲	▲		
Director	Yung Chin	Female	61-70	●	●	●	●	●	▲	▲	▲		
Director	Walsin Lihwa Corporation (Representative: Fred Pan)	Male	61-70	●	●	●	●	●	▲	▲	▲		
Director	Jamie Lin	Male	41-50	●	●	●	●	●		▲	▲		
Director	Wei-Hsin Ma	Female	51-60	●	●	●	●	●	▲	▲	▲		
Director	ELAINE SHIHLAN CHANG	Female	41-50	●	●		●	●	▲		▲		

For more information on the latest Winbond board members, please scan the QR code.

Professional Improvement

All 11 directors possessed extensive industry management experience, with a wide age distribution. Their academic knowledge and professional backgrounds covered various fields, equipping them with the necessary skills to perform their duties as directors, supervise, and provide constructive opinions and strategies.

Winbond regularly held seminars offering diverse training courses. In 2024, directors participated in other training courses or company-organized training, covering topics such as environmental sustainability, risk management (including climate change, sustainable finance, political risks) with 45 hours of training, business courses related to the company's industry (global economy, macro trends, semiconductor industry) with 39.5 hours of training, and legal compliance courses with 15 hours of training.

The average training hours for directors were 9.05 hours.

Evaluation of the Board's Performance and Remuneration

Boards' remuneration and performance evaluation	▪ Winbond established the "Board of Directors' Remuneration and Performance Evaluation Measures." ▪ The Compensation Committee regularly reviewed the Board of Directors' performance evaluation system.
Annual self-assessment of the Board of Directors' performance	▪ Self-assessments were conducted on the overall effectiveness of the Board of Directors, the performance of board members, the operation performance of the Compensation Committee, and the Audit Committee. The relevant evaluation results were reported to the Compensation Committee and the Board of Directors.
Performance evaluation of the Board conducted by an external independent professional institution	▪ Every three years, an external institution, the "Chinese Corporate Governance Association," was commissioned to conduct the Board of Directors' effectiveness evaluation.
Nomination of the Board	▪ The results of the Boards' performance evaluation were used as reference criteria for nominating directors.

2024 Self-assessment Results of the Board of Directors' Performance

✓The 2024 evaluation results were reported to the Compensation Committee and the Board of Directors on March 14, 2025.

Self-assessment Results of the Board

1 Evaluation Results: The score for "Participation in Company Operations" was relatively low.

2 Areas for Improvement

1. Strengthen the interaction and communication between the management team and the board through the mentor mechanism of the Managerial Training Committee, and enhance the company's succession team through the experience transfer of directors.
2. Organize exchange and dinner activities between the board and the management team to increase interaction and communication.
3. Invite directors to participate in the company's annual shareholders' meeting.

Self-assessment results of the functional committee

1 Evaluation Results: The Audit Committee scored slightly lower on "Functional Committee Responsibilities Awareness," while all other items received full marks. The Compensation Committee scored lower on "Participation in Company Operations," while all other items received full marks.

2 Areas for Improvement

1. Audit Committee: Continue to strengthen communication and interaction between accountants and audit committee members.
2. Compensation Committee: Provide meeting times for functional committees in advance to facilitate members' attendance.

Note: For information on the performance evaluation of the board of directors, please refer to the external evaluation results of the Winbond Electronics Corporation Board of Directors for the year 2022, as well as the 2024 Annual Report.

1.1.2 Operations and Responsibilities of the Functional Committees

To ensure the effective supervision and management functions of the board of directors, Winbond's board has established several functional committees, including the Audit Committee, Compensation Committee, ESG Committee, Risk Management Committee, and Manager Training Committee. Each functional committee is accountable to the board of directors and submits its proposals for board resolution.

Audit Committee

- Composed of independent directors, with Mr. Allen Hsu as the convener.
- In 2024, the Audit Committee held six meetings with a 100% attendance rate (including 95% actual attendance and 5% proxy attendance).
- Reported the information security management system, infrastructure, and implementation effectiveness to the Audit Committee on a quarterly basis; simultaneously established control points and conducted audits to ensure the effectiveness of information security controls

Responsibility

1. Adoption or amendment of the internal control system pursuant to Article 14-1 of the Securities and Exchange Act.
2. Assessment of the effectiveness of the internal control system.
3. 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.
4. Matters in which a director is an interested party.
5. Asset transactions or derivatives trading of a material nature.
6. Loans of funds, endorsements, or provision of guarantees of a material nature.
7. Offering, issuance, or private placement of equity-type securities.
8. Hiring or dismissal of a certified public accountant, or their compensation.
9. Appointment or discharge of a financial, accounting, or internal audit officer.
10. Annual and interim financial reports signed or sealed by the chairman, manager, and an accounting chief.
11. Other material matters as may be required by the Company or by the competent authority.

Compensation Committee

- Composed of independent directors, with Mr. Stephen T. Tso as the convener.
- In 2024, the Compensation Committee held five meetings with a 100% attendance rate (including 85% actual attendance and 15% proxy attendance).

Responsibility

Compensation Committee should exercise the care of a good administrator to faithfully perform the following responsibilities and submit its recommendations to the board for

1. Periodically reviewing this Charter and making recommendations for amendments.
2. Prescribing and periodically reviewing the annual performance assessments and remuneration policy, system, standards, and structure for directors and managerial officers.
3. 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.

Note 1 Winbond established the "Board of Directors Remuneration and Board Performance Evaluation Measures," specifying the basis for director remuneration and submitting it to the Compensation Committee for review and adjustment annually. Both the Audit Committee and the Compensation Committee were composed entirely of independent directors, ensuring independence. Winbond did not have a remuneration clawback mechanism. For information related to the remuneration of directors and managerial officers, please refer to the 2024 Annual Report.

Note 2 Winbond stakeholders could express their opinions through various channels, such as attending shareholders' meetings or employee engagement surveys. The Compensation Committee regularly considered these opinions as one of the factors in remuneration considerations. In the 2024 Annual Shareholders' Meeting, no shareholders raised questions regarding the remuneration of directors and employees, which was recorded in the minutes of the shareholders' meeting.

ESG Committee

- Composed of the chairman and all independent directors, with Mr. Arthur Yu-Cheng Chiao as the convener.
- In 2024, the Sustainability Committee held two meetings, achieving a 100% attendance rate—80% of members attended in person, while 20% participated via proxy.

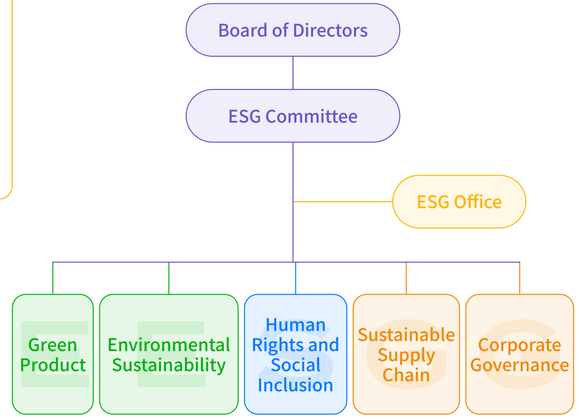
Responsibility

1. Formulate corporate sustainability policies and related management guidelines.
2. Develop short-term, mid-term, and long-term sustainability strategies and goals.
3. Review, track, and amend the implementation and performance of corporate sustainability.
4. Report the committee's execution results to the board annually.
5. Supervise the disclosure of IFRS sustainability information.

The ESG Committee established the ESG Office and 5 functional groups: Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. The committee reported its execution results to the board annually to ensure the promotion and implementation of corporate sustainability-related work.

The committee was led by the chairman, with independent directors as members. The ESG Committee held regular meetings twice a year, where each functional group reported the execution progress (results) for the current year and submitted the execution plan for the next year.

ESG Committee overseen by the Board of Directors



Risk Management Committee

- Composed of the chairman and all independent directors, with the chairman, Arthur Yu-Cheng Chiao, as the convener.
- In 2024, the Risk Management Committee held 2 meetings, with an attendance rate of 100% (including 90% actual attendance and 10% proxy attendance).

Responsibility

1. 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.
2. 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.
3. Set risk appetite, and review and manage the company's overall risk.
4. Assist and supervise various units in conducting risk management activities and coordinate cross-unit interaction and communication of risk management functions.
5. Adjust risk categories and undertaking methods according to environmental changes.
6. Execute other matters related to responsibilities as required by the board of directors.

Senior Executive Development Committee

- The committee members are composed of board members from Winbond and Nuvoton, serving as mentors. The committee chairman is elected by the directors, and currently, the chairman is independent director Kuan Chung-Ming. The mentee members are senior executives from Winbond and Nuvoton, and the board of directors discusses and adjusts the list of mentees annually.

Objective

1. Enhance the knowledge of participants beyond their primary industry.
2. Expand the international perspective of participants.
3. Enable directors to gain a better understanding of the company's internal operations.

Procedures

1. Seminar Courses for All Participants

   In 2024, a total of 4 seminar courses were held, with independent director Kuan Chung-Ming, the committee chairman, recommending the speakers. The course topics were diverse and adopted various formats such as in-person and online synchronous sessions, as well as digital course production, providing senior executives with flexible learning options.

   - A.International Economic Environment
   - B.Technology and Business Innovation
   - C.Leadership and Management

2. Mentor/Mentee System

   In 2024, mentors and mentees conducted in-depth exchanges for the first time, successfully establishing a good mutual trust relationship, enabling mentees to seek advice and interact in their daily work.

1.1.3 Shareholder Relations and Rights

To maintain shareholder relations and rights, Winbond primarily manages through the following four measures, ensuring smooth communication processes with shareholders that comply with due procedures, transparency of information, and effectively maintaining positive and proactive interactions between the company and shareholders.

Shareholders' Rights

Establish external communication channels.	Winbond has established spokesperson, deputy spokesperson, investor relations, and stock affairs management units.
Regularly disclose operational information.	▣ Regularly disclose monthly revenue, financial reports, and company annual reports on the official website. ▣ Starting from 2024, announce the board meeting dates before the quarterly financial reports are filed.
Formulate insider trading prevention management procedures.	▣ Conduct monthly promotions to prevent insider trading, avoiding violations due to unfamiliarity with regulations. ▣ Directors are prohibited from trading their stocks during the 30 days before the annual financial report announcement and the 15 days before the quarterly financial report announcement.
Hold 2 investor conferences and 1 annual shareholders' meeting each year.	▣ Winbond held 2 investor conferences in 2024. ▣ Winbond held one annual shareholders' meeting in 2024.

For more information on the rights and interest of shareholders, please refer to the videos and presentations from the institutional investor conferences.

1.1.4 Tax Management

Winbond Electronics Tax Governance Policy

In 2024, Winbond's tax governance unit completed the formulation of the "Winbond Electronics Tax Governance Policy," enhancing tax transparency, reducing tax risks, and promoting good relations between the company and tax authorities. This initiative aims to fulfill corporate social responsibility, advance economic, environmental, and social progress, and achieve sustainable development goals.

In response to the OECD global anti-tax avoidance trend, Winbond has ensured transparency by completing the transfer pricing documentation for parent and subsidiary companies as scheduled and regularly disclosing tax information in financial reports and annual reports. Regarding tax fairness, Winbond has completed local tax filings for parent and subsidiary companies within the deadlines and has appointed and consulted external professional advisors to ensure the group's tax responsibilities in various countries.

Seven Principles of Taxation Policy

1. The company should strictly comply with the local tax regulations applicable at each operating location, understanding and complying with the spirit of the tax laws and regulations, ensuring accurate, timely, and honest reporting and paying taxes, and fulfilling our social responsibilities as taxpayers.
2. Do not use tax structures or tax havens for tax avoidance, or transfer profits to low-tax jurisdictions.
3. Related party transactions should comply with the Arm' s Length Principle, and comply with the Transfer Pricing Guidelines defined by the Organization for Economic Cooperation and Development (OECD), no profit manipulation through related party transactions.
4. In the event of significant changes in tax compliance, should consult with the independent third-party tax advisors for suggestions if necessary, then make overall assessments and the responsive decisions.
5. Disclose the tax information in financial statements, annual reports and relevant reports that contribute to enhancing the tax information transparency.
6. Build a good relationship based on mutual trust and honest communications with the tax authorities.
7. Long-term cultivation of tax professionals to promote knowledge heritage and sustainable development.

Main Operating Activities and Employee Numbers Table

Item	Company Name	Major Operation	Total Employee
Taiwan	Winbond Electronics Corporation.	Design, development, manufacture and marketing of very large scale integration (VLSI) integrated circuits (ICs) used in a variety of microelectronic applications.	5,165
	Miraxia Technology Taiwan Corporation	Development of software and services for automotive and industrial control.	
	Nuvoton Technology Corporation.	Research, design, development, manufacture and marketing of Logic IC, 6-inch wafer product, test, and OEM	
	Song Yong Investment Corporation	Investment holding.	
Asia Pacific (exclude Taiwan)	Winbond Electronics Corporation Japan	Research, development, sales and after-sales service of semiconductor .	2,793
	Winbond Electronics India Private Limited	Sales and services of semiconductor.	
	Winbond Electronics (Hong Kong) Limited	Sales of semiconductor and investment holding.	
	Winbond Integrated Circuit (Suzhou) Limited	Design, development and marketing of VLSI integrated ICs	
	Winbond Technology Ltd	Design and services of semiconductor.	
	Callisto Holding Limited	Electronic commerce and investment holding.	
	Callisto Technology Limited	Electronic commerce and investment holding	
	Miraxia Edge Technology Corporation	Software and hardware integration design of semiconductor.	
	Atfields Manufacturing Technology Corporation	Manufacture of semiconductor and smart factory solutions.	
	Nuvoton Electronics Technology (Shanghai) Limited	Provide projects for sale in China and repairing, testing, consulting of software and equipment leasing business.	
	Nuvoton Electronics Technology (H.K.) Limited	Sales services of semiconductor.	
	Nuvoton Electronics Technology (Shenzhen) Limited	Computer software service (except I.C. design), wholesale business for computer, supplement and software.	
	Nuvoton Electronics Technology (Nanjing) Limited	Provide development of semiconductor and technology, consult service and sale.	
	Nuvoton Technology Israel Ltd.	Design and services of semiconductor.	
	Nuvoton Technology India Private Limited	Design, sales and services of semiconductor.	
	Nuvoton Technology Singapore Pte. Ltd.	Design, sales and service of semiconductor.	
	Nuvoton Technology Korea Ltd.	Design, sales and service of semiconductor	
	Nuvoton Technology Holdings Japan	Investment holding.	
	Nuvoton Technology Corporation Japan	Design, sales and service of semiconductor	
Other	Winbond International Corporation	Investment holding.	139
	Winbond Electronics Corporation America	Design, sales and service of semiconductor	
	Winbond Electronics Germany GmbH	Marketing services of semiconductor.	
	Marketplace Management Limited	Investment holding.	
	Nuvoton Technology Corporation America	Design, sales and service of semiconductor	
	Nuvoton Investment Holding Ltd.	Investment holding.	
	Nuvoton Technology Germany GmbH	Customer service and technical support for semiconductor.	

Operating Revenue, Operating Profit and Loss, Current Income Tax Expense, Income Tax Cash Payment Distribution Table

Item	Tax Jurisdiction	Amount (Unit: NT$ million)	
		2023	2024
Revenue	Taiwan	56,639	66,534
	Asia Pacific (exclude Taiwan)	66,721	59,242
	Other Area	2,830	3,442
Taxable Net Income (Loss)	Taiwan	218	1,040
	Asia Pacific (exclude Taiwan)	3,578	(753)
	Other Area	222	221
Income Tax Expense (Benefit)	Taiwan	(136)	(297)
	Asia Pacific (exclude Taiwan)	253	117
	Other Area	37	58
Income Tax Cash Payments[Note4]	Taiwan	944	314
	Asia Pacific (exclude Taiwan)	460	162
	Other Area	65	47

Note 1 The data are financial figures before consolidation eliminations.
Note 2 Tax jurisdictions in Asia (excluding Taiwan) include Japan, China (including Hong Kong), Israel, India, South Korea, and Singapore.
Note 3 Other regional tax jurisdictions include Germany and the United States.
Note 4 In 2024, income tax cash payments amounted to NT$523 million, accounting for approximately 0.64% of consolidated revenue.
In 2023, income tax cash payments amounted to NT$1.469 billion, accounting for approximately 1.96% of consolidated revenue.

Tax Reductions and Credits

Winbond and Nuvoton applied for the 2023 Taiwan Profit-Seeking Enterprise Income Tax in 2024, utilizing the tax credits for R&D expenditures and 5G smart machinery investments under Article 10 of the Industrial Innovation Act. The declared tax credit amount was NT$ 396,414 thousand, and the actual tax credit amount for the current period was NT$ 67,645 thousand.

Note The 2024 tax filing has not yet been approved by the tax authorities (National Taxation Bureau).

Subsidies of Investment, R&D, and Others

1. Winbond obtained a government preferential interest rate loan of NT$ 6,901,600 thousand under the "Action Plan for Welcoming Taiwanese Businesses Back to Taiwan". The interest rate after government subsidy was 1.38% to 2.73%, used for purchasing machinery and equipment and for working capital turnover.
2. Winbond applied for the "IC Design Top-Up Subsidy Program" from the Industrial Technology Department of the Ministry of Economic Affairs, which was approved in September 2024, with a total subsidy amount of NT$ 555,500 thousand.
3. Winbond applied for the "Post-Pandemic Low-Carbon Transformation Subsidy Program" from the Industrial Development Administration of the Ministry of Economic Affairs, collaborating with 13 suppliers and outsourcing manufacturers to formulate a carbon reduction plan, with a total subsidy amount of NT$ 6,635 thousand.

For related information, please refer to the 2024 Annual Consolidated Financial Report

1.2 Business Integrity

1.2.1 Business Integrity

Integrity Management is the highest ethical standard of the Winbond Group. The human resources unit is responsible for the establishment and development of the corporate culture of business integrity, and ethical compliance audits which is conducted quarterly in conjunction with internal control operations.

Winbond employees are familiar with the content of business integrity through the training of regulations, continuous improvement, supervision & control, and education & training; regulations are also formulated, such as "Corporate Governance Practices Guidelines," "Procedures for Ethical Management and Guidelines for Conduct," "Sustainability Development Best Practice Principles," "Responsible Business Alliance Code of Conduct Management Procedures," "The Code of Ethics and Professional Conduct for Directors," "Employee Code of Conduct," and "Winbond Anti-Corruption Commitment" embedding business integrity into the company's culture.

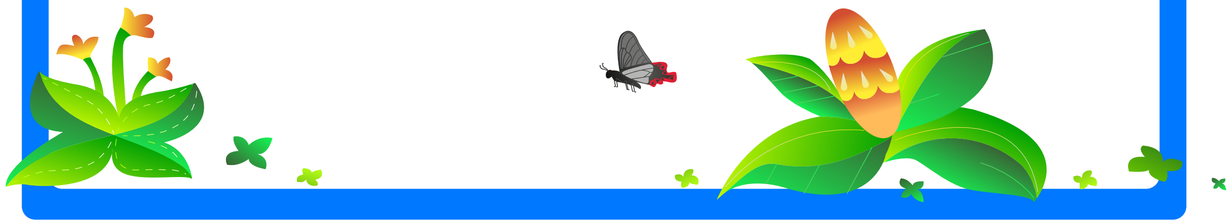
An annual report on business integrity management promotion and training is presented to the Board by the HR each year. Internal cultural promotion, weekly articles on corporate philosophy, and promotion of policy announcements published on the employees' homepages are used to strengthen the implementation of education and training on labor rights, environmental protection, health and safety, ethical standards, and prevention of insider trading. Winbond strengthens internal ethical awareness to ensure compliance with corporate ethics and government regulations and implements sound business integrity management.

In 2024, Winbond completed the formulation of the "Winbond Anti-Corruption Commitment," adhering to the corporate culture of "Integrity Management" to eliminate any corrupt practices.

2024 Performance Highlights

In 2024, Winbond and Nuvoton offered online course on "Human Rights and Labor Ethics Education and Training" and "Promotion of Corporate Integrity Behavior and Sustainable Development Code," which included topics such as "Integrity Management" (anti-bribery, anti-corruption, insider trading prevention, fair trade, advertising and competition, identity protection, and retaliation prevention) and labor rights.

- ✓ There were no violations related to economic or environmental issues, nor were there any incidents of corruption, anti-competitive behavior, or violations related to marketing and labeling.
- ✓ In 2024, there were no complaints regarding violations of integrity management through the reporting channels.
- ✓ In 2024, there were no cases of money laundering, insider trading, or conflicts of interest.



Training on Business Integrity

Training Total

Total Number Trained
5,702 people
(100% Completion Rate)

Total Training Hours
2,437 hr

Training Rate for the Board
100 %

Note Trained employees include Winbond and Nuvoton(Taiwan)

Completion Rates for Business Integrity Courses

Region/ Subsidiaries		Employee Type		Job Level		Total	Hours
		Direct Employee	Indirect Employee	Management	Non-Management		
Winbond (Taiwan)	Numbers of required trainees	332	3,047	530	2,849	3,379	1,352
	Numbers of completed trainees	332	3,047	530	2,849	3,379	
	Completion rate	100%	100%	100%	100%	100%	
Winbond Subsidiaries	Numbers of required trainees	-	766	108	658	766	306
	Numbers of completed trainees	-	766	108	658	766	
	Completion rate	-	100%	100%	100%	100%	
Nuvoton (Taiwan)	Numbers of required trainees	370	1,187	191	1,366	1,557	779
	Numbers of completed trainees	370	1,187	191	1,366	1,557	
	Completion rate	100%	100%	100%	100%	100%	
Total	Numbers of required trainees	702	5,000	829	4,873	5,702	2,437
	Numbers of completed trainees	702	5,000	829	4,873	5,702	
	Completion rate	100%	100%	100%	100%	100%	

Note 1 Scope of training area included Winbond(Taiwan), Winbond subsidiaries, and Nuvoton(Taiwan).
Note 2 The total training hours per session for Winbond(Taiwan) and Winbond subsidiaries were 0.4 hours, while Nuvoton(Taiwan)'s were 0.5 hours.
Note 3 The following personnel were not included in the list of required trainees: 1.Consultants 2.Those primarily serving affiliated enterprises 3.Those unable to attend training due to special reasons (such as leave of absence or planned resignation) 4.Non-full-time employees.

1.2.2 Internal Control and Audit

The internal audit unit of Winbond directly reports to the Board of Directors. The appointment and dismissal of the audit supervisor are approved by the Audit Committee and the Board of Directors. The internal audit unit, in addition to reviewing the self-assessment results of the internal control systems of each units and subsidiary, and evaluates the control operations of various business activities within Winbond's internal control system to measure the effectiveness, compliance, and impact of the current internal controls. The frequency and content of each cycle audit are determined based on regulatory requirements and risk assessments; important procedures or special cases may be audited at any time or on an ad-hoc basis.

The internal audit unit, in accordance with the annual audit plan approved by the Board of Directors, evaluates the effectiveness of design and implementation of the internal control system's control operations. If there are audit findings in the audit report, they are tracked until improvement is achieved to ensure that the relevant units have taken appropriate corrective actions in a timely manner. The internal audit supervisor reports to the independent directors (audit committee convener) monthly upon completion of the audit report and follow-up report, and submits the audit items to each independent director for review by the end of the month following the completion of the audits. The audit supervisor reports on audit activities to the Audit Committee and the Board of Directors on a quarterly basis. The 2024 annual audit plan has been implemented in accordance with regulations, and the audit results and follow-up improvements have been reported to the Audit Committee and the Board of Directors.

Winbond has established a whistleblowing channel for stakeholders. If internal or external personnel discover unfair business practices, bribery or improper benefits, fraud, coercion, or other illegal activities by company employees, they can report anonymously or non-anonymously. The identity and content of any whistleblower are kept strictly confidential. Whistleblowing cases are directly handled by the company's audit unit and simultaneously submitted to the Audit Committee. The handling procedures are carried out in accordance with the "Ethical Management Violation Handling Instruction."

1.3 Productivity and Business Performance

1.3.1 Productivity

Productivity and business performance are the cornerstone of Winbond's sustainable growth and the key driving force for enhancing market competitiveness. We firmly believe that by continuously improving productivity, we can not only effectively reduce operating costs and minimize resource waste but also expand revenue scale, thereby creating higher corporate value and operational efficiency.

In 2024, Winbond actively promoted digital transformation, completing 37 related activities and training sessions, systematically strengthening employees' understanding and application of digital tools and processes, thereby improving overall work efficiency and productivity. Notably, in response to the rapid development of global AI technology, Winbond significantly increased the proportion of AI-related activities and training courses from 6% in 2023 to 59%. This growth not only demonstrates Winbond employees' enthusiasm for embracing innovative technology but also highlights the company's determination and execution in deeply integrating AI technology into corporate operations and activities.

In terms of system construction, Winbond successfully completed the optimization and upgrade plan of the AP Request Portal in 2023, laying a solid foundation for enterprise productivity tracking management. Building on this important achievement, Winbond further analyzed the collaboration patterns and processes of employees using this system from 2024 onwards to identify more potential optimization opportunities. Looking ahead to 2025, Winbond will adopt a more comprehensive integration strategy, simultaneously advancing the coordinated development of systems, processes, and personnel to ensure effective tracking and management of productivity improvements across departments through IT systems, while also tracking and managing corresponding resource inputs to achieve maximum resource utilization efficiency.

Looking to the future, Winbond has set a mid-to-long-term vision for 2030, committed to achieving the ambitious goal of 100% employee participation in digital transformation. This means that every employee will become a key driver in the digital transformation journey, fully realizing their individual potential and jointly promoting the continuous growth of the enterprise. Winbond will continue to drive stable growth in corporate productivity through ongoing technological innovation, process optimization, and internal management enhancement, maintaining a leading position in market competition, and achieving sustainable profitability and long-term value creation.

Digital Transformation

AI Technology Implementation Class

From promoting data science to advanced practical courses, Winbond invited external experts and scholars along with internal automation team assistants to train seed students from various units.

Data Science Tools Series Courses

Courses such as "Power BI Data Visualization" and "JMP Statistical Analysis Software" were offered to cultivate employees' data science capabilities and align them with their work.

Digital Transformation Series Lectures

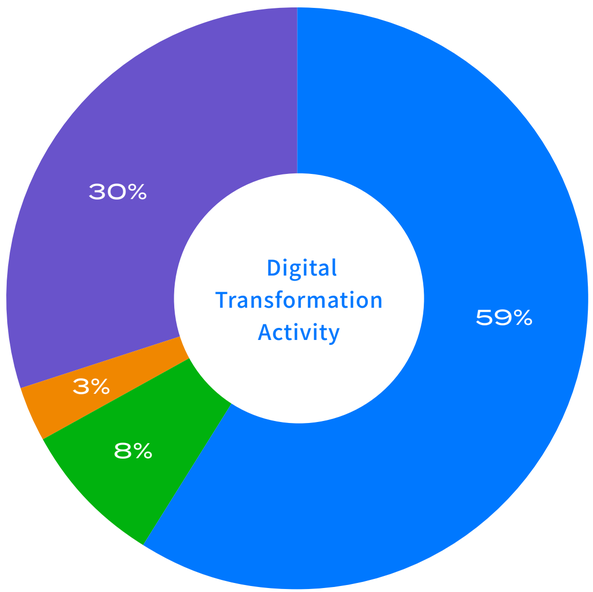
Speakers from various fields were invited to share their experiences in promoting digital transformation, providing insights and possibilities for supervisors to drive digital transformation.

Data Science Zone

Continuously summarizing and expanding learning resources, allowing employees to choose courses at various levels according to their own level and work needs, and learn anytime, anywhere.

Conducted 37 Digital Transformation Activity in 2024

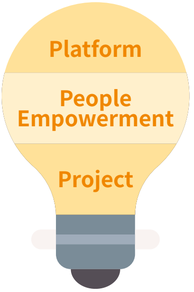
Percentage of the Activity



- AI：22 sessions
- BI：3 sessions
- Software Development and Management：1 session
- Seminar：11 sessions

1.3.2 Promotion of Digital Transformation in the Fab：Platform、People Empowerment、Project

The digital transformation of factories was driven by three main aspects: Platform, People Empowerment, and Project. Through digital technology, organizational capabilities were enhanced, creating manufacturing value.



Platform：Building Digital Foundations, Enhancing Efficiency and Standardization

The development goals of the digital platform are 5S (Scale, Speed, Standardization, Stability, Security). As of 2023, four major platforms (System / Data / BI / Observability) have been successfully implemented, significantly improving the efficiency and quality of system development, maintenance, and data analysis.

In 2024, further strengthening the infrastructure for Citizen Data Scientists, a User-Defined Data Warehouse was established, allowing users to define and store data, significantly enhancing the convenience and efficiency of data science work. Additionally, a new Application Platform was launched, integrating container technology to assist colleagues in quickly and conveniently packaging, deploying, and maintaining scheduled programs, further improving system development and maintenance efficiency.

Looking ahead to 2025, the focus will continue to be on strengthening the Data Platform and Application Platform, improving data access efficiency, expanding support for the deployment and maintenance of service programs, and comprehensively enhancing the efficiency of AI applications and system operations.

People Empowerment：Cultivating Data Talent and Promoting AI Technology Application

In terms of talent cultivation, we continued to promote five skill certifications in three major areas (Data Science / Data Engineering / Programming). In 2024, an additional 796 individuals passed the certification, representing an annual growth rate of 110%, bringing the total number of certified individuals to 1,525.

Among them, the AI technology implementation class continued to collaborate with National Taiwan University of Science and Technology, with a cumulative total of eight batches and 310 individuals obtaining certification. In 2024, three batches were completed with a total of 33 topics, and 137 individuals passed the certification. With the assistance of professional instructors and in-house data scientists, AI technology was successfully applied to the production environment, improving product quality and production efficiency.

Looking ahead to 2025, we will further collaborate with National Taiwan University and National Taiwan University of Science and Technology to promote the popularization and application of AI technology, deepening data analysis and smart manufacturing capabilities.

Project：Innovation and AI Application Enhancement

In 2024, a total of 30 projects were completed, bringing the cumulative number of projects to 138, covering areas such as production efficiency and quality improvement.

Looking ahead to 2025, in addition to continuing to promote production optimization projects, the focus will be on the integration and application of large language models (LLM) and CIM systems to further enhance production decision-making and development efficiency, driving the implementation of smart manufacturing.

Summary

Through Platform building digital foundations, People Empowerment cultivating data talent, and Project promoting innovative applications, the digital transformation of factories has gradually deepened, from underlying technology construction to talent cultivation, and practical application implementation, comprehensively enhancing manufacturing value and operational efficiency.

Looking ahead, we will continue to deepen data-driven decision-making models, expand the application scope of AI technology and digital transformation, and promote factories towards a more intelligent and automated direction, achieving the goal of data-enabled manufacturing and technology-led transformation.

Digital Transformation in the Fabs

- Project Focus: The project aimed to drive digital transformation to achieve smart manufacturing and employee empowerment.
- Percentage of Full-time Personnel Involved: 50% of the full-time personnel participated in the plan.

Key Benefit Quantitative Indicators

- Key Benefit Quantitative Indicators:
- CMP process Cpk increased by 16%, Etch process Cpk increased by 6%
- Yield loss in WET process reduced from 2% to 0%
- Litho photoresist coating quality AI image recognition detection rate 100%
- FAB productivity increased by 9%
- Annual cost savings of NT$ 46.9 million, one-time cost savings of NT$ 262.2 million
- Reduced carbon emissions by 1,388 tCO_2e.

Benefits of Digital Transformation

- Improved product quality and yield
- Increased FAB productivity
- Reduced costs and power consumption
- Enhanced employee's productivity
- Strengthened innovation and agility
- Increased production efficiency
- Enhanced employee engagement and retention.

1.3.3 Business Performance

In 2024, Winbond's consolidated revenue totaled NT$81.6 billion, an increase of 8.80% compared to 2023. The consolidated net profit after tax was NT$710 million, with a post-tax earnings per share (attributable to the parent company) of NT$0.14. For further explanations and analysis of other financial performance, please refer to the 2024 Annual Report.

Consolidated Financial Performance

Unit: NT$ Million

Item	2021	2022	2023	2024
Operating Revenue	99,570	94,530	75,006	81,610
Non-operating Income (Expense)	(205)	1,512	933	604
Generated Direct Economic Value [A]	99,365	96,042	75,939	82,214
Operating Costs	57,089	51,479	52,610	57,609
Employee Remuneration and Benefits (Personnel Expenses)	17,325	19,706	16,775	16,668
Payments to Investors	1,324	5,506	6,492	1,915
Payments to Government	274	3,799	974	346
Community Investments	6	7	7	6
Distributed Direct Economic Value [B]	76,018	80,497	76,858	76,544
Retained Economic Value [A-B]	23,347	15,545	(919)	5,670
Consolidated Net Profit Before Tax	18,223	18,046	(698)	1,112
Consolidated Net Profit After Tax	15,000	14,987	34	710
Earnings (Loss) Per Share	3.42	3.25	(0.29)	0.14

Sales Distribution and Product Categories and Revenue Ratios of Winbond Group's Applications in 2 Years

Item	Asia	Europe	America	Others
Sales Ratio of 2024 (100%)	92.65%	4.51%	2.60%	0.24%
Sales Ratio of 2023 (100%)	92.42%	4.38%	2.98%	0.22%

Item	Dynamic Random Access Memory	Flash Memory Products	Logic Products	Others
Sales Ratio of 2024 (100%)	23.82%	35.23%	38.82%	2.13%
Sales Ratio of 2023 (100%)	18.71%	32.06%	46.51%	2.72%

Note 1 Total wafer production was 440 (thousand pcs), while total die production was 7,099,216 (thousand pcs).
Note 2 For Winbond's financial performance in 2024, please refer to our 2024 Annual Report.

1.3.4 Investing in Taiwan

Winbond's headquarters and its first fab were established in the Central Taiwan Science Park. In response to the "Action Plan for Welcoming Taiwanese Businesses Back to Taiwan," Winbond applied for the plan for the first time in 2020, increasing investment in the CTSP Fab to expand production capacity and enhance technology, introducing smart automation equipment to provide higher value-added products. The second fab was completed in the Kaohsiung Fab in 2022. In March 2023, Winbond passed the second application for the "Action Plan for Welcoming Taiwanese Businesses Back to Taiwan," applicable to the syndicated loan agreement signed in April 2023. From the end of 2023 to 2024, loans were gradually drawn down to purchase advanced equipment and develop proprietary innovative technologies, expanding the production capacity of the Kaohsiung Fab and CTSP Fab and enhancing advanced processes to meet the long-term growth trend of the memory industry. The Kaohsiung Fab also continued to recruit employees, encouraging young people from the southern region to return to their hometowns for work. In addition to participating in the semiconductor industry cluster in the Kaohsiung area, Winbond further implemented the concept of staying rooted in Taiwan and investing in Taiwan through practical actions.

1.3.5 Winbond Group's Disclosure of 'Taiwan Sustainable Taxonomy'"

Winbond Group voluntarily discloses that its primary economic activities "comply" with the Taiwan Sustainable Taxonomy – "making a substantial contribution to one environmental objective without causing significant harm to other environmental objectives and social safeguards." It also refers to these guidelines in formulating and implementing strategies and plans for carbon reduction and sustainable transformation, aiming to achieve net-zero emissions in an orderly manner. For more information on the disclosure of the "Taiwan Sustainable Taxonomy," please refer to: Winbond Group's Disclosure of Reference Items for "Taiwan Sustainable Taxonomy."

1.4 Risk Management

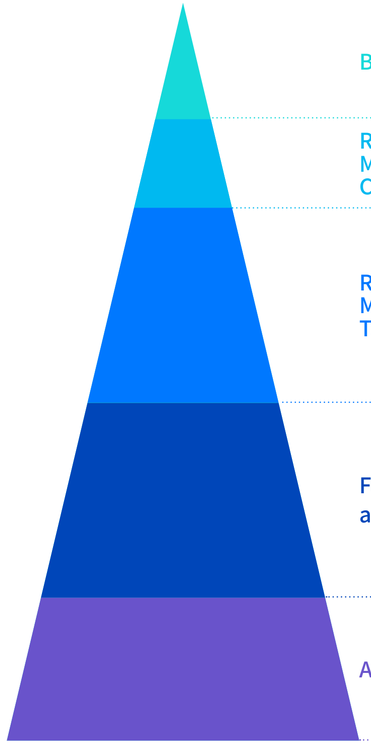
Winbond belongs to the semiconductor manufacturing industry. Facing natural disasters, accidents, human-made incidents, changes in international political and economic situations, the emergence of new technologies, and changes in policies and regulations may all cause serious impacts on its operations and finances. Therefore, in 2023, Winbond established a "Risk Management Committee" under the Board of Directors. This committee is one of the functional committees and organizes existing departments or units responsible for risk to enhance the overall risk management organizational structure. It formulates sound internal management regulations and operating procedures for each unit's scope of responsibility and conducts risk management.

In 2023, Winbond revised the "Risk Management Committee Charter" and formulated the "Risk Management Policy and Procedures" after receiving approval by the Board of Directors. It actively manages the four major types of risks faced by contemporary enterprises: "strategic," "operational," "financial," and "information security." It develops comprehensive plans and processes for pre-assessment, risk avoidance, loss prevention, and crisis management for various operational activities and regularly reports to the management and governance units to ensure that all corporate risk control goals are achieved. The risk management team should pay attention to the development of international and domestic risk management systems and changes in internal and external operating environments, adjust control mechanisms, report to the Risk Management Committee and the Board of Directors for approval, and enhance the effectiveness of risk management implementation. For details on the operation of the Risk Management Committee, please refer to Section 1.1.2 Operations and Responsibilities of the Functional Committee.

The company's internal audit unit is affiliated with the Board of Directors. Based on the results of risk assessments, it selects audit items and frequencies, formulates audit plans, and after approval by the Board of Directors, verifies the operations of the company's internal control system, and prepares audit reports. It regularly prepares follow-up reports on audit findings and recommendations until improvements are made to ensure that relevant units have taken appropriate corrective actions in a timely manner, continuously deepening the effectiveness of the risk management mechanism.

The internal audit unit also supervises each unit and subsidiary to regularly evaluate the implementation of the internal control system. In the annual internal control system effectiveness audit process, it incorporates risk management factors to conduct organizational operations and risk management audits. In January 2025, it completed the self-assessment of the internal control system for 2024 and the audit work of the internal audit unit.

Risk Management Structure



Board of Director	The highest governance unit: Approves the risk management mechanism and ensures its effective operation.
Risk Management 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, assess- ing, 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.

Winbond Risk Management Policies and Procedures

includes but not limit to

1. Risk management objectives.
2. Risk management organizational structure and responsibilities.
3. Risk management procedures

4 Scope of Risk Management

Operational Risk

1. Operational Planning and Execution
2. Product Quality Management
3. Environmental, Health, and Safety
4. Supply Chain Management
5. Global Human Resources Management
6. Intellectual Property Management
7. Internal Control Management

Strategic Risk

1. Political Change
2. Technology Change
3. Industrial Change
4. Climate Change

Sustainable Operation

Financial Risk

1. Financial Operations
2. Investment Management
3. Capital Management

Information Security Risk

1. Information Management
2. Information Security
3. AI Application

Winbond Risk Management Objectives

Winbond aims to manage various risks that may impact the achievement of company goals through a comprehensive risk management framework. By integrating risk management into operational activities and daily management processes, Winbond aims to achieve the following objectives:

1. Achieve company goals.
2. Enhance management efficiency.
3. Provide reliable information.
4. Allocate resources effectively.

Risk Management Process

Winbond's risk management process include at least five elements: risk identification, risk analysis, risk assessment, risk response, and supervision and review mechanism. The specific procedures and methods for each element are as follows:

Risk Identification

- Each functional unit and subsidiary should identify the risks of the short-, mid-, and long-term objectives and the business operations based on the company's risk management policies and procedures.
- Various feasible analysis tools and methods (such as process analysis, scenario analysis, questionnaire surveys, PESTLE analysis, etc.) should be used for risk identification. Risks should be analyzed from both top-down and bottom-up perspectives, considering internal and external risk factors, stakeholder concerns, etc., to comprehensively identify potential risk events that may affect the company's goals or cause losses or adverse impacts.

Risk Analysis

- Each functional unit and subsidiary should analyze the probability and impact of identified risks based on existing control measures, past experiences, industry cases, etc., and calculate the risk value accordingly.

1 Risk Analysis Measurement Standards

- ✓ The risk management team should establish appropriate quantitative or qualitative measurement standards based on the company's risk characteristics as the basis for risk analysis.
- ✓ Qualitative measurement standards refer to expressing the probability and impact of risk events through textual descriptions, while quantitative measurement standards refer to expressing the probability and impact of risk events through specific measurable numerical indicators (such as days, percentages, amounts, numbers, etc.).

2 Risk Appetite

- ✓ The risk management team should develop risk appetite (risk tolerance) and report it to the Risk Management Committee and the Board of Directors for determining the company's acceptable risk threshold. Based on the risk appetite, the risk management team should discuss the corresponding risk levels for each risk value and the response methods for each risk level, serving as the basis for subsequent risk assessment and risk response.

Risk Assessment

- Each functional unit and subsidiary should, based on the results of risk analysis, align with the risk appetite approved by the Risk Management Committee and the Board of Directors. They should then plan and execute subsequent risk response measures according to the risk levels.
- The relevant results of risk analysis and assessment should be accurately documented and reported to the Risk Management Committee.

Risk Response

- After assessing business risks, each unit should propose appropriate risk response measures and control operations and report them to the risk management team for review.

Supervision and Review

- The risk management team should regularly report the implementation results of risk management procedures to the Risk Management Committee as a reference, and report major risk events to the Risk Management Committee and the Board of Directors, as necessary.

In addition, Winbond has incorporated climate change risks into its long-term business operations management. To understand the impact on the environment and operations, Winbond has adopted the Task Force on Climate-related Financial Disclosures (TCFD) framework since 2021. Observing international regulatory trends and market developments, Winbond annually identifies and discloses the financial impacts of climate-related risks and opportunities (including quantitative and qualitative aspects), and proposes review and management strategies. Winbond will continue to monitor the risk impacts brought by climate and strengthen the company's operational capabilities, promote various carbon reduction projects, improve energy efficiency, and steadily move towards sustainable development.

For more details, please refer to section 1.6 Climate Change Management.

Strategical Risk

Type of Risk		Description of Impact	Response Measures	Mitigating Actions	Progress
Strategical Risk	Technological Change	▪ Emerging storage technologies provided alternative solutions that could impact the high-density NOR Flash market, thereby affecting Winbond's flash memory business. ▪ Geopolitical tensions could disrupt supply chains, impacting Winbond's business continuity and growth opportunities with tier-one customers and automotive clients. ▪ New ESG goals and carbon emission reduction regulations could increase manufacturing costs. ▪ In addition to existing major memory manufacturers, new Chinese memory design companies and increased capacity in China have intensified competition. ▪ Competitors using alternative technologies were offering smaller chip sizes, better performance, and lower costs, threatening Winbond's market share in flash memory.	▪ Through innovations in heterogeneous packaging, product design, product functionality, and process technology, and seeking cooperation with external emerging storage technology providers, we provided innovative storage solutions. ▪ Planned multi-source production supply chains to reduce the risk of product supply chain disruptions. ▪ According to Winbond's Renewable Energy (RE) strategy, actively promoted Winbond parts manufactured by RE, and supported our commitment to green products through the carbon accounting system to obtain premiums and reduce price erosion. ▪ Flash memory strategies included: 1) customized cooperation with leading customers, 2) expanding the high-density flash memory product portfolio, 3) innovative products, more digital circuits and processors built-in for intelligent storage, and heterogeneous storage integration. ▪ Improved products based on customer feedback and market feedback, focusing on customization for target applications.	▪ Continued investment in next-generation technology development and evaluation of emerging storage technologies. ▪ Deep understanding of customer needs, providing innovative features and excellent specifications—making Winbond's flash memory products sticky due to the features and specifications required by customers. ▪ Planned possible options for multi-source production supply chains according to customer expectations, and sought feasible solutions together with customers. ▪ Maintained the Renewable Energy (RE) strategy and clarified the demand for "clean energy" or "carbon-free energy" to formulate the next steps. ▪ Followed a customer-centric flash memory strategy, expanded business in leading customers, target, and emerging applications through product roadmap planning, product upgrades, customized applications, and then innovative products with new technologies and heterogeneous storage integration.	▪ A series of product lines with different cost structures and feature sets, including ultra-high performance (LPDDR4 NVM), Octal/Qspi Combo NOR Flash with RWW and security, Wide IO, and GP Flash. ▪ Communicated with customers to identify feasible multi-source production supply chain solutions, set a timetable, executed according to the plan, and made real-time adjustments as the situation changed. ▪ Branded green products, reflecting Winbond's competitiveness in unique value propositions, becoming the invisible champion in the flash memory field. ▪ Through deep cooperation with leading customers on customized flash memory solutions, brought sustainable revenue sources and higher profits to Winbond. ▪ Obtained new revenue sources from emerging applications through innovative products, bringing new momentum for long-term growth.
	Industrial Change	▪ China's localization policy could impact Winbond's performance in mainland China.	▪ Reduced reliance on mainland Chinese customers for its end market.	▪ Expanded business opportunities in Europe and the United States.	▪ Reduced the proportion of domestic sales in mainland China and increased opportunities for production exports from China.
	Climate Change	▪ Carbon fees could directly increase costs.	▪ Implemented energy-saving and carbon reduction measures. ▪ Purchased renewable energy.	▪ Set annual energy-saving and carbon reduction targets, planned and executed energy-saving and carbon reduction programs, and regularly tracked effectiveness. ▪ Continued to purchase renewable energy.	▪ Held quarterly ESG meetings chaired by the General Manager to track effectiveness. Held semi-annual Sustainability Development Committee meetings chaired by the Chairman to track effectiveness.
		▪ Climate change risks: Under the exacerbated environment of global warming and extreme weather, transitional climate risks and physical climate risks could impact the company's financial and operational aspects.	▪ Introduced the TCFD management framework, identified sources of climate risks and assessed their impacts, and formulated mitigation and adaptation measures to reduce climate risk impacts and enhance the company's operational resilience.	▪ According to the TCFD management framework, identified major climate risks, assessed response measures one by one, to mitigate and adapt to the impacts of climate change. ▪ Established the Winbond TCFD platform and continuously optimized it to facilitate the annual TCFD working group discussions and produce reports.	▪ Published the climate-related financial disclosure report (TCFD Report) to review Winbond's operational resilience in facing climate issues and improve climate information transparency.

Strategical Risk

Type of Risk		Description of Impact	Response Measures	Mitigating Actions	Progress
Strategical Risk	Climate Change	▣ Carbon rights management: Due to the immature voluntary carbon rights trading mechanism, the domestic and international trading market liquidity was poor, and currently faced risks such as carbon rights quality, source, and transaction transparency.	▣ Established Internal Voluntary Carbon Credit Investment Standards, implementing risk management mechanisms from pre-investment evaluation, division of responsibilities, quota authorization, and internal control systems. ▣ Formulated internal carbon rights investment standard checklists to comply with international high-quality carbon rights trends.	▣ Screened and evaluated transaction targets according to the provisions of the transaction procedures and executed transactions. ▣ Continuously tracked domestic and international voluntary carbon rights trading regulations and established high-quality carbon rights procurement channels, regularly reviewed carbon price fluctuations, and appropriately updated internal operating specifications.	▣ Participated in the voluntary carbon rights market transactions since 2022 and continuously increased diversified carbon rights acquisition channels, disclosed annually in the ESG report to review Winbond's carbon rights management practices.

Operational Risk

Type of Risk		Description of Impact	Response Measures	Mitigating Actions	Progress
Operational Risk	Operational Planning and Execution	▣ Disaster Risk: Semiconductor fabs are highly sensitive to disasters such as fires, earthquakes, water shortages, and power outages due to their characteristics of high precision equipment, production in cleanroom environments, stable water and power supply requirements, expensive equipment, and long lead times. Additionally, semiconductor processes require the use of various flammable gases and chemicals. Taiwan is located in a seismic zone and has faced ongoing concerns about power and water supply in recent years, making semiconductor fabs vulnerable to disaster hazards. If any of the aforementioned disasters occur, it could cause significant damage to plant equipment and business interruptions, as well as potential loss of customers due to supply disruptions.	▣ Fire: Established fire protection zones, used non-combustible materials for buildings and equipment as much as possible, fully installed automatic fire protection systems according to international insurance industry standards, conducted regular ERT training drills, and performed regular maintenance and testing of fire protection systems according to the plan. ▣ Earthquake: Designed buildings for earthquake resistance, fixed machines for earthquake resistance, and maintained inventory of spare parts. ▣ Power outage: Installed emergency generators and uninterruptible power systems, performed regular maintenance and testing of emergency generators and uninterruptible power systems according to the plan. ▣ Water shortage: Built backup water tanks and continuously implemented water-saving measures in the process.	▣ Existing fab equipment underwent regular inspections and testing to ensure system normalcy. ▣ New fab equipment continued to be designed and constructed according to standards.	▣ Since the establishment of the CTSP Fab and Kaohsiung Fab, normal supply has not been affected by natural disasters.

Type of Risk		Description of Impact	Response Measures	Mitigating Actions	Progress
Operational Risk	Environmental, Safety and Health	▣ Water Resource Management: If the park's standards are not met, additional sewage fees will be charged.	▣ Installed multiple continuous monitoring instruments in the effluent discharge pipes; tightened the definition of each measurement limit based on the park's standards and set up a feedback mechanism. ▣ Regularly commissioned external inspection agencies to sample and analyze to ensure normal monitoring.	▣ Installed continuous monitoring equipment; tightened the definition of each measurement limit based on the park's standards and set up a feedback mechanism. ▣ Conducted monthly self-commissioned external monitoring. ▣ Conducted statutory external monitoring every six months.	▣ In quarterly operational meetings and quality management review meetings, product failure rates and major incidents were reviewed, and effective improvement measures were taken and tracked.
		▣ Resource Recycling: If opportunities for recycling or reducing waste are not continuously sought, processing costs may continue to increase.	▣ Reduced waste generation in the fabs through reduction or reuse and increased recycling rates. ▣ The long-term goal of waste management is to achieve a waste recycling rate of over 90% annually in Taiwan fabs by 2030.	▣ Reduced waste generation in the fabs through reduction or reuse and increased recycling rates. ▣ The long-term goal of waste management was to achieve a waste recycling rate of over 90% annually in Taiwan by 2030.	▣ Quarterly environmental, safety, and health management meetings were held to track environmental, safety, and health indicators, with a waste recycling rate of >91%.
		▣ Major Occupational Accidents and Occupational Diseases: Affect production.	▣ According to the procedures of the Environmental, Safety, and Health Management System, through routine internal audits, reviews, and updates every six months, and annual external audits and supervision, Winbond continuously safeguarded the workplace safety environment for colleagues, reduced potential risk factors, and continuously improved.	▣ Established ISO 45001 and CNS 45001 Occupational Health and Safety Management Systems, formulated various regulations, implemented education and training, safety inspections, and operational safety permit systems, supplemented by internal and external audit procedures, and continuously improved.	▣ Quarterly environmental, safety, and health management meetings were held to track environmental, safety, and health indicators, with no major occupational accidents or occupational diseases occurring.
	Supply Chain Management	▣ Supply Chain Disruption Risk: Suppliers faced price increases or production interruptions and delays due to raw material acquisition, political interference, natural disasters, transportation, and other production costs, which could lead to deferred shipments, failure to meet customer delivery requirements, resulting in penalties or contract fines and loss of goodwill.	▣ High-risk critical raw materials, increased self-owned inventory levels. ▣ Increased second or third source suppliers to reduce reliance and limitations on a single source. ▣ Increased localization of supply to avoid cross-border transportation risks and costs. ▣ Enhanced digital system development and its efficiency, through real-time monitoring, timely identification, and resolution of potential issues.	▣ Dynamic adjustment of critical raw material inventory levels. ▣ Continuous evaluation of the introduction of second or third source suppliers. ▣ Continuous evaluation of the introduction of localized supply chains. ▣ Introduction and development of digital systems.	▣ Winbond has never experienced production interruptions or operational losses due to supply chain disruptions.

Type of Risk		Description of Impact	Response Measures	Mitigating Actions	Progress
Operational Risk	Global Talent Management	**Long-term Human Resource Supply Shortage:** ▪ Specific Area Impact: In 2024, the turnover rate of wafer fab employees and engineering assistants exceeded 7.6% and 13% respectively, with an average company-wide turnover rate of approximately 9%. ▪ Graduate Impact: The number of graduates at all levels from academic years 104 to 121 fluctuated, with a decrease rate of -15.8% for doctoral graduates and -22.4% for master's graduates, reducing from 56,000 to 43,000.	▪ Used retention bonuses to increase employee retention willingness, and provided education and training for supervisors at Kaohsiung Fab to boost team morale and create a positive organizational atmosphere. ▪ Created a cross-regional talent pool to flexibly support specific regional manpower gaps. ▪ Increased employee compensation, simultaneously raised annual salary adjustments and added retention bonuses. ▪ Introduced international talent. ▪ Used AI to enhance employee productivity, controlled headcount growth, and provided each employee with the opportunity to obtain higher reward resources.	▪ Retention bonuses: Completion of retention bonus operations for specific groups. ▪ Supervisor and team collaboration training: Ongoing. ▪ Establishment of a group talent pool: Conducting flexible personnel allocation across companies and establishing systematic management systems. ▪ Participation in government and school international programs. ▪ Introduction of AI tools.	▪ Retention bonuses: The turnover rate has stabilized. ▪ Education and training: The number of grievance cases has decreased. ▪ The number of cross-company flexible transfer cases continues to increase. ▪ Establishing an AI tool platform, scheduled for promotion by the end of the year.
	IP Management	**Royalty Expenditure and Image Damage Risk:** ▪ Intellectual Property Claims or Litigation by Competitors: Competitors filed intellectual property claims or litigation against Winbond. ▪ Intellectual Property Claims or Litigation by NPE: NPE (Non-Practicing Entity) filed intellectual property claims or litigation against Winbond. ▪ Business Secrets Theft by Competitors: Winbond's business secrets were stolen by competitors, reducing competitiveness.	▪ Encouraged and guided employees to produce high-value patents. ▪ Promoted the importance of business secrets and Winbond's protection measures.	▪ Conducting patent education and training ▪ Organizing activities to strengthen the concept of business secrets and enhancing various software and hardware protection measures.	▪ Achieved annual targets for patent and business secret applications.

Financial Risk

Type of Risk		Description of Impact	Response Measures	Mitigating Actions	Progress
Financial Risk	Financial Operations	▪ Exchange Rate Risk: When a company engages in import and export transactions using foreign currency, fluctuations in exchange rates during the payment period can result in differences in the final amount received or paid by the company, leading to exchange gains or losses.	▪ Engaged in foreign exchange derivative financial products and increased the proportion of foreign currency liabilities to effectively reduce the impact of exchange rate fluctuations on gains and losses. ▪ Closely monitored macroeconomic data and international political and economic events, Maintained contact with the foreign exchange trading room to understand the movements and operations of foreign investors and central bank.	▪ Daily tracking of foreign currency cash balance and close communication with sales, procurement, and funding units to confirm changes in foreign currency net positions. ▪ After president Trump was elected as the 47th President of the United States, tariff disputes and trade conflicts between the US, Europe, and China increased global economic uncertainty, delayed the decline of US inflation, and postponed the Federal Reserve's interest rate cuts; the situation will continue to be monitored, and trading strategies will be adjusted flexibly.	▪ Reviewed and analyzed the causes of exchange gains and losses twice a month, flexibly adjusted hedging strategies based on real-time market information, ensuring that exchange rate fluctuation risks and exchange gains and losses remained within controllable ranges.
		▪ Interest Rate Risk: When market interest rates rise, the interest expenses on long-term loans with floating interest rates increase; when market interest rates fall, the income from interest-bearing products decreases.	▪ Flexibly used floating and fixed interest rate financing tools to reduce the sensitivity of long-term loan positions to interest rate changes. ▪ Managed funds flexibly, using both long-term and short-term credit facilities. ▪ Arranged fixed deposits according to market interest rate trends. ▪ Applied for high-interest demand deposit accounts to improve overall bank account interest rates.	▪ Appropriate allocation of floating and fixed interest rate loan positions, and assessment of the impact of interest rate changes on interest costs, ensuring that the increase in interest expenses remains within a controllable range. ▪ Use short-term credit facilities according to funding needs, delaying borrowing higher interest rate long-term loan to reduce interest costs and risks under Taiwan's interest rate hike cycle. ▪ Arrange short-term fixed deposits when market interest rates are expected to rise to increase interest income; arrange long-term fixed deposits when market interest rates are expected to fall to lock in interest income. ▪ Concentrate account receivable in high-interest demand deposit accounts.	▪ Long-term loan interest rates included both floating and fixed pricing methods to mitigate interest rate fluctuation risks. ▪ Flexibly utilized short-term loan while maintaining reasonable fund levels, thereby preserving long-term loan facilities and reducing interest expenses. ▪ Accurately estimated receipt and payment amounts to increase fixed deposit positions. ▪ Placed short-term funds in bank demand accounts offering preferential interest rate.

Type of Risk		Description of Impact	Response Measures	Mitigating Actions	Progress
Financial Risk	Investment Management	▪ Investment Risk: Mainly arises from the investment returns and asset impairments of strategic and financial investments.	▪ Established prudent investment decision-making processes, conducting comprehensive evaluations of investment targets in terms of technology, products, market, management, and finance before investing, and setting different investment decision approval standards based on the investment amount. ▪ Regularly tracked and evaluated investment targets during the holding period to maximize investment returns and prevent or mitigate losses.	▪ Strictly follow relevant measures to control investment risks, such as "Regulations Governing the Securities Investment Management,""Regulations Governing the Acquisition and Disposal of Assets,"" "Regulations Governing the Subsidiary Management," and "Self-assessment Measures for Internal Control Systems." ▪ Continuously deepen pre-investment evaluation capabilities, paying attention to market economic trends, and simultaneously promoting cross-departmental cooperation to facilitate diversified evaluations. ▪ Automate the generation of post-investment management reports and optimize them, allowing the finance department to have more time to focus on reviewing and adjusting investment portfolios.	▪ Investment decision-making processes complied with both internal Winbond regulations and external regulatory authorities.
	Funds Management	▪ Funds Management Risk: Mainly arises from wrong financing decisions, causing significant funding gap, leading to credit risks where the company is unable to repay loans or pay interest on time.	▪ Assessed capital efficiency and repayment ability in advance to alleviate financial leverage risk and avoid impacting the stability of the company's financial structure due to excessive debt or improper fund allocation.	▪ Strictly follow relevant regulations to control fund management risks, such as "Regulations Governing Loan Management "and "Regulations Governing Fund Management Operation" ▪ Track cash flows generated by operations based on the five-year cash flow simulation provided by the accounting division, ensuring control over cash flow and future changes. ▪ Fund planning should ensure timely repayment and interest payments to reduce uncertainty and control fund management risks.	▪ Financing decisions and fund allocations complied with internal and external regulations, and were executed upon obtaining approval based on authority matrix. ▪ Regularly tracked changes in cash inflows and outflows to enhance control over cash positions.

Information Security Risk

Type of Risk		Description of Impact	Response Measures	Mitigating Actions	Progress
Information Security Risk	Information Management	▪ Information Management Risk: Vulnerabilities and threats at various stages of the data lifecycle could lead to data breaches, data integrity destruction, and data availability impairment. These risks further result in legal liabilities, financial losses, reputational damage, and decreased competitiveness.	▪ Personnel: Conducted regular data security awareness training and enhanced employee behavior monitoring. ▪ Technology: Established multi-layered security protection systems, adopted data encryption technology, implemented access control mechanisms, and conducted regular vulnerability scans. ▪ Processes: Classified and graded data based on its usage, sensitivity, and importance, stored it in different network segments, and adopted corresponding protection and control measures.	▪ Short-term: Established a data protection project, inventoried the company's business secrets and sensitive data, conducted data classification, grading, labeling, and management. ▪ Mid-term: Introduced automatic data labeling and advanced data encryption technology to ensure data security and convenient use. ▪ Long-term: Established an intelligent data leakage monitoring and prevention system to reduce damage caused by data breaches and cyberattacks.	▪ Significantly reduced data leakage risk: Enhanced data security. ▪ Strengthened regulatory compliance: Ensured data security management complies with relevant regulations. ▪ Increased customer trust: Maintained brand reputation and enhanced market competitiveness.
	Information Security	▪ Information Security Protection Risk: Originating from external threats (such as cyberattacks, malware, supply chain attacks) and internal threats (such as human error, malicious behavior, system vulnerabilities). These threats could cause system paralysis, service interruptions, data destruction or theft, leading to financial losses, legal liabilities, reputational damage, and decreased competitiveness.	▪ Personnel: Conducted comprehensive information security training, prevented phishing attacks, and strengthened incident reporting and response. ▪ Technology: Enhanced system protection, updated security patches, introduced firewalls and intrusion detection, and adopted multi-factor authentication. ▪ Processes: Established an information security management system, obtained ISO 27001 certification, and conducted regular security tests.	▪ Short-term: Strengthened endpoint protection and real-time monitoring of potential threats. ▪ Mid-term: Introduced threat intelligence and risk management systems, conducted penetration testing and red team exercises. ▪ Long-term: Introduced a zero-trust network architecture, established secure development processes, and developed AI defense capabilities.	▪ Improved network security protection level: Reduced cyberattack risks. ▪ Enhanced information security resilience: Shortened incident response time. ▪ Ensured business continuity: Reduced the impact of information security incidents on the company's finances and reputation. ▪ No information security incidents affecting company operations occurred in 2024. ▪ All employees received information security training: 100% completion rate.
	AI Application	▪ AI Application Risk: Covering multiple aspects including technology, operations, governance, compliance, ethics, and strategy, potentially leading to model performance instability, security incidents, decision errors, resource waste, and hindrance in transformation processes. Moreover, it causes financial losses, reputational damage, and decreased competitiveness.	▪ Personnel Training: Provided professional training for AI developers and users to enhance their understanding of decision-making risks, privacy protection, and governance risks. ▪ Data Management: Strengthened data quality control to ensure data accuracy and integrity. ▪ Risk Assessment: Conducted comprehensive risk assessments and reviews during the development and deployment of AI systems.	▪ Short-term: Enhanced data access control and protection, collaborated with legal and patent experts to reduce intellectual property risks. ▪ Mid-term: Strengthened talent training in the AI field, narrowed skill gaps, and established AI talent development and recruitment mechanisms. ▪ Long-term: Improved AI governance levels, established compliance systems, and ensured compliance.	▪ Reduced risks: Minimized decision errors, privacy breaches, and violations. ▪ Increased trust: Improved AI decision transparency, enhancing customer and partner trust. ▪ Enhanced competitiveness: Improved market position and competitive advantage through innovation and talent development.

Emerging Risk

Type of Risk	Description	Potential Impacts	Mitigating Actions
Geopolitical Risks	The U.S.-China rivalry and Taiwan Strait tensions have posed challenges to Taiwan's semiconductor industry. As trade friction and technological competition between the U.S. and China escalate, Taiwan has become a focal point for both countries. Security issues in the Taiwan Strait are also a concern for global companies, who worry about the stability of Taiwan's supply chain amid political uncertainty, which could impact semiconductor production. To mitigate their dependence on Taiwan, global companies are urging Taiwanese semiconductor firms to establish production bases in other regions. This strategy aims to diversify risks, ensure the stability of the global supply chain, and shield businesses from potential disruptions due to changes in Taiwan's political situation. In conclusion, Winbond should weigh the high investment costs of globalization in the current volatile global environment and enhance its risk management and contingency planning to stay competitive in the future market.	▪ China is actively supporting the localized semiconductor industry, which will increase the pressure of competition in the market. ▪ The U.S., Japan, and the European Union are inviting companies to set up factories in their countries, which will increase competition in the market. ▪ The supply of raw materials for semiconductors may be interrupted due to global or Taiwan Strait geopolitical or military actions, which may pose a challenge to operational stability. ▪ Winbond Group's semiconductor business has its main production base in Taiwan. In 2024, approximately 60% of the consolidated turnover was generated from its own wafer fabrication facilities in Taiwan. The remaining 40% is produced by foundries, with a portion also coming from their Taiwan-based facilities. In the event of a conflict in the Taiwan Strait, operations could be severely impacted.	▪ Find out the feasibility of transferring the production of foundry and packaging and testing companies to non-Taiwanese factories and reduce the proportion of manufacturing in Taiwan. ▪ Monitor the policy direction and implementing localization strategy by paying attention to the policy direction of each country. This includes the localization of product development and manufacturing. ▪ Establish a second warehousing and shipping center in Southeast Asia to diversify the risk of centralizing logistics in Taiwan and to provide customers with faster response time. ▪ Develop service-oriented business to increase added value and reduce dependence on manufacturing resources.
Risk of AI Applications	In the era of rapid development of AI technology, AI is expected to bring many growth opportunities for enterprises in terms of productivity enhancement, business modeling, and innovation. However, before the technology enters the maturity stage, AI application will also bring multiple and complex risks to enterprises, such as the security and reliability of the AI model itself, AI governance, ethics, privacy, and regulatory completeness, and so on. In the face of the global development trend led by AI, Winbond has been actively investing in various AI developments and applications. In addition to achieving concrete results in R&D, marketing, production and management, Winbond has also been considering the operational risks brought by AI and taking countermeasures. Overall, Winbond believes that through proactive risk analysis and management, we can accelerate and magnify the benefits of AI on business performance and minimize the negative impacts.	▪ At the stage of rapid development of technology and algorithms, technical issues such as insufficient data and defective models may lead to inaccurate analysis of data and decision-making suggestions, which in turn may lead to wrong business decisions and cause losses. ▪ More and more hackers are targeting the operation of AI, and competitors may use data contamination and parameter tampering to engage in negative business competition. ▪ The application of AI in decision-making may simultaneously create risks in terms of operation supervision, responsibility attribution, and legal compliance. ▪ AI is currently in a stage of accelerated growth, and if the application of AI lags its competitors, it may completely lose its original competitive advantage or even fall behind its competitors in a very short period of time.	▪ Winbond is actively enhancing talent recruitment, training, and algorithm development, while fostering partnerships with the AI industry and academia to improve AI tool quality used within Winbond. ▪ Winbond is strengthening network security against hackers, besides traditional network security, we focus on AI-specific protections and reinforce measures to prevent and verify hacking in algorithms and program codes, ensuring smooth data and algorithm operations. ▪ Winbond has established a hierarchical management system where supervisors and operators are accountable for their tasks while leveraging AI to boost productivity. Besides, Winbond continuously optimizes AI interfaces and ensures legal data use. Through our AI strategy of mass trials, rapid screening, and optimized promotion, ▪ Winbond maintains a competitive edge in the AI development process through extensive trials, rapid screening, and optimized promotion strategies. Dedicated AI teams swiftly assess and implement external tools or algorithms, continuously optimizing and enhancing AI applications as new solutions emerge.

1.5 Green Investment & Sustainability-Linked Loan

The whole world is facing the impact of climate change. As one of Taiwan's intensive electronics industry, we set up a green investment management unit to achieve the goal of green investment and create long-term value for investors and shareholders.

Green Investment Management Unit	As the basic operating unit, the Finance Department further submits relevant proposals to the board of directors for resolution, and the board of directors to participate in relevant decision-making together.
Responsibility	Assess the environmental, social and governance risks of investment projects, ensure that projects meet sustainable development goals, and make sustainable investment decisions.

1.5.1 Renewable Energy Investment

NT$ 955 million renewable energy investment plan

Cumulative investments in renewable energy development from 2022 to 2024, aiming to diversify power supply sources and increase investment returns.

In May 2022, Winbond acquired 15% equity in CHIA-HO Green Energy Corporation for NT$555 million, whose main business is to develop solar energy fields. Considering that its parent company, TCC Group Holdings, has valuable practical experience in the renewable energy industry. It will bring positive benefits to Winbond in fulfilling its corporate sustainable development goals, and help Winbond obtain part of the renewable energy electricity needed to move towards net-zero emissions goals.

In May 2024, Winbond participated in the joint establishment of Kai-Hong Energy Co., Ltd., with an expected investment of NT$ 400 million. Kai-Hong Energy's primary business involves investing in solar power generation and wind power generation infrastructure projects in Taiwan. Winbond's involvement in this joint venture not only aligns with the global and Taiwan 2050 net-zero goals, but also demonstrates its proactive engagement in green energy development. Apart from contributing to the company's net-zero emissions target through renewable energy, Winbond is progressively fulfilling its commitment to sustainable development.

As of April 2025, Winbond's board of directors has cumulatively approved NT$ 955 million in renewable energy investment plans. Going forward, Winbond will continue to seek suitable targets for green energy investment, laying the foundation for achieving net-zero emissions goal.

1.5.2 International Voluntary Carbon Credits

A total of 13,500 tCO_2e carbon credits

have been obtained since 2022 from voluntary carbon credit projects in 9 countries across Asia and Africa, creating diverse sustainable benefits.

In response to the global carbon neutrality trend and the 2050 net-zero goal, Winbond not only joined Singapore's global carbon exchange Climate Impact X (CIX) in 2022 and continued to participate in international carbon trading, but also became one of the first international carbon credits purchasers on Taiwan Carbon Solution Exchange (TCX) in 2023. By the end of 2024, Winbond had cumulatively obtained 13,500 metric tons of voluntary carbon credits from 9 countries in Asia and Africa.

The carbon credits obtained by Winbond are issued by international independent organizations such as Verra or Gold Standard. These credits cover various areas, including nature conservation, high-efficiency stoves, clean water sources, solar power generation, and wind power generation. The goal is not only to offset the company's own carbon emissions through carbon trading but also to achieve diverse sustainable benefits, such as protecting terrestrial and marine ecosystems, restoring water-related ecosystems, promoting investment in energy infrastructure and clean energy technology, and respecting the rights of local residents. Winbond's carbon credit projects align with 16 out of the 17 United Nations Sustainable Development Goals (SDGs).

While focusing on the semiconductor industry, Winbond also dedicates continuous and stable resources to participating in global carbon reduction initiatives, contributing to the sustainable survival and development of our planet.

The carbon credit projects include international voluntary carbon credit initiatives related to nature conservation, high-efficiency stoves, clean water sources, solar power generation, and wind power generation.

Establishing Internal Voluntary Carbon Credit Investment Standards in 2024

Rationale

Since 2022, Winbond has established internal carbon credit trading procedures, detailing various aspects such as responsibility division, quota authorization, and internal control systems. Starting in 2023, in response to international high-quality carbon credit investment strategy trends, Winbond further strengthened and established internal carbon credit investment standards.

Objective

- ✓ Optimized internal operating procedures to avoid purchasing controversial carbon credits.
- ✓ Developed an internal carbon credit checklist as a basis for subsequent carbon credit procurement.

Photo courtesy of Delta Blue Carbon Project

Evaluation Criteria	Note
Evaluation Criteria: Issuing Institutions that meet any of the following conditions: **International:** 1. The Verified Carbon Standards (VCS) 2. The Gold Standard (GS) 3. The American Carbon Registry (ACR) 4. The Climate Action Reserve (CAR) **Domestic:** Qualified inspection and certification institutions announced by the Ministry of Environment of the Executive Yuan	Necessary
Vintage The issuance year of the carbon credits should not exceed five years from the year of acquisition by the company	Necessary
UN SDGs Achieving three or more United Nations Sustainable Development Goals	Necessary
Risk Management 1. Transactions on compliant trading platforms domestically and internationally 2. Complete disclosure of project details and verification reports 3. Geopolitical stability of the country where the carbon credits are located 4. No major negative reports in the country where the carbon credits are located in the past three years	Necessary
International High-Quality Carbon Standards that meet any of the following conditions: 1. Compliance with Climate, Community & Biodiversity (CCB) 2. Compliance with The Core Carbon Principles (CCPs)	Prior
International Carbon Ratings that meet any of the following conditions: 1. BeZero: Carbon Rating A or above 2. Sylvera: Carbon Rating A or above 3. Calyx Global: GHG Rating B or above 4. Calyx Global: SDG Rating ★★★ or above	Prior

Zero Carbon Family Day

Held zero carbon family day for 3 consecutive years
Strengthening carbon reduction awareness among all employees and extending influence to the next generation.

Corporate sustainability and planetary sustainability are the same concept. This is not a new issue for Winbond. In daily operations, Winbond actively reduces waste and implements a carbon reduction culture. "Zero Carbon Family Day" is an example, using an educational and entertaining approach to encourage employees and their families to actively save energy and reduce carbon in their daily lives. This includes bringing their own eco-friendly lunch boxes, using eco-friendly cups, encouraging carpooling, ethical procurement, emphasizing environmental protection, avoiding waste, and driving electric vehicles, all contributing to mitigating climate change.

1.5.3 Sustainability-linked Loan

2 Years of Success: Achieving ESG Targets

In April 2023, Winbond signed a NT$20 billion sustainability-linked syndicated loan agreement, incorporating specific indicators for carbon reduction, energy saving, and corporate governance into the evaluation criteria. The actual performance of these sustainability indicators was regularly audited, and the results were rewarded to interest rate deduction. In June 2024, the bank confirmed that Winbond had achieved its annual sustainability targets for two consecutive years, resulting in a reduction of NT$1.89 million in interest expenses for 2024. The reduced interest rate conditions will apply to subsequent loan drawdown until the next audit period. Internally, the company also regularly tracked the achievement of various indicators to ensure the implementation of sustainable actions, working together with the syndicated loan group towards the goal of sustainable finance.

1.5.4 Sustainable Fixed Deposits

In 2024, Winbond continued to engage in sustainable development time deposits with banks for a period of at least three months. The funds were lent by the banks to other enterprises, utilized in various compliant green financing projects, or used to support green industries such as renewable energy or solar power plant investments and financing. Through diverse channels, Winbond participated in sustainable finance, further demonstrating its commitment to sustainable development.

1.6 Climate Change Management

Climate Change Management Framework (TCFD) Implementation Overview

Winbond introduced the Task Force on Climate-related Financial Disclosures (TCFD) framework to assess the risks and opportunities that climate change may bring by referring to the TCFD issued by the Financial Stability Board (FSB) TCFD task force. In 2023, we released our first TCFD report to review Winbond's operational resilience in the face of climate issues and enhance the transparency of climate information. In the same year, we also established the TCFD platform, providing a convenient management tool for climate change issues.

	Governance	Strategy	Risk Management	Metrics and Targets
Strategy and Actions	The Board of Directors, as the highest governance body for climate change, is responsible for guiding the company's response to and decision-making on climate change. The "ESG Committee" is established under the Board of Directors and chaired by the Chairman. The committee reported annually to the board of directors on the execution results of various sustainability initiatives, including climate change, to ensure the promotion and implementation of corporate sustainability efforts.	Discussion and identification of short-, medium and long-term climate risks and opportunities by the interdepartmental TCFD. Assessment of the possible impact on the company's financial or operation aspects for major risks and opportunities with high impact and high possibility of occurrence. Scenario analysis for major transition risks and physical risks.	Manage climate-related risks and integrating the processes into the companywide risk management framework. Establish a climate risk identification process based on the TCFD framework. For major risks and opportunities with high impact and high probability of occurrence, relevant units were asked to review and develop mitigation and adaptation measures.	Every year, statistics are gathered on the greenhouse gas emissions and water consumption of the CTSP Fab and the Kaohsiung Fab. The key performance indicators (KPI) - greenhouse gas emissions per unit of product and water recovery rate are set. The greenhouse gas emissions are verified annually by a third-party (ISO 14064-1). Target: Reduce greenhouse gas emissions by 60% by 2030 and achieve net-zero emissions by 2050.
Implementation	The Board of Directors passed a number of important climate-related proposals and reports, including capital expenditure plans for energy-saving equipment, solar power procurement projects, onshore wind power procurement projects, and offshore wind power procurement projects. These actions were taken to actively address the risks and challenges brought by climate change.	Identified 3 major climate risks and 6 minor climate risks, as well as 3 major climate opportunities and 3 minor climate opportunities. Qualitative or quantitative analysis of the financial or operational impact of major risks and opportunities. Regarding transition risks, simulations were carried out using three scenarios: (1) National net-zero pathway; (2) SSP1-1.9 scenario of IPCC AR6; (3) Science-Based Targets Net-zero pathway. Regarding physical risks, Winbond (Taiwan) followed the IPCC climate risk model, considered the three risk factors of hazard, vulnerability and exposure, and evaluated the risk value of the three potentials of flooding, debris flows and landslides caused by extreme precipitation under the four warming scenarios of RCP 2.6, RCP 4.5, RCP 6.0 and RCP 8.5.	The Risk Management Committee under the Board of Directors of the Winbond has established sound internal management regulations and operating procedures by organizing the existing departments or risk responsible units to carry out risk management on the areas of operation they are responsible for, and has incorporated climate change risk into long-term business operation management. The cross-functional TCFD project team was established by appointing relevant members from five cross-functional team under the ESG Committee, including Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. The TCFD project team discussed the impact of climate risks and opportunities toward finance and operations through workshops. The TCFD platform was continuously optimized, utilizing systematic tools to enhance the efficiency of the project team. Disclosed the climate risks and opportunities related assessment results and response practices in the TCFD report for review by the Winbond ESG Committee and representatives of various department heads to enhance the basis of promoting climate mitigation and adaptation actions.	Procurement of diverse renewable energy power: Near-shore floating solar power: Obtained 27 MW of power generation starting from April 2024. Onshore wind power: Obtained 9.24 MW of power generation in September and October 2024. Offshore wind power and solar power: The BoD resolved in November 2024 to procure 25 MW of offshore wind power and 48 MW of solar power for a 30-year term. [See 3.1.2.2 Renewable Energy Promotion Status] In 2024, obtained 43.96 million kWh of renewable energy power and 43,961 renewable energy certificates (T-REC). Invested in process research and development to reduce power consumption and improve productivity. Continued to promote sustainable procurement strategies and activities, sustainable risks assessment and management, and digital management of supplier ESG activities. Through the ISO 50001 energy management system, the equipment for major energy use was optimized. New measures in 2024 saved approximately 26.3 million kWh of electricity per year. In 2024, Winbond (Taiwan) reduced Scope 1 and Scope 2 greenhouse gas emissions by 1.1%. The company-wide water recovery rate was 81.9%, and the process water recovery rate was 89.3%, meeting the self-defined target values.

1.6.1 Climate Governance Framework

Winbond established the Winbond Corporate Social Responsibility (CSR) Committee in 2015 to serve as the key driver of the Company's sustainable development; in May 2022, the ESG Committee, which operates directly under the Board of Directors, was officially established as well. The Committee meeting should be held at least twice a year and is chaired by the Chairman. The purpose of the Committee is to plan the Company's sustainable development strategy and goals, formulate action plans, integrate company resources, and implement sustainability initiatives to enhance operational competitiveness.

The ESG Office and its five functional teams focusing on the areas of Environmental Sustainability, Green Product, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance were formed under the ESG Committee, which gives annual reports regarding the performance of the Committee to the Board of Directors to ensure the progress and implementation of corporate sustainable development. Members of the functional teams with the requisite expertise were tapped to form the TCFD project team.

The TCFD was coordinated by the Corporate Governance task force, which appointed members of the five functional teams with the requisite expertise to be Task Force members.

1.6.2 Procedures for Identifying Climate Change Risks and Opportunities

In 2024, Winbond convened representatives from 19 departmental units and group enterprises, with over 30 colleagues forming the TCFD project team. The team members were grouped according to the nature of their business, and each group discussed climate change issues relevant to their business. They used Winbond's internally developed TCFD platform to identify climate risks and opportunities, generate matrixes. The evaluation results had been reported in the ESG Committee meetings.

1. **Form a TCFD project team**
   Formed by members from 19 units, including Sales, Marketing, R&D, Resources, Subcon, Procurement, IT, Fab Facility, Public Affairs, Quality Management, Environmental Safety and Health, Legal and Human Resources, Finance, and Accounting.
2. **Create climate risk and opportunity list**
   Referencing the TCFD framework and CDP questionnaire items, and combining domestic and international regulatory trends and industry dynamics, a list of climate risks and opportunities was established, including 36 climate risks and 19 climate opportunities.
3. **Define evaluation criteria**
   Conducted evaluation based on impact degree, possibility of occurrence and time of occurrence.
4. **Generate risk matrix and opportunity matrix for each team**
   Each team identified major short-term, medium-term, and long-term risks and opportunities based on their impacts, possibility of occurrence , while considering their own business relevance.
5. **Develop the consolidated risk matrix and opportunity matrix**
   Aggregated the results from each team to generate the Winbond Climate Risk Matrix and Opportunity Matrix.
6. **Evaluate the financial and operational implications of major risks and opportunities**
   Conducted qualitative and quantitative analysis to assess potential financial impacts resulting from high-impact and high-likelihood risks and opportunities.
7. **Discuss response measures**
   Engaged relevant units to review and develop response measures for major risks and opportunities.

1.6.3 Climate Risk and Opportunity Matrix

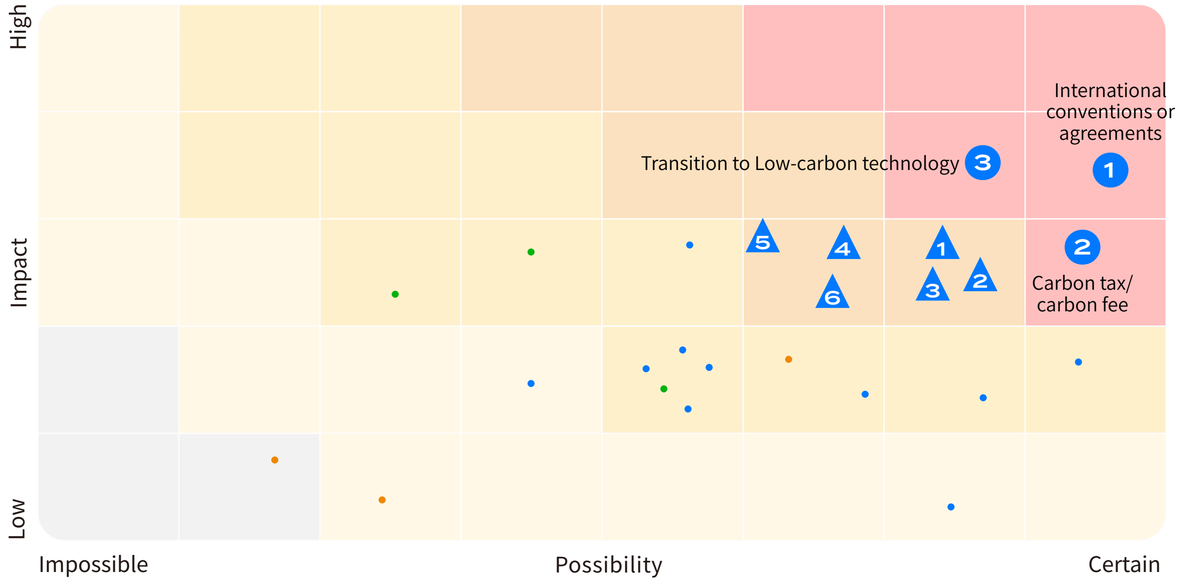
Through the course of workshops and educational training, and by utilizing Winbond's internally developed TCFD platform in 2023, Winbond identified climate risks and opportunities. From 36 climate risks (including 27 transition climate risks and 9 physical climate risks), Winbond identified 3 major climate risks and 6 minor climate risks. Additionally, from 19 climate opportunities, Winbond identified 3 major climate opportunities and 3 minor climate opportunities.

Possible Happening Time

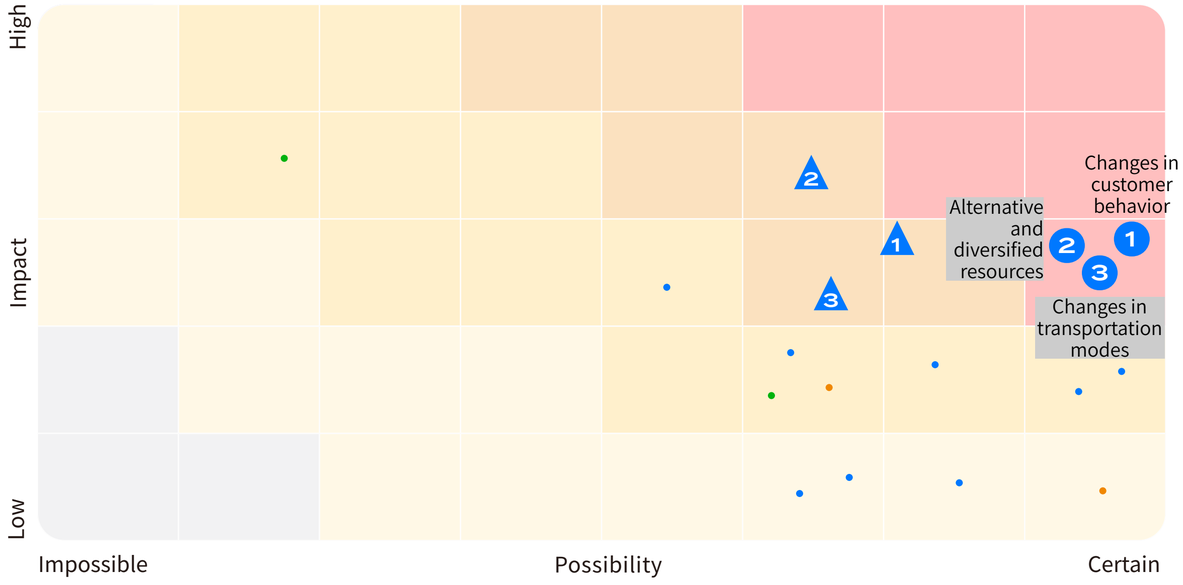
- Short-term : 1 to 3 years
- Mid-term:3 to 5 years
- Long-term : Over 5 years

Highlight Gray : New Major Opportunity added in 2024

Climate Risk Matrix



Climate Opportunity Matrix



Major Risk

1. International conventions or agreements
2. Carbon tax/carbon fee
3. Transition to Low-carbon technology

Minor Risk

1. Tropical cyclones
2. Changes in customer behavior
3. Environmental regulations
4. Uncertainty of new regulations
5. Greenhouse gas emissions cap-and-trade
6. Extreme rainfall and drought

Major Opportunities

1. Changes in customer behavior
2. Alternative and diversified resources
3. Changes in transportation modes

Minor Opportunities

1. Participate in renewable energy projects
2. Process optimization and R&D innovation
3. Obtain government collaboration and incentives

1.6.4 Impact and Response to Major Climate Change

Climate-related Risk Topics

Climate Risk		Time of Occurrence	Value Chain	Potential Financial or Operational Impacts (−) represents a negative impact (+) represents a positive impact	Response
Transitional Risk	International conventions or agreements	Short-term	▪ Company Operations	▪ Increase in indirect costs arising from the signing of the agreement (-) ▪ Increase in capital expenditure arising from the signing of the agreement (-) ▪ Reduce in carbon emissions leading to a decrease in carbon tax / carbon fee expenditure (+)	▪ Set the 2030 RE50 green electricity target to achieve the 2050 net-zero emission target ▪ Formulate a voluntary emission reduction plan to reduce greenhouse gas usage through process improvement, including accelerating the replacement of energy-saving components and installing exhaust gas treatment equipment at the machine end ▪ Establish on-site solar photovoltaic systems and purchase renewable energy power to increase the utilization rate of renewable energy
	Carbon tax/ carbon fee	Short-term	▪ Upstream or supply chain ▪ Company operations ▪ Downstream or end users	▪ Increase in indirect costs (-) ▪ Suppliers passed on their carbon tax/carbon fee expenditures, leading to increased procurement costs (-) ▪ Limited capacity expansion (-)	▪ Set the 2030 RE50 green electricity target to achieve the 2050 net-zero emission target ▪ Formulate a voluntary emission reduction plan to reduce greenhouse gas usage through process improvement, including accelerating the replacement of energy-saving components and installing exhaust gas treatment equipment at the machine end ▪ Establish on-site solar photovoltaic systems and purchase renewable energy power to increase the utilization rate of renewable energy ▪ Establish a carbon accounting system to achieve transparent management of carbon inventory and carbon footprint ▪ Establish internal voluntary carbon credit investment standards and continue to pay attention to the development of carbon credit offset systems ▪ Develop negotiation strategies to avoid unreasonable cost shifting by suppliers ▪ Manage suppliers with annual emissions greater than 25,000 tons, regularly collect and understand their reduction behaviors, and positively drive them to reduce carbon emissions through regular sustainability evaluations of suppliers
	Transition to Low-carbon technology	Short-term	▪ Upstream or supply chain ▪ Company operations	▪ Capital expenditure for equipment (-) ▪ R&D costs increase (-) ▪ Reduce in carbon emissions leading to a decrease in carbon tax/carbon fee expenditure (+)	▪ Implemented ISO 50001 Energy Management System, conducted energy audits, and continuously improved optimization. ▪ Executed energy-saving projects for production machinery and facilities infrastructure, including adding variable frequency drives to machine pumps, installing local scrubbers for exhaust treatment, and improving energy efficiency of the Make-up Air Handling Unit (MAU) water washing system. ▪ Utilized renewable energy sources to reduce greenhouse gas emissions. ▪ Continued engaging with outsourcing partners to develop low-carbon materials and optimize packaging processes. ▪ Actively monitored market transactions to mitigate procurement cost increases caused by information asymmetry.
Physical Risk	Tropical cyclones	Short-term	▪ Upstream or supply chain ▪ Company operations ▪ Downstream or end users	▪ Impact on production and revenue (-) ▪ Automated production lines continued to operate, legally paid overtime, leading to increased labor costs (-) ▪ Impact on supplier deliveries and Winbond production (-) ▪ Increase in natural disaster insurance premiums (-)	▪ Adopted automated production to reduce manual operation requirements ▪ Utilized digital tools to enhance remote work efficiency ▪ Promoted relevant countermeasures to suppliers, such as strengthening fab infrastructure and drainage facilities, and conducting daily drills ▪ Established a 24-hour emergency response team and continuously monitored disaster situations at suppliers' locations.

Due to the implementation of the aforementioned measures, the estimated management costs for 2024 are as follows:

- The budget for ESG-related equipment replacement is approximately NT$ 120,000,000.
- Maintenance cost for on-site solar photovoltaic systems is approximately NT$ 700,000 per year.
- Other associated costs encompass personnel training expenses related to sustainability topics, human resource costs for supplier engagement, and personnel costs for digital resources and event execution, among others.
- Subsidy for low-carbon raw material suppliers is NT$ 1,250,000 per year.
- Increased electricity cost for using green electricity compared to using gray electricity is approximately NT$ 87,000,000 per year.
- Verification cost for low-carbon materials and processes is NT$ 1,500,000 per year.

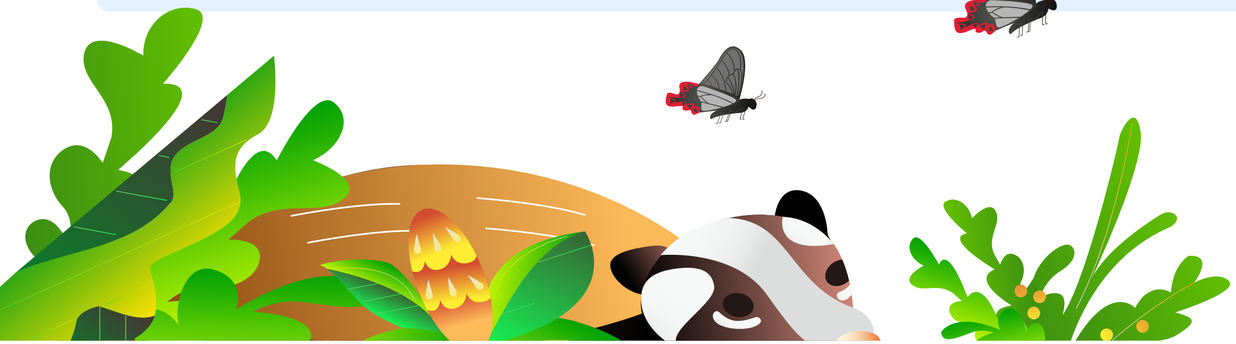
Note: The primary climate risks identified in 2024 were all transition risks. Considering the completeness of the climate risk assessment, the "tropical cyclones," which had the highest impact and likelihood among the physical risks in 2024, was included in the assessment.

Climate-related Opportunity Topics

Climate Opportunities	Time of Occurrence	Value Chain	Potential Financial or Operational Impacts	Response
Changes in customer behavior	Short-term	▪ Upstream or supply chain ▪ Company operations	▪ Product portfolio changes accelerated the positive development of the overall supply chain. ▪ Obtaining orders and expanding revenue ▪ Increased order stability and reduced revenue fluctuations ▪ Enhanced company reputation.	▪ Continuously understood customer requirements and specifications for green products, developed low power consumption and low carbon emission products to meet their needs. ▪ Increased the use of renewable energy in line with customer requirements, and continued to discuss with outsourcing partners to develop low-carbon materials and processes, launching products manufactured with renewable energy. ▪ Established a carbon emission information platform that integrates and manages carbon emission data to facilitate green and low-carbon production. ▪ Participated in global sustainability-related evaluations, enhancing the transparency of sustainability practices.
Alternative and diversified resources	Short-term	▪ Upstream or supply chain ▪ Company operations	▪ Enhanced supply chain reliability. ▪ Reduced production costs.	▪ Conducted comprehensive traceability for key raw materials, achieving 100% of the 14 predetermined goals. ▪ Regularly reported information on material supply, costs, and alternative materials, continuously monitoring the development of specific raw materials in their places of origin and distribution worldwide.
Changes in transportation modes	Short-term	▪ Upstream or supply chain ▪ Company operations	▪ Reduced indirect costs. ▪ Reduced carbon emissions leading to a decrease in carbon tax/ carbon fee expenditures.	▪ Completed localized procurement of five key materials in 2024, achieving a carbon reduction of 7.2 metric tons of CO_2 equivalent by reduced transportation distances.

Due to the implementation of the aforementioned measures, the estimated management costs for 2024 are as follows:

- Maintenance cost for self-built renewable energy generation devices is approximately NT$ 700,000 per year.
- Verification cost for low-carbon materials and processes is NT$ 1,500,000 per year.
- Increased electricity cost for using green electricity compared to using gray electricity is approximately NT$ 87,000,000 per year.
- New product design and process development costs.
- Subsidy amount for low-carbon raw material suppliers is NT$ 1,250,000 per year.
- Labor costs for developing suppliers and communicating with them.



1.6.5 Scenario Analysis

1.6.5.1 Transition Risk Scenario Analysis

Considering Winbond is a group based in Taiwan with a global market perspective, three scenarios were adopted for transition risk simulation. In addition to examining the risks of current domestic regulations, the impact of international carbon reduction trends was also included in the assessment. The three transition risk scenarios include: (1) National Net-zero Pathway; (2) SSP1-1.9 Low Emission Scenario from the Intergovernmental Panel on Climate Change (IPCC): Derived from the IPCC's sixth scientific assessment report.; (3) An annual reduction rate of 4.2% as required by the Science-Based Targets Net-zero (SBT-NZ) Standard for carbon emissions. The scope of the transition risk scenario analysis covers the group's main fabs and offices.

External Scenarios	Description	Assessed Sources of Emissions
National Net-zero Pathway	Based on Taiwan's current net-zero target	Scope 1 + Scope 2
SSP1-1.9	Based on the SSP1-1.9 pathway in the IPCC Sixth Assessment Report	
SBT-NZ	Based on the emissions reduction pathway required to achieve the SBT's net-zero criteria by 2050	

The issue of climate change is expected to have financial impacts on Winbond in terms of regulations, technology, market, and reputation. Among these, the introduction of carbon tax/carbon fee and fee, compliance with regulations for intensive electricity users to use of renewable energy electricity are estimated to result in a financial impacts of approximately NT$ 0.2~7 billion by 2030, which is about 0.3%~9% of revenue in 2024.

Carbon Tax Imposition

External Scenarios	Assumption	Estimated Financial Impact in 2030
National Net-zero Pathway	Estimated at US$2 to 10/t$CO_2$e from 2021 to 2050 by referring to SSP2-4.5	<NT$50 million
SSP1-1.9	It will reach about US$650 per ton CO_2e in 2050 by referring to SSP1-1.9	>NT$5 billion
SBT-NZ		

Carbon Fee Imposition

External Scenarios	Assumption	Estimated Financial Impact in 2030
National Net-zero Pathway	Estimated at the general rate of $300/t$CO_2$e Single fab carbon emission exemption quota of 25,000 tCO_2e/year	<NT$200 million
	Estimated at preferential rate A of $50/t$CO_2$e Single fab carbon emission exemption quota of 25,000 tCO_2e/year	<NT$50 million

Regulation of Renewable Energy

External Scenarios	Assumption	Estimated Financial Impact in 2030
National Net-zero Pathway	Procurement costs were estimated based on the average wholesale price of Taipower's renewable energy power plus the supply cost. The maintenance cost of solar photovoltaic systems was estimated based on the average maintenance cost in the IRENA report.	<NT$50 million
SSP1-1.9		
SBT-NZ		

Note 1 The Scope 1 and Scope 2 carbon emissions after 2025 were estimated data. The estimation was calculated by comprehensively considering the actual emissions in 2024, the future medium- and long-term average emission growth trends, and the predicted values of the electricity emission factor.

Note 2 Considering the current international trend towards carbon taxation, carbon fees is only considered under the national net-zero pathway scenario.

1.6.5.2 Physical Risk Scenario Analysis

Physical Risk Scenario Analysis of Winbond(Taiwan)'s Major Location

Winbond followed the IPCC Sixth Assessment Report to assess the risk of flooding, debris flows, and landslides in Winbond(Taiwan) under extreme precipitation. Referencing data from the Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP), National Science and Technology Council (NSTC), and National Science and Technology Center for Disaster Reduction (NCDR), scenario simulations were conducted using four climate models: RCP2.6, RCP4.5, RCP6.0, and RCP8.5 to avoid biased results .

The results showed that by the end of the 21st century, Winbond (Taiwan) 's main fabs and offices (including the CTS Fab, Kaohsiung Fab and Zhubei Building) have a risk level of 0 (low possibility of flooding, debris flows, and landslides) under four scenarios.

For further information related to the financial disclosure of climate risks, please refer to the TCFD report.

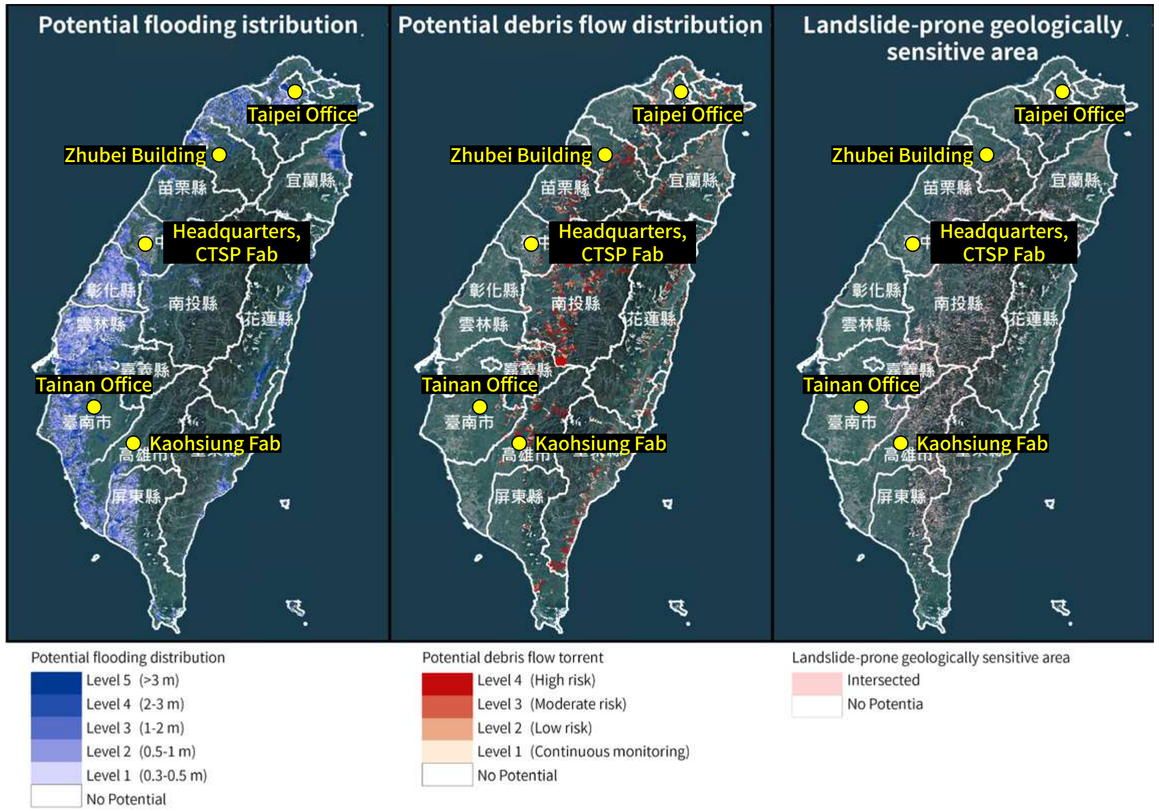
Physical Risk Scenario Analysis of Nuvoton(Taiwan) and Nuvoton(Japan)

Nuvoton followed the IPCC Sixth Assessment Report, adopting the worst-case global warming scenario SSP5-8.5 and high emission scenario SSP3-7.0, combined with data from the Taiwan Climate Change Projection Information and Adaptation Knowledge Platform, to assess the potential financial impact of typhoons, droughts, and other extreme weather events, as well as rising average temperatures on Nuvoton (Taiwan) and Nuvoton (Japan).

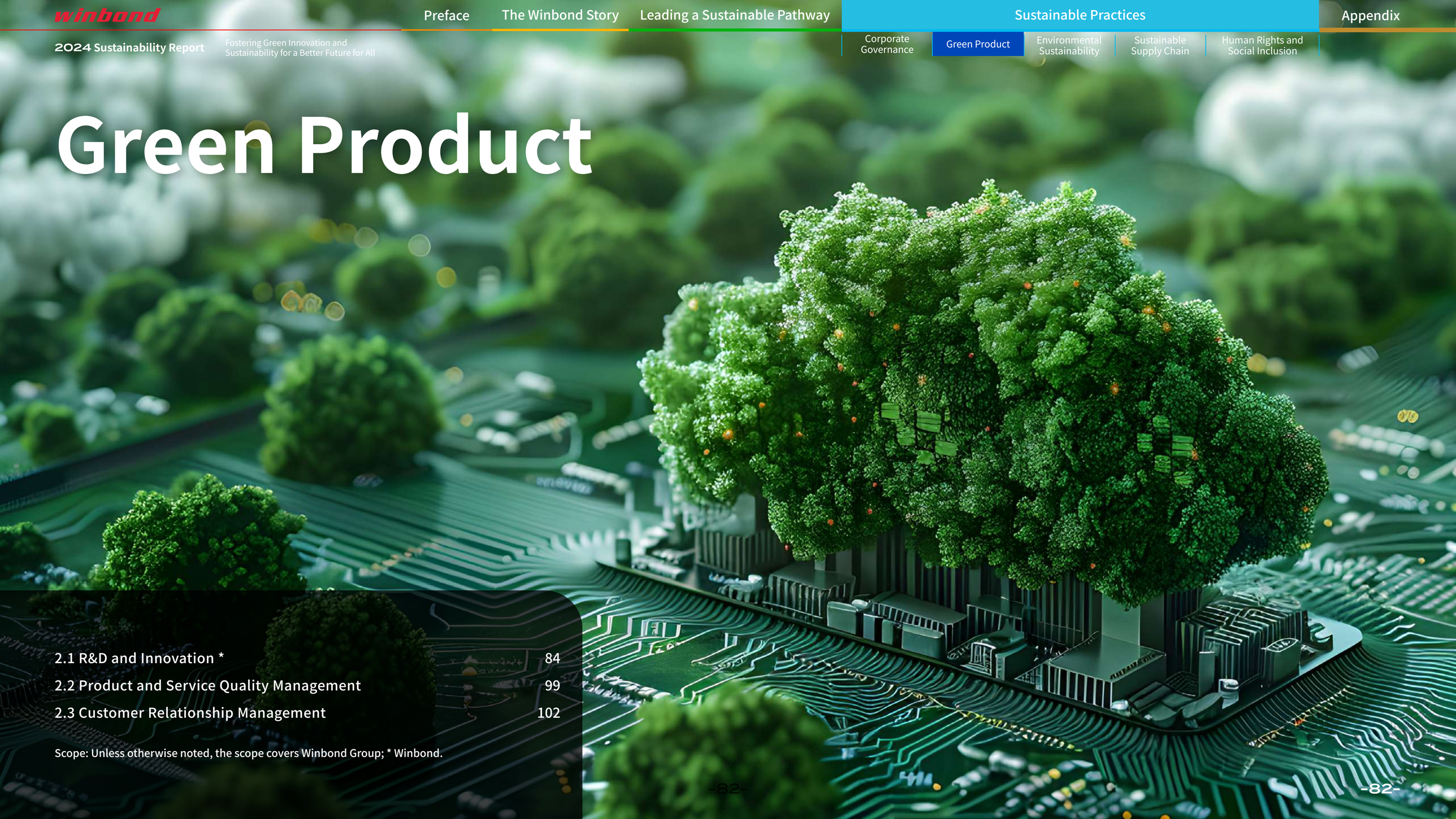
Risk analysis showed that extreme weather could lead to production interruptions, increased costs, operational impacts, and reputational damage. Under both scenarios, the potential impact on Nuvoton's revenue in 2030 was estimated at 0.1%. Rising average temperatures were projected to increase labor and operational costs, with a potential impact on Nuvoton's revenue in 2030 ranging from 0.8% to 1.2%.

For further information related to the financial disclosure of climate risks, please refer to Nuvoton's annual TCFD reports.

Physical Risks Scenario Analysis for Winbond (Taiwan) Major Location



Green Product



2.1 R&D and Innovation * 84
2.2 Product and Service Quality Management 99
2.3 Customer Relationship Management 102

Scope: Unless otherwise noted, the scope covers Winbond Group; * Winbond.

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Winbond combines its core competencies and innovative technologies with sustainable energy conservation and carbon reduction goals, and strictly controls every aspect of its products through R&D and optimization from multiple perspectives, such as green product design, information system digitization, and process efficiency improvement. Winbond is committed to delivering the best quality products to customers, so that the carbon emissions of products reaching end customers and consumers can be minimized, and while enjoying the convenience of science and technology, we are friendly to the global environment and help the entire value chain effectively reduce carbon emissions.

Net-zero carbon emissions have become a global consensus. Through the use of green materials, green product design, green electricity production and carbon emission reduction, Winbond has achieved the goal of carbon reduction and electricity saving in the production process and the manufacturing and use of end products. Winbond continuously optimizes the design and manufacturing process of its products, making the chips smaller, reducing power consumption, and using small and low-temperature soldering materials to encapsulate them, effectively saving materials and carbon emissions per unit, while reducing energy consumption, so as to achieve the vision of being a hidden champion in providing sustainable semiconductors to enrich human life.

Jen-Lieh Lin

Vice President, Flash Memory IC Business Group

2024 Performance Highlight

Save 50% Power consumption

- Industry-leading, launched the world's first NOR Flash that supports an operating voltage of 1.2V
- The 1.2V NOR Flash uses 50% less power than the 1.8V NOR Flash

Reduce product carbon emission by 60%

- Products manufactured using renewable energy were shipped starting in December 2024.
- Compared to conventional energy, products manufactured using renewable energy had approximately 60% less carbon emissions.

TIPS Verification Grade A

Passed Taiwan Intellectual Property Management System (TIPS) verification.

Achieved a Platinum Rating in RBA VAP

Winbond's Kaohsiung Fab conducted its first RBA VAP verification, achieving a platinum rating alongside the CTSP Fab

Save 90% power consumption

- LPDDR4/4X voltage was reduced to 1.1V/0.6V.
- In standby mode, it saved 90% of standby power consumption compared to standard DDR4.

Establishing a Carbon Accounting System

Constructed a comprehensive carbon accounting system, utilizing big data collection and aggregation to present the carbon emissions of individual products.

Selected as one of the Clarivate Top 100 Global Innovators

Selected for 3 consecutive years as one of the Clarivate Top 100 Global Innovators

Accumulated over 5,300 approved global patents

2.1 R&D and Innovation

2.1.1 Innovation in Technology and Services

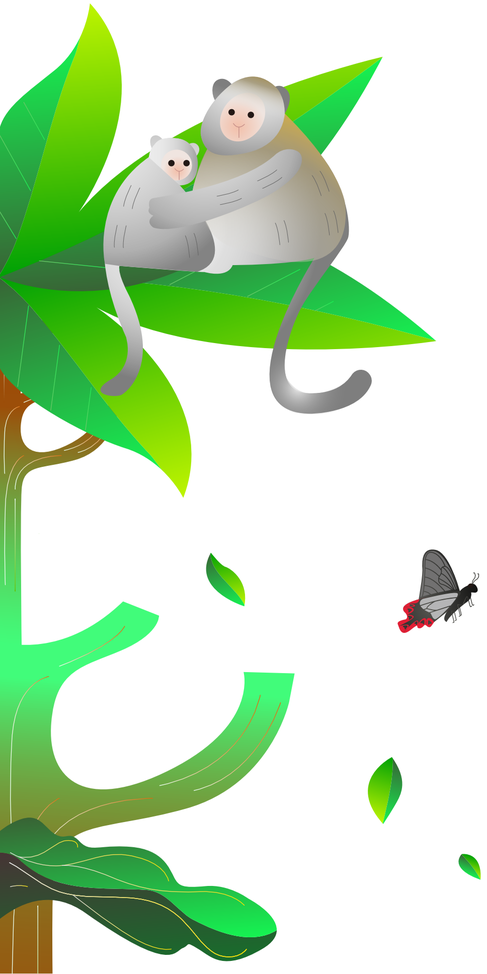
Winbond provides global customers with comprehensive specialty Memory solutions. Core products include Code Storage Flash Memory, TrustME® Secure Flash Memory, Specialty DRAM, and Mobile DRAM, making Winbond the only Taiwanese manufacturer with proprietary technologies in both Flash and DRAM. Winbond leverages the synergies generated by its product portfolio and adopts a green product design philosophy to meet diverse customer needs. This enables customers to combine their expertise with Winbond's innovative green products for applications in hand-held devices, consumer electronics, computer peripherals, artificial intelligence, automotive, and industrial electronics markets. To achieve environmental friendliness and sustainable growth while providing customers with high-quality and innovative products and services, Winbond continuously invests in research and development, technology, and talent. Winbond is committed to developing innovative products and technologies and remains focused on the following issues:

1. Development of green products in Flash memory, Secure Flash memory, Specialty DRAM, and Mobile DRAM
2. Development and production processes of green products, along with achievements in carbon reduction and energy saving
3. Key technology development focusing on high performance, small size, low energy consumption, high quality, and security
4. Refinement in design and process miniaturization
5. Innovation and intellectual property management

Key Technology	Products	Application
Low-Power NOR Flash Memory	**1.2V Flash Memory** ▪ Winbond launched the market's first 1.2V 64Mb QspiNOR Flash Memory: W25Q64NE. ▪ 128Mb was launched in 2024, and other capacities ranging from 8Mb to 256Mb are expected to be available in 2025.	▪ Wearable devices and other low-power application products. ▪ Meeting the low operating voltage requirements of advanced processes can eliminate the need for power management IC (PMIC), further reducing costs and area.
High Performance NAND Flash Memory	**8-channel NAND Flash Memory (Octal NAND)** ▪ Winbond's 46nm serial NAND Flash memory technology launched the market's first high-speed NAND Flash memory supporting 8-channel input/output. ▪ It can support products requiring higher capacity and high transmission speed applications.	▪ Automotive electronics (such as dashboards, driver assistance applications), meeting the needs for quick startup and rapid firmware updates. ▪ Smart visual doorbells, meeting the needs for quick startup detection applications.
Secure Flash Memory	**Anti-Quantum Computing Attack, Integration of PQC (Post-Quantum Cryptography) Secure Flash Memory with Leighton-Micali Signature (LMS) Algorithm** ▪ Supported asymmetric key encryption algorithm (Leighton-Micali Signature, LMS), enabling devices to achieve secure OTA requirements through LMS-OTS (One-Time Signature) as specified by NIST800-208. ▪ The component supported a high-performance 166MHz Quad-SPI interface and expanded Replay-Protected Monotonic Counter (RPMC) support, increasing to 8 counters, suitable for security enhancement and data protection in personal computers (UEFI and BIOS).	▪ The first memory supplier to integrate the LMS algorithm, meeting emerging security regulatory requirements and setting new standards in the industry. Optimized for industrial IoT, network, server, and critical infrastructure applications.
Low-Power Mobile Memory	**LPDDR4/4X 100 BGA Mobile Memory** ▪ Data transfer rate reached 4267 Mbps, voltage reduced to 1.1V/0.6V to lower power consumption, featuring low power consumption and high performance. ▪ 100BGA package, compared to the standard 200BGA package, size reduced by 50%. The reduction in package size also means that carbon emissions related to the package can be reduced by 50%.	▪ Automotive electronics, 5G mobile devices, wearable devices, IoT devices, and edge AI computing applications.

Semiconductor Industrial Chain

Winbond possesses an advanced and complete semiconductor industrial chain and professional specialization. This includes IP (Intellectual Property Rights) design and IC (Integrated Circuit) design, wafer fabrication, chip probing, and outsourced assembly and testing.



Upstream
- IP design /IC design contractor services → IC Design

Midstream
- IC /Wafer fabrication
  - Production process and testing equipment
  - Photomask
  - Chemical products

Downstream
- IC Packaging and Testing → IC modules
  - Production process and testing equipment
  - Lead frame
  - Printed circuit board
- IC distributors

Hidden Champion
Global leader in Known Good Die(KGD) Market share in niche markets

NOR Flash Products
Number one in global market share

Note Known Good Die (KGD): Refers to wafers which are not immediately packaged after being manufactured, but instead provided to customers and packaged into a single chip along with other products. Rigorous product quality standards thus need to be met for these products, in order to ensure that the functions of the final product would not be affected.

Reduce packaging

Known Good Die（KGD）

In the era of portable electronic products and the Internet of Things (IoT), Winbond continues to reduce the carbon footprint of its products. With years of expertise in KGD technology, Winbond collaborates with chip manufacturers to provide System in Package (SiP) multi-chip packaging solutions. This involves packaging memory chips together with logic chips in a KGD sales model, contributing to net-zero and environmental sus- tainability efforts by creating energy-efficient and low-carbon footprint end-products.

Many customers leverage Winbond's expertise to use KGD flash memory products for System-in-Package (SiP) solutions. Flash memory chips are stacked with controller chips and placed into single packages or mod- ules to provide SiP solutions. Other components' KGD can also be stacked with flash memory KGD, leading to savings in packaging materials, improved performance, reduced power consumption, and chip area optimization.

Winbond supports the low-temperature soldering process, resulting in a reduction of 57 mt of CO_2 emissions per year note for each surface-mount technology production line.

Low-temperature soldering process（LTS）

To mitigate global warming, Intel introduced the Low Temperature Soldering (LTS) process as early as 2017. According to calculations, reducing the Surface Mount Technology (SMT) temperature from the 220~260°C range of lead-free processes to approximately 190°C in low-temperature soldering processes significantly reduce carbon emission. The International Electronics Manufacturing Initiative (iNEMI) predicts that the market share of products using low-temperature soldering technology will increase from around 1% to over 20% by 2027, demonstrating the electronics industry's commitment to environmental issues and sustainable development.

In line with the "green electronics" trend, Winbond has launched flash memory products compatible with the low-temperature soldering process. These products comply with JEDEC standards and have undergone reliability verification procedures such as drop, vibration, and temperature cycling tests. This ensures that the products fully support the LTS process without quality concerns, contributing to environmental protection and sustainable development efforts.

Note Quoted from Intel's 2017 introduction to Low Temperature Solder (LTS) process.

Code Storage Flash Memory

Winbond is a leading manufacturer of flash memory, continuously striving to reduce the carbon footprint and power consumption of its products. For example, with the evolution of the process to the new generation of 45nm products, the area of a single die has been significantly reduced. In addition, the new generation of products also supports smaller packaging types, greatly reducing the carbon footprint of Flash products during wafer manufacturing and packaging stages. Taking the 128Mb NOR Flash in the new generation 45nm PW series as an example, its single die area is reduced to 50% of the 58nm product of the same capacity, and it can support smaller USON packaging. Ultimately, the carbon footprint is reduced by 18% compared to the 58nm FW series. Based on the sales volume of the new generation Serial NOR Flash in 2024, it saved 5.6 tCO_2e compared to the 58nm products.

The area of a one-dollar coin is approximately four times that of SOP 16 and twenty-six times that of USON 8 4x3 mm^2

Additionally, in terms of power consumption and extending battery life, Winbond developed new processes and circuit architectures. It introduced the world's first NOR Flash supporting an operating voltage of 1.2V. When paired with SoCs designed with advanced processes for low voltage, it achieved high-performance reading while significantly reducing power consumption, thus meeting the goals of high efficiency and energy savings.

1 .2V NOR Flash		
	Total power consumption	**Compared to the current 1.8V NOR Flash, the power consumption was reduced by 50%.** Under the usage scenario of 8 hours of operation per day, with 80% reading, 10% standby, and 10% sleep mode, after 3 years of use, based on the total sales of 1.2V NOR Flash in 2024, it saved 537,948 kWh of power consumption (equivalent to 1,936,612 million joules) compared to 1.8V NOR Flash, approximately reducing 255 tCO_2e, which is equivalent to the carbon sequestration of 0.66 Daan Park for a whole year
	Performance	Maintains similar transition level as 1.8V/3V Flash
	Product applications	Wireless headphones, smart watches, smart wristbands, smart glasses, and other wearable devices with high power-saving requirements

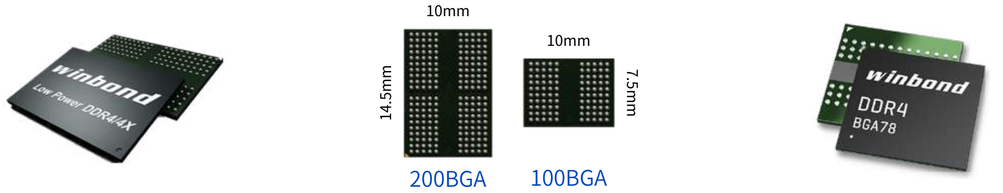
Note Based on the emission factor of 0.474 kg CO_2e/kWh announced by the Ministry of Economic Affairs in 2024, and the data published by the Forestry and Nature Conservation Agency, Ministry of Agriculture and the Taipei City Government Land Administration Bureau: 25.93 hectares, carbon sequestration factor of 14.9 metric tons of CO_2e/hectare/year, Daan Park's annual absorption of 386 metric tons of CO_2e was calculated

Customized Memory Solution (CMS)

Winbond launched the 100 BGA LPDDR4/4x solution with high performance and low power consumption advantages. Its data transfer rate reached 4,267 Mbps, significantly improving data transfer speed compared to DDR4 3200 Mbps, resulting in superior performance. In terms of power consumption, LPDDR4/4x voltage was 1.1/0.6V, greatly reducing power usage. To meet the low power consumption needs of emerging mobile and smart devices, this series' low power consumption characteristics effectively extended battery life.

The solution adopted a smaller 100BGA package, reducing its size by 50% compared to the standard 200BGA package. The reduction in package size also meant that carbon emissions related to packaging could be reduced by 50%. The 100BGA package was fully downward compatible with existing 200BGA single die package (SDP). By adjusting the PCBA layout, customers could directly adopt this advanced memory packaging solution without large-scale rework, thereby reducing resource consumption. Additionally, to meet the low power consumption needs of emerging consumer trends such as wearable and smart devices, Winbond launched the 1.2V HYPERRAM, which saved 33% power consumption compared to the original 1.8V HYPERRAM. Combined with high transfer rates, it provided customers with competitive and long-lasting battery life design solutions for smart wearables.

In 2024, Winbond focused on the development of DDR4 niche memory and launched the first 20nm DDR4 product. Compared to DDR3, DDR4 offered higher bandwidth and lower power consumption, providing better performance and efficiency. It was widely used in high-end industrial computers and industrial control devices, high-specification television and audio-visual equipment, and enterprise-grade network equipment. Additionally, through the evolution of process technology nodes, the product's carbon emissions were reduced. The next-generation 16nm DDR4 product is expected to be launched in 2025.



LPDDR4/4X

Winbond's LPDDR4/4X DRAM, the fourth generation of low-power memory, achieved a data transfer rate of 4,267 Mbps. In terms of energy consumption, with the VDDQ voltage reduced to 1.1/0.6V, it significantly lowered power usage, effectively extending battery life and achieving high performance and energy-saving goals.

100BGA Form Factor

Winbond's latest packaging, 100BGA LPDDR4/4X, has a size of only 7.5x10 mm2, which is 50% smaller compared to the 200BGA 14.5x10 mm2, and reduces packaging-related carbon emissions by 50%. The 100BGA packaging is fully downward compatible with the existing 200BGA single-chip packaging, allowing for adjustments to the PCBA layout without requiring extensive rework, thereby reducing resource consumption.

DDR4

In 2024, Winbond launched the 20nm DDR4 product, which offers higher bandwidth and lower power consumption compared to DDR3, providing better performance and efficiency. With the advancement of process technology nodes, its process carbon emissions can continue to decrease, and the 16nm DDR4 product is expected to be launched in 2025.

Secure Flash Memory

"Security" is not only a technical issue, but also a social and ethical issue. Security has significant impacts on the welfare and rights of society, economy, environment, individuals, and organizations, especially in today's digital transformation era and the economic losses and security threats caused by hackers through security vulnerabilities. Security ensures the confidentiality, integrity, and availability of data, information, and assets, preventing unauthorized access, modification, or destruction. Security also enables trust, privacy, and compliance in various sectors such as finance, healthcare, education, and government. However, security is not a one-time task or a static state. It requires continuous monitoring, updating, and improvement to address evolving challenges networks to the cloud, from users to devices. Therefore, security requires a comprehensive approach covering all aspects of systems and their environments.

In today's internet-connected world, daily life electronic devices and IoT devices rely on Flash memory to store control code and data protection. However, the widespread presence of these devices also makes them targets for hackers. Hackers often exploit system security vulnerabilities to access end-user's private data, plan large-scale attacks on enterprise infrastructure through networks and IoT devices, and even sabotage and espionage activities on government infrastructure.

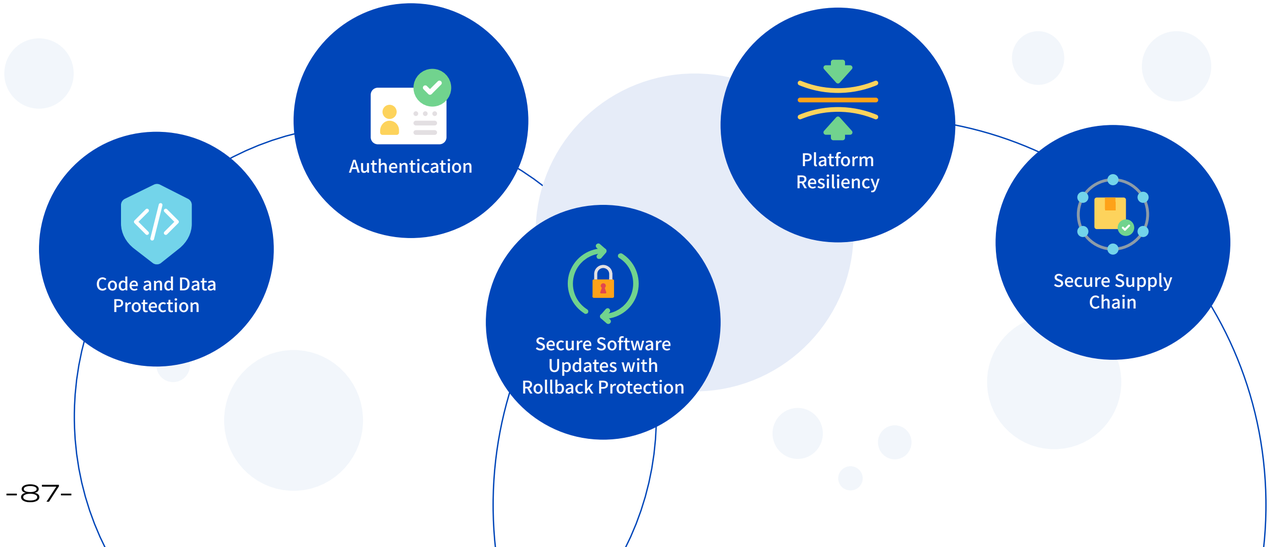
Winbond recognizes the severity of these challenges and has pioneered the development and launch of the TrustME® Secure Flash Memory product line. Secure memory is used to store sensitive data and code such as encryption keys, passwords, certificates, and firmware. Secure memory ensures that data and code are protected from unauthorized access, modification, or leakage both physically and logically. Secure memory also provides functions such as encryption, authentication, tamper detection, and self-destruction to enhance security levels and prevent attacks. These cutting-edge solutions are designed to protect Winbond customers' assets and create secure platforms, thus safeguarding end-users in various fields. Winbond's secure Flash memory is applied in consumer IoT, industrial IoT, servers, networks, and automotive sectors. Winbond is committed to protecting customers from emerging cyber- security threats. In anticipation of the upcoming post-quantum computing era, Winbond recently launched secure Flash memory enhanced with post-quantum encryption technology (PQC), ensuring that customers continue to enjoy robust protection in the evolving cybersecurity environment.

TrustME® Secure Serial Flash Memory W75F

The W75F memory series was developed in response to the high security identify verification needs of mobile payment services and other applications, and due to confidential data storage requiring encrypted system hardware modules to pos- sess EAL 5+ security certification. Products in the W75F series are the first secure Flash memory solution in the world to obtain Common Criteria (CC) EAL 5+ certification. They also support secure eXecute-in-Place (XiP), and are able to protect the confidentiality and integrity of codes and data stored in IoT devices.

TrustME® Secure Serial Flash Memory W77Q / W77T Series

The W77Q and W77T, compatible with traditional SPI specifications, offer essential security features for IoT endpoints, automotive, networks, and other types of connected devices. These features include hardware root of trust, secure boot, platform resilient, supply chain security confirmation, and robust data protection. Even if the host processor is compromised, the W77Q and W77T facilitate secure over-the-air software updates.



2.1.2 Green Products

Winbond foresees the market trends of new generation products and continuously invests resources in pursuing green semiconductor design, energy-saving and carbon-reducing production technologies, green energy production, and sustainable innovation of products, aiming to enhance the competitive advantage of green products while providing customers with high-quality products and service support.

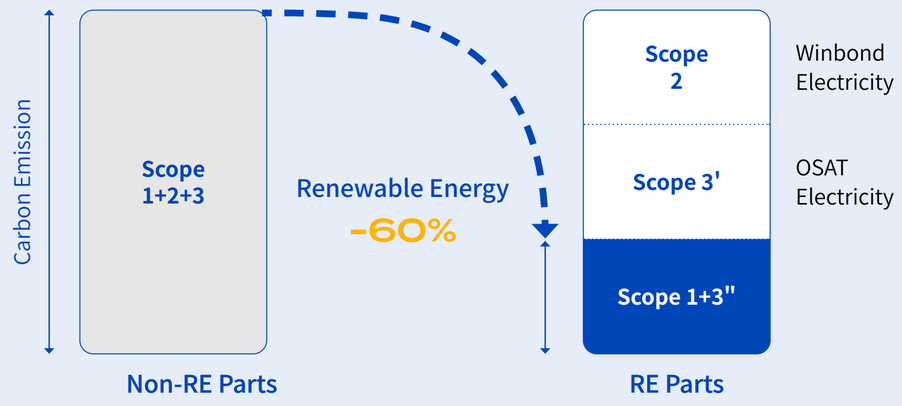
Winbond Green Product Manufacturing: Utilizing Renewable Energy for Product Manufacturing Demonstrates Commitment to Sustainable Development

Winbond actively promoted product innovation by reducing hazardous substances and carbon emissions in the manufacturing process, shortening production cycles, and lowering manufacturing costs. This approach helped develop smaller, more energy-efficient, and environmentally friendly products with low carbon emissions, while reducing the materials, electricity, carbon emissions, and power consumption of end devices during use, further reducing the carbon emissions of production electricity.

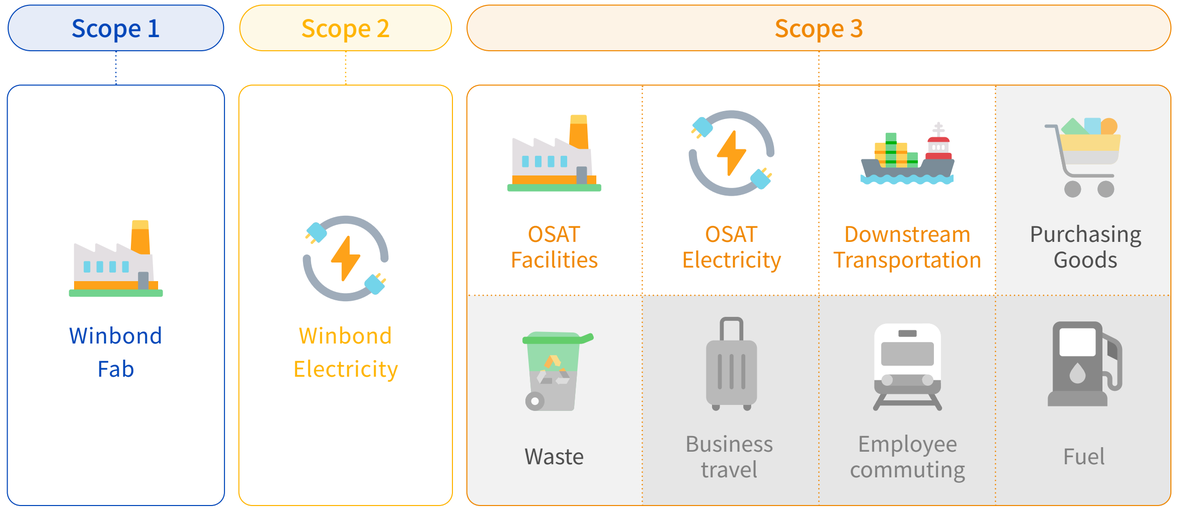
To further reduce the environmental impact of production and manufacturing, Winbond began using renewable energy for product manufacturing in 2024 and extended it to downstream packaging and testing plants. Green products manufactured with renewable energy represented the production and manufacturing at Winbond fabs, outsourced packaging plants, testing, and other processes, all powered by renewable energy, indicated by the 13th digit "G" in the product part number. Additionally, to effectively monitor carbon emission activities and achieve efficient real-time management, Winbond developed an advanced carbon accounting system. This system aggregated Scope 1 direct emissions from Winbond fabs, Scope 2 indirect emissions from electricity used at Winbond fabs, and Scope 3 other "indirect" greenhouse gas (GHG) emissions, integrating carbon emission information from manufacturing production and outsourced packaging and testing.

Winbond's products manufactured with renewable energy began mass shipments to key ESG-focused customers in December 2024, marking a significant milestone in aligning with ESG market trends and meeting the growing demand for green energy-saving products. These products manufactured with renewable energy had approximately 60% lower carbon emissions compared to those produced with conventional energy. As a leading supplier of green semiconductor memory, this move further demonstrated our commitment to sustainable development, aiming to achieve net-zero emissions by 2050.

We believe that the future of the planet is closely related to the sustainable development of enterprises. Therefore, ensuring innovation and environmental responsibility is crucial for driving corporate development. With the launch of products manufactured with renewable energy, Winbond has established an important milestone in its sustainability journey.



Note In the picture, Scope 3 = Scope 3' + Scope 3"
Scope 3': the indirect emissions from electricity in OSATs only
Scope 3": the indirect emissions in other upstream and downstream stages, including raw materials, indirect emissions from OSAT processes, downstream transportation and the waste, etc.



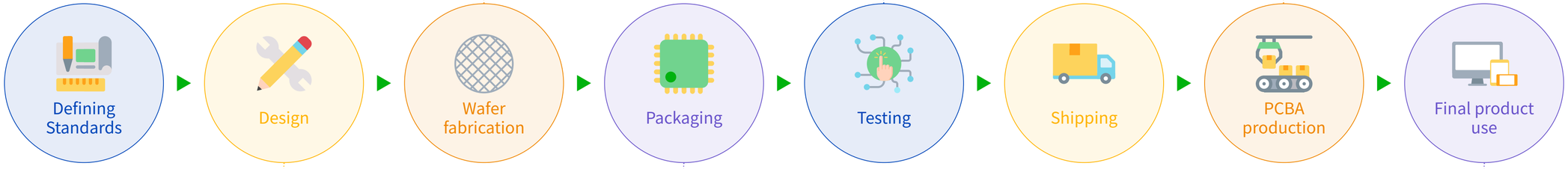
Note The anti-gray items indicates they are not included in the carbon emissions of Winbond products.

Green Product Development: Considering the Product Lifecycle Assessment, Carbon Emission and Energy Reduction

Starting from 2023, Winbond began using renewable energy to produce wafers, with the use of 50% green energy production at CTSP Fab by 2030.

Design for testing allows us to achieve a small package and low pin count, while also reducing the testing time required, greatly reducing carbon emissions.

Supporting Low Temperature Soldering (LTS) process. According to the calculations, reducing the SMT temperature from the range of 220~260°C in lead-free processes to ~190°C in low-temperature soldering processes results in a significant reduction in carbon emissions.



Through using low-carbon emissions raw materials, refining the production process and innovative designs, and relying on increased productivity to speed up the design process, Winbond has been able to shrink the chip' s surface area, reducing the number of signal pins.

Green materials are used for packaging. Low temperature soldering is supported, and the small package greatly reduces the PCB's use area, greatly reducing the materials needed and the electricity consumed by the PCBA, further reducing carbon emissions.

In the design process, Winbond has also designated reducing the operating and idle power consumption as design goals, in addition to high product performance. Combined with information security and safety functions for keeping information confidential and system resilience functions, our product is not only able to reduce energy consumption and carbon emissions but also protect customer privacy and confidentiality, emphasizing system security. This allows us to fulfill our corporate social responsibilities.

Low-carbon Products

2024	Low-carbon Products			Products which Avoided Emissions for Third-parties
Description	45nm PW - Serial NOR	Renewable Energy Products	100BGA LPDDR	1.2V Serial NOR
% of total revenues from green products	2.4%	1.6%	84%	23.7%
Estimated total avoided emissions per year (tCO_2e)	26.3 tCO_2e	294.6 tCO_2e	1.6 tCO_2e	255 tCO_2e

Resource Efficiency Benefits of Products

% of Total Products	Products
23%	1.2V Serial NOR

Product Life Cycle

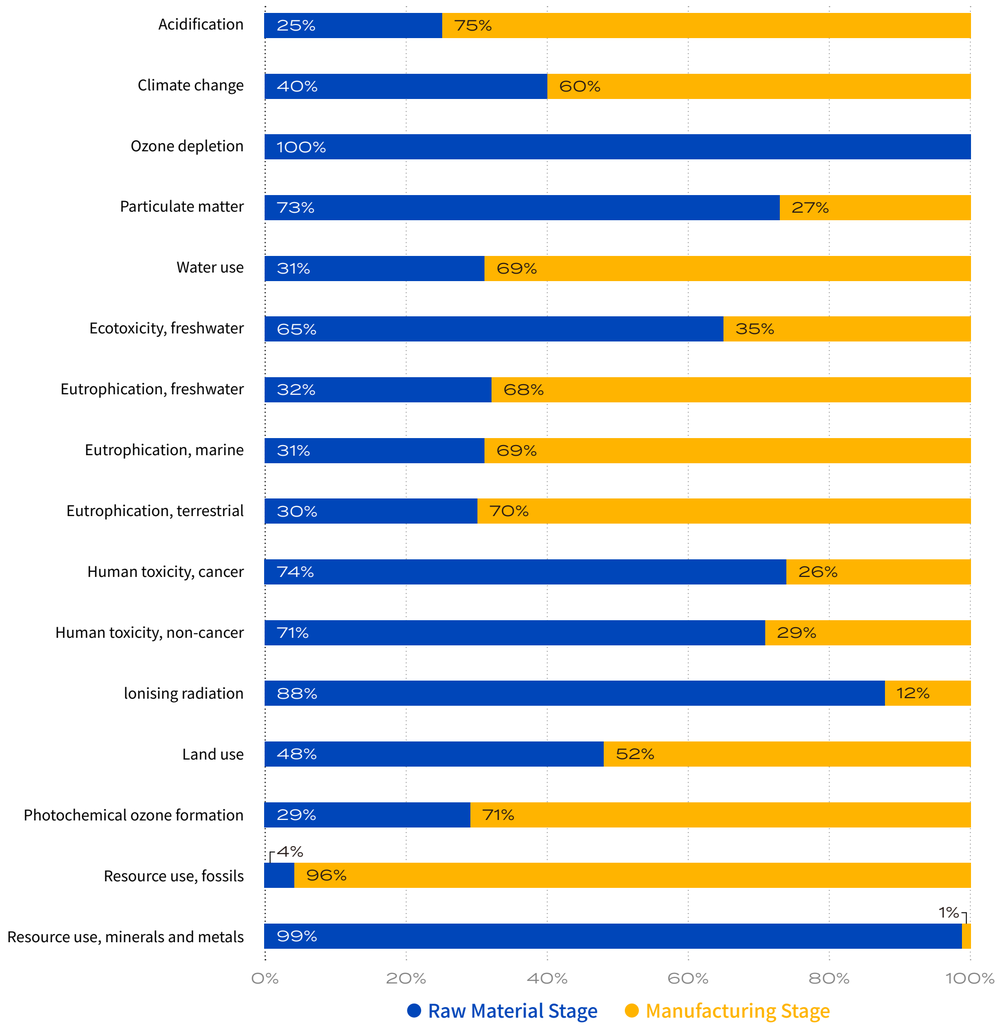
Winbond's main core products included Code Storage Flash Memory, TrustME® Secure Flash, and Customized Memory Solution (CMS). We gradually introduced ISO 14067 for product carbon footprint and ISO 14046 for product water footprint. Using the 2023 production information, they conducted a Life Cycle Assessment (LCA) for the entire product series with the Simapro Environmental Footprint 3.1 tool. This analysis evaluated the potential environmental impacts and calculated the environmental footprint during the raw material and production stages, such as global warming and ozone layer depletion. Through hotspot analysis, they identified improvement opportunities to enhance the environmental friendliness of raw materials and products.

According to ISO 14040 and ISO 14044 standards, they conducted a Life Cycle Assessment for products. The system boundary referred to the Product-Category Rules (PCR) announced by the Taiwan Semiconductor Industry Association: "For use in preparing 'Semiconductor Foundry' product environmental declarations (EPD) version 2.1 for scope definition." As the company did not belong to end products, they adopted Cradle-to-gate as the calculation boundary, including all chip substrates, chemicals, gases, and consumables used in the memory raw material acquisition stage, as well as the energy resources and waste used in the Winbond fab stage.

Environmental Impact: Three Main Hotspot

		2024 Progress	Strategy and Action
Electricity Usage	44.35%	▪ Completed 129 energy conservation action plans across six categories, resulting in an increase of approximately 26.3 million kWh in electricity savings compared to 2023. ▪ Purchased 40.336 million kWh of renewable energy.	▪ Promoted continuous improvement of ISO 50001 Energy Management System. ▪ Continued to purchase renewable energy according to the plan.
Raw Material Obtained	N_2 12% N_2O 7.5%	▪ Organized 8 supplier ESG workshops and 2 "Sustainable Supply Chain Upgrade+" forums. ▪ Introduced resources from industry, government, and academia, and collaborated on the "Large Lead Small" carbon reduction project, increasing the carbon reduction amount to 9,500 tons CO_2e, expanding the impact. ▪ Held 1 supply chain transformation diagnostic subsidy briefing, inviting suppliers with small procurement amounts and insufficient transformation resources to participate, utilizing government resources.	▪ In 2025, we will continue to promote low-carbon transformation through the "Large Lead Small" initiative, planning for 13 suppliers to cooperate in executing product carbon footprint inventory and implementing energy conservation and carbon reduction management programs.

Environmental Impact: Characterization Assessment Results



Hazardous Substance Management of Winbond

Winbond strictly adheres to international standards and regulations such as the "Hazardous Substance Process Management System Standard" (QC 080000), the "Restriction of Hazardous Substances Directive" (RoHS) of the European Union, the "Registration, Evaluation, Authorization, and Restriction of Chemicals" (REACH) regulation, California Proposition 65, the Toxic Substances Control Act (TSCA) of the United States, and the Canadian Convention to ensure that Wafer, Chip, Package IC, and other related products manufactured by Winbond comply with international environmental regulations and meet customer requirements for green products, thus avoiding environmental pollution and harm to human health. Winbond has established internal regulations for "Hazardous Substance Control" and formed a cross-departmental hazardous substance management team to control the design, procurement, production, and sales processes of products. Suppliers and subcontractors are required to incorporate green product requirements into their management systems to ultimately provide products free of hazardous substances (HSF) that meet customer demands. Winbond conducts its operations, including research and development, procurement, production, operations, and services, based on the following principles to reduce the company's impact on the natural environment and human health:

HSF Policy

Winbond's HSF policy aimed to design, procure, manufacture, and sell products free of hazardous substances to comply with international regulations, meet customer requirements, and protect the environment, fulfilling its social responsibility.

Hazardous Substance Process Management

Winbond established a Hazardous Substance Process Management (HSPM) system, with management representatives holding annual review meetings to discuss policies, objectives, regulations, audit results, and management performance, continuously improving the effectiveness of the hazardous substance management system.

1 Hazardous Substances Management Policies and Objectives	5 New Materials Assessment and Substitution Strategies
2 Regulatory Compliance and Conformity Management	6 Regular Testing and Monitoring of Hazardous Substances
3 Hazardous Substances Inventory and Control	7 Employee Training and Awareness Enhancement
4 Supply Chain Management and Green Procurement	8 Continuous Improvement and Performance Evaluation

2024 Progress of Winbond

- ✓ No non-compliance issues related to hazardous substances monitoring have occurred
- ✓ **100%** of Winbond personnel have completed hazardous substance training
- ✓ No non-compliance detected by customers' hazardous substance audits

2024 Progress of Nuvoton

- ✓ Non-compliance incidents in hazardous substance management operations: **0 cases**
- ✓ **100** completion of basic training on hazardous substances
- ✓ Customer complaints related to hazardous substances: **0 cases**
- ✓ Newly developed products and materials met Nuvoton's hazardous substance management requirements
- ✓ Completed annual hazardous substance content testing for wafer & IC to comply with RoHS and halogen-free requirements.

Hazardous Substance Management of Nuvoton

Nuvoton implements a rigorous five-step process to manage hazardous substances in all its products. This stringent self-imposed regulatory framework has been recognized by customers, including Sony Green Partner certification since 2009 and regular Sony Green Partner audits. Building on ISO 9001 and IATF 16949 management systems, Nuvoton achieved IECQ QC 080000, the International Electrotechnical Commission's (IEC) Hazardous Substance Process Management Standard, in 2008. This "process-oriented" approach minimizes or eliminates hazardous substances in products, enabling systematic hazardous substance management that meets RoHS, REACH, WEEE, and other customer-specific requirements, effectively operating a robust hazardous substance management system.

Declare a Hazardous Substance-Free Policy

Nuvoton is committed to designing, procuring, manufacturing, and selling hazardous substance-free products to comply with international regulations, meet customer demands, and fulfill its environmental responsibility.

Establish a Hazardous Substance Control List

Based on international environmental regulations and major customer requirements, Nuvoton maintains a controlled substance list that includes prohibited, restricted, and declarable substances. This list is reviewed and updated annually based on current conditions.

New Material Evaluation System

Nuvoton has established a new material evaluation process to ensure that newly developed products and materials comply with Nuvoton's hazardous substance management procedures and environmental, health, and safety requirements.

Green Procurement and Supplier Management

Raw material suppliers and subcontractors are required to sign a "Non-Use of Hazardous Substances Certificate" and provide third-party testing reports annually to ensure their products meet international standards.

Hazardous Substance Testing

Nuvoton annually samples Wafer & ICs for hazardous substance content, including RoHS and halogen content. Independent third-party organizations measure and monitor prohibited substances with environmental impact and health hazards in raw materials and products to meet RoHS and halogen-free requirements.

2.1.3 Intellectual Property Management

Intellectual property rights were important assets for maintaining the sustainable operation of the enterprise. To protect the company's investment in R&D resources and output, Winbond formulated intellectual property policies that align with the company's operational objectives. Through the operation of the intellectual property management system, Winbond fostered an innovative culture and enhanced employees' awareness of intellectual property protection, encouraging employees to continuously propose innovations and produce high-quality intellectual property while performing their duties, thereby strengthening Winbond's sustainable competitive advantage.

Accumulated Approximately **10,000** Approved Patents Globally until 2024

In strategic planning, Winbond set annual proposal targets through a comprehensive evaluation of the company's operational objectives and R&D resources, increasing the proportion of patent proposals driven by product development strategies, and promoting the connection between the company's operational objectives and intellectual property management strategies. As of 2024, Winbond had accumulated over 6,900 patent applications globally, with more than 5,300 patents granted worldwide.

Winbond established the Intellectual Property Department and Patent Committee to execute intellectual property management, including evaluation and review, award issuance, and strategic planning. During the internal proposal stage, proposals were strictly reviewed based on the patent laws, examination standards, and commercial value of each country, improving patent quality and certification rates to ensure proper protection of R&D results.

To encourage colleagues to understand the requirements of patent rights and actively submit proposals, Winbond also set up a generous incentive system. Additionally, to improve the quality of colleagues' proposals, Winbond customized educational training courses suitable for the proposing units, establishing the concept of intellectual property protection for colleagues, and guiding them to generate ideas through cases close to the proposing units, assisting them in producing high-quality invention proposals.

	Patents Application	Patents Granted
Winbond	Global applications accumulated over **6,900** cases **430** global patent applications in 2024 Ranked **13**th in the top 100 domestic corporate invention patent applications in 2024	Global approvals accumulated over **5,300** cases Nearly **380** global patents approved in 2024 Ranked **17**th in the top 100 domestic corporate invention patent announcements and certifications in 2024 Data sourced from the Ministry of Economic Affairs, Intellectual Property Office
Nuvoton	Global applications accumulated over **2,963** cases **343** global patent applications in 2024 Ranked **17**th in the top 100 domestic corporate invention patent applications in 2024	Global approvals accumulated over **1,984** cases **230** global patents approved in 2024 Ranked **14**th in the top 100 domestic corporate invention patent announcements and certifications in 2024 Data sourced from the Ministry of Economic Affairs, Intellectual Property Office
Nuvoton (Japan)	Global applications accumulated over **4,500** cases **203** global patent applications in 2024	Global approvals accumulated over **3,200** cases Nearly **106** global patents approved in 2024

Winbond passed the TIPS re-certification in 2024

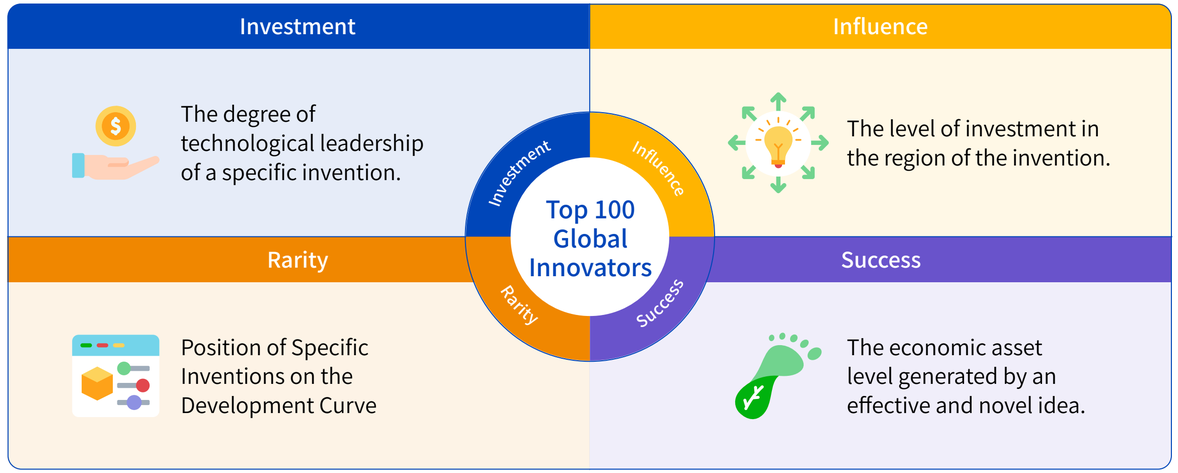
In 2023, Winbond officially implemented the "Taiwan Intellectual Property Management System (TIPS)" and passed the A-level certification. Through the introduction of TIPS, Winbond formulated intellectual property policies and goals that align with the company's operational objectives, fostering an innovative culture and enhancing employees' awareness of intellectual property protection. Employees were encouraged to continuously propose innovations and produce high-quality intellectual property, strengthening sustainable competitive advantages. In 2024, Winbond continued to implement TIPS and passed the A-level re-certification.

Promotion of Trade Secret Registration System

Trade secret management was part of the company's competitive advantage management, not just intellectual property management. Innovative thinking and practices should be adopted. Since 2022, Winbond has incorporated trade secrets into its intellectual property management strategy, initiating the strategic planning of the trade secret registration system and awarding the Excellent Trade Secret Award to encourage employees to register their R&D innovations, enhancing the company's technological competitive advantage. Winbond further integrated the technical content of the existing systems into the trade secret registration system, making the trade secret registration system a library of technical and innovative knowledge, preserving the company's competitive advantage trade secrets comprehensively. In 2024, the number of registered cases exceeded 11,300, with a cumulative registration of over 29,120 cases.

Selected as One of the Top 100 Global Innovators by Clarivate for 3 Conservative Years

"Proactive Innovation" was one of Winbond's core cultures. Winbond Group was selected as one of the Top 100 Global Innovators by Clarivate for three consecutive years. The selection criteria included not only the total number of invention patents reaching 500 but also the impact of patents, investment intensity, success footprint, and technological uniqueness. Winbond Group won the award from 3,000 candidate institutions worldwide, demonstrating Winbond's innovative R&D capabilities and the results and influence of its global patent layout. The high recognition from international evaluation institutions proved that Winbond was a semiconductor company that highly valued R&D investment and pursued innovation-driven growth and sustainable operation. In addition, Winbond was also committed to the adoption and development of green semiconductor technology, using low-carbon materials from the product design stage, developing high-performance, low-energy consumption, and low-resource demand green products to achieve the goal of protecting the environment and reducing environmental impact.



2.1.4 Digital Transformation

Since 2020, Winbond has fully promoted digital transformation, establishing the Digital Transformation Committee for Business (DTCB) and the Digital Transformation for Manufacturing (DTCM) to drive digital transformation in operations and manufacturing. The general manager regularly held meetings to review effectiveness; senior executives shared articles related to digital transformation weekly; the HR department invited external lecturers to provide relevant training and introduced internal collaboration platforms. The introduction of digital transformation technologies and tools has become the core system of Winbond's intelligent operations.

Wafer Fab Intelligence - Digital Transformation

Through the transformation enabled by data science methods, we aim to become an intelligent factory with highly efficient production and quality control.

Utilizing Industrial AI (Artificial Intelligence) Technology to Promote Smart Manufacturing Application

Four Major Digital Transformation Systems	Explanation of System Usage	Achievements
Flaws and Yield Analysis System	Consolidates measurement data from various module machines online, helping the research and development department analyze and make connections between data on development operations, analyzing and consolidating data with high efficiency.	▣ Greatly reduces data analysis times. ▣ Increase engineer productivity. ▣ Improved analysis system helps engineers increase data analysis efficiency by 60%.
Automated Engineering Reports System	Rapidly and automatically looks up and consolidates measurement data online.	▣ Effectively supports information processing operations. ▣ Helps the research and development team analyze and weigh experiment conditions, continuously optimizing the process. ▣ Automated system helps engineers more efficiently create engineering reports, increasing productivity by 80%.
Digitalize and Standardize Online Measurement and Electrical Data	Assists Winbond employees in adjusting process module conditions in a timely manner based on the data to meet requirements.	▣ Greatly improves the prediction and analysis of the key electrical properties of memory elements. ▣ Allows for good predictions to be made for key parameters. ▣ System able to improve productivity by 15%.
Memory Element Reliability Analysis System	Effectively consolidates and organizes massive amounts of measurement data, discovering the optimal operating parameters for use in product CP/FT testing.	▣ Significantly increases the data analysis speeds of our engineers. ▣ Increases data analysis efficiency by 80% through the system.

Establishing a Carbon Accounting System to Create a Green Future and Achieve Net Zero Emissions

Facing the increasingly severe challenges of climate change, countries around the world actively promoted carbon reduction policies, and enterprises faced multiple pressures from international regulations and internal and external demands. Achieving "Net Zero Carbon Emissions by 2050" had become a global consensus, and accurate carbon emission data management was the foundation for formulating effective emission reduction strategies.

To accurately grasp product carbon emission data, Winbond extended the concept of accounting systems to carbon data tracking with industry-leading innovation, developing a standardized and automated carbon accounting system for big data collection. This system realized the automation and standardization of carbon emission data collection, implemented product carbon inventory and carbon footprint systems, and provided in-depth analysis to assist in formulating product carbon emission reduction strategies. Through this well-constructed carbon accounting system, Winbond gradually moved towards the goal of net zero carbon emissions.

Investing in Carbon Data Management: The Cornerstone of Achieving Net Zero Carbon Emissions

The calculation and management of carbon emissions were the first steps in corporate carbon reduction actions. However, carbon data collection faced many challenges, including:

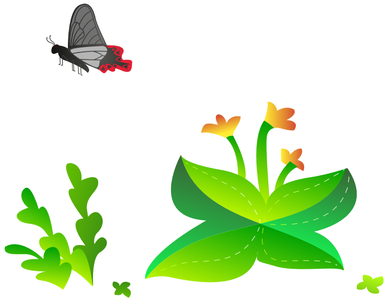
- Large data volume: Corporate operational activities involved many aspects, generating a large amount of carbon emission data, and collecting and organizing this data was a tedious task.
- Complex calculation methods: Calculating carbon emissions required different calculation methods based on various emission sources and activity data, posing high demands on corporate expertise and technical capabilities.
- Lack of real-time information: Traditional carbon data collection methods often relied on manual collection and organization, making it difficult to achieve real-time data updates and tracking, affecting corporate decision-making efficiency.

To overcome these challenges, Winbond extended the concept of accounting systems to carbon data tracking, developing an automated and standardized carbon accounting system that realized the automation and standardization of carbon emission data collection and provided in-depth analysis.

Establishing Winbond's Carbon Accounting System: Leading Green Transformation

Winbond's carbon accounting system aimed to comprehensively track and manage corporate carbon emissions, covering Scope 1, Scope 2, and Scope 3 emission sources, and provided data analysis and emission reduction strategy recommendations. The system had the following features:

- Integration with existing systems to create a unified data platform: The system integrated the company's existing accounting systems, combining carbon emission data with financial data, facilitating comprehensive analysis for the company.
- Automated data collection to improve efficiency: The automated data collection function could reduce manual input workload, improving data accuracy and efficiency.



The carbon accounting system was divided into three major sections:

Carbon Inventory System

Following ISO 14064 standards, it calculated the company's total carbon emissions, ensuring data reliability and comparability. It established a carbon emission database, developed calculation formulas, designed monitoring systems, and built analytical models. The system provided comprehensive carbon emission management tools, facilitating enterprises to track, analyze, and manage carbon emissions. It also offered strategies and recommendations for reducing carbon emissions, providing personalized reduction plans based on the actual situation of the enterprise.

Carbon Footprint System

Following ISO 14067 standards, it calculated the carbon emissions of products from cradle (raw materials) to gate (transportation), helping enterprises assess the environmental impact of products. The system evaluated the carbon footprint of products, understanding the environmental impact of products. Carbon footprint analysis helped enterprises identify the stages with the highest carbon emissions in the product life cycle and formulate corresponding reduction measures. It calculated the carbon emissions of each product based on direct attribution/allocation rules, enabling enterprises to more effectively formulate product carbon footprint management strategies.

Net Zero Emission Path and Management System (Under Construction)

Based on the aforementioned big data database, it helped formulate product carbon emission reduction strategies, moving towards the goal of net zero carbon emissions. The system's development came from the full investment of various departments of Winbond, leading the industry from scratch to establish Winbond's carbon accounting system. The entire company worked together for energy conservation and carbon reduction, creating Winbond's green culture.

Supply Chain Cooperation

Scope 3 carbon emissions accounted for the largest proportion and were also the biggest challenge in carbon accounting. Scope 3 carbon emissions mainly came from the supply chain, so the carbon footprint data of supply chain partners was the cornerstone of carbon reduction. However, the carbon accounting system also faced some challenges in supply chain management:

- Data completeness: Different suppliers might provide incomplete data, affecting the accuracy of overall carbon emission data.
- Data accuracy: Suppliers' carbon inventory capabilities varied, and data might have errors and inconsistencies.
- Supplier participation: Some suppliers might lack the motivation or resources to participate in carbon inventory, affecting the comprehensiveness of data collection.
- Technical and methodological differences: Different suppliers might use different technologies and methods to calculate carbon emissions, leading to data comparability issues.
- Reporting frequency: The frequency of suppliers reporting carbon emission data might be inconsistent, affecting the timeliness of data.

To address these challenges, Winbond actively cooperated with supply chain partners to promote the construction of a green supply chain, jointly moving towards the goal of net zero carbon emissions.

Future Outlook

The carbon accounting system is an important tool for enterprises to achieve the goal of net zero carbon emissions. To fully utilize its functions, enterprises need to continuously improve system functions and overcome challenges in data collection and management. At the same time, enterprises need to closely cooperate with supply chain partners to jointly promote the construction of a green supply chain to ultimately achieve the goal of sustainable development. In the future, Winbond will continue to improve the carbon accounting system and actively promote it to supply chain partners, jointly creating a green value chain and contributing to the goal of sustainable development.

Carbon Accounting System Architecture: Winbond's Carbon Accounting System aims to comprehensively track and manage the company's carbon emissions, covering Scope 1, Scope 2, and Scope 3 emission sources. It provides data analysis and emission reduction strategy recommendations. The system is divided into three main blocks: (1) Carbon Inventory, (2) Carbon Footprint, and (3) Net Zero Carbon Management System

Carbon Inventory System

Activity and carbon emissions Data by accounting methodology

Activities
- **Upstream**: Raw Material Transport
- **Organization**: Daily Activities
- **Downstream**: Transport, Waste Disposal

x

Emission Factors: Emission Factor by material and activities.

x

GWP: GWP (Global warming potential.)

=

Activity Carbon Emission: **Total Carbon Emissions** — Scope 1, Scope 2, Scope 3

Carbon Footprint System

Green Product Life Cycle Assessments

Carbon Emissions — **Material** — **Manufacture**: In-House, OSAT — **Transport**

Allocating: Direct attribution | Allocation rules

Product Carbon Emission: **Product Carbon Footprint** | **Carbon Cost** | **RE Cost**

Net Zero Emissions Pathway & Management System

Driving by Data Science

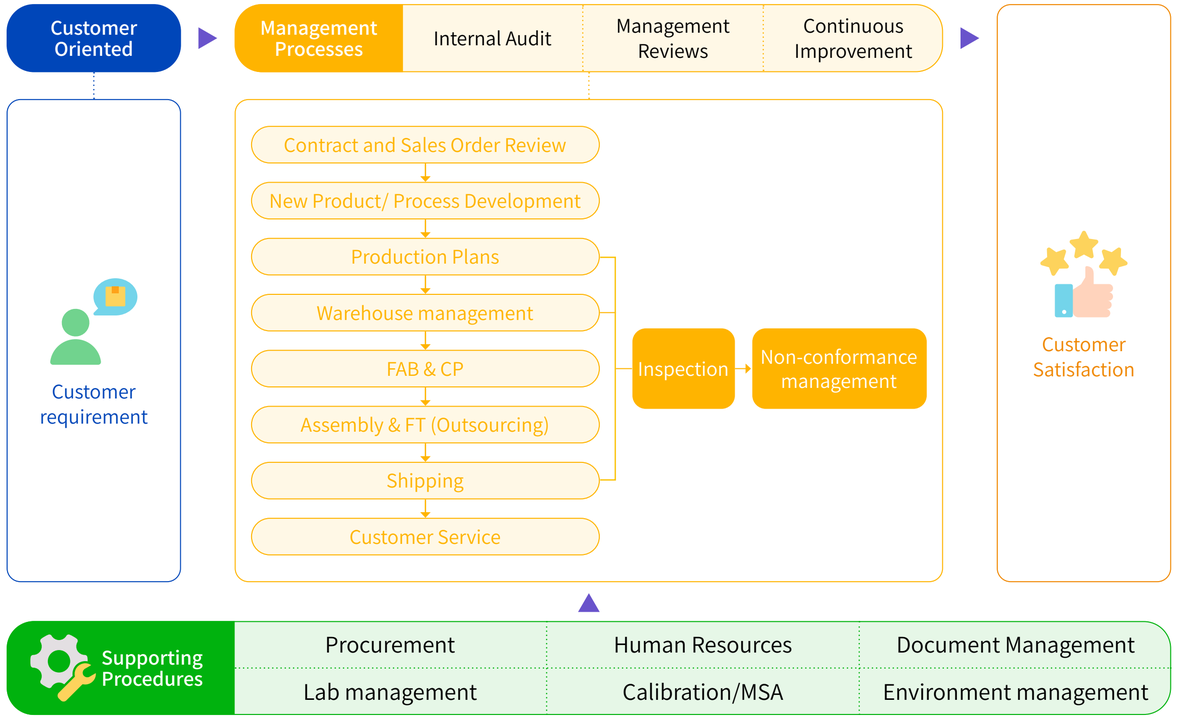
- Energy Management and Transformation
- Greenhouse Gas Emission Management
- Transportation and Waste Management
- Renewable Energy Certificate Management System

Enterprise Data Warehouse & Data Visualization

2.2 Quality Management for Products and Services

Winbond has formulated a quality policy that aims to establish a comprehensive quality management, zero-defect, and quality-first corporate culture through continuous improvement processes. The goal is to provide customer-satisfying products and services and become a world-class company. In accordance with this policy, Winbond has established various regulations and guidelines. In addition to ensuring that product quality and labeling comply with national and regional regulatory requirements, Winbond also manages quality through internationally recognized quality management systems verified by third-party inspection organizations, including ISO 9001, IATF 16949, and ISO 26262. Emphasis is placed on setting and tracking quality performance indicators and implementing continuous improvement measures. Various control processes, such as FMEA, SPC, and MSA, are employed to comprehensively inspect, assess, and improve product quality to meet customer needs and expectations.

Quality Management Systems and Processes



2.2.1 International Standards and Certification

Winbond continuously established rigorous production process control and quality management operations, including the stable and complete CTSP Fab. Since 2022, the Kaohsiung Fab, which started production, also successfully obtained international system certifications such as IATF 16949, ISO 9001, and QC 080000. To improve product quality, Winbond continuously enhanced yield analysis, supply chain management, and understanding customer needs. Additionally, Winbond ensured compliance with international standards such as RBA and ESG through various certifications, adhered to high customer standards, managed hazardous substances, and maintained production environment management, fulfilling corporate social responsibility.

Nuvoton established and implemented effective management systems based on various international standards such as ISO 9001, IATF 16949, IECQ QC080000, ISO 14001, and ISO 45001, covering aspects like product quality, green products, environmental protection, and occupational health and safety. These systems improved operational efficiency and effectiveness, enhanced product and service quality, and ensured the maintenance of sustainable responsibility.

Nuvoton(Japan) established the ISO 9001 Quality Management System and obtained the ISO 9001:2015 certification. Additionally, it obtained certifications for ISO 9001, ISO 14001, ISO 45001, ISO 27001, and ISO 21434 international standards.

Certification/Location	Winbond		Nuvoton	
	CTSP Fab	Kaohsiung Fab	Yanxin Fab	Japan
ISO 9001 Quality Management System	✓	✓	✓	✓
QC 080000 Hazardous Substance Process Management System	✓	✓	✓	
IATF 16949 Automotive Quality Management System	✓	✓	✓	
ISO 26262 Functional Safety for Road Vehicles	✓	✓		
ISO 21434 Cybersecurity for Road Vehicles	✓	✓		✓
ISO/IEC 27001 Information Security Management System	✓	✓	✓	✓
ISO 50001 Energy Management System	✓	✓	✓	✓
ISO 46001 Water Efficiency Management System	✓	✓		
ISO 14064-1 Greenhouse Gas Emissions Quantification and Reporting	✓	✓	✓	✓
ISO 14001 Environmental Management System	✓	✓	✓	✓
ISO 45001 Occupational Health and Safety Management System	✓	✓	✓	✓

2.2.2 Culture of Pursuing Quality

Quality Award Recognition

In 2024, the Taiwan Continuous Improvement Competition attracted a total of 180 teams from the northern, central, and southern regions. Winbond once again received recognition and affirmation from national judges for product quality and process improvement, winning two Gold Tower Awards and two Silver Tower Awards, demonstrating the company's commitment to continuous improvement and achievements.

The CTSP Fab's Collaborate Circle team, composed of professional engineers from different departments and fields, was dedicated to problem-solving. In 2024, the Collaborate Circle team aimed to improve the defect rate of machines, using statistical analysis techniques and TRIZ theory to identify root causes and propose innovative solutions, winning the Gold Tower Award again. This achievement not only improved product quality but also reduced production costs, reflecting Winbond's sustainable operation goals.

Team	Theme	Award
Collaborate Circle	To reduce the Process Abnormality Rate in CTSP Fab.	Golden Tower
Perseverance Circle	To reduce the Occurrence Rate of F58U Word Line Leakage	Golden Tower
Precision Circle	To reduce the Rate of Bent Needles in Epoxy Probe Card Grinding	Silver Tower
Interstellar Circle	To reduce ICA109 FWL Yield Loss	Silver Tower

The CTSP Fab's Perseverance Circle team members came from different fields and collaborated across departments, using experimental design and 5Whys analysis methods to deeply analyze process problems, successfully identifying six optimized process conditions and proposing innovative solutions. Particularly in improving the "F58U process character line short circuit failure rate," the team used intelligent manufacturing technology and data analysis to refine process control, effectively reducing wafer defects. These breakthroughs not only improved production efficiency but also raised product quality to higher standards.

These national awards fully affirmed Winbond's outstanding achievements. Winbond will continue to uphold the core values of "Integrity Management, Responsible Team, Passionate Learning, Proactive Innovation, Sustainable Contribution," combining the QIT spirit to continuously cultivate professional teams. We aim to elevate the quality culture to new heights with the spirit of "Being a hidden champion in providing sustainable semiconductors to enrich human life," and strive to achieve the goal of becoming a leading enterprise in net zero carbon emissions.

The Winbond Yili Circle is a problem-solving team composed of professional engineers from various departments and fields, focusing on improving process pain points. Upholding the spirit of "challenging zero defects and becoming an invisible champion," the team is dedicated to enhancing product stability and quality. Team members come from different fields and collaborate across departments, using experimental design, 5Whys, and other analytical methods to deeply analyze process issues, successfully identify optimal process conditions, and propose innovative solutions.

Year	2021	2022	2023	2024
Golden Tower Award	2	2	2	2
Silver Tower Award	2	2	1	2
Bronze Tower Award	0	0	0	0

Fostering a Culture of Excellence in QE 2.0

Since 2013, Winbond has entered the automotive electronics market, initiating a quality culture centered on "Zero Defects" and "Quality First," known as Excellence Quality QE 1.0. Over time, significant changes in internal and external environments have made merely meeting customer quality requirements insufficient to address current challenges. To achieve higher quality standards, the company introduced Excellence Quality QE 2.0, focusing on "Precision Description" and "Doing Things Right the First Time."

The company held various activities to promote quality culture:

- Excellence Quality Forum: Successfully held in 2024, attracting 555 participants and recorded as an e-learning course, becoming a mandatory course for company colleagues.
- FMEA Excellent Case Sharing Meeting: Held quarterly in 2024, with 1329 supervisors participating, strengthening the ability to analyze potential risks and solve systemic problems.
- Quality Month Activities: The 2024 Quality Month focused on "QE2.0," attracting 3032 participants.
- Senior Executive Quality Workshop: Held at the beginning of 2024, discussing how to enhance quality culture and improve quality, producing six improvement directions and implementation details.

Winbond encouraged employees to implement the company's business philosophy and values in daily management activities and promoted them throughout the supply chain through various opportunities to interact with suppliers and customers, pursuing excellence in operations and continuous improvement, forming a comprehensive corporate quality culture.

2.3 Customer Relationship Management

2.3.1 Maintaining Customer Relationships

Customer Satisfaction of Winbond

We deeply understand the critical importance of customers in business operations. Customers are closely linked to the value of the enterprise, and their satisfaction directly affects the sustainable development of the enterprise. Therefore, Winbond has long been committed to meeting customer needs, adhering to the philosophy of customer supremacy, and hoping to grow together with customers to achieve sustainable operations.

To ensure that we have a deep and comprehensive understanding of customer needs, we regularly conduct customer satisfaction surveys. This is not only a way to respond to market changes but also an important step in establishing a solid relationship with customers.

In the 2024 customer satisfaction survey, we commissioned an external neutral third-party research consulting company to conduct the survey. The survey method was to first interview some customers to understand their real needs, and then formulate a complete questionnaire based on the interview results to truly understand customer expectations and potential needs. The survey was conducted through online questionnaires. The coverage rate of customers in this survey reached 100%, and the survey content covered three main areas: sales and service, product and technical support, and quality. The survey results showed that the overall customer satisfaction reached **90%**.

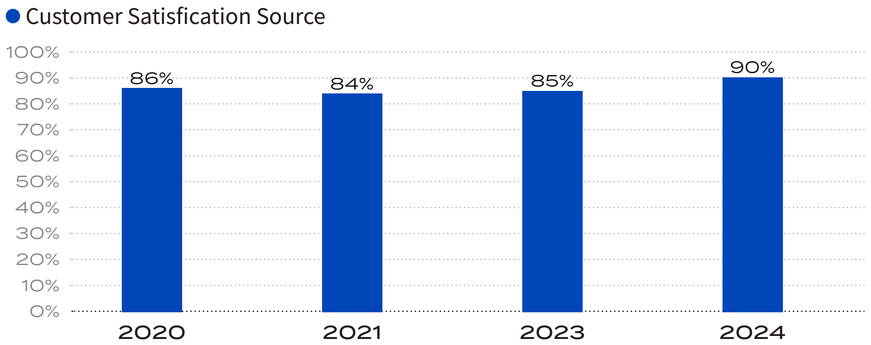
We will continue to conduct customer satisfaction surveys every year and raise the target to over **85%** to ensure that we continuously improve service quality, meet customer needs, and achieve sustainable development of the enterprise.

Satisfaction Survey of Winbond

Objective	Continuously improve our customer services quality and product competitive
Scope	"Sales & Order", "Product and Technical Support, "Quality"
Goal	Satisfaction Index > 85%
Coverage	100%
Frequency	Once a year

Customers' Satisfaction of Winbond

- In 2024, the overall customer satisfaction reached 90%. We will continue to conduct customer satisfaction surveys every year and raise the target to over 85%.



Customer Satisfaction of Nuvoton (Taiwan)

We deeply understand that in business operations, the role of customers is not only important but also crucial. Customers are closely linked to the value of the enterprise, and their satisfaction directly affects the sustainable development of the enterprise. Therefore, Winbond has long been committed to meeting customer needs, adhering to the philosophy of customer supremacy, and hoping to grow together with customers to achieve sustainable operations.

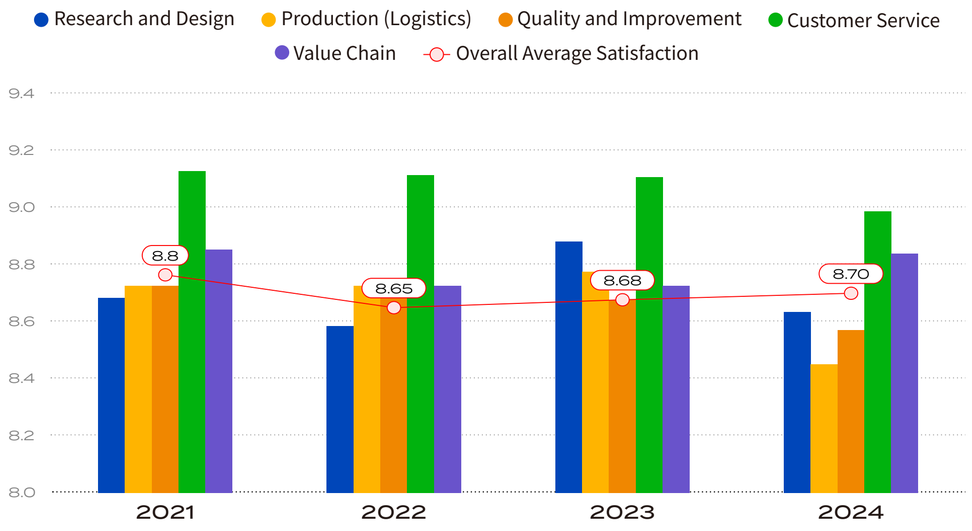
In this effort, we regularly conduct customer satisfaction surveys to ensure that we have a deep and comprehensive understanding of customer needs. This is not only a way to respond to market changes but also an important step in establishing a solid relationship with customers. In the 2024 customer satisfaction survey, we divided it into five major areas: R&D and design, production (logistics), quality and improvement, customer service, and value chain. The content includes aspects such as new product marketing/sales, delivery, quality improvement, technical support, customer service, and corporate image. In terms of R&D and design, our satisfaction reached 8.63 (out of 10); in production (logistics), we achieved a satisfaction of 8.45; in quality and improvement, we received a satisfaction of 8.57; in customer service and value chain, customers gave high satisfaction scores of 8.99 and 8.84. These numbers reflect our continuous efforts in different areas to provide customers with the highest quality products and services. The overall satisfaction reached 8.70, and 94% of customers gave satisfactory ratings (overall satisfaction ≥ 7.0), which represents a high evaluation of our performance by customers. This is not only the result of our past efforts but also a recognition of the trust and support from our customers.

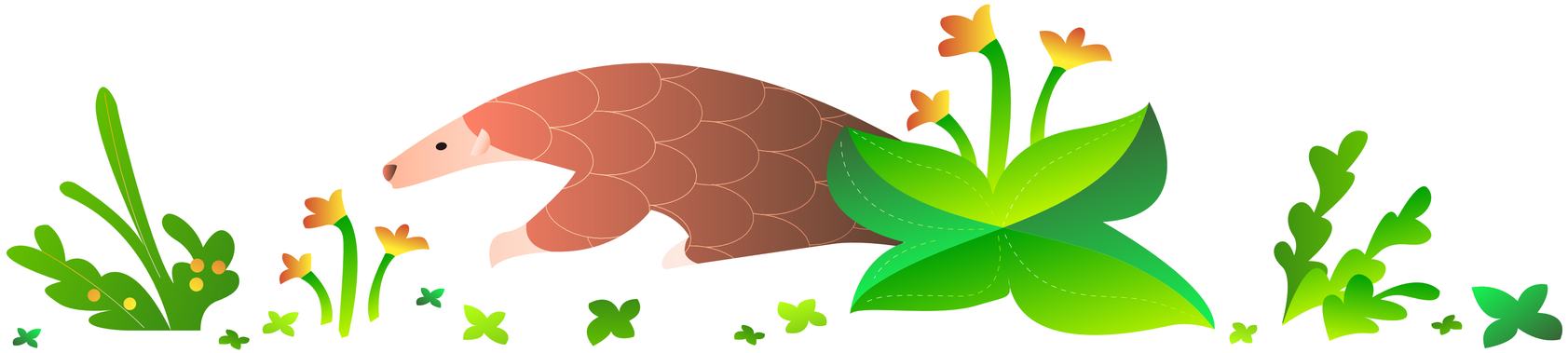
In the future, we will continue to maintain close contact with customers and continuously improve product and service levels to meet the ever-changing needs of customers.

Satisfaction Survey of Nuvoton (Taiwan)

Objective	Objective: To understand customer opinions on the services provided by Nuvoton.
Survey Scope	New product marketing/sales, delivery, quality improvement, technical support, customer service.
Goal	Customer satisfaction ratio (proportion of customers with overall satisfaction ≥ 7.0) ≥ 90%.
Target Customer Selection	Mainly the top 40 customers by revenue (covering total revenue ≥ 60%), adjusted by sales or business units based on customer future development or importance.
Customer Satisfaction Index	Score range (out of 10), from very dissatisfied, dissatisfied, neutral, satisfied, very satisfied.
Survey Frequency:	Once a year

Score of Customer Satisfaction of Nuvoton (Taiwan)





Tracking Customer Intentions

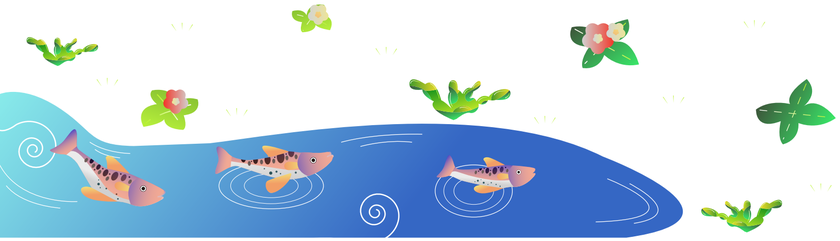
Winbond values its brand and continuously reviews its services. In 2024, we received a total of 2,317 customer complaints, of which 1,002 cases were clarified as non-Winbond quality or service issues after testing, accounting for 43%. Past customer complaint experiences, as well as current customer conditions and ideas, are used to customize solutions for clarifying and resolving customer issues, which is an integral part of customer service. Calculated based on the number of shipped units, customer complaints accounted for only 0.00003% of the shipment volume, which is considered a very good level. Additionally, there were no product recalls from 2020 to 2024.

Through analysis of confirmed failure cases, we can identify and resolve the root causes of deficiencies, and then propose corresponding failure mode tests and improvement plans, as well as formulate source process improvement plans. This ensures that we provide customers with the best service and products. Calculated as (number of failed ICs/total shipment volume), Winbond's failure rate reached an extremely low level of 0.03 dppm (2024: 0.3 dppm), thereby maintaining customer satisfaction, stabilizing operational performance, and achieving a win-win situation.

Quality Workshop

Winbond actively organized regular quality workshops, not only to gain an in-depth understanding of customer product needs and suggestions but also to invite professionals and industry experts to participate in discussions on quality and technical issues. Through this quality workshop exchange platform, Winbond was able to respond promptly to customer inquiries, provide solutions, and continuously improve product and service quality, further enhancing customer satisfaction. At the same time, Winbond gained more industry information and technical knowledge through this platform, continuously improving its technical level and product quality.

As of 2024, Winbond successfully held 8 customer quality workshops and continued to strive to achieve the goal of completing 8 customer quality workshops in 2025, hoping to achieve a win-win situation with customers. We firmly believe that in future development, quality workshops will continue to play a key role in the joint development of Winbond and its customers.



2.3.2 Customer Privacy Protection

Winbond strictly controls customer-related information, and all commercial information such as documents and data exchanged with customers is stored by Winbond's internal high-security system. We have established a Privacy Policy, and the approval and opening of operational permissions for relevant internal personnel are handled in accordance with relevant operational specifications and procedures to ensure the company protects customer privacy and prevents the theft or leakage of trade secrets and intellectual property rights. In 2022, we obtained ISO 27001 Information Security Management System certification, establishing a more comprehensive information security protection system.

The EU General Data Protection Regulation (GDPR) came into effect in May 2018. Winbond has made relevant adjustments according to GDPR requirements, modified the company website, and re-examined website member data to comply with GDPR regulations. GDPR-related regulations have also been incorporated into the online course on personal data protection law. In 2024, a total of 300 people completed the training, with a 100% pass rate, and the total training hours amounted to 150 hours.

Environmental Sustainability

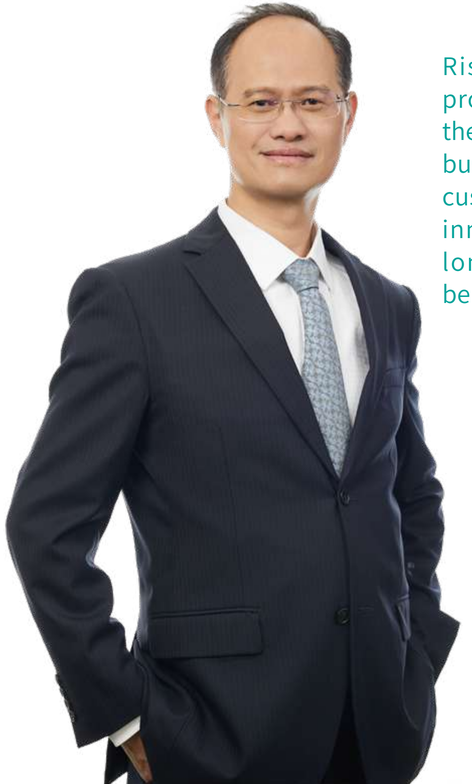
3.1 Energy and Greenhouse Gas Management 108
3.2 Water Resource Management 114
3.3 Waste Management 118
3.4 Air Pollution Control 119
3.5 Green Investment 120
3.6 Biodiversity 121

Scope of Coverage: Unless otherwise noted, the scope refers to the Winbond Group; The scope of sections mentioning "Subsidiaries" refers to Winbond (Subsidiaries), Nuvoton (Taiwan), Nuvoton (Subsidiaries), Nuvoton (Japan).

Winbond actively reduced the environmental impact of its business operations to advance global sustainability. There were no significant violations of environmental regulations. Winbond invested in innovative technologies and resources, implemented energy and carbon emission reduction measures, improved resource use efficiency, and strengthened waste and emission management actions to realize the blueprint for sustainable development.

Adhering to the commitment of "environmental sustainability, creating value," Winbond carried out environmental sustainability work in four key areas: (1) energy and greenhouse gas management, (2) water resource management, (3) waste management, and (4) air pollution prevention.

Through continuous improvement, Winbond achieved a series of positive results and benefits in these areas.



Risks also present opportunities. We provide abundant resources to stabilize the supply chain and continuously explore business models that create value for our customers. Through product and process innovation, Winbond aims to establish long-term, sustainable, and mutually beneficial relationships with its customers.

Wen-Hua Lu

Vice President, Memory IC Manufacturing Business Group

2024 Performance Highlight

Comprehensive Management System

- All manufacturing sites obtained ISO 14001 (Environmental Management), ISO 50001 (Energy Management), and ISO 46001 (Water Efficiency Management) certifications.
- Winbond also passed ISO 14067 Product Carbon Footprint and ISO 14046 Product Water Footprint verifications, and introduced Life-cycle assessment (LCA).

Greenhouse Gas and Energy Management

- Winbond and its subsidiaries completed Scope 1 and 2 greenhouse gas inventories. All manufacturing sites(including subsidiaries) obtained ISO 14064-1 greenhouse gas verification.
- Winbond continued its deployment of renewable energy by purchasing floating solar panels in 2024. Winbond (Taiwan) achieved a renewable energy usage rate of 5.9% and aims to reach 50% by 2030.
- In response to the Science Based Targets initiative (SBTi) of the international climate change organization, Winbond further expanded the Scope 3 greenhouse gas inventory calculation for the Winbond Group

Water Management

- Winbond used the World Resources Institute (WRI) water risk assessment tool. All operational operational sites in Taiwan were located in low water resource stress areas.
- Winbond(Taiwan) achieved a fab-wide water recycling rate of 81.9%, a process water recycling rate of 89.3%, and a comprehensive water pollution reduction index of 74.8%.

Waste Management

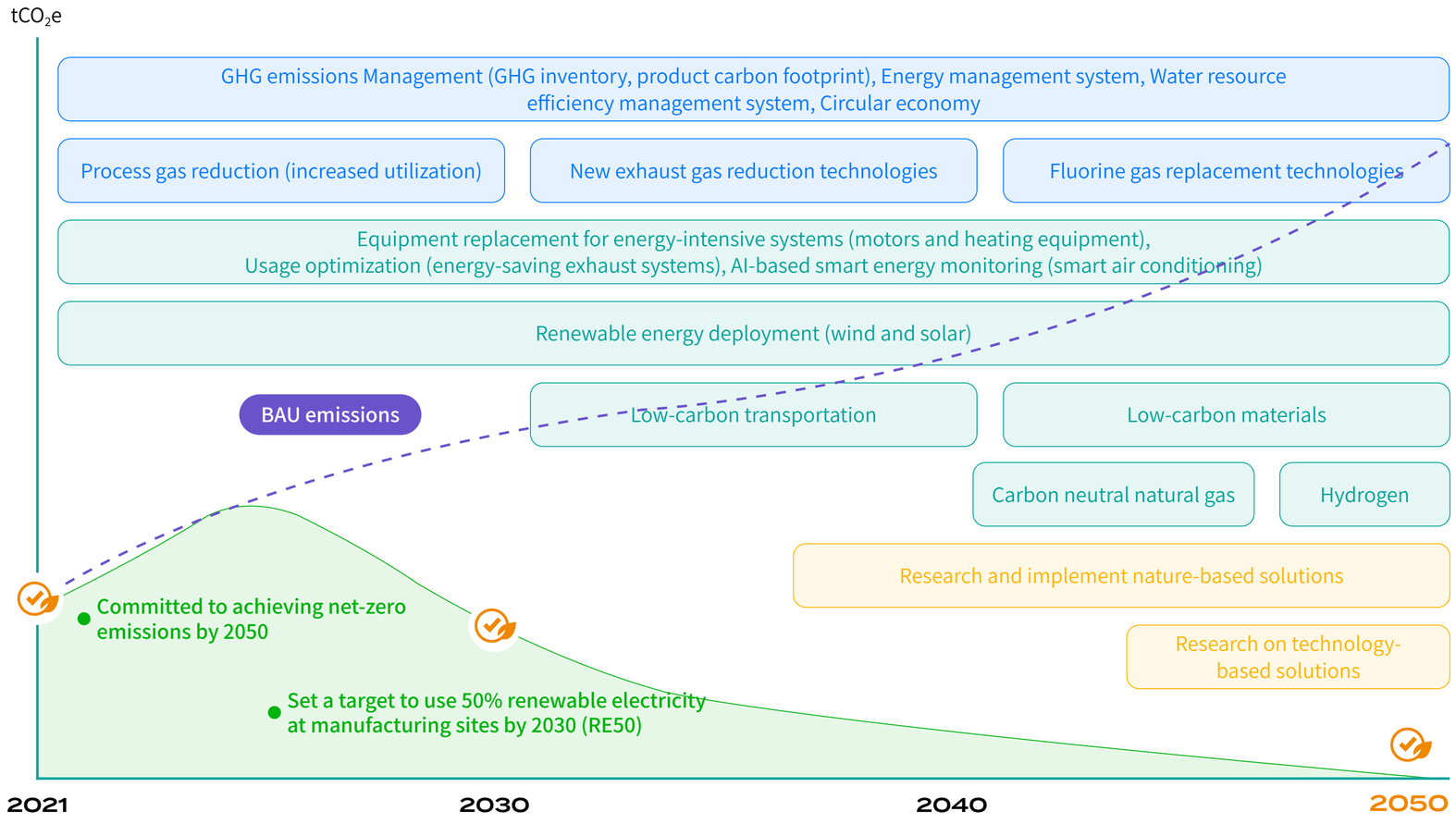
- Winbond promoted comprehensive recycling plans to minimize landfill waste treatment.
- Winbond (Taiwan) achieved a fab-wide waste recycling rate of over 91.9%, and 100% of industrial waste was properly disposed of by qualified domestic waste treatment institutions.

Air Pollution Control

- Winbond's air pollution prevention strategy began with source reduction. By rationalizing pollutant generation through process improvements and treating exhaust gases with high-efficiency control equipment, Winbond (Taiwan) achieved an average VOC removal rate of 99%, surpassing regulatory requirements.

Net Zero Strategy and Action Plan

To steadily advance towards sustainability, Winbond aligned its corporate sustainability strategy and ethos to establish short- term (by 2030), medium-term (by 2040), and long-term (by 2050) net-zero goals. Additionally, Winbond developed a roadmap to achieve net-zero emissions by 2050 and has been undertaking comprehensive actions to drive ongoing progress toward this commitment.



2050 Winbond Net-zero Roadmap

Net-Zero Action Plan

- Enterprise-wide carbon reduction initiative
- Reduce process gases
- Reduce process exhaust gases

- Enhance energy efficiency
- Utilize renewable energy
- Promote low-carbon value chains

- Carbon Removal

3.1 Energy and Greenhouse Gas Management

Winbond manages greenhouse gases and energy resources digitally through data governance. In 2020, Winbond began data sorting and inventory work to establish systematic management, and in 2023, expanded it to subsidiaries, gradually improving data management capability. Based on the inventory results, Winbond took various reduction actions and regularly tracked various data.

3.1.1 Greenhouse Gas Management

Winbond actively cooperates with the government's corporate greenhouse gas inventory registration efforts, implemented greenhouse gas management mechanisms within the fab, and conducted ISO 14064-1 greenhouse gas inventory using the operational control method. Winbond and its subsidiaries have comprehensively promoted the inventory and verification of greenhouse gas emissions, set reduction targets, identified reduction opportunities, and proposed improvement plans.

Winbond has set greenhouse gas emission reduction targets, aiming to reduce Scope 1 and Scope 2 emissions by 42% by 2030 (base year 2023). In 2024, Scope 1 and Scope 2 emissions were reduced by 1.1%. The greenhouse gas emission intensity indicator for 2024 was 12.7 kg CO_2 equivalent, compared to 15.5 kg CO_2 equivalent in 2023, representing a year-on-year reduction of approximately 18.1%. In the future, Winbond will continue to promote the reduction of process gases such as FCs (e.g., process improvements and installation of exhaust treatment equipment), energy-saving measures (process optimization, efficiency improvement, and smart energy-saving), and the use of renewable energy to continuously reduce carbon emissions.

Winbond continued investing in environmental sustainability to ensure the implementation of environmental sustainability strategies. In 2024, Winbond formulated an environmental responsibility policy, which was specifically explained through environmental sustainability management indicators, demonstrating its commitment and efforts in environmental sustainability development. Winbond looks forward to collaborating with suppliers, contractors, customers, and key partners to build a better future together.

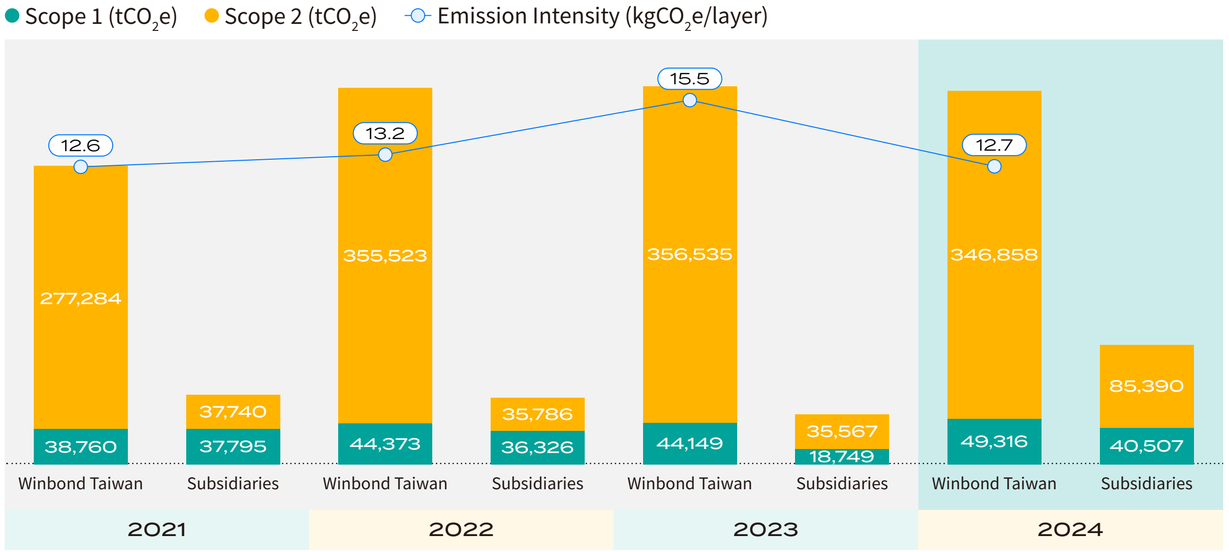
	2024 Progress	2025 Goal	2030 Goal
Energy and Greenhouse Gas Management Through technological innovation and efficiency improvement, energy consumption was controlled, and the monitoring and reduction of greenhouse gas emissions were actively implemented to improve energy use efficiency. Note The baseline year for greenhouse gas emission reduction was 2023.	▪ Winbond (Taiwan) reduced Scope 1 and Scope 2 greenhouse gas emissions by 1.1%. ▪ The greenhouse gas emission intensity indicator was 12.7 kg CO_2e/layer. ▪ The PFCs emission intensity indicator was 0.383 kg CO_2e/layer. ▪ The electricity intensity indicator was 23.85 kWh/layer. ▪ The annual electricity savings were 3.5%. ▪ Winbond (Taiwan) used 43.96 million kWh of renewable energy, accounting for 5.9%.	▪ 2.5% Winbond (Taiwan) Scope 1 and 2 GHG emissions reduction ▪ 12.6 kg CO_2e/layer unit GHG emission intensity indicator (average GHG emissions per layer of 12-inch wafer production) ▪ 0.471 kg unit PFCs emission intensity indicator CO_2e/layer (average PFCs GHG emissions per layer of 12-inch wafer production) ▪ Unit electricity consumption intensity indicator 24.90 kWh/layer (average electricity consumption per layer of 12-inch wafer production) ▪ 2~3% Annual electricity savings	▪ Winbond (Taiwan) Scope 1 and 2 GHG emissions reduction 42% ▪ Winbond (Taiwan) Scope 3 GHG emissions reduction 25% ▪ Cumulative electricity savings over 15% ▪ Achieve 50% renewable energy in Winbond (Taiwan)
Water Management Measures such as water conservation and recycling were adopted to protect and rationally utilize water resources to ensure sustainability.	▪ The water recycling volume was 13.68 million cubic meters, with a fab-wide water recycling rate of 81.9% and a process water recycling rate of 89.3%, meeting the commitments of the Science Park environmental impact assessment. ▪ The water intensity indicator was 147 liters/layer. ▪ The ultrapure water usage per unit capacity was 0.277 cubic meters/layer. ▪ The comprehensive water pollution reduction rate was 74.8%.	▪ Above 80% fab-wide water recycling rate ▪ 161 liters/layer unit water consumption intensity indicator (average water consumption per layer of 12-inch wafer production) ▪ 0.286 cubic meters/layer unit ultrapure water consumption intensity indicator (average ultrapure water consumption per layer of 12-inch wafer production) ▪ 78% water pollution comprehensive indicator reduction rate	▪ Above 80% fab-wide water recycling rate annually ▪ 78% Water pollution comprehensive indicator reduction rate
Waste Management Waste reduction, classification, and recycling measures were implemented to minimize negative environmental impacts.	▪ The fab generated 17,051 metric tons of waste, with a fab-wide waste recycling rate of 91.9%. ▪ The waste intensity indicator was 0.55 kg/layer.	▪ - Above 90% fab-wide waste recycling rate ▪ - 0.588 kg/layer unit waste output intensity indicator (average waste output per layer of 12-inch wafer production)	▪ Above 90% fab-wide water recycling rate annually
Air Pollution Control Emissions were controlled and process technology was improved to minimize the impact on the atmospheric environment.	▪ The average removal rate of volatile organic compounds (VOCs) was 99%. ▪ The VOCs emission intensity indicator was 0.151 g/layer.	▪ 90% average VOCs removal rate ▪ 0.204 g/layer unit VOCs emission intensity indicator (average VOCs emissions per layer of 12-inch wafer production)	▪ Above 90% Volatile organic compounds (VOCs) removal rate annually

3.1.1.1 Greenhouse Gas Inventory

Winbond continued to expand the scope of greenhouse gas management, fully implementing ISO 14064-1 greenhouse gas emissions inventory and verification at its Taiwan locations. Each year, Winbond conducts regular inventories of greenhouse gas emissions at each fab to monitor carbon emissions and verify the effectiveness of reduction actions. Starting in 2024, Winbond began including data from subsidiaries in its consolidated financial statements.

Scope 1 and Scope 2 Emission

Greenhouse Gas Emissions



Note 1 Winbond increased the reporting boundary in 2023 to include consolidated financial statement subsidiaries (Nuvoton (Taiwan)) to obtain more comprehensive emission information. Therefore, the base year for greenhouse gas inventory was tentatively set as 2023.

Note 2 The global warming potential (GWP) sources for 2021 and 2022 were from the IPCC Fourth Assessment Report (2007), while those for 2023 and 2024 were from the IPCC Fifth Assessment Report (2019). The subsidiary's 2024 sources were from the IPCC Sixth Assessment Report (2021).

Note 3 The types of greenhouse gases included nitrous oxide (N_2O), methane (CH_4), carbon dioxide (CO_2), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

Note 4 All energy consumption data were derived from measured values on billing receipts, monthly natural gas consumption settlement tables, material requisition forms, and AS400/ inventory change verification tables by material number, with no estimated values.

Note 5 Coefficient sources: Uncertainty data for emission factors were referenced from the latest version of the Climate Change Office's greenhouse gas emission factors, and the uncertainty assessment of activity data was referenced from the calibration and inspection technical specifications of metrology instruments.

Note 6 The 2024 values were estimates, as the 2024 electricity coefficients had not yet been announced.

Note 7 From 2021 to 2023, the scope was Winbond (Taiwan) and Nuvoton (Taiwan); in 2024, the scope expanded to include the entire Winbond Group.

2024 Greenhouse Gas Emissions

2024 Greenhouse Gas Emissions		Scope 1	Scope 2	Scope 3
Winbond (Taiwan)	Emission (tCO_2e)	49,316	346,858	405,474
	Percentage	6%	43%	51%
Subsidiaries	Emission (tCO_2e)	40,507	85,390	571,768
	Percentage	6%	12%	82%

Scope 3 Emissions Sources

Type of Emissions	2024 Scope 3 Emissions (tCO_2e)	
	Winbond(Taiwan)	Subsidiaries
Purchased goods and services	323,883	382,937
Fuel and energy-related activities	74,237	184,930
Upstream transportation and distribution	1,433	1,253
Waste generated in operations	2,570	135
Business travel	372	1,185
Employee commuting	2,980	1,328

3.1.1.2 Greenhouse Gas Reduction

Greenhouse Gas Reduction Strategy

Winbond's primary greenhouse gas emissions come from fluorinated gases (Fluorocarbons, FCs) used in processes and purchased electricity, accounting for over 90% of Scope 1 and Scope 2 greenhouse gas emissions. Therefore, reducing direct emissions of FCs (process improvements and installation of exhaust treatment equipment), indirect emissions through energy-saving measures, and using renewable energy are crucial strategies for reducing greenhouse gas emissions. Winbond plans to promote various carbon reduction projects and improve energy efficiency, establish a carbon emission information platform to integrate and manage carbon emission information, and achieve "Green low-carbon" is redundant and vague low-carbon production. Additionally, Winbond will respond to the Science Based Targets initiative (SBTi) by planning to use 50% renewable energy in Winbond (Taiwan) by 2030 and reduce Scope 1 and Scope 2 greenhouse gas emissions by 42% (based on 2023 levels), aiming for net-zero emissions at all fabs by 2050.

Action Plan

Winbond is committed to green semiconductor manufacturing, implementing process improvements to reduce greenhouse gas usage. Specific action plans include accelerating the replacement of energy-saving components and installing exhaust treatment equipment at the equipment end, implementing energy-saving projects for production machines and facilities, using renewable energy, and reducing the consumption of gas and chemical raw materials. The scope of new projects in 2024 covers Scope 1, 2, and 3, which can further reduce 26,860 metric tons of CO_2 equivalent emissions annually (Scope 1: 2,537 metric tons of CO_2 equivalent emissions; Scope 2: 12,989 metric tons of CO_2 equivalent emissions; Scope 3: 11,334 metric tons of CO_2 equivalent emissions), equivalent to the annual carbon sequestration of approximately 70 Daan Forest Parks. (For information on reduction actions, please see section

Note According to data from the Forestry and Nature Conservation Agency and the Taipei City Government's Department of Land Administration, Daan Forest Park covers 25.894 hectares and has a carbon fixation rate of 1.7 CO_2e per hectare per year. As a result, the park contributes to the area via absorption of approximately 363 CO_2e

Reduction of Fluorinated Greenhouse Gases

Winbond has participated in the Perfluorocarbons (PFCs) greenhouse gas emission reduction program of the Taiwan Semiconductor Industry Association (TSIA) and the World Semiconductor Council (WSC) since 2000. Through process adjustments, the use of alternative gases, and the installation of fluorinated greenhouse gas (FCs) reduction equipment, Winbond reduced greenhouse gas emissions by approximately 242,000 metric tons of carbon dioxide equivalent in 2024. This effort has lowered climate risk impacts, enhanced Winbond's ability to adapt to climate change, and increased industry competitiveness, creating value.

3.1.2 Energy Management

Winbond adhered to the vision of "Being a hidden champion in providing sustainable semiconductors to enrich human life." fulfilling its green manufacturing responsibilities and reducing the environmental impact of operations, enhancing product value while conserving energy and improving efficiency, and investing resources to support equipment energy optimization, aiming to fulfill social responsibility and achieve sustainable operations.

CTSP Fab obtained the ISO 50001 Energy Management System certification in 2022, effectively institutionalizing engineering management, while the newly built Kaohsiung Fab also introduced ISO 50001 in 2023, expanding the scope and benefits of energy management, and obtained certification in 2024.

Energy Management Programs

1. Energy Audits: Conduct comprehensive energy reviews to identify opportunities for improving energy performance, including inspecting equipment operation, analyzing energy consumption data, and identifying potential energy-saving measures.
2. Energy-saving Targets: Establish specific energy-saving reduction targets to help systematically advance various energy-saving action plans and ensure measurable and trackable results.
3. Energy-saving Actions: Implement a series of actions, such as replacing high-efficiency equipment, optimizing production processes, and improving facility energy efficiency.
4. Regular Evaluation and Continuous Improvement: Regularly evaluation the progress of energy-saving actions to ensure each action can be advanced as planned and achieve the expected results. Evaluation results provide feedback for timely adjustment and continuous improvement.
5. Use of Green Energy: Prioritize the use of clean green energy, such as solar and wind energy, to further reduce our carbon footprint and environmental impact.
6. Innovative Research and Development: Increase investment in innovative technology and research projects to seek new solutions to reduce energy consumption, improve energy efficiency, and promote sustainable development.
7. Sustainable Culture: Foster a culture of environmental responsibility among all employees, provide energy efficiency training to management, employees, suppliers/contractors, and expand value chain cooperation to foster a sustainable environment.

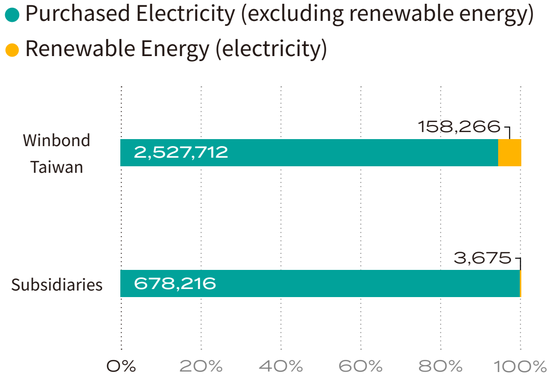
3.1.2.1 Energy Usage

In recent years, due to the expansion of the Kaohsiung Fab and the addition of new equipment, the consumption of various raw materials and fuels has shown an upward trend. In 2024, Winbond(Taiwan)'s total energy consumption was approximately 3,085,408 gigajoules, while the subsidiaries' total energy consumption was approximately 963,369 gigajoules.

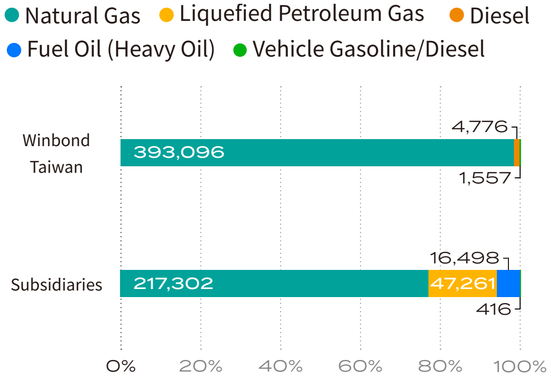
The energy consumption indicator for unit products in 2024: The average power consumption per layer of mask for producing 12-inch wafers was 85.8 megajoules, compared to 100.7 megajoules in 2023, the unit product power consumption decreased by approximately 14.8% YoY (megajoules/layer-mask). The power saving rate in 2024 was 3.5%, and the energy power reduction target for 2025 is to reduce the average power consumption per layer of mask for producing 12-inch wafers to below 89.7 megajoules. In the future, Winbond will continue to promote energy-saving projects such as equipment replacement, consumption reduction, process optimization, smart energy saving, and efficiency improvement to increase environmental sustainability benefits.

Energy Usage

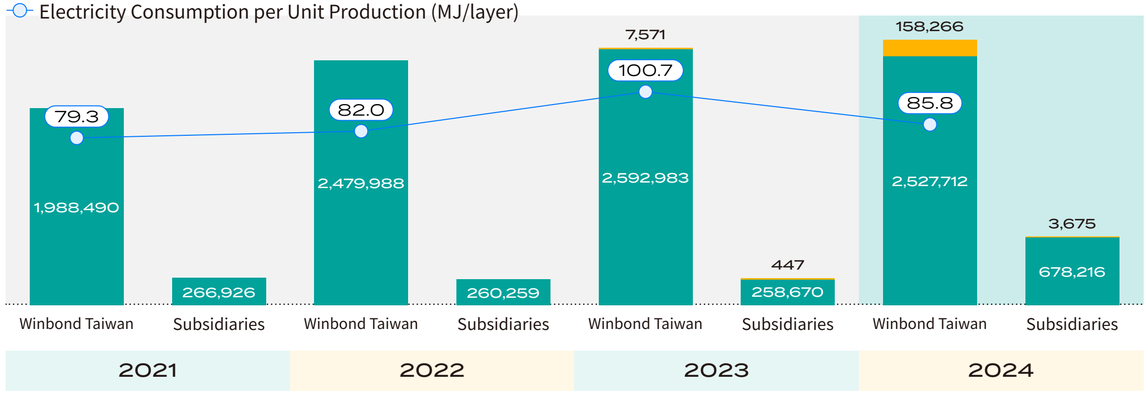
Electricity Usage (GJ)



Fuel Usage (GJ)



Electricity Usage (GJ)



Note 1 Energy consumption has been converted to joules. Except for natural gas, which is calculated based on the calorific value provided by the supplier, all other energy sources are calculated using the greenhouse gas emission coefficients announced by the Ministry of Environment and Climate Change. Electricity 1 kWh = 3,600 kJ, natural gas 1 cubic meter = 8,853 kcal, liquefied petroleum gas 1 liter = 6,635 kcal, fuel oil 1 liter = 9,600 kcal, diesel 1 liter = 8,642 kcal, gasoline 1 liter = 7,609 kcal, 1 calorie = 4.184 joules.

Note 2 Energy consumption is derived from measured values on billing receipts, monthly natural gas consumption settlement tables, and material inventory change verification tables by material number, with no estimated values.

Note 3 From 2021 to 2023, the scope was Winbond (Taiwan) and Nuvoton (Taiwan); in 2024, the scope was Winbond Group.

3.1.2.2 Renewable Energy Promotion

In 2023, Winbond completed its first renewable energy procurement.

Winbond expanded its renewable energy portfolio and made its first renewable energy procurement in 2023, acquiring onshore wind power, which is expected to provide Winbond with nearly ten million kWh of renewable energy annually, exceeding the annual electricity consumption of Winbond (Taiwan)'s non-manufacturing sites.

In 2024, Winbond continued to purchase diverse power sources.

In February 2024, Winbond signed a corporate power purchase agreement with Chenya Energy Co., Ltd., obtaining 27 MW of solar power from offshore floating solar farms starting in April. The total power supply during the five-year contract period is expected to reach approximately 175 million kWh, with carbon reduction benefits equivalent to the annual carbon absorption of 490 Da'an Forest Parks, and can supply the annual electricity consumption of 43,000 households.

In August 2024, Winbond signed a corporate power purchase agreement with Energy Helper TCC Corporation, to obtain a total of 9.24 MW of onshore wind power in September and October of the same year.

In November 2024, Winbond's board of directors approved the signing of a long-term renewable energy power purchase agreement with Sustainable Energy Solution Co., Ltd.(SES), renewable energy provider under Sino-American Silicon Products Group(SAS). Starting with the completion of the first phase of third-stage development project, SES will supply Winbond with offshore wind and solar power. This 30-year collaboration is expected to deliver approximately 4.8 billion kWh of renewable energy. This cooperation represents the first transaction in Taiwan in which offshore wind power is sold renewable energy provider to a domestic enterprise, demonstrating Winbond's determination to advance on the path to net zero. This cooperation not only covers offshore wind power but also extends to the supply of solar photovoltaic power, helping meet the company's green power needs at year-round through the complementary characteristics of both sources. This move is anticipated to help Winbond reduce approximately 80,000 metric tons of carbon dioxide emissions annually, with a cumulative reduction of 2.4 metric million tons over 30 years, marking a significant step toward sustainable development and net zero carbon emissions.

Establishment of Self-Generated Renewable Energy Power Devices

In response to the government's active promotion of green energy policies, Winbond Group has continuously invested in the development and utilization of renewable energy. In 2019, Winbond took the lead in installing a 499 KW rooftop solar power generation device at its fab, and in 2024, the generated power was converted for self-use, supporting green manufacturing. Nuvoton also followed suit, completing the installation of an 819 KW self-use solar power generation device in 2023.

In the future, Winbond Group will continue to evaluate the expansion of renewable energy device capacity, gradually increasing renewable energy use and progressing toward the goal of becoming a green enterprise.

In 2024, Winbond's renewable energy usage reached 43.96 million kWh, and obtained 43,961 renewable energy certificates.

3.1.2.3 Energy Conservation Plan

In 2024, Winbond employees implemented 129 energy-saving measures through benchmarking, precise control, and technical cooperation. These measures were categorized into six major types: equipment replacement, machine modification, efficiency improvement, usage reduction, process optimization, and smart energy saving. Among them were process improvements, optimization of the MAU (Make-up Air Unit) washing system, enhancement of air compressor operation efficiency, and replacement of energy-saving motors. Compared to 2023, this resulted in an increase of approximately 94,650 gigajoules, equivalent to approximately 26.3 million kWh—roughly the annual electricity consumption of 7,503 households.

Note The calculation basis is Taiwan Power Company - the average annual household electricity consumption in 2018 was 3,504 kWh, approximately 12.6 billion joules.

Type	Action Plan (Example)	Measures	Electricity Savings (10,000 kWh)	Gigajoules	Emission Reduction (tCO_2e)
Equipment Replacement	▣ Replacement of energy-efficient motors ▣ Replacement of energy-efficiency heating/cooling equipment	17	1,513	54,464	7,474
Machine Retrofit	▣ Machine heating/cooling equipment settings; Optimized machine exhaust reduction	20	223	3,830	526
Performance Enhancement	▣ Enhanced MAU System Performance ▣ Enhance the plate heat exchanger efficiency of PCW	13	106	16,715	2,294
Consumption Reduction	▣ Optimized heating/cooling equipment settings ▣ Optimized machine exhaust reduction	62	9	8,039	1,103
Process Optimization	▣ Simplified process steps	12	464	338	46
Smart Energy Saving	▣ Smart equipment control system ▣ Intelligent chiller	5	313	11,264	1,546

Note 1 The base year is 2021.
Note 2 The electricity carbon emission factor is 0.494 kg CO2 equivalent/kWh.

3.1.2.4 Case Study – Energy Conservation

The MAU Water Washing System

The MAU (Make-up Air Unit) water washing system introduced new nozzles, low-power energy-saving motors, wet plates, and guide plates, which reduced circulating water flow, pump power, and fan pressure loss, thereby decreasing pump and fan motor energy consumption which reduced circulating water flow, pump power, and fan pressure loss, thereby decreasing pump and fan motor energy consumption by 56%, saving approximately 3.06 million kWh annually.

New Type of Nozzle

High-Efficiency Nozzle
- Improved Washing Efficiency
- Reduced Number of Nozzles

Low-Power Energy-Saving Motor

Replaced Large Pump with Small Pump
- Installed Low-Power Pump
- Reduced Energy Consumption

Wetting Plate

High-Efficiency Low-Pressure Loss Wetting Plate
- Introduced New Wetting Plate
- Reduced Airflow Pressure Loss

Deflector

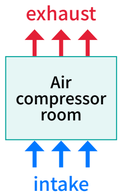
Replaced Baffle with Deflector
- Introduced New Deflector to Improve Airflow Distribution
- Reduced Airflow Pressure Loss

Improving Air Compressor Operational Efficiency

As the ambient temperature rises, air density decreases, causing the air compressor to compress more air to achieve the same compression ratio, increasing energy consumption. Winbond maintained appropriate ambient temperature and intake temperatures to preserve the compression ratio and operational efficiency of air compressors, reducing energy consumption by 7%, equivalent to saving approximately 840,000 kWh annually.

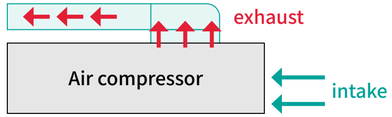
Strengthening the ventilation of the computer room environment

- Improving overall air exchange in the computer room to reduce ambient temperature



Independent exhaust for air compressors

- Adding independent fans and exhaust ducts to lower the temperature



Insulation for dryers

- Adding insulation cotton and aluminum skin insulation to prevent heat source dispersion

3.2 Water Management

Winbond adheres to the vision of "Being a hidden champion in providing sustainable semiconductors to enrich human life." fulfilling the responsibility of green manufacturing, reducing the impact and influence of corporate operations on the environment, aiming to fulfill social responsibility and sustainable management.

Water Resource Efficiency Policy

- ✓ All employees participate in water conservation, promoting awareness of water resource management.
- ✓ Prioritize water-saving designs and continuously improve water resource efficiency.
- ✓ Recycle and reuse water resources to ensure the achievement of water resource goals.
- ✓ Strictly comply with government regulations and conduct regular reviews of water resource management.

Water Resource Risk Assessment

To understand the water resource risk situation, Winbond uses the World Resources Institute (WRI) water risk assessment tool, adopting the "Aqueduct Water Risk Atlas" through the AQUEDUCT website to analyze the distribution of water resources in Taiwan, understanding that all Taiwan operation sites are located in low-risk areas for water resource pressure.

Water Resource Efficiency Management Guidelines

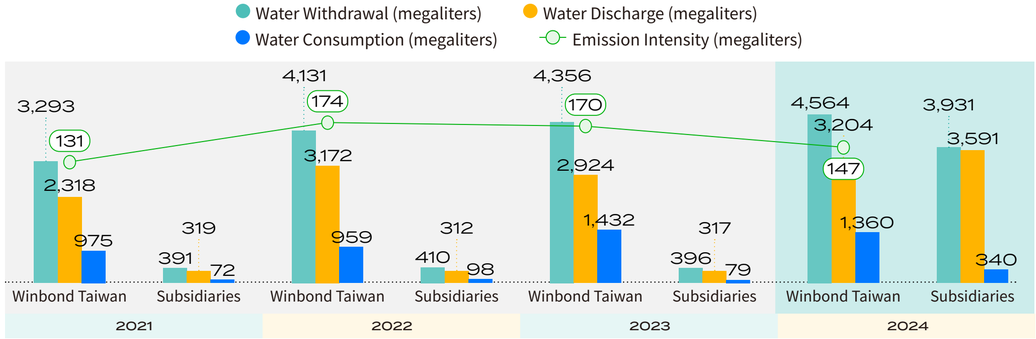
- Identify water-saving hotspots: Identify high water consumption points in the production process and continuously identify opportunities for water conservation and recycling within the company.
- Water-saving action plan: Implement a series of action plans, such as adopting water-saving designs, optimizing production processes, and improving the water efficiency of facilities.
- Water pollution prevention: Minimize harmful substance use and reduce sources of process wastewater, and properly treat wastewater to reduce or remove pollutant emissions, complying with regulatory standards.
- Water resource management targets: Ensure the safety of drinking water in the communities where operations are located; set specific water-saving targets to help systematically advance various water-saving action plans and ensure measurable and traceable results.
- Water recycling measures: Continuously improve the reuse rate of recycled water, develop diverse alternative water sources, and take actions to reduce water intake and consumption.
- Sustainable culture: Foster a culture of environmental responsibility among all employees, provide environmental education and awareness training to management, employees, suppliers/contractors, expand value chain cooperation and sharing, raise awareness and accountability of internal and external stakeholders for environmental sustainability, exert social influence, and jointly protect the integrity of terrestrial, freshwater, and marine ecosystems, creating a beautiful sustainable environment.

Water Withdrawal, Discharge, and Consumption

Winbond's water sources mainly come from tap water supplied by Taiwan Water Corporation, sourced from Liyutan Reservoir, Deji Reservoir, and Agongdian Reservoir, with a small portion coming from rainwater and air conditioning condensate. After the water shortage issue in 2021, Winbond has found stable natural water sources, and the fab has an underground reservoir with a capacity of 75,000 cubic meters, sufficient to support fab operations during water shortage and restriction crises. In 2024, Winbond received a B rating in the CDP water security evaluation.

In 2024, Winbond's total water consumption was approximately 4,564,136 cubic meters, with the unit product water consumption indicator – the average water consumption per layer of photomask for producing 12-inch wafers being 147 liters, compared to 170 liters per layer of photomask in 2023, the unit product water consumption YoY decreased by about 13.5%, and will continue to optimize the efficiency of the recycled water system and improve water efficiency.

Water Withdrawal, Discharge, and Consumption



Note 1 The third-party water source comes from surface water (freshwater ≤ 1,000 mg/L total dissolved solids); the total water withdrawal calculation method is the sum of surface water (total), groundwater (total), seawater (total), produced water (total), and third-party water (total).

Note 2 From 2021 to 2023, the scope was Winbond (Taiwan) and Nuvoton (Taiwan); in 2024, the scope was Winbond Group.

Rainwater and Condensate - Diverse Alternative Water Sources

Rainwater and condensate are also alternative water resources that can be utilized, and proper collection and use can reduce the impact on environmental water resources. Winbond's rainwater and condensate are mainly used for irrigation and secondary water use, with a usage of 0.26 megaliters in 2024.

3.2.1 Water Conservation and Recycling

The long-term goal of water resource management is to achieve an average annual water recycling rate of over 80% across the entire fab by 2030. In 2024, the water recycling volume reached 13.68 million cubic meters, with a fab-wide water recycling rate of 81.9% and a process water recycling rate of 89.3%, meeting the commitments of the Science Park environmental impact assessment (fab-wide water recycling rate greater than 77%, process water recycling rate greater than 85%).

Water-saving measures

Winbond continued to increase the reuse rate of recycled water, implementing 10 new water-saving measures in 2024, resulting in an increase of approximately 155,000 cubic meters of water saved. From 2019 to 2024, the cumulative water savings reached approximately 4,880 megaliters, equivalent to about 0.97 times the effective capacity of Baoshan Reservoir.

Introduction of ISO 46001 Water Resource Efficiency Management System

Winbond implemented ISO 46001 in 2023, with the Taichung Fab obtaining certification in January 2024 and the Kaohsiung Fab obtaining certification in October 2024. Through the ISO 46001 Water Resource Efficiency Management System, Winbond effectively managed the related risks of water resource supply, measured and monitored water resource usage, improved overall performance, and reduced water resource consumption to minimize environmental impact.

ISO 14046 Water Footprint Verification

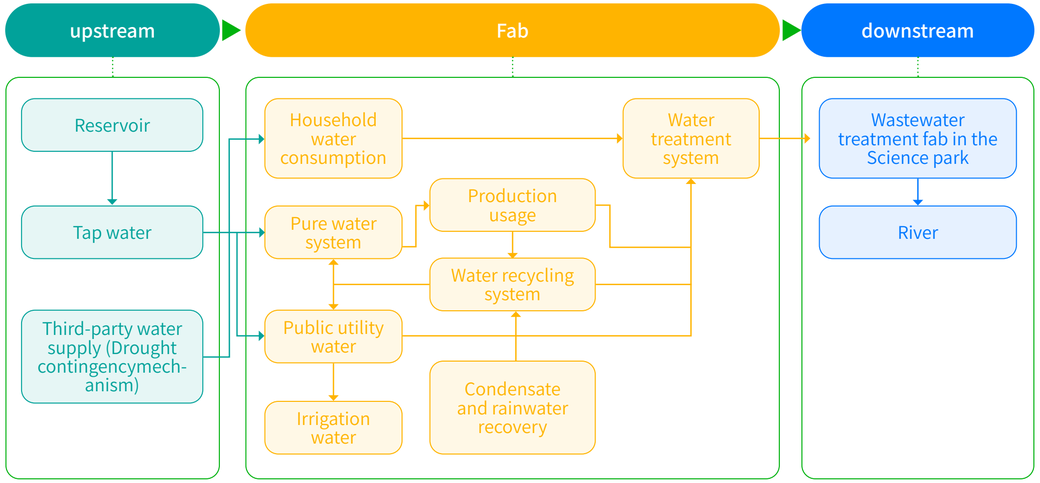
Winbond conducts ISO 14046 water footprint verification every three years. In February 2025, Flash and DRAM Wafer products passed the verification, further enhancing Winbond's product water management.

2024 Water Conservation Measures (Unit: megaliters/Year)

Item	Conservation Project	Description	Water Savings
1	Water Conservation and Drought Resistance Measures	Reduced tap water usage by using recycled water in cooling towers	59.3
2	Water-saving in process equipment	Adjusted parameters of process equipment to achieve water reduction	41.0
3	Water-saving in exhaust gas treatment equipment	Adjusted parameters of exhaust gas treatment equipment to achieve water reduction	22.8
4	Water-saving through optimization of fab system procedures	Extended the operating hours of pure water system units to achieve water reduction	11.0
5	Automation of RO membrane chemical cleaning in wastewater ROR recycling system	Precisely controlled the amount of tap water used for automatic backwashing	6.1
6	Improvement of RO water production rate in UPW system	Adjusted parameters to increase RO water production and reduce tap water usage	5.5
7	Water-saving in CMP Brush idle rinse	Reduced UPW water usage in Brush idle rinse	5.2
8	Reduction of drainage in cooling tower sand filter system	Reduced the frequency of backwashing in sand filter systems to reduce tap water usage	1.4
9	Reduction of soft water usage in WET Local Scrubber	Reduced soft water usage in Local Scrubber washing	1.4
10	Reduction of water usage in WET FOUP cleaner	Reduced UPW water usage in Tool idle	0.8

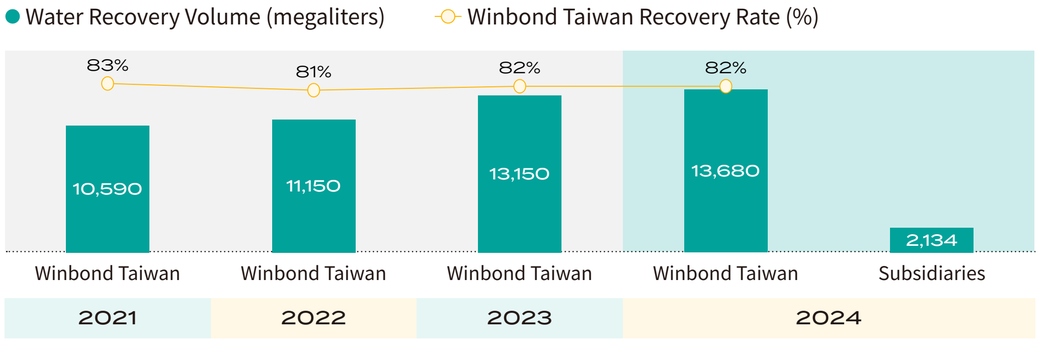
Note The scope of water conservation measures statistics is the Winbond (Taiwan) fab.

Site Water Usage Process



Note Public utility water includes the following: cooling tower circulating water and central/local scrubber circulating water.

Water Recovery



Note Fab water recovery rate= (Recycled Condensate + Recycled Process Water + Recycled Reclaimed Wastewater) / (Tap Water + Recycled Condensate + Recycled Process Water + Recycled Reclaimed Wastewater -Evaporation).

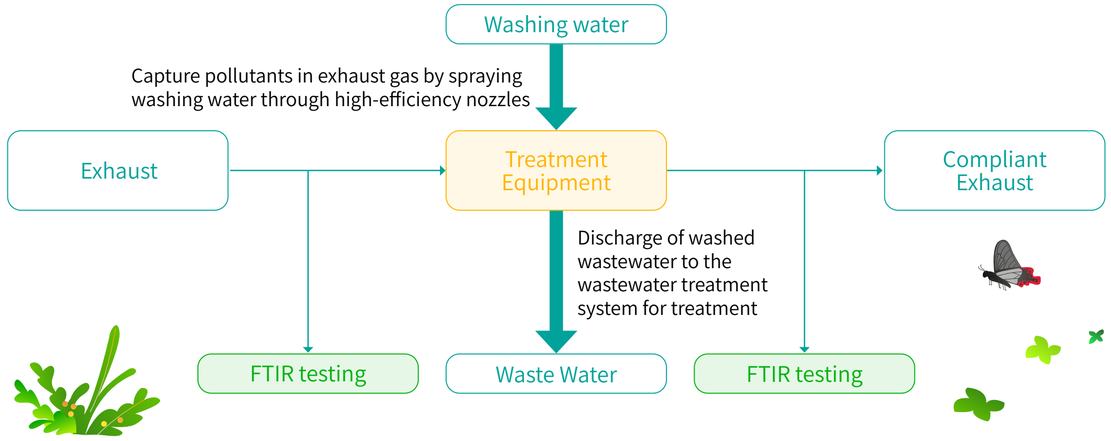
3.2.2 Case Study: Water Conservation

Water-saving in exhaust gas treatment equipment

In response to the advancement of semiconductor process technology, the consumption of water resources in the manufacturing process has gradually increased, making the reasonable management of water resources an urgent issue. Winbond is committed to achieving water conservation through various measures. Collaborating with exhaust gas treatment equipment manufacturers, Winbond gradually reduced the washing water flow for exhaust gas treatment equipment with lower loads, while simultaneously conducted emission concentration tests to ensure that the test results meet the requirements. This can saved approximately 22,776 tons of water annually. While meeting emission requirements, this effectively reduced water usage and wastewater discharge.

Schematic diagram of exhaust treatment equipment

saved approximately **22,776 tons of water annually**



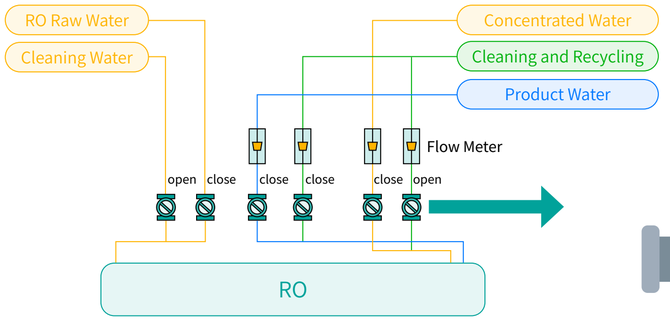
Automated of RO membrane chemical cleaning in wastewater ROR recycling system

The wastewater recycling system properly treated process wastewater to produce secondary water, which was then used in the fab system, reducing tap water usage. The RO unit backwashing operation in the wastewater recycling system was improved to an automatic backwashing mechanism, which allowed precise control of cleaning water and increased the recovery rate by more than 2%. This resulted in an increase of over 100 tons of recycled water per day, saved approximately 6,100 tons of water annually, and reduced the use of water resources.

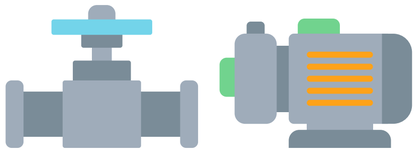
Diagram of the Wastewater Recycling System

saved approximately **6,100 tons of water annually**

RO Cleaning Valve Switching Diagram



The CIP chemical cleaning is automatically controlled by PLC, with the addition of pneumatic valves and backwash pumps to achieve automatic backwashing efficiency.



CIP Chemical Washing Automatic Control Diagram

3.2.3 Water Pollution Prevention

Wastewater Treatment Facility

During the initial design phase, operational waste liquids were categorized into over 20 distinct pipeline types for collection, homogenizing the wastewater quality. Based on the characteristics of the wastewater, 11 major categories of wastewater treatment facilities were established. To reduce the environmental load and chemical usage in wastewater treatment facilities, plans were made for the recovery of waste liquids from washing towers, cooling towers, process cooling waste liquids, and process soft water. After treatment, these systems supply secondary water for use within the fab.

3 Major Principles for Wastewater Treatment in Winbond's Fab

Reduction of Process Wastewater Sources

Separating and treating wastewater

Establish appropriate treatment facilities based on the nature of the wastewater produced.Properly treat wastewate through various treatment systems, until wastewater reaches CTSP Sewage System Water Quality Standards.

Wastewater is discharged into the CTSP Sewage Treatment fab, where water is treated again until it reaches water quality standards for discharge.

Final discharge

- Water from the CTSP is released into the Dadu River.
- Water from the Kaohsiung Science Park is released into the Tuku Canal

Recycling and reuse

Wastewater produced by the wafer fabrication process: Treat the acidic and alkaline wastewa- ter, fluoridated, wafer planarization, ammonia nitrogen, tetramethylammonium hydroxide, copper, and hydrogen peroxide wastewater generated during wafer fabrication.

Domestic wastewater from employee activities: treated using a membrane bioreactor (MBR) system.

Water Quality Testing

In accordance with relevant water pollution prevention regulations and the Soil and Groundwater Pollution Remediation Act, Winbond has established and applied for operational discharge permits. Through biannual testing by laboratories accredited by the Environmental Inspection Institute, Winbond ensures that the discharge water quality meets the standards of the park's management. Winbond continuously improves water pollution prevention facilities to reduce biochemical oxygen demand (BOD), chemical oxygen demand (COD), suspended solids (SS), and sludge. In 2024, the test data for BOD, COD, and SS were all better than the water quality standards set by the Science Park Administration Bureau.

Regulatory Standards / Monitoring Values (unit：mg/L)			Chemical Oxygen Demand	Suspended Solids	Biochemical Oxygen Demand
Winbond	CTSP Fab (Central Taiwan Science Park)	Regulatory Standards	400	300	240
		Monitoring Values	22.4~104	10.6~16.9	14.5~52.8
	Kaohsiung Fab (Southern Taiwan Science Park)	Regulatory Standards	450	250	250
		Monitoring Values	133~222	13.1~25.7	<1.0
Nuvoton	Yanshin Fab (Hsinchu Science Park)	Regulatory Standards	500	300	-
		Monitoring Values	49.9~74.2	36~167	-

Comprehensive Water Pollution Index Reduction Rate

To assess the impact of effluent pollutants on the environment, Winbond compared the average effluent concentration of major pollutants in the fabs in Taiwan for the first and second half of the year against regulatory standards set by local authorities. A comprehensive water pollution index was established as a key indicator for water pollution prevention. In 2024, the comprehensive water pollution index reduction rate for the fabs was 74.8%, with a target of 78% set for 2025. Winbond will continue investing in wastewater technology research and optimizing monitoring systems to gradually improve the annual reduction rate of the comprehensive water pollution index.

3.3 Waste Management

Winbond adheres to its "Safety, Health, and Environmental Policy," aiming to implement environmental protection measures and reduce risks related to the environment, safety, health, and assets. The waste management strategy focuses on "minimizing waste treatment and maximizing resource recycling," through source reduction, enhanced recycling and reuse, and reduced environmental impact from production.

Waste Management Plan:

- Identifying waste reduction hotspots: Identifying key links in the production process that generate large amounts of waste and continuously seeking opportunities for internal waste reduction or recycling.
- Waste reduction actions: Reducing or reusing and increasing recycling rates to minimize the amount of waste generated within the fab, aiming to minimize environmental impact and pollution.
- Quantifying waste reduction targets: The long-term goal of waste management is to achieve an annual waste recycling rate of over 90% in Taiwan fabs by 2030.
- Developing new waste reduction technologies: Winbond conducts research, procurement, production, operations, and services based on the following principles to reduce the harm and impact of the company's operations on the natural environment and humans:
  1. Reducing resource and energy consumption in products and services
  2. Reducing the emission of pollutants, toxins, and waste, and properly handling waste
  3. Enhancing the recyclability and reuse of raw materials or products
  4. Maximizing the sustainable use of renewable resources
  5. Extending the durability of products
  6. Increasing the efficiency of products and services
- Sustainable culture: Establishing a culture of environmental protection responsibility among all employees, providing environmental education and training to management, employees, suppliers/contractors, expanding value chain cooperation and sharing, and enhancing the awareness and responsibility of internal and external stakeholders for environmental sustainability, exerting social influence, and creating a better sustainable environment.
- Comprehensive recycling and zero landfill: Promoting comprehensive recycling plans to minimize waste landfill treatment.
- Independent certification conversion rate: Aiming for third-party certification to ensure the reliability of waste recycling, reuse, or incineration conversion data.

To ensure the correct and safe handling of waste generated during operations, Winbond has formulated waste management procedures and conducted audits of waste removal and treatment vendors. By reducing or reusing and increasing recycling rates, the amount of waste generated within the fab is minimized, aiming to minimize environmental impact and pollution. In 2024, waste production in Winbond(Taiwan) was approximately 17,051 tons, with an average waste production per layer of mask for producing 12-inch wafers of approximately 0.550 kg; 100% of hazardous industrial waste was properly disposed of by qualified domestic waste treatment institutions.

Regarding waste recycling, reuse, or incineration conversion data management, Winbond plans to introduce UL 2799 Zero Waste to Landfill certification in 2025. Through third-party certification, Winbond aims to implement waste management and continue to move towards the goal of zero waste resources.

3.3 Waste Management

Source Reduction and Efficient Treatment

Winbond's air pollution prevention strategy began with source reduction, rationally reducing the generation of air pollutants through process improvements, and then treating the pollutants in exhaust gas with high-efficiency prevention equipment, ensuring that the pollutant content entering the atmosphere is better than government regulations. Winbond's annual test results show that air pollutant emissions are better than the emission standards stipulated by regulations.

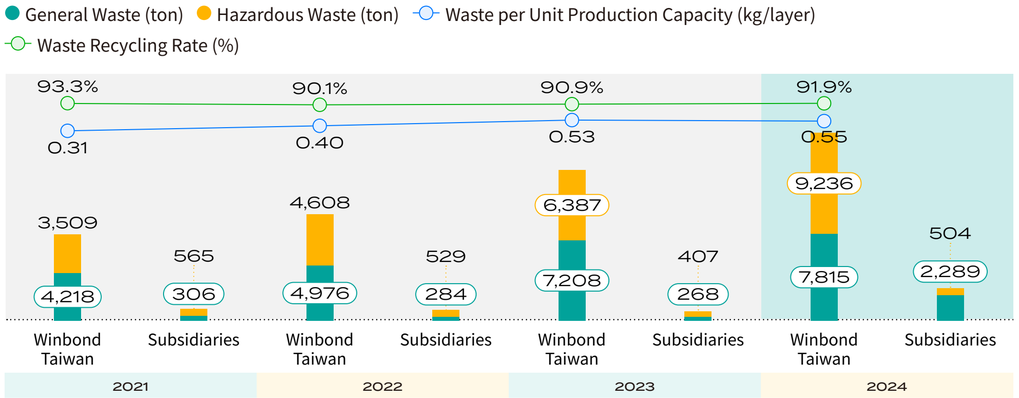
Total Waste Generation

19,844 Tons/year

Hazardous Waste		Recycle		Landfill	Incineration(without energy recovery)	Solidification Treatment
		Recycling	Incineration(with energy recovery)			
9,740 Tons/year	Winbond (Taiwan)	8,097	1,132	0	0	7
		88%	12%	0%	0%	0%
	Subsidiaries	479	24	0	0	1
		95%	5%	0%	0%	0.2%

General Waste		Recycle		Landfill	Incineration(without energy recovery)	Solidification Treatment
		Recycling	Incineration(with energy recovery)			
10,104 Tons/year	Winbond (Taiwan)	8,097	1,132	0	0	7
		88%	12%	0%	0%	0%
	Subsidiaries	479	24	0	0	1
		95%	5%	0%	0%	0.2%

Waste Generation



Note 1 The waste output is reported according to the regulations of the Waste Disposal Act.

Note 2 All production waste generated within Winbond's fab is directly disposed of by qualified treatment facilities outside the fab, and not directly disposed of within the fab.

Note 3 The recycling of waste is all material recycling for reuse.

Note 4 Consolidated financial statements Subsidiaries statistical data (2021-2023 Subsidiaries scope only includes Nuvoton (Taiwan)).

3.4 Air Pollution Control

Source Reduction and Efficient Treatment

Winbond's air pollution prevention strategy starts with source reduction, rationally reducing the generation of air pollutants through process improvements, and then treating the pollutants in exhaust gas with high-efficiency prevention equipment, ensuring that the pollutant content entering the atmosphere is better than government regulations. Winbond's annual test results show that air pollutant emissions are better than the emission standards stipulated by regulations.

Proper Treatment, Better Than Regulatory

Winbond has installed local scrubbers at the equipment end for specific hazardous, flammable, and fluorinated greenhouse gases (FCs) in process exhaust gas, first performing special treatments such as adsorption and combustion oxidation. The part of the exhaust containing inorganic acids and bases is then sent to the central scrubber for water washing and neutralization; the exhaust containing volatile organic compounds is sent to the zeolite rotor for adsorption and treated by direct-fired oxidation furnace. In 2024, the average removal rate of volatile organic waste gas reached 99%, better than the relevant regulations.

Real-time Monitoring, Stable Operation

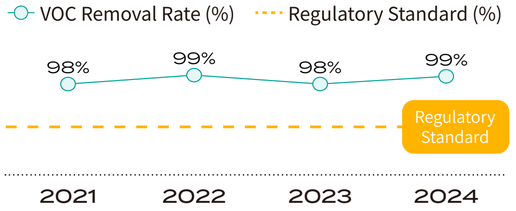
Air pollution prevention equipment has the function of immediately switching to backup equipment in case of emergency or maintenance, and is equipped with emergency power and advanced real-time monitoring systems, monitoring system operation parameters 24 hours a day. If deviations exceed the preset internal control values, the system will immediately send out an alert, and personnel will handle it immediately, providing stable operation 24 hours a day, 365 days a year, effectively treating air pollutants, and complying with Taiwan's "Air Pollutant Control and Emission Standards for Semiconductor Manufacturing Industry" and "Air Pollutant Emission Standards for Stationary Pollution Sources".

Air Polluting Emissions (Metric Tons)

Emission Type	Winbond(Taiwan)	Subsidiaries
NOx	16.13	12.45
SOx	0.50	2.77
VOC	4.67	2.35

Note The emission volume of gases is reported according to local regulatory requirements.

Winbond Taiwan Air Pollution VOCs Removal Rate



3.5 Green Investment

Environmental Protection Investment

Winbond adheres to the principles of green manufacturing, listing carbon emission reduction as a key objective. Starting from the research and development stage, Winbond aims to become a green product advocate through process optimization and the introduction of zero-carbon exhaust gases, leveraging its core capabilities to achieve green impact. Each year, Winbond allocates environmental funds for invest in and maintain hardware and software systems related to environmental protection. The projects include enhancements to air pollution control, water pollution prevention, and waste treatment systems. In 2024, Winbond (Taiwan) invested a total of NT$1.025 billion in environmental protection measures, accounting for approximately 2.2% of annual individual revenue, continuously reducing environmental impact.

Economic Benefits of Environmental Investment

The economic benefits brought by environmental protection investments should not be underestimated. In 2024, Winbond (Taiwan) invested approximately NT$676 million in environmental protection.

Environmental Investment (Unit: NT$ 1000)

	2021		2022		2023		2024	
	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries
Capital Investment	27,100	2,290	829,235	22,005	373,724	51,594	370,803	80,951
Operating Expenses	351,138	36,552	504,720	44,841	568,087	48,018	654,181	107,781
Total Expenses (Total Expenses = Capital Investment + Operating Expenses)	378,238	38,842	1,333,955	66,846	941,811	99,612	1,024,984	188,733
Savings, Cost Avoidance, Revenue, Tax Incentives, etc.	206,382	446	345,143	160	438,581	243	676,425	51,304

Note Consolidated financial statements Subsidiaries statistical data (2021-2023 Subsidiaries scope only includes Nuvoton (Taiwan)).

Economic Benefits of Environmental Investment (Unit: NT$ 1000)

Cost Type	Item	2021	2022	2023	2024
Revenue	Waste Recycling	6,008	6,324	5,786	9,313
Saving	Energy-saving Measures	189,780	329,639	419,553	656,264
	Water-saving Measures	10,594	9,180	13,243	10,848
Total Economic Value Creation		206,382	345,143	438,581	676,425

3.6 Biodiversity

Winbond Electronics Biodiversity Commitment

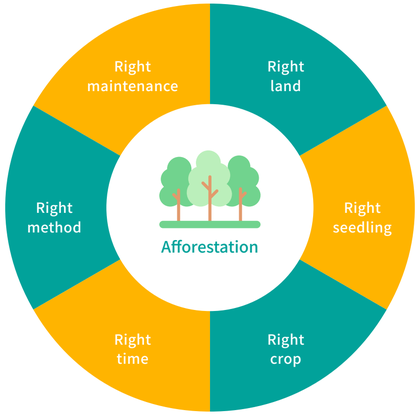
Winbond is committed to protecting biodiversity, considering it a key aspect of sustainable development. The "Winbond Electronics Biodiversity Commitment" was signed by the Chairman, and the company promises to reduce the environmental impact of its operations and value chain, while supporting sustainable natural technologies.

Through green manufacturing, afforestation, sustainable supply chain collaboration, and natural carbon sink research, Winbond actively mitigates biodiversity loss. The company also emphasizes environmental education to raise public awareness of ecological protection. The goal is to achieve net positive impact and zero deforestation, ensuring the integrity of ecosystems.

Nature-based Solutions (NBS)

Winbond is committed to carbon removal while preserving biodiversity

To achieve net-zero targets, Winbond has begun researching strategies to remove carbon dioxide from the atmosphere. Scientists have discovered that capturing and storing carbon dioxide from the atmosphere is essential for reaching net-zero emissions. It can be stored through means such as in soils, the ocean, and rocks. Winbond has been researching nature-based solutions and, through industry-university collaboration and tripartite collaboration between industry, government, and academia, has implemented tree planting and adoption, invested in blue carbon projects, and engaged in conservation and breeding of tree species. These approaches contribute to the removal of carbon dioxide from the atmosphere while protecting biodiversity.



Nature-based solution – Afforestation

The afforestation carbon reduction project is conservatively estimated to remove at least 10,000 metric tons of carbon dioxide equivalent.

- Based on recommendations from academia and experts, Winbond systematically planned new afforestation operations, following steps such as suitable land, suitable species, suitable seedlings, suitable timing, suitable methods, and suitable maintenance. From afforestation design, seedling cultivation and selection, land preparation, new afforestation, nurturing, and sustainable harvesting, Winbond invested significant time and effort in systematically planning the sustainable forest management project, aiming to increase Taiwan's forest carbon sinks.
- At the Kaohsiung Fab, Winbond planted five native tree species: *Bischofia javanica, Elaeocarpus sylvestris, Acacia confusa, Melia azedarach, and Cinnamomum camphora*. In collaboration with National Chung Hsing University, Winbond carried out a 30-year afforestation project, with an estimated total carbon sequestration of 390 metric tons of carbon dioxide equivalent. Following the principle of suitable land and suitable trees in forest management, Winbond removed invasive species and planted native Taiwanese tree species, creating green spaces with native plants within the fab to achieve carbon sequestration, environmental beautification, and air purification, stabilizing the natural ecological environment.
- Additionally, Winbond actively participated in the tree adoption program of the Forestry and Nature Conservation Agency of the Ministry of Agriculture, adopting state-owned forest land in Tainan City and Chiayi County. On 29,400 square meters of land, Winbond planted four native tree species: *Zelkova serrata, Liquidambar formosana, Acacia confusa, and Melia azedarach*, with an estimated total carbon sequestration of 990 metric tons of carbon dioxide equivalent. Currently, over 7,700 trees have been planted on the land. Through afforestation efforts, Winbond aims to restore vegetation cover on the slopes and continue assisting in cultivation efforts to maintain local plant diversity, increase local biodiversity and species habitats, maintain ecological stability, and provide ecosystem services such as soil and water conservation, disaster reduction, soil fertility maintenance, and water flow regulation.
- In 2024, Winbond, through its affiliated company Theaceae Conservation Corporation won the bid for the Ministry of Finance's National Property Administration's natural carbon sink state-owned land investment project. In the future, a large-scale Carbon Sink Afforestation Program will be launched in Sanxing, Yilan. The total carbon sequestration of this afforestation project is estimated to be 10,477 metric tons of carbon dioxide equivalent. The Corporation collaborated with National Ilan University to improve the environment of the abandoned gravel plant, which is overgrown with weeds and Leucaena, and restore the natural ecology of the Lanyang River basin through tree planting and afforestation. This project integrated drone technology to manage sustainable smart forestry and develop green technology. It aims to promote land use and enhance carbon sink capacity while closely aligning with environmental ecological benefits and added value, ensuring that a healthy forest ecosystem is maintained during land development.

Conservation and Breeding Program

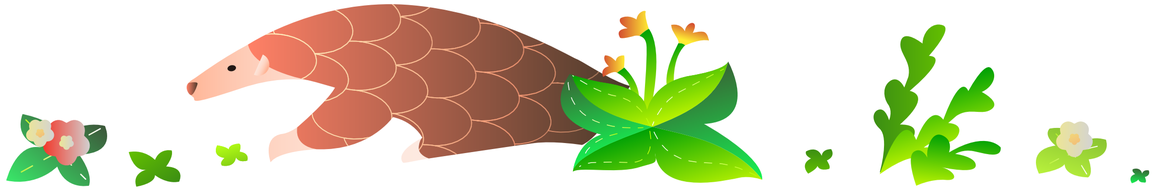
- The program focuses on the 42 species of Theaceae plants found in Taiwan, 33 of which have already been collected and cultivated. Of these, 1 species is critically endangered, 1 is endangered, 7 are vulnerable, and 3 are near threatened.

In 2021, Winbond integrated group resources to launch the Baoshan Park conservation and breeding project, selecting plants from the Theaceae family to collect and cultivate native Taiwanese plant germplasm.

Theaceae plants are the main tree species in evergreen broad-leaved forests. In addition to habitat destruction caused by development, some Theaceae plants face various crises due to their economic value. For example, *Camellia japonica* was often stolen in the early years for use as grafting rootstock or ornamental plants; *Camellia formosensis* was often stolen and dwarfed due to the high value of its tea leaves; tea leaves and tea oil have high economic value, leading tea farmers to introduce various foreign tea species for hybridization, causing confusion in the wild gene pool of native Camellia species, all of which have harmed the native Theaceae populations in Taiwan. Moreover, Theaceae plants grow very slowly, making it difficult to recover after being damaged.

In view of this, Winbond adheres to the spirit of "protecting native Taiwanese plants and preserving Theaceae genetic resources." Through cooperation with the Theaceae Conservation Corporation and National Chung Hsing University, Winbond aims to achieve three goals: species conservation and breeding, ecological education, and sustainable forestry. The hope is to preserve a forest park with conservation, educational, and cultural value amidst the rapid development and expansion of society.

The conservation and breeding program of Theaceae Plant Species



Discovered Endangered Wild Plant '*Spiranthes*'! Smallest Native Plain Orchid in Taiwan

Spiranthes sinensis once a thriving and abundant plant on the plains of Taiwan has experienced a significant reduction in its habitat in recent years due to habitat loss, fragmentation, and the decline of native green spaces on the plains. This has resulted in its inclusion in the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The green spaces at Winbond's CTSP Fab and Tainan building, which were free of pesticides, were found to be suitable habitats for the expansion of *Spiranthes* populations. To conserve *Spiranthes* populations, Winbond postponed weeding during the plant's flowering and fruiting period, allowing it to reproduce naturally. After the flowering period, maintenance was performed on the greenway to ensure that *Spiranthes* had the opportunity to continue reproducing through rhizomes and seeds. Wild plants are an essential component of biodiversity. We educated our colleagues on the importance of conserving wild plants and encouraged them to join this initiative. Conservation is urgent. Winbond is committed to preserving Taiwan's biodiversity and ecology by protecting endangered wild plants and contributing to the conservation of this land.

Endangered wild plant – *Spiranthes*

The above aligns with SDG 15, which focuses on the conservation of terrestrial ecosystems. By protecting endangered species, it also achieves conservation and educational significance.

Bringing Ecology Back to Life: Creating Ecological Landscapes with Native Plants

Winbond's Zhubei Building selected 20 native Taiwanese plants to create a native wildflower garden, including one species assessed as critically endangered in the Red Book, three species as endangered, and three species as vulnerable. Winbond adopted the concept of Wild Gardening, using 20 native Taiwanese species to create an ecological landscape in approximately 1.6 square meters of green space, creating a small patch of native plant ecology in the city. The garden's aesthetic combines greening, environmental protection, and energy-saving design, with distinct seasonal landscapes that provide ecological benefits such as environmental beautification, microclimate regulation, and dust absorption. Winbond set up explanatory signs to help community residents understand the ecological significance of native plants.

Winbond's CTSP Fab planned and implemented greening with species suitable for the central Taiwan low mountain forest, planting 149 plants. This includes three species assessed as critically endangered in the Red Book, three species as vulnerable, five species as near-threatened, and 14 other endemic plants. Winbond remains committed to sustainable ecology, integrating ex situ conservation of endangered native plants into the fab's green landscape, preserving the genetic resources of native Taiwanese plants within the fab, and creating ecological stepping stones in the Central Taiwan Science Park with small green patches. In 2025, Winbond plans to plant 33 native species and 130 seedlings. Through advocacy and education, Winbond helps employees understand how to coexist with nature, from understanding and caring to action, rediscovering the value of ecology.

As urban development progresses, people often overlook the need for ecological services in daily life, such as regulating temperature and humidity, absorbing carbon dioxide, producing fresh oxygen, and adsorbing air pollution and suspended particles. Winbond provides nature-based solutions by bringing forests back to office buildings and fabs, emulating nature to create a more resilient and sustainable urban life for employees.

The Reborn of Butterfly – Protect the beautiful home of the great purple butterfly

The Formosan Purple Emperor Butterfly (Sasakia charonda formosana) is an endangered species protected by wildlife conservation laws. It is assessed as vulnerable in the IUCN Red List and is only found in the mountainous areas of Jianshi Township in Hsinchu County and Fuxing Township in Taoyuan County. During its life cycle, the Formosan Purple Emperor Butterfly lays eggs on the branches or leaves of the Hackberry tree. After hatching, the larvae move to the leaf litter under the tree to overwinter. Currently, its habitat is shrinking, and the number of mature Hackberry trees is decreasing, directly affecting the population of the Formosan Purple Emperor Butterfly.

Nuvoton(Taiwan) and the Forestry Bureau have planned this project in collaboration with the Bailan Tribe in Wufeng Township, using aerial remote sensing technology to record the distribution and phenology of Hackberry trees. The community patrol team regularly maintains the trees, establishing a long-term monitoring database for ecological tours and appropriately developing eco-tourism routes. Nuvoton combines technology to conserve precious species, uniting local tribes to protect their homeland, and aims to raise awareness through environmental education, promoting the ideal blueprint for sustainable urban and rural areas.

The Great Purple Emperor and the Sand Persimmon

Sustainable Supply Chain

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4.4 Responsible Sourcing of Minerals 146

Scope: Unless otherwise noted, the scope covers the Winbond Group.

Winbond, building on the governance foundation of "Practicing Responsible Procurement," and remaining "People-oriented," adopts an ecosystem-based approach to design the work for promoting supply chain sustainability. It continues to implement sustainable supply chain management through the dual-axis transformation tools of digitalization and low-carbonization. In 2024, Winbond made significant progress in three key areas, leveraging strong supply chain partnerships and sustainability principles. Firstly, in responsible procurement, procurement efforts comprehensively promoted local, green, and circular procurement. In regular supplier evaluations, it has developed into sustainable regular evaluations, providing follow-up incentives to encourage suppliers to become Winbond's sustainable "+1".

Additionally, to effectively enhance supply chain resilience, Winbond integrated climate change, sustainable materials, human rights due diligence, information security, etc., into the existing supply chain risk investigation, elevating them to comprehensive supplier sustainability due diligence, maintaining overall supply chain resilience based on a people-oriented approach. Finally, in promoting a low-carbon and green supply chain, Winbond's sustainable supply chain team used science-based reduction targets to guide Scope 3 carbon reduction efforts, aiming to reduce carbon by 30% before 2030 and 5% annually to drive carbon reduction work design in various departments.

Facing a highly challenging business environment, we believe that only by constantly maintaining innovative management thinking, quickly adjusting and responding, and evolving appropriate business capabilities with suppliers can we truly practice the common good and common benefit of the supply chain, which is the truth of corporate sustainable governance.

Through responsible procurement, Winbond continuously enhances supply chain resilience and promotes a low-carbon supply chain, collaborating with supplier partners to build a sustainable and resilient ecosystem.

Shu-Cheng Chang

Assistant Vice President,
Supply Chain Management Center

2024 Performance Highlight

Suppliers directly related to Scope 3 emissions achieved a 100% response rate to energy resource usage surveys

- The baseline year for supply chain carbon reduction was set as 2021, including data either self-reported or verified by third-party certification bodies.

Supply chain ecosystem co-learning activities totaled 38,646 hours

- Actively engaged diverse stakeholders in advancing sustainable supply chain initiatives, achieving an annual growth rate of over 56%

100% of OSAT suppliers have established production capacity for renewable energy-based products

- The annual carbon emissions reduction from OSAT suppliers handling Winbond products was equivalent to the carbon sequestration of 16 Daan Forest Parks.

100% response rate achieved from OSAT suppliers to the electronic carbon data exchange

- All OSAT suppliers participated in the PACT early-stage verification program in 2024

Digital management of supply chain communication

- Winbond launched the ESG interactive network (https://sscm.winbond.com/)

100% completion rate for supplier sustainability audits and guidance

- All high-risk suppliers underwent on-site audits and received guidance

4.1 Supply Chain Overview

4.1.1 Composition and Type of Suppliers

Winbond is one of the leading global memory manufacturers. In the supply chain, Winbond undertakes upstream IC/IP design requirements, produces 12-inch wafers at Winbond, and outsources backend packaging and testing to complete the memory manufacturing process. In 2024, Winbond's operational scope included Winbond and Nuvoton. Our primary operational sites are in Taiwan, with additional locations in Mainland China, Japan, South Korea, and Israel. Nuvoton's major operational sites are mainly in Taiwan and Japan, with business locations in Mainland China, Japan, South Korea, Israel, the United States, Germany, India, and Singapore to meet customer service needs. To ensure timely product delivery, suppliers trading with Winbond and Nuvoton also come from around the world, including Japan, the United States, South Korea, Belgium, and Germany, with a total of 1,117 suppliers for Winbond and 791 suppliers for Nuvoton. According to procurement categories and applications, the main categories include raw materials, outsourcing, backend packaging and testing, machinery and equipment, spare parts, maintenance services, plant engineering, and others (such as transportation and logistics, waste disposal, waste removal, information equipment and software, and general affairs).

To maintain global supply capabilities, Winbond Group actively screens suppliers for risks related to production bases (national aspect), products, technologies, and services (industry and product aspects). When potential suppliers enter the qualification stage for formal trading, Winbond Group incorporates Business Principles, Significant Supplier Identification Criteria, and Environmental, Social, and Governance (ESG) Criteria to comprehensively screen and evaluate supplier operations and ensure supply chain stability.

Suppliers Composition

Composition of Winbond Suppliers

Raw Materials	Outsourcing
Outsourced semiconductor assembly and testing (OSAT)	Machinery and equipment
Factory engineering	Components
Maintenance and repair	Others

Supplier Focus Criteria

- National Aspect: Political and country-specific stability, rigor of laws and regulations, frequency of social events (such as strikes, demonstrations), completeness of national infrastructure.
- Sector-specific Aspect: Intensity of energy resource consumption, uniqueness of natural resources (specific minerals), specialization of technology and services.
- Commodity-specific Aspect: Degree of supply and demand balance, degree of price fluctuation, degree of labor balance, background of required fixed equipment and capital.
- Business Principles: Market share, industry competitiveness, supply performance and reputation in the industry, product, technology and service quality, operational facilities and production equipment.
- Significant Supplier Identification Criteria: Annual procurement amount, diversity of supply sources, key spare parts.
- Sustainability (ESG) Criteria: Environmental protection and climate change response, maintenance of human rights and labor rights, corporate governance capability and transparency.

Winbond (Taiwan)	2023	2024
1-1 Number of Tier-1 suppliers	1,026	1,117
1-2 Number of significant suppliers in Tier-1	44	60
1-3 % of total spend on significant suppliers in Tier-1	80%	80%
1-4 Number of significant suppliers in non Tier-1	6	5
1-5 Number of significant suppliers (Tier-1 and non Tier-1)	50	65

Winbond (Subsidiaries)	2023	2024
1-1 Number of Tier-1 suppliers	505	505
1-2 Number of significant suppliers in Tier-1	108	107
1-3 % of total spend on significant suppliers in Tier-1	80%	80%
1-4 Number of significant suppliers in non Tier-1	183	184
1-5 Number of significant suppliers (Tier-1 and non Tier-1)	291	291

Nuvoton (Taiwan)	2023	2024
1-1 Number of Tier-1 suppliers	814	791
1-2 Number of significant suppliers in Tier-1	5	6
1-3 % of total spend on significant suppliers in Tier-1	80%	81%
1-4 Number of significant suppliers in non Tier-1	71	70
1-5 Number of significant suppliers (Tier-1 and non Tier-1)	76	76

Nuvoton (Subsidiaries)	2023	2024
1-1 Number of Tier-1 suppliers	451	477
1-2 Number of significant suppliers in Tier-1	46	61
1-3 % of total spend on significant suppliers in Tier-1	80%	80%
1-4 Number of significant suppliers in non Tier-1	5	5
1-5 Number of significant suppliers (Tier-1 and non Tier-1)	51	66

Nuvoton (Japan)	2023	2024
1-1 Number of Tier-1 suppliers	60	53
1-2 Number of significant suppliers in Tier-1	9	9
1-3 % of total spend on significant suppliers in Tier-1	93%	89%
1-4 Number of significant suppliers in non Tier-1	5	5
1-5 Number of significant suppliers (Tier-1 and non Tier-1)	14	14

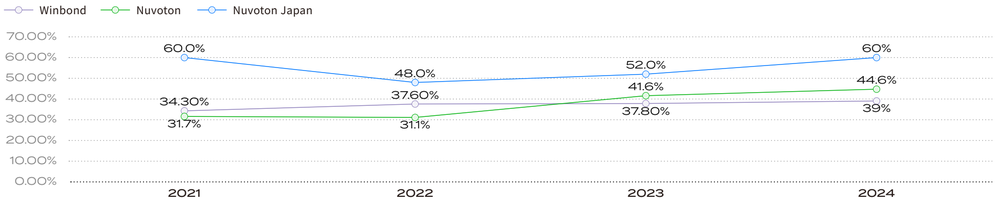
4.1.2 Local Procurement

Winbond expects more suppliers to become sustainable "+1" members of its supply chain. Therefore, we actively leverage the economic benefits generated by procurement activities to collaborate with existing and potential suppliers as long-term partners. In 2024, Winbond fully promoted economically beneficial sustainable procurement practices, including local procurement to reduce greenhouse gas emissions from international transportation, circular procurement to create material recycling and reuse, and green procurement to encourage domestic suppliers to provide Green Products/services.

To ensure the sustainability of Winbond's CTSP Fab, Kaohsiung Fab, Nuvoton, and Nuvoton (Japan) manufacturing, raw materials closely related to wafer manufacturing, including chemicals, gases, targets, and wafers, were the main focus of Winbond Group's promotion of local procurement. In 2024, Winbond Group faced external challenges such as climate change, reforms to international climate agreements, inflationary pressures, and geopolitical conflicts including the Russia-Ukraine and Israel wars; internally, to meet the needs of Winbond Group's green products and process improvements, in addition to setting management goals annually, we actively adjusted the procurement ratio of local raw material suppliers. Overall, Winbond Group made good progress in local procurement performance, including the proportion of local procurement of raw materials for Winbond increasing from 37.8% in 2023 to 39% in 2024, an annual increase of 1.2%; the proportion of local procurement of raw materials for Nuvoton increased from 41.6% in 2023 to 44.6% in 2024, an annual increase of 3%; the proportion of local procurement of raw materials for Nuvoton (Japan) increased from 52% in 2023 to 60% in 2024, an annual increase of 8%.

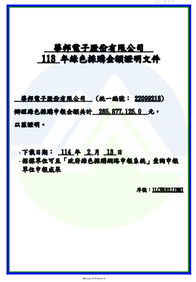
Examining Winbond's local procurement strategy for raw materials in 2024, it not only improved the economic benefits of local semiconductor suppliers but also significantly reduced international transportation, resulting in a reduction of over 7.2 tCO_2e emissions. This clearly shows the sustainability benefits of the local procurement strategy for the overall industry. Looking ahead, Winbond Group will continue to explore the possibilities of localizing various raw materials and, through various sustainability agreements, encourage local semiconductor suppliers to develop green products/services, leveraging the scale of supply chain organizations to achieve the synergy of corporate sustainability.

Proportion of local procurement amount of raw materials



4.1.3 Green Procurement

"Sustainable Living" is an eco-friendly lifestyle. In 2024, Winbond Group utilized its procurement power to effectively influence the supply side. In the production and manufacturing sector, the group gradually promoted the adoption of energy-saving, low-pollution, recyclable, reusable, and green building materials and equipment. On the employee lifestyle side, the group actively advocated the benefits of green living for individuals and the environment. In 2024, Winbond Group officially reported a green procurement amount exceeding NT$265 million on the Green Procurement Declaration Platform of the Environmental Protection Administration of the Executive Yuan. In the future, to continue exerting the sustainable influence of green procurement on the environment, society, and economy, Winbond Group will not only continue to promote the benefits of green living but also seek suitable Green Products/services for administrative and manufacturing use.


華邦電子股份有限公司
113 年綠色採購金額證明文件

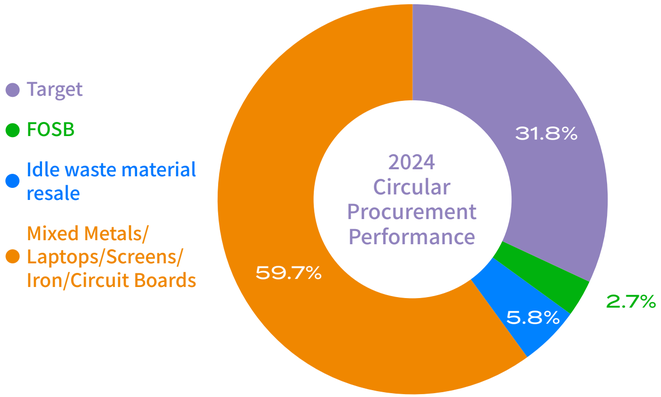
華邦電子股份有限公司 (統一編號: 22090218)
綠色採購金額為新台幣 265,877,135.0 元，
以茲證明。

中華民國: 114 年 2 月 18 日
本證明書僅可用「政府綠色採購網站申報系統」查詢申報
資料申報成果

4.1.4 Circular Procurement

According to the EU's explanation of circular procurement, Winbond utilizes the concept of maximizing resource utilization efficiency emphasized by the circular economy's "Closing the Loop" to identify products or services that can generate circular economic benefits during the operations of the CTSP Fab and Kaohsiung Fab. By fully leveraging procurement bargaining power and negotiating with relevant suppliers, Winbond has achieved significant results. In 2024, through the recycling and sale of recyclable waste, including waste targets, quartz, waste wafers, O-rings, FOSBs, Mixed Metals/Laptops/Screens/Iron/Circuit Boards, Winbond generated over NT$6.52 million in revenue from recyclable waste sales, a 64% increase compared to 2023. Looking ahead, Winbond will continue to seek products that can be repaired, reused, or recycled during the procurement process, emphasizing resource utilization efficiency through circular procurement to promote the achievement of sustainable development goals.

2024 Circular Procurement Performance



4.2 Sustainable Supply Chain Management

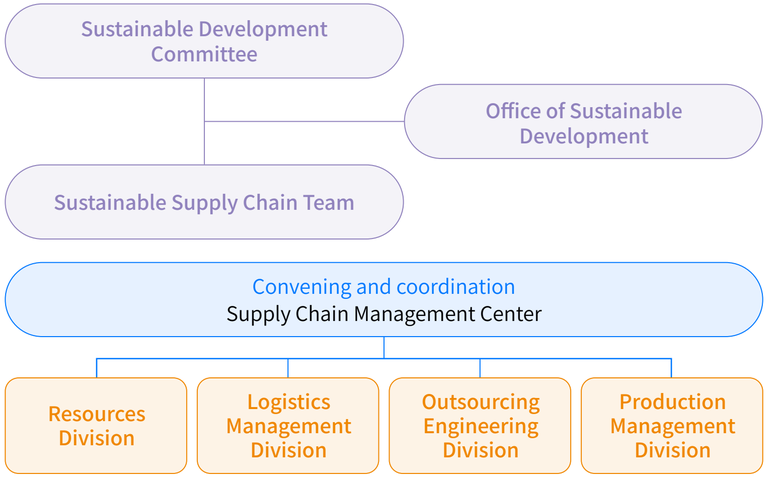
4.2.1 Supply Chain Management Strategy and Policy

Under the Sustainable Development Committee (composed of the Chairman and Independent Directors), Winbond has established the Sustainable Supply Chain Group, led by the Assistant Vice President of the Supply Chain Management Center, with dedicated personnel from various departments forming the Sustainable Supply Chain Group. Oversight of supplier ESG implementation is conducted by the Sustainable Development Committee, which reports to the Board of Directors and convenes twice a year. Implementation begins only after formal resolution by the committee. Additionally, the group reports its progress to the Sustainability Office four times a year to ensure the achievement of supply chain sustainability goals.

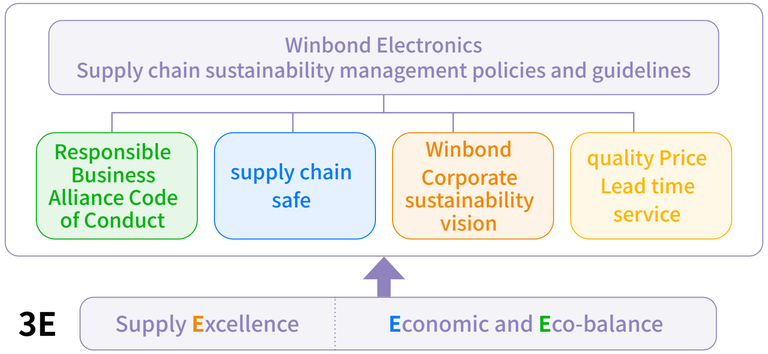
The work of the Sustainable Supply Chain Group includes existing supplier management and responsible procurement practices, such as the Responsible Business Alliance (RBA), Hazardous Substance Free (HSF) policy, traditional supplier management (quality, price, delivery, and process capability), and Authorized Economic Operator (AEO) certification. The group incorporates the concepts of environmental and ecological well-being and mutual benefits with suppliers, planning and enhancing the promotion and management of supply chain sustainability.

In 2024, Winbond continued to promote and implement related sustainability tasks, using digital measures to enhance the speed of sustainability information dissemination and impact within the supply chain. This includes promoting sustainability (environmental friendliness, social well-being, and good governance) among suppliers and contractors, managing Green Product production operations, and maintaining internal green logistics systems. In terms of supply risk control, Winbond revised and published the <Winbond Electronics Supplier Code of Conduct> based on international standards, incorporating human-centric principles into supply chain risk investigations, elevating it to due diligence.

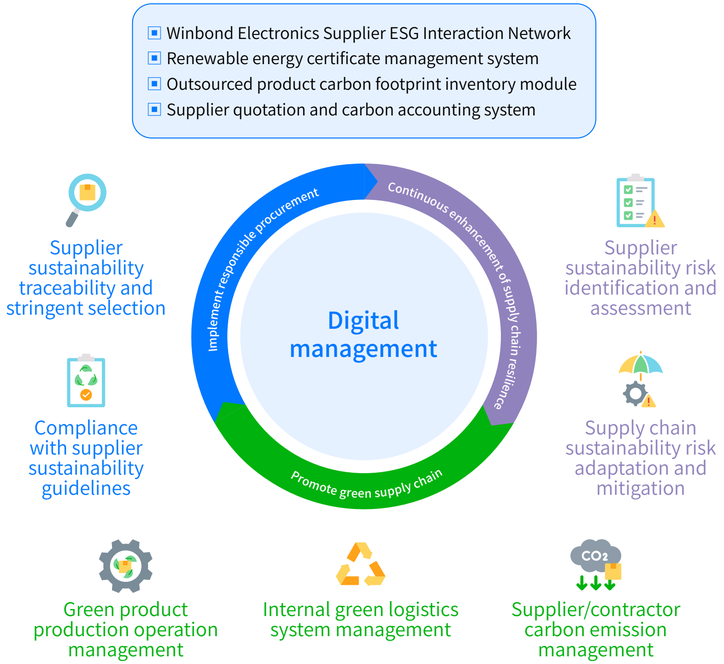
Sustainable Supply Chain Organization Chart



Supply Chain Management Policy



Supply Chain Management Framework



Sustainable Supply Chain Activity

Responsible Procurement	▪ New supplier traceability and sustainability selection ▪ Signing and regular promotion of the Integrity Commitment Letter ▪ Compliance with Winbond Electronics Corporation's Supplier Code of Conduct ▪ No use of prohibited substances ▪ No use of conflict minerals ▪ Regular supplier evaluations
Strengthening Supply Chain Resilience	▪ Internal Compliance Program, ICP ▪ Authorized Economic Operator, AEO ▪ Sustainable risk Due Diligence in the supply chain ▪ Supplier on-site audits, coaching, improvement, and enhancement ▪ Suppliers ESG ecosystem engagement ▪ Develop supply chain risk management plans (including climate change, environmental impact, human rights, governance, etc.) ▪ Sustainable education and training by the Supply Chain Management Center.
Low-carbon Supply Chain	▪ Sustainable procurement (including local, circular, and green procurement) ▪ Conduct energy resource usage surveys for major suppliers ▪ Achieve a 10% carbon reduction in the supply chain and a 60% carbon reduction in OSAT products ▪ Facilitate and guide sustainable resources in the supply chain ▪ Internal green logistics systems management ▪ Green product production management

4.2.2 Suppliers Management Process and Mechanisms

2024 Key Suppliers' Sustainable Achievement highlights

- 100% Signing rate of Winbond Supplier Code of Conduct Commitment (CoC) Letter
- 100% Signing rate of declarations on non-use of banned substances and conflict materials
- 100% Compliance rate of new traceability suppliers with economic, environmental and social standards

Suppliers Management Process

Traceability and Assessment of New Suppliers ▶ Signing of Winbond Suppliers CoC ▼ Regular evaluation of qualified suppliers ◀ Sampling audits and improvements for qualified suppliers

Under the principle of sustainable supply chain development, building long-term and stable cooperation with suppliers is the foundation of a stable management system. Winbond adopts the systematic Plan-Do-Check-Act (PDCA) cycle as the core design of the Sustainable Supply Chain management system. The first step is the traceability and selection of new suppliers. Before becoming qualified suppliers, they must sign and comply with the Winbond Electronics Supplier Code of Conduct to become officially tradeable suppliers. Subsequently, we conduct regular evaluations of qualified suppliers and perform key desk and on-site assessments based on the evaluation results, followed by tracking and improvement of deficiencies. We actively implement the requirements of SDG 17.16 "Partnerships for the Goals." Internally, we strictly control the quality of materials and technology supplied by suppliers; externally, through regular supplier evaluations, on-site audits, and the identification and improvement of deficiencies, we work with suppliers to identify areas for improvement in operational or production activities. Winbond hopes to achieve the concept of Sustainable Supply Chain management by regularly tracking, discussing improvement status, and other refinement methods, working collaboratively with suppliers.

Traceability and Assessment of New Suppliers

Winbond's new supplier selection mechanism includes quality system evaluations (covering quality, delivery, service, technology, supplier quality systems), RBA Code of Conduct, and corporate sustainability development standards. Additionally, Winbond is a member of the Ministry of Economic Affairs' International Trade Administration's Internal Compliance Program (ICP), and during the traceability stage, it closely monitors the sanction lists updated by the United Nations Security Council and Taiwan's Ministry of Justice to effectively maintain supply chain security and safety.

Suppliers that comply with the previously noted stages must subsequently provide third-party quality system certification, Process/Product Change Notice (PCN) management principles, and complete the hazardous substance management questionnaire. Outsourcing suppliers of safety products must also provide international safety certification and complete the "Safety Product Outsourcing Safety Control Measures Audit Questionnaire." In 2024, all nine new suppliers of Winbond Group (including 4 for Winbond, 3 for Nuvoton, and 2 for Nuvoton Japan)achieved 100% compliance with environmental, social, and economic standards evaluation.

Percentage/number of new suppliers passed based on economic, social, and governance standards in 4 year

Year	Number of New Suppliers	Number that Passed
2021	3	100%
2022	5	100%
2023	9	100%
2024	9	100%
Total	26	100%

Regular Evaluation of Qualified Suppliers

Winbond conducts annual systematic assessments of qualified suppliers, categorized into suppliers and OSAT (Outsourced Semiconductor Assembly and Test) suppliers. The evaluation covers quality (product/technology), delivery, service, and price. Suppliers are categorized into three levels: A, B, and C (Excellent, Good, Under Review), while OSAT suppliers are categorized into four levels: Excellent, Grade A, Grade B, and Grade C. These classifications serve as the basis for tiered management and continuous improvement measures.

To encourage all suppliers to actively implement initiatives that contribute to sustainable development, Winbond officially incorporated supplier sustainability performance into regular evaluations of all suppliers in 2024, with a weighting of 5%. The weighting is scheduled to increase to 15% in 2025 to further strengthen supplier commitment to corporate sustainability.The evaluation covers participation in Winbond's sustainability activities, development of sustainability goals, and achievement of energy-saving and carbon reduction targets. To ensure fairness in the evaluation process, Winbond also deducts points for suppliers subject to disciplinary actions in the areas of environment, social, or governance. Suppliers who fail to meet the evaluation standards are required to submit a corrective action plan within one month. Those who still fail to meet the corrective requirements will have their partnership terminated.In 2024, all qualified suppliers achieved B grade (suppliers) or Grade A (OSAT suppliers) or above, with no terminations due to major sustainability deficiencies. Looking ahead, Winbond will continue to maintain active communication and promotion with suppliers, closely monitor disciplinary actions announced through official government channels, and track developments in suppliers' operational management to ensure that all supply activities are conducted in full compliance. In addition, Winbond will establish a reward mechanism to recognize and reward suppliers who demonstrate excellence in sustainable performance.

Mechanism for Rewarding Suppliers with Sustainable Performance

1. Awarding and public recognition at supplier forums/OSAT supplier conferences
2. Assistance from the Sustainable Supply Chain Team in conducting sustainability evaluations, audits and guidance of suppliers/OSAT suppliers, with results used for preferential procurement management measures (such as priority selection, increased quantities, etc.) in transactions.

Suppliers/OSAT suppliers Evaluation and Management Mechanism

Rating Content (QCDSS)

Vendor / OSAT suppliers

Existing supplier evaluation orientation:
- Product/ Technology/ Engineering Quality (Q)
- Cost (C)
- Lead time(D)
- Service(s)

+

Supplier sustainability rating content:

Sustainability
- Winbond's participation in sustainability activities and external sustainability initiatives (40%)
- Sustainability Management Goal Formulation (30%)
- Energy conservation and carbon reduction targets achieved (30%)

Negative sub-categories

In the case of industrial safety accidents, environmental protection fines, labor disputes and management fines in the current year, points will be deducted based on the seriousness of the circumstances

Rating and management mechanism

Grade A (≥ 85)	Grade B (70 < Score ≦ 85)	Grade C (< 70)
Ongoing collaboration	Deadline for replying with improvement measures If rated Grade B twice consecutively, it will be downgraded to Grade C.	Respond to improvement measures within a time limit Reduce or stop cooperating

Top (≥ 90)	First Class (90 < Score ≦ 80)	Second Class (80 < Score ≦ 75)	Third Class (< 75)
It is recommended to increase the quantity	Keep watching	A reduction in quantity is recommended	Terminate cooperation

Qualified Supplier Audit and Improvement

In order to effectively control the operation of all qualified suppliers, Winbond's supplier audit team conducts annual key audits of all qualified suppliers. First of all, in terms of written audit, the audit content includes the effective holding of various certificates such as "quality management" and "green audit". On-site audits focus on the core items outlined in the RBA 8.0 Audit Manual, and comprehensively incorporate "sustainability reviews" into their execution. In 2024, there are 63 audits, including 19 raw material suppliers, 15 OSAT suppliers and 29 waste disposal suppliers. In 2024, additional sustainability criteria were integrated into the audit scope to further reinforce the importance that suppliers place on sustainability practices.

According to the audit records, the performance of suppliers is in line with Winbond's requirements, and no qualified supplier will be disqualified as a supplier due to non-compliance with environmental and safety and health, labor and ethics, product and technical quality, and sustainability management system. In order to promote the sustainable development of suppliers, a total of 146 recommended improvement work items were collected in a total of 63 audit work, and with the active communication of Winbond's audit team, the improvement rate increased by 3.4% compared to 2023. Winbond firmly believes that only by allowing suppliers to identify potential risks in advance from their daily operations can they achieve the proactive prevention of audit work and effectively improve the sustainability of suppliers.

The number and passing rate of new suppliers selected based on environmental, social, and economic standards

ESG aspect	Audit Item	Passing Rate
Economic	ISO 9001 Quality Management Systems	100%
	IATF 16949	100%
Environmental	ISO 14001 Environmental ManagementSystems	100%
	REACH	100%
	RoHS	100%
	HSPM Hazardous Substance Process Management	100%
Social	RBA Social Responsibilities	100%

Improvement Items in Economic, Environmental, and Social for Qualified Suppliers and Winbond Responses

Aspect	Improvement Items	Our Responses
Environmental and Safety Health	1. The temporary storage area of oxygen and acetylene cylinders on site is only marked outside the fence, and the hazard is not clearly marked. 2. The relevant emergency rinsing eyewash equipment does not meet the specifications and is not properly cleaned, resulting in dirty water quality. 3. The location of the protective clothing is not clearly marked	1. Comprehensive inspection of the temporary storage area for oxygen and acetylene cylinders and hazard labeling. 2. Regular inspection of water quality status and monthly feedback on inspection records. 3. Require suppliers to document the configuration of protective clothing.
Fire protection system	1. The evacuation exit/evacuation direction indicator lights are not kept on. 2. The pressure of a fire extinguisher in the electronic component disassembly area exceeds the upper limit. 3. The placement of materials is messy and affects the handling and escape routes.	1. Regular inspection of indicator lights and fire extinguisher status, and attach inspection records. 2. Recommend implementing 5S management courses to ensure cleanliness and orderliness of the work site.
Labor & Ethics	1. The frequency and upper limit of the gift acceptance policy were not defined. Policies related to integrity and ethics are not announced in multiple languages for foreign employees. 2. Multiple complaint channels are not set up.	1. Set the upper limit and management methods for gift acceptance. 2. Announce multilingual versions based on the nationality of employees within the fab. 3. Require suppliers to establish electronic and physical complaint channels.
Product & Technical Quality	1. The grading process for handling non-conforming products lacked clearly define standards. 2. The shipping specification system input was reviewed by quality control, but there were no defined procedures and execution records. 3. The switching standards for product filling were not defined. 4. The in-process products did not have the required accompanying label cards. 5. The description of the abnormal handling specifications for the manufacturing process was incomplete.	1. Require clear definition of grading standards. 2. Require formal definition of procedures and retention of execution records. 3. Require clear definition of switching standards for pressure difference. 4. Require improvement and implementation of operating procedures. 5. Require clear definition of procedures.
Management System	1. The supplier evaluation items and scoring content are inconsistent. 2. There is no clear timing for on-the-job training. 3. The internal audit records do not clearly record the audit deficiencies. 4. The business continuity plan does not have a risk management concept.	1. Clearly and uniformly define the evaluation methods for each item. 2. Require on-the-job training to be implemented regularly. 3. Require specific documentation of deficiencies. 4. Incorporate the concept of risk level assessment into the business continuity plan.
Corporate Sustainability	1. The ESG management concept of senior executives is not yet complete. 2. There are no clear subsequent carbon reduction measures reflecting the relationship with the achievement of carbon reduction targets. 3. Conflict mineral management data is not clearly classified by product category.	1. Recommend introducing advanced sustainability education and training, and regularly track to ensure learning effectiveness. 2. In the future, regular sustainability evaluations of suppliers will be conducted to strengthen incentives for suppliers to implement energy-saving and carbon reduction measures, and regular meetings will be held to track progress. 3. Require suppliers to classify data according to RMI management rules.

4.2.3 Sustainable Supply Chain Risk Management

2024 Key Suppliers' Sustainable Achievement highlights

- The signing rate of all suppliers committing to Winbond's ethical and integrity policies.
- The proportion of first-tier significant suppliers implementing sustainable due diligence is 100%.
- The completion rate of sustainable due diligence guidance for high-risk suppliers is 100%.

Risk Management Process

The composition of the supply chain is formed by Winbond's purchasing behavior, which brings together different types of suppliers and companies located at various production bases, supplying their products or services to Winbond. In light of this, Winbond's supply chain Risk Management is conducted with a systematic approach based on ISO 31000 Risk Management for monitoring and impact assessment.

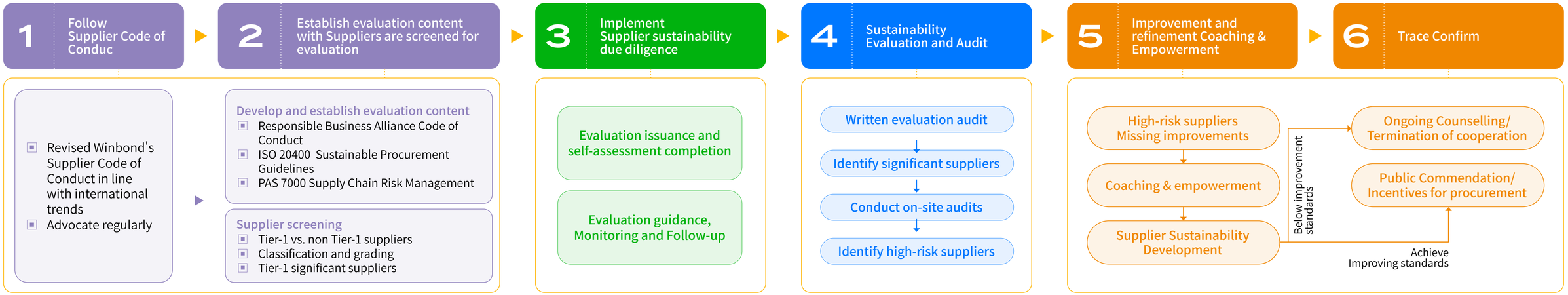
Firstly, risks are identified and categorized into internal risks, intra-partnership risks, and external risks. Secondly, corresponding management methods are established according to the differences in risk sources and types. Thirdly, each management event is reviewed, and improvements are made based on the deficiencies identified in the events to reduce the impact of future risks on supply chain management.

Supply Chain Risk Management Mechanism

To address the varying impact levels and stages of different risks, Winbond has designed different management systems to ensure the overall stability of the supply chain operations. Specifically, for intra-partnership risks, Winbond regularly updates the Winbond Electronics Supplier Code of Conduct. In 2024, aligning with international trends, new guidelines were added, including anti-slavery and anti-human trafficking, diverse and inclusive workplace culture, and ecological resource protection. Additionally, every six months, Winbond conducts ethical integrity policy advocacy for all suppliers to enhance their familiarity with the Supplier Code of Conduct.

Categories	Material Risk	Intrapartnership Risk	External Risk
Definition	Risk that is directly related to the production and manufacturing	Integrity risks that arise	External risks are divided into three categories: climate change, natural disaster, and non-natural risks (political, economic and social risks, etc.).
Management System/ Measure	▪ Winbond regards the Responsible Business Alliance (RBA) requirements for conflict-free minerals as a core management principle. Annually, Winbond conducts due diligence investigations on critical suppliers using the Conflict Minerals Reporting Template (CMRT) provided by the Responsible Minerals Initiative (RMI) and publishes an annual Conflict Minerals Due Diligence Report. ▪ To uphold product quality, Winbond has established the Process/Product Change Notice (PCN) management principle for suppliers. This management mechanism is activated whenever there is any change in raw materials or in OSAT suppliers' raw material, process, or packaging materials.	▪ Require newly qualified suppliers to sign Winbond's Supplier Code of Conduct Commitment Letter. ▪ Conduct biannual ethics and integrity policy advocacy for all suppliers. ▪ Include Winbond's information security management policy in the order, require suppliers of qualified transactions to strictly abide by it, and outline the response and compensation responsibilities of both parties when information security risks occur. Winbond Suppliers' Code of Conduct	▪ In the event of natural disasters such as earthquakes, Winbond utilizes its Emergency Response System to promptly reflect seismic intensity worldwide, allowing procurement staff to assess the impact on suppliers. ▪ In controlling the impact of climate change, Winbond has analyzed the disaster potential of more than 1,400 domestic suppliers at their operating sites according to various warming scenarios. ▪ Regarding political-economic risks (e.g., Russia-Ukraine and Israel wars) and social risks (e.g., supplier factory safety accidents, strikes) that may cause supply disruptions, Winbond promptly establishes an emergency response team to manage situation reporting, compilation, notification, analysis, and assessment. ▪ Winbond strictly adheres to the regulations of the Customs Administration, Ministry of Finance, regarding "Authorized Economic Operator" (AEO) status, and requires suppliers to comply with and improve trade security management.

Supply Chain Sustainability Due Diligence



In 2024, Winbond conducted surveys for Tier-1 significant suppliers, including raw materials, OSAT, and critical spare parts (such as quartz, photomasks, PAD) with significant procurement amounts and directly related to production and manufacturing. For the first time, due diligence was conducted for first-tier non-significant suppliers whose procurement amounts ranked in the top 90% of 2024, totaling 120 suppliers, with a recovery rate of 100%. Among the surveyed suppliers, the overall average ESG score was 86.3 points, with high scores clustered among raw materials and packaging testing suppliers. Additionally, observing the implementation items of Tier-1 significant suppliers in various sub-evaluation items, suppliers generally performed well in occupational safety and health and human rights labor and protection, with average scores rising to over 90 points compared to 2023. However, to enhance the overall resilience of the supply chain, Winbond suppliers still need to strengthen management practices in response to environmental changes and protection, emerging issues such as sustainable materials, and human rights due diligence management. In the future, to effectively continue to control the overall risk impact and sustainability level of the supply chain, Winbond will take four major measures. First, based on the results of desk audits, sustainability audits will be conducted for suppliers with significant negative impacts, including second-party industry standard on-site audits and introducing third-party verification units to accompany high-risk suppliers for on-site audits. Second, continue to hold sustainable supply chain upgrade forums, regularly providing suppliers with correct management thinking, thereby enhancing suppliers' improvement capabilities in environmental and social aspects. Third, introduce resources from government, industry, academia, and research in our country, providing suppliers with the necessary improvement resources, thereby reducing financial burdens. Fourth, use the Winbond Supplier ESG Interaction Network platform to proactively provide various corporate sustainability and training information.

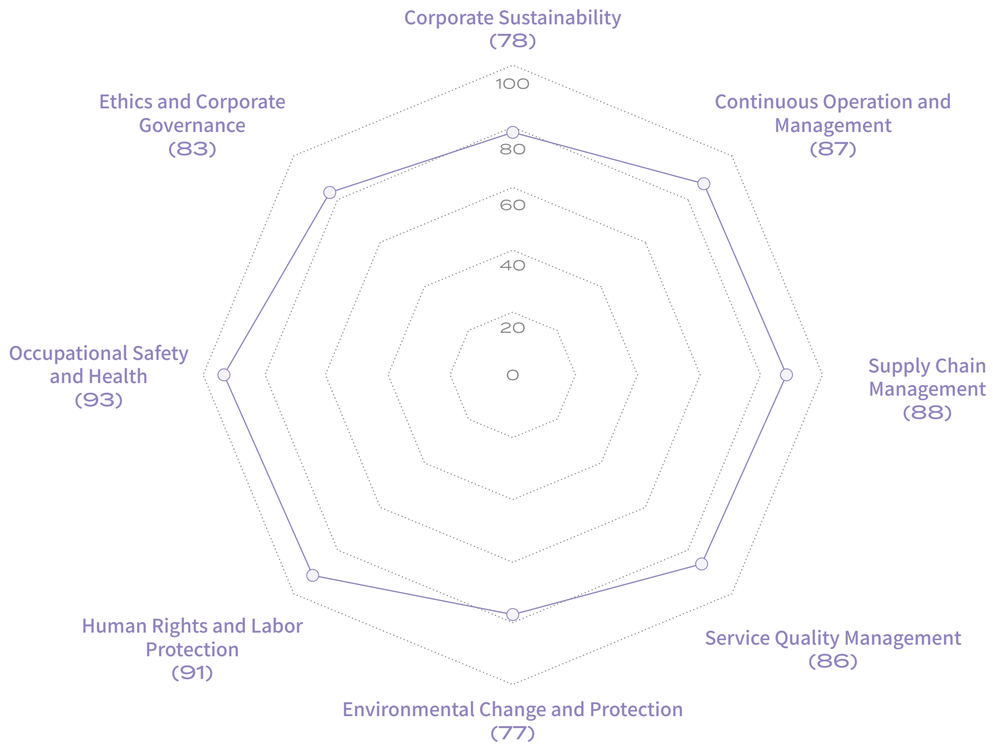
Work Flow	Supplier Evaluation and Development		2023 Results	2024 Results
Investigate with Evaluation phase	Number of suppliers who have accepted sustainability (ESG) due-diligence SAQ		69	120
Audit stage	Number of suppliers who have accepted sustainability (ESG) due diligence audits	Completion of desk audit	69	120
		Completion of second-party on-site audit (including industry standard RBA VAP)	5	11
	Proportion of Tier-1 significant suppliers audited (%)		100%	100%
	The number of suppliers in the Tier-1 that are significant and have a real negative impact		0	13
	The number of suppliers with significant and actual negative impact in the Tier-1 who have completed on-site audits (proportion).		0	4 (100%)
Improvement phase	Number of suppliers supported in corrective action plan implementation (proportion).		0	13 (100%)
	Number of suppliers with substantial actual or potential negative impacts that were terminated		0	0

Note: Sustainable Supply Chain team developed an in-house supply chain risk assessment system. In 2022, the focus was on establishing evaluation content, items, and management systems. The first implementation of this assessment was in 2023. Based on the 2023 assessment results, in 2024, Winbond conducted on-site sustainability audits for significant and high-risk suppliers in Taiwan. Therefore, the number of audits conducted was planned based on the previous year's assessment results.

Average ESG Score of Tier-1 Significant Suppliers

Winbond developed a Supplier Sustainability Due Diligence Self-Assessment Questionnaire (SAQ) aligned with the RBA 7.0 Code and the ISO 20400:2017 Sustainable Procurement Standard. In 2024, with the EU's adoption of the Corporate Sustainability Due Diligence Directive (CSDDD) and Taiwan's first publication of the "Guidelines for Corporate and Supply Chain Respect for Human Rights," Winbond upgraded its supply chain risk assessment to a comprehensive sustainability due diligence. It included four new aspects: climate change and mitigation, sustainable materials, human rights risk identification and adaptation, and information security. This not only effectively aligns Winbond suppliers with international trends but also helps mitigate the risk of supply chain disruptions for small and medium-sized enterprises with fewer resources.

Average Score
86.3



Content of Supplier Sustainability Due-Diligence Self-Assessment Questionnaire

Management	Environment	Society	Governance
Definitions	Starting with product life cycle traceability and supply, Winbond has committed to requiring our partnered suppliers to operate in an environ-mentally-friendly and economic manner	Suppliers are required to sign the Winbond Supplier Code of Conduct Commitment Letter, ensuring that our suppliers provide a safe and healthy workplace compliant with internation- al labor rights standards.	Suppliers are required to conduct business operations ethically and with in- tegrity, ensuring that this standard is applied to all internal business operations.
Assessment Items	▪ Environmental management systems ▪ Air pollution prevention ▪ Water management ▪ Waste management ▪ Sustainable materials ▪ Greenhouse gas management ▪ Biodiversity management ▪ Hazardous and shared substance management	▪ Human Rights Protection ▪ Work and Labor Rights Protection ▪ Human Rights Risk Identification and Adaptation ▪ Occupational Safety and Health ▪ Health Management System ▪ Chemical Safety ▪ Fire Safety ▪ Equipment Safety	▪ Formalization of corporate sustainability ▪ Degree of sustainability response and disclosure ▪ Climate change and adaptation business continuity and management ▪ Supply chain management ▪ Service quality management ▪ Business ethics and philanthropy ▪ Corporate governance ▪ Information security
Criteria for Identifying High-Risk Suppliers	▪ Suppliers with recorded penalties or deferred sanctions within the past three years. ▪ Suppliers with greenhouse gas emissions exceeding 25,000 tons without relevant management measures. ▪ Suppliers with a carbon management score below 3.	▪ Suppliers with penalty records and deferred penalties within the past three years. ▪ Suppliers without clear management regulations prohibiting child labor and protecting the work rights of pregnant women. ▪ Suppliers without proper management of living conditions for foreign workers.	▪ Suppliers with penalty records and deferred penalties within the past three years. ▪ Suppliers with known cybersecurity incidents or IP litigation within the past three years. ▪ Suppliers without a business continuity and supply chain management plan.

Note 1 Winbond's Tier-1 significant Suppliers: Suppliers directly related to production and manufacturing, single source of supply, critical and affecting production of spare parts (photomasks, PAD, quartz, packaging for shipment), with annual order transaction amounts exceeding NT$10 million.
Note 2 Definition of Local Supplier: Suppliers that directly transact with the operational site in the respective country (e.g., Winbond headquarter transact in Taiwan, Winbond Japan transacts in Japan, etc.).

Supplier Sustainability Due-Diligence Self-Assessment

Key Actions

Sustainability Audits
on-site assistance and require improvement

Environment
- To enhance suppliers' greenhouse gas reduction efforts in line with international initiatives and disclosure standards, and to establish climate change adaptation measures
- Winbond requires suppliers to adopt a circular economy mindset to strengthen the supply of products, technologies, and services.
- Suppliers, especially those with high emission intensity, are required to conduct organizational greenhouse gas and product carbon footprint assessments.

Introducing Resource
Integrating resources from government, industry, and academia

Social
- Assist suppliers in establishing human rights risk adaptation and management capabilities to maintain the human rights quality of supply chain employees.
- Strengthen the intensity of occupational safety and health discussions during on-site supplier audits to enhance the prevention of work-related accidents.
- Require suppliers to enhance employee health care during peak periods of specific disease outbreaks.

Introducing Resource
Integrating resources from government, industry, and academia

Governance
- Require suppliers to introduce advanced education in governance and management to strengthen the competencies of their management teams.
- Encourage suppliers to learn about sustainability governance information and knowledge from the perspective of international disclosure standards.
- Encourage suppliers to regularly implement or assign employees to participate in information security-related courses.

Winbond Supply Chain Human Rights Risk Adaptation and Management

Early Action

In 2024, Winbond collaborated with its long-term advocate for human rights management and diversity, equity, and inclusion (DEI), the benchmark supplier Merck Taiwan, to organize "The S Power in ESG," fostering human-centered sustainable innovation. This initiative introduced human-centered thinking to strengthen the sustainable governance of the supply chain.

Guidelines Announcement

Suppliers should commit to respecting workers' human rights and ensuring the dignity of their employees. This includes prohibiting forced labor, protecting young workers, regulating working hours, ensuring fair wages and benefits, preventing discrimination and harassment, promoting humane treatment, upholding freedom of association and collective bargaining, combating slavery and human trafficking, and fostering a diverse and inclusive workplace culture.

Survey Distribution

In the supplier sustainability due diligence SAQ, human rights risk identification and adaptation surveys were added. Based on Taiwan's 2024 "Guidelines for Corporate and Supply Chain Respect for Human Rights," the survey investigates suppliers' implementation of corporate human rights policies, human rights due diligence, and remediation measures.

Survey Results and Response Plans

To enhance the importance of human rights management, Winbond will strengthen advocacy on the Winbond Electronics Supplier ESG Interaction Network. Additionally, at the annual supply chain forum, professional lecturers will be invited to teach about establishing corporate human rights risk management and adaptation measures.

Sustainable Training in Supply Chain Management Center

經濟部

經濟部產業人才能力鑑定證書
MOEA Certificate of Industry Professional Assessment System

淨零碳規劃管理師-初級能力鑑定
Net-Zero Carbon Emission Planning Administrator - Associate Level

茲證明以上應試者達到鑑定級等授證標準
The examinee has successfully completed the assessment level requirements.

經濟部部長
Minister
Ministry of Economic Affairs

郭智輝

證書號 Certificate No. A-Q11-4908-2024
中華民國一一三年十二月三十一日
Date of Issue: 2024/12/31

To effectively advance supply chain management towards sustainability, Winbond integrates innovative thinking and management models with a foundation of technology and quality in its existing supplier collaboration efforts. Beyond regular environmental, safety, and health training for suppliers and contractors, as well as OSAT suppliers conferences, Winbond has established the ESG Academy within the Supply Chain Management Center to provide supplier training on ESG programs and requirements. This academy conducts regular internal sustainability education and training to ensure that frontline employees interacting with suppliers possess the latest skills, knowledge, and capabilities.

In 2024, Winbond's total training hours for supplier/contractor workplace equality and environmental, safety, and health training reached 3,362 person-hours. Training hours for employees at the Supply Chain Management Center totaled 4,831 person-hours, with an average of 33 hours of sustainability training per employee. The training content includes routine supplier management courses, quality courses, and supplier manufacturing management courses. This year, procurement employees' personal work reports also included topics on supply risk and resilience, enhancing their ability to manage supply layouts.

Additionally, on corporate green and low-carbon topics (including understanding carbon costs, ISO 14064, ISO 14067, ISO 14083), employees were sent to participate in the Ministry of Economic Affairs' Industrial Development Bureau's recharging program. Over 60% of participants passed the iPAS Net Zero Manager certification, exceeding the national average of 35.8%. This demonstrates Winbond's frontline supply chain management employees' dedication to learning about sustainability issues and highlights Winbond's commitment to nurturing talent for a sustainable supply chain.

To effectively maintain workplace equality and safety at Winbond, and to enhance the awareness of suppliers regarding related work, Winbond conducts relevant training for supplier employees who work on-site or provide on-site services every year. Due to the unique nature of the semiconductor work environment, Winbond provides comprehensive hazard notification and special operation education and training for contractor employees entering the fab each year. In 2024, the trainings were implemented at various locations, including the Jhubei Office, CTSP Fab, and Kaohsiung Fab. For detailed implementation methods and content, please refer to Section 5.4 Occupational Health and Safety of this report.

Suppliers / Contractors' Regular Environmental, Safety, and Health Training

Topic	Content	Number of people	Total training hours (people * hours)	Factory
Equality in workplace	Training and advocacy on workplace bullying, abuse, harassment, etc.	9	42	Zhubei building
		28		CTSP fab
		36		Kaohsiung fab
Occupational safety and health	Hazard notification and special operation education training	283	3,320	Zhubei building
		1,490		CTSP fab
		1,547		Kaohsiung fab

ESG Workshops in Supply Chain Management Center

Suppliers site visit

Monthly ESG training

Personal job report

Course	Number	Person*hours
Suppliers on-site training	3	35
Supply chain management center personal work report	6	221
Industry sustainability trends	8	261
Corporate green and low-carbon issues	22	4,059
iPAS Net-Zero Carbon Emission Planning Administrator Training	3	96
International carbon net zero external training	1	160

Supplier Sustainability Training

In-depth Communication and Collaborative Learning with Sustainable Benchmark Suppliers

Supplier ESG Workshop

Since launching the Sustainable Supply Chain initiative, Winbond has expanded collaborative learning workshops to cover environmental resource reduction, climate change measures, greenhouse gas and carbon management, human rights and labor protection, and corporate governance and ethics. By 2024, 33 companies participated, with 2,078 participants and 4,169 person-hours of learning.

This year, for the first time, the workshops included entities that are both suppliers and customers, fostering diverse dialogues. Winbond's innovative sustainable learning mechanism keeps up with ESG trends in the semiconductor industry and benefits from the sharing of best practices by benchmark suppliers. This allows Winbond to learn diversified ESG practices and acquire new ESG knowledge.

Internally, these workshops provide the latest industry information to colleagues, aiding in the planning and execution of Winbond's supply chain sustainability efforts. Externally, the workshops are becoming a platform for supply chain members to disclose their sustainability beliefs and practices.

Looking ahead, Winbond aims to use this collaborative learning model to stimulate research and development in low-carbon processes and green products among suppliers, enhancing the international competitiveness of Taiwan's semiconductor supply chain.

33 companies participated in the exchange

2,078 participants

Total hours **4,169** hours

Note: The starting and ending time for the calculation of the cumulative hours of sustainability training and training of suppliers is 2022~2024

To Be the Best Partner for Suppliers, Providing Continuous Sustainable Empowerment

Sustainable Supply Chain Upgrade + Forums

The purpose of the "Sustainable Supply Chain Upgrade+" forum is to enhance suppliers' acquisition of sustainable professional knowledge and execution motivation through professional courses and open discussions. The forum also encourages suppliers to share this knowledge with colleagues in different departments within their companies, leveraging the learning effect and spreading information, making sustainability a daily operational consideration for suppliers.

In 2024, Winbond held five forums and one low-carbon cooperation ceremony, totaling 7,222 person-hours. Topics included popular carbon issues, water resource management, supply chain resilience, and human rights due diligence. The invited suppliers ranged from raw materials, OSAT suppliers and testing subcontractors, machinery and equipment, plant engineering, maintenance and spare parts, to waste management.

To effectively enhance suppliers' ESG management concepts and operational capabilities in the carbon pricing era, Winbond invited a well-performing ESG supplier, King Yuan Electronics, to share their organizational management after incorporating ESG concepts in the first half of the year. In the second half, Winbond invited the Chung-Hua Institution for Economic Research and the Market Intelligence & Consulting Institute, Institute for Information Industry to discuss carbon costs, response strategies, necessary guidance, and subsidies. Winbond also officially announced the introduction of a carbon accounting management mechanism within the supply chain to collect Scope 3 carbon information. Winbond aims to actively assist suppliers in establishing comprehensive carbon and cost management thinking, thereby enhancing the competitiveness of the semiconductor industry from the supply side.

Sharing of Sustainable Benchmark Suppliers: King Yuan Electronics Co., Ltd.

2024 H2 Sustainable Supply Chain Upgrade Forum: Opportunities for Supply Chain Transformation in the Era of Carbon Pricing.

Supplier Sustainability Training

Advanced Packaging Technology Forum

Innovation is also a key success factor for supply chain sustainability. Enhancing the R&D capabilities of OSAT suppliers is equivalent to enhancing the competitiveness of Winbond's products. The purpose of the "Advanced Packaging Technology" forum is to facilitate direct communication between various departments within Winbond and backend packaging and testing, inspiring product research and development that better meets future needs.

In 2024, the "Advanced Packaging Technology Forum" held a total of four sessions. These sessions included inviting top-performing subcontractors in advanced packaging technology, such as ASE, Powertech Technology Inc., and Advantest, to share topics including advanced packaging process introduction, Flash programming applications, and appearance inspection solutions. Participants included engineers from Winbond and packaging and testing fabs, with a total of over 2,123 person-hours of participant.

◀ OSAT supplier: ASE Group

OSAT suppliers- PTI Technology, Advantest ▶

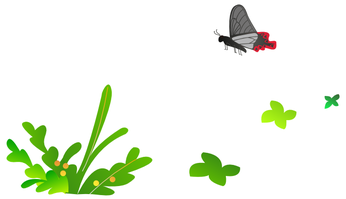
2024 OSAT Supplier Conference Theme: Co-Creating Sustainable Value: Emerging ESG Trends and Practice Enhancement

The competitiveness of Winbond's memory products relies not only on the quality control by all Winbond employees but also on the advanced and stable quality technologies provided by OSAT suppliers. In 2024, OSAT suppliers include Powertech Technology Inc., Winstek Semiconductor Co., Ltd., King Yuan Electronics Co., Ltd., ChipMOS Technologies Inc., Walton Advanced Engineering, Inc., Formosa Advanced Technologies Co., Ltd., Lingsen Precision Industries, Ltd., Greatek Electronics Inc., and Probe Test System Corp. all assigned senior executives and achieved 100% attendance at the OSAT Supplier conference.

During the conference, Winbond's president first analyzed the semiconductor industry market conditions, aligning subcontractors' focus on renewable energy product manufacturing and cooperation. Subsequently, Winbond's fab managers shared recent sustainability execution experiences with the OSAT suppliers. In 2024, Winbond comprehensively evaluated subcontractors on quality, delivery, cost, service, and sustainability performance, and awarded the Outstanding Sustainable Subcontractor Award.

2024 OSAT Suppliers

- Best Packaging OSAT Supplier - ChipMOS Technologies
- Best Test OSAT Supplier - PTI Technology
- Best Quality - Winstek Semiconductor Co., Ltd.
- Best ESG Contribution - Walton Advanced Engineering, Inc.



2024 OSAT Supplier Conference

4.3 Supply Chain Engagement and Impact

4.3.1 Green and Low-carbon Supply Chain

In order to effectively move towards the 2050 net-zero goal, in 2024, in addition to continuing to organize supplier ESG negotiation activities related to energy conservation and carbon reduction, Winbond expanded the scope of supply chain carbon reduction, and lead by example, starting from Scope 3 reduction, including upstream transportation, back-end packaging and measurement services, waste treatment, etc. The spirit of target setting and substantial carbon reduction drives the design of carbon reduction work of all units, hoping to achieve the target of 30% reduction by 2030. In view of this, in 2024, Winbond focuses on the promotion of green and low-carbon supply chains, namely "Leading the Way - 2024 Internal Scope 3 Carbon Reduction " and "Diffusion and Impact - Low-carbon Supply Chain Governance".

2024 Achievement Highlights

- The proportion of Tier-1 significant suppliers (note) disclosing energy resource usage in sustainable supply chain surveys is > 95%.
- Assisting all OSAT suppliers in establishing renewable energy product production planning and manufacturing capabilities 100%.
- Achieved a Scope 3 carbon reduction of 228 tons of CO_2e.

Low-Carbon Supply Chain Management Process

1. Identify conflicts and establish a reciprocal mindset
2. Declare carbon reduction goals and establish sustainability objectives
3. Collect and enhance data transparency
4. Conduct training and open discussions
5. Introduce resources from industry, government, and academia to collaborate on carbon reduction

Leading the Way - 2024 Internal Scope 3 Carbon Reduction Initiative

Winbond Scope 3 (Supply side)

Upstream transportation

- A total of 14 key materials have been traced to multiple sources, and local procurement for five of these materials reduced carbon emissions by 7.2 tons of CO_2e.
- Introduce a shared logistics mechanism, negotiate with 2 suppliers to join the shared transportation mode, and reduce carbon emissions by 0.1 tons of CO_2e per year
- Simplified packaging and paperless import and export operations can reduce CO_2e by 0.32 tons per year

Back-end packaging and testing services

- Low-carbon material development and process optimization: Discuss the opportunities for manufacturing process optimization with 2 OSAT suppliers to jointly verify low-carbon materials, and 6 OSAT suppliers to identify carbon reduction hotspots as the core
- Conduct regular product carbon emission inventory: In 2024, a total of 8 companies will conduct a second product carbon footprint inventory, which confirmed the changes in product carbon emissions and continue to target carbon reduction targets for hot spots
- Set up a packaging material carbon reduction project: Promote work items including replacing cartons with electrostatic boxes, reducing reel materials, recycling and reusing Carrier tape, recycling and reusing tube materials, and eliminating duplicate labels, reducing CO_2e by a total of 175 tons
- Energy-saving test production planning was introduced for packaging and testing, reducing CO_2e by a total of 42 tons

Low carbon materials,
carbon emission reduction benefit 14%
(WBGA96 7.5x13mm)

1. Recycled gold wire
2. Recycled solder balls
3. Low carbon plastic pellets

Waste disposal

- Recycling of waste PVC gloves: In 2024, Winbond initially clean, cut and crush waste plastic gloves, resell them to pelletizing fabs, and then remold them into different recycled plastic products according to different market needs. It is estimated that it can reduce about 2.8 tons of CO_2e per year, and in terms of economic terms, it is estimated that it can create economic benefits of more than NT$260,000 per year

2024 Supply Chain Low-Carbon Governance Performance

Low-carbon Management Promote Measures	2024 Measures and Actions
Carbon Reduction and Resource Efficiency Commitments	By 2030, the supply chain must achieve a 10% carbon reduction ▪ Annual electricity consumption saving target of 1% ▪ 5% annual water saving target ▪ Annual waste reduction target of 1%
Supply chain energy resource usage disclosure	Winbond surveyed a total of 358 suppliers directly related to Winbond's Scope 3 emissions to review the achievement of annual electricity savings, water consumption, waste production, and progress in greenhouse-gas reduction.
Conduct Training and Open Discussions	Winbond held a total of 8 supplier ESG workshops and 2 sustainable supply chain upgrade + forums. From the perspective of thematic learning and benefiting suppliers, the scope of learning includes plant energy conservation, low-carbon footprint of raw materials, hydrogen energy application, data center carbon reduction, and supply chain SBTi reduction target setting and promotion.
Introduce Industry-Government-Academia Collaboration to Advance Carbon Reduction	▪ In 2024, Winbond, in collaboration with its suppliers, increased the carbon reduction amount of the "Large Leads Small" project from 5,866 tons CO_2e to 9,500 tons CO2e, expanding the impact of the industry demonstration project. ▪ Winbond hold Winbond Electronics Supply Chain Transformation Diagnosis Subsidy Briefing, and specially invite suppliers with small procurement amounts and insufficient transformation resources to participate. A total of 80 companies participated, with 92 participants contributing 184 person-hours of work. ▪ Strengthen the promotion of iPAS Net-Zero Carbon Emission Planning Administrator resources jointly organized by the Ministry of Economic Affairs and the Ministry of Education to help small and medium-sized suppliers alleviate the problem of sustainable talent shortage

Note 1 The baseline year for energy resource conservation and carbon reduction in Winbond's supply chain is 2021, and only those who provide relevant supporting documents, statutory declaration materials, and those who have disclosed them for three consecutive years will be deemed to be valid
Note 2 Percentage of households achieving the savings target = Number of households achieving the savings target / Number of surveyed homes in the current year
Note 3 Tier-1 significant Suppliers are those directly related to Winbond's Scope 3 Emission Category 4 (ISO 14064:2018)

Winbond has performed well in Large Leads Small Decarbonization Project, and was interviewed by Unique Business News /TechOrange

4.3.2 Sustainable Raw Material Management

Sustainable Raw Material Policy

Winbond is a professional memory integrated circuit company, providing global customers with a full range of memory solution services from product design, technology research and development, wafer manufacturing to private label marketing worldwide. In terms of corporate sustainability, we will continue to pay attention to world trends, social issues and the resilience of self-governance, implement responsible material procurement, expand the positive impact on the environment and society in a sustainable way, and strive to become a hidden champion that enriches human life with green semiconductor technology.

Winbond Electronics Sustainability Raw Materials Policy

Winbond's Supply Chain Biodiversity Conservation

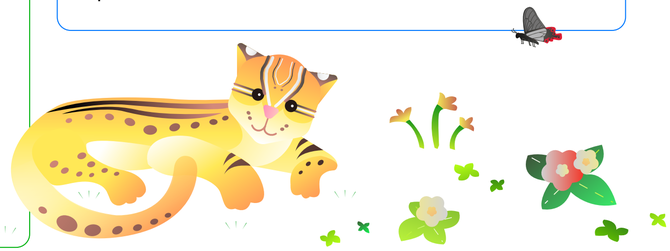
Supplier Management Guidelines Announcement

The environmental section of Winbond's Supplier Code of Conduct adds a new clause on the protection of ecological resources and explicitly requires suppliers to:

1. Pay attention to the impact on the surrounding ecological conditions, and take necessary remedial and maintenance measures at any time.
2. Comply with laws and regulations related to biodiversity conservation, avoid operations affecting biologically important habitats, and participate in actions to conserve natural ecosystems.
3. Commit not to operate in or near important biodiversity sites in the future.
4. Suppliers shall undertake to propose impact mitigation measures, including avoidance, mitigation, recovery, and compensation.
5. Commit to compensatory measures for forest land restoration and to terminate any form of future development.

Environmental impact analysis and supplier assistance

In 2024, Winbond first conducted environmental impact analysis on a total of 506 sites and coastal reserves, important wildlife habitats, nature reserves, important wetlands, national parks, wildlife sanctuaries, nature reserves, conservation axes, and key biodiversity areas of its suppliers in Taiwan. In the future, Winbond will expand the scope of the supplier survey to further assess whether the addresses of international suppliers are located in the Global Database of Protected Areas (WDPA) provided by the International Union for Conservation of Nature (IUCN), and provide necessary assistance to suppliers located in hot spots.



Raw Material Program

In 2024, Winbond conducted a comprehensive review of existing raw materials and carried out traceability and root source tracing work to minimize the environmental impact of its procurement activities, as part of a raw materials sustainability program that includes prioritization based on environmental and social criteria. The raw materials purchased by Winbond, including wafers, process chemicals, gases, targets, etc., are evaluated according to the criteria of quality, technology, commerciality, environmental friendliness, and humanity, respectively, to determine the priority for using sustainable raw materials. First of all, regenerated and recycled wafers are prioritized as the main sustainable raw material procurement objects. Looking ahead, Winbond will actively seek out third-party verified raw materials. We have set targets to increase their procurement ratio annually without compromising process quality. And with appropriate education and training on sustainable raw materials, we ensure that front-line supply chain managers can apply relevant knowledge to their work.

Education and training on sustainable raw materials

In order to effectively help frontline procurement personnel understand sustainable raw materials and expand the scope of upstream traceability, Winbond provided 1,293 person-hours of internal training related to sustainable raw materials in 2024, including:

- 2024 Environmental Education - Climate Change
- 2024 DEI Series Activities|Enhance DEI in the workplace
- The Power of Behaviour Change – Green Living & Green Procurement
- ISO 14064 Organizational Greenhouse Gas Inventory and Verification
- ISO 14067 Product Carbon Footprint Inventory and Verification
- ISO 14083 Global Logistics Carbon Accounting Standard
- Carbon neutrality implementation standards

2024 Short-term Sustainable Raw Material Plan

The raw material category	Purchased items	Sustainable raw materials			
		Percentage of use		Percentage of recycling	
		Target (%)	Actual (%)	Target (%)	Actual (%)
Silicon wafers	Control/Slide Regenerated silicon crystals	68%	68%	100%	100%

2027 Medium-term Sustainable Raw Materials Plan

The raw material category	Purchased items	Sustainable raw materials	
		Target usage percentage (%)	Proportion of target recycling (%)
Silicon wafers	Control/Slide Regenerated silicon crystals	71%	100%
Targets	Copper target	10%	100%

2030 Long-term Sustainable Raw Material Plan

The raw material category	Purchased items	Sustainable raw materials	
		Target usage percentage (%)	Proportion of target recycling (%)
Silicon wafers	Control/stop recycled silicon wafers	72%	100%
Targets	Copper target	20%	100%
	Copper and manganese targets Titanium target	We will evaluate the management plan based on the criteria of quality, technology, commerciality, environmental responsibility, and humanity, and disclose the management plan year by year	100%
Chemicals	isopropanol		

In 2024, Winbond's usage of metal raw materials and the proportion of recycled materials used are listed in the table below. Winbond Electronics actively sought to incorporate metal raw materials into the recycling process to achieve environmental friendliness. On the supply side, in 2025, Winbond will continue to initiate the traceability of recycled metal raw materials and strengthen the requirements for raw material suppliers and packaging and testing companies to execute product development requirements such as recycling and remanufacturing of related metals, minimizing source extraction and maximizing environmental friendliness.

Metals/Minerals	Total Use	
	Usage (Metric Ton)	Percentage of recycled material used
Gold	0.23	2%
Aluminium	0.79	0%
Cobalt	0.52	0%
Copper	62.63	5%
Iron/steel	6	0%
Nickel	15.1	0%
Lithium	0	0%
Titanium	0.02	0%
Total use	85.06	4%

Case Study 1 - OSAT suppliers Green Product Capability Building Project

With its corporate vision of "Being the hidden champion of sustainable semiconductors enriching human life", Winbond is prioritizing green products as the challenges of climate change and the urgent need for carbon reduction. In view of this, we have made full use of the advantages of supply chain collaboration and cooperation. Since 2022, we have actively negotiated with OSAT suppliers for back-end packaging and testing to jointly complete the manufacturing capacity of renewable energy products, and finally at the end of 2024, Winbond became the first memory manufacturer with the capability to produce products using renewable energy.

Step 1

2021
2022

Assist the OSAT supplier to have the ability to organize and conduct product carbon footprint inventory

Since 2021, Winbond has taken three major measures to build the overall carbon capability of the supply chain: first, it has actively negotiated with OSAT suppliers to set a 60% carbon reduction target and the concept of renewable energy product manufacturing; secondly, to conduct product carbon footprint inventory and verification for its own 12-inch wafer manufacturing and outsourcing packaging and testing services; Third, we need to hold regular meetings to keep track of the OSAT supplier's carbon reduction progress. In 2024, all of Winbond's OSAT suppliers in Taiwan have completed the product carbon footprint inventory of BGA, SOP, SON, WLCSP, and RDL, and will continue to identify opportunities for the reduction of carbon footprint coefficients for packaging and testing services. It is evident that Winbond and its OSAT supplier partners are working together to reduce the carbon emissions of their products.

Step 2

2023
2024

Call on OSAT suppliers to join the ranks of carbon data electronic data exchange empirical ranks

Based on the Pathfinder Framework proposed by the Partnership for Carbon Transparency (PACT) of the World Business Council for Sustainable Development, Winbond has partnered with the Institute for Digital Transformation of the Information Industry to act as an industry think tank. Winbond and its OSAT supplier partners play the role of industry demonstrators in the demonstration of carbon emission data exchange between heterogeneous platforms. In 2024, 100% of OSAT suppliers responded, which served as a significant industry demonstration in terms of carbon data streaming for manufacturing and outsourcing services.

Step 3

2024

Improve the ability of OSAT suppliers to produce and plan renewable energy products

Winbond leads the industry by using the manufacturing characteristics of its own self-made 12-inch wafers and outsourced packaging and testing services, and on the basis of supply chain collaborative planning and cooperation, it proposes to use a sustainable production operation management mechanism to create sustainable and comprehensive effects with supply chain characteristics in two major measures. In the future, on the one hand, carbon emission reduction within the supply chain can be achieved, and on the other hand, the green electric products required by customers can be delivered within the time limit.

winbond We Deliver

Integration of Supplier Technical Capabilities
Collaborated with engineering teams and packaging testing plants to develop new testing platforms and introduced energy-saving testing equipment.

Establishment of Green Power Production Planning
Broke the "quantity" mindset and established production planning that combines "quantity" and "green power".

2021-2022
ESG Requirements for OSATs Agreed Upon

2023-2024
OSAT suppliers join the ranks of carbon data electronic data exchange empirical activities

2023-2024
Share experience in supply chain carbon data management across industries (including ASUS, Taichung Precision Machinery, Institute for Information Technology, BCSD)

2024
The first batch of renewable energy products are ready to go

Case Study 2 - Supply Chain Sustainable Logistics and Low-Carbon Transportation

Logistics and transportation encompass both the "first mile" of inbound shipments from our suppliers to Winbond and the "last mile" of outbound deliveries to our customers. Winbond actively identifies all potential carbon reduction opportunities within our Scope 3 emissions, using supplier collaboration as a foundation to drive the planning and design of reduction initiatives. In 2024, Winbond officially launched a shared logistics system for inbound transportation from our suppliers.

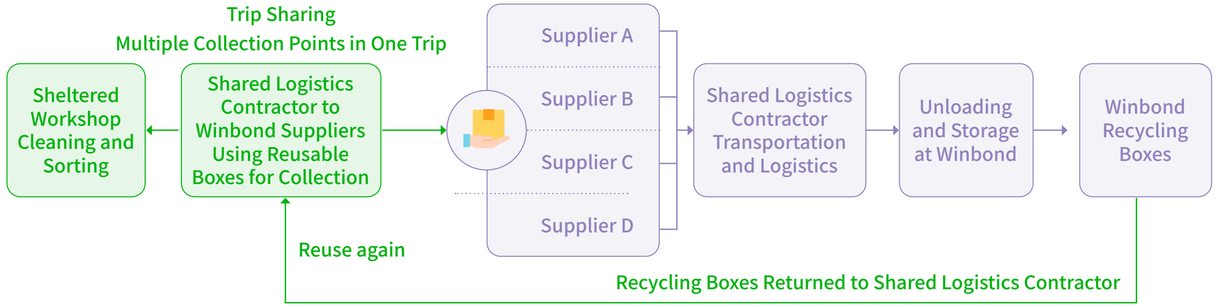
Looking ahead, we will leverage the strategic locations of our warehouses to plan efficient, low-carbon transportation for outbound shipments to customers.

Winbond's material supply side

resource recycling, sustainable logistics

In 2024, Winbond took the materials used in the factory (such as cleanroom gloves and masks) as the primary assessment, and negotiate with relevant suppliers to abandon carton packaging and use reusable recycling boxes to supply to Winbond's operating sites based on Winbond's annual consumption. In the shared logistics management model, the scale economy and low-carbon nature of transportation will be met by using trip sharing, and a total of 0.1 tons of CO_2e will be reduced by 2024. It is worth mentioning that the reusable recycling boxes will be handed over to the sheltered factories for cleaning and sorting after recycling, creating income and disadvantaged employment opportunities for sheltered factories, which is a logistics operation mode that can create comprehensive sustainable benefits. In the future, Winbond will actively negotiate with more suppliers to join the ranks of this shared logistics and apply the scale of the supply chain to improve its sustainable and comprehensive efficiency.

Shared logistics operation mode

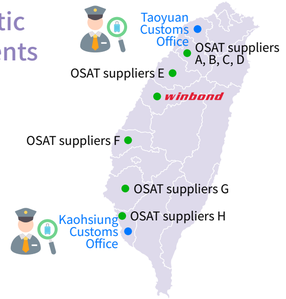


Winbond's product shipment

minus per trip, carbon emission reduction plus

Winbond adopts 12-inch wafer self-production and packaging and testing outsourcing in manufacturing, and adopts the direct delivery mode, and the semi-finished products and finished products are stored at the packaging and testing company, and the OSAT suppliers will carry out domestic and international shipments after the customer orders. In 2024, Winbond will explore opportunities for carbon reduction from digital management and entrepot operation. We have integrated the transportation route records, the addresses of each temporary storage point, the distance, the order weight, and the emissions per tonne-kilometer delayed for the whole year, optimized the transportation routes and shifts, reduced unnecessary trips, and ensured that the transportation vehicles can fully carry the cargo. In the future, we will continue to seek the sustainable development of low-carbon transportation in this model, in order to significantly reduce fuel consumption and carbon emissions.

Domestic shipments



International shipments

2024 Suppliers Empowerment Initiatives

Since the establishment of the Sustainable Supply Chain team in 2022, Winbond has been actively seeking opportunities for suppliers to join the sustainability ranks. In 2024, we carried out a total of four sustainability training projects for supplier sustainability management, including "Winbond Supplier Energy Conservation and Carbon Reduction Diagnostic Counseling", "Carbon Data Electronic Data Interchange - PACT Advanced Demonstration", "Supply Chain Sustainable Logistics and Low-carbon Transportation", "Reinventing the New Project - Recycling of Waste PVC Gloves", etc., and as of 2024, a total of 62 suppliers had accepted Winbond's sustainability agreement and training. In the future, Winbond will continue to uphold the principle of shared prosperity within the supply chain by partnering with suppliers who share our commitment to sustainability, expecting these projects to serve as powerful industry demonstrations that influence more suppliers to join us in a virtuous cycle.

Supplier Capacity Building Program		Number of suppliers involved
2022	Co-Sustainability project – ESG perspective exchange and co-learning	32
2023	Winbond Electronics' low-carbon transformation cooperation project for sustainable supply chain	13
2024	Supplier energy conservation and carbon reduction diagnostic counseling	2
	Electronic data exchange of carbon data - PACT preliminary evidence	9
	Supply chain sustainable logistics and low-carbon transportation	2
	Reinventing the new life project - scrap PVC gloves for recycling	4
Total number of suppliers in capacity building programs		62
% of unique significant suppliers in capacity building programs		37%

Note Proportion of significant suppliers with implementation of the PEP program = number of significant suppliers with implementation of the PEP program / number of Tier-1 significant suppliers with negative impact in 2024

Social Mutual Benefit and Practice-Actively respond to the government's sustainable industrial policy 2024 Sustainable Supply Chain Forum

Data Exchange Standard X Carbon Management Change

In addition to actively engaging suppliers to join the ranks of sustainability from different aspects, Winbond is also actively responding to the government's sustainability policy and is a committed corporate sustainability citizen, with a total of 4,692 person-hours of corporate and government-related activities as of 2024. In 2024, the convener was invited to the Sustainable Supply Chain Summit Forum hosted by the Industrial Development Administration (IDA), Ministry of Economic Affairs to share Winbond's measures in low-carbon supply chain management with the theme of "Driving the Sustainable Economic Benefits of the Semiconductor Supply Chain - Multiple Transformations of Low Carbon, Digital and Carbon Costs". Since 2022, data governance has been the core of carbon management for suppliers. Emission data was collected on a regular basis to grasp the carbon reduction progress of suppliers. The OSAT suppliers have completed their product carbon footprint inventory. In terms of Scope 3 information collection, we introduced the industry's first carbon accounting management mechanism. Furthermore, demonstrating our commitment to innovation, we collaborated with the Institute for Information Industry's (III) Digital Transformation Research Institute and our OSAT suppliers, to establish a supply chain carbon information electronic data exchange mechanism based on PACT specifications. This content not only aroused heated discussions among more than 400 audiences from industry, government, academia and research, but also made Winbond understand that as a member of the earth, it is not only necessary to continue to innovate in terms of sustainability, but also to share and drive positive influence in society, which is also a driver of corporate sustainability.

Group photo of representatives of the 2024 electronics industry demonstration

Shu-Cheng Chang, Assistant Vice President of supply chain management center, share the progress of Winbond's supply chain carbon management

Ecosystem member feedback

Co-prosperity of the environment

Electronic Exchange of Carbon Data for OSAT suppliers - PACT Preliminary Evidence

Winstek Semiconductor Corp.

Thanks to Winbond's invitation to participate in the Carbon Data Electronic Information Exchange Standard Verification Program, by establishing a safe and correct exchange standard and sharing transparent industrial carbon data information, in addition to reducing the labor cost of repeatedly filling in carbon footprint information, it also accelerates the solution of the challenge of supply chain data collection in carbon inventory, so as to achieve the long-term goal of net zero emissions.

Advancing Shared Social Value

Advocacy and response to external corporate sustainability activities

BCSD Taiwan

Council for Sustainable Development Taiwan

Winbond was invited to participate in the presentation and workshop of "Guidelines for Accounting and Exchange of Carbon Emissions in the Product Life Cycle" organized by BCSD Taiwan to share the capabilities of carbon data accounting and exchange, so that the participating representatives benefited from how to set strategies and goals, how to negotiate with the supply chain, and how to implement it into the risk management framework.

Supplier Social Impact Campaign - The S Power in ESG

Merck Ltd., Taiwan

Thank you for being invited to Winbond Zhongke in 2024 to share sustainability issues, so that Winbond's partners can have an in-depth understanding of how Merck implements the concept of sustainable development in corporate operations. We talked about our practical experience in digital transformation, carbon reduction, DEI policies and environmentally friendly product development, and looked forward to continuing to work with Winbond to create greater social and environmental value

Governance Excellence

Sustainable Procurement On-site Training

Shih Her Technology

Winbond is a key player in the semiconductor customers who actively drive the decarbonization of suppliers. At present, in addition to the Hsinchu Guangfu No. 2 Plant, which has been expanded in the first two years, and has been put into production capacity one after another, another new plant is currently being planned, and in the future, it will continue to provide high-quality, clean and low-carbon services with the increase in the proportion of new production capacity and advanced process operation for customers.

Kertz Technology

Thanks to Winbond for not only conducting on-site procurement training, but also inviting us to participate in the "Sustainable Supply Chain Upgrade+" forum on sustainability issues, so that we can understand the needs of customers in ESG sustainability, and have a sense of mission to protect the earth, so that we can work together to promote ESG and net zero carbon emissions.

4.4 Responsible Sourcing of Minerals

Winbond actively promotes the requirements of Responsible Business Alliances in the supply chain and considers them to be an essential element of supply chain management. In accordance with the management recommendations of the Organization for Eco-nomic Co-operation and Development (OECD) due diligence, Winbond first issued a statement on the non-use of conflict minerals. Secondly, the material analysis is carried out according to the composition of the company's products, and the suppliers that need to be investigated are identified to facilitate the implementation of due diligence. Suppliers are strictly required to select qualified smelters and update the information according to the validity period, and finally, based on the survey results, prepare an annual due diligence report on conflict minerals for public disclosure. In 2024, a total of 15 suppliers involved in 3TG metal, cobalt, mica and other minerals directly related to the company's products, of which 1 has completed a comprehensive written investigation and on-site audit, and the qualified rate is 100% except for all of them.

2024 Achievement Highlights

- 100% coverage rate of suppliers receiving the conflict-free mineral policy advocacy
- 100% of new suppliers signed Winbond CoC (including conflict-free minerals)
- 100% qualification rate for suppliers surveyed and audited

Responsible Sourcing Management Process

Conflict-free minerals statement ▶ Material Analysis and Mineral Sourcing Summarize ▼ Conduct Due Diligence ◀ Disclose Results Publicly

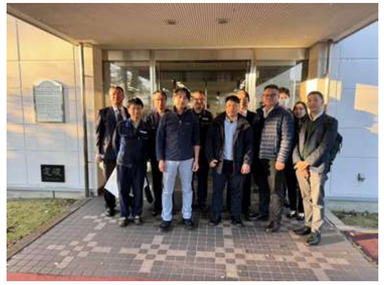
4.4.1 Conflict-free Minerals Statement

Winbond follows the RMI (Responsible Minerals Initiative) to conduct due diligence on the source and regulation of tantalum, tin, tungsten, gold, cobalt, and mica in the products it manufactures to ensure that its sourcing practices are in line with the OECD Guidelines for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas or an equivalent and recognized due diligence framework. At the same time, Winbond also requires all suppliers to comply with and sign the Code of Conduct and Ethics related to sustainable development, the Employee Code of Ethics, the International Declaration of Human Rights and the International Labor Organization's Tripartite Declaration of Principles, the adoption of green products, environmental protection and no hazardous substances (HSF) policies, or comply with the requirements set by the Responsible Business Alliance (RBA). In 2024, all qualified suppliers signed the Winbond Code of Ethics and Integrity, the Winbond Supplier Code of Conduct Commitment (including the terms of the RBA and Conflict Minerals Statement) to ensure that there are no "responsible minerals from substandard smelters" and products from Congo or countries and regions adjacent to conflict zones, and comply with applicable regional and international laws on responsible minerals.

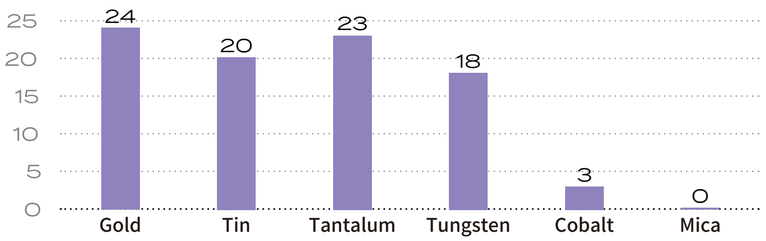
4.4.2 Identification and results of 3TG metal sources

Winbond first determines the composition of the supplied products based on the Safety Data Sheet provided by the supplier and identifies whether it contains specific metals, and then adopts the Conflict Minerals Reporting Template (CMRT) and the Extended Minerals Reporting Template (EMRT) Investigate suppliers whose product composition involves gold (Au), tantalum (Ta), tin (Sn), tungsten (W), cobalt (Co), mica, and other responsible mineral sources as reported in the Responsible Minerals Initiative (RMI). In 2024, a total of 15 suppliers will be surveyed, and the smelters from which various metals come from 26 countries include North America, South America, Europe, Asia and Central Asia, and a total of 88 qualified smelters will provide metal smelting. In addition, Winbond has also formally implemented on-site audits of suppliers on conflict production, which not only strengthens Winbond's determination not to use conflict production, but also ensures suppliers' commitment to conflict production management through on-site audits. In 2024, a total of 2 Japanese raw material suppliers and a total of 15 written audits were conducted on the spot, all of which will comply with the requirements and have not been prohibited from selling related products to Winbond.

Mineral	Year 2024
Gold	24
Tin	20
Tantalum	23
Tungsten	18
Cobalt	3
Mica	0
Total	88



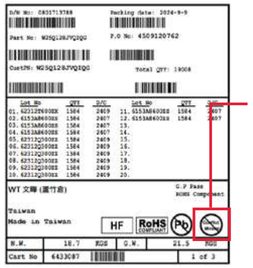
On-site audit of supplier conflict production



4.4.3 Supplier management and labeling of Conflict Minerals

As global political relations are volatile, and in recent years, cross-border government conflicts or wars have occurred only overnight, in order to ensure that Winbond abides by its commitment not to use conflict minerals, Winbond has taken three measures to prevent and control the risks in the use of 3TG metals. First, we continued to issue regular due diligence and annual due diligence reports on conflict minerals, and simultaneously expanded to suppliers who use 3TG metals, conducting on-site audits to ensure their practices are consistent with their stated policies. Second, we continued to trace the source of suppliers who have lawfully mined 3TG ore sources at home and abroad and have also implemented conflict minerals management policies, implementing diversified supply risk control and conflict prevention of mine sources. Third, Winbond did its best to assist suppliers in the traceability of other compliant minerals for suppliers with potential use or procurement risks of conflict minerals, and if no improvement is made, Winbond will cease business with the supplier. It is worth mentioning that Winbond's supply chain team was also actively paying attention to the stakeholders' requirements for conflict minerals management, dynamically adjusting internal management measures based on a principle of proactive prevention, hoping to ensure the humane spirit of mineral mining with the strictest standards.

Winbond's products are 100% conflict-free minerals



Conflict-Free Mineral Label

In 2024, in accordance with the regulations of the RBA and the U.S. Securities and Exchange Commission, Winbond also actively responded to the Dodd-Frank Act (DFA) and strengthened the implementation of corporate social responsibility. All product outer packaging bore a"Conflict-Free" label, explicitly declaring that the company's products contained no conflict minerals.

Mechanism adopted by suppliers to prevent the use of conflict minerals

- Regular inspections and on-site audits
- Trace compliance resources and suppliers
- Provide assistance to suppliers with risks; if no improvement is made, transactions will be stopped

Human Rights and Social Inclusion

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5.2 Talent Attraction and Development 152
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5.4 Occupational Safety and Health 173
5.5 Social Impact 178

Scope of coverage: Unless otherwise specified, the scope covers Winbond Group; * Winbond

Winbond adheres to internationally recognized human rights standards and labor-related regulations as its highest guiding principles, striving to maintain employees' freedom of association and speech rights. The company does not discriminate based on race, age, gender, sexual orientation, disability, pregnancy, political affiliation, or religion, and works to create a non-discriminatory workplace environment.

Winbond upholds a 'people-oriented' approach and fully complies with international human rights conventions and labor-related regulations. Through the Human Resources Department, the company has established a comprehensive personnel system to ensure the practice of diversity, equality, and human rights protection. After completing human rights due diligence in 2022, Winbond has since optimized management measures in 2023, extending human rights management concepts to suppliers and overseas subsidiaries. In 2024, Winbond continued to enhance human rights management, improving employee experience in Taiwan and striving to create a friendly workplace environment. These efforts have been recognized with multiple awards and positively impacted global subsidiaries, strengthening the depth of human rights training. Simultaneously, Winbond continues to invest in public welfare by focusing on environmental protection and supporting disadvantaged groups, expanding its positive social impact and achieving sustainable development and common prosperity goals.

Winbond's commitment to upholding human rights and promoting social integration is an ongoing pursuit—there is always room for improvement. In safeguarding these values, the standard is never merely "good enough," but a continuous striving for "better." This reflects Winbond's steadfast dedication to its employees and society, and the enduring vision of its management team.

Hsiang-Yun Fan

Executive VP, Headquarter Functions

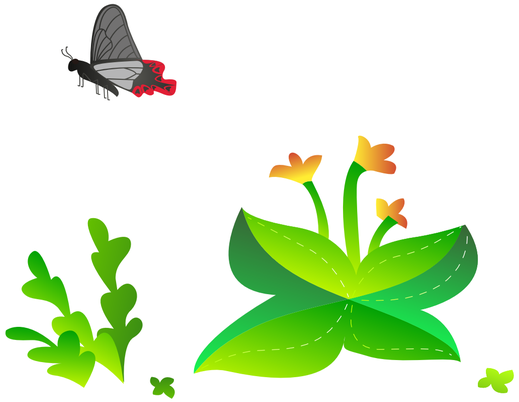
2024 Performance Highlights

- Taiwan Corporate Sustainability Award: Awarded First Place in the Manufacturing Sector for both the Talent Development Leadership Award and the Workplace Well-being Leadership Award
- Full-time employee salary of non-management of Winbond (Taiwan). Average NT$1.73 million
- University semiconductor program investment: Nearly NT$10 million
- Employee Childcare Allowance (Cumulative) Over NT$390 million
- Average Annual Training Hours per Employee (Winbond Taiwan) 70 hours
- Winbond Group's total training expenses in 2024 Over NT$42.87 million
- Human rights and labor ethics training 100% completion rate
- The number of children sponsored by the Endeavor Scholarship 1,062 beneficiaries
- Social public welfare investment (Winbond) NT$23.7 million

Note The scope of Winbond (subsidiaries) and Nuvoton (subsidiaries) mentioned in this section are as follows:
Winbond (subsidiaries) includes Winbond Integrated Circuit (Suzhou) Co., Ltd., Winbond Integrated Circuit (Suzhou) Co., Ltd. - Shenzhen Branch, Winbond Electronics (Hong Kong) Co., Ltd., Winbond Electronics (Japan) Co., Ltd., Atfields Manufacturing Technology Corporation, Miraxia Edge Technology Corporation, Winbond Electronics (America) Corporation, Winbond Electronics (America) Corporation - Pleasanton Office, Winbond Electronics (Israel) Ltd., Winbond Electronics (Germany) GmbH.
Nuvoton (subsidiaries) includes Nuvoton Technology Shenzhen Ltd., Nuvoton Technology Hong Kong Ltd., Nuvoton Technology Shanghai Ltd., Nuvoton Technology Nanjing Ltd., Nuvoton Technology Israel Ltd., Nuvoton Technology Corp. America, Nuvoton Technology India Private Limited, Nuvoton Technology Germany GmbH, Nuvoton Technology Korea Limited, Nuvoton Technology Singapore Pte. Ltd.

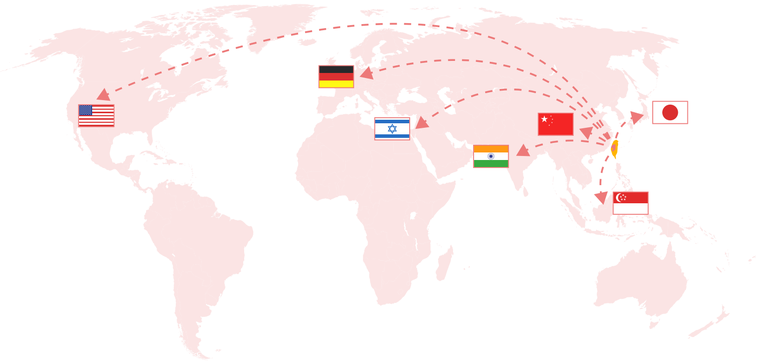
5.1 Human Rights Management

Human rights issues are a crucial aspect of Winbond's sustainable management practices. To align with company development and global trends, Winbond optimized its human rights policy in 2024 to enhance the management of and focus on human rights issues among its partners. Winbond has been actively involved in human rights management activities for many years. In 2022, Winbond conducted its first human rights due diligence for employees in Taiwan, and in 2023, implemented mitigation and preventive measures for human rights-related risks. In 2024, Winbond continued to optimize human rights management, improve employee experience, and create a friendly workplace. These ongoing efforts achieved significant results in the field of human rights and have been recognized and affirmed by external parties. Winbond has received the TCSA Single Performance Award for Human Rights Practice and Development Leadership, Workplace Well-being Leadership, and Talent Development Leadership, the Ministry of Labor's 113th Work-Life Balance Award for "Family-Friendly Award," the Southern Taiwan Science Park's "Outstanding Enterprise for Promoting Workplace Equality," and the "Happy Enterprise" award selected by job banks. These awards demonstrate Winbond's efforts and achievements in human rights management and support



5.1.1 Global Human Rights Training

In 2024, Winbond (Taiwan), its subsidiaries, and Nuvoton (Taiwan) conducted human rights and labor ethics training for 5,702 employees across 10 subsidiaries, including those in the United States, Japan, Germany, Israel, and Mainland China/Hong Kong. The training covered topics such as working hours, forced or compulsory labor, bullying, and harassment, achieved a 100% completion rate. These efforts aim to cultivate human rights knowledge and foster a workplace culture that respects human rights.

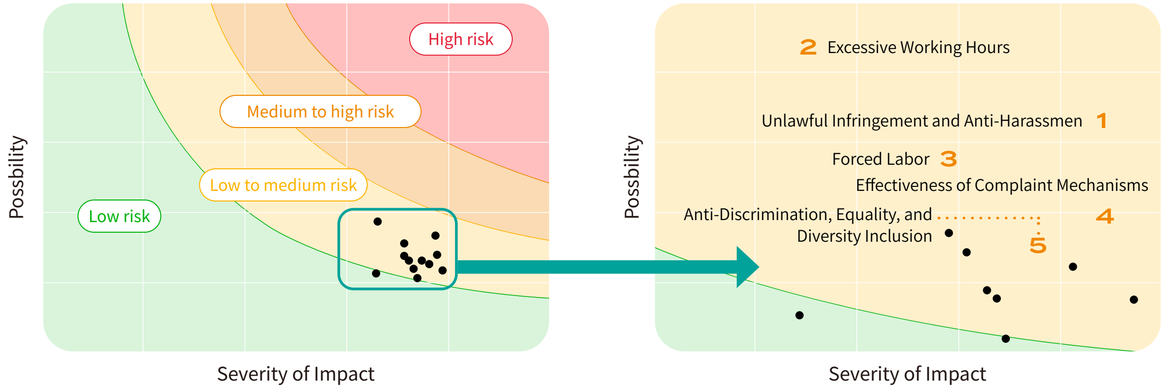


Winbond (Taiwan) continues to cultivate the values of diversity, equity, and inclusion (DEI) within its corporate culture. The company actively promotes the establishment of DEI thinking and provides courses to help employees become aware of unconscious biases. Additionally, Winbond introduces the work cultures of other countries to foster mutual understanding and respect among different cultural groups. Furthermore, the company organizes women's leadership seminars to promote a more friendly work environment and encourage women to realize their leadership potential in the workplace. In Q3, Winbond launched its first DEI newsletter to share and exchange ideas across generational groups. These efforts aim to create an inclusive and equitable workplace where every employee can fully demonstrate their value and talents.

To continuously enhance awareness of corporate sustainability and human rights management across different countries, Winbond (Taiwan) invited senior executives and relevant personnel from 13 overseas subsidiaries, including those in the United States, Japan, Germany, Israel, China, South Korea, and Singapore, to Taiwan in May 2024 for a three-day "Winbond Group Global Connect" event. During the event, participants were presented with ESG development trends, sustainable management, human rights due diligence, and best practices in human rights management. The event also provided a platform for participants to gain in-depth understanding and share knowledge and experiences on these important topics, promoting consistency and sustainability in human rights management globally. The involvement of senior executives provides clear guidance and support to the subsidiaries, ensuring that they actively fulfill their human rights responsibilities in daily business operations.

5.1.2 Implementation of Human Rights Management

After completing its first human rights due diligence in 2022, Winbond (Taiwan) shared its execution experience with Nuvoton (Taiwan). In 2024, Nuvoton (Taiwan) formulated a human rights policy and conducted a human rights due diligence in July, covering all employees at Nuvoton (Taiwan) headquarters. The results indicated that among the 14 human rights issues in the survey, there were no high-risk issues requiring immediate action. Among the medium-risk issues, the top five that require ongoing monitoring are "illegal infringement and anti-harassment," "excessive working hours," "forced labor," "effectiveness of grievance mechanisms," and "anti-discrimination, equality, and diversity inclusion." Nuvoton (Taiwan) will continue to optimize measures to mitigate the occurrence and impact of these risks.



In 2025, Winbond (Taiwan) will assist its subsidiaries in conducting human rights due diligence and employee core values and engagement surveys, continuing to promote human rights protection on a global scale.

5.2 Talent Attraction and Development

Winbond continues to enhance its human resource management system and optimize its human resource integration system. This includes improvements in recruitment, retention, compensation, benefits and talent development. Winbond is committed to promoting a people-centric corporate culture, increasing employee engagement with Winbond, and dedicating substantial resources to talent attraction and retention. In the face of global uncertainties, Winbond strives to maintain a strong competitive edge.

Percentage of Employees Requiring a Work Visa

Winbond (Taiwan)	Winbond (Subsidiaries)	Nuvoton (Taiwan)	Nuvoton (Subsidiaries)	Nuvoton (Japan)	Winbond Group
1.23%	1.62%	8.22%	6.21%	2.57%	3.20%

5.2.1 Workforce Structure

Global Workforce

As of the end of 2024, Winbond Group's total number of employees reached 8,097. The global workforce is distributed across Taiwan, Asia, North America, Europe, and the Middle East. Through this global presence, the Group can attract diverse talents, promote cultural exchange, and enhance international competitiveness, thereby improving the company's agility and innovation in the global market. The majority of Winbond Group's employees are from Taiwan (5,021) and Japan (2,278), with an additional 798 employees from Asia, North America, the Middle East, and Europe, representing a total of 23 countries. Winbond Group is committed to hiring talent from diverse nationalities, embodying diversity and inclusion, and nurturing outstanding global talents.

Global Workforce Structure by Nationality (Units: People)

Countries / Group Total	Numbers	Total of All	Share in total workforce	Management position	Share in all management positions
Taiwan	5,021	8,097	62.01%	739	56.93%
Japan	2,278		28.13%	405	31.20%
Other Asian Countries	514		6.35%	76	5.85%
North America	77		0.95%	15	1.16%
Middle East	42		0.52%	10	0.77%
Europe	163		2.01%	52	4.01%
Other Countries (Including Oceania and Africa)	2		0.03%	1	0.08%

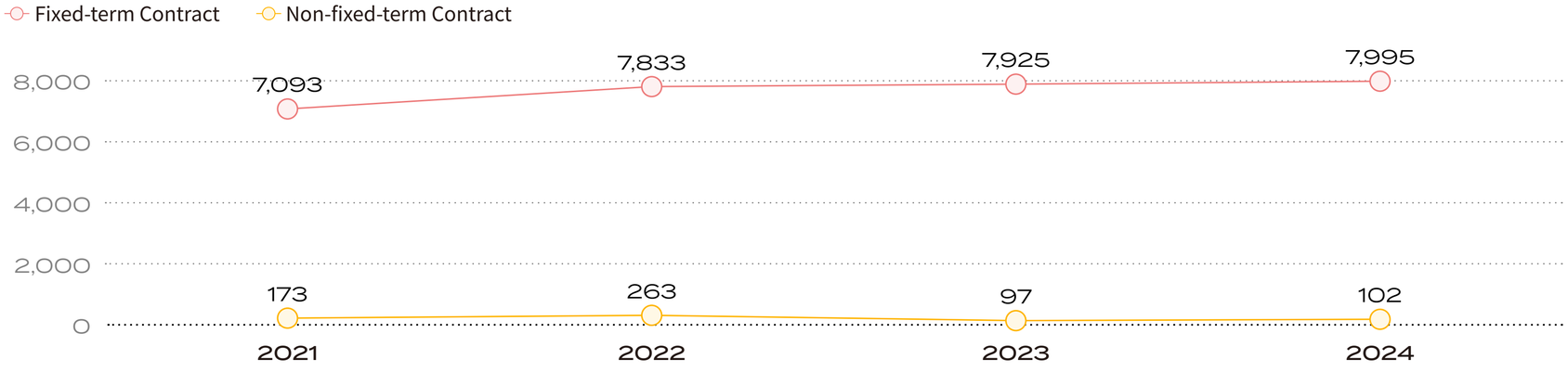
Note Notes: Other Asian Countries: including China, India, Indonesia, Malaysia, Philippines, Hong Kong, Russia, Myanmar, Singapore, South Korea, Vietnam, Thailand, Pakistan.

Global Workforce by Work Location (Unit: People)

Company	Winbond (Taiwan)		Winbond (Subsidiaries)		Nuvoton (Taiwan)		Nuvoton (Subsidiaries)		Nuvoton (Japan)		Winbond Group
Work Location	Permanent employees	Temporary employees	Permanent employees	Temporary employees	Permanent employees	Temporary employees	Permanent employees	Temporary employees	Permanent employees	Temporary employees	
Taiwan	3,533	40	0	0	1,577	15	0	0	0	0	5,165 (63.78%)
Asia (excluding Taiwan)	2	0	638	44	2	0	232	1	1,674	0	2.593 (32.02%)
North America	0	0	78	0	0	0	56	1	0	0	135 (1.68%)
Europe	0	0	0	1	0	0	3	0	0	0	4 (0.05%)
Middle East	0	0	42	0	0	0	158	0	0	0	200 (2.47%)
Subtotal	3,535	40	758	45	1,579	15	449	2	1,674	0	8,097 (100%)
Total	3,575		803		1,594		451		1,674		

Note Employee classification according to GRI definitions: Fixed-term contract employees are considered temporary employees; non-fixed-term contract employees are considered permanent employees.

Global Workforce Distribution Trend



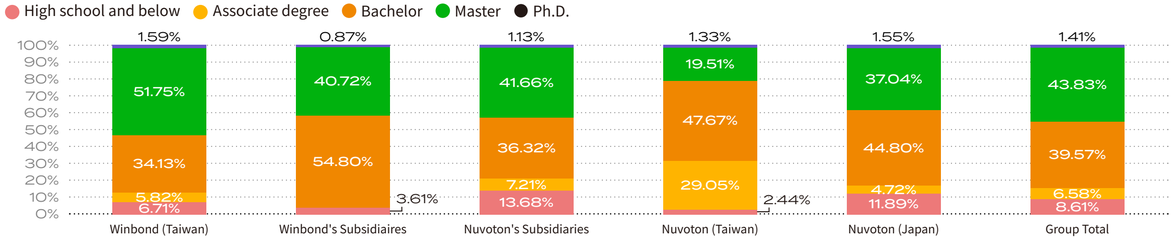
Employee Composition

Winbond Group regularly reviews its workforce composition and formulates high-quality recruitment strategies to attract suitable professionals and maintain industry competitiveness. In 2024, the proportion of employees with master's and doctoral degrees at Winbond (Taiwan) reached 53%, while those with bachelor's degrees accounted for 34%. At Winbond's subsidiaries, the proportion of employees with master's and doctoral degrees reached 42%, while those with bachelor's degrees accounted for 55%. Overall, the proportion of employees with master's and doctoral degrees in the Winbond Group reached 45%, while those with bachelor's degrees accounted for 40%, reflecting the knowledge-intensive nature of the semiconductor industry.

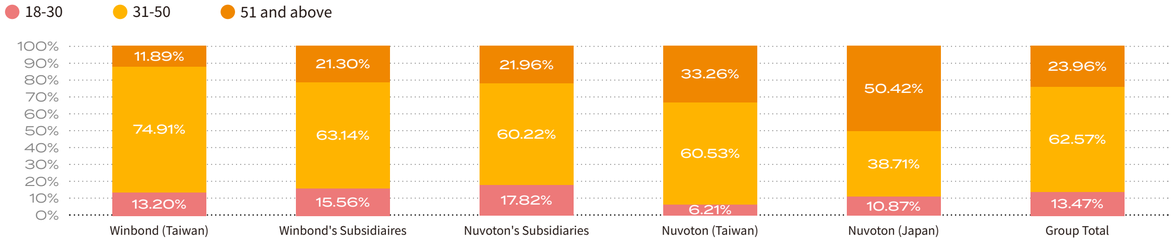
In terms of age distribution, Winbond Group strictly adheres to domestic and international labor laws and the Responsible Business Alliance (RBA) Code of Conduct, ensuring no employment of child labor or individuals who have not completed compulsory education. All employees are above 18 years old. At Winbond (Taiwan), approximately 75% of general staff are aged between 31 and 50. At Winbond's subsidiaries, approximately 63% of general staff are aged between 31 and 50. Overall, approximately 63% of general staff in the Winbond Group are aged between 31 and 50.

By job category, Winbond Group employed a total of 1,298 managerial staff and 6,799 non-managerial staff. The age structure of employees is primarily between 31 and 50 years old. The majority of Winbond Group employees are employed under indefinite contracts, totaling 7,996 people, and the majority of employment types are full-time, totaling 8,093 people.

Global Workforce by Education



Global Workforce by Age



Global Workforce Structure by Categories (Unit: People)

Categories	Company	Winbond (Taiwan)		Winbond (Subsidiaries)		Nuvoton (Taiwan)		Nuvoton (Subsidiaries)		Nuvoton (Japan)		Winbond Group
		Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	
Position	Managers	67	490	19	88	26	163	17	95	3	329	1,298 (16.03%)
	R&D/ Operation	675	1,316	16	209	472	618	52	164	79	795	4,395 (54.28%)
	Admin/ Sales	215	82	44	37	92	45	50	34	47	126	772 (9.53%)
	Production support	213	517	23	367	73	105	18	21	40	255	1,632 (20.16%)
Employee Contract	Fixed-term Contract	13	27	29	16	3	12	1	1	0	0	102 (1.26%)
	Non-fixed-term Contract	1,157	2,378	73	685	660	919	136	313	169	1,505	7,995 (98.74%)
Employment Types	Full-time	1,170	2,405	100	699	663	931	137	314	169	1,505	8,093 (99.95%)
	Part-time	0	0	2	2	0	0	0	0	0	0	4 (0.05%)

Note A supervisor is defined as an employee at the section manager level or above, responsible for guiding department staff.

Gender Distribution of Employees

Due to the characteristics of the technology industry and the employment market, the majority of employees in the Winbond Group are male. The total number of male and female employees is 5,856 and 2,241, respectively, with a male-to-female ratio of approximately 2.5:1. Winbond Group maintains a certain proportion of female employees, treats all employees equally, and provides job security without gender-based differences in recruitment and promotion, aiming to balance the gender composition of employees. Although the semiconductor industry is traditionally male-dominated and Winbond Group is influenced by the male-majority labor market structure in Japan, the company is committed to maintaining diversity and inclusion. Winbond Group continuously cultivates female managers and R&D talents, values women's talents in management and technical fields, provides equal development opportunities, and encourages more women to engage in the semiconductor R&D field. The company aims to increase the proportion of female managers to 15%.

Global Workforce by Gender (Unit: People)

Company / Gender	Winbond (Taiwan)		Winbond (Subsidiaries)		Nuvoton (Taiwan)		Nuvoton (Taiwan)		Nuvoton (Taiwan)		Winbond Group
	Permanent employees	Temporary employees	Permanent employees	Temporary employees	Permanent employees	Temporary employees	Permanent employees	Temporary employees	Permanent employees	Temporary employees	
female	1,157	13	73	29	660	3	136	1	169	0	2,241 (27.68%)
male	2,378	27	685	16	919	12	313	1	1,505	0	5,856 (72.32%)
subtotal	3,535	40	758	45	1,579	15	449	2	1,674	0	8,097 (100%)
total	3,575		803		1,594		451		1,674		

Note Employee classification according to GRI definitions: Fixed-term contract employees are considered temporary employees; non-fixed-term contract employees are considered permanent employees.

Percentage of Global Female Workforce

item	Winbond (Taiwan)	Winbond (Subsidiaries)	Nuvoton (Taiwan)	Nuvoton (Taiwan)	Nuvoton (Taiwan)	Winbond Group
Share of women in total workforce	32.73%	12.70%	41.59%	30.38%	10.10%	27.68%
Share of women in all management positions	12.03%	17.76%	14.21%	15.18%	0.90%	10.25%
Share of women in junior management positions	12.10%	19.05%	15.79%	14.12%	1.13%	10.49%
Share of women in top management positions	11.63%	13.04%	10.53%	18.52%	0.00%	9.27%
Share of women in management positions in revenue-generating functions	38.46%	83.33%	9.09%	10.00%	3.03%	17.81%
Share of women in STEM-related positions	19.76%	8.76%	21.03%	25.16%	5.33%	18.03%

5.2.2 Talent Recruitment and Performance Evaluation

Winbond offers a compensation and benefits system that exceeds legal requirements, attracting and retaining outstanding talent based on principles of equality. In addition to quarterly reviews of various labor compensation benefits and gender-related laws, Winbond regularly surveys industry market conditions to adjust employee compensation and benefits standards. The company also combines a comprehensive evaluation system to reward employees with excellent performance. At the same time, through the company's development goals, appropriate and reasonable personnel changes bring new ideas and perspectives to Winbond.

Diverse Recruitment Channels

Winbond values workplace diversity and attracts outstanding talents from various diverse regions, ages groups, and professional backgrounds. Through multiple recruitment channels — including job platforms, campus recruitment, social media, industry-academia collaboration, and internal referrals—the company ensures a robust and inclusive talent pipeline. Additionally, Winbond's internal transfer system promotes cross-functional mobility, empowering employees to broaden their skill sets and excel in roles aligned with their strengths. Since 2022, Winbond has implemented a structured summer internship program aimed at providing university and graduate students with meaningful exposure to the professional environment. The 2024 internship program, themed "Win 棒！AI 力," encourages students with expertise in big data language models, data engineering, data mining, and machine learning to explore cross-disciplinary career paths. In alignment with the company's culture of enthusiastic learning, interns in 2024 completed an averaged of 20 hours in "self-exploration and on-the-job training." The program also achieved a near-equal gender ratio, contributing to the reduction of gender disparities in the semiconductor industry and challenging traditional biases. Through the internship program, Winbond (Taiwan) engages with outstanding young talents in advance, achieving the goals of talent cultivation and sustainable development.

Recruitment and Retention

Winbond is committed to creating a diverse and inclusive workplace, providing an equal working environment. The company believes that a diverse management team and employee composition help grasp market trends, understand customer needs, inspire innovative results, and maintain a competitive edge.

In 2024, Winbond (Taiwan) recruited a total of 380 new employees, with an annual recruitment rate of 10%. Among them, 50% were under the age of 30, while 47% were between the ages of 31 and 50. The company aims to invigorate organizational vitality through the recruitment of young talent and promote organizational efficiency through the addition of experienced talents. Across the Winbond Group, a total of 821 new employees were hired in 2024, also reflecting a 10% annual recruitment rate, with approximately 94% of new hires under the age of 50. The recruitment rate of female employees at Winbond (Taiwan) in 2024 was 13%, higher than the overall annual recruitment rate of 11%. For the entire Winbond Group, the recruitment rate of female employees in 2024 was 12%, also higher than the overall annual recruitment rate of 10%. This indicates that the recruitment rate of female employees has gradually surpassed that of male employees. Winbond welcomes more outstanding female talents to join the semiconductor industry in the future.

New Hiring Statistics

Category		2024 New Hire					
		Winbond (Taiwan)		Winbond (Subsidiaries)		Winbond Group	
		Number	Proportion of employees	Number	Proportion of employees	Number	Proportion of employees
Gender	Female	148	39%	14	18%	273	33%
	Male	233	61%	63	82%	548	67%
Age	51 years of age or older	11	3%	11	14%	47	6%
	31~50 years old	177	47%	38	49%	361	44%
	Under 30 years of age	192	50%	28	37%	413	50%

Note Winbond Group includes Winbond (Taiwan), Winbond(Subsidiaries), Nuvoton (Taiwan), Nuvoton (Subsidiaries), and Nuvoton Japan

Number and Ratio of New Hire

Category	Year	Male		Female		Total number of people	
		Number	Hiring rate	Number	Hiring rate	Number	Hiring rate
Winbond (Taiwan)	2021	456	21%	236	23%	692	21%
	2022	426	18%	294	24%	720	20%
	2023	95	4%	69	6%	164	5%
	2024	233	10%	148	13%	381	11%
Winbond (Subsidiaries)	2021	39	8%	7	8%	46	8%
	2022	51	10%	10	12%	61	10%
	2023	83	12%	13	14%	96	12%
	2024	63	9%	14	14%	77	10%
Winbond Group	2021	722	14%	338	16%	1,060	15%
	2022	763	13%	437	19%	1,200	15%
	2023	382	7%	150	7%	532	7%
	2024	548	9%	273	12%	821	10%

Note Winbond Group includes Winbond (Taiwan), Winbond subsidiaries, Nuvoton (Taiwan), Nuvoton subsidiaries, and Nuvoton Japan. The new employee rate for each gender is calculated by dividing the number of new employees of that gender in the current year by the total number of employees of that gender as of December 31 of the current year.

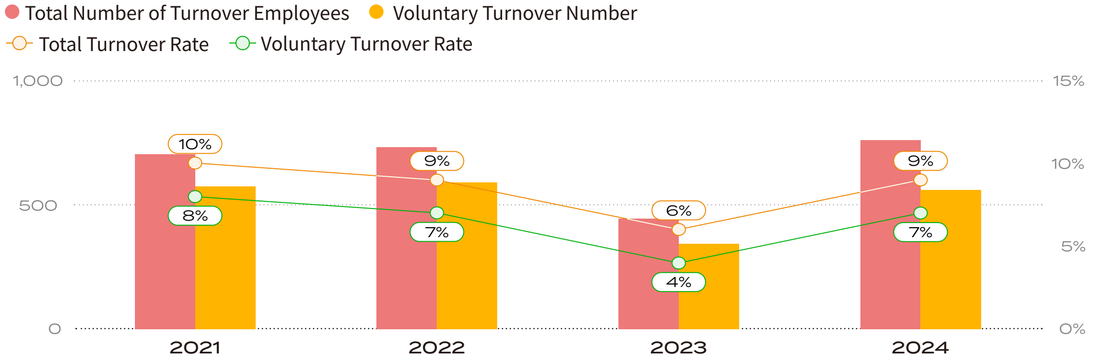
Recruitment Cost

Group Total	2021	2022	2023	2024
Total new hires	1,058	1,223	517	821
Ratio of internal transfers or promotions	20%	25%	26%	30%
Average recruitment cost for new employees (NTD)	62,984	82,179	188,563	121,034

In 2024, with the market recovery, the semiconductor industry's employment market became more dynamic. The Winbond Group experienced 753 resignations, resulting in an overall turnover rate of 9%. The turnover rate at Winbond (Taiwan) reflects a healthy level. Winbond continues to implement adaptation courses for new employees, care measures, and incentive systems to enhance new employee retention, fostering mutual growth with the company.

Turnover Rate

Turnover Rate



Turnover Statistics

Category		Winbond (Taiwan)		Winbond (Subsidiaries)		Winbond Group	
		Number	Percentage of employees	Number	Percentage of employees	Number	Percentage of employees
Gender	Female	148	42%	8	16%	251	33%
	Male	204	58%	43	84%	502	67%
Age	51 years of age or older	42	12%	20	39%	112	15%
	31-50 years old	186	53%	27	53%	340	45%
	Under 30 years of age	124	35%	4	8%	301	40%

Note Winbond Group covers Winbond (Taiwan) + Winbond subsidiaries + Nuvoton (Taiwan) + Nuvoton subsidiaries + Nuvoton Japan subsidiaries. The number of separations in the current year includes retirees.

Number and Ratio of Turnover

Category	annual	Male		Female		Total	
		Number	Turnover rate	Number	Turnover rate	Number	Turnover rate
Winbond (Taiwan)	2021	220	10%	117	12%	337	11%
	2022	245	11%	150	14%	395	12%
	2023	118	5%	85	7%	203	6%
	2024	204	9%	148	13%	352	10%
Winbond (Subsidiaries)	2021	24	4%	3	3%	27	4%
	2022	19	3%	8	9%	27	4%
	2023	21	3%	9	10%	30	4%
	2024	43	6%	8	8%	51	7%
Winbond Group	2021	500	10%	201	10%	701	10%
	2022	486	9%	248	12%	734	10%
	2023	295	5%	153	7%	448	6%
	2024	502	9%	251	11%	753	9%

Note The Winbond Group includes Winbond (Taiwan), Winbond subsidiaries, Nuvoton (Taiwan), Nuvoton subsidiaries, and Nuvoton Japan subsidiaries. The turnover rate for each gender is calculated by dividing the number of annual resignations by the average number of employees during the year: (number of employees at the beginning of the period + number of employees at the end of the period) / 2.

Company Core Values and Employee Engagement survey

97% of employees are committed to contributing their talents to Winbond (Taiwan) for the next five years.

Since 2021, Winbond (Taiwan) has conducted the "Company Core Values and Employee Engagement survey" every two years. The survey focuses on the company's five core values and includes questions related to leadership, career development, and compensation. By understanding employees' perceptions of core values, job satisfaction, and engagement, the company adjusts its strategies to strengthen the mutual commitment between the company and its employees.

The 2021 and 2023 surveys covered all employees in the Winbond (Taiwan) region, with response rates of 76% and 78%, respectively. In both years, over 97% of employees expressed their willingness to fully commit to improving the company and continue working at Winbond for the next 5 years. Nuvoton (Japan) conducts an annual engagement survey, with response rates exceeding 90% for four consecutive years. Overall, the survey response rate reached 82%, with over 83% of employees showing a high level of identification and confidence in the company. In the future, the engagement survey will be expanded globally.

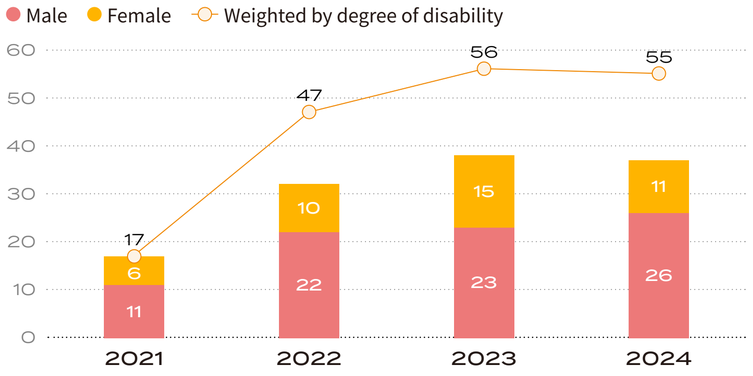
Item	2021	2022	2023	2024
Winbond (Taiwan) Employee Engagement	97%	97%	97%	97%
Nuvoton (Japan) Employee Engagement	52%	56%	53%	54%
Total Engagement	83%	84%	83%	83% Goal for Winbond (Taiwan) is 95%
Winbond Group Response Rate	82%	81%	83%	82%

Employment of People with Disabilities

Winbond continues to focus on the employment rights of individuals with disabilities and is committed to increasing their employment rate. By the end of 2024, Winbond (Taiwan) employed 37 individuals with disabilities. According to Taiwan's legal regulations, the weighted number of employees with disabilities was 55, resulting in an employment rate of 1.5%, which is higher than the legal requirement of 1.0%. At the group level, the Winbond Group also achieved a 1.0% employment rate for individuals with disabilities by the end of 2024, demonstrating the company's ongoing commitment to inclusive hiring practices and the promotion of equal employment opportunities

For employees with disabilities who are actively involved in company operations, Winbond assists newcomers in understanding commuting routes, work processes, and other practical situations based on each individual's specific needs their individual disabilities before they report to work. After reporting, appropriate personnel assistance, equipment, and work environment are provided to create a friendly workplace, allowing them to work comfortably and utilize their strengths. Since 2022, Winbond has introduced the position of visually impaired massage therapists, offering massage services to employees to effectively relieve fatigue, promote health and welfare, and create employment opportunities for visually impaired workers.

Number of employees with disabilities



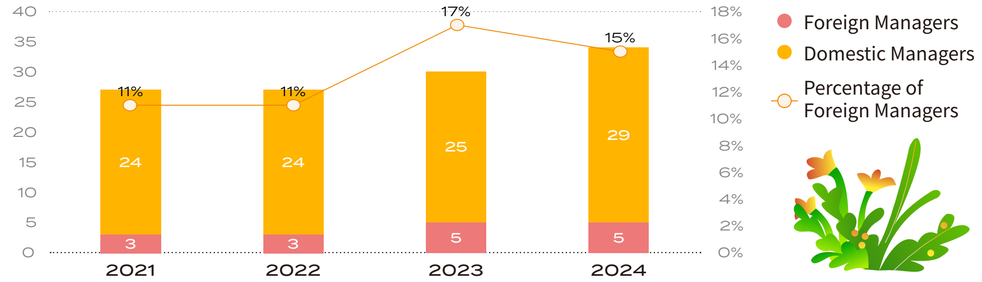
Recruitment of Foreign Experts

In pursuit of sustainability, Winbond (Taiwan) recruits outstanding talents from around the world, providing equal career development opportunities for talents from various countries. Winbond continues to engage with foreign talents through diverse channels and offers supportive services to assist new foreign employees and their families with relocation and settling in.

To expand the recruitment and attraction of global talents, Winbond headquater and global subsidiaries have increased the use of global talent recruitment platforms (such as LinkedIn), strengthening the global talent deployment in regions including Japan, the United States, Israel, Germany, and India. By integrating external platforms with Winbond's recruitment portal, the company showcases various aspects of its working environment and enhances engagement with foreign candidates. In 2024, to strengthen connections with foreign students in Taiwan, Winbond proactively promoted foreign talent recruitment by inviting international students from the Taipei School of Economics and Political Science at National Tsing Hua University for a company visit. The event featured in-depth discussion and experience sharing, offering students a closer look at Winbond's core technologies and its diverse, inclusive work environment. This initiative helped foreign students gain a deeper understanding of Winbond's corporate culture and development opportunities, inspiring their career aspirations and interest in joining the company.

After years of cultivating the foreign talent market, Winbond's workforce in Taiwan had grown increasingly diverse by the end of 2024, with foreign employees hailing from nine different countries—primarily Japan and South Korea. We have welcomed professional talents from various countries studying in Taiwan who are committed to the semiconductor industry, bringing diversity to the team. Among all foreign employees, 37% hold managerial positions, 26% serve at the Vice Director level or above. Furthermore, Winbond has continued to broaden the diversity of its leadership team, with foreign executives comprising 15% of the decision-making group in 2024. This marks a significant step forward in fostering a globally minded leadership, strengthening both our international perspective and competitive edge.

Foreign Managers in the Decision-Making Group



Note: Managers in the decision-making group refer to managers above the level of executive

Recruitment of Indigenous People

Winbond employees have diverse backgrounds. In 2024, Winbond (Taiwan) had 19 employees with indigenous status, while Nuvoton (Taiwan) had 4. To protect their rights to participate in cultural activities, Winbond (Taiwan) offers indigenous employees the opportunity to apply for indigenous ceremonial leave, contributing to the preservation of Taiwan's precious indigenous culture.

Winbond (Taiwan): Indigenous Employees and Tribal Festival Leave

Year	Number of Indigenous Employees	Applications for Tribal Festival Leave	
		Numbers of people	Ratio
2021	12	0	0%
2022	16	2	13%
2023	15	6	40%
2024	19	8	42%

Performance Management System

To align the company's goals with the performance objectives of both managers and employees, Winbond Group has established a comprehensive performance management system. Each year, the company sets unified goals for all employees based on overall company's goals. Managers can assign team goals to individuals, allowing employees to clearly understand the connection between their personal goals and organizational goals. Managers and employees are required to use the SMART principles to jointly set personal performance goals based on work tasks, team goals, and company direction, planning milestones for achieving these goals and reaching a consensus.

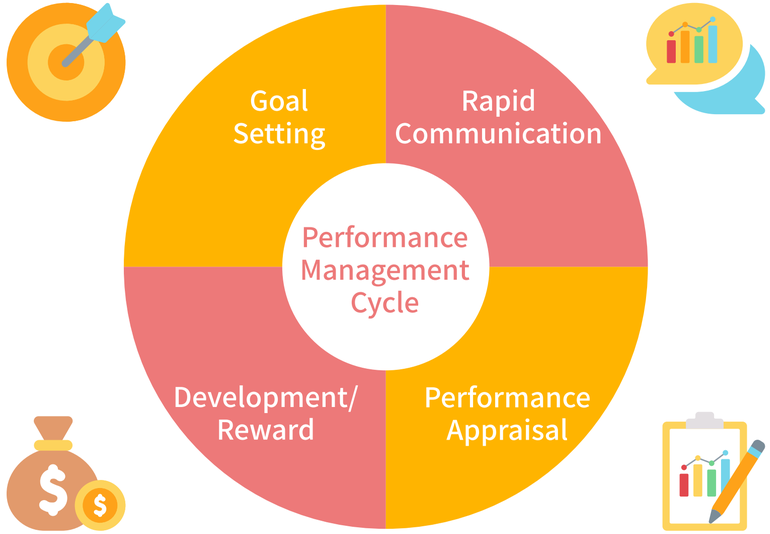
The company encourages managers to engage in "performance communication" and discussions with employees in real-time based on goal settings. Managers and employees can discuss performance at any time through the performance management system, providing explanations and comments on goals, establishing goal discussions and coaching activities , and maintaining complete communication records. Employees can document key achievements based on goal attainment, enabling managers to review team and personal goal progress and track areas for improvement in daily work. This helps employees in their work and personal development, ensuring two-way communication and immediate feedback between managers and employees, thereby enhancing the company's competitiveness and overall team performance.

During the probation period for new employees, Winbond has established an evaluation mechanism. Through personal feedback from new employees and assessments by managers, the company can promptly determine the suitability of new hires.

To ensure that employees can fully utilize their strengths and develop their potential, thereby creating organizational value and achieving the company's overall operational goals, Winbond (Taiwan) and Nuvoton (Taiwan) conduct performance evaluations twice a year. Through the performance management system, a comprehensive assessment is made combining employee self-evaluation and supervisor evaluation. This multi-faceted evaluation includes reviewing the achievement of work goals (such as milestone execution progress and key results, performance communication, and performance coaching activity records), as well as assessing employees' competencies and specific behavior demonstrations.

In addition to managerial and professional competency evaluations, the assessment also incorporates core competency demonstrations. This approach helps to ensure that employees keep their commitments, adhere to ethical standards, and contribute to society. During evaluations, managers can seek feedback and comments from subordinates and partners to enhance the objectivity and reference value of the evaluation results.

Winbond Group employs a fair and equitable performance evaluation system to grasp talent capabilities and understand talent gaps, emphasizing the planning of employees' long-term and future capability development. The results of performance evaluations serve as a reference for rewards, promotions, and performance counseling. In 2024, both direct and indirect personnel underwent 100% performance evaluation.



ESG Implementation Is Included in Performance Appraisals

To enhance the ESG awareness of all employees and promote sustainable development goals, Winbond (Taiwan) has incorporated ESG implementation into performance evaluation items starting from 2024. Employees are encouraged to actively participate in ESG-related activities and training, and to implement sustainable action plans through annual performance goals.

5.2.3 Compensation and Benefits

Executive Compensation

The policies, systems, standards, and structures for the performance evaluation and compensation of directors and managers, as well as individual compensation, are determined and reviewed by the company's Compensation Committee, which submits its recommendations to the Board of Directors for discussion.

The salary levels of managers at Winbond (Taiwan) and Nuvoton (Taiwan) must be competitive within the industry to attract outstanding external talent and retain excellent internal talent. Individual salary levels for managers are differentiated based on responsibilities and performance to encourage them to take on responsibilities and achieve results. Managers are responsible for operational performance, and incentives should balance the company's short-term and long-term performance.

Fixed compensation	Variable compensation
Fixed compensation is determined based on the responsibilities and performance differentiation of senior executives.	Variable compensation for senior executives is measured using indicators that include financial metrics (such as gross profit and gross profit margin, operating profit and operating profit margin, pre-tax net profit, etc.) as well as ESG-related indicators (such as tCO2e reduction accumulated and electricity saved). These serve as important criteria for the distribution of variable compensation for senior executives, and are determined based on the execution status of the operational strategies, objectives, and sustainable development outcomes they are responsible for.

Employee Compensation

Talent is a critical asset for any company, and at Winbond, we recognize the importance of attracting and retaining the best talent. To achieve this, Winbond Group offers a highly competitive salary system and comprehensive benefits, including generous base salary, allowances, employee bonuses, and remuneration. Employees' performance and professional skills are evaluated comprehensively to provide corresponding bonuses and remuneration. By distributing bonuses promptly, employees share in the company's operational achievements, continuously boosting morale.

Individual employee compensation is determined based on job responsibilities and professional skills. Bonuses and employee remuneration are awarded based on individual performance and contributions. In 2024, the basic monthly salary for inexperienced personnel at Winbond Group exceeded the statutory minimum wage. The company conducts annual market salary surveys to review and adjust salaries based on performance, rewarding and retaining talent. In 2023, the average salary of full-time non- management employees at Winbond (Taiwan) was in the top 25% of the industry.

Salary, benefits, evaluations, and promotions are all considered objectively based on human rights principles. There is no differential treatment based on gender, race, color, religion, political affiliation, sexual orientation, age, marital status, pregnancy, disability, blood type, zodiac sign, or labor representative status. Winbond is committed to promoting equal pay for equal work and ensuring minimal starting salary differences between male and female employees across regions.

Note The results of the previous year are announced by Taiwan Stock Exchange each July.

Ratio of Entry-Level Salary (for inexperienced candidates) to Local Minimum Wage at Winbond Group

Region		Item	2023	2024
Winbond (Taiwan)		Direct Employee	1.3 times	1.3 times
		Indirect Employee	1.7 times	1.6 times
Nuvoton (Taiwan)		Direct Employee	1.1 times	1.1 times
		Indirect Employee	1.5 times	1.6 times
Other Subsidiaries	Hong Kong	Direct Employee	1.2 times	1.2 times
	China	Indirect Employee	3.9 times	4.1 times
	Japan	Direct Employee	1.5 times ~ 1.6 times	1.5 times ~ 1.6 times
	Singapore	Indirect Employee	2.7 times	2.5 times

Note Direct employees are paid based on the basic monthly salary for inexperienced candidates. Indirect employees, on the other hand, are paid based on the basic monthly salary for inexperienced candidates with a college degree.

Ratio of Entry-level Salary between Male and Female Employees at Winbond Group

In 2024		Minimum starting salary		Minimum Wage
Region		Female	Male	
Winbond (Taiwan)		1.6	1.6	1
Nuvoton (Taiwan)		1.6	1.6	1
Other Subsidiaries	Hong Kong	1.2	1.2	1
	China	4.1	4.1	1
	Japan	1.5~1.6	1.5~1.6	1
	Singapore	2.5	2.5	1

Note Standard salaries are not different based on gender.

Salary Statistics of Full-time Employees in Non-Management Roles (Taiwan)

Item	In 2023	In 2024	Annual Difference
Number of full-time employees in Non-Management Roles	3,488 persons	3,422 persons	-1.93%
Total salary of full-time employees in Non-Management Roles	$5,540,880 (thousand)	$5,907,684 (thousand)	6.62%
"Average salary" of full-time employees in Non-Management Roles	$1,589 (thousand)	$1,726 (thousand)	8.62%
"Median salary" of full-time employees in Non-Management Roles	$1,382 (thousand)	$1,513 (thousand)	9.48%

Note The above statistics are calculated according to the regulations of the Taiwan Stock Exchange.

Annual Total Salary Compensation Ratio at Winbond Group

Region	Ratio of Highest-Paid Individual's Compensation to Median Employee Compensation in 2024	Change in Annual Total Compensation Ratio from 2023 to 2024
Winbond (Taiwan)	11.2 : 1	0.6 : 1
Winbond (Subsidiaries)	7.6 : 1	1.1 : 1
Nuvoton (Taiwan)	12.9 : 1	0.4 : 1
Nuvoton (Subsidiaries)	4.1 : 1	1 : 1
Nuvoton (Japan)	6.2 : 1	0.8 : 1

Note 1 Change in Annual Total Compensation Ratio:
This is calculated as the percentage increase in the annual total compensation of the highest-paid individual in the organization divided by the percentage increase in the median annual total compensation of all employees (excluding the highest-paid individual).

Note 2 The formula for calculating the annual total salary compensation change between 2024 and 2023 is C = (A) / (B)
A = Annual total compensation of the highest-paid individual in 2024 / Annual total compensation of the highest-paid individual in 2023
B = Median annual total compensation of employees in 2024 / Median annual total compensation of employees in 2023

Employee compensation ratio

Company	Region	Category	Base Salary		Total salary	
			Male	Female	Male	Female
Winbond	Taiwan	Senior Management	0.96	1	0.89	1
		Management	1.08	1	1.08	1
		Professional Personnel	1.01	1	1.02	1
		Engineering Personnel	1.08	1	1.08	1
		Non-engineering Personnel	0.92	1	0.92	1
		Direct Personnel	0.96	1	0.96	1
	Japan	Management	1.07	1	1.08	1
		Non-management	1.03	1	1.04	1
Nuvoton	Taiwan	Senior Management	0.86	1	0.89	1
		Management	1.20	1	1.21	1
		Professional Personnel	1.19	1	1.22	1
		Engineering Personnel	1.13	1	1.12	1
		Non-engineering Personnel	0.98	1	1.00	1
		Direct Personnel	0.94	1	0.96	1
	Japan	Management	1.04	1	1.09	1
		Non-management	1.07	1	1.07	1
Total		Senior Management	0.87	1	0.84	1
		Management	1.03	1	1.11	1
		Non-management	1.38	1	1.41	1

Note Senior Management refers to the heads of "Centers" (major business units) and above. Management refer to section-level managers and above, excluding senior management. Non-management include professional personnel, engineering personnel, non-engineering personnel and direct personnel.

Benefits

Winbond Group has established welfare systems that exceed legal requirements, in accordance with local laws worldwide, providing all employees with comprehensive welfare items and measures. These include incentives from work-related bonuses, living expense subsidies, employee leave, and diverse clubs, which motivate employees and help them balance work and life, achieve personal fulfillment.

Flexible Work System: The company regards employees as its most valuable assets and is committed to creating a diverse, equitable, and inclusive (DEI) workplace culture. It provides a friendly work environment that balances work and life. To enhance employees' autonomy and productivity without affecting work, Winbond (Taiwan) offers flexible working hours and work-from-home regulations for employees to apply:

1. Flexible Working Hours: With prior supervisor approval, employees may arrange their work schedules within the specified range of flexible working hours, ensuring they meet the required daily working hours without affecting their work.
2. Work from Home: Considering the nature of work and management needs of different units, Winbond has implemented "Work from Home (WFH)" regulations. Each unit can set application conditions according to these regulations, and upon approval, employees can engage in short-term or long-term remote work.

In 2024, the total employee welfare expenses amounted to NT$16,668 thousand (including consolidated subsidiaries). This includes short-term employee benefits of NT$15,713 thousand, post-employment benefits of NT$894 thousand, and employee remuneration stock costs of NT$61 thousand.

Note 3 The regulations for various welfare items are handled according to relevant regulations.
Note 4 Short-term employee benefits refer to employee benefits that should be settled within 12 months after the end of the period in which the employees provided the related services (excluding termination benefits).
Note 5 Employee welfare expenses include health insurance, club subsidies, retirement pension subsidies, and equity-based compensation.

Total Comprehensive Care

Bonuses	Festival Bonuses, Special Bonuses, Operating Performance, Employee remuneration, Motivation Fund, Winbond Star Bonus, Patent Bonus, Pension
Subsidies/ Insurance	Childbirth Allowance, Marriage Allowance, Childcare Allowance, Group Insurance, Retirement and Transfer Program
Leave	LOHAS Leave, Unpaid Parental Leave
Lifestyle Support	Foreign Employee Care, Health Exam, Health Care, Health Promotion
Clubs & Activities	Clubs(Sports, Arts, LOHA, Public Welfare), Family Day

Bonus: Diverse Incentives

Winbond (Taiwan) encourages employees to actively innovate and passionately learn through a diverse incentive bonus system. In 2024, four teams were honored and rewarded with the "Winbond Star Bonus." The team themes were: SAP S/4 Migration (ERP/ESR/DPR) Digital Transformation Team, D25 Silicon Capacitor Development Team, F24 NAND Flash Memory Technology Development Team, and Carbon Intelligence Leadership Team.

Diverse Incentive Bonuses

Item	Explanation
Special Bonuses	Winbond provides immediate rewards and recognition to employees who demonstrate outstanding performance in their job responsibilities or excel in special projects.
Operating Performance Bonus	Share operational achievements with colleagues quarterly based on the company's operational status.
Employee Remuneration	Every year, the company's profits are shared with employees based on the company's regulations, determining the total amount to be distributed. The rewards are then given to employees based on their contributions to the company and individual performance, acknowledging their dedication and efforts.
Team Building Fund	Winbond provides funding for colleagues to organize activities and gatherings, fostering a sense of camaraderie and strengthening the bonds among team members. These events serve to boost morale, maintain a positive work atmosphere.
Winbond Stars Bonus	Quarterly commendation of individuals and teams who demonstrate the core values of Winbond ("Conduct business with integrity and ethical behavior," "Accountable teamwork," "Enthusiasm of learning," "Aggressively innovate," and "Sustainable contribution.")and make significant contributions to the company.
Intellectual Property Bonus	Winbond encourages colleagues to engage in creative inventions and innovations related to product design, manufacturing, testing, application, marketing, and other areas.

Note In 2024, NT$370,074 thousand was awarded at Winbond (Taiwan) and NT$384,358 thousand for Winbond subsidiaries through our diverse range of incentives and bonuses.

Allowance/Insurance : Childcare Allowance

Since April 2011, Winbond has actively responded to the government's policy encouraging childbirth by launching the "Childcare Subsidy" program. This policy provides a monthly subsidy of NT$6,000 for Winbond (Taiwan) employees and NT$5,000 for Nuvoton (Taiwan) employees for their newborn children until they reach the age of four. This not only effectively enhances employees' willingness to have children but also demonstrates the company's care for employees' families.

As of 2024, a total of 2,137 employees' children have benefited from this program. From 2021 to 2024, the number of newborns at Winbond (Taiwan) and Nuvoton (Taiwan) accounted for approximately 0.1% of all newborns in Taiwan. This means that for four consecutive years, approximately one out of every thousand newborns in Taiwan was a Winbond Group baby.

Winbond's childcare subsidy policy not only effectively increases the willingness to have children but also attracts more outstanding talents to join Winbond. By helping new parents alleviate financial pressure and enhancing employee happiness, we will continue to create a work environment that cares for employees and supports families.

Childcare Allowance Performance

Item	Description
Outcomes	▣ The cumulative number of children who have applied for and received subsidies: From the implementation in 2011 to 2024, a total of 2,137 children of Winbond (Taiwan) and Nuvoton (Taiwan) employees have benefited, with a cumulative disbursement of NT$394,543,572. ▣ Total amount for 2024: A total of NT$43,931,703.

Allowances/Insurance: Group Insurance

Winbond Group, in its commitment to employee care, provides a comprehensive group insurance medical system. In addition to the legally required labor insurance and national health insurance for each employee, Winbond (Taiwan) offers a complete group medical insurance system. This includes term life insurance, accident insurance, hospitalization insurance, and cancer insurance, covering not only employees but also their spouses and children. Additionally, there are self-paid group insurance plans available, covering employees, their spouses, children, and parents, allowing employees to choose different additional insurance plans according to their needs. This comprehensive family group insurance plan ensures better health care protection for employees and their families, allowing employees to work with peace of mind. The total insurance premiums paid in 2024 amounted to NT$32,540 thousand.

Allowances/Insurance: Pension Fund and Transfer Program

Winbond follows the local retirement laws and regulations in Taiwan and overseas subsidiaries to ensure employees' retirement benefits. Winbond (Taiwan) and Nuvoton (Taiwan) sets aside retirement reserves for each full-time employee (old scheme) or contributes to retirement savings (new scheme). For those entitled to retirement benefits under the "Retirement Regulations" stipulated by the Labor Standards Act, they may apply for retirement with the company. The payment of employee retirement benefits is calculated based on the years of service and the average salary of the six months before the approved retirement date and is paid within thirty days of the employee's retirement date. Employees with up to 15 years of service (inclusive) receive two units per year of service, while those with more than 15 years of service receive one unit per year of service, capped at a maximum of 45 units. In addition to contributing 2% of the monthly salary to retirement reserves, Winbond regularly reviews the contribution rate annually. If the balance is insufficient to cover the retirement benefits of eligible employees for the next year, the shortfall will be contributed to a special account held by the Labor Retirement Reserve Supervisory Committee at the Bank of Taiwan before the end of March of the following year. As of the end of 2024, Winbond (Taiwan) planned fair value of assets (consolidated) amounted to NT$2,706,706 thousand, and the amount required to be set aside for future legal obligations has been recorded as accrued retirement benefit liabilities, resulting in a net defined benefit liability (consolidated) of NT$1,278,185 thousand.

Under the contemporary Labor Pension Act scheme, Winbond (Taiwan) contributes 6% of each employee's monthly salary to their individual retirement fund, corresponding with the salary grade. Employees are also encouraged to make voluntary contributions within the 6% limit to their retirement accounts based on personal preference. In 2024, the combined expenses for the retirement reserve (old scheme) and the retirement fund contributions (new scheme) reached NT$269,207 thousand. Further information can be found in Winbond's consolidated financial report for 2024.

Leave: Leave Policies Exceeding Legal Requirements

To promote work-life balance for employees, Winbond (Taiwan) offers a "LOHAS Leave" system that exceeds the requirements of the Labor Standards Act. Employees are entitled to seven days of LOHAS Leave in their first year of employment (pro-rated based on the year of employment). A flexible leave system is also provided, allowing employees to take leave by the hour, catering to their needs. Winbond (Taiwan) further encourages employees to plan for longer vacations each year to spend more leisure time with family and friends, achieving a balance between work and life and adding color to their lives. In 2024, 3,093 employees utilized this leave, with a usage rate of 79%.

Winbond subsidiaries also offer leave that exceeds local legal requirements. Atfields Manufacturing Technology Corporation provides 14 additional calendar days of prenatal leave beyond the legal requirement to ensure employees can give birth with peace of mind. Miraxia Edge Corporation grants 22 days of paid leave from the date of employment, exceeding the legal requirement of 10 days of paid leave within the first six months of employment. In mainland China, subsidiaries not only provide legally mandated annual leave but also implement a seniority leave system. Employees enjoy seniority leave from their first year of work, with the number of days increasing based on years of service. Employees can take leave by the hour or by the day, offering greater flexibility and encouraging employees to achieve work-life balance. The annual usage rate of seniority leave among employees is 100%.

Leave: Parental Leave

Beyond legally mandated unpaid parental leave, Winbond offers a flexible leave management system, enabling employees to take leave as needed for childcare, thus balancing family and career. In 2024, a total of 38 employees at Winbond (Taiwan) applied for unpaid parental leave. Additionally, Winbond encourages male employees to apply for parental leave, with 16 male employees applying in 2024, which was double the number from 2023. The return-to-work rate for employees who took parental leave was 88% in 2024, with a 95% return rate for female employees. This demonstrates Winbond provides sufficient family support and implements equal return-to-work plans for employees. Furthermore, Winbond's overseas subsidiaries comply with local regulations and provide parental leave benefits that exceed government requirements, supporting employees in balancing family care and work.

Unpaid Parental Leave

2024 Paid Parental Leave	Winbond (Taiwan)			Nuvoton (Taiwan)		
	Female	Man	Total	Female	Man	total
Number of employees eligible (A)	108	346	454	48	112	160
Number of employees who actually used parental leave(B)	22	16	38	8	3	11
Application rate (B/A)	20%	5%	8%	17%	3%	7%
Number of employees expected to return (C)	21	13	34	9	3	12
Number of employees returning (or earlier) (D)	20	10	30	6	2	8
Retention Rate (D/C)%	95%	77%	88%	67%	67%	67%
Number of employees returning in 2023 (or earlier) (E)	16	7	24	7	0	7
Number of employees expected to return from parental leave and still employed at the end of 2024 (F)	14	5	20	6	0	6
Retention rate (F/E)	88%	71%	83%	86%	-	86%

Note 1 According to government regulations, parental leave can be applied for up to two years before the child turns three years old. Therefore, the number of employees who took maternity or paternity leave starting from 2021 is estimated.
Note 2 From the effective date of the employee's return to work, continuous employment for one year without resignation is calculated until December 31, 2024.
Note 3 The scope of parental leave statistics includes Winbond (Taiwan) and Nuvoton (Taiwan), which are governed by local labor rights regulations in Taiwan. The above statistics do not include overseas subsidiaries.

Lifestyle Support: Foreign Talent Care

Winbond (Taiwan) strives to enhance its operational processes and elevating the quality of its R&D talent by actively attracting outstanding overseas professionals. Recognizing that foreign employees may encounter challenges related to lifestyle, language, and cultural adaptation upon arriving in Taiwan—especially when relocating with their families—Winbond provides comprehensive relocation support.

Dedicated personnel are assigned to offer pre-arrival assistance, ensuring a clear understanding of each employee's and their family's needs. This includes arranging airport pickups and temporary accommodations. After arrival, foreign employees continue to receive personalized support in areas such as residence permit and work document applications, children's school enrollment, housing search and rental, and navigating company policies and local government regulations. This all-encompassing support system ensures that foreign employees feel welcome and settled while working abroad. As of the end of 2024, the average tenure of foreign employees at Winbond (Taiwan), including time served at subsidiaries, is 6.1 years—with 65% having worked with the company for more than five years.

Lifestyle Support: Health Promotion

Winbond (Taiwan) and Nuvoton (Taiwan) are committed to creating a work environment that cares for employee well-being. We provide massage services by visually impaired therapists to alleviate physical fatigue for all employees and create employment opportunities for visually impaired individuals. In 2024, the reservation usage rate for massage services by visually impaired therapists at various Winbond (Taiwan) locations reached 98%, serving over 8,000 sessions. At Nuvoton (Taiwan), the usage rate was 93%, with approximately 4,000 sessions. This service enhances employees' physical and mental health and well-being, reflecting our commitment to social responsibility.

Club & Activities : Clubs

Winbond Group has established various diverse clubs to encourage employees to engage in health-promoting and public welfare activities. Winbond and Nuvoton have formulated the "Employee Welfare Committee Club Subsidy Management Measures," aiming to enhance emotional exchanges, improve physical and mental health, and increase work efficiency through club activities. As of 2024, Winbond has registered 38 clubs (including 4 newly established clubs), and Nuvoton has registered 16 clubs, totaling 54 clubs. The clubs are categorized into four types based on the nature of their activities: sports, arts and culture, Lohas (lifestyle of health and sustainability), and public welfare. With the easing of the COVID-19 pandemic, clubs have gradually resumed physical activities, making company clubs more active.

Club Activities

Club type: Sports

There are a total of 39 clubs, including various ball sports, cycling, and running clubs, accounting for 73% of the total clubs. Many senior executives actively participate in club activities, thereby promoting a culture of sports participation among department employees. The CTSP Badminton Club and Softball Club have consistently achieved excellent results in the "CTSP Cup Annual Ball Sports Competition," and the Nuvoton Mountain and Water Club won awards in the 2024 dragon boat race representing Nuvoton.

Pool Club

Club type: Arts and culture

There are a total of 3 clubs, including popular music clubs and photography clubs, accounting for 6% of the total clubs. Art and cultural clubs effectively utilize existing company resources to organize teaching lectures, annual photography exhibitions, movie appreciation activities, etc. These types of activities have the highest participation rate among employees and their families.

Pop Music Club

Club type: Public Welfare

There are a total of 2 clubs, accounting for 2% of the overall clubs. Silent Givers Club (Winbond) and Love Club (Nuvoton). The main activities of Silent Givers Club include caring for the disadvantaged, social services, and environmental sustainability, aiming to fulfill corporate social responsibility. Since its establishment in 2010, it has organized a series of activities such as neighborhood cleaning, dream fulfillment activities, orphanage cleaning, environmental engineering repairs, and the Happy Children's Breakfast Program. The Love Club organizes blood donation and fundraising activities every year, promoting a cycle of sustainable charity.

Silent Givers Club

Club type: LOHAS

There are a total of 10 clubs, the most diverse, including wine tasting clubs, camping clubs, board game clubs, coffee clubs, bridge clubs, etc. These diverse and rich club activities account for 19% of the total clubs, allowing employees to expand their horizons and cultivate interests through the clubs.

Camping Club

Club and Activity: Family Day

Zero-Carbon Family Day

In 2024, Winbond celebrated its 37th anniversary with a Zero-Carbon Family Day themed "Green Life, Sustainable Action," attracting over 7,000 Winbond employees and their families from across Taiwan. The event aimed to combine environmental concepts with family interactions, allowing employees and their families to experience and practice sustainable lifestyles through a series of green activities.

Since 2022, Winbond has responded to the future trend of net-zero carbon emissions by hosting Zero-Carbon Family Day through the purchase of voluntary carbon credits to offset carbon emissions. To continue the sustainable development concept, Winbond has conducted carbon emission inventories for the Family Day event for three consecutive years and offset the carbon emissions with its own voluntary carbon credits.

Additionally, Winbond has applied for official offsets through the CIX platform from international carbon credit certification bodies, continuously creating the "Zero-Carbon Family Day" at Winbond.

Implementing Green Actions in Every Aspect

Environmental Aspects

- Electronic park tickets are used to reduce the use of paper
- Stainless steel cutlery was distributed as a check-in gift

Social Aspects

- Promoting local cultural identity through Indigenous stage performances and handicraft activities (e.g. weaving, carving, etc.).
- Visually impaired massages and their families are invited to join the event

Economic Aspects

- Stimulate the flow of people and promote the local economic development through activities

5.2.4 Talent Development and Learning Outcomes

Each year, based on the company's strategy, vision, business decisions, and core culture, supplemented by training needs surveys, various training and development programs are planned and promoted according to organizational levels, professional capabilities, and specific targets. Under the "dual-track" talent development system, employees can choose to enhance managerial competencies or deepen technical expertise based on personal development and job requirements.

Additionally, in 2024, the company continued to focus on digital transformation, establishing AI learning maps and certification systems, promoting data analysis tools, and advocating for diversity and inclusion in the workplace. In 2024, Winbond (Taiwan) delivered a total of 213,361 hours of employee education and training, averaging 70 hours per employee. Across the entire Winbond Group, total training hours reached 322,707, with an average of 43 hours per employee. The total training expenses for Winbond Group in 2024 were NT$42.87 million, with an average training expense of over NT$5,700 per employee.

Training Effectiveness Evaluation

To track and ensure the effectiveness of training, the company evaluates courses based on their attributes through various educational training assessment models to determine if they meet course objectives. Employees are encouraged to apply their learning directly to their work. Some courses incorporate tests, assignments, project presentations, and one-on-one interviews to reflect the principle of immediate application in adult learning.

Satisfaction with Talent Cultivation Courses in 2024

Winbond Group provides various training resources and activities to enhance employees' professional capabilities. For direct employees, training focuses on on-the-job learning, machine operation training, and company culture or strategy promotion activities, ensuring continuous improvement. For indirect employees, professional training is planned and provided according to their job functions and positions. Since many female employees work in administrative support roles, their required professional knowledge and skills are mainly acquired through on-the-job learning. As a result, the average training hours for male employees are slightly higher than those for female employees.

Number of employees receiving professional course training and hours

Course Categories	Number of courses	Number of trainees	Number of training hours
Company Culture	460	26,637	20,323
Domain Knowledge	5,659	134,680	208,151
Data Science	843	29,457	55,940
Leadership	445	14,305	38,293

Training Hours by Gender and Employee positions

Total Hours of Employee Training (Hours)	Manager	Non-Manager	Total training hours
Female	7,238	67,486	74,724
Male	56,045	191,938	247,983
Total training hours	63,283	259,424	322,707

Number of Employees by Gender and Employee positions

Category	Manager	Non-Manager	Total number of employees
Female	121	1,615	1,736
Male	1,152	4,617	5,769
Total number of employees	1,273	6,232	7,505

Note The calculation basis is (Number of global employees at the beginning of the period + Number of global employees at the end of the period) / 2.

Average Training Hours by Gender and Employee positions

Total Hours of Employee Training (Hours)	Manager	Non-Manager	Total training hours
Female	60	42	43
Male	49	42	43
Total average hours	50	42	43

Note 'Manager' refers to staff at or above the supervisor level who assist and guide their department

Designing a Training System Based On Competency Concepts

The training blueprint of Winbond Group encompasses three main aspects: core competencies (corporate culture), professional competencies, and management competencies. This design ensures that employees from different units receive training tailored to the skills required for their positions. In 2024, the focus continues to be on enhancing data science capabilities (AI competencies) within the professional competencies

New-Hire Training

In 2024, Winbond (Taiwan) utilized an online learning platform to provide new employees with orientation courses upon their arrival. These courses included guidance on new employee life, cultural promotion, legal knowledge, and company policies, totaling 21 courses. The completion rate for all courses offered to new employees in 2024 was 100%

In 2024, Winbond organized a 2-week "New Employee Boot Camp" for new employees. The program included introductions to work rules and regulations, presentation and communication skills, problem analysis, and data science courses to enhance the competencies of new employees. Additionally, the camp aimed to foster interaction between new employees and supervisors.

Two team competitions were arranged, with department-level supervisors invited to participate as judges. These competitions not only encouraged teamwork among trainees but also allowed them to apply what they had learned in the courses. The competitions were held in the auditorium to create a dynamic and immersive atmosphere, underscoring supervisors' strong commitment to new employee training.

During the final stage of personal achievement presentations, supervisors were invited to serve as judges, and the direct supervisors of the new employees were also invited to participate. This allowed them to witness the transformation and growth of the new employees. The presentations not only increased the transparency of the training but also helped supervisors better understand the learning outcomes of the new employees.

The satisfaction rate of the new employees in this batch averaged 4.33 out of 5, successfully promoting interaction between supervisors and new employees and laying a solid foundation for the company's future talent development.

Cultivating Management Talent and Leadership Succession

A comprehensive leadership talent development plan can streamline company management operations. In 2024, Winbond (Taiwan) continues to emphasize the cultivation of management talent, systematically developing key talent pipelines in corporate management, professional technical skills, and leadership capabilities

Continuously Developing Leadership

Facing the globalization of operations, Winbond Group is particularly cautious in the selection and long-term development of supervisors. We continuously enhance the exchange and cultivation of management talents through evaluation tools, job rotations, project experiences, management course training, and external training at renowned international schools (Harvard).

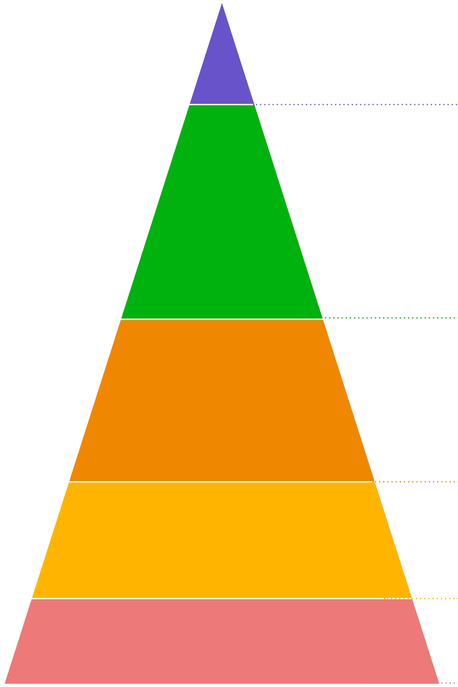
First-line supervisors are the cornerstone of maintaining the daily operations of the organization. The initial talent development training framework of "Test → Learn → Practice → Assess" assists supervisors in making correct talent selection decisions through systematic selection processes. It also helps subordinates set effective goals, build confidence and a sense of responsibility in the performance management cycle, promoting subordinates to achieve optimal performance. By the end of 2024, we have cumulatively assisted over 90% of new supervisors at Winbond (Taiwan) in undergoing a series of course training

Supervisor Management Talent Development Training Program

1. Cultivating mindset and thinking, transitioning from individual contributors to team leaders.
2. Strengthening company core values, promoting core values from top to bottom.
3. Learning management skills, using the "Test → Learn → Practice → Evaluate" framework to observe the application of what supervisors have learned, assisting in effectively building teams, improving team efficiency to achieve unit work goals, employee retention rate of 85%, resulting in annual recruitment cost savings of approximately NT$5.6 million.
4. Supervisor Capability Development Program: Designed to enhance management skills, motivate team growth, and improve employee employability. By the end of 2024, 91% of grassroots supervisors at Winbond (Taiwan) had participated, representing 17% of the total workforce.

Cumulative participation ratio of grassroots supervisors (% of all grassroots

91%



L5 ▶ ROI

- Annual recruitment cost savings of approximately NT$5.6 million.

L4 ▶ Outcome Evaluation

- Assisted new supervisors in accurately identifying talents that fit the team and corporate culture. Since 2023, 104 new supervisors were recruited and trained, helping new partners quickly integrate into the team, enhancing employee employability, and increasing job satisfaction. The employee retention rate is 85%.

L3 ▶ Behavioral Evaluation

- 100% of the direct supervisors of the trainees understand the learning outcomes of their subordinates, continuously encouraging and observing the application of what they have learned.

L2 ▶ Learning Evaluation

- Through pre- and post-course assessments, learning effectiveness has improved by approximately 13%.

L1 ▶ Reaction Evaluation

- Post-course satisfaction score of 4.76

- The performance management system is designed to ensure that company policies and organizational goals are clearly and consistently cascaded to all levels. It also serves as the basis for employee training and development. In 2024, exclusive courses were designed for each level, continuously strengthening a friendly and mutually supportive performance management environment characterized by shared trust, consensus, and responsibility

General staff	Department/Section Head	Division level supervisor
From a personal perspective, discuss how to effectively manage overall benefit realization.	iscuss how to guide and effectively communicate with subordinates to achieve organizational goals.	Discuss how to concretize organizational goals and implement them from top to bottom.
2024 Results	2024 Results	2024 Results
Online live interactive courses (employees from various locations learn together, not limited by learning location).	Simulation exercise practical courses (collect common questions before the course, discuss coping techniques during the course, promote reflection and progress).	Simulation exercise practical courses (strengthen team psychological safety and build trust, lead people and hearts).
4.57 points course satisfaction	**4.79 points** course satisfaction	**4.69 points** course satisfaction

- Professional and management experience is an important resource within the company. To continue the globalization and resource-sharing policy, Winbond continuously holds internal business wisdom sharing sessions, inviting domestic and international senior executives to give 20-30 minute presentations. In the enthusiastic learning culture, over 80% of supervisors actively participated in 2024, fully embodying Winbond Group's core value of enthusiastic learning.
- Continuing to collaborate with renowned external professional consulting teams, over 90% of senior executives use management competency and personality assessment tools to understand their strengths and areas for development, which helps in discussing and planning their personal development plans.
- The ongoing rotation mechanism continued to cultivate cross-disciplinary capabilities and organizational experience inheritance, since 2022, Winbond Group has had 44% of supervisors above the department level undergo unit rotation or promotion, including cross-national and cross-group rotations.
- The "Senior Executive Development Committee" continued to enhance group governance capabilities in 2024 with full support from the board of directors. Through one-on-one guidance, the committee focused on cultivating group managers, enhancing their professional qualities and international competitiveness, and expanding their management vision. Additionally, external experts are invited monthly for thematic sharing and in-depth exchanges, comprehensively strengthening the leadership talent pool

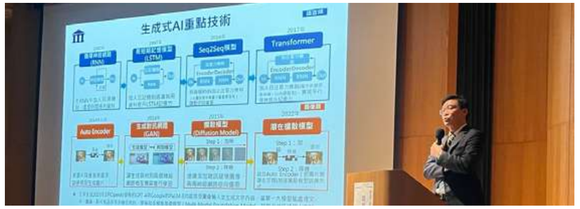
Fostering Diversity and Inclusion

In 2024, Winbond (Taiwan) was dedicated to promoting a diverse and inclusive workplace environment through various measures, including language subsidies, course training, and lectures.

To encourage multilingual talent exchange, Winbond continues to provide language subsidies for English, Japanese, and Korean in 2024. Employees who meet the learning achievement standards can receive a subsidy covering 50% of the language training expenses. Additionally, those who attain language certification levels are eligible to apply for further rewards, encouraging employees to learn multiple languages independently. Throughout the year, 14% of employees participated in the program, with over 70% of participants in the first phase achieving the required learning outcomes and receiving subsidies. The company also planned related lectures in English and Japanese, including cultural and conversational courses, to help employees learn and understand cross-cultural workplace communication, enhancing their workplace language skills.

We aim for employees to gain a more comprehensive understanding of the importance of ESG and embody these values in their daily work. In 2024, the average training hours for ESG-related courses at Winbond Group was 4.18 hours per person.

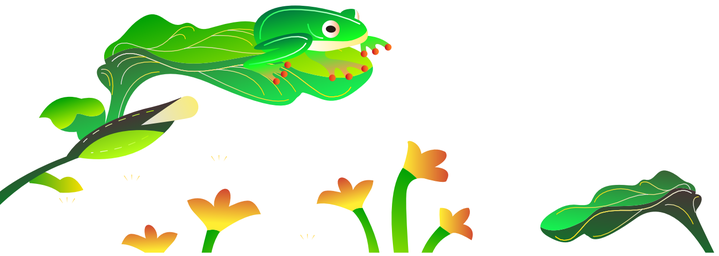
- In 2024, a series of DEI activities were held, starting with the online seminar titled "Enhancing Workplace DEI: Starting with Unconscious Bias Improvement." Through common phenomena in daily life, employees were guided to recognize, identify, and learn how to prevent "unconscious bias." They were reminded to practice self-awareness of unconscious bias in their workplace life, resolving differences through communication to create a spirit of diversity, equity, and inclusion. The seminar satisfaction score was 4.9 out of 5.
- The women's seminar "Forge Ahead in Your Career, Illuminate a Future of Diversity and Inclusion! We're all in this together!" invited Ms. Amy Lu, Chief R&D Director of Microsoft Taiwan, to share her experiences of over ten years in the technology industry, facing career growth and challenges, and how to exert female influence and self-breakthrough. The event aimed to help female employees recognize their importance in the workplace and inspire them with the courage to move forward fearlessly. The seminar satisfaction score was 4.9 out of 5.
- The in-person seminar "The Hyperactive Life of an Insect Enthusiast" invited Taiwanese entomology teacher and writer Ms. Ching-Chieh Wu. In addition to sharing entomological knowledge, she also discussed the obstacles she faced when her appearance did not conform to traditional female stereotypes during her early teaching career, as well as her experiences as an advocate for LGBTQ+ rights and living with ADHD. This encouraged and inspired attendees. The seminar satisfaction score was 4.9 out of 5.
- The in-person seminar "Can ChatGPT be Gender Biased?" invited Associate Professor Ms. Yu-Nung Chen from the Department of Computer Science and Information Engineering at National Taiwan University to discuss AI and gender diversity issues. The seminar explored how breaking human biases can help improve AI bias, with the aim of encouraging employees to maintain an awareness of embracing diversity. The seminar satisfaction score was 4.7 out of 5.
- Intergenerational communication is one of the diversity and inclusion topics that Winbond values. In 2024, a DEI newsletter was published, sharing management insights from employees and supervisors belonging to the X, Y, and Z generations. This guided employees to gain a deeper understanding of the work values and key management communication strategies within intergenerational teams. By learning to embrace each other's differences, we aim to create sustainable mutual success. The newsletter received nearly 800 clicks.
- The "Intergenerational Leadership - Coaching Dialogue" course taught supervisors about the characteristics of different leadership styles and how to enhance the quality of conversations and build positive relationships through dialogue principles and communication skills. The course satisfaction score was 4.8 out of 5.
- The "Horizontal Management Golf" course provided solid training through 18 case studies, establishing correct cross-departmental collaboration values for employees. It taught them to overcome a silo mentality, understand internal customers, and reflect on the best and most appropriate techniques when facing communication conflicts. These skills further extend to personal interpersonal interactions and the ability to handle matters harmoniously. The course satisfaction score was 4.6 out of 5.



Promoting Continuous Enhancement of AI Competencies in Digital Transformation

To accelerate the application and promotion of M365 Copilot and AI tools across the company, we collaborated with Microsoft to launch the M365 Copilot Mastery Program, enhancing employees' skills and productivity through the establishment of a network of promotion champions.

- Establishing a Network of Promotion Ambassadors: A network of promotion champions was established in various centers of the company. These champions promote the application of M365 Copilot and AI tools internally, facilitating the popularization and usage of technology. A total of over 80 promotion champions were trained.
- Comprehensive Training and Support: We provided in-depth training courses of 2 hours per week to ensure that promotion champions possessed the necessary skills and knowledge, becoming AI consultants within their centers. The training project totaled 522 hours.
- Practical Application and Promotion: Promotion champions actively promoted and applied new technologies within their centers, helping colleagues understand and practice best operations, thereby improving overall work efficiency.
- Results Presentation and Sharing: The results of the program were showcased to the entire group during the "Digital and AI Carnival," sharing successful experiences and best practices, promoting the application and innovation of technology across the company.



AI Practical Class: A Model for Promoting Technological Innovation and Talent Development

- Since its inception in early 2022, the AI Practical Class has successfully held its eighth session, becoming an important milestone for Winbond in technological innovation and talent development. The program aims to enhance employees' AI skills and ensure that each participant masters practical AI techniques through a rigorous learning certification map.
- Course Design and Learning Mode：Before the official course, AI Practical Class participants must complete over 10 hours of online courses. These online preparatory courses are not limited to Practical Class participants and are open to the entire company. A total of 1,667 Winbond employees have completed at least one of these preparatory courses. Practical Class participants then attend 9 hours of in-person courses taught by academic experts and scholars. Independent consultation time with the teaching professors is also arranged based on the needs of each group of participants.
- Results Presentation and Competition Mechanism: In the 2024 AI Practical Class presentation, a group competition mechanism was introduced, inviting senior executives to participate as judges. The scoring criteria cover multiple aspects, including project problem description, data exploration and processing, feature engineering, model selection, model evaluation, and presentation performance, ensuring that each practical group engages in solid learning and project practice. By the end of 2024, the AI Practical Class had trained 326 employees, with a pass rate of 100%. The presentation was attended by 1,239 participants.

Digital Transformation

- Project Focus: Advancing digital transformation to enhance the operation of new plants and employee efficiency.
- Percentage of full-time personnel involved in the plan: 50%

Key Benefit Quantitative Indicator

- CMP process Cpk improvement: 16%, Etch process Cpk improvement: 6%
- Yield loss in WET process reduced from 2% to 0%
- Litho photoresist coating quality AI image recognition detection rate: 100%
- FAB productivity improvement: 9%
- Annual cost savings: NT$46.9 million, one-time cost savings: NT$262.2 million

Benefits of Digital Transformation

- Improved product quality and yield
- Increased FAB productivity
- Reduced costs and power consumption
- Enhanced personnel productivity
- Strengthened innovation and agility
- Improved production efficiency
- Increased employee engagement and retention rate.

ROI of Human Capital

Item	2021	2022	2023	2024
ROI of Human Capital	5.3588	4.4514	4.0391	4.4866

Note Return on Investment in Human Capital = (Operating Revenue - (Operating Expenses - Labor Costs)) / Labor Costs.

5.3 Employee Communication and Relations

The Winbond Group regularly monitors industry market trends to adjust employee salary and benefits standards, combining a comprehensive performance evaluation system to provide competitive compensation and benefits that exceed legal requirements. This approach aims to attract and retain outstanding talent. Continuing the achievements of 2023, we received the "Work-Life Balance Award from Ministry of Labor," the "2024 Happy Enterprise: Gold" from 1111 Job Bank, and the "Outstanding Enterprise for Promoting Workplace Equality" award from the Southern Taiwan Science Park in 2024. Additionally, Winbond places great importance on employees' opinions and rights, ensuring that colleagues have opportunities to voice their concerns and interact effectively with the company. Both Winbond (Taiwan) and Nuvoton (Taiwan) were awarded the "Workplace Welfare Leadership Award" in the 2024 Taiwan Corporate Sustainability Awards, further demonstrating the company's excellence in employee care and welfare.

5.3.1 Employment Engagement

Winbond Group respects employees' freedom of assembly, association, and collective bargaining rights, and clearly defines employee rights in the "Responsible Business Alliance Code of Conduct Management Procedure." Winbond Group establishes labor unions or holds regular functional meetings according to local regulations to ensure employees' voices are heard and to promote labor-management communication. For example, Winbond (Taiwan) and Nuvoton (Taiwan) hold quarterly labor-management meetings at each office location, where labor representatives elected by all employees discuss issues of concern (including changes in working conditions and employment terms) with management. The employee coverage rate in Taiwan is 100%. Additionally, management discussion meetings, production management meetings, and quality re-education meetings are held, providing diverse, open, and transparent communication channels, which are placed on the company's employee homepage to ensure high accessibility. We collect employee feedback on a regular or ad hoc basis to improve management policies and service quality, and arrange orientation and training sessions for new employees or unit supervisors to ensure they understand the relevant communication channels.

Winbond subsidiaries also value labor-management communication. In the Asia-Pacific region subsidiaries, in addition to regular labor-management meetings, employees can use email or anonymous suggestion boxes to reflect their opinions, which are discussed to improve compensation, benefits, and working environment. We actively use feedback systems to collect employee opinions, encourage anonymous postings, and promote an open communication environment. Subsidiaries in Europe and the United States collect employee opinions through focus groups and individual interviews, and use these as a basis to improve management policies and service quality, committing to continuously review this feedback. These measures demonstrate our emphasis on employee opinions and our dedication to creating an open, transparent, and positive work environment.

Winbond Group takes employee feedback or complaints seriously and handles them confidentially according to company regulations. The complaint handling process and content are kept confidential, and the handling personnel and relevant supervisors must keep the identity and content of the complainant/whistleblower absolutely confidential. Cases are filed and processed as confidential documents, and identities are not disclosed without consent.

In 2024, Winbond Group received and processed 25 proposals through suggestion boxes (physical and online), with Winbond (Taiwan) accounting for 17 cases, mainly involving suggestions for improving company facilities, equipment, or welfare measures. These proposals are forwarded to relevant departments for improvement, and feedback is provided to the employees who submitted them, ensuring smooth internal communication. For workplace interpersonal relationships or other personal work-related issues, we engage directly with employees to clarify concerns and seek consensus-based solutions, ensuring all opinions receive effective responses and providing necessary company or EAP employee care resources.

Winbond Group's complaint hotline and Care complaint mailbox handled 7 cases, including 4 workplace illegal infringement (improper treatment) cases, 2 sexual harassment cases, and 1 management dispute case; Winbond (Taiwan) accounted for 6 cases. These cases were investigated, reviewed, and decided according to Winbond Group's internal complaint procedures. Cases of workplace misconduct were handled by investigation teams established in accordance with national guidelines on workplace violations. After approval, the resolution plan is communicated with both the complainant and the accused, and executed upon consensus.

In 2024, Winbond Group handled 2 sexual harassment cases, both of which were investigated by sexual harassment committees and provided with psychological counseling and other disposal plans to ensure support for both the complainant and the accused. If the handling process and results involve violations of national laws or company regulations, they are handled according to work rules. Although the final investigation decisions for the 2 sexual harassment cases were not established, the company continues to track the effectiveness of the disposal plans and cares for the complainant's situation within three months to prevent retaliation. If the cases involve management issues or employee misconduct, identifiable information is hidden and announced for education, and management is notified to conduct employee training to prevent similar incidents.

Diverse Channels for Communication

Suggestion Boxes

There are suggestion boxes provided for all employees to share feedback near the cafeteria and the restrooms by production lines.

Grievance Hotline

Winbond has established the "75234 (I Want to Complain)" hotline for employees to provide their feedback and complaints. To file a complaint, employees are required to complete the "Internal Complaint Form" and submit it either in writing or by mail to the human resource department or the designated "Employee Feedback Box." A dedicated team is responsible for handling and addressing these complaints. Furthermore, in order to safeguard the rights and interests of employees and job seekers and to ensure a work environment free from sexual harassment, Winbond has established the "Workplace Sexual Harassment Prevention Measures" in accordance with the Gender Equality in Employment Act. The company has set up a "Sexual Harassment Prevention Awareness Website" and formed the "Sexual Harassment Complaint Review Committee" to handle sexual harassment cases.

Factory Discussion Meeting

Every six months, factory supervisors host communication and discussion meetings with direct personnel to engage in two-way communication on management and production issues, as well as online operations. Additionally, there are also focused re-education courses on quality or Responsible Business Alliance (RBA) Code of Conduct to ensure compliance with industry standards and guidelines.

Labor-Management Meetings

Regular labor-management meetings are held to facilitate open dialogue between all employees. Labor representatives are elected by the workforce on a periodic basis. During these meetings, employee sugges- tions and feedback are collected every quarter. The discussions revolve around labor-management relations, promoting cooperation, improving working conditions, enhancing welfare, and increasing work efficiency. The aim is to foster effective communication, address concerns, and find solutions collaboratively.

Management Conference

The purpose of management conferences is to facilitate direct two-way interaction between all managers and the Chairman and President. The main objective is to engage in open discussions and communications on on various aspects of company operations, management systems.

5.4 Occupational Safety and Health

Safety, Health, and Environmental Policy

Winbond is committed to meeting internationally recognized standards for safety, health, and environmental protection. We pledge to provide a legally compliant and healthy work environment through mechanisms of respect, care, and consultation with participation from frontline workers. Upholding the spirit of continuous improvement, we aim to achieve inherent safety, eliminate hazards, reduce environmental, safety, and asset risks, promote comprehensive health management and health promotion, and foster a vibrant corporate culture. We strive to advance towards a friendly, diverse, and inclusive workplace for safety and health.

Winbond's "Occupational Safety, Health, and Environmental Policy" signed by the Chairman, serves as the highest guiding principle. It applies to all operations and employees, including contractors and individuals under the company's supervision. We adhere to relevant occupational safety and health laws, respect the voices and participation of frontline workers, and ensure that labor representatives can participate in the modification of environmental, safety, and health policies and related safety proposals and discussions..

Through regulatory identification, stakeholder engagement, and case studies, Winbond identifies organizational levels and operational risks at the fab level. We set short, medium, and long-term improvement goals for significant occupational safety and health risks, covering the protection of Winbond workers, enhancing contractors' autonomous safety management, and jointly creating a safe and healthy workplace. Key achievements in safety and health management implementation are detailed on the next page.

5.4.1 Occupational Safety and Health Management System

All Winbond manufacturing sites have obtained ISO 45001 Occupational Health and Safety Management System certification. Additionally, Winbond (Taiwan) has acquired the third-party certification for TOSHMS Taiwan Occupational Safety and Health Management System, which covers 100% of employees and contractors.

Winbond (Taiwan) has a dedicated Environmental Health and Safety unit that convenes the company's Environmental Health and Safety Committee quarterly. The committee, chaired by the General Manager, discusses the progress of environmental health and safety management items and performance, and addresses improvement topics to ensure the internal safety and health management system operates with continuous improvement. The proportion of labor representatives in the Occupational Health and Safety Committee is 44%, which exceeds regulatory requirements.

Each department has designated safety, health, and environmental officers to assist, consult, and implement related safety, health, and environmental affairs. This provides ample opportunities for employees and managers to communicate face-to-face on safety, health, and environmental issues, ensuring comprehensive awareness and participation.

To meet the zero-accident goal of the environmental health and safety policy, mid- and long-term safety management objectives are set, including autonomous inspections by unit supervisors, supervisor safety observations, on-site safety proposals, and proactive reporting of near misses with rewards, gradually reducing the personnel injury rate. Supervisor safety observations primarily involve dynamic on-site observations by supervisors at all levels, combined with hazard identification and risk assessment. Relevant colleagues in the observed work area are gathered to discuss and communicate potential risk issues within their workplace, including injury prevention, chemical spills, and fire prevention methods.

Winbond Kaohsiung Fab held a joint safety coordination for the Southern Taiwan Science Park Kaohsiung Park, fostering consensus on park safety and medical care resources.

Winbond CTSP Fab and the Taichung City Fire Department First Brigade conducted a joint drill simulating a scenario where a leak occured during the replacement of SiH4 cylinders, causing a fire and injuries to personnel.

Item	2024 Highlights
Risk and Hazard Identification	▪ The "Environmental Safety and Health Risk Assessment Procedure" identifies the risk levels of various operations through a risk matrix. In 2024, a total of 5,196 operations were identified, of which 1,012 were high-risk operations. The original potential severe consequences of these high-risk operations could lead to fire accidents, personnel injuries, or chemical spills. After engineering improvements and administrative interventions, the risks were reduced to 684 medium-risk operations and 328 low-risk operations ▪ For Class A hazardous locations, Hazard and Operability Studies (HazOp) are used to analyze operational risks in the workplace, and Failure Mode and Effects Analysis (FMEA) or the 5-Whys method are used to identify key risk factors.
Emergency Response	▪ Winbond manufacturing sites refer to the risk assessments identified by the "Environmental Safety and Health Risk Assessment Procedure" and the "Emergency Response Procedure" to plan and execute emergency response processes, personnel organization, drills, and training. The drills and training include employees and contractors. In 2024, there were 143 drills with different scenarios such as fire, chemical spills, and personnel injuries. ▪ Winbond (Taiwan) manufacturing sites are located in the Central and Southern Science Parks. They collaborate with local fire departments and science park management bureaus to hold joint defense emergency drills or joint defense team meetings. The Kaohsiung fab also serves as the leader of the 10th group of the Southern District Toxic Disaster Response Joint Defense Team, regularly conducting toxic disaster joint defense team training and inviting the Southern District Toxic Disaster Response Center to conduct activities such as emergency response safety precautions, protective equipment introduction, and case sharing to jointly improve the park's toxic disaster response capabilities. ▪ Winbond (Taiwan) conducts earthquake evacuation drills twice a year to enhance emergency response awareness. The drills cover all employees and contractors and include day/night shifts.
Chemical Management	▪ Winbond has independently developed a chemical management system that conducts comprehensive risk assessments at all stages, from procurement, supply and use, storage, to disposal. This system ensures the control of restricted substances and health risks. ▪ Winbond (Taiwan) performs work environment exposure assessments and monitoring that exceed regulatory standards. The company's internal control standard is to maintain the permissible exposure limit (PEL) ratio below 1/10. These assessments and monitoring are conducted every six months, and the results are publicly announced.
Safety and Health Education	▪ The "Environmental Safety and Health Education and Training Regulations" are established to prevent occupational accidents and enhance employees' safety awareness. In addition to statutory new employee and specific operation safety regular retraining, diversified training modes are provided, including the establishment of XR Center occupational safety disaster prevention simulation classes and Southern District Toxic Disaster Response Consultation Center emergency response personnel training classes. In 2024, a total of 14,869 training sessions were conducted, totaling 12,728.5 hours. ▪ In addition to physical courses, Winbond provides online training channels that are not limited by space and time, allowing training to be completed through the learning system. Feedback, satisfaction, and cognitive shifts before and after the course can be assessed through questionnaires. ▪ When developing health management and promotion measures plans, workers are included in age assessments, and occupational medicine specialists regularly discuss providing appropriate safety management recommendations for older workers in various operations.
Contractor Management	▪ When evaluating procurement, supplier selection criteria are included, and after obtaining orders, suppliers sign the factory's environmental and safety behavior guidelines. Each month, the safety agreement organization conducts face-to-face communication, guidance, and training with suppliers. In 2024, a total of 3,320 contractor personnel participated in hazard notification courses upon entering the factory. ▪ Each high-risk operation has corresponding safety regulations, and contractors must complete special operation certification before performing related operations. In 2024, total 1,358 contractor personnel obtained Contractor Hazard Notification Training. ▪ There are also evaluation methods for contractors, and the results are announced by the agreement organization, providing reference for the selection of contractors by the supervisors of various engineering units.
Internal Check and Audit	▪ Risks identified during inspections and operational safety observations are tracked in the system until 100% improvement is achieved. ▪ According to the internal audit procedures of the Environmental, Safety, and Health Management System, at least one internal audit is conducted annually.

Item	2024 Highlights
Accident Investigation	▪ The "Safety and Environmental Incident Reporting, Investigation, and Handling Regulations" stipulate the standard operating procedures for reporting, handling, investigating causes, and implementing corrective and preventive actions for safety and environmental incidents, near-miss events, and traffic accidents. These regulations aim to ensure the safety of all employees and non-employees and prevent the recurrence of safety and environmental incidents. ▪ In 2024, there were 10 near-miss incidents. Bonuses are awarded at monthly safety meetings to those who proactively report near-miss incidents.
Procurement Management	▪ Safety and health management regulations for the procurement of equipment, materials, and raw materials are introduced in procurement and contract requirements. ▪ A strict supplier audit system is established. New suppliers must undergo fire safety and environmental safety audits at their factories. If the audit results are unsatisfactory, procurement transactions will not be conducted until improvements are completed. For existing suppliers, an audit team composed of relevant units will conduct audits and evaluations on their fire safety and environmental safety aspects, and continuous improvement will be tracked.
Health Management	▪ Employee health check items, which exceed legal requirements and are paid for by the company, include: cardiovascular disease risk assessment items such as insulin, insulin resistance index, glycated hemoglobin, high-sensitivity C-reactive protein; cancer risk assessment items such as alpha-fetoprotein, prostate-specific antigen; imaging examination items such as abdominal ultrasound, female breast ultrasound. ▪ Health consultation clinics: Monthly health consultation clinics with occupational physicians/family physicians are provided, analyzing employee health check results. On-site services by ophthalmologists are added, and monthly on-site services by psychiatrists are arranged to promote mental health. Based on the results of health questionnaires, professional counselors provide care for employees with high stress or depressive tendencies.

5.4.2 Accident Investigation and Injury Prevention

Winbond has established standard procedures such as the "Environmental Health and Safety Risk Assessment Procedure," "Identification and Inspection Management Procedure for Environmental Health and Safety Regulations," and "Internal Audit Procedure for Environmental Health and Safety Management System." These procedures are regularly and irregularly reviewed to ensure the management system operates effectively. When there are significant changes in processes, facilities, or operations, hazard identification and risk assessment are conducted again according to the "Safety, Health, and Environmental Change Management Specification." Winbond continuously safeguards workplace safety for colleagues and strives to reduce potential risks. When immediate hazard risks are identified through risk assessment, safety prevention management is promptly implemented. Additionally, employee education and training, as well as hazard notification courses, are conducted to reinforce reminders that if potential safety risks are encountered during operations, work can be immediately stopped and reported to prioritize the safety and health of workers. Exercising the right to retreat will not result in penalties.

In the spirit of "no repeat accidents," Winbond (Taiwan) has established the "Accident, Near Miss, Non-Conformance Correction and Preventive Measures Procedure." This management procedure applies to all Winbond employees, contractors, and visitors. When an accident occurs, different investigation levels and investigation teams are formed based on the severity and type of the accident. The standard accident investigation process is as follows:

1 Situation Investigation and Cause Analysis
Conduct a root cause analysis based on to the findings of the investigation to draw conclusions.

2 Identify the Root Cause
Validate the factors found during the analysis and remove factors of no significance to identify the true cause of the anomaly.

3 Develop a Response
Recommend feasible improvement strategies and methods to address the true cause of the anomaly while considering cost effectiveness and risk improvement.

4 Strategy for Preventing Recurrence and Standardization
Extend effective strategies across related machines or processes.

5.4.3 Occupational Health Services

Exceeding regulatory requirements, Winbond (Taiwan) provides 24/7 on-site health services staffed by nurses—offering occupational health, health promotion, and health management services to workers. They collaborate with nearby teaching hospitals to ensure expedited emergency care. The services are available to both employees and non-employees. Those in need can consult the factory nurses for health care and emergency medical assistance. Key health management achievements in 2024 include:

Injury Prevention Management

Item	Content	2024 Progress
Prevention of Human Factors Hazards	▣ Caring for employees with musculoskeletal pain, introducing the "Workplace Musculoskeletal Health Risk Assessment Survey" electronic questionnaire: arranging employees to fill out the questionnaire every 3 years and scheduling interviews with occupational medicine specialists for potential risk individuals. ▣ Development of automated processes and promotion of employee muscular endurance health.	▣ After evaluation and consultation by occupational medicine physicians, the number of employees needing improvement is 0. ▣ The number of employees receiving compensation for occupational musculoskeletal injuries is 0.
Prevention of Diseases Triggered by Abnormal Workload	▣ System automation to remind supervisors and employees daily and monthly to pay attention to working hours. ▣ Annual employee questionnaire survey to identify and assess the risk levels of employees with abnormal work loads.	▣ Winbond arranged professional physician interviews and guidance for 142 employees with potential risks. ▣ All employees received health education promotion from nurses, providing individual consultation and referral services for employee assistance programs (EAP) to relieve stress and improve sleep.
Prevention of Workplace Violence and Harassment	▣ Annual review of internal workplaces, evaluating and improving based on "physical environment" and "workplace design" aspects. ▣ Conduct hazard identification and risk assessment for workplace unlawful invasion prevention every 3 years.	▣ No new potential risks have been identified, and relevant control and protective measures have been established for existing risk factors. ▣ Conducted once every 3 years.
Maternal Health Protection	▣ Nurses conduct interviews to explain hazard identification, risk assessment, work content confirmation, and prenatal and postnatal health education. ▣ Proactively provide information on subsidy allowances.	▣ 53 pregnant female employees received maternal health protection.

Health Promotion

Employee Health Protection Services	▣ Uninterrupted Health Services: Winbond (Taiwan) exceeds regulatory requirements by employing a higher number of nurses, with a health budget exceeding NT$20 million. ▣ Emergency Rescue: Collaborates with nearby teaching hospitals to establish emergency green channels. ▣ Health Checkups: Provides additional specialized checkups for new employees based on their health examination results, and offers superior health checkup items for current employees that exceed regulatory requirements. ▣ Work Stress Management: The system automatically reminds supervisors and employees daily and monthly to pay attention to working hours. Annual surveys are conducted for all employees to identify and assess risks associated with abnormal workloads. All employees receive educational emails from nurses, providing stress relief, good sleep advice, expert consultations, and referral assistance services. ▣ Breastfeeding Space: Winbond provides comfortable breastfeeding spaces for colleagues to create a friendly workplace environment. AED Safe Workplace Certification: Winbond (Taiwan)'s Zhubei Building, CTSP Fab, and Kaohsiung Fab all received this certification in 2024.
Improving Employee Health Outcomes	▣ Professional Counseling Services: Collaborating with the Employee Counseling Center, Winbond provides consultations on career development, family and parenting, gender relationships, mental stress, legal, financial, and workplace management. ▣ Winbond Employee Health Network: The medical office monitors for employees' re-examination status and assists in scheduling consultations with doctors within the company. In 2024, the care rate was 100%. ▣ Education and Training / Health Seminars: Planned courses include stress relief and good sleep, hypertension prevention, CPR & AED for all, and traffic safety awareness seminars. In 2024, a total of 16 events were held, with 2,339 participants. ▣ Flu Vaccination Campaign: In 2024, a total of 1,760 people participated in the vaccination campaign. ▣ Exercise Promotion Participation: Various employee exercise promotion activities were continuously held, including self-exercise habits, stretching exercises, and activities after long working hours. In 2024, a total of 38,438 people participated in exercise promotion activities, with a cumulative calorie consumption of 12,526,500 calories.

5.4.4 Work-related Injury or Ill Health

The statistics on occupational injuries are calculated according to the definitions of occupational injuries under the Occupational Safety and Health Act and the important disabling injury statistics indicators published by the Global Reporting Initiative (GRI). The main data indicators are the Disabling Injury Frequency Rate (FR) and the Disabling Injury Severity Rate (SR). In 2024, Winbond (Taiwan) had a total of 4 employee disabling injury cases, with a Disabling Injury Frequency Rate (FR) of 0.51 and a Disabling Injury Severity Rate (SR) of 2. The Disabling Injury Frequency Rate (FR) did not meet the established target. There were no accidents among contractors. From 2020 to 2024, there were no occupational disease deaths or confirmed cases of occupational diseases or work-related illnesses diagnosed by occupational medicine specialists among employees and contractors.

In 2024, Winbond (Taiwan) and its subsidiaries had a total of 9 disabling injury incidents, of which 5 were injuries in non-work areas of public spaces. Each unit supervisor is required to convey the importance of safety awareness to frontline employees through activities such as supervisor inspections and safety observations. In addition to continuously strengthening the requirements for operational safety discipline, safety reminders should be reinforced as much as possible in public areas. Additionally, the absentee rate of group employees has remained stable and below the company target of 1.5% over the past four years.

Work-related Injury Statics

2024 Indicators	Winbond(Taiwan)		Subsidiary	
	employee	Non-employees	employee	Non-employees
Number	3,575	637	4,522	95
Total working hours	7,778,183	1,860,712	8,695,796	767,014
Number of disabled injuries	4	0	5	0
Number of serious injuries	0	0	0	0
Number of deaths	0	0	0	0
Disabling frequency rate (FR)	0.51	0	0.57	0
Disabling severity rate (SR)	0	0	0	0
Rate of deaths caused by occupational injuries	0	0	0	0

Note 1 The number of disabling injuries can be recorded as the number of occupational injuries; the frequency of disabling injuries can be recorded as the occupational injury rate.
Note 2 Subsidiaries = Winbond (Subsidiaries) + Nuvoton (Taiwan) + Nuvoton (Subsidiaries) + Nuvoton (Japan)
Note 3 Other non-employee workers: refers to workers who are not employees but whose work and/or workplace are controlled by the organization. The average daily number of non-employee workers entering the factory is calculated by dividing the total annual number of worker entries by 365 days. The types of non-employee workers include but are not limited to waste, finished products, semi-finished products transportation/environmental cleaning/security maintenance/equipment and facility maintenance/gas/chemical supply and filling/kitchen catering/equipment vendors.

Disabling Injury Type

Injury Type/Number of cases	fall	Chemicals	Cut wounds
Winbond(Taiwan)	4	0	0
Subsidiary	2	1	2

Absentee Rate

Employee Absenteeism %	In 2021	In 2022	In 2023	In 2024
Winbond (Taiwan)	0.61%	1.27%	1.19%	0.94%
Subsidiary	0.60%	0.94%	1.05%	0.90%
Group total	0.60%	1.10%	1.11%	0.92%
Data coverage	100%	100%	100%	100%

Note Subsidiaries=Winbond subsidiaries + Nuvoton (Taiwan) + Nuvoton subsidiaries + Nuvoton Japan

5.5 Social Impact

Starting from its ESG vision, Winbond aligns with the United Nations Sustainable Development Goals (SDGs) to tackle various societal challenges. It incorporates Winbond's core strengths into three main strategic initiatives: Talent Development, Nature-based Solutions, and the Promotion of Charity and Environmental Protection, aiming to leverage resources for social impact.

Talent Development

Winbond is committed to fostering individuals by imparting new knowledge and skills, thereby offering opportunities for their development. Notable initiatives in 2024 include the "Semiconductor Academy," "Academic Sponsorship," and organizing "Cultural Events."

- Culture Event
- Semiconductor Academy

Natural-based Solutions

In line with achieving the 2050 net-zero target, Winbond collaborates with various sectors to promote industry-academia-government cooperation programs. Key projects in 2024 include "Afforestation" and "Conservation and Breeding," aimed at carbon removal from the atmosphere and enhancing biodiversity simultaneously.

- Conservation and Breeding

Promotion of Charity and Environmental Protection

Winbond dedicates resources to assist vulnerable groups and improve livelihoods. Key initiatives in 2024 include "Supporting the Disadvantaged," "Emergency Aid," and "Environmental Protection."

- Supporting the Disadvantaged
- Emergency Aid

Strategies of Social Inclusion

Volunteers
385 people

Donators
1,089 people

Resources
23.7 million

Note TCSA

5.5.1 Talent Development

Semiconductor Academy

Winbond combines its core operational capabilities with collaborations among industry, government, academia, and research institutions, actively responding to government technology policies. In 2024, Winbond continued to co-organize the Smart Semiconductor and Sustainable Manufacturing Institute with National Cheng Kung University, focusing on cultivating semiconductor professionals. This initiative not only enhances students' knowledge and skills but also bridges the gap between academic learning and practical application.

Additionally, Winbond provides internship programs to support students' growth in STEM education and encourages them to engage in practical work early, preparing them for future careers.

Establishment of Semiconductor Program to Actively Cultivate the Next-Generation

542 students enrolled in key semiconductor technology and leadership practical courses.

18 experts actively involved in teaching key semiconductor technology and leadership practical courses.

Winbond invested approximately NT$10 million in 2024 to support Taiwan's semiconductor industry and talent cultivation. This includes assisting National Cheng Kung University in establishing the Smart Semiconductor and Sustainable Manufacturing Institute. Since 2022, Winbond has promoted the "Semiconductor Leadership Program" and the 3-credit "Semiconductor Key Technologies and Leadership Practices Course," planned by senior executives. These courses combine practical and professional advice to help students lead the future semiconductor industry while also possessing basic concepts of artificial intelligence.

Winbond also collaborates with schools on joint research projects, enhancing students' practical research capabilities and perspectives, thereby laying a solid foundation for their future employability.

WinTern Leadership Program

Winbond is committed to developing local talent. Through courses on fundamental semiconductor knowledge and cultural guidance, we help trainees master the ability to integrate AI technology into real-world scenarios and complete comprehensive projects during their learning and practice. Among these initiatives, the WinTern internship program combines three major concepts: Wonder (curiosity), Innovation, and Navigate (guidance). During a two-month period, 15 interns completed 15 projects covering AI technology applications, process optimization, and data analysis, successfully focusing on the practical results of AI technology in semiconductor and cross-disciplinary applications.

Campus Talent Development Program: Campus Career Seminars

In 2024, multiple campus career seminars were held, with over 150 students participating. These seminars provided participants with an initial understanding of the semiconductor industry, including topics such as memory technology applications, market overview, interview skills enhancement workshops, and resume check-ups. These activities helped students improve their future workplace soft skills from various perspectives.

Education

Winbond actively promotes the technological advancement and global exchange in the semiconductor industry through sponsorship of the VLSI-TSA, VLSI-DAT symposiums, and the Taiwan Semiconductor Industry Association Convention (TSIA). Additionally, through academic lectures, Winbond assists institutions in retaining outstanding professors, further enhancing the depth of industry-academia research and the overall quality of the semiconductor industry's environment, laying the foundation for the sustainable development of the industry

Sponsorship of International Semiconductor Technology Symposium VLSI-TSA/VLSI-DAT and Taiwan Semiconductor Association Annual Meeting

Through long-term support for International Symposium on VLSI-TSA and VLSI-DAT and Taiwan Semiconductor Association Annual Meeting, Winbond can accelerate the upgrade of Taiwan's information and communications industry and increase the exchange of industrial technologies domestically and abroad. We contribute to the advancement of Taiwan's semiconductor technology by promoting a platform for the exchange of cutting-edge technologies among researchers in the semiconductor field.

Sponsorship of Research to Retain Outstanding Professors

Since 2019, Winbond has sponsored the "Chair Professor Research Fund" project at National Yang Ming Chiao Tung University for six consecutive years, assisting the school in enhancing academic standards, recruiting and retaining outstanding scholars from both domestic and international backgrounds, and supporting professors in continuously improving their teaching and research. This initiative promotes academic research and talent cultivation in the field of information and communication technology. Additionally, by integrating academic resources, Winbond aims to jointly improve the environmental quality of the semiconductor industry, achieving the win-win goal of industry-academia collaboration.

5.5.2 Natural-Based Solution

Afforestation

Winbond is committed to carbon removal from the atmosphere while considering the benefits of biodiversity enhancement.

In its journey towards achieving its net-zero goal, Winbond has initiated research into methods of atmospheric carbon removal. Scientists acknowledge that capturing and storing carbon dioxide is a critical component of attaining successful net-zero outcomes. Through partnerships across industry, academia, and government, Winbond is engaging in afforestation, tree stewardship, and native seedling propagation projects aimed at extracting carbon from the atmosphere. These efforts are undertaken with a keen awareness of the added benefits to biodiversity.

Afforestation

Conservatively estimated to remove at least 10,000 metric tons of carbon dioxide equivalent.

Winbond has launched an afforestation initiative in collaboration with National Chung Hsing University, planting native tree species such as Bischofia javanica, Palaquium formosanum, Acacia confusa, Melia azedarach, and Fraxinus griffithii at the Kaohsiung Fab. This afforestation project will span 30 years, with an estimated carbon sequestration of 390 metric tons of carbon dioxide equivalent during the execution period.

Simultaneously, Winbond is also participating in the Forestry and Nature Conservation Agency's tree adoption program, adopting state-owned forest land in Tainan City and Chiayi County. On 29,400 square meters of land, Winbond has planted over 7,700 native trees, including Taiwan beech, Liquidambar formosana, Acacia confusa, and Melia azedarach. The total estimated carbon sequestration is 990 metric tons of carbon dioxide equivalent.

In 2024, Winbond's affiliated company, Theaceae Conservation Corporation, won the bid for the Ministry of Finance's state-owned land carbon sink project. In the future, a large-scale carbon sink afforestation project will be launched in Sanxing, Yilan. The total carbon sequestration of this afforestation project is estimated to be 10,477 metric tons of carbon dioxide equivalent. Nuvoton will collaborate with National Ilan University to improve the environment of the abandoned gravel plant land, which is overgrown with weeds and Leucaena leucocephala, and restore the original natural ecology of the Lanyang River floodplain through tree planting and afforestation.

Conserving Seedlings

Conservation and Breeding of Native Taiwanese Plants.

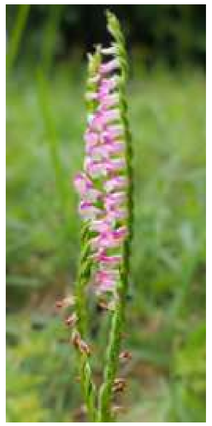
Since 2021, Winbond has integrated group resources to launch the Baoshan Park conservation and breeding project, targeting Taiwan native tree species. The project focuses on the Theaceae family, collecting and cultivating Taiwan native plant germplasm.

There are total 42 species of Theaceae plants in Taiwan, and currently, 33 species have been collected and cultivated. Among these, one species is assessed as critically endangered in the Red Book, one species is endangered, seven species are vulnerable, and three species are near threatened.

Conservation and Breeding of Native Taiwanese Plants.

Endangered Wild Plant '*Spiranthes*' Discovered!
Taiwan's Smallest Native Plain Orchid

Spiranthes sinensis, originally a robust plant species widely distributed across Taiwan's plains and green spaces, has seen a significant reduction in its habitat in recent years. Consequently, it has been listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). At Winbond's CTSP Fab and Tainan Building, wild populations of *Spiranthes* sinensis have been discovered due to the absence of herbicide application. To conserve *Spiranthes* sinensis, Winbond has adjusted its vegetation management schedule to coincide with the plant's flowering and fruiting periods, ensuring opportunities for root sprout and seed propagation. Wild plants are crucial components of biodiversity, and Winbond aims to conserve endangered native plants to maintain Taiwan's biodiversity and ecological health, contributing to the well-being of this land.

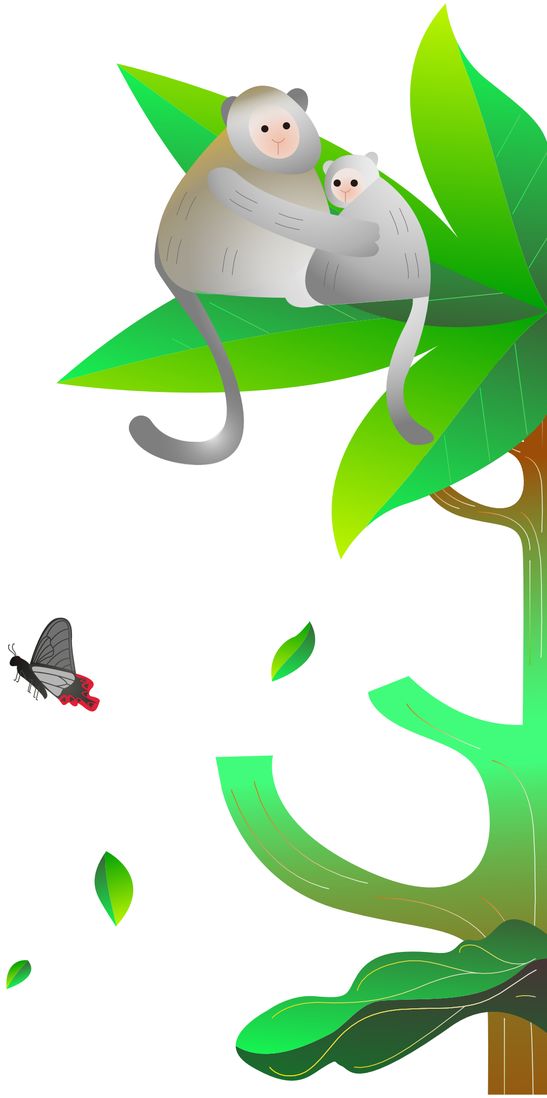


The Reborn of Butterfly

Protect the beautiful home of the great purple butterfly

The Sasakia charonda formosana, classified as an endangered wild animal under wildlife conservation regulations, is assessed as vulnerable in the IUCN Red List. It is only found in the mountainous areas of Jianshi Township, Hsinchu County, and Fuxing Township, Taoyuan County. During its life cycle, the butterfly lays eggs on the branches or leaves of Quercus glauca. After hatching, the larvae move to the leaf litter under the trees to overwinter. Currently, its habitat has shrunk, and the number of mature Quercus glauca trees has decreased, directly affecting the population of Sasakia charonda formosana.

Nuvoton, a subsidiary, and the Forestry and Nature Conservation Agency, Ministry of Agriculture (FANCA) have planned this project in collaboration with the Bailan Tribe of Wufeng Township. Using remote sensing technology, they record the distribution and phenology of Quercus glauca, with regular maintenance by the community patrol team. This establishes a long-term monitoring database for use in ecological tours and appropriately develops ecotourism routes. Nuvoton combines technological innovation to conserve precious species, uniting local tribes to protect their homeland, and hopes to raise awareness through environmental education, promoting the ideal blueprint for sustainable urban and rural development.



5.5.3 Promotion of Charity and Environmental Protection

Supporting the Disadvantaged

Winbond leverages its corporate resources to enhance employee involvement in social welfare, actively supporting and contributing to local communities while extending care to vulnerable groups.

Food Rescue Life Camp

Winbond's employees in Israeli teamed up with local farmers field to organize the 2024 Food Rescue Camp. During the camp, high-quality, edible food that might otherwise be discarded was harvested firsthand and redistributed to communities in need. This initiative not only effectively reduced food waste but also helped alleviate the issue of unequal food distribution.

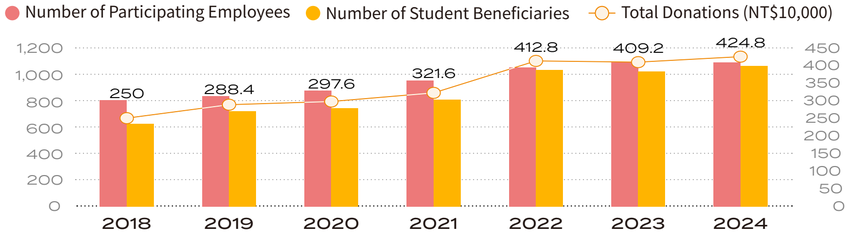
Sustainable Table Workshop

Winbond's employees in Israeli collaborated with Jerusalem Food Market to co-organize the 2024 Sustainable Dining Workshop. Through practical actions, they promoted the concept of reducing food waste by preparing nutritionally balanced meals during the workshop. At the same time, they supported communities lacking equal food resources, striving to maximize the value of food and ensure its reasonable distribution and utilization.

Educational Aid for Underprivileged Students

Since 2017, Winbond has collaborated with the Taiwan Fund for Children and Families to enhance educational resources for children from impoverished families, ensuring their regular school attendance. By encouraging employee contributions towards educational financial aid, Winbond has made a significant impact. In 2024, 1,089 employees collectively raised $4,248,000, supporting 1,062 elementary school students for an entire year. Through long-term and stable donations and attention, Winbond received the highest award, the "Special Appreciation Award," from the Child Welfare League Foundation in 2024.

Scholarship Fundraising Results (2018–2024)



Happy Breakfast Program for School Children in Rural Areas

Since 2011, Winbond has been making voluntary donations through a non-profit organization to support the Happy Breakfast Program for rural elementary schools in Hsinchu and Taichung. This initiative aims to improve breakfast options for school children in rural areas, providing them with the necessary nutrition and support to sustain their basic needs and health. By ensuring children are well-nourished, the program helps them to be physically and mentally prepared toexplore the world. In 2024, Winbond contributed NT$600,000 towards breakfast funding to continue supporting the healthy learning environment for school children. Furthermore, Winbond employees also engaged in on-site visits to better understand the program's impact, allowing for further evaluation and potential enhancement of the initiative.

Visually Impaired Experience Activity: I Am Your Eyes

To promote the physical and mental well-being of visually impaired colleagues, providing opportunities to connect with nature and relax, Winbond collaborated the Society of Wilderness to organize a nature experience activity. Through professional wilderness guided tours and interactive experiences, the activity aimed to enhance the environmental perception abilities of visually impaired colleagues. The event also invited Winbond employees to volunteer, fostering empathy through interaction and creating a more inclusive work environment.

Emergency Aid

Winbond implements the concept of social care by donating medical equipment, organizing blood donation activities, and providing emergency assistance and loan programs for employees, demonstrating deep concern for social responsibility and employee well-being.

Blood Donation

Winbond annually encourages its employees to donate blood, demonstrating the company's commitment to valuing life through practical action. In 2024, seven blood donation events were held, with a total of 458 participants and 685 bags of blood donated.

Emergency Assistance

When employees or their family members encounter emergencies such as disability, death, or accidents that severely affect their family's livelihood, Winbond provides emergency assistance and loan programs to alleviate employees' financial burdens. This is done in the spirit of mutual help and friendship, ensuring that their temporary living needs are met. The aim is to allow employees and their families to work and live with peace of mind.

Environmental Protection

From the perspective of biodiversity conservation, we continuously organize coastal adoption and beach cleanup environmental education experiences to raise awareness about protecting wildlife and the environment. Considering the net-zero carbon reduction goals, we plan environmental education courses focused on carbon reduction and biodiversity themes, leveraging corporate influence to help participants understand the importance of climate change and environmental sustainability.

New Lifestyle of Cutting Plastic Webinar X Waste-free Item Exchange Event ▶ Pre-Event Education Seminar: Zhubei Nanliao ▶ The cleanup and restoration of Yuanjhong Harbor Wetland

A New Lifestyle of Plastic Reduction: Webinar & Waste-Free Exchange Event

In 2024, Winbond explored the practical details of living a minimalist lifestyle from various aspects such as food, clothing, housing, transportation, education, and entertainment, as well as mindset adjustment. Through analyzing common blind spots, the company delved into the seemingly simple yet often overlooked daily issue of plastic reduction. After the lecture, interested colleagues were invited to bring an idle item from home to participate in the "Waste-Free" exchange activity, collectively practicing circular utilization and embodying the core spirit of a minimalist lifestyle.

Beach Cleanup Action: Nanliao, Zhubei

Before organizing the "Beach Cleanup Action: Nanliao, Zhubei " event, Winbond held a pre-event briefing to help participants understand the significance of waste source reduction, the usage of the ICC classification table, and discuss ways to reduce plastic usage to achieve the goal of waste reduction. The event emphasized that since tides continuously bring new waste, the ultimate goal of a beach cleanup is not just removal, but prevention by reducing waste at its source. This action not only demonstrates the company's commitment to sustainable development but also encourages employees and their families to actively participate in environmental protection and promote more effective plastic reduction actions.

Wetland Cleanup at Kaohsiung Yuanjhong Harbor Wetland

Winbond collaborated with the Society of Wilderness for the first time to organize a cleanup action at the Yuan Zhonggang Wetland in Kaohsiung. The Yuan Zhonggang Wetland boasts rich biodiversity, playing a crucial role in maintaining local biodiversity, climate regulation, and water quality regulation. Additionally, this initiative aims to enhance public awareness of wetland restoration and waste source reduction.

Activity	Participants	Garbage weight	Description
Beach Cleanup in Nanliao, Hsinchu	112	521 kg	Colleagues gained a deeper understanding of the importance of reducing waste at its source through hands-on creek cleanup activities.
Cleanup Activity in Fa-Zi River Taichung	72	74 kg	Winbond colleagues and their families braved the scorching sun, waded through the creek, rolled up their sleeves, and fully engaged in trash cleanup, improving the aquatic ecosystem.
Wetland Cleanup at Kaohsiung	26	63 kg	Yuanjhong Harbor Wetland is an important ecological conservation area in Kaohsiung, rich in biodiversity. It plays a crucial role in maintaining local biodiversity, climate regulation, and water quality regulation.

Sponsoring Houfeng Bikeway

In 2024, Winbond continued to participate in the adoption of public recreational facilities, collaborating with the Taichung City Tourism Bureau for the corporate adoption of the Houfeng Bikeway. Winbond is responsible for regular road cleaning and tree pruning to maintain the beauty and safety of the Houfeng Bikeway. This partnership aims to safeguard the cleanliness of Taichung City's public recreational facilities and enhance the quality of the recreational environment.

Appendix

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Appendix 1 GRI Content Index

- Statement of Use: Winbond Electronics Corporation has followed the GRI guidelines to report the content from January 1, 2024, to December 31, 2024.
- GRI 1 used: GRI 1 : Foundation 2021
- Applicable GRI Sector Standard(s): There were no applicable GRI Sector Standards during the reporting period of this report.

GRI 1 Foundation 2021

GRI 2 General Disclosure 2021

GRI Standard	Disclosure	Corresponding Section	Page	Remarks
1. The Organization and Its Reporting Practices				
2-1	Organizational details	Winbond Group Overview 1.1 Corporate Governance	8 49	
2-2	Entities included in the organization's sustainability reporting	About This Report Winbond Group Overview	4 8	
2-3	Reporting period, frequency and contact point	About This Report	4	
2-4	Restatements of information	About This Report	4	No restatements of information
2-5	External assurance	Appendix 9 Assurance Statement	208	
2. Activities and Workers				
2-6	Activities, value chain and other Business Relationships	Winbond Group Overview 2.1.1 Innovation in Technology and Services 4.1 Supply Chain Overview	8 84 126	No significant changes during the reporting period
2-7	Employees	5.2.1 Workforce Structure	152	
2-8	Workers who are not employees	5.4.4 Work-related Injury or Ill Health	177	

GRI 2 General Disclosure 2021

GRI Standard	Disclosure	Corresponding Section	Page	Remarks
3. Governance				
2-9	Governance structure and composition	1.1 Corporate Governance	49	
2-10	Nomination and selection of the highest governance body	1.1.1 Board of Directors	49	
2-11	Chair of the highest governance body	ESG Implementation Framework 1.1.1 Board of Directors	27 49	
2-12	Role of the highest governance body in overseeing the management of impacts	1.1.1 Board of Directors Materiality Analysis and Stakeholder Engagement	49 25	
2-13	Delegation of responsibility for managing impacts	ESG Implementation Framework 1.1.2 Operations and Responsibilities of the Functional Committees 1.4 Risk Management	24 52 62	
2-14	Role of the highest governance body in sustainability reporting	Materiality Analysis and Stakeholder Engagement About This Report	25 4	
2-15	Conflicts of interest	1.1.1 Board of Directors	49	
2-16	Communication of critical concerns	1.1.1 Board of Directors	49	
2-17	Collective knowledge of the highest governance body	1.1.1 Board of Directors	49	
2-18	Evaluation of the performance of the highest governance body	1.1.1 Board of Directors 1.1.2 Operations and Responsibilities of the Functional Committees	49 52	
2-19	Remuneration policies	1.1.2 Operations and Responsibilities of the Functional Committees	52	
2-20	Process to determine remuneration	1.1.2 Operations and Responsibilities of the Functional Committees	52	

GRI 2 General Disclosure 2021				
GRI Standard	Disclosure	Corresponding Section	Page	Remarks
2-21	Annual total compensation ratio	5.2.3 Compensation and Benefits	160	
4. Strategy, Policies, and Practices				
2-22	Statement on sustainable development strategy	Message from our Chairman Message from our President	5 6	
2-23	Policy commitments	4.1 Supply Chain Overview 5.1 Human Rights Management	126 150	
2-24	Embedding policy commitments	4.2 Sustainable Supply Chain Management 5.1 Human Rights Management	128 150	
2-25	Processes to remediate negative impacts	Materiality Analysis and Stakeholder Engagement 1.4 Risk Management 5.3 Employee Communication and Relations	28 62 171	
2-26	Mechanisms for seeking advice and raising concerns	1.2.2 Internal Controls and Audits 5.3 Employee Communication and Relations	57 171	
2-27	Compliance with laws and regulations	1.2 Business Integrity 3 Environmental Sustainability 5 Human Rights and Social Inclusion	56 105 148	
2-28	Membership associations	Appendix 7 Public Participation	203	
5. Stakeholder Engagement				
2-29	Approach to stakeholder engagement	Materiality Analysis and Stakeholder Engagement	28	
2-30	Collective bargaining agreements	5.3 Employee Communication and Relations	171	Currently, only Nuvoton(Japan) has established a labor union. Other locations do not have union organizations, so employees have not yet signed collective agreements. Labor issues are communicated through labor-management coordination meetings.

GRI 3 Material Topics 2021					
GRI Standard	GRI Standard		Corresponding Section	Page	Remarks
Productivity and Business Performance*					
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 1.1 Corporate Governance	28 49	
	3-2	List of material topics			
	3-3	Management of material topics			
GRI 201 Economic Performance 2016	201-1	Direct economic value generated and distributed	1.3.3 Economic Performance	60	
	201-2	Financial implications and other risks and opportunities due to climate change	1.6 Climate Change Management	75	
	201-3	Defined benefit plan obligations and other retirement plans	5.2.3 Compensation and Benefits	160	
	201-4	Financial assistance received from government	1.1.4 Tax Management	54	
Business Integrity and Corporate Governance*					
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 1.1 Corporate Governance	28 49	
	3-2	List of material topics			
	3-3	Management of material topics			
GRI 205: Anti-Corruption 2016	205-2	Communication and training about anti-corruption policies and procedures	1.2 Business Integrity	56	no incidents of corruption
	205-3	Confirmed incidents of corruption and actions taken	1.2 Business Integrity	56	
GRI 206 Anti-Competitive Behavior 2016	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	1.2 Business Integrity	56	no incidents of anti-competitive behavior

GRI 3 Material Topics 2021					
GRI Standard		GRI Standard	Corresponding Section	Page	Remarks
Energy and Greenhouse Gas Management *					
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 3 Environmental Sustainability	28	
	3-2	List of material topics			
	3-3	Management of material topics		105	
GRI 302 Energy 2016	302-1	Energy consumption within the organization	3.1.2 Energy Management	110	
	302-3	Energy intensity	3.1.2 Energy Management	110	
	302-4	Reduction of energy consumption	3.1.2 Energy Management	110	
	302-5	Reductions in energy requirements of products and services	2.1.1 Innovation in Technology and Services	84	
GRI 305：Emissions 2016	305-1	Direct (Scope 1) GHG emissions	3.1.1 Greenhouse Gas Management	108	
	305-2	Energy indirect (Scope 2) GHG emissions	3.1.1 Greenhouse Gas Management	108	
	305-3	Other indirect (Scope 3) GHG emissions	3.1.1 Greenhouse Gas Management	108	
	305-4	GHG emissions intensity	3.1.1 Greenhouse Gas Management	108	
	305-5	Reduction of GHG emissions	3.1.1 Greenhouse Gas Management	108	
	305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	3.4 Air Pollution Control	119	
Water Resource Management					
GRI 303 Water and Effluents 2018	303-1	Interactions with water as a shared resource	3.2 Water Resource Management	114	
	303-2	Management of water discharge-related impacts	3.2 Water Resource Management	114	
	303-3	Water withdrawal	3.2 Water Resource Management	114	
	303-4	Water discharge	3.2 Water Resource Management	114	
	303-5	Water consumption	3.2 Water Resource Management	114	

GRI 3 Material Topics 2021					
GRI Standard		GRI Standard	Corresponding Section	Page	Remarks
Waste Management					
GRI 306 Waste 2020	306-3	Waste generated	3.3 Waste Management	118	
	306-4	Waste diverted from disposal	3.3 Waste Management	118	
	306-5	Waste directed to disposal	3.3 Waste Management	118	
Talent Management*					
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 5 Human Rights and Social Inclusion	28	
	3-2	List of material topics		148	
	3-3	Management of material topics			
GRI 401：Employment 2016	401-1	New employee hires and employee turnover	5.2.2 Talent Recruitment and Performance Evaluation	155	
	401-2	Benefits provided to full-time employees that are not provided to temporaryor part-time employees	5.2.3 Compensation and Benefits	160	
	401-3	Parental leave	5.2.3 Compensation and Benefits	160	
GRI 403 Occupational Health and Safety 2018	403-1	Occupational health and safety management system	5.4.1 Occupational Safety and Health Management System	173	
	403-2	Hazard identification, risk assessment, and incident investigation	5.4.1 Occupational Safety and Health Management System 5.4.2 Accident Investigation and Injury Prevention	173 175	
	403-3	Occupational health services	5.4.1 Occupational Safety and Health Management System	173	
	403-4	Worker participation, consultation, and communication on occupational health and safety	5.4.1 Occupational Safety and Health Management System	173	
	403-5	Worker training on occupational health and safety	5.4.1 Occupational Safety and Health Management System	173	
	403-6	Promotion of worker health	5.2.3 Compensation and Benefits 5.4.3 Occupational Health Services	160 176	

GRI 3 Material Topics 2021					
GRI Standard		GRI Standard	Corresponding Section	Page	Remarks
Talent Management*					
GRI 403 Occupational Health and Safety 2018	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	5.4.1 Occupational Safety and Health Management System 5.4.2 Accident Investigation and Injury Prevention	173 175	
	403-8	Workers covered by an occupational health and safety management system	5.4.1 Occupational Safety and Health Management System	173	
	403-9	Work-related injuries	5.4.4 Work-related Injury or Ill Health	177	
	403-10	Work-related ill health	5.4.4 Work-related Injury or Ill Health	177	No incidents of occupational diseases
GRI 404 Training and Education 2016	404-1	Average hours of training per year per employee	5.2.4 Talent Development and Learning Outcomes	166	
	404-2	Programs for upgrading employee skills and transition assistance programs	5.2.4 Talent Development and Learning Outcomes	166	
	404-3	Percentage of employees receiving regular performance and career development reviews	5.2.2 Talent Recruitment and Performance Evaluation	155	
GRI 405：Diversity and Equal Opportunity 2016	405-1	Diversity of governance bodies and employees	1.1.1 Board of Directors 5.2.1 Workforce Structure 5.2.2 Talent Recruitment and Performance Evaluation	49 152 155	
	405-2	Ratio of basic salary and remuneration of women to men	5.2.3 Compensation and Benefits	160	
GRI 406：Non-discrimination 2016	406-1	Incidents of discrimination and corrective actions taken	5 Human Rights and Social Inclusion	148	No incidents of discrimination occurred
GRI 408：Child Labor 2016	408-1	Operations and suppliers at significant risk for incidents of child labor	4.2.3 Sustainable Supply ChainRisk Management 5.2.1 Workforce Structure	131 152	No incidents of child labor occurred at operational sites and among suppliers.
Supply Chain Management*					

GRI 3 Material Topics 2021					
GRI Standard		GRI Standard	Corresponding Section	Page	Remarks
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 4 Sustainable Supply Chain	28	
	3-2	List of material topics		124	
	3-3	Management of material topics			
GRI 204 Procurement Practices	204-1	Proportion of spending on local suppliers	4.1.2 Local Procurement	127	
GRI 308：Supplier Environmental Assessment 2016	308-1	New suppliers that were screened using environmental criteria	4.2.2 Suppliers Management Process and Mechanisms	129	
	308-2	Negative environmental impacts in the supply chain and actions taken	4.2.2 Suppliers Management Process and Mechanisms	129	
GRI 414：Supplier Social Assessment 2016	414-1	New suppliers that were screened using social criteria	4.2.2 Suppliers Management Process and Mechanisms	129	
	414-2	Negative social impacts in the supply chain and actions taken	4.2.2 Suppliers Management Process and Mechanisms	129	
Green Product*					
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 2.1 R&D and Innovation	28	
	3-2	List of material topics		84	
	3-3	Management of material topics			
GRI 417 Marketing and Labeling 2016	417-2	Incidents of non-compliance concerning product and service information and labeling	1.2 Business Integrity	56	No incidents of non-compliance concerning product and service information and Labeling
	417-3	Incidents of non-compliance concerning marketing communications	1.2 Business Integrity	56	No incidents of non-compliance concerning product and service information and Labeling
Self-defined topics -Green Product	—	—	2 Green Product	82	

GRI 3 Material Topics 2021					
GRI Standard		GRI Standard	Corresponding Section	Page	Remarks
Research, Development and Innovation*					
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 2.1 R&D and Innovation	28	
	3-2	List of material topics		84	
	3-3	Management of material topics			
Self-defined topics – Research, Development and Innovation	—	—	2.1 R&D and Innovation	84	
Risk Management*					
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 1.1 Corporate Governance	28	
	3-2	List of material topics		49	
	3-3	Management of material topics			
GRI 418 Customer Privacy 2016	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	2.3.2 Customer Privacy Protection	104	No substantiated complaints regarding breaches of customer privacy and losses of customer data

GRI 3 Material Topics 2021					
GRI Standard		GRI Standard	Corresponding Section	Page	Remarks
Self-defined topics -Risk Management	—	—	1.4 Risk Management	62	
Regulatory Compliance*					
GRI 3	3-1	Process to determine material topics	Materiality Analysis and Stakeholder Engagement 1.1 Corporate Governance	28	
	3-2	List of material topics		49	
	3-3	Management of material topics			
Self-defined topics -Regulatory Compliance	—	—	1.2 Business Integrity 3 Environmental Sustainability 5 Human Rights and Social Inclusion	56 105 148	

Note *Material Topics

Appendix 2: SASB (Sustainability Accounting Standards Board) Index

Topic	Code	Category	Metric	2023	2024	Note
Greenhouse Gas Emissions	TC-SC-110a.1	Quantitative	(1) Gross global Scope 1 emissions	Winbond (Taiwan)：44,149 tCO_2e Subsidiaries： 18,835 tCO_2e	Winbond (Taiwan)：49,316 tCO_2e Subsidiaries： 40,507 tCO2e	Not subject to Scope 1 related emission controls. 3.1.2 Energy Management
			(2) Amount of total emissions from perfluorinated compounds	Winbond (Taiwan)：11,631 tCO_2e	Winbond (Taiwan)：11,868 tCO_2e Subsidiaries：8,217 tCO_2e	
	TC-SC-110a.2	Discussion and Analysis	Discussion of long- and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Please refer to 3.1.1 Greenhouse Gas Management In 2024, Winbond (Taiwan) reduced Scope 1 and Scope 2 greenhouse gas emissions by 1.1% (base year 2023). The greenhouse gas emission intensity indicator in 2024 was 12.7 kg CO_2 equivalent, compared to 15.5 kg CO_2 equivalent in 2023, representing a YoY reduction of approximately 18.1% in unit product carbon emissions. In the future, we will continue to promote the reduction of process gases FCs (such as process improvement and installation of exhaust gas treatment equipment), energy-saving electricity use (process optimization, efficiency improvement, and smart energy-saving), and the use of renewable energy plans to continuously reduce carbon emissions. Please refer to 3.1.1.2 Greenhouse Gas Reduction Direct emissions FCs reduction (process improvement and installation of exhaust gas treatment equipment), indirect emissions energy-saving electricity use, and the use of renewable energy are important greenhouse gas reduction strategies for Winbond. In the future, we will promote various carbon reduction plans and improve energy use efficiency, establish a carbon emission information platform to integrate and manage carbon emission information, and achieve green low-carbon production. In addition, Winbond will respond to the international climate change organization - Science Based Targets initiative (SBTi), planning to use 50% renewable energy in Winbond (Taiwan) by 2030, and reduce Scope 1 and Scope 2 greenhouse gas emissions by 42% (based on 2023), and achieve net zero emissions in all Winbond fabs by 2050.		3.1.2 Energy Management
Energy Management in Manufacturing	TC-SC-130a.1	Quantitative	(1) Total energy consumed,	Winbond (Taiwan)：Around 2,958,834 GJ Subsidiaries：Around 269,250 GJ	Winbond (Taiwan)：Around 3,085,408GJ Subsidiaries：Around 963,369GJ	3.1.1 Greenhouse Gas Management
			(2) Percentage grid electricity and	Winbond (Taiwan)：87.9 %	Winbond (Taiwan)：87.1 % Subsidiaries：70.8%	3.1.1 Greenhouse Gas Management
			(3) Percentage renewable	Winbond (Taiwan)：0.3 %	Winbond (Taiwan)：5.1 % Subsidiaries：0.4%	3.1.1 Greenhouse Gas Management
Water Management	TC-SC-140a.1	Quantitative	(1) Total water withdrawn	Winbond (Taiwan)：4,356 megaliters Subsidiaries： 396 megaliters	Winbond (Taiwan)：4,564 megaliters Subsidiaries： 3,931 megaliters	3.2 Water Resource Management Locations of operations in Taiwan are all located in low risk areas of water resource pressure
			(2) total water consumed; percentage of each in regions	Winbond (Taiwan)：1,432 megaliters Subsidiaries： 79 megaliters	Winbond (Taiwan)：1,360 megaliters Subsidiaries： 340 megaliters	
Waste Management	TC-SC-150a.1	Quantitative	(1) Amount of hazardous waste from manufacturing, (2) percentage recycled	Winbond (Taiwan)： ▣ Hazardous waste 6,387 metric tons ▣ Hazardous waste recycling rate: 83% Subsidiaries： ▣ Hazardous waste 407 metric tons ▣ Hazardous waste recycling rate: 95%	Winbond (Taiwan)： ▣ Hazardous waste 9,236 metric tons ▣ Hazardous waste recycling rate: 88 % Subsidiaries： ▣ Hazardous waste 504 metric tons ▣ Hazardous waste recycling rate: 95 %	3.3 Waste Management

Topic	Code	Category	Metric	2023	2024	Note
Workforce Health & Safety	TC-SC-320a.1	Discussion and Analysis	Description of efforts to assess, monitor, and reduce exposure of workforce to human health hazards	Please refer to 5.4 Occupational Safety and Health ▣ Winbond has formulated the "ESH Risk Assessment Operating Procedure" to identify ESH risks and opportunities to the environment, personnel safety, and hygiene from activities, products, or services. ▣ Based on past operational history and the current situation, the potential situation, effect or impact, and probability are assessed to calculate the risk level. Improvement measures are then drawn up for risk reduction in the following order: elimination, replacement, engineering control, signage/warning/management control, and personal protective equipment. ▣ In Taiwan fab, internal audits are conducted at least once a year along with annual reviews; any major changes to production processes, facilities, or operations will trigger a new assessment.		5.4 Occupational Safety and Health
	TC-SC-320a.2	Quantitative	Total amount of monetary losses as a result of legal proceedings associated with employee health and safety violations	No penalties associated with Occupational Safety and Health violations in 2023 and 2024.		
Recruiting & Managing a Global & Skilled Workforce	TC-SC-330a.1	Quantitative	Percentage of employees that require a work visa	—	3.20%	5.2.1 Workforce Structure
Product Lifecycle Management	TC-SC-410a.1	Quantitative	Percentage of products by revenue that contain IEC 62474 declarable substances	No IEC 62474 declarable products		
	TC-SC-410a.2	Quantitative	Processor energy efficiency at a system level for: (1) servers, (2) desktops and (3) laptops	Not producing servers, desktops and laptops.		
Materials Sourcing	TC-SC-440a.1	Qualitative description	Description of the management of risks associated with the use of critical materials	Under the ESG committee, a Sustainable Supply Chain team was established and is responsible for developing supplier management policies and related sustainable development issues. 2024 Supplier Sustainability Management Results: ▣ Signing rate of Winbond Supplier Code of Conduct Commitment Letter: 100% ▣ Percentage of suppliers who have signed agreements not to use prohibited materials and conflict minerals declaration: 100% ▣ Compliance rates of newly traced suppliers with respect to economic, environmental, and social standards: 100%		4.1 Supply Chain Overview
Intellectual Property Protection & Competitive Behaviour	TC-SC-520a.1	Quantitative	Total amount of monetary losses as a result of legal proceedings associated with anti-competitive behaviour regulations	No violations of anti-competitive regulations in 2023.	No violations of anti-competitive regulations in 2024	1.2 Business Integrity
Activity Metrics	TC-SC-000.A	Quantitative	Total production	Total wafer production was 408 thousand pcs Total die production was 7,153,705 thousand pcs	Total wafer production was 440 thousand pcs Total die production was 7,099,216 thousand pcs	For financial performance and sales volume in 2024, please refer to Winbond's 2024 Annual Report,
	TC-SC-000.B	Quantitative	Percentage of production from owned facilities	Winbond：100%；Nuvoton：24.8%；Nuvoton (Japan)：0%	Winbond：100%；Nuvoton：27.2%；Nuvoton (Japan)：0%	

Appendix 3: TWSE Sustainability Index - Semiconductor Industry

Note	Indicator	Type	2024 Progress	Page
1	Total energy consumption, percentage of purchased electricity, utilization rate of renewable energy	Quantitative	▣ Total energy consumption: Winbond (Taiwan): 3,085,408 GJ, Subsidiaries: 963,369 GJ ▣ Purchased electricity: Winbond (Taiwan): 2,684,598 GJ, Subsidiaries: 678,216 GJ ▣ Renewable energy usage rate: Winbond (Taiwan): 5.9%, Subsidiaries: 0.5%	110-120
2	Total water withdrawn, total water consumption	Quantitative	▣ Total water withdrawal: Winbond (Taiwan): 4,564 thousand cubic meters (1,000m^3), Subsidiaries: 3,931 thousand cubic meters (1,000m^3) ▣ Total water consumption: Winbond (Taiwan): 1,360 thousand cubic meters (1,000m^3), Subsidiaries: 340 thousand cubic meters (1,000m^3)	104
3	Total hazardous waste generated, and percentage recycled	Quantitative	▣ Hazardous waste: Winbond (Taiwan): 9,236 metric tons, Subsidiaries: 504 metric tons ▣ Hazardous waste recycling rate: Winbond (Taiwan): 88%, Subsidiaries: 95%	118-119
4	Types of, number of employees in and rate of occupational accidents	Quantitative	▣ Occupational injury category: Falls ▣ Recordable occupational injuries: 4 cases ▣ Recordable occupational injury rate: 0.51	177
5	Product Lifecycle Management Disclosure: including weights of scraps and electronic waste and percentage recycled [Note]	Quantitative	Refer to 3.3 Waste Management ▣ Waste generation: Winbond (Taiwan): 17,051 metric tons, Subsidiaries: 2,793 metric tons ▣ Overall waste recycling rate: Winbond (Taiwan): 92%, Subsidiaries: 27%	114, 202
6	Description of the management of risks associated with the use of critical materials	Qualitative Discussion	Refer to 4.2 Sustainable Supply Chain Management The Sustainable Development Committee (ESG Committee) has established a Sustainable Supply Chain Group responsible for formulating supplier management policies and related sustainability matters. 2024 Sustainable Supplier Management Achievements: ▣ Winbond Supplier Code of Conduct Commitment Letter signing rate: 100% ▣ Declaration of not using prohibited substances and conflict minerals signing rate: 100% ▣ New suppliers' compliance rate with economic, environmental, and social standards: 100%	128-129
7	Total amount of monetary losses as a result of legal proceedings associated with anticompetitive behavior regulations	Quantitative	No violations of anti-competitive regulations in 2024	56-57
8	Production by product category	Quantitative	▣ Total wafer production: 440 thousand pieces ▣ Total die production: 7,099,216 thousand pieces	For financial performance and sales volume in 2024, please refer to Winbond's 2024 Annual Report

[Note] Including the sale of scrap materials or other recycling processes, relevant explanations should be provided.

Appendix 4: Climate Related Index

1 Execution Status of Climate-related Information

Risks and opportunities brought by climate change to the company and related countermeasures taken by the company. Please refer to section 1.6, Climate Change Management, or Winbond's 2023 Task Force on Climate-related Financial Disclosures Report.

Item	Execution Status	
Description of the Board and management's oversight and governance of climate-related risks and opportunities	The Board of Directors serves as the highest governing body for climate change, responsible for guiding the company's response and decision-making regarding climate change. The ESG Committee, established under the Board of Directors and chaired by the Chairman, provides annual reports to the Board on the implementation outcomes related to climate change and other ESG initiatives. This ensures the effective promotion and execution of the company's sustainable development efforts.	
Description on how the identified climate risks and opportunities impact the company's business, strategies, and finance (short, mid, long-term) Description of the financial impact of extreme climate events and transitional actions	Climate Risks	Climate Opportunities
	1 Transition to low-carbon technology Short-term ▣ Capital expenditure for equipment (-) ▣ R&D costs increase (-) ▣ Reduce in carbon emissions leading to a decrease in carbon tax/carbon fee expenditure (+) **2 Carbon tax/carbon fee** Short-term ▣ Increase in indirect costs (-) ▣ Suppliers passing on their carbon tax/carbon fee expenditures, leading to increased procurement costs (-) ▣ Limited capacity expansion (-) **3 International conventions or agreements** Short-term ▣ Increase in indirect costs arising from the signing of the agreement (-) ▣ Increase in capital expenditure arising from the signing of the agreement (-) ▣ Reduce in carbon emissions leading to a decrease in carbon tax / carbon fee expenditure (+) **4 Tropical cyclones** Short-term ▣ Impact on production and revenue (-) ▣ Automated production lines continued to operate, and overtime paid in accordance with the law led to increased labor costs (-) ▣ Impact on supplier deliveries and Winbond production (-) ▣ Increase in natural disaster insurance premiums (-)	**1 Changes in customer behavior** Short-term ▣ Product portfolio changes accelerated the positive development of the overall supply chain. ▣ Obtaining orders and expanding revenue ▣ Increased order stability and reduced revenue fluctuations ▣ Enhanced company reputation **2 Alternative and diversified resources** Short-term ▣ Enhanced supply chain reliability ▣ Reduced production costs **3 Changes in transportation modes** Short-term ▣ Reduced indirect costs. ▣ Reduced carbon emissions leading to a decrease in carbon tax/carbon fee expenditures.

Item	Execution Status
Description on how the climate risk identification, assessment, and management process is integrated in the overall risk management system	In 2024, Winbond convened 19 departmental units and over 30 colleagues to establish the TCFD project team. The team referenced the division of labor of the ESG Committee's promotion team, grouping members according to the nature of their business. Each group discussed climate change issues based on business relevance.
If scenario analysis is used to assess the Company's resilience in face of climate change risks, explanations on the scenario, parameters, assumptions, analysis factors and major financial impacts should be provided	**Conducted risk simulations for 3 scenarios related to transition risk, which includes** ▪ National Net Zero Pathway, primarily assessing domestic regulatory risks ▪ SSP1-1.9 Low Emission Scenario from the Intergovernmental Panel on Climate Change (IPCC): Derived from the IPCC's sixth scientific assessment report. ▪ An annual reduction rate of 4.2% as required by the Science-Based Targets Net-zero (SBT-NZ) Standard for carbon emissions. **External Scenarios /Assumption /Estimated Financial Impact in 2030** **1 Carbon Tax** ▪ National Net Zero Pathway / Estimated at US$2 to 10/t$CO_2$e from 2021 to 2050 by referring to SSP2-4.5 / <NT$ 50 million ▪ SSP1-1.9 & SBT-NZ / Referencing SSP1-1.9, estimated at US$650/t$CO_2$e by 2050 / >NT$ 5 billion **2 Carbon Fee** ▪ National Net Zero Pathway / Carbon emission exemption quota of 25,000 tCO_2e/year for a single fab; carbon fee estimated at NT$300/t$CO_2$e / <NT$ 200 million ▪ Carbon emission exemption quota of 25,000 tCO_2e/year for a single fab; carbon fee estimated at NT$50/t$CO_2$e / <NT$ 50 million **3 Regulation of Renewable Energy** ▪ National Net Zero Pathway / Procurement costs were estimated based on the average wholesale price of Taipower's renewable energy power plus the supply cost. The maintenance cost of solar photovoltaic systems was estimated based on the average maintenance cost in the IRENA report./ <NT$ 50 million ▪ SSP1-1.9 / Procurement costs were estimated based on the average wholesale price of Taipower's renewable energy power plus the supply cost. The maintenance cost of solar photovoltaic systems was estimated based on the average maintenance cost in the IRENA report. / <NT$ 50 million ▪ SBT-NZ / Procurement costs were estimated based on the average wholesale price of Taipower's renewable energy power plus the supply cost. The maintenance cost of solar photovoltaic systems was estimated based on the average maintenance cost in the IRENA report. / <NT$ 50 million

Item	Execution Status	
	Climate-related risk transition plan	Climate-related metrics and goals
▣ Should there be transitional programs in response to managing climate-related risks, please explain the program's content and metrics and targets used to identify and manage physical and transitional risks	**1 Green Product** ▣ Enhancing productivity ▣ Reduction in power consumption of products ▣ Lowering power consumption and extending battery life ▣ Supporting environmentally friendly and low-power consumption low-temperature soldering processes	**1 Green Product** ▣ 1.2V HyperRAM mass production: 20% reduction in product lifecycle carbon emissions by 2030 ▣ Flash memory series relative to F58s mass production: 110,000 tCO2e reduction by 2030
	2 Sustainable Supply Chain ▣ Continuously enhancing resilience in supply chain ▣ Promoting green and low-carbon supply chains ▣ Promoting internal carbon reduction initiatives • Gradually improving sustainable procurement performance • Continuously monitoring the low-carbon management performance of OSAT suppliers • Actively establishing internal green logistics systems	**2 Sustainable Supply Chain** ▣ 100% of tier-1 significant suppliers subject to sustainability due diligence by 2030 ▣ Supply chain carbon reduction: 10% reduction in supply chain carbon emissions by 2030 (based on 2021) ▣ 42% Local procurement ratio of raw materials by 2030 ▣ Electronic data exchange of OSAT suppliers product carbon data and renewable energy product production system usage rate: 100% by 2030 ▣ Internal green logistics system establishment rate: 100% by 2030
	3 Energy and Greenhouse Gas Management ▣ Implementing energy conservation measures ▣ Planning for the use of renewable energy ▣ Introducing greenhouse gas management processes ▣ Setting strategic goals for greenhouse gas emissions in production and manufacturing, and building a carbon emission information platform.	**3 Energy and Greenhouse Gas Management** ▣ Greenhouse gas emission: 42% reduction in Scope 1 and 2 emissions for Winbond (Taiwan) by 2030 (based on 2023) ▣ Total energy savings: cumulative energy savings of over 15% by 2030 ▣ Renewable energy usage / proportion: 50% renewable energy usage for Winbond (Taiwan) by 2030 ▣ fab-wide water recycling rate: ≥ 80% by 2030
	4 Water Resource Management ▣ As of 2023, all Taiwan operation sites are located in low-risk areas for water resource stress.	**4 Adaptation to Climate Risk** ▣ Operational Interruptions Caused by Climate Disasters (Days): 0 days
	5 Sustainable Investment and Financing ▣ Continuing renewable energy strategies ▣ Participating in sustainable finance through various channels	

Item	Execution Status
▣ Should the internal carbon pricing is used as the planning tool, the pricing mechanism should be explained	A series of plans for carbon emission management are being implemented, currently focusing on greenhouse gas inventory and carbon accounting system establishment. Carbon pricing will be discussed in accordance with the above plans.
▣ If climate-related goals are set, information such as the activities covered, the scope of greenhouse gas emissions, the planned schedule, and the progress achieved each year shall be stated; if carbon offsets or Renewable Energy Certificates (RECs) are used to achieve relevant goals, the source and quantity of carbon reduction credits or the number of RECs offset shall be stated.	**Climate-related target activities** ▣ Reduction of process gases and process exhaust ▣ Improvement of energy efficiency, zero-carbon energy, low-carbon value chain ▣ Carbon offset ▣ In 2024, use of renewable energy power, obtaining 43,961 renewable energy certificates (T-RECs) ▣ Net zero emission pathway from 2021 to 2050 ▣ By 2030: Winbond (Taiwan) uses 50% green electricity ▣ By 2050: Net zero emissions
▣ Greenhouse gas inventory and assurance situation (See 1-1 and 1-2)	1-1 Greenhouse Gas Inventories and Verification Information for the Most Recent Two Years 1-2 Greenhouse Gas Reduction Targets, Strategies, and Specific Action Plans

1-1 Greenhouse Gas Inventories and Verification Information for the Most Recent Two Years

- Greenhouse Gas Inventories Information: This section provides details on greenhouse gas emissions (in tCO_2e), intensity (in tCO_2e per NT$ million), and data coverage for the most recent two years.
- Greenhouse Gas Verification Information: This section describes the verification status for the past two years, including the scope of verification, verifying organization, verification criteria, and verification opinions.

Basic Information

- ■ Companies in the steel or cement industries with a capital of more than NT$10 billion
- ☐ Companies with a capital of more than NT$5 billion but less than NT$10 billion
- ☐ Companies with a capital of less than NT$5 billion

According to the provisions of the sustainable development roadmap of the TWSE/ TPEx-listed companies, the disclosure shall at least include

- ■ Parent company only inventory
- ■ Inventory of subsidiaries in the consolidated financial statements
- ■ Parent company only assurance
- ☐ Assurance of subsidiaries in the consolidated financial statements

2023

Scope 1	Total Emissions (tCO_2e)	Intensity (tCO_2e/ NT$ million)	Assurance Provider	Description
Winbond	44,149	1.175	BSI Taiwan	Our company disclosed a total greenhouse gas emission of 44,149 tCO_2e (accounting for 100% of total emissions), which has been assured by a verification body following ISO 14064-3 standards, with a reasonable assurance opinion.
Total	44,149	1.175		

Scope 2	Total Emissions (tCO_2e)	Intensity (tCO_2e/ NT$ million)	Assurance Provider	Description
Winbond	356,535	9.492	BSI Taiwan	Our company disclosed a total greenhouse gas emission of 356,535 tCO_2e (accounting for 100% of total emissions), which has been assured by a verification body following ISO 14064-3 standards, with a reasonable assurance opinion.
Total	356,535	9.492		

2024

Scope 1	Total Emissions (tCO_2e)	Intensity (tCO_2e/ NT$ million)	Assurance Provider	Description
Winbond	49316	1.039	BSI Taiwan	Our company disclosed a total greenhouse gas emission of 49,316 tCO_2e (accounting for 100% of total emissions), which has been assured by a verification body following ISO 14064-3 standards, with a reasonable assurance opinion.
Subsidiaries	40507	1.187	DNV Taiwan	Subsidiaries disclosed a total greenhouse gas emission of 40,428 tCO_2e (accounting for 99.8% of total emissions), which has been assured by a verification body following ISO 14064-3 standards, with a reasonable assurance opinion.
Total	89823	1.101		

Scope 2	Total Emissions (tCO_2e)	Intensity (tCO_2e/ NT$ million)	Assurance Provider	Description
Winbond	346858	7.305	BSI Taiwan	Our company disclosed a total greenhouse gas emission of 346,858 tCO_2e (accounting for 100% of total emissions), which has been assured by a verification body following ISO 214064-3 standards, with a reasonable assurance opinion.
Subsidiaries	85390	2.502	DNV Taiwan	Subsidiaries disclosed a total greenhouse gas emission of 85,008 tCO_2e (accounting for 99.6% of total emissions), which has been assured by a verification body following ISO 214064-3 standards, with a reasonable assurance opinion.
Total	432248	5.297		

1-2 Greenhouse Gas Reduction Targets, Strategies, and Specific Action Plans

Specify the base year and data for greenhouse gas reduction, reduction targets, strategies, specific action plans, and the achievement of reduction targets	
1	Base year: In 2023, Winbond (Taiwan) Scope 1 and 2 greenhouse gas emissions amounted to 400,684 metric tons of CO_2 equivalent.
2	Reduction targets and achievements ✓ In 2024, the greenhouse gas emission intensity indicator per unit - "Average greenhouse gas emissions per mask layer for 12-inch wafer production" was 12.7 kg of CO_2 equivalent, compared to 15.5 kg of CO_2 equivalent in 2023, representing a year-on-year reduction of approximately 18.1% in unit product carbon emissions. ✓ By 2030, Winbond (Taiwan) aims to reduce carbon emissions by 42%. In 2024, Winbond (Taiwan) achieved a 1.1% reduction in greenhouse gas emissions (Scope 1 and 2).
3	Strategy: In the future, we will continue to promote the reduction of process gases FCs (such as process improvements and installation of exhaust treatment equipment), energy-saving measures (process optimization, efficiency improvement, and smart energy-saving), and the use of renewable energy to continuously reduce carbon emissions.
4	Specific action plan: Please refer to section 3.1.2.3 Energy-saving action plan.

Appendix 5 UN Global Compact

Principles			Explanation and Policies	Corresponding Section
Human Rights	1	Businesses should support and respect the protection of internationally proclaimed human rights.	Winbond commits to adhering to internationally recognized human rights standards as the highest guiding principles. These standards include the United Nations Guiding Principles on Business and Human Rights, the International Labor Organization's Declaration on Fundamental Principles and Rights at Work, and the Universal Declaration of Human Rights. Winbond implements relevant guidelines from the Code of Conduct - Responsible Business Alliance to support and safeguard human rights, ensuring a safe and ethically sound working environment. For further details, please refer to the sections on 5.1 Human Rights Governance and Human Rights Policy.	5.1 Human Rights Management
	2	Make sure that they are not complicit in human rights abuses.	IIn accordance with the Responsible Business Alliance (RBA) Code of Conduct, Winbond ensures that they do not purchase or use miner- als from conflict areas controlled by non-governmental military groups or illegal military factions in the Democratic Republic of the Congo. These conflict minerals include gold (Au), tantalum (Ta), tungsten (W), and tin (Sn). The signing rate of the Winbond Supplier Code of Conduct Commitment Letter reached 100% among our key suppliers. For more details, refer to chapter 4. Sustainable Supply Chain and Winbond Responsible Minerals Due Diligence Report.	4 Sustainable Supply Chain
Labor	3	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.	Winbond places significant emphasis on the development of human rights issues and actively engages in Human Rights Management activities. In order to comprehensively assess the current state of human rights risks and facilitate continuous improvement, Winbond conducted its first-ever human rights due diligence survey for all employees in 2022. The results of this survey did not reveal any high-risk issues. However, Winbond remains committed to optimizing and minimizing the occurrence and impact of six important human rights issues. For detailed information on the investigation process, improvement measures, and tracking items, please refer to the sections on 5.1 Human Rights Governance and the 2022 Human Rights Due Diligence Report.	5.1 Human Rights Management 5.3 Employee Communication and Relations
	4	The elimination of all forms of forced and compulsory labor.		5.1 Human Rights Management
	5	The effective abolition of child labor.		5.1 Human Rights Management 5.2 Talent Management
	6	The elimination of discrimination in respect of employment and occupation.		5 Human Rights and Social Inclusion
Environment	7	Businesses should support a precautionary approach to environmental challenges.	While engaged in business operations, Winbond actively practices sustainable development to align with international trends. Through corporate citizenship, Winbond aims to enhance national economic contributions, improve the quality of life for employees, communities, and society, and foster sustainable development as a competitive advantage. For further details, please refer to company regulations on Sustainable Development Best Practice Principles.	3 Environmental Sustainability
	8	Undertake initiatives to promote greater environmental responsibility.	Winbond stands shoulder to shoulder with global nations and businesses in implementing green sustainability. They actively reduce the environmental impact of their operational processes, ensuring alignment with the Sustainable Development Goals (SDGs).	3 Environmental Sustainability
	9	Encourage the development and diffusion of environmentally friendly technologies.	Winbond's vision is to "Be a hidden champion in providing sustainable semiconductors to enrich human life." They are committed to developing high-performance, compact, energy-efficient, and high-quality green memory products and processes. Winbond pledges to leverage innovative technology to create energy-saving and low-carbon emission solutions.	2.1 R&D and Innovation
Anti-Corruption	10	Businesses should work against corruption in all its forms, including extortion and	Business Integrity is Winbond's highest ethical standard. The Human Resources department is responsible for fostering a corporate culture of Business Integrity. This involves establishing and developing norms, continuous improvement, monitoring and control, creating proper reporting channels, implementing confidentiality measures, and providing education and training. Winbond adheres to the Responsible Business Alliance (RBA) Code of Conduct and the Business Integrity Guidelines for listed companies. For further details, please refer to the Procedures for Ethical Management and Guidelines for Conduct and Ethical Management Violation Handling Instruction.	1.2 Business Integrity

Appendix 6: Environmental Data

Category	Environmental Performance Index	Unit	2021		2022		2023		2024	
			Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries
Greenhouse Gas (GHG)	Scope 1	tCO_2e	38,760	37,795	44,373	36,326	44,149	18,749	49,316	40,507
	Scope 2	tCO_2e	277,284	37,740	353,523	35,786	356,535	35,567	346,858	85,390
	Scope 3	tCO_2e	451,771	92,268	443,204	90,433	454,221	98,972	405,474	571,768
	PFCs	tCO_2e	12,860	11,430	13,071	11,355	11,631	6,527	11,868	8,217
	Unit production emission (Scope 1 + Scope 2)	kg CO_2e/layer	12.6	-	13.2	-	15.5	-	12.7	-
Energy	Purchased electricity (excluding renewable energy)	GWh	552	74	689	72	720	72	702	188
		GJ	1,988,490	266,926	2,479,988	260,259	2,592,983	258,670	2,527,712	678,216
	Renewable energy (electricity)	GWh	-	-	-	-	2	0.1	44	1
		GJ	-	-	-	-	7,571	447	158,266	3,675
	Natural gas	Ten thousand cubic meters	654	22	854	22	938	27	1,061	489
		GJ	242,327	7,485	314,966	7,526	345,558	9,903	393,096	217,302
	Liquefied petroleum gas	tons	-	-	-	-	-	-	-	936
		GJ	-	-	-	-	-	-	-	47,261
	Fuel oil (heavy oil)	Cubic meters	-	-	-	-	-	-	-	410
		GJ	-	-	-	-	-	-	-	16,498
	Diesel	Cubic meters	55	-	285	-	310	4	132	-
		GJ	1,934	-	10,023	-	10,899	148	4,776	-
	Gasoline/diesel for vehicles	Cubic meters	64	1	67	1	56	1	49	13
		GJ	2,088	37	2,200	26	1,823	35	1,557	416
	Total non-renewable energy consumption	GJ	2,234,839	274,448	2,807,177	267,811	2,951,263	268,756	2,927,142	959,694
	Electricity consumption per unit of production capacity	MJ/layer	79.3	-	82.0	-	100.7	-	85.8	-

Category		Environmental Performance Index	Unit	2021		2022		2023		2024	
				Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries
Water	Withdrawal	By source - Third-party tap water	megaliters	3,293	391	4,131	410	4,356	396	4,564	485
		By source - Groundwater	megaliters	-	-	-	-	-	-	-	3,446
		Usage of ultrapure water	Cubic meters	7,329,565	498,589	6,753,960	485,106	8,416,193	451,900	8,590,883	1,585,360
	Discharge	By endpoint category - Third-party wastewater treatment plant reprocessing	megaliters	2,318	319	3,172	312	2,924	317	3,204	3,591
		By treatment level -Tertiary treatment	megaliters	2,318	-	3,172	-	2,924	-	3,204	-
		By treatment level-Secondary treatment	megaliters	-	319	-	312	-	317	-	3,561
	Consumption	Total water consumption	megaliters	975	72	959	98	1,432	79	1,360	340
		Changes in water storage	megaliters	-	-	-	-	-	-	-	-
	Unit water consumption		Liters/layer	131	-	174	-	170	-	147	-
Waste	General Waste	Recycling volume	tons	4,137	105	4,784	93	7,030	93	7,569	268
		Landfill volume	tons	-	38	-	18	-	67	-	32
		Incineration volume (including energy recovery)	tons	76	163	185	173	172	108	190	1,267
		Incineration volume (excluding energy recovery)	tons	-	-	-	-	-	-	-	-
		Chemical treatment volume	tons	5	-	7	-	6	-	56	722
		Output volume	tons	4,218	306	4,976	284	7,208	268	7,815	2,289
		Recycling rate	%	98.1%	34.3%	96.1%	32.7%	97.5%	34.7%	96.9%	11.7%
		General waste volume per unit of production capacity	kg/layer	0.17	-	0.21	-	0.28	-	0.25	-
	Hazardous Waste	Recycling volume	tons	3,074	542	3,849	503	5,331	387	8,097	479
		Landfill	tons	-	-	-	-	-	-	-	-
		Incineration (including energy recovery)	tons	432	21	756	25	1,054	19	1,132	24
		Incineration (excluding energy recovery)	tons	-	-	-	-	-	-	-	-
		Solidification treatment volume	tons	3	2	3	1	2	1	7	1
		Output volume	tons	3,509	565	4,608	529	6,387	407	9,236	504
		Recycling rate	%	87.6%	95.9%	83.5%	95.1%	83.5%	95.1%	87.7%	95.0%
		Hazardous waste volume per unit of production capacity	kg/layer	0.14	-	0.19	-	0.25	-	0.30	-

Category	Environmental Performance Index	Unit	2021		2022		2023		2024	
			Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries
Waste	Total recycling rate	%	93.3%	74.3%	90.1%	73.3%	90.9%	71.1%	91.9%	26.8%
	Unit production waste volume	kg/layer	0.31	-	0.40	-	0.53	-	0.55	-
Air Pollution	NOx	tons	10.89	2.90	12.18	3.14	13.65	3.36	16.13	3.29
	SOx	tons	0.42	1.46	0.47	1.52	0.54	0.89	0.50	1.75
	VOCs	tons	4.22	3.14	4.26	3.24	4.30	2.74	4.67	2.35
	Unit production VOCs output volume	tons	0.00017	-	0.00018	-	0.00017	-	0.00015	-

Environmental Violations

	Unit	2021		2022		2023		2024	
		Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries	Winbond (Taiwan)	Subsidiaries
Number of significant violations of legal obligations/regulations	Number of violations	0	0	0	0	0	0	0	0
Amount of fines/penalties related to the above	Thousand dollars	0	0	0	0	0	0	0	0

Appendix 7 Public Participation

To enhance the operational quality of Taiwan's industries, our company actively participates in various industry associations and societies, holding positions as directors, supervisors, and representatives in these organizations. Through these industry associations, we exchange operational experiences with peers, share the latest market trends, supply and demand changes, and technological information with the industry, aiming to contribute to the overall industry.

Unit：NT$

Association Name	2021	2022	2023	2024	Type of Organization	Significant role
Taiwan Climate Partnership （TCP）	-	150,000	50,000	50,000	TCP responds to the requirements of international brand customers with practical actions, and at the same time raises the attention of Taiwanese companies and all walks of life to the issue of climate change through international initiatives and linkage.	Served as a director
Business Council for Sustainable Development Taiwan (BCSD Taiwan)	-	-	90,000	60,000	BCSD Taiwan is the sole global alliance partner of the World Business Council for Sustainable Development (WBCSD) in Taiwan. It was established with the purpose of assisting Taiwanese businesses in developing sustainable strategies and introducing international market standards and research institutions' guidelines on sustainability-related issues.	Served as a member
The Allied Association for Science Park Industries	540,000	540,000	540,000	540,000	The Association serves as a bridge for communication of policies and feedback between the government and industry.It coordinates industry efforts and promotes the stable development of science park industries.	Served as a director
Taiwan Semiconductor Industry Association (TSIA)	320,000	320,000	320,000	320,000	TSIA activities are aimed at building consensus on industry development in order to promote cooperation in competition and the sound development of the industry as a whole.	Served as a director
Taiwan Electrical and Electronic Manufacturers' Association (TEEMA)	84,000	84,000	84,000	84,000	TEEMA serves as a bridge between the government and the industry. It provides members with a diverse range of services on expanding international trade, promoting international relations, supporting industry development, information services, legal advice, and talent development.	Winbond: Serving as Advisor Nuvoton: Serving as Representative
Chinese National Association of Industry and Commerce (CNAIC)	-	63,200	40,000	40,000	Dedicated to promoting Taiwan's economic development and international trade relations. The association acts as a bridge between the government and businesses, providing economic and financial policy recommendations, and fostering international industrial cooperation and trade exchanges.	Served as a member
Global Semiconductor Alliance(GSA)	735,000	782,250	808,500	992,250	GSA is a leading industry organization dedicated to creating a highly efficient, profitable, and sustainable global ecosystem for the semiconductor and high-tech industries. It brings together global industry leaders to foster innovation and accelerate industry growth.	Served as a member
Semiconductor Equipment and Materials International (SEMI)	-	-	689,073	663,264	SEMI is a global industry association dedicated to connecting member companies and professionals in the semiconductor and electronic design and manufacturing supply chain to drive industry development. Through initiatives in advocacy, talent development, sustainability, and supply chain management, SEMI promotes collaboration and innovation among industry members, enhancing the competitiveness of the semiconductor industry in Taiwan and globally.	Served as a member

Micro Sensors and Actuators Technology Consortium (MEMS)	20,000	20,000	20,000	20,000	The MEMS provides technical services and talent training that cover the upstream, midstream, and downstream industries of micro sensors and actuators. This includes design, manufacturing, packaging, and testing, playing a role in technical support and resource integration.	Served as a member
Japan Electronics and Information Technology Industries Association (JEITA)	1,519,060	1,713,768	2,007,314	2,984,671	As one of the largest industry associations in Japan, they aim to be a platform that brings together diverse stakeholders, with the IT and electronics industries at its core, in order to solve social issues toward Society 5.0.	Served as a member
Semiconductor Industry Association in Japan (JSIA)	-	-	-	-	As one of JEITA's subcommittees, its purpose is to address not only immediate issues but also medium to long-term challenges commonly faced by the Japanese semiconductor industry.	Served as a director
The Institute of Electrical Engineers of Japan	-	6,363	6,363	6,363	An academic corporation in Japan, established in 1888, composed of scholars and engineers. Its purpose is to contribute to society through research and investigative activities in the field of electrical engineering, including electronics, information, energy, and environment, as well as the presentation of results, from an international perspective.	Served as vice chairman
Total Amount	3,218,060	3,679,581	4,655,250	5,760,548		

Note The data is presented in New Taiwan Dollars (NTD). The financial data of Nuvoton Japan is converted using Winbond Group's 2024 average exchange rate of 1 Japanese Yen to 0.2121 NTD.

Costs of Association Participation

Unit：NT$

Category	2021	2022	2023	2024
Trade associations or tax-exempt groups	3,218,060	3,679,581	4,655,250	5,760,548
Lobbying, interest representatives, or similar	0	0	0	0
Local, regional, or national political campaigns/ candidates	0	0	0	0
Others (e.g., spending related to ballot measures or referendums)	0	0	0	0

Direct Lobbying and Trade Association Involvement – Climate-Related Issues

Winbond has established management systems for direct lobbying and trade association engagement that cover Winbond and its subsidiaries' global operations. Ensure that lobbying content is in line with Winbond's Sustainability Policy and the Paris Agreement, review and update association participation on an annual basis to ensure consistency with Winbond's position and approved by the Chairman of the Board of Directors. If an association's position on climate change-related issues differs from the company's, Winbond will endeavor to communicate and coordinate with the association, and if it is not possible to reach a consensus, Winbond will withdraw from the association.

	Name	Consistency Results
1	Semiconductor Equipment and Materials International (SEMI)	Recognizes climate risks, supports the Paris Agreement, established the Semiconductor Climate Consortium (SCC), and promotes the Pathway to Net Zero through conferences and public advocacy.
2	Taiwan Semiconductor Industry Association	Recognizes climate risks, supports net zero goals, provides recommendations for government policies on net zero and energy, and holds conferences to promote the Pathway to Net Zero.
3	Taiwan Electrical and Electronic Manufacturers' Association	Taiwan Electrical and Electronic Manufacturers' Association Recognizes climate risks, supports net zero goals, provides recommendations for government policies on net zero and energy, and holds conferences to promote the Pathway to Net Zero.
4	Taiwan Institute for Sustainable Energy	Recognizes climate risks, supports the Paris Agreement, established the Taiwan Alliance for Net Zero Emissions, and promotes the Pathway to Net Zero through conferences and public advocacy.
5	Chinese National Association of Industry and Commerce	Chinese National Association of Industry and Commerce Recognizes climate risks, supports the Paris Agreement, and promotes the Pathway to Net Zero through conferences and public advocacy.
6	The Business Council for Sustainable Development	Recognizes climate risks, supports net zero goals, and conducts initiatives and promotes the Pathway to Net Zero through conferences.
7	Taiwan Climate Partnership	Recognizes climate risks, promotes the Pathway to Net Zero through conferences.

Appendix 8 Implementation of IFRS (International Financial Reporting Standards) Sustainability Disclosure Standards

- According to the "Blueprint for Taiwan's Adoption of IFRS Sustainability Disclosure Standards" issued by the Financial Supervisory Commission on August 17, 2023, Winbond (Taiwan), as a company with a paid-in capital of over NT$10 billion, should apply IFRS Sustainability Disclosure Standards in 2026 (i.e., disclose 2026 sustainability information prepared in accordance with IFRS Sustainability Disclosure Standards in the 2027 annual report sustainability information chapter). Winbond (Taiwan) will continue to monitor the implementation of the introduction plan in accordance with the reference guidelines and relevant regulations issued by the competent authorities.
- To ensure the smooth introduction of IFRS Sustainability Disclosure Standards, Winbond's response strategies include establishing a cross-departmental project team, regularly reporting progress to the board of directors to ensure the promotion and implementation of the introduction work; in addition, Winbond promotes internal education and training to enhance the understanding of the standards among relevant personnel, and cooperates with external consultants to assist Winbond in efficiently completing the introduction process; in the future, Winbond will continue to improve the governance process of sustainability risks and opportunities, internal control, and operational processes.

Phase	Tasks	Execution Steps and Procedures	Expected (Completed) Timeline
Phase One: Analysis and Planning	1-1. Establish a cross-departmental project team to adopt IFRS Sustainability Disclosure Standards.	1. Hold a meeting for senior management on the adoption of IFRS Sustainability Disclosure Standards and obtain support from the Board of Directors and the Audit Committee. 2. Select suitable members for the project team. 3. Convene the first project team meeting. 4. Assign responsibilities, confirm the duties of each member, and establish an operational model.	Completed in Q4 2024
	1-2. Initially identify significant differences and impacts between current sustainability information and IFRS Sustainability Disclosure Standards.	1. Understand the requirements of IFRS Sustainability Disclosure Standards, including exemptions in IFRS S1 and S2, such as the option to disclose only climate-related risks and opportunities in the first year and the exemption from disclosing Scope 3 greenhouse gas emissions in the first year. 2. Identify significant differences and potential impacts between Winbond's current sustainability information (e.g., prepared according to GRI, TCFD, or SASB) and IFRS Sustainability Disclosure Standards.	Expected to be completed in Q2 2025
	1-3. Initially identify reporting entities.	1. Initially identify reporting entities (according to IFRS Sustainability Disclosure Standards, reporting entities must be the same as those in consolidated financial statements). 2. Actively communicate with subsidiaries to collaborate on the implementation of the IFRS Sustainability Disclosure Standards at each stage of the project.	Expected to be completed in Q3 2025
	1-4. Develop an implementation plan.	1. Develop an implementation plan based on Winbond's operational scale and the opinions of internal and external professionals.	Expected to be completed in Q4 2025
Phase Two: Design and Execution	2-1. Identify sustainability-related risks and opportunities and financial impacts, and assess significant sustainability-related financial information.	Identify significant information on sustainability-related risks and opportunities that could reasonably be expected to affect Winbond's outlook, covering aspects such as "governance, strategy, risk management, and metrics and targets." Specifically, Winbond will sequentially execute the following procedures: 1. Identify the aforementioned sustainability-related risks and opportunities. When identifying, refer to the industry disclosure topics in the Sustainability Accounting Standards Board (SASB) standards and consider their applicability. Winbond also determines the scope of the value chain related to each of these sustainability-related risks and opportunities (including greenhouse gas inventory). 2. Identify the potential impacts of sustainability-related risks and opportunities on current and anticipated financials. 3. Assess significant information related to the aforementioned sustainability-related risks and opportunities (considering whether such information could reasonably be expected to influence the decisions of investors, lenders, and creditors).	Expected to be completed in Q3 2026

Phase	Tasks	Execution Steps and Procedures	Expected (Completed) Timeline
Phase Two: Design and Execution	2-2. Identify and collect required data.	1. Based on the significant sustainability-related financial information assessed in 2-1, identify the data within the reporting boundary and value chain that Winbond needs to collect. 2. Ensure that the data to be collected meets the requirements of IFRS Sustainability Disclosure Standards and relevant sustainability regulations. 3. Identify and consider data collection sources, and arrange the data collection schedule in line with the sustainability information reporting timeline (e.g., climate-related scenario analysis, greenhouse gas emissions). 4.Evaluate the connection between the collected sustainability-related data and the data used in financial reporting (e.g., input values and parameters).	Expected to be completed in Q4 2026
	2-3. Revise and adjust Winbond processes, financial and non-financial reporting processes, information systems, supply chain management processes, internal controls, and daily operations of various departments.	1. Propose solutions to the operational impacts of adopting IFRS Sustainability Disclosure Standards, identify necessary adjustments to related processes and systems, and execute the necessary adjustments.	Expected to be completed in Q1 2027
Phase Three: Implementation	3-1. Pilot the preparation of a dedicated sustainability information section in the annual report.	1. Pilot the preparation of a dedicated sustainability information section in the annual report according to IFRS Sustainability Disclosure Standards and use it as a basis for improving the reporting process for formal announcements and submissions.	Completed in Q4 2024
	3-2. Continuously update the internal control operation manual related to IFRS sustainability information and conduct education and training.	1. Adjust and modify internal control processes according to IFRS Sustainability Disclosure Standards, update or create relevant operation manuals, such as establishing and modifying approval authorities in the reporting process (including the data collection stage). 2. Evaluate and schedule training plans for relevant Winbond members and conduct education and training.	Expected to be completed in Q2 2025
Phase Four: Adjustment and Improvement	4-1. Announce and report the dedicated sustainability information section in the annual report.	1. Disclose relevant information in the dedicated sustainability information section of the 2026 annual report according to IFRS Sustainability Disclosure Standards and complete the announcement and submission simultaneously with the 2026 financial statements.	Expected to be completed in Q3 2025

Appendix 9 Assurance Statement

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By Royal Charter

INDEPENDENT ASSURANCE OPINION STATEMENT

Winbond 2024 Sustainability Report

The British Standards Institution is independent to Winbond Electronics Corporation (hereafter referred to as Winbond in this statement) and has no financial interest in the operation of Winbond other than for the assessment and verification of the sustainability statements contained in this report.

This independent assurance opinion statement has been prepared for the stakeholders of Winbond only for the purposes of assuring its statements relating to its sustainability report, more particularly described in the Scope below. It was not prepared for any other purpose. The British Standards Institution will not, in providing this independent assurance opinion statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used, or to any person by whom the independent assurance opinion statement may be read.

This independent assurance opinion statement is prepared on the basis of review by the British Standards Institution of information presented to it by Winbond. The review does not extend beyond such information and is solely based on it. In performing such review, the British Standards Institution has assumed that all such information is complete and accurate.

Any queries that may arise by virtue of this independent assurance opinion statement or matters relating to it should be addressed to Winbond only.

Scope

The scope of engagement agreed upon with Winbond includes the followings:

1. The assurance scope is consistent with the description of Winbond 2024 Sustainability Report.
2. The evaluation of the nature and extent of the Winbond's adherence to AA1000 AccountAbility Principles (2018) and the reliability of specified sustainability performance information in this report as conducted in accordance with type 2 of AA1000 AS v3 sustainability assurance engagement.

This statement was prepared in English and translated into Chinese for reference only.

Opinion Statement

We conclude that the Winbond 2024 Sustainability Report provides a fair view of the Winbond sustainability programmes and performances during 2024. The sustainability report subject to assurance is materially correct without voluntary omissions based upon testing within the limitations of the scope of the assurance, the information and data provided by the Winbond and the sample taken. We believe that the performance information of Environment, Social and Governance (ESG) are correctly represented. The sustainability performance information disclosed in the report demonstrate Winbond's efforts recognized by its stakeholders.

Our work was carried out by a team of sustainability report assurors in accordance with the AA1000AS v3. We planned and performed this part of our work to obtain the necessary information and explanations we considered to provide sufficient evidence that Winbond's description of their approach to AA1000AS v3 and their self-declaration in accordance with GRI Standards were fairly stated.

Methodology

Our work was designed to gather evidence on which to base our conclusion. We undertook the following activities:

- a top level review of issues raised by external parties that could be relevant to Winbond's policies to provide a check on the appropriateness of statements made in the report.
- discussion with managers on Winbond's approach to stakeholder engagement. Moreover, we had sampled 1 external stakeholder to conduct interview.
- interview with 57 staffs involved in sustainability management, report preparation and provision of report information were carried out.
- review of materiality assessment process.
- review of key organizational developments.
- review of the extent and maturity of the relevant accounting systems for financial and non-financial reports.
- review of the findings of internal audits.
- the verification of performance data and claims made in the report through meeting with managers responsible for gathering data.
- review of the processes for gathering and ensuring the accuracy of data, followed data trails to initial aggregated source and checked sample data to greater depth during site visits.
- the consolidated financial data are based on audited financial data, we checked that this data was consistently reproduced.
- review of supporting evidence for claims made in the reports.
- an assessment of the organization's reporting and management processes concerning this reporting against the principles of Inclusivity, Materiality, Responsiveness, and Impact as described in the AA1000AP (2018).

Conclusions

A detailed review against the Inclusivity, Materiality, Responsiveness, and Impact of AA1000AP (2018) and sustainability performance information as well as GRI Standards is set out below:

Inclusivity

In this report, it reflects that Winbond has continually sought the engagement of its stakeholders and established material sustainability topics, as the participation of stakeholders has been conducted in developing and achieving an accountable and strategic response to sustainability. There are fair reporting and disclosures for the information of Environment, Social and Governance (ESG) in this report, so that appropriate planning and target-setting can be supported. In our professional opinion the report covers the Winbond's inclusivity issues and has demonstrated sustainable conduct supported by top management and implemented in all levels among organization.

Materiality

The Winbond publishes material topics that will substantively influence and impact the assessments, decisions, actions and performance of Winbond and its stakeholders. The sustainability information disclosed enables its stakeholders to make informed judgements about the Winbond's management and performance. In our professional opinion the report covers the Winbond's materiality assessment process and material issues.

Responsiveness

Winbond has implemented the practice to respond to the expectations and perceptions of its stakeholders. An Ethical Policy for the Winbond is developed and continually provides the opportunity to further enhance Winbond's responsiveness to stakeholder concerns. Topics that stakeholder concern about have been responded timely. In our professional opinion the report covers the Winbond's responsiveness issues.

Impact

Winbond has identified and fairly represented impacts that were measured and disclosed in probably balanced and effective way. Winbond has established processes to monitor, measure, evaluate, and manage impacts that lead to more effective decision-making and results-based management within an organization. In our professional opinion the report covers the Winbond's impact issues.

Performance information

Based on our work described in this statement and with no conflict of interest with the Winbond in relation to providing the assurance of ESG performance information, which has been assured, specified sustainability performance information such as GRI Standards disclosures disclosed in this report, Winbond and BSI have agreed upon to include in the scope. In our view, nothing has come to our attention that the data and information contained within Winbond 2024 Sustainability Report were no significant errors, omissions, or misstatements based on procedures undertaken by means of vouching, re-tracking, re-computing and confirmation.

GRI Sustainability Reporting Standards (GRI Standards)

Winbond provided us with their self-declaration of in accordance with GRI Standards 2021 (For each material topic covered in the applicable GRI Sector Standard and relevant GRI Topic Standard, including the disclosures of applicable economic, environmental, and social information, comply with all reporting requirements for disclosures). Based on our review, we confirm that sustainable development disclosures with reference to GRI Standards' disclosures are reported, partially reported, or omitted. In our professional opinion the self-declaration covers the Winbond's sustainability topics.

Assurance level

The moderate level assurance provided is in accordance with AA1000AS v3 in our review, as defined by the scope and methodology described in this statement.

Responsibility

This sustainability report is the responsibility of the Winbond's chairman as declared in his responsibility letter. Our responsibility is to provide an independent assurance opinion statement to stakeholders giving our professional opinion based on the scope and methodology described.

Competency and Independence

The assurance team was composed of auditors experienced in relevant sectors, and trained in a range of sustainability, environmental and social standards including AA1000AS, ISO 14001, ISO 45001, ISO 14064, and ISO 9001. BSI is a leading global standards and assessment body founded in 1901. The assurance is carried out in line with the BSI Fair Trading Code of Practice

For and on behalf of BSI:

Peter Pu, Managing Director BSI Taiwan

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2025-04-15

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