winbond

2022

Winbond Electronics Corporation

Corporate Sustainability Report

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Message from the Chairman and CEO

It has been over 35 years since Winbond's establishment in 1987. The recent challenges have deviated from tradition: the shift from globalized to regionalized supply chains, the COVID-19 pandemic, regional conflicts, economic changes caused by interest rate hikes and inflation, and the damages of climate change—all vividly present. However, I believe that constant change is the norm in the world, and compared to the changes faced by century-old companies that can withstand the test of time, the fluctuations of a few years are still relatively small. Companies do not need to deliberately talk about transformation; instead, they should focus on the foundation of sustainable existence. The key still lies in whether we can maintain a high level of insight and adaptability, continuously monitor and adjust accordingly.

Therefore, "sustainability" is a multifaceted concept for us. It represents a spirit of enduring enterprise that transcends time, aiming to maintain the ability to continuously create value in a changing world, inspiring us to become pillars of sustainable development in human society. It reminds us to wisely utilize resources and cherish our one and only Earth. Winbond embody this spirit through the following five aspects: “Conduct business with integrity and ethical behavior,” “Accountable teamwork,” “Enthusiasm of learning,” “Aggressively innovate,” “Sustainable contribution.” Integrity establishes our foundation, accountability drive practical implementation, learning expands our horizons, and innovation keeps us up to date. Most importantly, it is crucial for all colleagues to constantly remember how to contribute to society with their own abilities, as this is the core key to the long-term existence of the company.

With this belief, we have recently embraced the vision of being an "Be a hidden champion in providing sustainable semiconductors to enrich human life" and actively invested in the development of green products and technologies. We aim to practice the core competitiveness of safe and low-carbon technologies through applications in data processing, communications, transportation, smart living, and more. Gradually, we respond to the high demand of contemporary society for environmental sustainability. In order to ensure that all colleagues understand this belief, we will establish the product carbon footprint as a key measure of innovative value and implement a systematic carbon performance management process. This will enable every employee to clearly understand that prioritizing green initiatives is of utmost importance and to internalize this mindset, naturally shaping the company's culture of sustainability.

Employees are the carriers of corporate culture, so Winbond highly emphasize their development. We believe that if a company is willing to invest a large and wide range of educational resources in its employees, encourage their passion for learning, and support their continuous growth within the company, it will surpass academic qualifications and experiences obtained in the same amount of time from schools or the external world. Additionally, through emphasizing opportunities for job rotation between departments, we ensure that theory and practice complement each other, enabling all colleagues to possess abundant capabilities.

Social sustainability is the foundation for the sustainability of a company, and the sustainability of employees is crucial for the continuity of the company's spirit. That's why we are committed to developing green products responsibly and dedicated to creating a joyful learning environment in the workplace. Having the ability to give back to society is the trajectory for stable growth of the company. In the future, as humanity continues to explore and develop various possibilities, our company will maintain its spirit of sustainability and, with innovative capabilities, join forces with all sectors to enrich and improve the lives of all human beings.

Arthur Yu-Cheng Chiao
Chairman and CEO

Message from the President

Looking back on the pivotal events of 2022, it became evident that the global movement towards decarbonization had gained significant momentum as a response to the pressing challenges of climate change confronting the world. Simultaneously, a growing awareness of human rights and an escalating demand for green-collar experts were driving positive change across various industries. Issues pertaining to corporate fairness, justice, and employee rights were increasingly capturing public attention day by day. Meanwhile, as we move into 2023, the market is facing additional hurdles with the impact of war and inflation leading to fluctuations. Companies endeavor to display resilience, proactively addressing risks and challenges with efficiency and effectiveness. Their ability to delivering sophisticated solutions and adeptly meet clients' expectations was critical in turbulent times.

Winbond actively participated in the Taiwan Climate Partnership (TCP) and has served as a board member in its inaugural term. Also, with the dedicated ESG department established, we continuously monitor domestic and international Environmental Social and Governance (ESG) trends and regulatory policies, laying a solid foundation to plan and execute our ESG strategy projects. In addition, Winbond commits to enhancing its core technological competitiveness to differentiate from competitors, including R&D innovation, and zero-defect quality; integrates such elevations into our development pathway; and upholds our corporate vision“Be a hidden champion in providing sustainable semiconductors to enrich human life.” There will be a myriad of challenges ahead waiting for us in the future, however, Winbond shall advance with confidence toward its goal and meet stakeholders’ demands and expectations.

E Green Innovation and Development

To implement carbon management systems, Winbond has utilized digital tools to analyze and achieve carbon reduction. In 2022, Winbond collaborated with Microsoft to establish the Carbon Emissions Information Platform, which accurately calculates the carbon emissions throughout each IC production process, prioritizing potential carbon reduction hotspots within product life cycle. For instance, GHG emissions can be reduced by implementing local scrubber equipment that supports in the treatment of exhaust gas during the manufacturing process. In terms of energy, Winbond has established dedicated departments responsible for green energy investment and renewable energy certificates purchase. With diligently R&D on smaller chips and enhancement design on product packaging, we can save materials, reduce testing time, and minimize power consumptions. Winbond commits to green manufacturing through advancing process technology, reducing production time, and implementing energy-saving measures. Winbond aims to complete ISO 14067 Product Carbon Footprint verification in 2023.

S Talent Development and Social Participation

Talent is a crucial asset for businesses, and Winbond values human rights and embed such topic into our corporate management framework. In 2022, we saw a significant boost in the employment rate of people with disabilities at Winbond. Furthermore, our Central Taiwan Science Park (CTSP) fab attained a perfect score in the RBA VAP platinum certificate and completed human rights due diligence.

In terms of talent recruitment, Winbond has implemented industry-academia cooperation to collaborate with schools in nurturing students through programs such as industry expert courses, scholarships, and internship opportunities. Also, Winbond provides specialized assistances for international employees on relocation during on-board process, ensuring a hassle-free working environment. In recent years, Winbond has built an environment for lifelong learning and interdisciplinary practical engagement, through various licensed software and platforms installed, and development programs organized, encouraging employees to continuously improve their skills and apply their knowledge in their work.

Nowadays, the scope of work extends beyond livelihood considerations and also encompasses the pursuit of personal values. In 2022, Winbond organized the Hou-Feng Bike Path Adoption program, attracting over 300 employees and their families to participate; and host activities such as river cleanup and birdwatching in collaboration with the Society of Wilderness. Winbond wishes to reinforce employees' self-worth, promote family harmony, create a joyful working dynamic, and contribute to society via collective efforts through diverse social engagement opportunities.

G Excellent R&D to Meet Market Demands

To strengthen operational stability through risk management, Winbond has established a centralized risk management organization responsible for coordinating research on regulations, response measures, and supporting risk management across subsidiaries. Risk management units have been established within each department to address the challenges of regulatory and risk differences around the globe. For example, Risk Management Committee is instituted under the Board of Directors, along with and ESG Committee, all units monitor risks collaboratively, ensuring better resource utilization and responses lead time.

To mitigate the impact of climate change and energy transition (such as water and electricity shortages), Winbond has implemented corresponding measures, including securing long-term natural water sources, and a 45-thousand-ton underground on-site reservoir that can sustain Kaohsiung Fab's operations for four months, under the government's Level 3 alert where 15% of water is rationing.

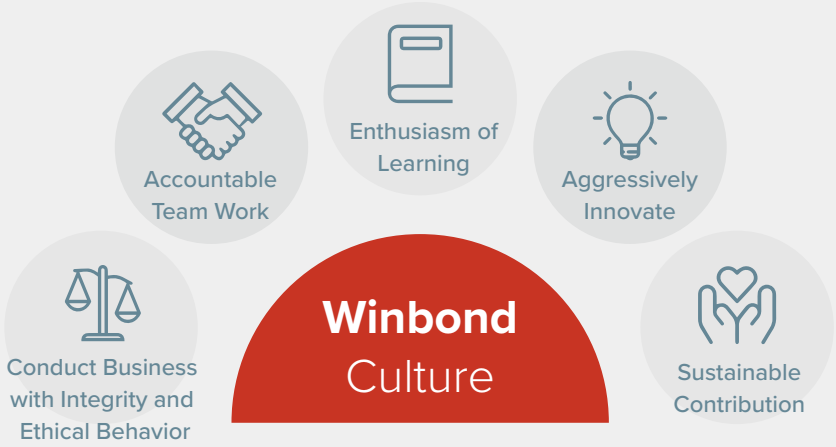
Winbond is committed to expanding product lines to address fast-changing markets realities. In addition to existing consumer products, Winbond has aggressively developed high-end products for industries such as automotive, industrial application, and medical care. Furthermore, Winbond pays close attention and actively responds to the demand of green products from customer, hence preserving strong customer relationship. Also, by leveraging data science technology, Winbond optimizes production scheduling, machine condition prediction, and improves factory management efficiency. Digital transformation has also been extensively applied across departments to enhance work efficiency, and this effort has yielded significant outcomes.

James Pei-Ming Chen
President

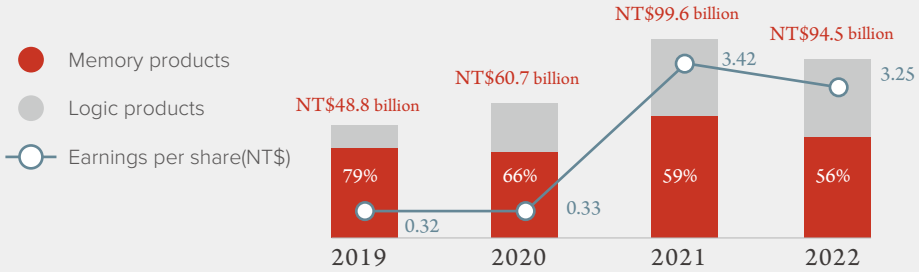
Company Profile

Corporate Culture and Vision

The corporate culture of Winbond Electronics Corporation ("Winbond") is defined by "business integrity, accountable team work, enthusiasm for learning, aggressive innovation, and contribution to sustainability," which also serves as Winbond's core value, belief, and conduct.



Business Performance in 2022



Leading Position

Global **TOP1** NOR Flash supplier

Global **TOP5** DRAM supplier

Revenue
NT$94.53 billion

Corporate Governance
Ranked top 6-20% in TWSE Corporate Governance Evaluation

Earnings per share
NT$3.25

Net Profit
NT$15 billion

Product Information

Main products

Code Storage Flash Memory, TrustME® Secure Flash, Specialty DRAM, and Mobile DRAM

Link to product information			
Code Storage Flash Memory	TrustME® Secure Flash Memory	Specialty DRAM	Mobile DRAM

Application scope

Handheld applications, consumer electronics, computer peripherals, and automotive and industrial-use electronics, which are all fields that have extremely high standards for product quality

Link to product applications				
Automotive	Industrial	Communication	Computer	Consumer

Important Events of Winbond

1987
- Established in Hsinchu Science Park

1995
- Listed on Taiwan Stock Exchange (TWSE)

2004
- Built a 12-inch fab in CTSP

2006
- Official operation of the 12-inch wafer fab in CTSP

2008
- Logic product business spun off as Nuvoton Technology Co. established

2010
- WEC transformed to be a Specialty Memory provider
- Nuvoton Technology Co. listed on TWSE

2013
- Successful verification of DRAM product with self-developed 46nm process technology.

2017
- Won the top 5% excellent companies in the 3rd corporate governance evaluation of listed companies and OTC companies included in the constituent stocks list of "Taiwan Corporate Governance 100 Index" and "Taiwan High Salary 100 Index"

2018
- Mass production of DRAM product with self-developed 25nm process technology
- Groundbreaking ceremony for the Kaohsiung Fab
- Winbond 1.2V Serial NOR Flash won "The 2018 World Electronics Achievement Award for Memory of the Year" from the ASPENCORE Double Summits

2019
- Worldwide Top 1 NOR Flash Supplier

2021
- Worldwide Top 5 DRAM Supplier
- Worldwide Top 1 NOR Flash supplier
- Kaohsiung Fab received the quality management system and EHS management system certificate.

2023
- Winbond Group recognized as a "**Top 100 Global Innovators**" from Clarivate

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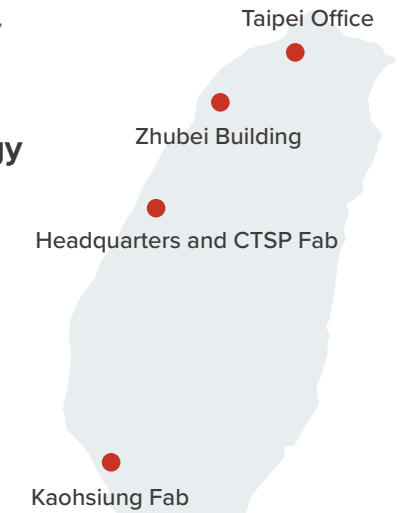

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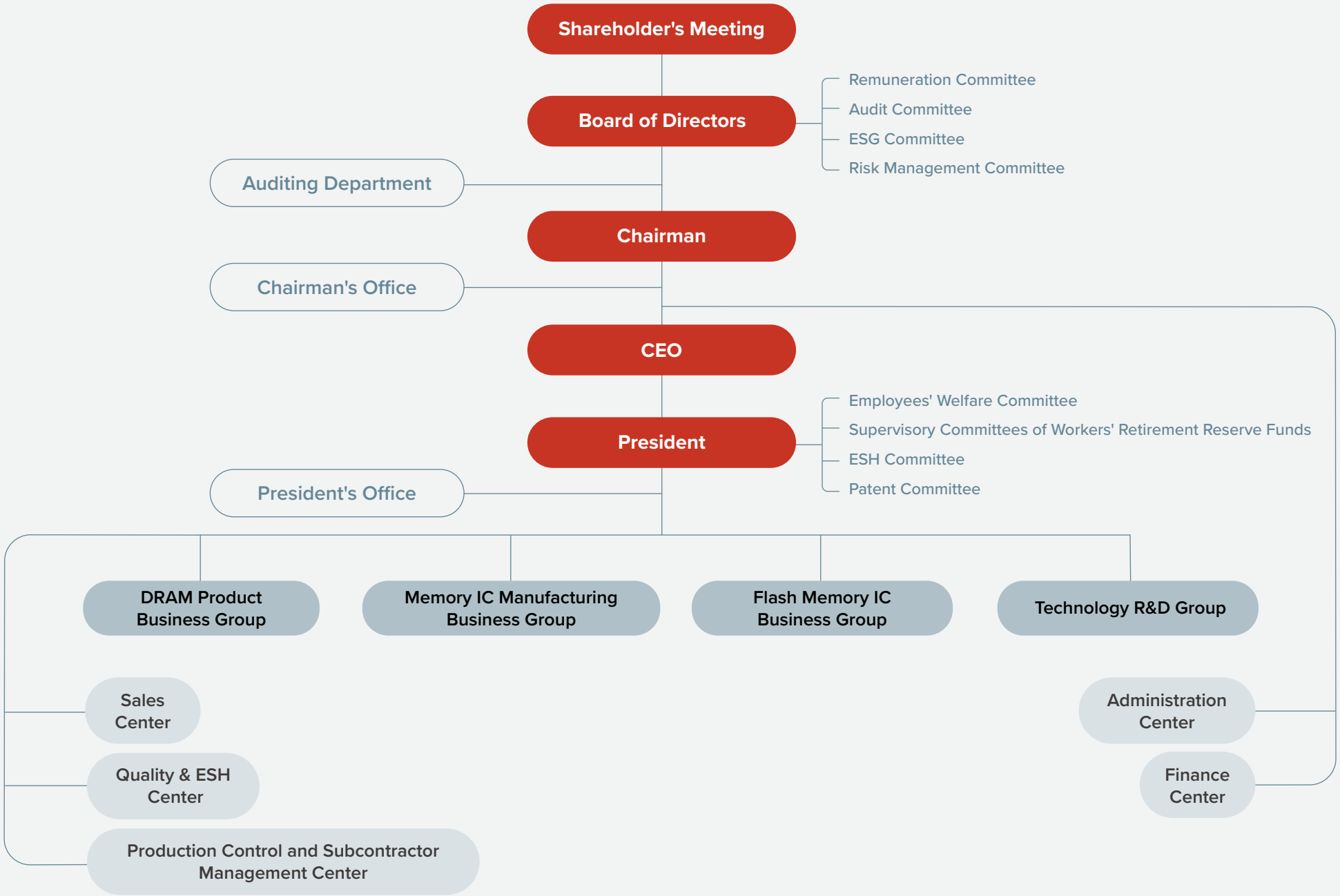
Winbond Organization Chart



December 31, 2022

Winbond's Values

Embracing Future Trends, Practicing Core Values

Observing market trends for the new generation of products, Winbond has continuously invested resources into semiconductor design, manufacturing technologies, and sustainable innovations for products, providing customers with low-carbon and low-power-consumption green products while creating competitive advantages and increasing our market share in green business opportunities. Winbond strives for continuous improvement to enhance overall sustainable competitiveness.

Design and Development Focus

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

Product Innovation Advantages

- Utilize raw materials with low carbon emissions
- Enhance product performance
- Increase product energy efficiency
- Reduce production energy consumption
- Achieve smaller sizes

	Automotive Electronics	Industrial Electronics	5G Communications	IoT	Consumer Electronics
Technology Platforms					
Explanation	From vehicle body to power systems, to 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.	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.	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.	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.	For consumer products, Winbond delivers more powerful, energy-efficient, and feature-rich solutions, offering an enhanced product experience.
Applications and Products	• Vehicle-to-Everything (V2X) • Advanced driver-assistance systems (ADAS) • Vehicle dashboards • In-Vehicle Infotainment (IVI) systems • Telematics • Automotive sensing components • Automotive gateways	• Real-time sales information devices • Smart factories • Smart dashboards • Programmable logic controllers • Graphical user interfaces • Industrial gateways • Industrial machine vision • Industrial computers • Surveillance cameras	• 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	• Smart cities • Smart transportation systems • Self-driving cars • Smart factories • Telehealth • Smart home • Smart meter	• Smartphones • Smartwatches • AR smart glasses • Tablet computers • Smart TV • Smart home • Satellite navigation • Digital cameras • True wireless earphones • Set-top boxes

2022 Awards and Recognition

Sustainability Recognition

Taiwan Corporate Sustainability Awards

- TCSA Corporate Sustainability Report Award (Electronics): - Platinum
- Top 100 Sustainability Model Award
- People Development Award

Responsible Business Alliance (RBA)

Platinum, VAP (Validated Assessment Program)

FTSE4Good

Selected as

- Constituent company of FTSE4Good Index Series
- Constituent company of FTSE4Good TIP Taiwan ESG Index

Carbon Disclosure Project (CDP)

Achieved B List (Management Level) in "Climate Change"

British Standards Institution (BSI)

2022 BSI Sustainable and Resilient Outstanding Award

Taiwan Continuous Improvement Award

2 Golden Tower Awards
2 Silver Tower Awards

Corporate Governance

Taiwan Stock Exchange Corporation (TWSE)

Selected as

- Constituent company of the TWSE Corporate Governance 100 Index
- Constituent company of TWSE RAFI® Taiwan High Compensation 100 Index
- Ranked top 6~ 20% of listed companies of the 9th Corporate Governance Evaluation

Product Innovation

Clarivate

Top 100 Global Innovators

SESIP

TrustME® W77Q Secure Flash obtained SESIP Level 2 certification

Intellectual Property Office, MOEA TIPO

TIPO Top 100 Patent Applicants in 2022:

- 17th Place among the Applicants of the Taiwanese Juridical Persons
- 16th Place among the Patentees of the Taiwanese Juridical Persons

OFweek China IoT & AI Awards 2022

TrustME® W77Q Secure Flash won the 2022 Innovative Technology Product Award

Elecfans

HYPERRAM™ 3.0 won the 2022 China IoT Innovation Award

Sustainability Performance

Environmental

2.1 million tons CO_2e Reduction

Since 2006, Winbond has participated in Taiwan Semiconductor Industry Association (TSIA) and the World Semiconductor Council (WSC) PFCs emission reduction projects, and has reduced a total of about 2.1 million tons CO_2e

380 GWh electricity Saving

From 2018 to 2022, a total of 380 million GWh of electricity has been saved, which is equivalent to the annual electricity consumption of 108,361 households

Develop **Carbon Emissions Information Platform**

Winbond collaborates with Microsoft to develop Carbon Emissions Information Platform

Rooftop solar power system generated a total of **660,000 kWh**

Central Taiwan Science Park Facility has installed rooftop solar power generation equipment, and the power generation capacity reached 660,000 kWh in 2022

Water Recycling Rate reached **80.5%**

The water recycling volume reached 11.15 million cubic meters, and the plant-wide water recycling rate reached 80.5%

Water Conservation of **3,530 megaliters**

Cumulative water conservation of 3,530 megaliters from 2018 to 2022

Waste recycling rate **90.1%**

8,633 metric tons of waste were recycled, resulting in a recycling rate of 90. 1%

ISO 50001

Certified ISO 50001 Energy Management System in 2022

Social

100% coverage of human rights due diligence investigation

In 2022, human rights due diligence were implemented for all employees for the first time

Childcare subsidy has exceeded **290 million**

Provide employees' children with a "childcare subsidy" of 6,000 NT per month. From 2011 to 2022, a total of NT$ 298,832,873 has been paid

82% utilization rate of LOHAS leave in 2022 (7 days LOHAS leave per year)

The average salary of non-supervisors is **1.93 million**

The average salary of non-supervisor full-time employees is 1.93 million

Weighted employment of disabled individuals increased by **147%**

By the end of 2022, there will be 32 employees with disabilities on the job, and the number of employees weighted according to the degree of disability will be 47

Invest nearly **NT$10 million**

Nurturing cross-disciplinary talent in the semiconductor field, collaborating with National Cheng Kung University to promote the 'Semiconductor Program'

The average training hours of staff is **42 hours**

Human Rights Due Diligence Report

First independent Human Rights Due Diligence report published in 2023

Governance

TCFD Report

Publish the first independent TCFD Report in 2023

Winbond **Zero-carbon family day**

The first purchase of blue carbon credits to offset the carbon emissions for the family day, to achieve a zero-carbon family day

Investing **NT$555 million** in green energy development

Investing in renewable energy development projects and continuing alliances and exchanges with green industry suppliers

NT$20 billion sustainability-linked syndicated loan

Signed a NT$20 billion sustainability-linked syndicated loan joint credit agreement with 11 banks, and maintained sustainable performances such as carbon reduction, power saving and corporate governance

Taiwan Climate Partnership (TCP)

Join the Taiwan Climate Partnership in 2022, and the chairman served as a member of the alliance

1,000 tons of CO_2e blue carbon credits

Invested in Pakistan's mangrove conservation project, which is currently the largest blue carbon project in the world

ISO 27001

Certified ISO 27001 Information Security Management System , and set up Chief Information Security Officer

Winbond Group selected as one of the **Top 100 Global Innovators from Clarivate**

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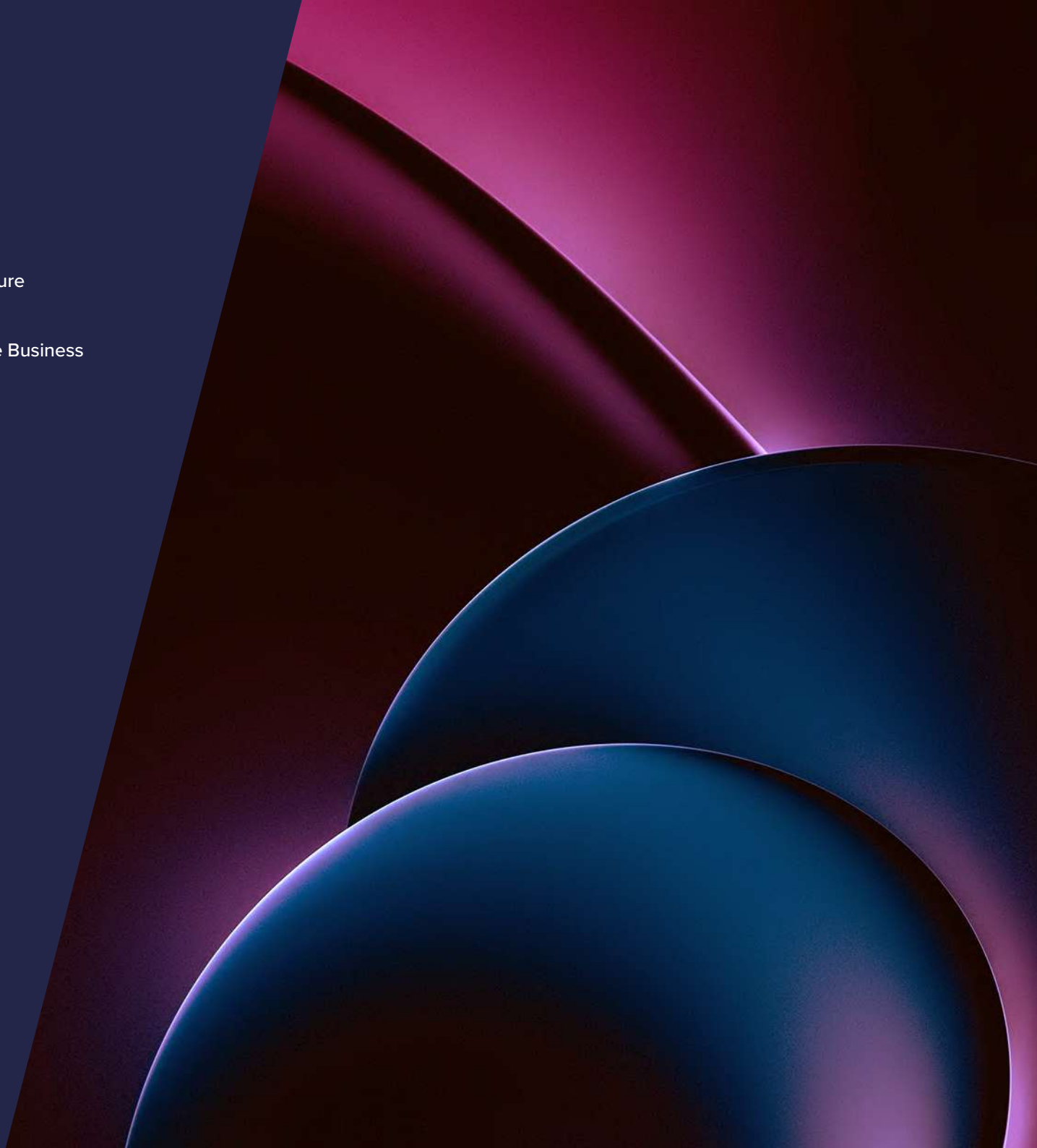


Winbond's Story

Proactive Innovation, Pioneering a Zero Carbon Future

Deliver low-carbon footprint future by innovation

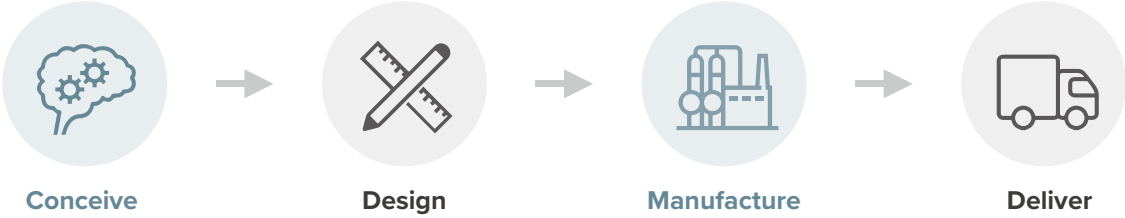
> Winbond is a technology innovative company that strives to improve the quality of human life and ensure the sustainability of the planet through technological advancements.

With the global goal and challenge of achieving net-zero emissions by 2050, Winbond continuously enhances relevant research, development, and manufacturing efforts. In addition, Winbond actively invests in the development of green products and technologies and have embarked on a digital transformation journey to create the "Carbon Emissions Information Platform." We aims to realize the goal of transitioning towards net-zero emissions by focusing on three key areas: designing innovatively for green products, implementing green and low-carbon production practices, and constructing a green information platform.

Green Design: Innovation in Sustainable Product Design

Winbond understands that following the same path won't lead to new destinations. Starting from the concept of product life cycle, Winbond focuses on selecting low-carbon raw materials, continuously improving processes and design innovation, enhancing productivity, and reducing design time to achieve smaller chip sizes, fewer pins. With incorporating Design for Test (DFT) techniques, this results in smaller form factor, lower pin counts, shorter testing time, and finally significantly reducing carbon emissions generated during the manufacturing process. In addition, Winbond emphasizes the use of environmentally friendly materials for packaging, supports low-temperature soldering processes, and reduces PCB usage through smaller form factors. These efforts help downstream customers reduce overall raw material usage and energy consumption during PCBA production, further lowering carbon emissions. Moreover, Winbond commits to reduce power consumption and prolonging power usage time during the product usage phase. Besides continuously design the Flash memory with lower operating currents along with process evolution, Winbond has developed new processes and circuit architectures, and introduced the world's first NOR Flash that supports operating voltage of 1.2V. At every stage of the product life cycle, Winbond considers energy-saving and carbon reduction measures, striving towards net-zero emissions.

— Winbond integrates product performance with environmental protection, ensuring a sustainable approach throughout the product life cycle —



Green product innovation

In the era of portable electronic products and the Internet of Things, Winbond continues to focus on designing low-power-consumption products. For example, our value is demonstrated in the context of net-zero and environmental sustainability by offering the Known Good Die (KGD) sales model, where memory chips are packaged together with logic chips, creating energy-efficient and carbon-saving end products that prioritize low carbon emissions and green features.

Known Good Die (KGD) quick fact

With the assistance of Winbond's expertise, many customers utilize the Known Good Die (KGD) of our flash memory products for System-in-Package (SiP) solutions. Flash memory chips are stacked with controller chips and placed in a single package or module to provide SiP solutions. KGD of other components can also be stacked with flash memory KGD, saving packaging materials, improving performance, and reducing power consumption and chip size.

Winbond Group selected as one of the Top 100 Global Innovators from Clarivate

With "Aggressive Innovation" as one of our core values, Winbond was selected as one of Clarivate's Top 100 Global Innovators. The evaluation criteria for this award include not only the total number of patents, reaching 500, but also factors such as the industry influence, track record of success, globalization, and technology applications. Out of 3,200 candidate organizations worldwide, Winbond Group has been recognized, demonstrating our strength in innovative research and development, as well as the global impact of our patent portfolio. This recognition from an international evaluation institution proves that Winbond is a semiconductor company that values research and development investments, pursues growth driven by innovation, and is committed to environmental sustainability. From the product design stage, Winbond focuses on using low-carbon materials and developing green products that are high-performance, low-power, and require minimal resources. Our goal is to protect and minimize our impact on the environment.

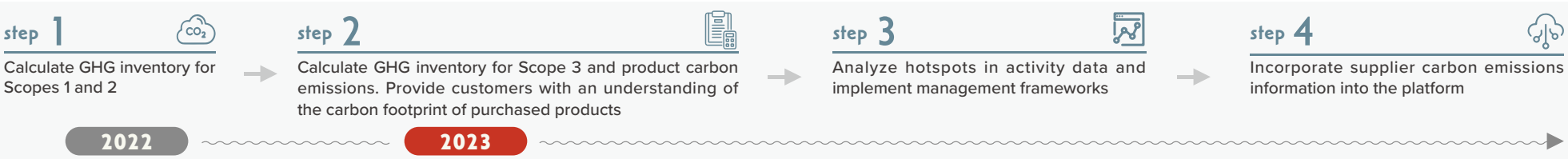
Green Information Construction

Carbon management serves as an important indicator for mitigating climate change. In 2022, Winbond collaborated with consulting teams from Microsoft Taiwan and SoftwareOne Taiwan to develop the "Carbon Emissions Information Platform." By leveraging Microsoft's cloud services and Power Platform, Winbond has created an automated integration system for carbon emission data, enabling real-time data visualization and management.

The semiconductor manufacturing process is complex and diverse, presenting three major challenges in integrating carbon emission data: standardization, manual processing, and visualized management. The "Carbon Emissions Information Platform" addresses these challenges and provides solutions for various pain points. For example, it allows for inventorying historical data, monitoring dynamic reports, and simulating and predicting future carbon emissions based on future capacity growth. This enables the evaluation of relevant reduction measures, facilitating the construction and management of green information and supporting the goal of transitioning to a greener paradigm.

4 Steps to launch a digital zero-carbon new future

The "Carbon Emissions Information Platform" completed Step 1 calculations of GHG inventory for Scopes 1 and 2 in 2022. Winbond plans to achieve Step 4 by the end of 2023, calculating Scope 3 and product carbon emissions. Winbond will provide customers with carbon footprint data for purchased products and incorporate activity data analysis and supplier carbon emissions information. The goal is to integrate and provide real-time information and management for green products and green manufacturing through the Carbon Emissions Information Platform.



Green Manufacture

Since the first day of constructing our Kaohsiung Fab, the balance of environment, talent, and manufacturing efficiency has been taken into account. The smart factory leverages automation technology, artificial intelligence, and big data to enhance production efficiency, enabling human resources to focus on high-value innovation. The Kaohsiung Fab has adopted high-energy-saving designs, resulting in significant reductions in energy consumption (as shown in the table below). This achievement aligns with the goals of environmental protection, carbon reduction, and the realization of green and low-carbon manufacturing.

Achievements in Energy Saving and Carbon Reduction at the Kaohsiung Fab

Type	Name of energy-conservation/ carbon reduction project	Energy Savings		GHG Emission Reduction (tCO_2e)
		(kWh)	(GJ)	
Energy-Efficient Design of the Fab	Waste heat recovery from hot ultra-pure water heat pump	8,488,000	30,558	4,320
	Waste heat recovery from air compressor dryer	54,750	197	28
	High-efficiency energy-saving boiler	9,855,000	35,478	3,230
	Increased outlet water temperature of chilled water system	10,444,110	37,599	5,316
	LED Energy-conserving lighting	1,656,000	5,962	843
	Total	**30,497,860**	**109,793**	**13,737**

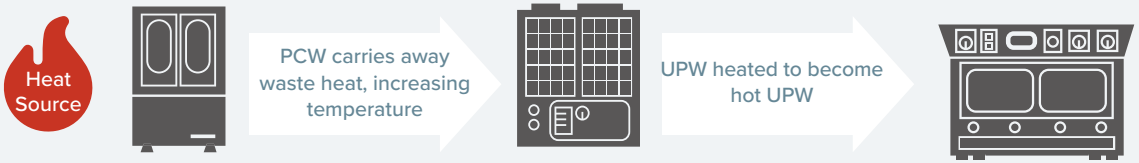
Note 1.The energy-saving design of the new fab was based on the CTSP Fab as the reference. 2.The GHG reduction of the high-efficiency energy-saving boiler project was the comprehensive calculation result of electricity saving and natural gas usage.

Pic. Kaohsiung Fab

Energy-conserving Design of Kaohsiung Fab

With green production as the goal, Winbond's Kaohsiung Fab incorporated numerous energy-conserving designs in its initial design. The facility is able to conserve large amounts of energy through methods such as recycling waste heat, using low-power LED lights, and adopting energy-conserving chiller designs. Take waste heat recovery and energy-saving chiller design as examples:

1 **Waste heat recovery from hot ultra-pure water heat pump: Waste heat generated by the process cooling water (PCW) is recovered. A heat pump is used to heat the UPW, which is then supplied to the equipment.**



Machines generate waste heat

Heat pump transfers the heat from higher-temperature PCW to UPW

UPW supplied to machines

2 **Increased outlet water temperature of chilled water system: The outlet water temperature of the chiller is increased to 12°C, significantly reducing energy consumption compared to the previous 9°C chiller operation.**

The hot water system was switched from an electric boiler to a gas boiler to reduce carbon emissions

Energy recovery from UPW system for reuse

Energy-saving planning and design for the chilled water system

Energy-saving system for the chilled water system

ISO 50001 Energy Management System Certification

In 2022, Winbond's CTSP Fab achieved ISO 50001 Energy Management System certification. This certification establishes management procedures, energy baselines, and energy performance indicators. Through the P-D-C-A cycle, continuous improvement is pursued, optimizing equipment related to major energy consumption. The goal is to achieve systematic energy management. By implementing the ISO 50001 management system, Winbond has achieved tangible benefits such as improved energy efficiency, reduced energy costs, and decreased greenhouse gas emissions. This includes effectively managing and optimizing the electricity efficiency of process and utility equipment, as well as implementing various carbon reduction measures, such as introducing perfluorocarbons (PFCs) emissions reduction projects, smart air conditioning, energy-saving chillers, waste heat recovery from hot ultra-pure water heat pumps, and high-efficiency energy-saving boilers, to reduce carbon emissions during the production process.

Implement energy-saving measures

By implementing the ISO 50001 Energy Management System, Winbond has successfully completed 21 energy-saving measures in 2022, resulted in 35.9 million kWh of electricity saved and GHG emissions of 16,485 metric tons reduced

PFCs emissions reduction projects

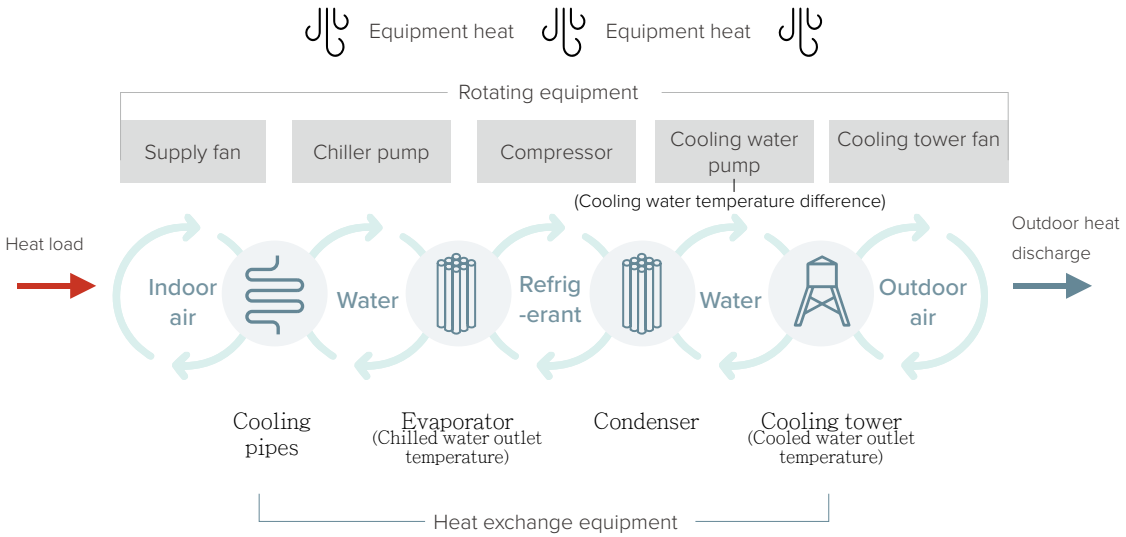
PFCs emissions reduction projects: Over the past 15 years, a cumulative reduction of approximately 2.1 million metric tons has been achieved.

Winbond has from 2006 onwards participated in the PFCs emissions reduction projects organized by the Taiwan Semiconductor Industry Association and the World Semiconductor Council. Over the past 15 years, a cumulative reduction of approximately 2.1 million metric tons has been achieved.

Energy-saving chillers

In 2022, Winbond collaborated with National Taiwan University on an industry-academia partnership to implement group control settings for chillers. By establishing a kW/RT energy consumption model and combining it with weather forecast data from the Central Weather Bureau for the next six hours, optimal settings for chiller energy savings were derived, resulting in an energy-saving ratio of approximately 2.8%.

Objective: Optimize chiller parameters setting → Improve power efficiency and reduce electricity consumption



AS-WAS

Consider current individual component temperature settings

NOW

Predict future 6-hour air conditioning demand
Integrate all components to achieve multi-point temperature optimization recommendations

Chillers		Smart chillers		Reduced energy consumption
Time	Energy consumption (kWh/RT)	Time	Energy consumption (kWh/RT)	
2022/1	0.71	2023/1	0.69	2.82%
2022/2	0.72	2023/2	0.70	2.78%
2022/3	0.72	2023/3	0.70	2.78%
2022/4	0.72	2023/4	0.70	2.78%

Note Due to the schedule of compiling the Corporate Sustainability Report, the energy consumption comparison table is disclosed up to April.

Corporate governance and green investment

Climate change is the biggest global risk and a significant challenge for businesses. Winbond recognizes the trends and, by strengthening its core competencies, is gradually exploring green and sustainable business opportunities. In 2022, Winbond elevated the organizational level of the ESG Committee to be under the purview of the Board of Directors, with the chairman directly serving as the committee's chairman. Winbond has allocated resources to three main aspects: TCFD climate governance, green investment, and promoting a carbon reduction culture. Winbond aim to strengthen employees' awareness and behavior towards carbon reduction through the communication of principles and practical operations, thus exerting a positive impact on the environment and society, and fulfilling our commitment to sustainable development.

The organizational level of the ESG Committee elevated to be under the purview of the Board of Directors

Winbond has restructured the current "Winbond Corporate Social Responsibility (CSR) Implementation Committee" into the ESG Committee in May 2022 (as shown in Figure 1). The level of committee is raised to be under the purview of the Board of Directors. It shall be composed of several directors and five to seven executive managers from relevant departments including the President. The term of the directors is the same as the term of the Board of Directors while the Chairman serves as the chairperson of the committee.

Under the ESG Committee, Winbond established the ESG office and five task forces, including Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. Winbond has developed a sustainable strategy framework (as shown in Figure 2) and continue to promote sustainable actions. The committee reports its implementation achievements to the Board of Directors every fourth quarter to ensure the promotion and implementation of works related to corporate sustainability.

— ESG Committee —

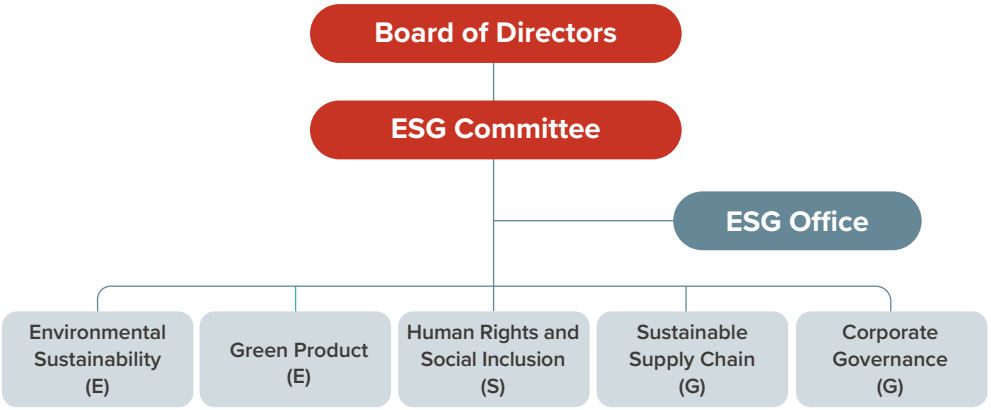


Figure 1

— Carbon footprint as an assessment indicator of innovative contributions —

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; Sustainable Supply Chain; Environmental Sustainability; Human Rights and Social Inclusion; Corporate Governance
Talent	ESG Awareness Building (Education and Training, Sustainable Education and Training Platform); ESG Sustainability Capabilities Building
Processes	G Risk Management Process; G Sustainable Governance Process; G Compliance Disclosure; ESG Sustainable Innovation Culture (ESG Award)
Technology	ESG Digital Transformation; ESG Sustainable Data Establishment and Application; E Carbon Emissions Information Platform

Figure 2

Enhancing TCFD climate change governance

To strengthen climate change governance, a TCFD has been established and the TCFD management framework has been introduced for us to identify climate-related risks and opportunities as the basis for reviewing Winbond's strategies in response to climate issues and establishing relevant management indicators. Winbond also publishes climate-related financial disclosure reports to continuously review and focus on enhancing Winbond's operational resilience towards climate change.

Important Board agenda and reports related to climate in 2022

- Report on GHG inventory and verification schedule (including subsidiary companies)
- Passed the proposed increase budget for capital expenditure (for replacement with energy-efficient equipment)
- Passed the establishment of the ESG Committee and the formulation of organizational regulations
- Passed the investment in Chia-Ho Green Energy Corporation
- Report on the plan to achieve the 2030 renewable energy target
- Report on the 2022 carbon credit trading plan
- Regular reports on the progress of GHG inventory in 2022 (including subsidiary companies)
- Regular reports on the progress of sustainable development initiatives

Joining Taiwan Climate Partnership to exert social influence

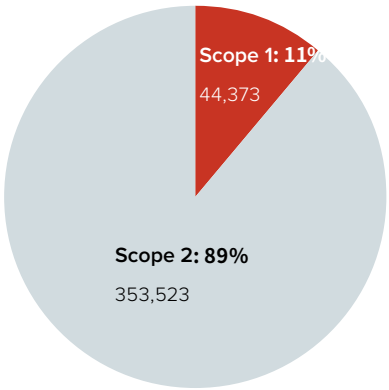
In 2022, Winbond joined the Taiwan Climate Partnership, with Chairman Yu-Cheng Chiao serving as a board member of the Partnership. By joining the Taiwan Climate Partnership, Winbond aims to leverage its industry influence and take practical actions to realize carbon reduction goals in collaboration with the upstream and downstream supply chains. In addition to responding to the demands of international brand customers, this move also demonstrates Winbond's high level of concern for climate change issues.

Taiwan Climate Partnership Council

Initiating green investment

Investing NT$555 million in green energy development as a crucial first step towards achieving carbon neutrality

Upon conducting a comprehensive GHG inventory across the entire Company, Winbond discovered that indirect energy emissions accounted for approximately 89% of the total emissions. To meet carbon reduction and carbon neutrality targets, Winbond has been actively evaluating investments in renewable energy. In 2022, Winbond invested NT$555 million in green energy development related business, marking a crucial first step in initiating green investment. Through green investment and continuous collaboration with green industry suppliers and alliances, Winbond aims to expand the scope and impact of its green investment.



Unit tCO_2e

Scope 1
Scope 2

Scope 1

Refers to direct emissions from processes or facilities, such as emissions from factory chimneys, processes, ventilation equipment, and emissions from owned or controlled stationary combustion sources, process emissions, and emissions from transportation vehicles.

Scope 2

Represents indirect energy emissions, which are emissions resulting from the use of purchased electricity, heat, or steam.

Winbond has acquired carbon credits from the world's largest blue carbon project, contributing to environmental protection and biodiversity conservation

In the face of the climate crisis, the next decade is crucial, and global resources and collective innovation are needed. Winbond has actively evaluated green investment and invested in the Pakistan Mangrove Conservation Project in 2022, which is currently the world's largest blue carbon project. Covering an area of over 350,000 hectares, the project encompasses habitats of several endangered species and brings significant climate adaptation benefits to the region's biodiversity, and contributes to climate change mitigation, biodiversity conservation, and job creation opportunities.

Winbond's investment in the world's largest blue carbon project has contributed to climate change mitigation, biodiversity conservation, and job creation efforts.

The Pakistan Mangrove Conservation Project is currently the world's largest blue carbon project, covering an area of over 350,000 hectares. It encompasses habitats of several endangered species and brings significant climate change adaptation benefits to the region's biodiversity. The project is expected to benefit around 42,000 local residents through various co-benefits, including the creation of over 21,000 full-time jobs, access to clean drinking water sources, conservation-focused education and training, public health improvements, and gender equality advocacy.

Blue Carbon quick fact

Based on the sources and storage methods of "carbon", scientists classify carbon into different colors: gray carbon, black carbon, brown carbon, green carbon, and blue carbon. "Blue carbon" refers to all carbon absorbed and stored by marine organisms from the atmosphere within the ecosystem. Plant-based "blue carbon" in the ocean includes seagrasses, herbaceous plants in salt marshes, mangroves, and algae.

Driving a carbon reduction culture: embracing sustainable thinking everywhere

Corporate sustainability and global sustainability are interconnected concepts, and it is not a new issue for Winbond. Winbond actively reduces waste and implement a carbon reduction culture in our daily operations. The "Zero Carbon Family Day" is an example of this. In a fun and educational way, Winbond encourages employees and their families to actively conserve energy and reduce carbon emissions in their daily lives, such as bringing their own eco-friendly food containers, using reusable cups, promoting carpooling, ethical purchasing, environmental awareness, waste reduction, and using electric vehicles, among other practices, to collectively contribute to mitigating climate change.

Zero Carbon Family Day strengthens the carbon reduction awareness of all employees and extends influence to the next generation

Winbond's "Zero Carbon Family Day" focused on promoting net-zero emissions and green living, with nearly 7,000 employees and their families participating together, showing their concern for green sustainability issues and expanding their influence!

For the first time, the carbon emissions generated on Family Day were retired through the purchase of blue carbon credits, achieving a zero carbon family day.

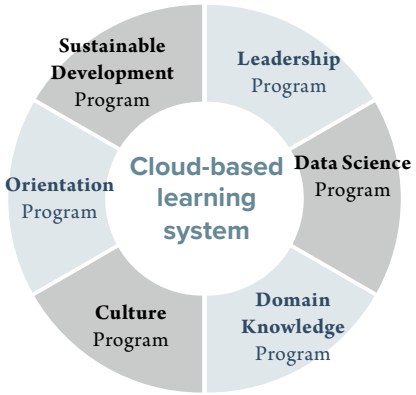
The retirement certificate was issued by the Climate Impact X, a carbon credit exchange based in Singapore

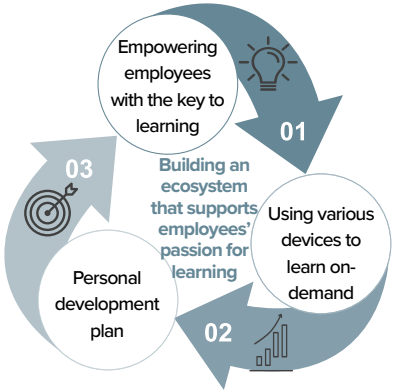
In a rapidly changing world, talent is Winbond's ace in transforming the world

The cultural spirit, excellence in quality, research and development innovation, and sustainable development of a company all rely on "people" for inheritance and creation. With the impact of declining birth rates expanding, Taiwan's semiconductor industry will also face a shortage of talent. Therefore, Winbond not only values "talent cultivation" but also knows how to cherish talent. Winbond is committed to providing a good learning environment for potential talents and senior employees alike, initiating proactive actions to support them in terms of technology, resources, and life. Winbond hopes to cultivate a stronger semiconductor industry talent pool for Taiwan and even the world, through Winbond's professionalism, influence, and encouragement of a passion for learning.

Establishing an ecosystem that supports employees' passion for learning

As a technology innovation enterprise, Winbond values talent development and has established a learning ecosystem to cultivate semiconductor talents through a culture of passionate learning. Winbond empowers employees with the key to learning, encouraging them to learn anytime, anywhere based on their own learning needs. Winbond's learning platform offers six major programs with over 3,200 courses, allowing employees to learn at their own pace. At the same time, Winbond provides diverse learning channels to assist employees in their personal career development.





— Multiple learning platforms and channels are provided —

- Winbond's learning platform
- Overseas executive leadership courses
- On-site training
- Online learning platforms
- On-the-job training
- Overseas seminars
- Overseas assignments and training
- Job rotations

Driving digital transformation and continuously empowering employees

Innovations and the development of artificial intelligence technology are accelerating the transformation of our future work and life. As talent is the core of Winbond's sustainable development, Winbond places great emphasis on talent development and cultivation, aiming to assist employees in facing the future world with sufficient capabilities. Winbond continues to drive digital transformation and has established the Data Science Program to support lifelong learning for employees.

Data science learning results

- Offering 804 online self-learning courses to employees
- Receiving nearly 7,608 views
- Total training time of 23,745 hours

Jointly cultivating semiconductor talent in Taiwan through industry-academia collaboration

To enhance the quality of semiconductor talent in Taiwan, Winbond actively supports the collaboration between industry, government, and academia to foster talent. Through various means such as technology exchange, knowledge sharing, and teaching, Winbond actively participates in the cultivation of talent in society, aiming to enhance Taiwan's industrial competitiveness.

Establishing Semiconductor Program to cultivate the next generation of talent

With a sense of responsibility for the development of Taiwan's semiconductor industry and talent cultivation, Winbond invested nearly NT$10 million each year to assist in the establishment of the Academy of Innovative Semiconductor and Sustainable Manufacturing at National Cheng Kung University. In 2022, Winbond collaborated with the Academy to launch the "Semiconductor Program," which was planned by Winbond's senior executives. The program aims to help students lead the future semiconductor industry and develop a foundational understanding of artificial intelligence. Winbond also provides scholarships, internship/visit opportunities, guaranteed job interviews, and signing bonuses as part of its high-quality programs, encouraging the new generation of talent to join the semiconductor industry. As of 2022, over a hundred students have participated in Winbond's Semiconductor Program.

Semiconductor Program Planning

		Component process integration program / Equipment program
Essential semiconductor expertise and skills	*Semiconductor professional knowledge*	Required: **24** credits, Elective: **6** credits (Semiconductor process/Linear algebra/Experimental design, etc.)
Possessing data science concepts (Next-generation requirements)	*Fundamentals of AI courses*	Required: **3** credits (Data analysis, machine learning, computer vision, etc.)
Core competencies (Practical and quick integration into the organization)	*Key technologies and leadership practices courses*	Required: **3** credits (Taught by industry experts from Winbond)

Total **36** credits

Collaborative smart manufacturing project for joint research and innovation environment

From 2021 to 2022, Winbond cooperated with Professor Chia-Yen Lee of National Taiwan University on smart manufacturing project. The graduate students led by the professor and Winbond jointly conducted project development and research. The main contents included "Data Analytics Efficiency", "Quality Enhancement", "Yield Improvement", "Energy Saving Analysis" and other topics to help students connect with the industry in advance while at school.

Research and development sponsorship for industry upgrading

Winbond sponsored the "Chair Professor Research Grant" project at National Yang Ming Chiao Tung University to assist the university in enhancing its academic standards. The sponsorship aimed to attract and retain outstanding domestic and international scholars, supporting professors in continuously improving their teaching and research capabilities, with a dedication to advancing academic research and fostering talent development in the field of information and communication technology. By combining resources with academia, Winbond strives to improve the environmental quality of the semiconductor industry.

Not only do Winbond take care of our employees, but Winbond also take care of their families

Employees are long-term partners of Winbond, and as they enter the family stage of life, Winbond strives to become the most reliable ally for every employee who becomes a parent. We provide childcare allowances, flexible working hours, work-from-home options, and LOHAS Holiday, allowing our employees to balance their work and family life. Winbond is one of the few companies in the industry that extends group medical insurance coverage to employees' spouses and children.

Creating a friendly work environment during the COVID-19 pandemic

During the COVID-19 pandemic, Winbond has implemented various employee welfare measures related to epidemic prevention based on the employee needs. These measures include paid vaccine leave, epidemic care leave, and group epidemic insurance, which covers employees, their spouses, and children. As work and lifestyle patterns have changed during the pandemic, Winbond provides systematic and professional psychological counseling services to support employees. Remote medical consultations and workplace resilience seminars are also conducted to provide employees with emotional and mental support during the epidemic. Winbond aims to create a friendly work environment during the epidemic, ensuring that employees can work in a healthy and secure manner.

Industry-leading childcare allowance

Winbond believes in creating a supportive work environment that provides resources for childcare. This not only helps mitigate the risks associated with declining birth rates but also recognizes that every child has the right to receive proper care and development. Winbond offers a monthly "Childcare Allowance" of NT$6,000 for employees' children in the hopes of easing the financial burden of childcare and providing support for employees' career development.

Since 2011, the Childcare Allowance has cumulatively reached **NT$298,832,873**, benefiting a total of 1,122 employees and 1,667 children who have received this support!

Father of five children

We have enjoyed the company's childcare allowance, and you can too!

During my 15 years at Winbond, I went from being single to getting married and having five sons.

I am extremely grateful for Winbond's supportive policies that help employees achieve a balance between work and family. The LOHAS Holiday and flexible working hours have provided me with more quality time to spend with my children. The flexible vacation and delegation system also allow us to focus on our children when we are at home.

But the most significant support has been the childbirth allowance. When we had our first child, we had to start from scratch, buying everything from diapers and cribs to baby clothes, car seats, strollers, and toys. They were all very expensive, and the quarterly childbirth allowance provided over four years felt like a regular dose of happiness. It greatly relieved the financial burden of raising children. Winbond's genuine commitment to its employees' families and personal lives is not just a slogan; it's something we can genuinely feel and experience.

Contribution to Sustainability - Taking the Lead

26 I. ESG Implementation Framework

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I. ESG Implementation Framework

Winbond strives to become "a hidden champion in providing sustainable semiconductors to enrich human life". Under the leadership of the Chairman, Winbond upholds integrity, innovation, and passion, and continuously enhances corporate values, while paying attention to global trends, caring about social issues, and responding to the expectations of stakeholders. Winbond has developed a strategic blueprint based on the vision of ESG in three frameworks, aligning with the action plan for the United Nations Sustainable Development Goals (SDGs). By integrating sustainability principles into our core capabilities, Winbond is fostering new possibilities for talent, processes, and technologies, and creating a better future for society.

— Winbond Sustainability 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.

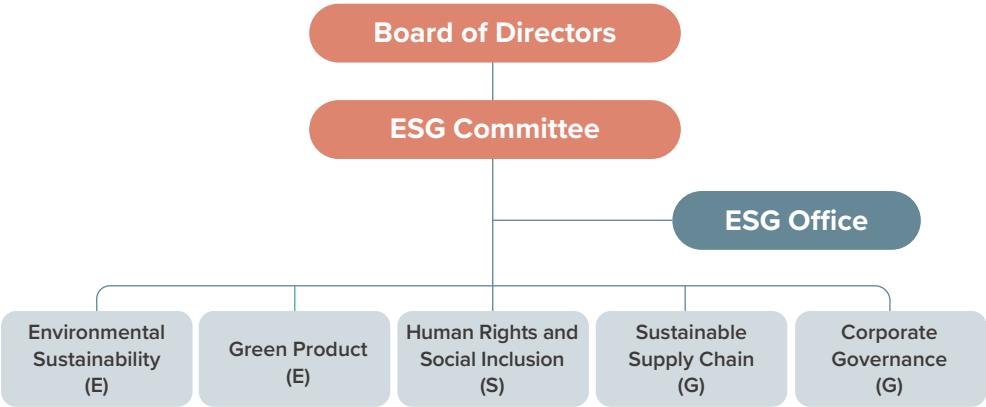
Strategy	Green Product	Sustainable Supply Chain	Environmental Sustainability	Human Rights and Social Inclusion	Corporate Governance
Action Plans	• Energy-efficient product planning and promotion • Development of new green manufacturing processes • Product carbon footprint tracking system	• Implementation of sustainable risk assessment • Development of a low-carbon supply chain • Execution of due diligence on conflict minerals • Supplier sustainability training and communication • Establishment of a digital supplier management platform	• Creation of a carbon emissions information platform and reporting system • Carbon reduction plan • Participation in energy-saving and carbon reduction initiatives • ISO 50001 energy management system and energy-saving measures • 2050 net-zero plan	• Best employer • Talent cultivation • Creating a diverse and inclusive workplace • Human rights due diligence • Social impact • Semiconductor academy	• Corporate governance assessment • Climate-related financial disclosures • Green energy procurement • Carbon credits • Protection of intellectual property rights • Preservation of trade secrets • Maintenance of information security defense mechanisms and resilience
Talent	ESG Awareness Building (Education and Training, Sustainable Education and Training Platform) ESG Sustainability Capabilities Building				
Processes	G Risk Management Process G Sustainable Governance Process G Compliance Disclosure ESG Sustainable Innovation Culture (ESG Award)				
Technology	ESG Digital Transformation ESG Sustainable Data Establishment and Application E Carbon Emissions Information Platform				

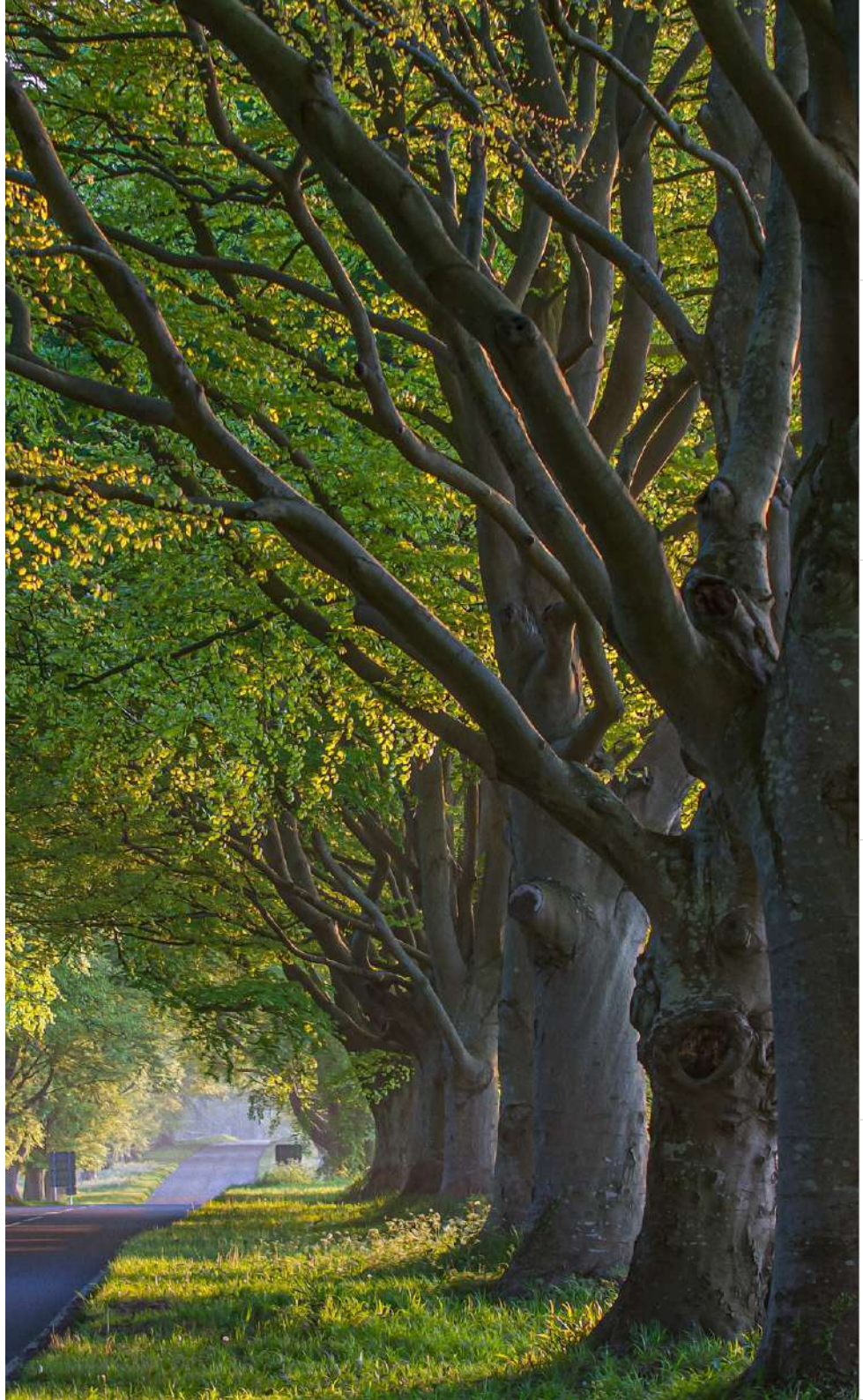
II. Sustainable Development Governance

In 2015, Winbond established the "Winbond Corporate Social Responsibility (CSR) Implementation Committee" as the main management for promoting sustainable development within the Winbond. It was restructured into the ESG Committee in 2022. The level of committee is raised to the level of the Board of Directors. The committee convenes at least twice a year, with the Chairman serving as its chairperson. The purpose of the committee is to plan Winbond's sustainable development strategies and goals, formulate corresponding action plans, integrate company resources, and address various sustainability issues to enhance operational competitiveness.

Under the ESG Committee, Winbond established the ESG Office and five task forces, including Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. The committee regularly reports its implementation results to the Board of Directors annually to ensure the promotion and implementation of works related to corporate sustainability.

— ESG Committee —





Sustainability Statement

Hsiang-Yun Fan Vice President, DRAM Product Business Group

Winbond is committed to the research and innovation of low-power memory products, aiming to enrich human life through green semiconductor technology and mindset. Winbond strives to make concrete contributions to our customers and society in terms of sustainability.

Wen-Hua Lu Vice President, Memory IC Manufacturing Business Group

Risks are also opportunities, and Winbond actively manages controllable operational risks to minimize their impact. Winbond provides abundant resources to stabilize the supply chain and continuously explore business models that create value for our customers. Through product and process innovation, Winbond hopes to establish long-term and sustainable win-win relationships with our customers.

Jen-Lieh Lin Vice President, Flash Memory IC Business Group

Net-zero carbon emissions have become a global consensus, and through green product design process, Winbond brings significant benefits on carbon emission to end users, by memory product design, chip manufacture, device making and user end devices. Winbond continuously optimizes product design and processe technology , reduces the size of chips and use small form factor packages, which effectively saves materials and reduces carbon emissions per chip. Additionally, Winbond aims to reduce energy consumption during end product usage. Winbond commits on reducing the carbon reduction to enrich human experience and also environment friendly. From product design and manufacturing to end-user usage, Winbond strives to create maximum value and benefits to customers.

Jing-Fong Tsai Vice President, Quality & ESH Center

R&D innovation is Winbond's most powerful advantage in adapting to trends. Winbond has incorporated it into our company's development path, aligning it with market demands while maintaining service quality. With confidence, our team continues to strive towards the development of high-end products, aiming to cultivate competitiveness and core technologies to face various risk challenges.

Wen-Chang Hong Vice President, Sales Center

Business integrity and innovation are embedded in Winbond's DNA. Winbond strives to continuously innovate and develop green products that enrich human lives while contributing to carbon reduction on our planet.

Pei-Lin Pai Vice President, Technology R&D Group

Winbond is committed to develop low carbon footprint process, production, and products for environment protection, starting from the planning phase and throughout the development cycles. We will never stop simplifying and optimizing our process technology to ensure market competitiveness and business sustainability.

Chih-Chung Chou Chief Financial Officer, Finance Center

In addition to financial performance indicators, expectations from diverse stakeholders for sustainable development should be emphasized in corporate values. Winbond will fully implement ESG strategies through integrating financial information and promoting cross-departmental communication and collaboration. Winbond aims to establish long-term positive impact in contribution to sustainability and well-being, fostering mutual wellness and prosperity for both the environment and society.

Chi-Ching Lai Human Resources Executive, Human Resources Division

In addition to fostering better employee work-life balance and providing learning opportunities, Winbond also actively participates in social welfare activities through donations, volunteer services, and many other means of support. Our goal is not only making positive contributions to society but also promoting Winbond's sustainable development and advancing diverse culture and talent development.

Shu-Cheng Chang Technology Executive, Prod. Control and Sub. Management Center

Supply chain is the relationship between a company and its suppliers, including aspects such as materials, equipment, and services. Winbond, continuously established partnerships and work with suppliers to achieve ESG goals and promote sustainable development. This effort further enhances business ethics, environmental protection, social care, and transparency in governance structure.

Outcomes of SDGs Promotion

Since the release of United Nations' and Taiwan's Sustainable Development Goals (SDGs), Winbond has immediately begun incorporating SDGs related to our core business into our ESG policy and business approach.

Corresponding SDGs	2022 Performance Highlights	Future Directions
4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship **4.5** By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations	• Data Science Program: Assisting individuals in mastering AI, big data technologies, and commanding AI. Winbond offered physical and online course lectures covering four categories: core, professional, data science, and management. The courses were conducted a total of 2,631 times, with a cumulative participation of 117,526 individuals. • Industry-academia collaboration - Semiconductor Academy: Investing NT$10 million and collaborating with NCKU to design semiconductor courses, with 17 instructors involved in this initiative. • Education grants for underprivileged students: To supplement education resources for children from impoverished families so they can attend school on a regular basis, Winbond has been working with Taiwan Fund for Children and Families since 2017 by inviting employees to join the effort of raising education grants. From the general manager to grassroots staff, there has been enthusiastic participation in donation drives. From 2017 to 2022, a total of 4,343 beneficiaries have been supported, with a cumulative donation amount of NT$17.372 million. In 2022, 1,032 students were assisted, with a donation amount of NT$4.128 million. • Promoting a culture of passionate learning: The LMS platform offers five major programs with a total of 3,241 courses. This allows employees to learn anytime and anywhere at their own pace. In 2022, there were a cumulative 117,526 participants with a total of 142,711 learning hours.	• Use Kirkpatrick's four-level educational training evaluation model to track course effectiveness assessment and continuously optimize the cloud-based learning platform. Increase the interactivity of live courses to enhance employee competitiveness, self-realization, and improve job performance. • Expand the types of subsidized educational resources and provide relevant resources based on the needs of students.
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	• Water recycling: Winbond values all resources and is committed to improving the reuse rate of recycled water. In 2022, the overall water recycling rate in the entire plant was approximately 80.5%, and the process water recycling rate was approximately 89%. • In 2022, three new water-saving measures were implemented, resulting in an increase in water savings of approximately 64,000 cubic meters.	• Continue to assess and promote new water-saving measures • Improve the reuse rate of recycled water • Reduce water consumption per unit of product • Fab water recycling rate reaches 80% or more
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	• Invested 550 million in renewable energy projects to increase the development of the renewable energy industry and increase the proportion of renewable energy in the global energy structure. • A 499kW rooftop renewable energy generation equipment has been installed, and the renewable energy it generated was sold to Taiwan Power Company. In 2022, approximately 660,000 kWh of power was generated. • In 2022, the CTSP Fab obtained ISO 50001 certification for energy management systems, effectively integrating energy management into engineering operations. The Kaohsiung Fab is also planning to adopt ISO 50001, aiming to expand the scope and effectiveness of energy management.	• Align with the government's renewable energy policy and assess the feasibility of implementing renewable energy installations • Achieve a year-on-year reduction of over 1% in the electricity consumption per unit of product • Increase the utilization rate of renewable energy
8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	• Winbond strives to create economic values for various stakeholders. In 2022, the company's consolidated revenue totaled NT$94.53 billion, a slight decrease of 5% compared to 2021. The consolidated net income after tax was NT$15 billion, with an earnings per share of NT$3.25. • The employment rate for individuals with disabilities increased by 147%, with 32 employees with disabilities in position by the end of 2022. Taking into account the weighted number of employees based on the severity of disabilities, the total reached 47. The employment rate exceeded legal requirements.	• Continue to monitor market changes and improve our financial performance • Understand the situation of employees with disabilities and provide a more inclusive work environment

Corresponding SDGs	2022 Performance Highlights	Future Directions
8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value **8.8** Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	• Winbond continued to actively engage with foreign talent through various channels and provided services to newly hired foreign employees to assist with their relocation and settlement, ensuring a smooth transition for both the employees and their families. • COVID-19 prevention measures: providing paid leave for vaccination, prevention kits for confirmed cases, epidemic prevention insurance, and rapid antigen test kits were provided. • Group insurance for employees, their spouses and children: offering self-paid group insurance plans which covered employees, their spouses, children, and parents, allowing them to choose different coverage options based on their own needs. • Flexible working hours/work-from-home: Employees can apply if they have family needs.	• Continue to recruit diverse talents to enhance talent diversity, and promote cultural integration to unleash innovative vitality
9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities **9.b** Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	• Winbond seeks to consolidate our competitive advantage through continuous innovation in products and technologies. Winbond expands its production capacity and upgrades production processes to provide customers with energy-efficient and environmentally-friendly green products. Winbond granted nearly 380 patents in 2022, and the accumulated granted patents have exceeded 4,500. • In 2022, Winbond incorporated trade secrets into the IP strategies and set about planning the mechanism of registering trade secrets. A total of 23 trade secret workshops were conducted.	• Winbond aims to accumulate over 5,700 global patents by 2025. • Winbond continuously providing guidance to each department to identify and inventory confidential information and trade secrets related to their business responsibilities, in order to further enhave the protection of Winbod's intellectual property.
12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse **12.8** By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	• Winbond has incorporated environmental considerations into design practices to actualize the concept of corporate sustainability, achieving a total reuse of 5,200 tons/year of recycled materials in 2022. • Winbond places importance on corporate sustainability performance and regularly holds supplier conferences to utilize sustainability review standards, actively working with partners to improve. In 2022, Wah Bang's suppliers/outsourcing partners achieved a 100% pass rate in audits and assessments in economic, environmental, and social dimensions. • Waste recycling rate: 90.1%. • Promoting sustainability awareness: Establishing the Sustainable Education and Training Platform • Conflict minerals: 100% of primary suppliers have signed the Winbond Supplier Code of Conduct Commitment Letter, and Winbond formally declared to suppliers Winbond's policy of not using conflict minerals through website and advocacy letters.	• Continuously implement green design and processes to reduce the size and enhance efficiency, resulting in energy saving and reduced material usage. • Collaborate with outsourcing partners to promote sustainability development, including conducting carbon footprint assessments/verification, setting carbon reduction targets, and implementing carbon reduction plans. • Achieve a waste recycling rate of over 90% • Promote sustainability awareness and culture • Practice responsible procurement
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	• Established a Climate Change Task Force Team: Members were assigned from various departments under the ESG Committee to form a cross-departmental TCFD Task Force Team consisting of over 40 individuals to identify climate risks and opportunities and discuss financial impacts and mitigation measures. The first TCFD report was published in 2023 • Blue carbon procurement: Winbond invested in the world's largest blue carbon project, contributed efforts to climate change mitigation, biodiversity conservation, and job creation efforts.	• Continue improving the TCFD management mechanism and regularly track management goals. • Develop a TCFD information platform to enhance efficiency through digital tools.

Corresponding SDGs	2022 Performance Highlights	Future Directions
17.16 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries	• Winbond promoted supply chain decarbonization and implemented the Co-Sustainability project, with the first phase targeting raw material and outsourcing suppliers. • In 2022, the Key Supplier ESG Learning Forum was established for comprehensive ESG knowledge exchange and deep learning. • Winbond communicated and engaged with suppliers to convey and discuss the 10% carbon reduction target for the Winbond supply chain, and conducted carbon footprint assessments/ certifications with outsourcing partners.	• In 2023, focus on supplier ESG Learning and Exchange Workshop and Co-Sustainability projects, and targeting key suppliers will be expanded to other types of suppliers. • Sustainability risk assessments will be implemented for the first-tier key suppliers in 2023 and based on the assessment results, plan corresponding sustainability audit activities. • Establish a digital supplier management platform to digitize various sustainability surveys, receive information feedback, and share sustainability-related information with suppliers for mutual learning and growth.

III. 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. In 2023, Winbond published its first Materiality Analysis Report, disclosing the material topics 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 topics, Winbond has identified 9 material topics in 2022, after consolidating similar topics into a single topic category: Business integrity and corporate governance, regulatory compliance, risk management (information security and personal information protection, climate-related risks and opportunities), research and development innovation, productivity and business performance, supply chain management, green product (product and service quality), energy and carbon emissions management, human resources management (recruitment, compensation and benefits, employee care, education, and training). New topics compared to 2021 are: human resources management (recruitment, compensation and benefits, employee care, education, and training), green products, supply chain management, and carbon emissions management. The following is a description of each 2022 material topic:

List of 2021 Material Topics	List of 2022 Material Topics	Description of Changes
Business Integrity and Corporate Governance **Regulatory Compliance** **Risk Management** **Research, Development and Innovation** **Business Performance** **Information Security and Personal Information Protection** **Product and Service Quality** **Occupational Health and Safety**	**Business Integrity and Corporate Governance**	-
	Regulatory Compliance	-
	Risk Management (Information Security and Personal Information Protection, Climate-related Risks and Opportunities)	-
	Research, Development and Innovation	-
	Productivity and Business Performance	-
	Supply Chain Management	Supply chain management is a topic that Winbond's senior management has assessed as having a noticeable impact on Winbond operations.
	Green Product (product and service quality)	Green products have become an important issue as Winbond continues to progress towards achieving net zero carbon emissions. It is newly-added to Winbond's list of sustainability topics this year, and also an issue highly concerned by stakeholders and senior management of Winbond.
	Energy and Carbon Emissions Management	Energy and Carbon Emissions management is a topic that Winbond's senior management has assessed as a noticeable impact on operations.
	Human Resources Management (recruitment, compensation and benefits, employee care, education, and training)	Human Resources Management is a new material topic after consolidating multiple issues with similar perspective, and is a topic in line with our material topic management. This topic displays Winbond's focus on human rights topics, and our commitment on diverse talents development and care.

— Stakeholder and Material Topic Assessment Process —

01 Identifying Stakeholders

7 types of stakeholders identified

Explanation Winbond's senior management fills out a stakeholder identification survey, and material stakeholders are identified after confirming the extent of the stakeholder's relationship with Winbond.

02 Investigate Issues of Concern

282 valid survey responses received from stakeholders

Surveys are sent out to the identified stakeholders to understand the level stakeholder is concerned with each of the 19 different sustainability topics. Based on these results, a list of the top 10 sustainability topics is ranked in order of importance.

03 Assess Positive and Negative Impact

22 internal impact assessment surveys

Based on the definition of "Materiality" provided in the GRI Standards (2021), Winbond's senior management fills out the operational impact assessment survey, also taking into consideration the concept of double materiality, to assess Winbond's positive and negative economic, environmental, and social impact through these 19 sustainability topics. They would also assess the likelihood of the impact occurring, and the severity of any potential impact.

After this process, analysis of the results of the sustainability impact assessment would be conducted, organizing into sets the top 10 sustainability topics with the largest positive and negative impact. After selecting and consolidating topics, Winbond has come up with 13 internal sustainability topics.

04 Make Adjustments

Board of Directors Confirm 9 Material Topics

The material topics identified in procedures 2 and 3 are organized and submitted to the ESG Committee for review. Based on the priority set by Winbond for its various Sustainable Development Goals, the impact of each topic on Winbond's internal corporate development, the external economic, environmental, and social (including human rights) impact of Winbond's business operations, and in line with Winbond's philosophy for managing material topics, similar material topics are consolidated into a single topic. Through this adjustment process, 9 material sustainability topics are identified this year.

05 Review and Approval of Material Topics

Winbond ESG Committee reviews the material topics identified, and confirms that they meet sustainability context and complete disclosure requirements. A management approach will also be determined for each material topic, and submitted to the Board of Directors for approval.

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

In 2022, 22 of Winbond senior management were involved in conducting the stakeholder identification survey, and identified the following major stakeholders after confirming the extent of each stakeholder's relationship with Winbond: government agencies, customers, employees, investors/shareholders, media, suppliers/contractors, and community groups. A stakeholder section has been established on Winbond website, providing stakeholders with ways to communicate with Winbond. Should a stakeholder have any question or suggestion related to a sustainability topic, he/she is able to communicate with Winbond through these methods, with different contacts responsible for responding to different types of stakeholders. This ensures that Winbond is able to communicate effectively with stakeholders.

— Stakeholder Communications and Outcomes —

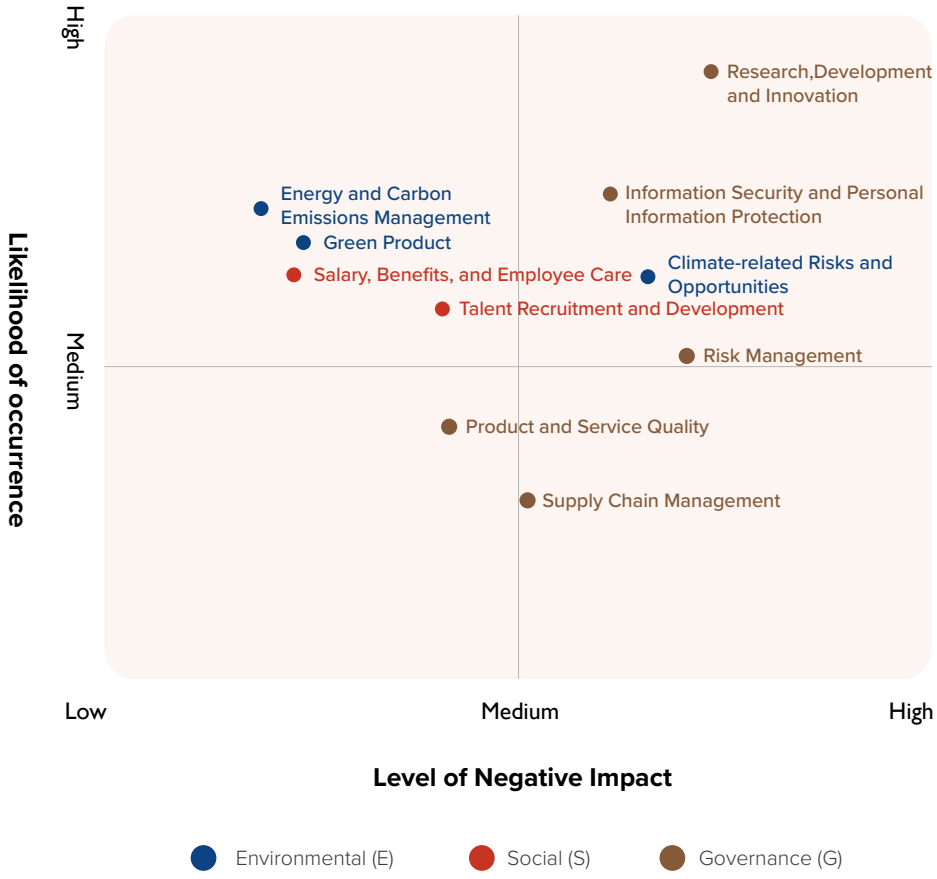
Stakeholders	Importance of Stakeholder to Winbond	Topics of Concern	Channel and Frequency of Communication		2022 Communication Performance
Government Agencies	Government agencies are concerned with Winbond's regulatory compliance on environmental, social and governance (ESG) matters. Its influence on industry development and policy implementation makes it a material stakeholder.	• Business Integrity and Corporate Governance • Human Resources Management • Energy and Carbon Emissions Management • Regulatory Compliance • Risk Management	• Official documents and correspondence (ad hoc) • Public hearings (ad hoc) • Policy information sessions (ad hoc) • Regulatory conferences (ad hoc)	• Inspections by competent authority (ad hoc) • ESG questionnaire (annual)	• Participated in 18 meetings with environmental, safety and health authorities. • 28 on-site audits and inspections were conducted by environmental, safety, and health authorities.
Customers	Customers are the main source of the economic value created by Winbond. They are primarily concerned with the ESG performance of Winbond operations.	• Business Integrity and Corporate Governance • Energy and Carbon Emissions Management • Green Product • Regulatory Compliance • Productivity and Business Performance • Research, Development and Innovation • Risk Management • Supply Chain Management	• Winbond official website, telephone, and e-mail (immediate) • Sales meetings (regular) • ESG questionnaire (annual) • Technical seminars (annual)	• Internal Audit (annual) • Customer audits (ad hoc)	• Winbond invited our customers to take part in the WinTech 2022 conference, and also opened up the conference to online participation. Our customers responded favorably to all conference topics, including those on market dynamics and future trends. • Winbond attended and showed off our products at the Electronica electronic components trade fair in Munich, taking this opportunity to seek out more opportunities to collaborate with potential customers. • Regular customer communications were carried out through telephone, email, or regular in-person visits. Winbond also adopted the D365 system to keep track of data on past visits. Apart from using the system to track sales, Winbond was also able to look up past interactions between Account Sales and each customer before visiting these customers.
Employees	Employees are one of Winbond's most important assets, being key stakeholders in our continued breakthroughs and innovations. Employees are one of Winbond's most important assets, being key stakeholders in our continued breakthroughs and innovations.	• Business Integrity and Corporate Governanc • Human Resources Management • Regulatory Compliance • Productivity and Business Performance	• Internal Hotline 75234 Employee Complaints Hotline (always available) • Care" Employee Suggestions Box (always available) • Illegal Employment Infringement Appeals and Arbitration Committee (always available) • Health Consultation (always available) • Health Promotion Activities (ad hoc)	• Surveys on Health, Stress, and Physical Aches (annual) • Employee Welfare Committee (ad hoc) • Employer-Employee Meetings and Supervisor Communication Meetings (quarterly) • Functional Communications Meetings (regular) • Internal Bulletin Board (ad hoc) • Articles on Winbond Philosophy Published on the Employee Homepage	• 7 cases of internal complaints in total • 9 reports of everyday issues received through suggestion box (both physical and email messages). • 1,634 persons attended the President's Talk event, held online because of the pandemic, with 55 pieces of feedback received through the event. • 0 cases of sexual harassment. • 2 cases of illegal workplace infringements. • 12 labor management meetings held. (Zhubei, Central Taiwan Science Park, Kaohsiung) • Elections were held for new labor and management representatives for the Central Taiwan Science Park and Zhubei locations, due to the terms of the previous representatives expiring. • 4 quarterly executive management and issue discussion conferences were held. These sessions were attended by 1,973 people, achieving an attendance rate of 87%. • EP articles. • Public announcements to all.
Shareholders/ Investors	Shareholders/Investors are Winbond's main source of capital. They are mainly concerned with Winbond's operating performance and sustainable development.	• Business Integrity and Corporate Governance • Green Product • Regulatory Compliance • Productivity and Business Performance • Research, Development and Innovation • Risk Management	• Telephone and e-mail (immediate) • Winbond official website (ad hoc) • The Taiwan Stock Exchange Market Observation Post System (ad hoc) • Investor conference (biannual, or whenever necessary due to special circumstances)	• One-on-one meetings with institutional investors (10-20 times/quarter) • Shareholders' Meeting (annual) • ESG questionnaire (annual)	• 12 disclosures of revenues • 1 annual shareholders' meeting • 2 institutional investor conferences • 4 disclosures of financial reports

Stakeholders	Importance of Stakeholder to Winbond	Topics of Concern	Channel and Frequency of Communication	2022 Communication Performance
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.	• Business Integrity and Corporate Governance • Human Resources Management • Green Product • Productivity and Business Performance • Research, Development and Innovation	• Telephone and e-mail (immediate) • Press release (regular) • Media interviews (annual) • ESG questionnaire (annual)	• 20 telephone and e-mail communications • 29 press releases • Winbond operating report provided 2 times • 3 press conferences held
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.	• Business Integrity and Corporate Governance • Green Product • Regulatory Compliance • Research, Development and Innovation • Supply Chain Management	• Winbond Ethics and Integrity Policy and complaint channel (Six months) • External complaints channels (immediate) • Supplier audits (annual) • Evaluations of major suppliers (once every six months) • ESG questionnaire (annual)	• All suppliers have signed the Commitment to Ethical Conduct and the Responsible Business Alliance (RBA) Code of Conduct • 100% of key suppliers have signed the Declaration of Non-Use of Conflict Minerals • 100% of key suppliers have signed the Hazardous Substance Free Declaration (HSF). • 0 cases of supplier complaints • 100% of suppliers have passed economic, environmental, and social impact audits, and have adopted sustainability review standards.
Community	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.	• Business Integrity and Corporate Governance • Human Resources Management • Regulatory Compliance	• Volunteer activities (ad hoc) • Collaborative projects and visits (ad hoc)	• In 2022, the orphanage and after-school tutoring volunteer activities were suspended due to the COVID-19 pandemic. • In 2022, 1,052 employees contributed a total of NT$4.128 million to student grants. • In 2022, 5 blood donation events were held, attracting a total of 219 participants.

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

Matrix of Level of Potential Positive Impact and Likelihood of Occurrence

Matrix of Potential Negative Impact and Likelihood of Occurrence



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.

Note Ranking of top 10 sustainability issues with positive or negative impact and likelihood of occurring

— Material topics and their relationship with Winbond value chain —

● Direct impact
▲ Indirect impact through commercial relationship

Material Topic	Topics defined in GRI Standards/ Self-defined Topics	Implications of Material Topic to Winbond	Type of Impact (positive/negative)	Description of Impact (description of economy, environment, and people (including human rights) impact)	Scope of Impact to Value Chain			Corres-ponding Section
					Winbond	Customers	Supply Chain	
Business Integrity and Corporate Governance	**GRI 205** Anti-corruption **GRI 206** Anti-competitive behavior	The foundation of how high-tech companies are able to survive during the information economy age.	• Improve positive brand image • Corruption and anti-competitive behavior reduce the trust that stakeholders have in Winbond, negatively affecting our operating revenue	• Good corporate governance and legal compliance leads to increased investment • Avoids Winbond and other Winbond entities from losing assets or rights due to illegal behavior	●	▲	▲	Corporate Governance
Regulatory Compliance	**Regulatory Compliance** (Self-defined Topics)	Winbond is committed to a corporate philosophy of sustainable development, and to doing our part as a responsible corporation. Winbond has complied with all laws and regulations throughout our overall business operations.	• Receiving legal or regulatory penalties may damage Winbond's reputation, and negatively impact our financial situation and employees.	• Complying with laws and regulations improves our reputation, leading to increased investment and revenues. • Avoiding negative impacts to society and Winbond from violating social and environmental laws and regulations	●	▲	▲	Environmental Sustainability Human Rights and Social Inclusion Corporate Governance
Risk Management	**Risk Management** (Self-defined Topics)	A sound and well-implemented risk management system is the foundation of Winbond's sustainable business operations.	• Improve corporate resilience, reducing the impact of risk on the Winbond. • Without a risk management system, potential risks that occur may damage Winbond's reputation and lead to financial losses • Information security leaks may lead to security or financial losses	• Through effective corporate governance, human rights, and supply chain risk management systems, the impact and likelihood of risks from climate change and human factors can be reduced • Encourage greater investment from Winbond's stakeholders	●	▲	▲	Corporate Governance
Research, Development and Innovation	**Research, Development and Innovation** (Self-defined Topics)	Research, development and innovation into our products, technologies, and business model are the sources of our competitiveness and value. They are also one of the most effective ways to conserve energy and reduce carbon emissions.	• Research and development into improving energy conservation and carbon reduction performance are able to provide both Winbond and our customers with benefits. • If research, development, and innovation are unable to provide results that customers are satisfied with, Winbond's competitiveness would decline.	• The energy conservation and carbon reduction benefits provided through research and development are able to reduce environmental impact. • Innovative technologies can satisfy customer requirements, leading to more competitive products and higher revenues for Winbond.	●	●	▲	Green Product
Productivity and Business Performance	**GRI 201** Economic Performance	Productivity and business performance are critical to Winbond's continued development. Improving productivity can lead to lower costs and less waste while increasing income at the same time, further increasing corporate profits and improving business performance.	• Increased productivity, positively impacting revenues. • Insufficient productivity, reducing business performance.	• Increased productivity can reduce costs and waste, improving business performance and capabilities. • Insufficient productivity can lead to higher costs and waste, leading to revenue losses and increased environmental burden.costs and waste, leading to revenue losses and increased environmental burden.	●	▲	▲	Corporate Governance
Supply Chain Management	**GRI 308** Supplier Environmental **GRI 414** Supplier Social Assessment	Building a sustainable and resilient supply chain system, coordinating and integrating logistics, production, procurement, and other sales-related activities, achieving high production and service efficiency and maximizing value.	• Refine the supply chain management system, making the goods supply process more stable and smooth. • Supply channels obstructed, leading to production and sales delays.	• Build a comprehensive supply chain management system, ensuring that supply is stable, leading to increased business production efficiency and higher revenues. • Poor management of the social and environmental aspects of the supply chain, leading to lower customer trust and sales orders.increased environmental burden.	●	▲	●	Sustainable Supply Chain

Material Topic	Topics Defined in GRI Standards/ Self-defined Topics	Implications of Material Topic to Winbond	Type of Impact (positive/negative)	Description of Impact (description of economy, environment, and people (including human rights) impact)	Scope of Impact to Value Chain			Corres-ponding Section
					Winbond	Customers	Supply Chain	
Green Product	**GRI 417** Marketing and Labeling	Creating value, reducing risks, and developing sustainable technologies and products in order to create secure, energy-saving, and smart lifestyles.	• Improving product functions and reducing product energy consumption can create positive benefits for the environment. • Product market competitiveness.	• Consistent with sustainability trends, meet customer expectations, improve product positioning and revenues, while also benefiting the environment. • Product value and revenues would fall if Winbond is unable to meet customer requirements.	●	●	▲	Green Product
Energy and Carbon Emissions Management	**GRI 302** Energy **GRI 305** Emissions	Extreme climate conditions threaten to upset ecosystem balance. Winbond needs to do our part to save energy and reduce carbon emissions.	• If energy consumptions and emissions go unmanaged, this may lead to severe environmental impacts and accelerate the negative impact of climate change. • Carbon emissions management, calculating and managing carbon costs.	• Reduce the likelihood of extreme climate conditions impacting business operations. • Manage Winbond's energy consumption and Carbon emissions, effectively reducing costs.	●	▲	▲	Environmental Sustainability
Human Resources Management	**GRI 401** Employment **GRI 403** Occupational Health and Safety **GRI 404** Training and Education **GRI 405** Diversity and Equal **GRI 406** Non-discrimination **GRI 408** Child Labor	Talent is the key to Winbond's success. Recruiting talent, using talent, cultivating talent, and retaining talent are all long-term operational tasks.	• Two-way communications between employers and employees help promote smooth business operations. • Workplace safety, and rules on diversity and equality can all affect whether talent is retained, or leaves the Winbond.	• Through recruiting and retaining talent, as well as improving employee abilities and self-worth through cultivating employee growth, companies with high employee satisfaction can better achieve sustainable management and improve research, development, and innovation capabilities. • Implement measures for occupational health and safety management, preventing serious injuries, and improving employee physical and mental health.	●	▲	▲	Human Rights and Social Inclusion

	Medium and Long-term Goals (refers to goals planned to be achieved in 2030 or later)	Short-term Goals (refers to goals planned to be achieved before 2030)	Outcome of Management Approach Assessment
Business Integrity and Corporate Governance Legal compliance is the minimum threshold to be achieved. The Winbond considers "ethical business management" to be the highest standard for business ethics, and by following these standards, the Company strives for mutual prosperity for both the Company and society.	• The corporate culture of ethical business management is deeply rooted in our sales operations, where Winbond aim to win the trust of long-term customers.	• Fulfill our responsibilities as Winbond management, protecting the legitimate rights and interests of shareholders, and the rights of other stakeholders.	• Winbond was ranked in the top 6-20% by the 2022 Corporate Governance Evaluation. • No violations of laws and regulations on corporate governance and business integrity.
Regulatory Compliance Winbond shall fully complies with all laws and regulations on corporate governance, financial operations, trade, environmental protection, occupational safety and health, information security, intellectual property, worker rights, internal controls, and risk management relevant to our business operations.	• Held 15 courses each year on legal compliance. • Assessed the adoption of the ISO 37301 Compliance Management Systems standard • Completed 2 legal compliance review meetings for each year. • Complied with international and domestic laws, no major legal violations reported	• Improved legal compliance management systems • Held 12 courses each year on legal compliance • Complied with international and domestic laws, no major legal violations reported	• Held courses each year on legal compliance (including courses on: corporate law, securities and exchange laws, insider trading, business secrets, labor standards laws, labor laws, information security, occupational safety and environmental protection, and environmental safety and protection for new hires), 10 courses held in total. • No legal violations occurred in 2022.
Risk Management Adhering to the goal of sustainable business operations, establishing a risk management mechanism, integrating and managing various potential risks that may affect operations and profitability, including but not limited to financial, environmental, cybersecurity, operational, and climate risks.	• Establish long-term identification, analysis, evaluation, response, monitoring, and review systems.	• Regularly convene risk management committee meetings, continuing to track and implement risk management measures.	• Any lapses discovered shall be reviewed by the responsible employees or department, and an action plan shall be proposed to address the issue.
Research, Development and Innovation Winbond promises to provide the most competitive products and services in our targeted markets. Winbond promises to deliver most energy efficient and power saving, as well as low carbon emission, products through our innovative technologies from R&D.	• Winbond strives to exceed our customers' expectations for product energy efficiency and performance through our technologies, designs, and manufacturing. • Together with our strategic partners, Winbond is developing new technologies and products capable to sustain long term business operations and enrich human beings' lifestyles.	• Winbond will reduce the carbon emissions from each new generation by 20% per bit(memory unit). • Winbond will target at over 80% satisfaction ratings for both internal and external customers. • To achieve technical leadership, Winbond will have over 350 patent approvals globally by 2023.	• Granted nearly 380 patents, and the accumulated granted patents have exceeded 4,500 as of 2022. • Completed ISO 14067 carbon footprint inventory for our IC products. • Our pioneering 1.2V NOR Flash uses 45% less power than the current 1.8V NOR Flash in mainstream today. • Winbond completed JEDEC reliability test procedures for low temperature soldering, reducing carbon dioxide in the manufacturing process by approximately 57 tons a year.
Productivity and Business Performance Winbond is committed to improving productivity and business performance, with sustainable development and the enhancement of corporate value as our guiding goals. We are actively promoting digital transformation, introducing advanced technology, and popularizing the application of data and AI. We continuously optimize our business strategy and management models to improve corporate competitiveness and market share, while also strengthening employee training and motivation.	• Through world-class technology and innovation, optimization of internal management optimization, promotion of digital transformation and cultivation of a forward-thinking culture, we are committed to continuously improving Winbond's productivity and business performance.	• Between 2023 and 2025, we aim to complete more than 72 promotion activities and training courses related to digital transformation across the entire company. • We plan to deploy a productivity tracking system by 2025.	• We have achieved a consolidated total revenue of NTD 94.53 billion.

	Medium and Long-term Goals (refers to goals planned to be achieved in 2030 or later)	Short-term Goals (refers to goals planned to be achieved before 2030)	Outcome of Management Approach Assessment
Supply Chain Management Winbond is committed to ensuring the stability of our supply chains, improving supply chain transparency, and establishing and implementing polices on environmental protection and corporate social responsibility through close collaborations with our suppliers. These efforts aim to promote the overall legal compliance and continued development of the overall supply chain.	• Establish a global supply chain by 2030 able to effectively diversify operating risks, providing the overall supply chain with more potential for continued development. Further promote our values to indirect suppliers, continuously expanding the scope of our influence in promoting environmental protection and corporate social responsibility. • Reduce carbon emissions from our supply chain by 10% by 2030.	• Improve the reliability of our supply chain, optimize inventory management, and improve supply chain risk management by 2024. • Establish a high-quality supply chain management team by 2026, and gradually begin building up a sustainable green supply chain, improving the environmental-friendliness and corporate social responsibility of our products.	• 100% of suppliers have signed Winbond's sustainable supply chain declarations and documents. • 100% of audited suppliers have no major environmental, social responsibility, and corporate governance issues, and no audited suppliers have consequently been disqualified.
Green Product Winbond's vision is to become a "hidden champion in providing sustainable semiconductors to enrich human life", and Winbond has devoted ourselves to developing a high-efficiency, small-size, low energy-consumption, and high-quality green memory products and green manufacturing processes.	• Reduce carbon emissions from flash memory by 110,000 tons by 2030 (using the total number of products shipped in 2021 as the baseline). • By using the 16nm advanced technology process by 2030, the new developing DRAM memory is able to reduce carbon emissions by 20% across its product life cycle.	• Reduce carbon emissions from flash memory by 35,000 tons by 2024 (using the total number of products shipped in 2021 as the baseline). • Develop new flash memory products apply to new energy and healthcare applications to reduce carbon emissions by 34% and electricity consumption by 27% per chip. responsibility of our products.	• According to the total sales volume of 1.2V NOR Flash in 2022, compared with the power consumption of 1.8V NOR flash, it will save up-to 493,727 kWh of power consumption, which is equivalent to a reduction of 251.3 tons of carbon dioxide equivalent.
Energy and Greenhouse Gas Management Combine data science and professional knowledge, and together with our plant facility systems suppliers, continue to improve energy usage efficiency, gradually increase the proportion of renewable energy used, and reduce greenhouse gas emissions.	• Have our Central Taiwan Science Park (CTSP) Fab use 90% renewable energy by 2030. • Reduce carbon emissions from our CTSP Fab by 60% by 2030. • Achieve net-zero emissions across the whole Company by 2050.	• Reduce greenhouse gas emissions intensity by at least 5% per unit year-on-year from 2023 to 2030. • Reduce product energy consumption by at least 1% per product unit year-on-year from 2023 to 2030. • Recycle at least 80% of all water used by our plant facilities each year from 2023 to 2030. • Recycle at least 90% of all total waste produced each year from 2023 to 2030.	• Conducted ISO 14067 carbon footprint inventory of a portion of our IC products in 2022. • Fully adopted ISO 14064-1 greenhouse gas emissions inventory standards and audits across the entire Company. • Our Central Taiwan Science Park (CTSP) Facility achieved ISO 50001 Energy Management Systems certification.
Human Resources Management Winbond is committed to providing a high-quality working environment, competitive compensation and benefits to attract, develop, and retain our talents, aiming to enhance employee engagement and dedication.	• Implement human rights management by promoting human rights concepts and due diligence checks, to manage and continuously improve human rights risks. • Provide competitive compensation, salary, and benefits, as well as diverse training resources to enhance employee engagement, creating a stable and attractive workplace. • To increase our impact in social welfare activities, we actively participate in various social welfare initiatives.	• Conduct human rights training continuously, with the goal of achieving a 100% global training rate. • Maintain overall compensation within the top 25% level in the industry. • Aim to have more than 95% of employees willing to contribute their expertise in Winbond for the next five years. • Continue donating to promote social inclusion each year. • Achieve an average of 48 hours of learning per employee per year.	• Completed human rights due diligence investigation in 2022. • Performance evaluations were conducted for both direct and indirect employees, with a 100% participation rate. • Winbond achieved the highest Platinum level certification in the Responsible Business Alliance (RBA) Validated Assessment Program (VAP) . • Average annual learning hours per employee were 42 hours. • No significant deficiencies were found in audits or labor inspections.

— Systems for Managing Material Topics —

Material Topic	Tracking Systems	Reporting/Communication Mechanism
Business Integrity and Corporate Governance	• Through systematic audits and internal controls implemented by functional committees. • Established whistleblowing systems, acting together with the monitoring system implemented by the audit committee under the Board of Directors. • Externally, Winbond is subject to regular accountant audits, who also communicate appropriately with the Audit Committee.	Established whistleblowing system (note 1): • Whistleblowing channels for stakeholders on Winbond's website. • (Anonymous/Non-anonymous) reporting hotline and mailbox.
Regulatory Compliance	• Notification system: Disciplinary actions and penalties are managed and regular progress reports made until the case is resolved. • Review system: Annual legal compliance review meetings are convened, where each responsible department reports on any issues that have occurred, and the preventive measures taken. • Reporting system: Winbond's Chief Corporate Governance Officer shall report on the year's legal compliance operations to the President in the annual Management Audit Meeting, and report on the summarized results • Possesses ability to learn about new global laws and regulations.	• Legal Department assist with the legal questions or provide legal advice.
Risk Management	• Risk identification shall be carried out using the risk identification results of other companies in the industry as a benchmark for comparison. • Risk analysis indicators and calculations shall be based on methods accepted by the industry or academic community, and adjusted when appropriate, in order to maintain objective and correct results. • The approved risk appetite and the results of regular assessments shall be combined with information systems in order to produce management reports, ensuring that risk assessments have been conducted. • Risk management operations and other related documents will be included in Winbond's internal controls, and disclosed when necessary pursuant to law.	Established whistleblowing system (note 1): • Whistleblowing channels for stakeholders on Winbond's website. • (Anonymous/Non-anonymous) reporting hotline and mailbox.
Research, Development and Innovation	• Conduct internal and external satisfaction surveys each year. • Conduct product competitiveness analyses each year, ensuring that our products possess competitive advantages. • Conduct product competitiveness analyses each year, ensuring that our products meet energy consumption and carbon footprint reduction goals. • Upper management personally communicate with customers each quarter, directly learning what expectations customers have towards our service and products. • Review business performance of each business group year, as an indicator of each group's competitiveness.	• Innovation R&D teams regularly meet for discussions and brainstorming sessions, incorporating various internal opinions and suggestions. • Intellectual Property Department provides R&D departments with training related to intellectual property protection and invention proposals, as well as consultation on patent strategies.
Productivity and Business Performance	• Digital Transformation Committee: Responsible for promoting an overall digital transition, further improving productivity and business performance. Also reviews digital transformation plans and results, while also monitoring employee abilities and training. • Benchmark comparisons: Understand the role of Winbond in the industry, and our strengths and weaknesses. Discover problems and opportunities, and establish refined plans in response. • Stakeholder feedback: Collect suggestions on Winbond's productivity and business performance to improve Winbond's fulfillment of corporate social responsibilities and brand image.	Established whistleblowing system (note 1): • Whistleblowing channels for stakeholders on Winbond's website. • (Anonymous/Non-anonymous) reporting hotline and mailbox.
Supply Chain Management	• Winbond has continued to conduct internal and external audits, alongside other measures for verifying product quality. At the same time, Winbond has also conducted regular evaluations of our suppliers, detecting, preventing, and resolving issues, and helping our suppliers propose methods for improvement. From 2022 onwards, due to climate change and sustainable development trends, Winbond has engaged in ESG exchanges and conducted ESG investigations into our suppliers, creating a low carbon emissions supply chain management investigation report, and continuing to track how our suppliers are progressing in reducing carbon emissions. • Held a supplier conference and ESG workshop for material (key) suppliers, engaging in two-way communication.	• Held a supplier conference and the Sustainable Supply Chain Upgrading forum, engaging in two-way communication at the venue.

Material Topic	Tracking Systems	Reporting/Communication Mechanism
Green Product	• Established goals to reduce energy consumption during production and product energy consumption in our new product development plans, tracking how effectively Winbond can conserve energy and reduce carbon emissions during the actual production process.	• Innovation R&D teams regularly meet for discussions and brainstorming sessions, while carrying out product development innovative new ideas are implemented with the goal of reducing carbon emissions and energy consumption throughout the product development processes of raw materials, innovative design, testing, packaging and production.
Energy and Carbon Emissions Management	• ISO 14067 Verifying carbon footprint of products • ISO 14064-1 Greenhouse gas emissions verification • ISO 50001 Energy management systems verification • Regular reports made by ESG Committee	• ESG Committee regularly reports on how Winbond is managing and reducing its energy consumption and greenhouse gas emissions, and continues to review, analyze, and plan improvement measures. ESG Committee is also responsible for monitoring domestic and international trends, laws, and regulations.
Human Resources Management	• Regularly review human rights due diligence investigation. • Regularly review the Employee Core Values and Engagement Survey. • Conduct salary surveys on the labor market. • Regularly review Responsible Business Alliance certification audits. • ISO 45001 Occupational safety and health management systems verification • Safety performance indicators	Diverse, open, and transparent channels for effective communication: • Physical suggestion boxes • 75234 Employee Complaints Hotline • Care Complaints Mailbox • Sexual Harassment Complaints Committee, etc. Functional regular communications meetings: • Employer-employee Meetings • Management Discussion Meetings • Employees Welfare Committee etc.

Note 1 Whistleblowing channels for stakeholders on the Winbond website include: (1) Whistleblowing Hotline: +886-4-2521-3579; (2) Whistleblowing Email: internal_audit@winbond.com; (3) The whistleblowing channels available on the Winbond official website provides our employees and persons not affiliated with the Winbond with methods to make anonymous or non-anonymous reports if they discover that the Winbond's employees have engaged in illegal activities, such as unfair business practices, bribery, earning illegal profits, fraud, or coercion. Whistleblowing reports shall be handled by dedicated responsible units, and an investigation team may be established if necessary. Measures have been implemented to ensure confidentiality and protection during the investigation process, allowing for reports to be handled fairly. Winbond shall not dismiss, re-assign, or otherwise change how an employee is treated at work due to the employee making a whistleblowing report. Employees at all levels within the Winbond may not discriminate against, threaten, or otherwise negatively treat the whistleblowing employee, in order to encourage all stakeholders, including Winbond employees, to have the courage to expose illegal behavior.

Note 2 Winbond conducts regular (quarterly) and ad hoc strategic meetings, where the management team reports on any material topics to the Board of Directors, and listens to suggestions from the Board.

1.1 Research, Development, and Innovation
1.2 Quality Management for Products and Services
1.3 Green Manufacturing
1.4 Customer Relationship Management

1. Green Product

Winbond has integrated our core innovative technology competencies with sustainable energy conservation and carbon reduction goals. Through green product design, digitalizing information systems, and improving production efficiency, Winbond can develop and optimize our products in various different areas, strictly controlling each step of our product process. Winbond promises to deliver the highest quality products to customers, minimizing the carbon emissions required to deliver our products into the hands of customers and consumers. While benefiting from the convenience brought about by technology, Winbond is lowing the impact to environment and helping the overall value chain effectively reducing carbon emissions.

2022 Performance Highlights

The accumulated granted patents have exceeded **4,500**.

ISO/SAE 21434

The world's first memory manufacturer obtained Cybersecurity Systems for Road Vehicles

Developed the world's first NOR Flash that supports an operating voltage of 1.2V, Winbond 1.2V NOR Flash uses **45%** less power than the 1.8V NOR Flash in mainstream use today.

Four Major Digital Transformation Systems

Improved analysis system helps engineers increase data analysis efficiency and productivity.

1.1 Research, Development, and Innovation

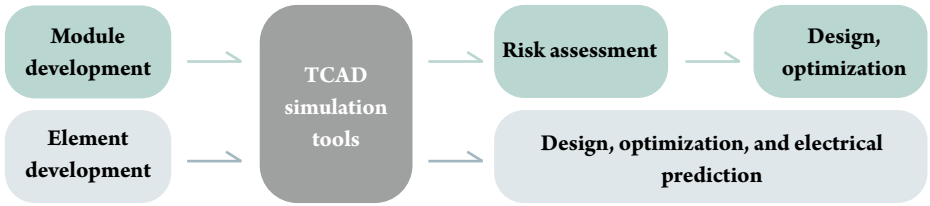
Digital Transformation

From 2020 onwards, Winbond has been pushing for the Company to undergo a full digital transformation. Winbond has established the Digital Transformation Committee for Business (DTCB) and the Digital Transformation Committee for Manufacturing (DTCM), which are responsible for driving the digital transformation of our business, production, and manufacturing operations. The President shall regularly convene meetings to discuss the progress being made by these Committees. Additionally, senior management shares articles on digital transformation each week; and our human resources departments have invited external speakers to provide training related to digital transformation. Winbond has also established a platform for internal collaborations. As of 2022, digital transformation has already become an effective tool regularly used by each of our departments in their day to day operations, demonstrating the effectiveness of our digital transformation measures.

In 2022, Winbond adopted professional software to replace traditional document recording methods. By doing so, Winbond has made information sharing more transparent, lowered communications costs, and increased teamwork effectiveness. Through the Visual Basic for Applications (VBA) online real-time monitoring system, Winbond is able to reduce the time needed to search through and organize documents. Additionally, by using the big data analysis system Power BI to analyze large amounts of data and produce analysis reports, Winbond has been able to greatly reduce the amount of time, manpower, and accuracy constraints for these procedures.

Technology Computer-Aided Design (TCAD) Simulation Tools

Winbond has adopted TCAD simulation tools for integrating our research and development and productions processes, as well as in module and element development. These tools have helped us collect data on experiment conditions, reduce chip usage, and improve the working model of our research and development team. These tools have not only helped Winbond reduce research and development times, but have reduced the amount of resources consumed by the process.

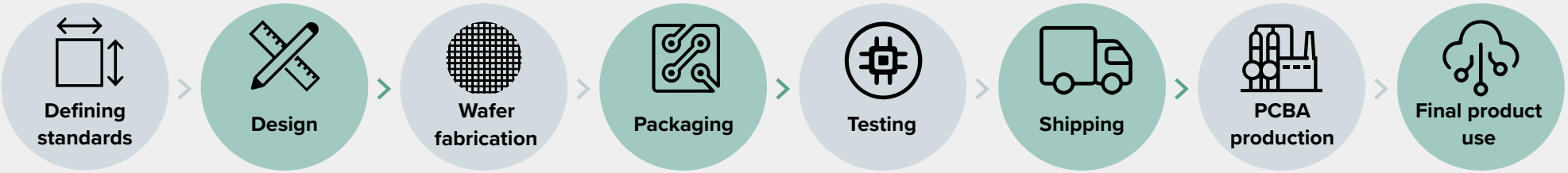


Launch of Four Major Digital Transformation Systems

In 2022, Winbond launched four systems able to effectively increase the productivity of the research and development department, with the help of the Computer-Integrated Manufacturing (CIM) team.

Four Major Digital Transformation Systems	Explanation of system usage	Results
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 reduce information analysis times. • Increase engineer productivity. • Improved analysis system helps engineers increase data analysis efficiency by 50%.
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	Helps Winbond employees make adjustments based on data to production module conditions when necessary 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.	• Greatly increases the data analysis speeds of our engineers. • System able to improve data analysis productivity by 70%.

— Winbond green product development: Design considerations that take into account the product life cycle and reducing 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.

- 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.

- 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.

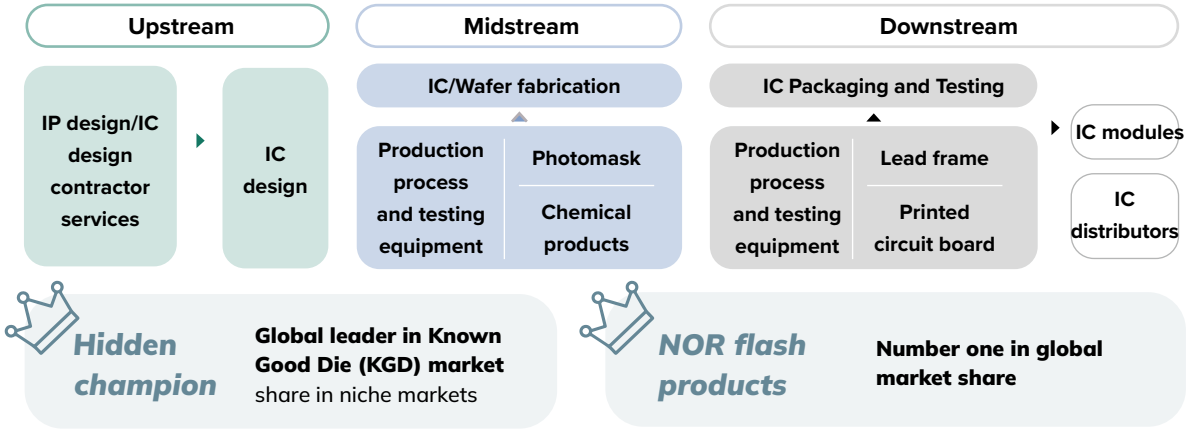
Green Innovation Research and Development

Predicting market trends for the new generation of products, Winbond has continuously invested resources into semiconductor design, manufacturing technologies, and sustainable innovations for products, creating competitive advantages and increasing market share for our green products. At the same time, Winbond has provided high quality products and services for our customers, whose needs Winbond has placed first.

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 backend packaging and testing.

Additionally, Winbond has been deep involved in the KGD (Known Good Die) field for many years, working together with chip factories to provide SiP (System in Package) multichip packaging solutions and creating more value in collaboration with the semiconductor industrial chain.



Note

- System in Package (SiP): From a packaging perspective (downstream of the semiconductor industrial chain), this term refers to arranging multiple chips in series or in a stack, creating a single packaged electronic element.
- 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.

Winbond provides global customers with comprehensive specialty DRAM solutions and services. Our major product lines include Code Storage Flash Memory, TrustME® Secure Flash Memory, Specialty DRAM and Mobile DRAM, which all have been designed with green product concepts in mind. Winbond is the only company in Taiwan with the ability to develop DRAM and Flash products in-house. By leveraging the synergies between each product in our portfolio, Winbond is able to fully satisfy the various needs of our customers, allowing customers to integrate their own products with Winbond's products to create a wide range of hand-held applications, consumer electronics, computer peripherals, artificial Intelligence, automotive and industrial-use electronics, which are all fields that have extremely high standards for product quality.

Current Status and Results from Research, Development, and Innovation

In 2022, Winbond launched the HYPERRAM 3.0. This series of products is ideal for use in low power consumption IoT devices such as wearable devices. It is able to support voice control and tinyML calculations, and can also be used in vehicle dashboards, entertainment and remote communications systems, machine vision, HMI displays, and communications modules. In 2022, our Kaohsiung Fab formally began mass production, an important milestone for Winbond. DRAM production line capacities can be gradually expanded in the future, adding new product lines for DDR4, or even higher speed ASIC DRAM products etc. to meet various customer requirements.

HYPERRAM ™ 3.0

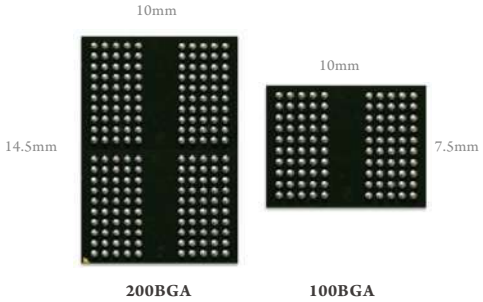
The third generation of our HYPPERRAM products utilizes the all-new 16-bit extended HYPERBUS interface, supporting data transfer speeds up to 800 Mbps through the same commands, bit address signals, and data bus format. It features the same standby power consumption, and only requires an adjustment to a small number of signal pins. The product also features a higher frequency.

DDR3

Shrinking from 38nm to 25nm, and then further down to 25S nm. Operating efficiency goes up with each technology node, and our 2Gb DDR3 products have 35% reduced power consumption. Winbond has continued to supply DDR3 products, making sure to satisfy long-term customer demand.

LPDDR4 Single Channel x16 4,267Mbps

Winbond provides single-die package (SDP) and dual-die package (DDP) product combinations, with faster data transfer speeds compared to DDR4 x16 3200Mbps and LPDDR4 Dual Channels x32 4,267 Mbps that provide even higher performance.



100BGA LPDDR4/4X Memory

Winbond is committed to shrinking the surface area of printed circuit boards (PCBs), and launched the 1Gb and 2Gb 100BGA LPDDR4/4X memory of Single Channel x16 with data transfer speeds up to 4,267 Mbps in 2022. This product not only meets JEDEC JED209-4 standards but also takes up 50% less surface area compared to the original standard 200BGA products. This memory is ideal for IoT devices that require small packages with higher data transfer speeds.

Secure Flash Memory

Due to the constant advancement of IoT technology, digital information security needs have also been increasing. Governments around the world have continued to strengthen security laws and regulations. However, it takes multiple years for a product to become certified, creating practical challenges due to the short useful lives of products. In response, Winbond has created the TrustME® W77Q Secure Flash Memory series and other secure memory elements able to ensure the stability of IoT devices and provide protection for end-to-end connections.

W76S Secure Element

The W76S possesses a SecurCoreTM, SC000TM 32-bit RISC core, and includes a 4MB W75F Secure Flash Memory Element whose memory size can be adjusted based on the requirements of the circuit designer. It has a core clock with speeds up to 100Mhz and a Memory Protection Unit (MPU), and utilizes various coprocessors and encryption technologies while also being Common Criteria EAL5+ and EMVCo certified, making it an innovative solution for security applications.The W76S can be used in embedded Universal Integrated Circuit Card (eUICC) applications, and supports multi-profiles and remote provisioning. At the same time, it also reduces the amount of space used on the PCB. eUICC can also promote growth and enhance operational efficiency for the M2M ecosystem.

TrustME® Secure Serial Flash Memory W77Q Series

Improves protection against software and hardware attacks in line with the information security requirements of IoT systems, and also meets Common Criteria EAL 2+ certification standards for IoT devices. In addition to protection against software and hardware attacks, the W77Q series also supports secure eXecute In Place (XIP), and possesses sophisticated cryptographic encryption of the communications channel. It allows for personalization of each device with unique keys, cryptographic read and write locks, data integrity protection, secure over-the-air (OTA) firmware updates, root of trust (RoT) functions, and secure read, write and erase operations. The memory is ideal as a secure storage solution for operating systems with limited storage space, pins, and power.

TrustME® Secure Serial Flash Memory W75F

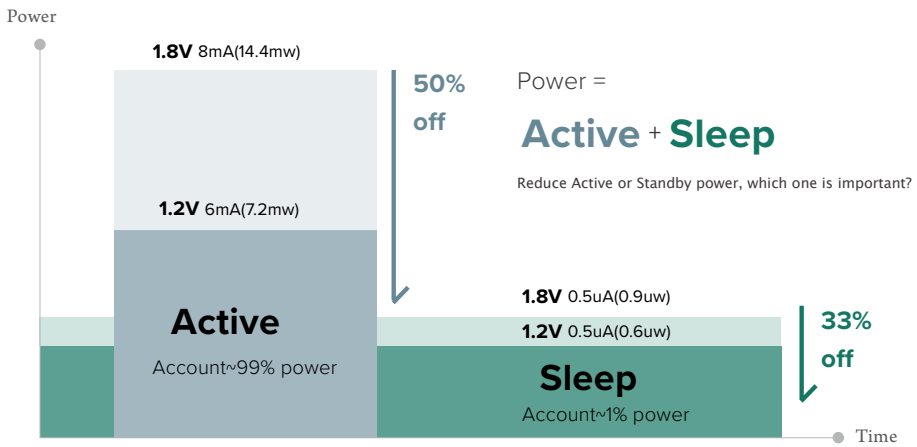
The W75F memory series was developed in response to the high security identify verification needs of mobile payment services and other applications, and due to confidential data storage requiring encrypted system hardware modules to possess EAL 5+ security certification.Products in the W75F series are 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.

Code Storage Flash Memory

One of Winbond's goals has always been to reduce power consumption and prolong battery life. To that end, Winbond has developed new processes and circuit architectures, and launching the world's first NOR Flash support 1.2V operating voltage, and through matching with the SoC that use advanced manufacturing process and low-voltage design to achieve high read and write speeds while also conserving power consumption.

In a scenario of true wireless application environment where 8 hours operation a day, and based on the total sales volume quantity of 1.2V Nor Flash memory in 2022, Winbond has saved power consumption 493,727 kWh comparing using 1.8V Nor Flash products, which is equivalent to reducing carbon dioxide emissions by 251.3 tCO_2e, or **0.65 times the amount of carbon absorbed by the Da'an Forest Park** (based on data published by the Executive Yuan Council of Agriculture and the Taipei City Government Department of Land Administration: 25.93 hectares, when calculated based on a carbon fixation coefficient of 14.9 tCO_2e /hectare/year, Da'an Forest Park absorbs 386 metric tons of carbon dioxide a year).

1.2V NOR Flash	
Total power consumption	45% less power consumed compared to the 1.8V NOR Flash in mainstream use today
Performance	Maintains similar level as 1.8V/3V Flash
Advantages	Reduces PCB surface area used, allowing for lighter and smaller consumer electronics products to be designed
Product applications	Wireless headphones, smart watches, smart wristbands, smart glasses, and other wearable devices with high power-saving requirements



Intellectual Property Management

Patent applications

- Cumulative number of worldwide patent applications exceed **6,000**.
- Apply **450** patent applications in 2022.
- **17th** Place among the Applicants of the Taiwanese Juridical Persons, place on the top **20 Applicants** of the Taiwanese Juridical Persons for **six consecutive years**.*

Patents granted

- Cumulative number of worldwide granted patents exceed **4,500**.
- Worldwide granted patents nearly **380** in 2022.
- **16th** Place among the Patentees of the Taiwanese Juridical Persons, place on the top **20 Patentees** of the Taiwanese Juridical Persons for **seven consecutive years**.*

Note Data sourced from the Ministry of Economic Affairs, Intellectual Property Office

Intellectual property (IP) are important assets for maintaining corporate sustainability. In order to protect the research and development resources and results invested by Winbond, Winbond has established IP policies in line with the Winbond's operating goals. By institutionalized IP management, Winbond nurturs a coporate culture of innovation and strengthens the IP protection awareness of employees. Winbond encourages the continuous innovation and IP right creation of our employees during the course of work which strengthens the sustainable competitive advantages.

Winbond has established annual IP goals based on an overall assessment of the business objectives and research and development resources, connecting our business objectives with our IP strategy. As of 2022, the cumulative worldwide patent applications have exceeded 6,000 and the cumulative worldwide issued patents has exceeded 4,500.

Winbond has established an IP department and Patent Committee responsible for IP right management, assessment, promotion, and utilization. Started from the incubation stage, Winbond rigorously reviews the patent proposals based on official patent examination guidance from various countries and the commercial value so as to improve our patent qualities and protect our research and development outcomes appropriately.

Winbond provides generous incentives and bonuses which encourage our employees to learn the requirements of patent rights and submit patent proposals proactively. In addition, Winbond provides training courses customized for each department which sought to inspire our employees to think innovatively by presenting them with cases relevant to their work, leading to more high-quality inventions being proposed.

With regard to the technical topics important to the business objectives, Winbond utilizes variety approaches to construct a high-value and diversified patent portfolio such as holding thematic brainstorming meetings with relevant technical departments and conducting patent map analysis.

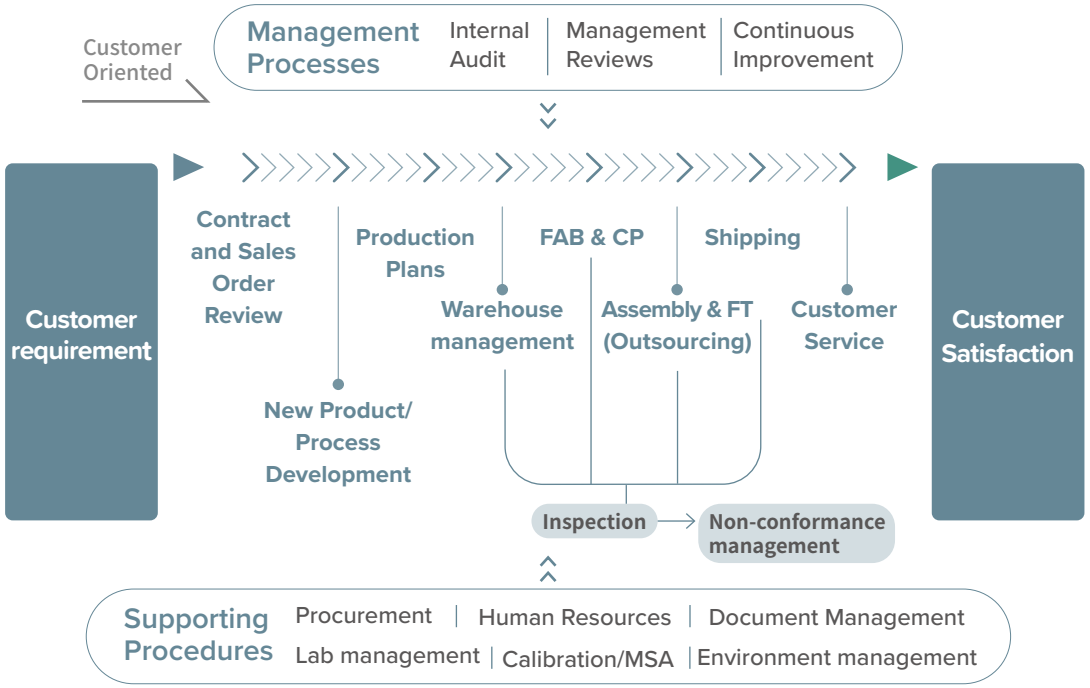
Apart from continuing to develop a diversified patent portfolio, Winbond has as of 2022 included trade secrets into our IP strategies. Winbond set about planning the mechanism of registering trade secrets, and held a total of 23 workshops which educate our employees on how to identify and take inventory of confidential information or trade secrets that they may encounter as part of their work duties, further improving Winbond's IP protection.

1.2 Quality Management for Products and Services

Winbond's product policy is to become a world class company offering products/services that best satisfy our customers, by establishing Total Quality Management, Zero Defect and Quality First quality culture through the process of continuous improvement. Following this policy, Winbond has established various rules and standards that Winbond abide by. Apart from ensuring that our product quality and packaging meets the legal requirements of each country and region, Winbond has also carried out quality management through various international product quality systems, such as the ISO 9001, IATF 16949, and ISO 26262 standards that Winbond has received third-party certification for. Winbond has focused on carrying out quality management by defining and tracking quality performance indicators, and have continuously implemented improvement measures. By adopting various management processes, such as FMEA, SPC, and MSA tools, Winbond conduct comprehensive assessments, evaluations, and improvements to our product quality in order to meet the needs and expectations of customers.

Apart from having adopted international product quality management systems to meet our product quality goals, Winbond has also proactively attempted to cultivate a culture of product quality management through methods such as FMEA analysis, 5-Why analysis, and creating the Winbond Quality Newsletter, advocating for and promoting quality-related policies, culture, activities, and methods, that enable our employees to gain a deeper understanding and awareness of quality.

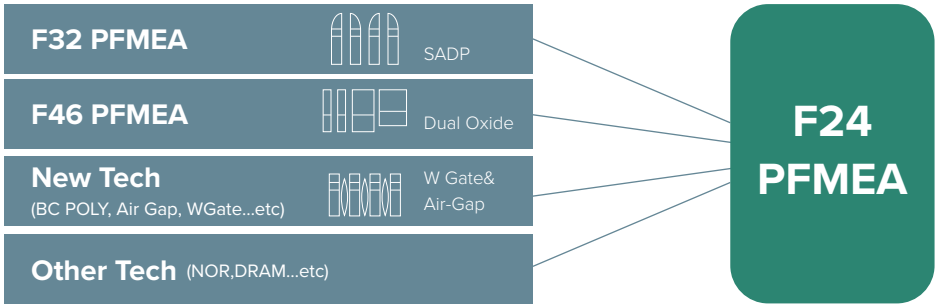
— Quality Management Systems and Processes —



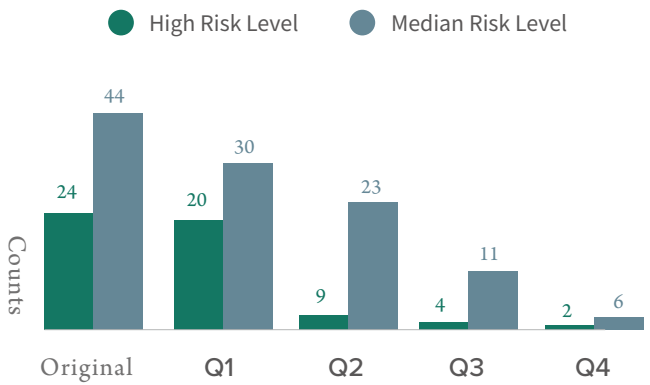
Failure Mode and Effect Analysis (FMEA) Systemization Project

In 2022, Winbond fully adopted FMEA into our new product development process, applying this analysis to the development of our 20nm DRAM and 24nm Flash technologies for the first time. Based on the various risk assessments generated through this method, such as production process, electrical, and design risk assessments, our employees can choose to focus on "Man, Machine, Material, Method, Environment" based on the different risks posed by each factor, using this information to keep the production process stable. This structured analysis method has increased the depth and scope of failure analysis, helping to avoid more potential failures from taking place.

— F24 PFMEA Architecture —



— PFMEA F24 Status —



High Risk Level
improve **91.7%** from 2021/Q4 to 2022/Q4

Median Risk Level
improve **86.3%** from 2021/Q4 to 2022/Q4

Winbond employees are able to effectively utilize these techniques in their day-to-day work. Winbond working groups also carry out regular audit meetings, helping to greatly optimize product design and shore up weak points in the production process. Throughout

the year, 539 total improvement measures were implemented, allowing each weak point in the operational processes to be corrected and optimized, preventing them from causing further issues.

June
Explanation of FMEA Concepts

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June-July
Practical Seed Training Courses and Counseling

>>

July-Oct.
FMEA Promotion

- There is a total of **9** centers and **24** factories participated in the activity, and through training activities such as courses on FMEA concepts, practical case training, and guidance, participants were familiarized with FMEA techniques and applications.
- Completed training of **51** seed instructors in total, and trained **562** employees on FMEA concepts.
- The **24** participating plants created **24** administrative FMEA failure prevention and correction reports in 2022, after guidance from the seed instructors and repeated explanations to the employees, and after learning from a risk analysis of real-world work operations.

From 2021 onwards, Winbond has regularly held an annual FMEA working group results announcement meeting in the fourth quarter of each year, where each working group shares their results and experiences with promoting FMEA. This allows each group to observe and learn from other groups, implementing the philosophy of "never make the same mistake twice" into daily operations. These meetings have received good feedback and have been well received. In the 2022 results announcement meeting, 322 employees above the rank of assistant manager attended, an increase of 40 compared to 2021. This shows the proactive attitude and focus that Winbond's executives have towards quality management. This has not only greatly assisted Winbond in promoting and implementing FMEA, but also helped improve communications and learning within the company organization.

2022 FMEA working group results announcement meeting

Introduction to Quality Management - FMEA

FMEA is a reliability evaluation that describes the impact of systems or equipment failure. The latest version of FMEA was jointly established in 2019 by the North American Automotive Industry Action Group (AIAG) and the German Verband der Automobilindustrie (VDA). Known as the first version of the AIAG VDA FMEA, this version of FMEA is the one currently adopted by Winbond.

A Corporate Culture of Pursuing Quality

In the digital age, Winbond has, through a digital transformation, integrated ourselves with future AI development trends, establishing a more comprehensive information platform. Through concrete action, Winbond has stopped corrupt practices, innovated, and continued to optimize rules and processes, with the goal of providing our customers with quality services that they can be satisfied with. In the future, Winbond shall remain committed to our original mission, and strictly manage each quality checkpoint for our customers and for the Company, with a goal of constant self-improvement.

With regard to improving the quality of our procured materials, Winbond launched the Chemical Analysis Information Platform in 2022, which consolidates and provides the supplier's COA shipping information, Winbond's supply inspection IQC information, regular inspection results from the warehouse system, and micro-pollutant information from the Winbond's equipment department. Through a digital transformation and optimizing the inspection process, Winbond has improved the efficiency of producing IQC information, and of our chemical experiment lab operations. At the same time, Winbond has allowed our engineering department to more quickly obtain micro-pollutant analysis information.

In 2022, Winbond newly created a Supplier Quality Management Platform, which systematically records past related information that can help us easily and quickly communicate with suppliers, ensuring that our quality requirements have been met. From 2021 onwards, Winbond has also began building the Visual Inspection QC System, providing more transparent information on our product flaws, and developing a smart visual identification function for identifying product flaws. Quickly following the beginning of development, Winbond completed the automated identification system in 2022. After the AI visual identification system was launched, Winbond was able to save 90% of the manpower previously necessary for flaw identification. By transferring standardized processes to a machine, Winbond allows our employees to focus on more high value activities, increasing productivity and decreasing the risk of coming into contact with sensitive information.

5-Why

From 2018 onwards, Winbond has been promoting the 5-Why courses, including these courses as a KPI for each of our departments, and providing bonus reward activities and competitions. Following this guidance, when our employees face an issue, they would first search for all possibilities, and uncover the root cause of the issue through verifying all possibilities, allowing them to precisely pin down the correct response to resolve the issue.

— 5-Why Verification and Validation —

Conduct a complete analysis following a step-by-step process, starting by analyzing the technology/failure link, then conducting verification and validation, and then analyzing the process, with the entire procedure encompassing these three aspects.

Technology/Failure link	Verification and Validation	Process layer
Human, Machine, Material	Method, measurement	Procedures, Management, Environment
Why did this issue occur?	Why wasn't this issue discovered?	What issue occurred in the system?

In 2022, 167 employees attended Winbond's 5-Why Advanced Coaching Elite Course held online. Through the training provided by this course, employees were able to improve their skills, and the course also discussed the 5-Why process by applying it to various different scenarios, such as for engineering departments, non-engineering departments, and fab work. This allowed employees to more precisely analyze issues through the 5-Why method.

Winbond Quality Newsletter

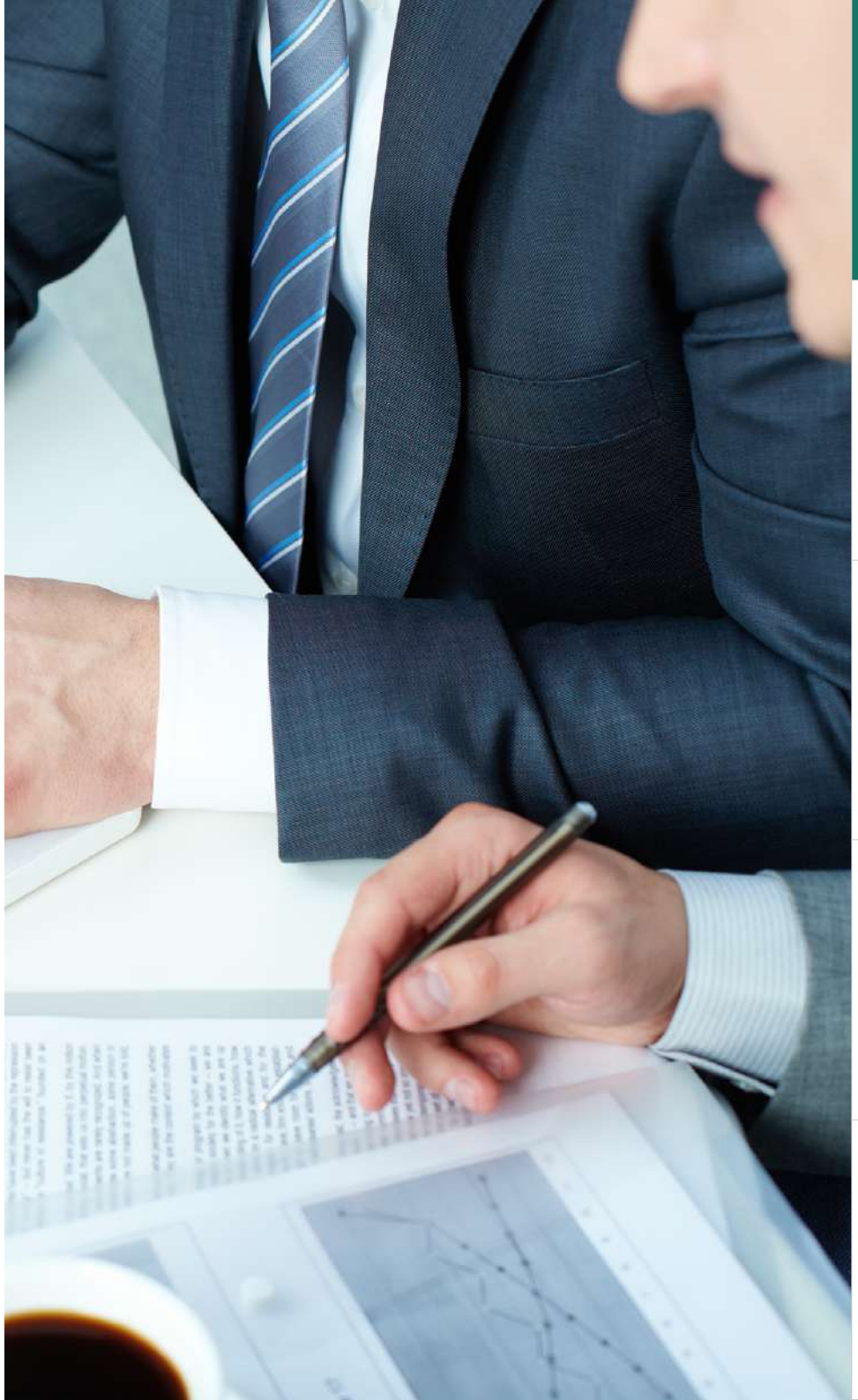
Since the fourth quarter of 2021, Winbond has published a Quality Newsletter. Through this internal platform, Winbond has cultivated a corporate culture of placing quality first, and shared various articles, videos, websites, and livestreams on quality control topics, deeply instilling our quality culture into the lifestyles and work of our employees through these different approaches, embedding these values into the DNA of our employees.

Each Quality Newsletter thoughtfully incorporates quality-related activities, making the newsletter a more appealing read for Winbond employees. Through presenting interesting topics, the Newsletter has successfully promoted quality-related policies, culture, activities, and techniques.

- Accumulated **76** articles and videos on quality-related topics
- Browsed **21,531** times

Winbond Quality Month

The theme for the Winbond Quality Month in 2022 was “Bond Investigations Bureau”, employing educational entertainment to increase employee awareness of quality. The diverse activities put on for the month attracted eager participation and discussion from our employees, with these activities including a Teams weekly raffle, Quality Video Shorts competition, and the Winbond Knowledge King Quiz. For the first time, a vlog of a day in the life of a Kaohsiung/CTSP engineer was also displayed, which was well received by the audience. The video allowed Winbond employees to understand the work duties of employees in other departments, promoting mutual understanding between internal employees. These activities attracted 4,424 participants, an increase of approximately 5% compared to 2021. In the future, Winbond will continue to promote Winbond Quality Month through various creative ways.



International Standards Certification

Winbond has continued to strictly manage our production process and quality control. Not only the stable and well-appointed factory in Central Science Park factory but also our Kaohsiung Fab began production operations, and successfully obtained the IATF 16949, ISO 9001, and QC 080000 international standards certifications in 2022. In order to improve product quality, Winbond has improved its yield analysis, supply chain management, and adopted other methods to better understand customer needs in order to continuously improve its product quality. Additionally, Winbond has received multiple certifications verifying our compliance with RBA, ESG, and other international standards. Following the high standards of our customers, Winbond has implemented hazardous substances and production environment management, as well as fulfill our corporate social responsibilities.

ISO 9001
IATF 16949
QC 080000

ISO 14001
ISO 45001

ISO 27001

ISO 9001

IATF 16949

QC 080000

ISO 27001

ISO/SAE 21434

ISO 26262

ISO 14001

ISO 45001

ISO 50001

— ISO/SAE 21434 Cybersecurity Systems for Road Vehicles —

Winbond has in the past few years expanded into the field of automotive electronics. In order to improve the reliability and functional safety of our automotive electronics products, Winbond has entered the global advanced automotive safety systems supply chain.

2019

Winbond has obtained ISO 26262 certification, the world's highest-level automotive electronic safety standard. This also makes us the first maker of automotive-use memory in Taiwan to obtain this certification on road vehicle functional safety, allowing us to become a trusted partner of international automakers.

2020

Winbond has obtained the higher-level ASIL (Automotive Safety Integrity Level) standard product certificates for individual products, expanding into the automotive electronics market and providing automotive electronics products that meet the supply chain needs of international automakers.

2022

Winbond has obtained ISO/SAE 21434 Cybersecurity Systems for Road Vehicles certification from TÜV NORD, becoming the first memory manufacturer in the world to have obtained this certification.

Introduction to Quality Management - ISO/SAE 21434 Road Vehicles - Cybersecurity Engineering

The ISO/SAE 21434 standard covers all necessary safety standards related to the design concept, development, production, use, and disposal of a car, applicable to the microcomputers and other components used and developed in these processes. The standard requires car systems to be equipped with stronger information security functions for preventing cyberattacks, effectively improving the ability of a vehicle to manage network threats.

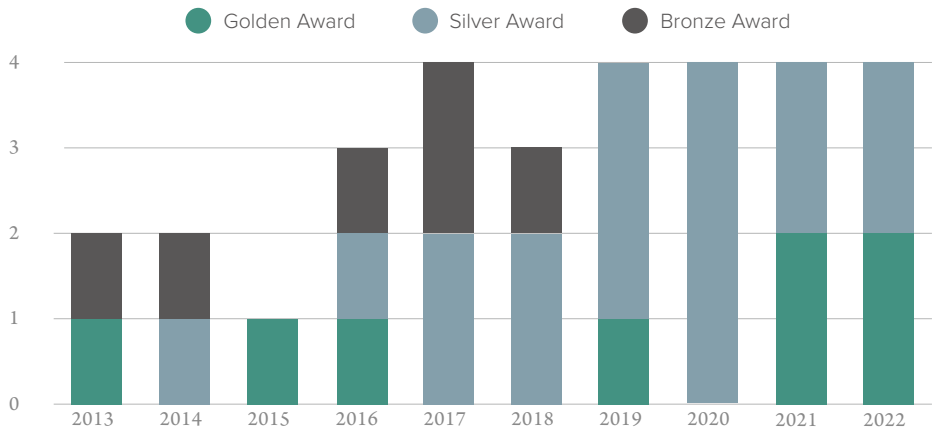
Matthias Springer, Senior Vice President of Functional Safety and Security at TÜV NORD: "Winbond's current cybersecurity systems have been certified as meeting ISO/SAE 21434 standards, and are able to provide comprehensive security solutions for automotives. This is unmistakably an important milestone. Additionally, Winbond highly recommend OEMs and suppliers in industries with relatively high security requirements, such as the automotive industry, to obtain these certifications."

Quality Awards Won

Winbond has proactively participated in the Taiwan Continuous Improvement Awards (TCIA), a national competition supervised by the Ministry of Economic Affairs Industrial Development Bureau, and organized by the Corporate Synergy Development Center. From 2013 onwards, Winbond has for ten years in a row been promoted to the highest-level Zhi-Shan Group. Each year, Winbond continue to work hard towards improving our quality. In 2022, Winbond also won two Golden Awards and two Silver Awards, showcasing our exceptional achievements. These honors are a testament to the enthusiasm towards learning displayed by Winbond employees, as well as of the high priority Winbond place on quality and our commitment to making continuous improvements. At the same time, they are evidence that Winbond has lived up to the trust that our customers have placed on us. These achievements have further advanced Winbond's long-term stable development.

Team name	Event theme	Prize
Team Perseverance	Reducing the incidence of memory wafer pad corrosion	Golden Award
Team Collaboration	Creating a smart chemicals plant, greatly improving Winbond production capacity	Golden Award
Team Green	Increasing tap water usage efficiency	Silver Award
Team Precision	Established the Probe Card precision prediction system, greatly improving testing productivity	Silver Award

— Quality Awards Won —



1.3 Green Manufacturing

Winbond has remained committed to green manufacturing principles. Winbond has included reducing carbon emissions as an important goal, and have implemented measures to do so starting from the research and development phase. Through methods such as optimizing our production processes and adopting zero carbon emissions gases, Winbond hopes to become a model for promoting green products, relying on our core competencies to create a green impact. In 2022, Winbond invested NT$1.334 billion into implementing environmental protection measures, and have continued to invest into reducing the environmental impact caused by our business operations. Compared to 2021, Winbond has invested 253% more funding into these efforts, with this increase mainly due to the many pollution prevention/treatment facilities built for our new Kaohsiung Fab. Winbond has continued to reduce the environmental impact caused by our operations, and the economic benefits brought about by the environmental protection investments above have totaled NT$36 million.

— Environmental Investment Amount —

Expense category	Expense items	2020	2021	2022
New prevention/ treatment equipment	Air pollution prevention equipmen	95,355	3,500	388,432
	Water pollution treatment equipment	2,900	23,600	440,803
Operational and maintenance expenses for prevention equipment	Air pollution prevention equipmen	93,889	98,582	129,979
	Water pollution treatment equipment	113,214	162,020	259,322
Waste processing expenses	General industrial waste	34,558	33,839	40,390
	Hazardous industrial waste	32,833	56,697	75,029
Total		372,749	378,238	1,333,955
Revenues (by entity)		39,649,875	57,532,802	51,139,171
Percentage of revenues (Total expenses/revenues)		0.94%	0.66%	2.61%

(Unit: NTD Thousands)

— Economic Benefits from Environmental Investment —

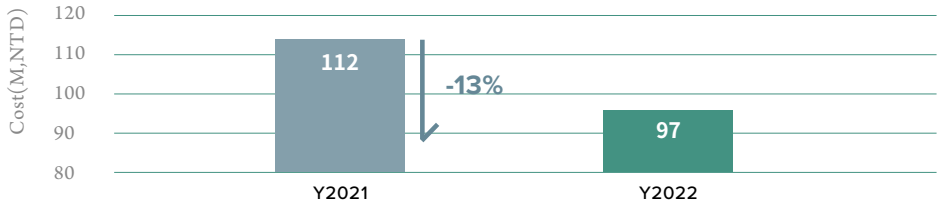
	Type	2020	2021	2022
Benefits	Waste Recycling	8,100	6,008	6,324
Amount conserved	Electricity conservation measures	170,500	189,780	329,639
	Water Conservation Measures	7,512	10,594	9,180
Total economic benefits created		186,112	206,382	345,143

(Unit: NTD Thousands)

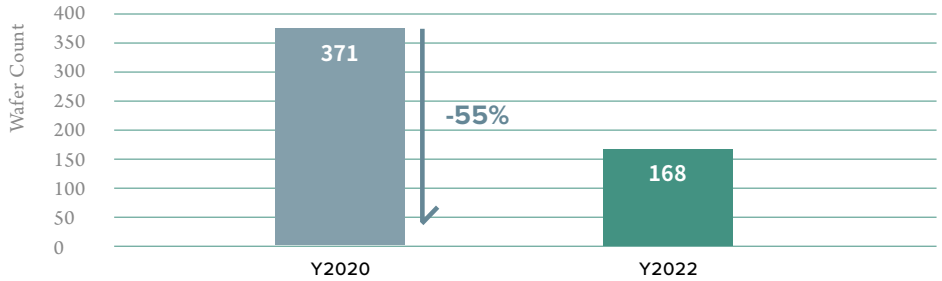
Smart Manufacturing Prognostic and Health Management (PHM)

By using PHM for smart health monitoring of the production process, Winbond is able to discover and repair damage to the electrostatic chuck (ESC) early before serious damage occurs, effectively reducing ESC usage costs, and reducing the number of wafers that need to be discarded due to ESC damage. In 2022, our ESC usage costs were lower by 13% compared to 2021. Winbond also discarded 55% less wafers, a major improvement.

— ESC Usage —



— Scrape Wafer due to ESC Fall —



1.4 Customer Relationship Management

Maintaining Customer Relationships

Customer Satisfaction

Customers play an important role in corporate business management. The value chain of a company is closely linked to its customers, which means that Winbond is devoted to satisfying the needs of its customers and placing customers first. Winbond hopes to grow and develop sustainably alongside our customers. In 2022, Winbond adopted the use of internal control reports for the first time to monitor product delivery needs. Winbond regularly reviews and tracks whether or not our products are being delivered on time, as a way of measuring customer satisfaction. Additionally, warnings for differences between the target and sales order price are displayed through an upper and lower range indicator. The Production Part Approval Process (PPAP) system has standardized customer query responses for frequently seen customer queries. Winbond hopes to be able to communicate with customers more proactively and timely, responding to customer issues in real time by implementing adjustments and improvements. Winbond hopes to prevent customer complaints before they happen, allowing our customers to enjoy the benefits of this "unseen" customer service, and building sound relationships of trust.

Tracking Customer Intentions

At Winbond, we place a high priority on our brand value. Winbond continues to monitor customer complaints received in the past and take the customer's requirements and thoughts in these past complaints into account to create customized services. In 2022, Winbond received a total of 1,085 customer complaints. Out of these cases, Winbond was able to determine through testing that 637 complaints, or 59% of total complaints, were not due to Winbond's quality or service issues. Understanding and removing these customer complaints allowed these cases to become a useful reference for us, with this process also being a part of our customer services. Considering the amount of chips shipped, customer complaints were only received for 0.000055% of all chips shipped, which is an extremely good track record.

After analyzing customer complaints and determining the causes of failure for each case, Winbond was able to discover and resolve the root causes for each failure. Winbond also proposed further failure mode analyses and correction plans to be implemented, as well as establish correction plans to address the issue from the initial production process. This ensures that customers are provided with the best customer service quality and products. Winbond has also achieved an extremely low failure rate (calculated as total number of failed ICs/total ICs shipped) of 0.2ppm. By maintaining customer satisfaction levels. Winbond is able to maintain stable business performance, creating a win-win situation.

Quality Workshop

Winbond regularly holds quality workshops. Apart from allowing us to understand customer requirements and suggestion for products, Winbond also invites professionals and experts from the industry to attend, creating opportunities for discussions on quality and technology issues. Through the opportunities for communication offered by these quality workshops, Winbond is able to propose solutions to customer issues in real-time, as well as continuously improve and raise production and quality. These efforts can further raise customer satisfaction, while also allowing us to gain more industry and technical knowledge, helping us to continue improving our own technological capabilities and product quality. Winbond believes that quality workshops will continue playing an important role in future development, contributing to the mutual development of Winbond and our customers.

Customer Privacy Protection

Winbond Electronics strictly manages customer information. All business information, such as documents and information on customer interactions, are stored in Winbond's internal highly-protected system. Winbond approves and release work access rights for our employees based on the relevant operational guidelines and procedures. In order to ensure that the Winbond is able to protect customer privacy and prevent business secrets and intellectual property rights from being stolen or leaked, Winbond has in 2022 obtained the ISO 27001 Information Security Management Systems certification, establishing a comprehensive information security protection system.

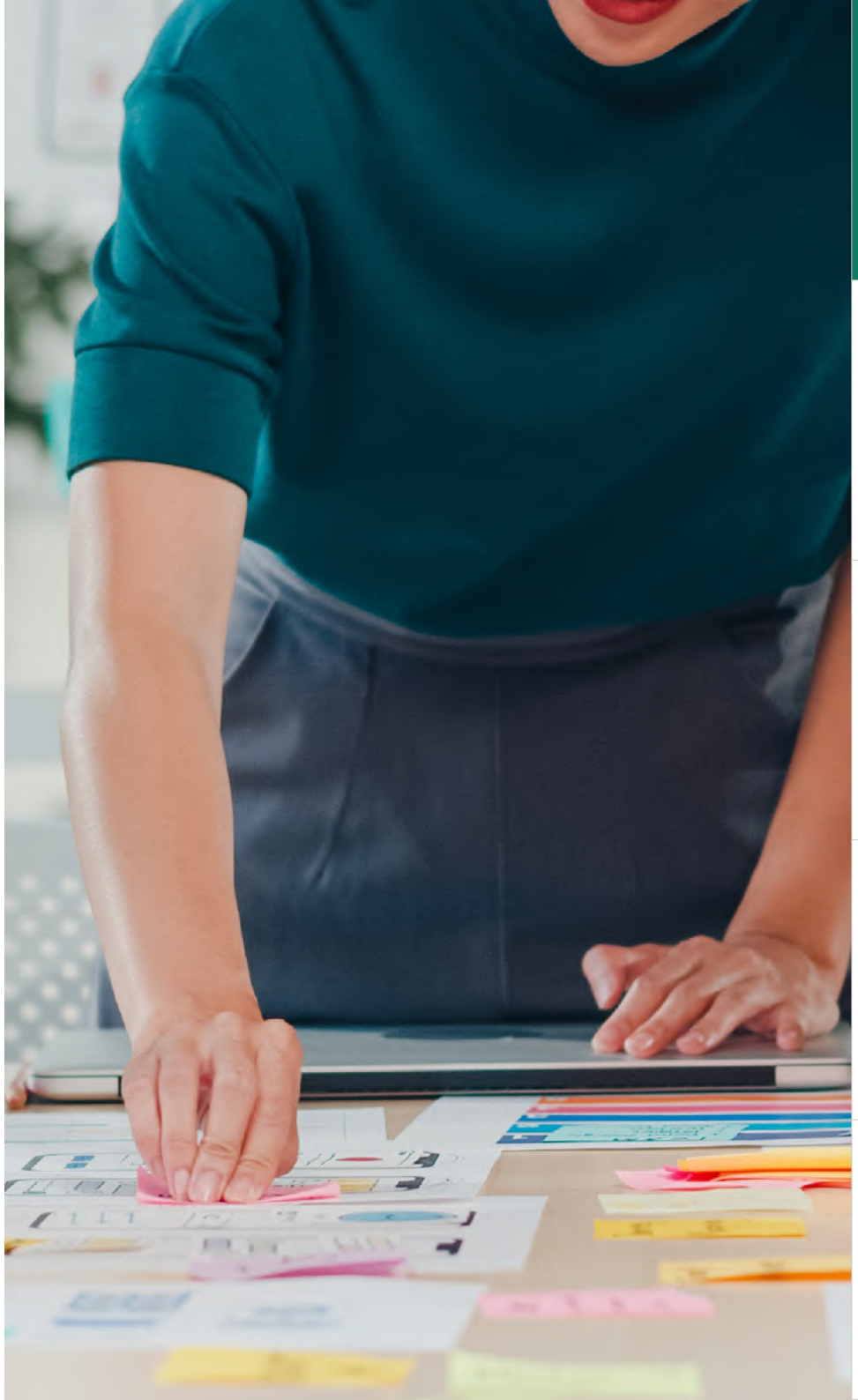
Winbond Electronics has already made the required adjustments to remain compliant with the European Union's General Data Protection Regulations (GDPR) which came into effect in May 2018, amending the Winbond's official website and re-inspecting the information of all website members. The GDPR has also been included in online courses on the Personal Data Protection Act. In 2022, 3,052 employees participated in these

training courses, where 100% of them passed the training exam. In total, 1,526 training hours were provided.

Smart transition reinforces customer privacy protection - Notifications settings system & cloud services.

In order to ensure that customer privacy has been well protected, Winbond has signed confidentiality agreements with our suppliers and customers, working together to protect each other's confidential information and preventing sensitive information from being inappropriately disclosed. Winbond has established operational guidelines and provided regular education and training on our internal employee work procedures, such as on: Phishing emails, ICP import and export restrictions, red alerts, etc. Additionally, Winbond has in 2022 implemented a smart transition for our reporting systems, using programming tools and Robotic Process Automation (RPA) for: Handling computer viruses, adopting systems for running automated consistency checks on information systems, delivering mail notifications. In order to allow users to more easily operate the system in an emergency, Winbond hopes to change this system from a passive into an active one. By providing early warnings, Winbond can reduce risks, Winbond has adopted Microsoft's cloud services to conduct automatic verifications and deliver notifications for why an account has been locked.

In 2022, Winbond continued to have no reported incidents where Winbond violated customer privacy or lost customer information, or where Winbond was fined for violating product liability laws and regulations.



2.1 Energy and Greenhouse Gas Management
2.2 Resource Management
2.3 Waste Management
2.4 Air Pollution Control
2.5 Hazardous Substance Management

2. Environmental Sustainability

Winbond has worked alongside countries and companies from around the world to implement green sustainability measures, proactively reducing the impact that our business operations have on the environment. Apart from having no major violations of environmental laws, Winbond has also committed innovative new technologies and significant resources into adopting measures for reducing energy consumption and carbon emissions, improving resource utilization rates, and improving waste and emissions management, taking concrete action to implement our sustainable development blueprint.

2022 Performance Highlights

- Cumulative electricity savings of **380 GWh** from 2018 to 2022
- The power generation capacity of the rooftop renewable energy equipment in CTSP Fab reached **660,000 kWh**
- GHG emissions per layer of wafer photomask was **13.2** (kg CO_2e/ layer- wafer photomask)
- Electricity consumption per layer of wafer photomask was **82** (MJ/ layer - wafer photomask)
- Water withdrawal per layer of wafer photomask was **134** (liter/ layer - wafer photomask)
- Cumulative water saving of **3,530** megaliters from 2018 to 2022
- The water recovery rate of the whole plant reached **80.5%**
- Waste recycling rate reached **90.1%**
- Removal rate for VOCs in 2022 reached **99%**

2.1 Energy and Greenhouse Gas Management

2.1.1 Energy Management

Our use of raw materials/fuel has increased in recent years due to the building of new facilities and the addition of new equipment. In 2022, Winbond consumed approximately 2,807,178 GJ of energy. In view of these figures, Winbond has continued to implement energy conservation measures in 2022, changing 21 pieces of equipment in order to conserve more energy, including: Utilizing smart air conditioning, and optimizing the Make-up Air Unit (MAU) air washer system. In 2022, our Central Taiwan Science Park (CTSP) Facility obtained ISO 50001 energy management systems certification, effectively standardizing the facility's management processes and allowing it be managed by our engineering units. Our Kaohsiung Fab is also planned to undergo ISO 50001 certification, with the hopes of expanding the scope and benefits of our energy management operations. Amount of electricity saving increased about 129,229 GJ compared to 2021. In 2022, the average electricity consumption per layer of photomask for 12-inch wafers was 82 MJ. Compared to the 79.3 MJ consumed in 2021, electricity consumption per product unit increased by approximately 3.4% YoY (MJ/layer - wafer photomask). Compared to our target of 80.1 MJ for 2022, electricity consumption per product unit was higher by approximately 2.4% YoY (MJ/layer - wafer photomask). This was due to the global economic deterioration in 2022 leading to lower demand, in turn causing the average electricity consumed to produce one product unit to slightly overshoot our target levels. In the future, Winbond shall continue to promote energy conservation plans to reduce the burden on the environment.

From 2018 to 2022, a total of 1,366,906 GJ of electricity was conserved, equivalent to the annual electricity consumption of 108,361 households

Note This figure is based on the Taiwan Power Company's 2018 statistics, which showed that average annual electricity consumption for one household was 3,504 kWh, approximately12.6 GJ.

— Target Achievement Progress —

Indicators and Targets	2022 Targets	2022 Achievements
Electricity Intensity (MJ/layer - wafer photomask)	≦ 80.1	82
Electricity Intensity (kWh/layer - wafer photomask)	≦ 22.26	22.76

— Energy conserved in previous years —

Total energy conderved/Year	2018	2019	2020	2021	2022
Accumulated electricity-conserving measures (individual sets)	201	208	219	227	248
Total electric ity saved each year (GJ)	227,556	234,244	243,201	266,338	395,567
Total electricity saved each year (million kWh)	63.2	65.1	67.6	74.0	109.9

— 2022 Energy-Conserving Measures and Outcomes —

Type	Energy-saving/Carbon Reduction Project	Energy Savings (kWh)	Energy Savings (GJ)	GHG Emission Reduction (tCO_2e)
Light-ing	Replacement of LED lighting equipment in mechanical areas of the facility	49,801	179	25
	Replacement of LED lighting equipment in the office areas	17,928	65	9
Facility Equip-ment	Smart air conditioning	2,270,518	8,174	1,156
	Optimization of the MAU air washer system	499,084	1,797	254
	Enhanced the plate heat exchanger efficiency of UPW (Ultra-Pure Water) and PCW (Process Cooling Water) system	589,641	2,123	300
	Replacing heating units of machinery in fab	516,932	1,861	263
	Energy-saving improvements for exhaust systems	623,506	2,245	317
	Optimization of VOC system operation	83,665	301	43
	Optimization of bulk gas purifier regeneration	53,586	193	27
	Optimized the loading of PCW(Process Cooling Water) system	39,841	143	20
	Water and energy saving of UPW(Ultra-Pure Water) system	1,594	6	1
	Improved water production rate of RO system	79,681	287	41
	Optimization of compressor dryer units	896	3	0.5
	Reduction of exhaust emissions from VMB and gas cabinets	490,040	1,764	249
	Energy-saving for air conditioning in the cleanroom of testing production	81,673	294	42
	Motor upgrades for soft water system	730	3	0.4
Total		*5,399,116*	*19,438*	*2,748*

Note 1 2021 used as the base year.

— 2022 Results of Energy-Conserving Designs Implemented in Kaohsiung Fab —

Type	Name of energy-conservation/carbon reduction project	Energy Savings		GHG Emission Reduction (tCO_2e)
		(kWh)	(GJ)	
Fab constr-uction	Waste heat recovery from the hot purified water heat pump system	8,488,000	30,557	4,320
	Waste heat recovery for air compressor dryers	54,750	197	28
	High-efficiency boilers	9,855,000	35,478	3,230
	Increasing the outlet temperature of the chilled water system to save energy	10,444,110	37,599	5,316
	Energy-saving LED lighting	1,656,000	5,962	843
Total		*30,497,860*	*109,793*	*13,737*

Note

1.The energy-saving design of the new fab was based on the CTSP Fab as the reference.

2.The GHG reduction of the high-efficiency energy-saving boiler project was the comprehensive calculation result of electricity saving and natural gas usage.

— Energy use and energy intensity for each product unit —

Energy intensity/year	2020	2021	2022
Total energy consumption (GJ)	2,207,442	2,234,839	2,807,178
Energy consumption per unit (MJ/layer - wafer photomask)	90	89.1	92.2
Electricity usage (GWh)	546	552	689
Total electricity consumption (GJ)	1,966,533	1,988,490	2,479,988
Electricity consumption per unit (MJ/layer - wafer photomask)	80.1	79.3	82.0
Percentage of total electricity usage (%)	89.1	89.0	88.3
Natural gas usage (ten thousand cubic meters)	636	654	854
Total natural gas usage (GJ)	236,788	242,327	314,966
Natural gas usage per unit (MJ/layer - wafer photomask)	9.7	9.7	10.9
Percentage of total natural gas usage (%)	10.7	10.8	11.2
Diesel usage (cubic meters)	54	55	285
Total diesel usage (GJ)	1,899	1,934	10,023
Diesel usage per unit (MJ/layer - wafer photomask)	0.1	0.1	0.1
Percentage of total diesel usage (%)	0.1	0.1	0.4
Automotive gasoline/diesel usage (cubic meters)	68	64	67
Automotive gasoline/diesel usage (GJ)	2,221	2,088	2,200
Automotive gasoline/diesel usage per unit (MJ/layer - wafer photomask)	0.1	0.1	0.1
Automotive gasoline/diesel usage as percentage of total energy consumption (%)	0.1	0.1	0.1

Note

- Winbond has not used renewable energy.
- Energy usage has been converted into joules 1 kWh of electricity = 3,600 kJ, 1 cubic meter of natural gas = 8,809 kcal, 1 liter of diesel = 8,400 kcal, 1 liter of gasoline = 7,800 kcal, 1 calorie = 4.184 joules
- Standards, methodology, assumptions, and/or tools used: All energy usage information comes from meter readings, the natural gas monthly consumption statement and the requisition form/item number inventory change record checklist. These tables contain no estimates.
- Source of conversion factors: Apart from natural gas, which had been calculated using the caloric values provided by the supplier, all other conversion factors were based on the Environmental Protection Agency's Table of Greenhouse Gas Emissions Coefficients Version 6.0.4.
- Data for the Kaohsiung Fab was added in 2022. Additionally, as the Kaohsiung Fab is newly-established and just began operations, it has not been included in this year's calculation of energy consumption per product unit.

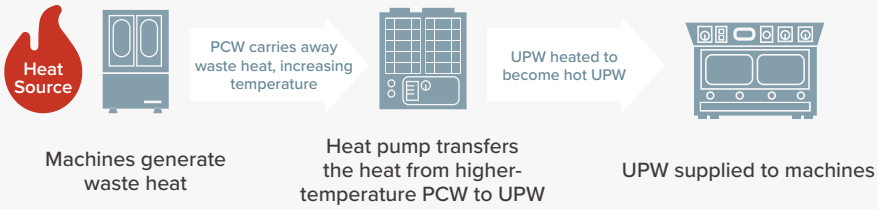
Investment into Renewable Energy

In response to local government renewable energy policies, Winbond has installed a 499 kW rooftop renewable energy generation system in 2019. **In 2022, the system generated 660,000 kWh of electricity**, and all electricity generated each year is sold to the Taiwan Power Company, contributing to Taiwan's push for renewable energy.

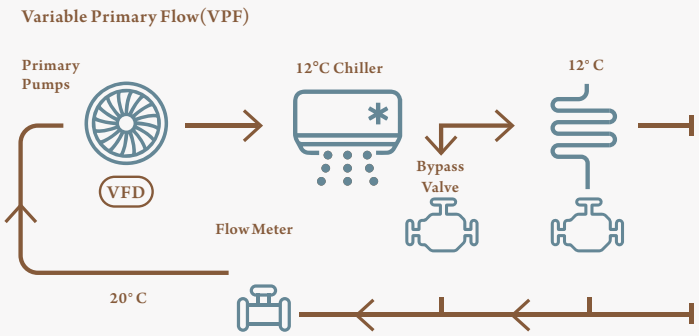
Energy-conserving Design of Kaohsiung Fab

1. Winbond Electronics' Kaohsiung Fab incorporated numerous energy-conserving designs in its initial design. The facility is able to conserve large amounts of energy through methods such as recycling waste heat, using LED lights instead of traditional light bulbs, and adopting energy-conserving chiller designs.

2. Waste heat recovery from hot ultra-pure water heat pump: Waste heat generated by the process cooling water (PCW) is recovered. A heat pump is used to heat the UPW, which is then supplied to the equipment.



3. Increased outlet water temperature of chilled water system: The temperature of water output by the chiller was increased to 12℃, increasing power-saving efficiency compared to the previous temperature of 9℃.



2.1.2 Greenhouse gas management

Winbond has proactively cooperated with the government in conducting inventory and verification of greenhouse gas emissions. Winbond has implemented greenhouse gas management systems within our plant facilities, adopted the operational control approach, and adopted ISO 14064-1 standards to carry out comprehensive greenhouse gas emissions inventory and verification. Winbond has also set carbon reduction targets, looked for opportunities to reduce emissions, and proposed improvement plans. In 2022, Winbond conducted ISO 14067 carbon footprint inventory of a portion of our IC products in 2022, gradually improving our greenhouse gas reduction results.

In 2022, Winbond completed ISO 14067 carbon footprint inventory and verification of a portion of our IC products.

— 3 Major Components of Winbond's Greenhouse Gas Emissions —

Scope 1 **Direct GHG emissions**	Includes the greenhouse gases emitted during the production process (hydrofluorocarbons, perfluorocarbons, perfluorochemicals, nitrogen trifluoride, nitrous oxide, methane, and carbon dioxide), and greenhouse gases produced from burning fuels (such as: natural gas, petrol, and diesel), and the fugitive emissions from treated organic waste gases, septic tanks, high and medium-voltage panels, and firefighting equipment.
Scope 2 **Energy indirect GHG emissions**	From electricity purchased indirectly.
Scope 3 **Other indirect emissions**	Scope 3 includes other indirect greenhouse gas emissions, including emissions from production of the raw materials used, IC outsourcing package measurement service, and from transporting goods.

Additionally, Winbond has from 2000 onwards participated in the perfluorocarbons (hereinafter referred to as PFCs) emissions reduction projects organized by the Taiwan Semiconductor Industry Association and the World Semiconductor Council. Through adjustments to our manufacturing process, using other gases as a substitute, installing fluorocarbons (hereinafter referred to as FCs), reducing equipment, and obtaining 285,771 tCO_2e of the EPA's preliminary carbon reduction credits, Winbond has reduced our greenhouse gas emissions and lowered the risk of the impact of climate changes on Winbond. This has improved our ability to adapt to climate change and our competitiveness in the industry, creating new opportunities and allowing us reduce

our energy consumed per product unit by approximately 4.8% YoY (MJ/Layer - wafer photomask) in advance before total caps on carbon emissions are introduced.

Progress on Our Greenhouse Gas Emissions Strategies and Targets

Most of Winbond Electronics greenhouse gas emissions are derived from the FCs and purchased electricity used in our manufacturing process, making up over 94% of our total Scope 1 and Scope 2 greenhouse gas emissions. Therefore, our main targets are to reduce direct emissions of FCs (including by increasing utilization rates in our manufacturing process and installing exhaust gas treatment equipment) and reduce indirect emissions by conserving electricity. Winbond use the amount of average greenhouse gases emitted to produce one 12-inch wafer photomask layer as a metric for measuring our greenhouse gas intensity per product unit. In 2022, Winbond emitted 13.2 kilograms of carbon dioxide equivalents per layer, which is approximately a 4.8% YoY increase (kilogram of carbon dioxide equivalent/Layer - wafer photomask) in carbon emissions per product unit compared to the 12.6 kilograms of carbon dioxide equivalents emitted in 2021. This is due to the global economic downturn in 2022 leading to lower total production capacity, which in turn had caused carbon emission per product unit to rise. Compared to our target of 13.3 kilograms of emitted carbon dioxide equivalents for 2022, the actual amount emitted was lower by 0.8 YoY.

— Target Achievement Progress —

Indicators and Targets	2022 Targets	2022 Achievements
Intensity of greenhouse gas emissions for each product unit (One kilogram of carbon dioxide equivalent/Layer - wafer photomask)	≦ 13.3	13.2

Note

- Carbon reduction targets are split into those for Scope 1 and Scope 2.
- Tier 2b calculation methods have been used to calculate the direct emissions produced by the manufacturing process in the greenhouse gas inventory report.
- The Kaohsiung Fab was newly-established and began operations in 2022, so it has not been included in this year's calculations of greenhouse gas emissions intensity per product unit.

— GHG Emissions Overview (Unit:metric tons of carbon dioxide equivalent, tCO_2e) —

Indicators and Targets	2020	2021	2022
Scope 1	53,271	38,760	44,373
Scope 2	278,046	277,284	353,523
Scope 3	-	-	443,204
Total Emissions	331,317	316,044	841,100
Emission Intensity (Scope 1 and Scope 2) (kilogram of carbon dioxide equivalent/ Layer - wafer photomask)	13.5	12.6	13.2

Note

- In order to reduce and manage greenhouse gas emissions, Winbond has in 2020 adopted the PFCs tracking system for production process gases, using this system to differentiate between the gases used by each production process. Winbond also changed our greenhouse gas emissions calculation method from Tier 2a to Tier 2b, with the hope of being able to produce more precise emissions information. The baseline year for greenhouse gas inventory is temporarily set as 2020, where carbon emissions were 331,317 metric tons of CO_2e.
- The Global Warming Potential (GWP) used in this table comes from the "IPCC Fourth Assessment Report (2007)".
- The types of greenhouse gases include N_2O, CH_4, CO_2, HFCs, PFCs, SF_6, NF_3, etc.
- Standards, methodology, assumptions and tools used: All energy usage comes from meter readings, the natural gas monthly settlement form/requisition form, and the AS400/part number inventory change record check list. The table contains no estimates.
- The emission factors used are mainly based on the recommendations in the EPA's latest version of GHG emission factors, and the uncertainty data for emission factors were used as reference. To assess the uncertainty in activity data, Winbond used the technical specifications of the measuring instrument as the basis for our assessment.
- Values for 2022 are estimated values, as the emissions factor of electricity for 2022 has not yet been announced.
- New data for the Kaohsiung Fab was added in 2022. Additionally, as the Kaohsiung Fab is newly-established and only began operations in 2022, it has not been included in this year's calculations of greenhouse gas emissions intensity per product unit.

— List of Scope 1 Emissions Sources (Unit:metric tons of carbon dioxide equivalent, tCO_2e) —

Types	Scope 1 emissions
Carbon Dioxide (CO_2)	19,709
Methane (CH_4)	86
Nitrous Oxide (N_2O)	3,976
Hydrofluorocarbons (HFCs)	3,368
Perfluorocarbons (PFCs)	13,071
Sulfur Hexafluoride (SF_6)	1,252
Nitrogen Trifluoride (NF_3)	2,911

— List of Scope 3 Emissions Sources List (Unit:metric tons of carbon dioxide equivalent, tCO_2e) —

Types	Scope 3 emissions
Greenhouse gas emissions indirectly derived from transportation	4,494
Greenhouse gas emissions indirectly derived from product usage	438,710

Winbond continues to promote various carbon reduction plans and increase resource utilization rates. In 2022, Winbond reduced our emissions by 260,898 tCO_2e, equivalent to 676 times the annual carbon reductions achieved by the Da'an Forest Park. (Based on data published by the Forestry Bureau of the Council of Agriculture Executive Yuan and the Department of Land Administration of the Taipei City Government: 25.93 hectares, when calculated based on a carbon fixation rate of 14.9 tCO_2e /hectare/year, Da'an Forest Park absorbs 386 metric tons of carbon dioxide a year). Additionally, in order to reduce the number of times that our employees would need to drive from our Zhubei Building to our Central Taiwan South Park facility, Winbond has arranged for a public transport shuttle bus that makes 6 trips a day between the Zhubei Building and our Central Taiwan Science Park Facility on working days. Winbond has encouraged our employees to use this shuttle bus as much as possible. Our Central Taiwan Science Park Facility also provides shuttle bus services to our engineering assistants (with routes to the Taichung city center, and with routes heading both north and south), allowing our engineering assistants to use these shuttle buses for their work commute and reducing fuel consumption and air pollution.

In 2022, total greenhouse gas reductions were equivalent to 260,898 metric tons of carbon dioxide equivalent (tCO_2e)

— Greenhouse Gas reduction achievements (Unit:metric tons of carbon dioxide equivalent, tCO_2e) —

Reduction in greenhouse gas emissions/year	2020	2021	2022
Direct reductions in greenhouse gas emissions (Scope 1)	173,089	192,106	194,302
Indirect greenhouse gas emissions reductions from energy consumption (Scope 2)	34,386	37,139	55,928
Other Indirect greenhouse gas emissions (Scope 3)	-	-	10,668
Total reductions in greenhouse gas emissions	207,475	229,245	260,898

Note

- Greenhouse gas reductions have been calculated by comparing the differences between greenhouse gas emissions before and after carbon reduction programs for the year were implemented
- Carbon reduction measures adopted in past years helped us reduce carbon dioxide equivalent emissions by 260,898 tCO_2e in 2022
- Values for 2022 are estimated values, as the emissions factor of electricity for 2022 has not yet been announced
- Scope 3 emissions have been disclosed starting from 2022

2030 goal：Achieve 90% of electricity consumption as renewable energy in CTSP Fab.

Winbond's goal is to have the Central Taiwan Science Park (CTSP) Facility using 90% renewable energy by 2030, displaying our determination to work together alongside the rest of the world to achieve net zero carbon emissions. Currently, our CTSP Fab has already been installed with solar power generation, while evaluations for our Kaohsiung Fab are underway. In the future, Winbond shall make plans to collaborate with other companies to build new solar power projects and purchase T-RECs.

2.2 Resource Management

Winbond has maintained the principle of optimizing material/fuel use to reduce consumption, waste output, and greenhouse gas emissions. At the same time, production costs can be reduced, allowing us to reap both environmental protection and economic benefits.

2.2.1 Raw material management

Winbond regularly reviews the overall performance of Winbond's material reduction measures, and constantly adjusts the operating parameters of raw materials in order to optimize and minimize demand for raw materials. Apart from reducing pollution and the amount of waste produced, Winbond is also able to reduce our operating costs, creating a win-win situation. Due to the continuous addition of new plant equipment in the past three years, there has been a gradual increase in all raw materials usage, but Winbond has also continued to invest in improving the efficiency of raw material usage and making good use of every resource.

— Raw material usage —

Raw Materials/Energy	2020	2021	2022
12-inch wafers (Metric Tons)	84	86	80
Process Gas Usage (Metric Tons)	407	423	420
Process Chemical Usage (Metric Tons)	11,877	12,560	11,535
Plant Gas Usage (Million Cubic Meters)	217	222	219
Plant Chemical Usage (Metric Tons)	19,093	21,019	21,073

Note Recycled materials cannot be used due to the nature of Winbond products.

2.2.2 Water Usage

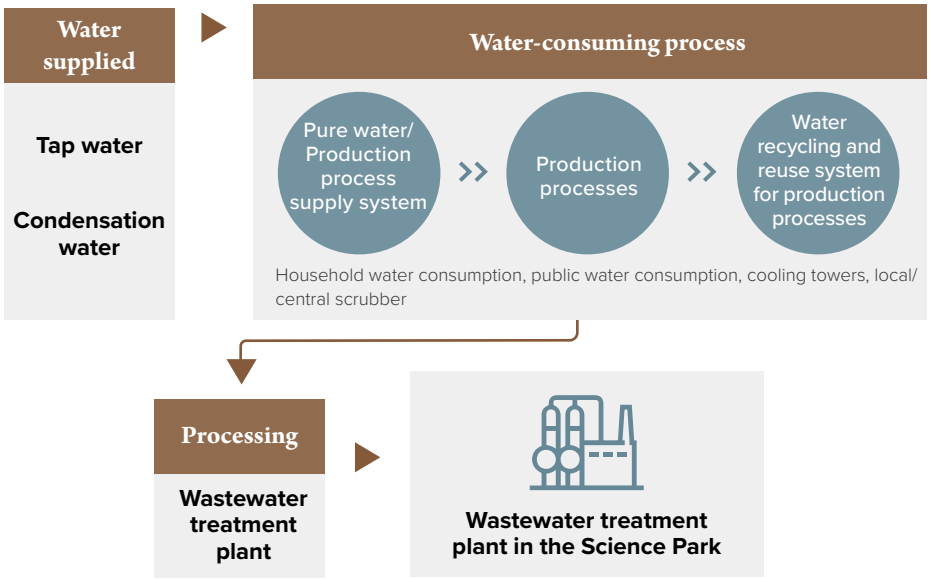
Water Risk Assessment

Winbond has employed the water risk assessment tool developed by the Water Resources Institute (WRI) and the Aqueduct Water Risk Atlas on the Aqueduct website to analyze Taiwan's water resource distribution. The analysis found that all of our operating locations in Taiwan are located in regions with low water resource risk.

Winbond's main source of water is tap water supplied by the Taiwan Water Corporation. Most of this water is supplied by the Liyutan, Deji, and A Gong Dian reservoirs, with a small part coming from rainwater and air-conditioning condensation. After the 2021 drought issues, Winbond has already developed other stable natural water sources. A 75,000 cubic meter underground reservoir has been built on-site at our plant, sufficient for supplying water to our plant operations in times of drought or water restrictions. In 2022, our total water consumption amounted to 4,130,000 cubic meters. Looking at our metric for measuring water intensity per product unit, Winbond averaged 134 liters of water usage to produce one 12-inch wafer photomask layer, meeting our target for 2022 (≤ 145 Liters/Layer - wafer photomask). In 2022, Winbond implemented 3 new water conservation measures that increased total water saved by approximately 64 megaliters.

In 2022, Winbond recycled 11.15 million cubic meters of water, achieving an **80.5%** recycling rate for all water used by our plant

— Site Water Usage Process —



Note Local Scrubber: Exhaust gas treatment equipment, Central Scrubber: Central waste gas scrubber

— 2022 Target Achievement —

Indicators and Targets	2022 Targets	2022 Achievements
Water consumption per product unit (liter/layer - wafer photomask)	≦ 145	134
Fab Water Recycling Rate (%)	≧ 80	80.5

Note Data for the Kaohsiung Fab was added in 2022. Additionally, as the Kaohsiung Fab is newly-established and just began operations, it has not been included in this year's calculation of water consumption per product unit.

— 2022 Water-Saving Measures (Unit: megaliters /year) —

Item	Water Conservation Measures	Explanation of Water Conservation Measures	Water Saving
1	**Water-saving measures for UPW used in production process**	Water consumption parameters adjusted for production machines	17.2
2	**Increased recycling rate for ROR systems**	Increase recycling rate for RO water production equipment	11.8
3	**Improve RO water production rates for UPW system**	Adjust system operation times, reducing amount of concentrated water discharged	35.3

— Water Withdrawal (Unit: megaliters) —

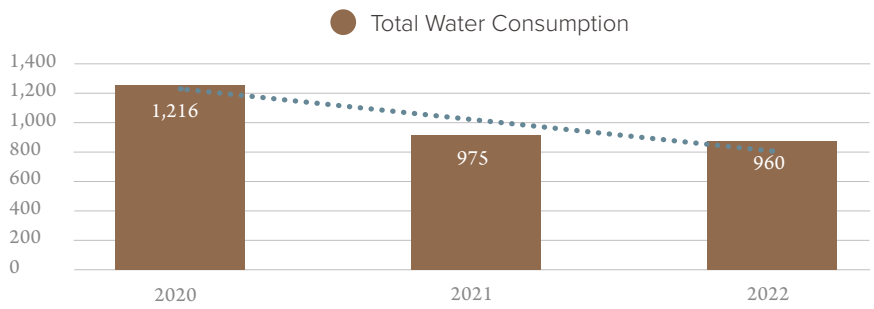
Water Resources Types		2020	2021	2022
Water withdrawal by source	**Third-party water**	3,633	3,293	4,131
	Total water withdrawal	3,633	3,293	4,131

Note Winbond uses tap water provided by a third-party. Winbond do not use surface water, ground water, seawater or discharge water. Our third-party water suppliers source water from surface water (fresh water with≤1,000 mg/L total dissolved solids). Total water withdrawal is calculated as the sum of surface water (total), ground water (total), seawater (total), discharge water (total), and third-party water (total) withdrawn.

— Water Consumption (Unit: megaliters) —

Water Resources Types	2020	2021	2022
Total Water Consumption	1,216	975	960
Change in water storage	0	0	0

Note Changes in water storage is calculated as the difference in total water storage between the start and end of the reporting period. The water storage tanks at our sites have a fixed capacity so there was no change.



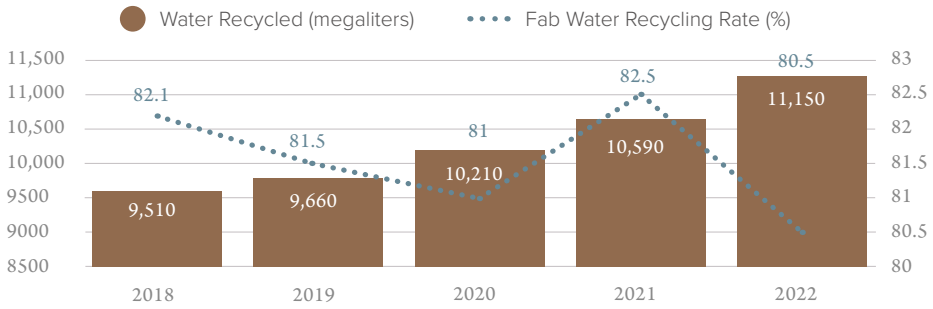
2.2.3 Water Recycling

Winbond continues to increase water recycling rates. In 2022, the overall plant recycled approximately 80.5% of its water and 89.3% of its process water (meeting the science park's commitment under the environmental impact assessment to recycle more than 77% of all water used, and more than 85% of all process water used). Winbond implemented 3 new water conservation measures in 2022 that increased total water saved by 64,000 cubic meters. Accumulated water savings between 2018 and 2022 has reached 3,530 megaliters, equivalent to 0.7 times the Baoshan Reservoir's capacity.

— Water Recycling Performance in Past Years —

Water Recycling Rate/ Year	2018	2019	2020	2021	2022
Water Recycled (megaliters)	9,510	9,660	10,210	10,590	11,150
Fab Water Recycling Rate (%)	82.1	81.5	81.0	82.5	80.5

Note Fab Water Recycling Rate= (Recycled Condensate + Recycled Process Water + Recycled Reclaimed Wastewater) / (Tap Water + Recycled Condensate + Recycled Process Water + Recycled Reclaimed Wastewater -Evaporation).



2.2.4 Wastewater Management

— Winbond's 3 major principles for plant wastewater treatment —

Reducing amount of wastewater produced in the production process ▶ **Separating and treating wastewater** ▶ **Recycling and reuse**

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

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

Wastewater produced by employee day-to-day lifestyle activities:
Treated through membrane bio-reactor (MBR)

Wastewater is discharged into the CTSP Sewage Treatment Plant, 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.

Winbond's wastewater treatment facilities are designed to collect up to 20 types of waste liquids through separate pipelines standardizing wastewater quality. Each wastewater type is then treated through 11 distinct wastewater treatment facilities. Operating and discharge permits are applied for pursuant to the Water Pollution Control Act and the Soil and Groundwater Pollution Remediation Act. Testing is conducted by a laboratory accredited by the Environmental Analysis Laboratory twice a year to confirm that the discharge water quality satisfies CTSP's influent standards. Additionally, in order to reduce the environmental burden of the wastewater treatment facility, and to reduce the use of chemical products, Winbond also collect and treat waste liquids from the washing towers, cooling towers, process cooling water, and recycled soft water from production processes, reusing this treated waste liquid in secondary water applications throughout the site Apart from these measures, Winbond has continued to promote improvements to our water pollution prevention facilities, reduced our pollutant biochemical oxygen demand (BOD), chemical oxygen demand (COD), and the amount of suspended solids (SS) and sludge. Measured COD, SS and BOD values for 2022 were far below the CTSP influent standards.

— Discharged Water Quality (Unit: mg/liter) **—**

Influent Standard/ Threshold Value	Chemical Oxygen Demand	Suspended Solids	Biochemical Oxygen Demand
CTSP Influent Standard	500 mg/L	300 mg/L	300 mg/L
Measured in first half of 2022	33.8	29.2	33.8
Measured in second half of 2022	19.2	4.4	19.2
Kaohsiung Science Park Influent Standards	450 mg/L	250 mg/L	250 mg/L
Measured in first half of 2022	21.6	2.5	21.6
Measured in second half of 2022	46.8	59.2	46.8

— Amount of Water Discharged (Unit: megaliters) **—**

Item	Type	2020	2021	2022
Emissions by Destination	Total Surface Water Emissions	2,417	2,318	3,172
Emissions by Treatment Level	Total Emissions after Level 3 Treatment	2,417	2,318	3,172

Note Categorized by discharge destination, wastewater from Winbond was mainly discharged into surface water (fresh water ≤ 1,000 mg/L total dissolved solids).

2.3 Waste Management

Winbond ensures that waste generated during business operations is properly and safely disposed of pursuant to our Waste Disposal Management Procedures. Waste reduction, reuse and recycling are used to reduce the amount of waste generated by our plant in order to minimize pollution and environmental impact.

— Waste Management Process —

Winbond generated approximately 9,584 metric tons of waste in 2022. Waste generated per layer of 12" wafer photomask averaged 0.000317 metric tons. 100% of hazardous industrial waste was disposed of through licensed domestic waste disposal organizations.

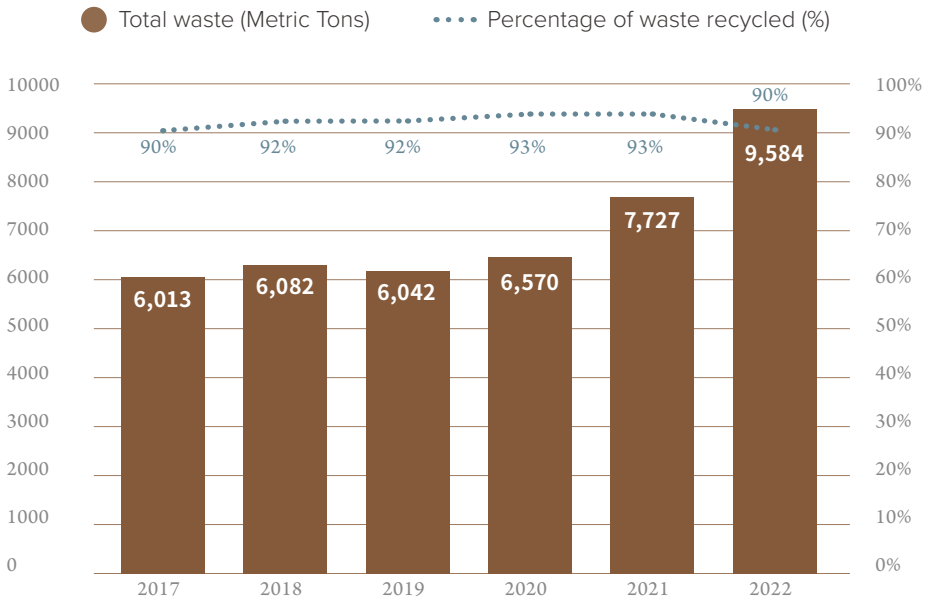
Winbond achieved a recycling rate of 90.1% with 8,633 metric tons of waste recycled, meeting our annual target of achieving a recycling rate above 90%.

— Waste Production, Disposal, and Transfer (Unit: Metric Tons) —

Waste Composition		2020	2021	2022
General waste	Waste generated	4,064	4,218	4,976
	Recycling	3,960	4,137	4,784
	Incineration	97	76	185
	Landfilling	0	0	0
	Chemical treatment	7	5	7
Hazardous waste	Waste generated	2,506	3,509	4,608
	Recycling	2,119	3,074	3,849
	Incineration	384	432	756
	Landfilling	0	0	0
	Solidification	3	3	3
	Waste Recycling	6,079	7,212	8,633
Percentage of Hazardous Waste		38%	45%	48%

— Waste Recycling Rate (Unit: %) —

Year	2020	2021	2022
Total Waste Recycling Rate	92.5	93.3	90.1



Note

- The amount of waste generated is the value reported under waste disposal regulations.
- All waste generated by Winbond sites is removed for processing by qualified disposal organizations and none is processed directly on-site.
- Waste recycling refers to the recycling of waste materials for reuse.
- Data on waste materials produced by the Kaohsiung Fab was added in 2022, resulting in an increase to total waste materials. Additionally, as the Kaohsiung Fab is newly-established and just began operations, it has not been included in this year's calculation of waste materials produced per 12-inch wafer photomask layer produced.

2.4 Air Pollution Control

Winbond's air pollution prevention strategy starts with reducing emissions at the source. Process improvements are used to reduce the amount of pollutants generated to a reasonable level. Pollutants in the missions are then treated with high-performance control equipment to ensure that atmospheric emissions exceed government standards for pollutant content. All past measurements found that Winbond emissions were all lower than EPA emission standards.

Our average removal rate for VOCs in 2022 reached 99% and exceeded the relevant EPA regulations.

Emissions produced during Winbond's production process	Measures for preventing air pollution
General exhaust	General Exhaust is from machine cooling, does not cause air pollution
Acidic exhaust	Appropriate air pollution control equipment is installed to process each type of emission based on their characteristics.
Alkaline exhaust	
Volatile organic compounds	

Winbond has installed local scrubber equipment for certain hazardous, flammable, FCs and PFCs emissions from our production processes. These emissions go through absorption and incineration treatment processes before being delivered to the central scrubber to be washed and have their organic acids and alkaloids neutralized. Emissions that contain volatile organic compounds are sent directly to the zeolite rotor for absorption before being treated by vertical incinerators.

Our air pollution prevention system can be immediately switched to a backup system in an emergency or during maintenance. They are equipped with emergency power backup systems as well as an advanced real-time monitoring system that tracks changes in the system's operating parameters 24 hours a day. An alert is immediately sent if a pre-set threshold is exceeded for immediate action to ensure reliable and continuous operations 24 hours a day, 365 days a year. The effective treatment of air pollutants conforms with the relevant regulations of the "Air Pollution Control and Emissions Standards for Semiconductor Industry" and the "Air Pollutant Emissions Standards for Stationary Pollution Source."

— Air Polluting Emissions (Unit: Metric Tons) **—**

Item	2020	2021	2022
NOx	12.06	10.89	12.18
SOx	0.45	0.42	0.47
VOC	4.80	4.22	4.26

2.5 Hazardous Substance Management

Winbond adheres strictly to international guidelines and standards such as the QC 080000 (Hazardous Substance Process Management System Requirements), RoHS Directive (EU Restriction of Hazardous Substances in Electrical and Electronic Equipment), REACH (Registration, Evaluation, Authorization and Restriction of Chemicals), California Proposition 65, TSCA (Toxic Substances Control Act) and the Canada Convention. This ensures that the hazardous substance content of wafer, chip, and package IC products manufactured by Winbond satisfy international environmental regulations and the green product requirements of our customers, preventing environmental pollution and posing a threat to human health. Winbond has also drawn up the Hazardous Substances Control Regulations and set up a cross-department hazardous substance management team to oversee all product-related design, purchasing, production, and sales processes. Suppliers and subcontractors are additionally required to adopt green product requirements. Our ultimate goal is to supply customers with Hazardous Substance Free (HSF) products that meet their requirements. Winbond also focuses on fostering an awareness of environmental protection concepts in our employees. All employees (including new employees) have received Hazardous Substance Identification and Pollution Prevention Training, and the following principles are followed during research and development, purchasing, production, operations, and service provision to reduce the impact of our company operations on the natural environment and human beings:

1. **Reduce the resource and energy consumption of products and services.**
2. **Reduce emissions of pollutants, toxic substances and wastes; and properly dispose of the waste.**
3. **Improve the recyclability and reusability of raw materials or products.**
4. **Optimize the sustainable use of renewable resources.**
5. **Extend the durability of products.**

6. Enhance the effectiveness of products and services.

Winbond's HSF Policy commits us to the design, purchase, manufacture, and sale of hazardous substance-free products. Every effort is made to fulfill the Company's responsibilities as a corporate citizen through complying with international regulations, satisfying customers' requirements, and protecting the environment. Winbond has also separately established the Hazardous Substance Process Management System (HSPM), where management representatives convene a management review meeting every year to review and discuss policies, targets, regulations, audit outcomes and management performance in order to continuously improve the effectiveness of our hazardous substance management system.

Targets achieved in 2022

- 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

IV. Sustainable Practices | Sustainable Supply Chain

3.1 Supply Chain Composition and Overview
3.2 Sustainable Supply Chain Management Framework
3.3 Low Carbon Supply Chain
3.4 Sustainability Risk Assessment
3.5 Conflict Minerals
3.6 Sustainable Supply Chain Communication

3. Sustainable Supply Chain

Supply chain management is becoming regional and shorter than ever before. Therefore, how to manage supply chain to keep sustainability has become one of the main challenges today. In order to establish a more resilient and sustainable supply chain, Winbond has proactively promoted corporate sustainable development by broadening the scope of these efforts. For pursuring a long-term and sustainable partnerships with our suppliers, we also hope to attract potential suppliers who share the same vision of sustainable business operations with us. By implementing sustainable supply chain management policies, and collaborating on regular ESG supplier workshops, environmental conservation investigations, and supplier sustainability training courses, we are truly appreciated to embed sustainability elements into Winbond's sustainable supply chain management system gradually.

2022 Performance Highlights

15 Material Suppliers Participated in ESG Workshops

65 Material Suppliers Sustainable supply chain environmental surveys

8 packaging and testing outsourcers completed product carbon footprint inventory and verification

3.1 Supply Chain Composition and Overview

Winbond's most important operating location is Taiwan, while the other important locations distributed across Japan, Korea, Israel, and China. The key suppliers who Winbond works with are from Japan, the US, Korea, Belgium, and Germany. These suppliers include those for raw materials, outsourced semiconductor assembly and testing (OSAT), machinery and equipment, factory engineering, components, maintenance, and other suppliers or contractors (for logistics, waste handlers, waste removal providers, information equipment and software, general items suppliers, and waste). In particular, these key major suppliers include raw materials directly or indirectly used for production. Materials directly used for production referring to raw materials which used in manufacturing products. These raw materials impact on final product quality a lot. Indirect materials referring to materials used in production including PADs, and quartz, packaging and then shipment. Compared to the previous reporting period, there are no changes within our supplier activities, value chain, or other business interactions.

Note

- A key supplier is defined as: a supplier directly related to production operations, a supplier accounting for more than 75% of total procurement spending for 2022, the sole supplier for a material/supplier responsible for a certain level of inventory stock, or a supplier of spare parts critical for production operations.
- Definition of domestic supplier: Refers mainly to Taiwanese suppliers.

In order to effectively reduce the negative environmental impact deriving from long-distance shipping and global threats associated with international geopolitics, to help domestic suppliers research, develop technologies and innovate, Winbond frequently does suppliers chasing and sought to find second suppliers as another sources.

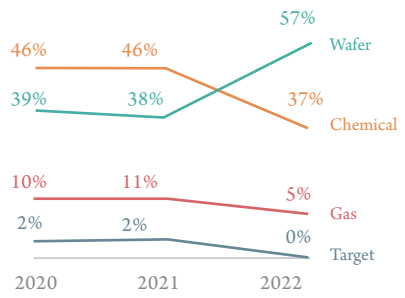
In terms of local procurement performance in recent years, the proportion of chemicals, gases, and targets purchased has slightly decreased due to production strategy adjustments, but the proportion of wafer purchases in mid-2022 will increase by 19% compared to 2021.

Composition of Winbond suppliers

- Raw materials
- Outsourced semiconductor assembly and testing (OSAT)
- Machinery and equipment
- Factory engineering operations
- Parts
- Maintenance and repair
- Logistics
- Waste processing

— Proportion of Raw Materials Procured Domestically for Past Three Years —

(CTSP and Kaohsiung Fab)



3.2 Sustainable Supply Chain Management Framework

Winbond has established a Sustainable Supply Chain Task Force under the ESG Committee. We are responsible for developing and proposing supplier management policies and sustainable development work. In 2022, Winbond re-organized our existing supplier management policies, which include the Responsible Business Alliance (RBA) standards, our Hazardous Substance Free (HSF) policies, and traditional supplier management elements (quality, price, delivery and technical capabilities). At the same time, in response to extreme climate change, global economic, trade and geopolitical concerns, Winbond has organized sustainable procurement strategies and ESG risk assessments/audits into these policies, integrating all of these requirements into our sustainable supply chain strategies and policies.

With the goal of sustainable supply chain development in mind, building stable long-term relationships with our suppliers is the foundation of a stable management system. Winbond has designed the sustainable supply chain management system based on systematic Plan-Do-Check-Act (PDCA) procedures. These procedures allow us to trace and select new suppliers, regularly evaluate key suppliers, and finally to track and correct any issues. Winbond has proactively implemented SDG 17.16 "Partnerships for the Goals requirements", enforcing strict internal quality requirements on the raw materials provided by suppliers. Externally, Winbond has carried out regular supplier evaluations, discovering new ways to improve our operational and manufacturing operations together with our suppliers. Through methods such as regular tracking, discussing progress on implementing improvements, and other methods to refine our business operations, Winbond hopes to work alongside our suppliers to implement sustainable supply chain development philosophies.

Winbond Sustainable Supply Chain Management Strategies

Management Policy	Management Measures/Activity
Ethical and Responsible Procurement	• Evaluation of New Suppliers • Winbond's Corporate Social Responsibility (CSR) and Integrity Policies • WINBOND SUPPLIER CODE OF CONDUCT • Hazardous Substance Free (HSF) • Non Use for Conflict Minerals
Strengthening Supply Chain Resilience	• Regular supplier evaluations • First-Tier (Non)Key Suppliers Identification • Sustainable Risk Assessment and Audit
Low Carbon Supply Chain	• ESG co-learning workshops for key suppliers • Environmental investigation of Sustainable supply chain management • Sustainable Supply Chain Upgrading Forum • ESG-KSA Upgrading Training for Purchasing Team

2022 Key Supplier Sustainability Management Results

Percentage of suppliers who have signed agreements with Winbond's Corporate Social Responsibility (CSR) and Integrity Policies 100%

Percentage of suppliers who have signed the Winbond Supplier Code of Conduct Commitment Letter 100%

Percentage of suppliers who have signed agreements not to use conflict materials 100%

Sourcing and Assessment of New Suppliers

Winbond's selection system for new suppliers includes evaluation items such as a quality system questionnaire (including questions on quality, delivery, services, technologies, and the supplier's quality management system), which based on RBA Code of Conduct. Additionally, the supplier is required to provide third-party certification of its quality management system, its management guidelines for Process/Product Change Notices (PCN), and fill out a questionnaire on its hazardous substance management. Suppliers who are responsible for outsourced work on security products are additionally required to possess an international safety verification certificate, and fill out the Questionnaire on Safety Control Measures for Outsourced Work on Security Products. In 2022, we have passed 5 new suppliers, who have all passed the evaluation process.

— Percentage/Number of New Suppliers Selected Based on Economic, Social, and Governance Standards (Unit: %) **—**

Year	Number of new suppliers	Percentage of suppliers selected
2018	2	100
2019	11	100
2020	4	100
2021	3	100
2022	5	100
Total	25	100

Regular Evaluation and Audits of Key Suppliers

Winbond conducts regular supplier evaluations on qualified suppliers. Evaluation items include quality, delivery, services, and prices, with each item being awarded an A, B or C grade (Excellent, Good, Requires Review) after being evaluated. Suppliers would receive different treatment depending on the grade earned. Additionally, in order to ensure that these systems are operating normally, Winbond conducts annual audits on our OSAT suppliers, ensuring that supply chain risk is being appropriately managed. Apart from quality management audits, the audit also includes two other main items, namely green assessment and social responsibility assessment. The annual supplier audit is carried out through a document audit or a physical visit to the supplier. In 2022, a total of 12 OSAT and 5 raw materials suppliers were audited. All audited suppliers were able to meet Winbond's standards. No suppliers were found to not have committed major environmental, social, or governance violations, and no suppliers lost their supplier qualifications as a result.

— Pass rate of Key Suppliers/Outsourcers for the Audit's Economic, Environmental, and Social Items (Unit: %) **—**

ESG aspect	Procurement category	Key Supplier/Outsourcer (providers of packaging and testing services)
Economic	ISO 9001 Quality Management Systems	100
	IATF 16949	100
Environmental	ISO 14001 Environmental Management Systems	100
	REACH	100
	RoHS	100
	HSPM Hazardous Substance Process Management	100
Social	RBA Social Responsibilities	100

— Economic, Social, and Governance Evaluation Results for Suppliers/ Outsourcers —

Supplier Category	Number of suppliers audited	Number of suppliers passed audit
Providers of packaging and testing services	12	12
Raw materials suppliers	5	5

— Supplier/Outsourcer Evaluation Management system —

Supplier Evaluation Grade	Grade A Excellent (Score ≧ 90)	Grade B Good (80 ≦ Score<90)	Grade C Review Required (Score < 80)
Supplier Treatment	The original mode of collaboration shall be maintained with the supplier. Supplier shall be subject to periodic document audits.	• The supplier shall sign and return the Notice of Improvement for Raw Materials Suppliers within 1 month, and provide us with measures for improvement • Suppliers who received a B grade twice or more in a row shall be labeled as having a C grade.	• The supplier shall sign and return the Notice of Improvement for Raw Materials Suppliers within 1 month, and provide us with measures for improvement • When necessary, Winbond shall reduce our purchases from C grade suppliers, or request the procuring unit to prepare evaluation plans for using other materials.

3.3 Low Carbon Supply Chain

Co-Sustainability Programs

From 2022, Winbond has gradually implement sustainability elements into our procurement activities. Winbond began promoting project "Co-Sustainability" in 2022, which is focused on our efforts to create a low carbon supply chain through management measures. The main activity conducted under this program include ESG co-learning workshops for key suppliers. In 2022, we have interacted with 16 key suppliers who had accounted for a major portion of our procurement spending in 2021, and who have also long implemented ESG measures and have displayed exceptional performance. The second activity conducted under this program was an investigation including the electricity consumption, water consumption, greenhouse gas and energy management, and product traceability management of each company in our supply chain. Based on the results of this investigation, Winbond established goals to reduce supply chain carbon emissions by 10% by 2030.

ESG Workshops for Material (Key) Suppliers

In 2022, the discussions and information exchanges held with 15 of our suppliers included topics such as reducing use of environmental resources, measures for responding to climate change, and measures for managing greenhouse gases and carbon emissions, human and labor rights protections, and corporate governance and ethics. Building on these discussion results, Winbond has absorbed and referenced the experiences of our suppliers in implementing their own ESG activities, and applied these experiences to the planning and implementation of our own internal sustainable supply chain.

ESG Co-learning Workshops with Powertech Technology Inc.

ESG Co-learning Workshops with Chipmos Technologies Inc.

Environmental investigation of Sustainable supply chain management

In order to achieve our target 10%of reducing carbon emissions across our entire supply chain by 2030, Winbond has began conducting environmental surveys on sustainable supply chain management topics in 2022. Winbond surveyed 65 of our suppliers in total, including 52 raw material suppliers and 13 OSAT suppliers. Based on our survey results, Winbond has not only set energy conservation targets/quantities for each year, but also established a strategic direction for our low carbon supply chain management by implementing related measures.

Sustainable supply chain management environmental surveys

Purpose

- Implementing Winbond low carbon supply chain management in order to achieve our goal of reducing supply chain carbon emissions by 10% by 2030.
- This survey includes electricity consumption, water consumption, waste materials, greenhouse gases, energy management and consumption, resource utilization methods, and Scope 3 emissions.

Reduction measures

Establish emergency power supply equipment	Conserve water usage	Improve efforts to raise awareness and implement recycling
Adjust production activities	Establish second water source	Induce Material Flow Cost Accounting
Increase renewable energy usage	Increase water recycling rate	Develop reuse techniques

Results Predicted for 2023

- Supplier annual electricity conservation target: 1%
- Supplier annual water conservation target: 5%
- Suppliers annual waste reduction target: 1%
- Obtain ISO 14064:2018 certification: 30%
- Conduct carbon footprint inventory and verification: 5 companies

ESG-KSA Upgrading Training for Purchasing Team

The 2021 report published by the World Economic Forum titled "Net-Zero Challenge: The Supply Chain Opportunity" points out that appropriate communication on reducing carbon emissions for procurement and business operations is critical to the success of supply chain carbon reduction measures. Based on this view, Winbond has established the ESG-KSA Upgrading Training for Purchasing Team. Winbond has applied this sustainability knowledge to the results of the carbon management grade assigned to each supplier in our sustainable supply chain management environmental surveys, and to the greenhouse gas management status of each supplier (including organizational greenhouse gases and product carbon footprints), strengthening two-way communication on supply chain carbon reduction, and improving our understanding of the greening of products procured from suppliers.

Lack of procurement team understanding

Conflicting procurement priorities

Procurement incentives not aligned to climate

WORLD ECONOMIC FORUM

Net-Zero Challenge:
The supply chain opportunity

3.4 Sustainability Risk Assessment

In order to gradually establish a resilient Winbond supply chain, Winbond has developed a supplier ESG risk assessment (which evaluates suppliers on 3 major aspects, environmental, social, and governance, and 21 assessment sub-items) based on the RBA standards since 2022. In 2023, Winbond will assess first-tier key suppliers, identifying high-risk suppliers and the type of risk. In the near future, through regular surveys, risk assessments, and assessing degrees of impact, Winbond hopes to propose improving actions targeting areas where our suppliers can move on. Winbond hopes to work together to increase the internal resilience of the overall supply chain.

Supplier ESG Self-Assessment Questionnaire

Purpose	Measures	Results Predicted for 2023
• Identify supply chain risks and the severity of impact on supply chains through regular sustainability surveys and assessments • Manage and reduce the operating risks faced by first-level suppliers with regard to sustainable business operations and RBA standards, gradually improving the internal resilience of the Winbond supply chain	Implementing key supplier ESG self-evaluations Completing ESG risk analysis of key suppliers Planning supplier sustainability risk audits	• 100% of key supplier sustainable supply chain self-evaluation questionnaires completed • Identifing high-risk suppliers and risk types • Establishing supplier ESG performance as part of our supplier selection criteria

Content of supplier ESG risk assessments

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 environmentally-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 international labor rights standards.	Suppliers are required to conduct business operations ethically and with integrity, the highest standard for business ethics, and ensure that this standard is applied to all internal business operations.
Assessment items	• Environmental Management Systems • Air Pollution Prevention • Water Management • Water Management • Greenhouse Gas Management • Biodiversity Management • Hazardous and Shared Substance Management	• Human Rights Protection • Employment and Labor Rights Protection • Occupational Health and Safety, and General Health Management • Chemical Safety • Fire Safety • Equipment Safety	• Degree to Which Corporate Sustainability has been Formally Incorporated • Sustainability Impact and Degree of Disclosure • Business Continuity and Management • Supply Chain Management • Service Quality Management • Business Ethics and Philanthropy • Corporate Governance

3.5 Conflict Minerals

Following the provisions on conflict minerals in the Responsible Business Alliance's Code of Conduct, Winbond does not procure or utilize any minerals sourced from regions of the Democratic Republic of the Congo which are under the control of non-government or unlawful military groups. Prohibited minerals include gold (Au), silver (Ta), tantalum (Ta), Tungsten (W), and Tin (Sn). 100% of our main suppliers have signed the Winbond Supplier Code of Conduct Commitment Letter.Winbond has also formally announced to our suppliers our policy of not using conflict minerals through public declarations on our official website and advocacy letters.

Winbond has also used the Conflict Minerals Reporting Template (CMRT Ver. 6.22) according to the RBA Code of Conduct to investigate the use of conflict minerals by suppliers. Winbond has requested suppliers to disclose information on smelters which process conflict minerals, and taken action to ensure that information provided from suppliers is accurate. In the future, Winbond shall continue to cooperate with its suppliers to ensure that all suppliers use materials from Tier 1 Conflict-Free Smelters certified and announced in the RBA Code of Conduct as smelters which do not use any conflict minerals. Winbond conducted an investigation into conflict minerals for 18 of our suppliers (9 raw materials suppliers and 9 outsourcers). All of these suppliers were found to be compliant with related rules. In 2022, no products were prohibited from being sold to Winbond. (For more details, please refer to the Winbond Conflict Minerals Investigation Report on our official website.)

3.6 Sustainable Supply Chain Communication

Winbond regularly communicates with suppliers. Winbond highly values our partnership with suppliers, and hope to work together with our suppliers to collectively improve sustainability competitiveness and performance, which Winbond considers part of our social responsibility. As part of our regular communications, Winbond hold regular supplier conferences, supplier guidance courses, and safety education and training courses. As part of our emergency communications measures, Winbond has established systems for making disaster reports to our suppliers. For example, during an earthquake, Winbond has systematic communications channels in place to make emergency reports to companies in our supply chain, warning them of emergency situations. In the future, Winbond shall continue planning and holding forums for promoting sustainable supply chain upgrading and on advanced testing and packaging technologies. Winbond shall also adopt digital management measures, allowing us to avoid previous supply chain restrictions related to time and location in order to spread information on sustainability activities more efficiently.

Supplier Conference

Winbond Electronics highly values its long-term partnerships with our outsourcers, and hosts an annual supplier conference where Winbond announces our quality and corporate social responsibility policies to our suppliers. Through this conference, Winbond is also able to update our suppliers on any changes to our quality requirements, and share new innovative technologies in the industry, deepening our common understanding and partnership with our OSAT suppliers. Winbond hopes to work together with our suppliers to implement sustainable development, and in 2022 100% of our outsourcers attended the supplier conference.

2022 Supplier Conference

Supplier/Outsourcer Guidance

Product Carbon Footprint

Winbond hopes to be able grow alongside our supplier and outsourcer partners, creating a sustainable supply chain. In order to share our carbon footprint inventory and verification experiences with our outsourcers, Winbond has proactively assisted our outsourcers in completing their own carbon footprint inventory, in order to better achieve future carbon reduction goals and implement carbon reduction programs. This creates a win-win situation, while also improving supply chain sustainable resilience at the same time.

— 2022 Outsourcer Guidance Outcomes —

Content	Item Scope	Outcomes
Carbon footprint inventory	8 packaging and testing outsourcers conducted carbon footprint inventory and verification	In 2022, 8 packaging and testing outsourcers all 100% completed product carbon footprint inventory and verification

Training for Security Personnel

Winbond establishes a training schedule for its security personnel each year, and conducts regular training on topics such as human rights. Winbond also arrange for our security contractors to undergo RBA audits. As of 2022, all of our security contractors have passed RBA audits comprised of 10 total audit items, including items on human rights, health, and safety. This not only ensures that Winbond is able to maintain a safe workplace, but also increases the awareness of our security contractors on their social responsibilities, improving their performance in this aspect.

Due to still being impacted by the COVID-19 pandemic in 2022, security personnel at our facilities have been requested to more strictly enforce COVID prevention measures for entering our facilities, such as taking body temperatures and wearing face marks. Winbond has also provided our security personnel with training on COVID prevention and management.

— Education and Training Outcomes —

Topic	Content	Number of security personnel	Length of training course (hours)	Facility
Workplace equality	Training and courses on topics such as workplace bullying, abuse, harassment	26	0.5	CTSP Fab
		22	0.5	Kaohsiung Fab
		10	0.5	Zhubei Building
COVID awareness	Informed security personnel on the need for employees/visitors/ contractor employees to have their body temperatures taken and to wear a mask when entering our facilities	26	1	CTSP Fab
		22	1	Kaohsiung Fab
		10	1	Zhubei Building

Sustainable Communications for the Future

Sustainable Supply Chain Upgrading+ forum Advanced Packaging and Testing Technologies forum

From 2023, Winbond shall hold sustainability training courses for our suppliers through forums. These include the Sustainable Supply Chain Upgrading+ forum, which aims to promote knowledge on climate change and improve supply chain risk resilience. The Advanced Packaging and Testing Technologies forum, which aims to improve green and low carbon packaging and testing technologies.

Digital management - Winbond Supplier ESG Interactive Website

Purpose

- Make promoting sustainability information and collecting various sustainability survey data more efficient across the entire supply chain
- Working together with suppliers to continue deepening knowledge on sustainable business operations

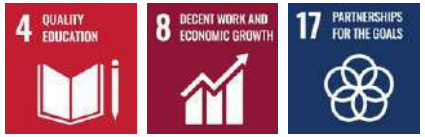
Measures

- Completing planning and establishing content for each section
- Completing preparing the platform for use by procurement employees for promotion and trainin
- Completing the promotion and training of website for supplier's usage

Expected Results in 2023

- Digitalizing sustainability surveys and data collection
- Guiding suppliers on applying for and registering on the network
- Completing promoting use of the network to suppliers

4.1 Human Rights Due Diligence Investigation
4.2 Human Resources Management
4.3 Employer-Employee Relations
4.4 Occupational Safety and Health
4.5 Social Impact



4. Human Rights and Social Inclusion

Winbond complies with internationally-recognized human rights standards, taking these standards as our highest-level guiding principle, and labor rights laws. Winbond protects our employees' freedom of association and right to free speech, and do not discriminate against employees on the basis of race, age, gender, sexual preference, disability, pregnancy, politics, and religion. Winbond is devoted to creating a workplace free from discrimination.

Winbond is committed to putting people first, and adheres to international human rights conventions and labor rights laws. Through the comprehensive human resource policies established by our human resource department, Winbond has protected the human rights of our employees, and ensured that Winbond practices diversity, equality, and human rights protection. In 2022, Winbond was certified by the RBA Validated Assessment Program (VAP) as having zero violations, and experienced no violation of laws and regulations. Winbond continuously lead employees to actively engage in social welfare activities, benefit the external community, create value and expand our positive social impact.

2022 Performance Highlights

- First completion of **100%** coverage of human rights due diligence investigation
- Weighted employment of disabled individuals increased by **147%**
- Providing a monthly childcare subsidy of **NT$6,000** for employees' children
- Total public welfare donations exceed **NT$17** million (including childcare, support for vulnerable groups, academic sponsorship, public welfare promotion, and environmental education)
- **82%** utilization rate of "Life-Work Balance Leave" (7 days per year)
- Average staff training hours per year: **42** hours
- Average annual salary for non-supervisory full-time employees is **1.93** million
- First independent **Human Rights Due Diligence** report published in 2023

4.1 Human Rights Due Diligence Investigation

Winbond places a high priority on the development of human rights issues, and has proactively invested into human rights management activities. In order to sufficiently assess human rights risks, allowing for continuous improvements to be made, Winbond has performed a human rights due diligence investigation of all of our employees for the first time in 2022.

Winbond has conducted this investigation with reference to sustainability assessment and standards trends, developing a framework for this investigation based on an analysis of these trends. These standards include, without limitation, the UN Global Compact, the International Bill of Human Rights, the UNGPs on Business and Human Rights, the ILO-Declaration of Fundamental Right at Work, the International Labor Office Tripartite Declaration of Principles, and the OECD Due Diligence Guidance for Responsible Business Conduct.

— Implementation of the Human Rights Due Diligence Investigation —

Scope	All employees at Taiwan headquarters, including the Taipei Office, Zhubei Office, CTSP Fab, Tainan Office, and Kaohsiung Fab.
Duration	2022
Coverage rate of potential negative human rights impact assessment	100% coverage

— Human Rights Due Diligence Investigation Procedures —

Data analysis	Research background, business models, and management conditions for assessed industries, to understand the scope of the issue, and identify targets for each stage of the assessment.
Identification of Potential Negative Impact	Identify the human rights risks and issues applicable to Winbond, use this information as a the basis for the assessment.
Assessment of Potential Negative Impact	Conduct quantitative and qualitative studies. A quantitative risk value is calculated based on the occurrence frequency and severity of impact reported on the human rights risk assessment questionnaire, together with internal practice assessments and employee interviews.
Analysis of Potential Negative Impact	Undertake human rights risk mitigation and remediation actions based on the assessment results, and establish a management cycle for continuous improvements.
Report and Disclosure	Produce human rights due diligence investigation report on the regular basis, which reveals the investigation process and related risk analysis results.

Human Rights Risk Assessment

Guidelines for Conducting Potential Negative Human Rights Impact Assessment

Our human rights risk identification procedures had identified 37 risks that can potentially lead to a negative human rights impact.

Amoung the 37 risks, 9 risks can be assessed through internal practice review and prove no human righs violations, thus Winbond created questionnaires for the 28 other risks(including but not limited to forced labor, human trafficking, child labor, freedom of association, collective bargaining, equal pay for equal work, and discrimination) under the four main categories of labor rights. health and safety, environment and society, and governance and ethics.

Winbond assessed how frequently these negative human rights impacts occur and the severity of the impact based on the results of the questionnaires, and derive a risk product value by multiplying these two values together. A human rights risk matrix is then constructed based on the value of this product.

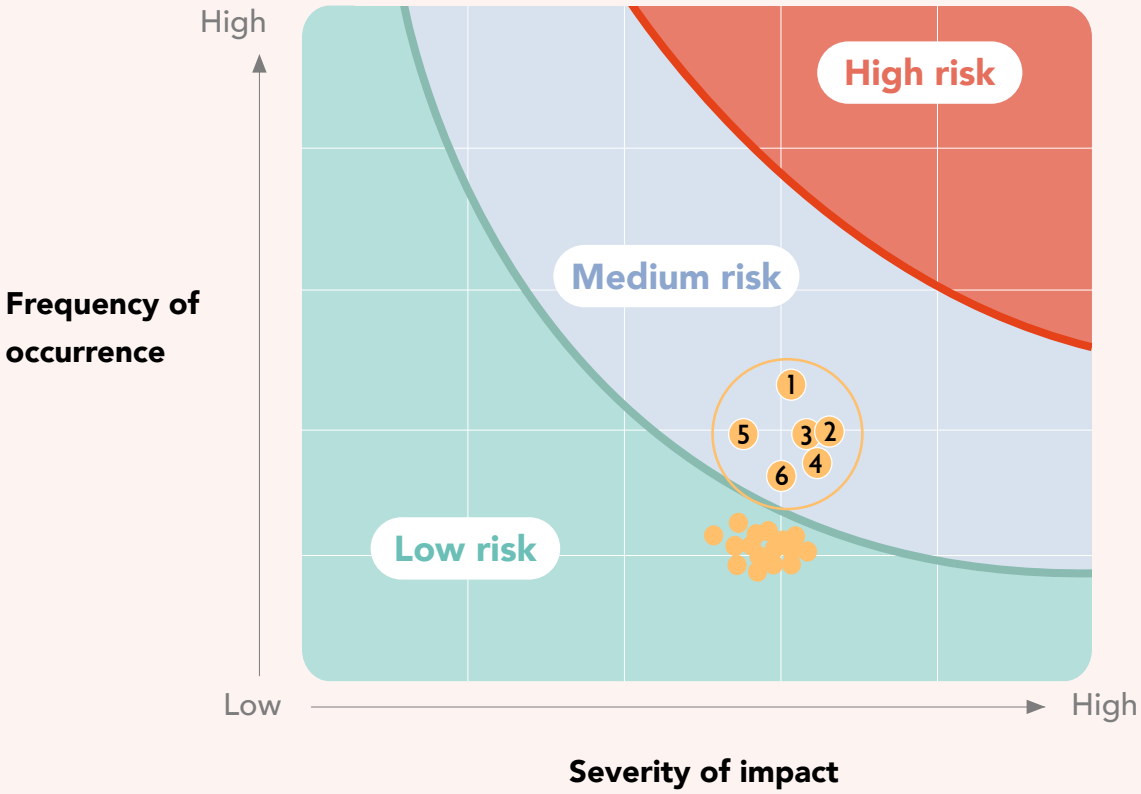
Human Rights Due Diligence Investigation Results

There is no high-risk impact requiring immediate remedial actions

Based on the risk product value derived from the frequency and impact of a specific potential human rights impacts, Winbond has divided impacts into three categories: high risk, medium risk, and low risk. Low risk issues lie to the left of the green line. Medium risk issues lie between the green and red lines. High risk issues lie to the right of the red line.

The results of these questionnaires reveal that none of the 28 issues identified are high risk issues which requires immediately action. 6 issues are medium risks which requires additional mitigation measures. The remaining 22 issues are all low risks, revealing that employees generally believe that there is only a low probability for these human rights risks to take place at Winbond, and that their impact on human rights is limited.

— Human Rights Risk Assessment Matrix —



List of important risks

Risk products ranked

1. Working Hours
2. Forced labor
3. Work life balance
4. Bullying and harassment
5. Talent training and development
6. Physical and mental health

Improvement and Follow-Ups

No high risks were discovered in this assessment. Winbond continues addressing the 6 medium risks, reducing the occurrence and the impact.The action plans are described in the table below:

Risk	Mitigation Measures	Remediation Measures
Working Hours	• Winbond has reviewed production capacity and manpower requirements regularly for talent recruiting and work arrangement. • Winbond has analyzed and addressed the issue through a mechanism and system for managing working hours. • Winbond has arranged regular annual training to enhance awareness of working hour management.	If any violation occurred, internal investigation will be conducted and disciplinary action will be taken, and the rights of employees whose interests have been damaged shall be restored.
Forced Labor	Annual training on forced labor issues for supervisors will be arranged to enhance management awareness.	If any violation occurred, internal investigation will be conducted and disciplinary action will be taken, and the rights of employees whose interests have been damaged shall be restored.
Work Life Balance	Winbond regularly organizes events such as parenting seminars and wellness workshops to provide employees with information and support for their personal lives, and to enhance their work-life balance. Please refer to section 4.4.1 Occupational Safety and Health Management System for more details.	The “employee assistance program” (EAP) is provided to employees. Through the consultant team's professional counseling in interpersonal relationships, physical and mental health, finance, law, and management, we assist employees in regaining work-life balance.
Bullying and Harassment	• The measures for preventing workplace unlawful infringement and preventing workplace harassment, including sexual harassment, have been strictly implemented. • Winbond has held regular anti-bullying and anti-harassment management courses, and courses on communication techniques will be arranged. For more details, please see section 4.4.1 Occupational Safety and Health Management System. • The prohibition of workplace unlawful infringement is regularly promoted through channels such as email, bulletin boards, or posters to ensure that employees understand the company's regulations. • An internal complaints channel is established, as well as a follow-up tracking procedure, in order to provide employees with sufficient channels for receiving help. For more details, please see section 4.3 Open Employer-Employee Communications.	• An internal complaints channel is established, as well as procedures for following up on and addressing complaint reports, in order to provide employees with sufficient channels for receiving help. • If any violation occurred, appropriate protection and arrangements are provided for victims of bullying and harassment. • Internal measures for investigating and disciplinary actions of bullying and harassment issues are implemented.
Talent Training and Development	• The comprehensive training and development programs are planned based on the Winbond’s vision and core culture. For more details, please see section 4.2.4 Talent Development and Learning Outcomes. • Internal job opportunities are announced, and channels are provided employees to apply. • Succession programs for key positions are established, focusing on long-term cultivation of key talents. For more details, please refer to section 4.2.4 Continuous Development of Key Talent Cohorts.	• If employees provide feedback indicating insufficient training content, the responsible unit will assess the needs based on their specific topics and provide appropriate solutions. • The promotion of internal rotation regulations will also be carried out.
Physical and Mental Health	• Diverse health promotion activities are regularly organized to provide our employees with accurate health information, and to enhance their ability to manage and improve their personal health. For more details, please refer to section 4.4.1 Health Services and Promotion. • Winbond regularly uses employee health check survey to assess employees' health risks and provide reminders and follow-up assistance to help improve their health.	If it is found that the shift system, rest time, epidemic prevention policy, and other practices violate legal regulations, an investigation should be conducted, and the disciplinary action shall be taken in accordance with the internal disciplinary regulations. The rights of employees whose interests have been damaged shall be restored.

4.2 Human Resources Management

Winbond continues to enhance its human resource management system and optimize its human resource integration system, including 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.

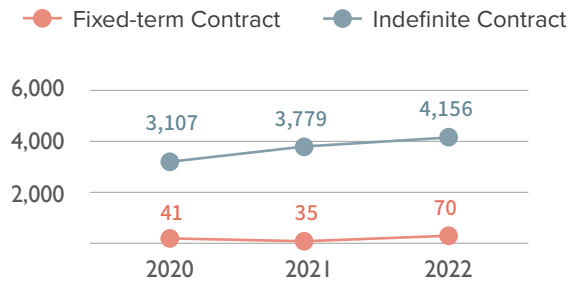
4.2.1 Workforce Structure

Global Talent Deployment

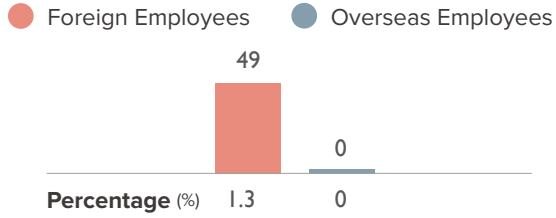
As of 2022, the total number of employees at Winbond's Taiwan headquarters 3,630, including 2,921 executives in research and development/production, administration/sales, as well as 709 production support personnel.

As of 2022, the total number of employees at Winbond's Taiwan headquarters was 3,630 with the main growth factor since 2020 being the construction of the Kaohsiung plant in 2019. These includes 2,921 managers and personnel in research and development/production, administration/sales, as well as 709 production support personnel. The global workforce is predominantly located in Asia, with the increase attributed to the acquisitions of semiconductor companies in Japan, which aims to enhance the diversity of global talent and cultivate international competitiveness.

— Global Workforce Distribution (Unit: persons) **—**



— Distribution of Foreign and Overseas Employees for the Taiwan Head Office —



Note The proportion of foreign and overseas employees is calculated by dividing the number of foreign and overseas employees by the total number of employees at the Taiwan headquarters.

— Global Workforce Distribution (Unit: persons) **—**

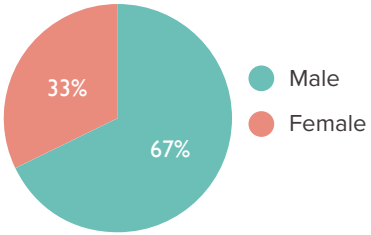
Item	Head Office (Taiwan)		Asia (excluding Taiwan)		North America		Middle East		Europe	
	Fixed-term Contract	Indefinite Contract	Fixed-term Contract	Indefinite Contract	Fixed-term Contract	Indefinite Contract	Fixed-term Contract	Indefinite Contract	Fixed-term Contract	Indefinite Contract
Male	16	2,409	9	413	1	54	5	29	3	1
Female	25	1,180	8	48	0	12	3	9	0	1
Subtotal	41	3,589	17	461	1	66	8	38	3	2
Total	3,630		478		67		46		5	

Note Employees classification according to GRI corresponds to fixed-term contract employees classified as temporary staff; indefinite contract employees classified as permanent staff. Winbond does not employ staff without guaranteed working hours.

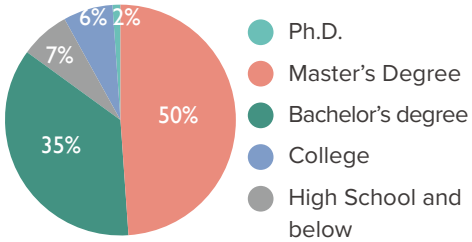
2022 Employee Composition

Winbond conducts regular reviews of its workforce composition, and formulates effective talent recruitment strategies to attract suitable professional talents, ensuring the company's competitiveness in the semiconductor industry. In 2022, Taiwan headquarters achieved 50% ration of hiring master's and doctoral degree holders and a 35% ratio of bachelor's degree holders to cater to the knowledge-intensive nature of the industry. Regarding age distribution, Winbond strictly adheres to domestic and international labor laws and the Responsible Business Alliance (RBA) Code of Conduct. The human resource department verifies the actual age of applicants to ensure compliance and refrains from employing child labor or individuals who have not completed compulsory education, guaranteeing that all employees are aged 18 and above. Generally, our staff members' ages range from 31 to 50 years old, accounting for approximately 73% of the total workforce.

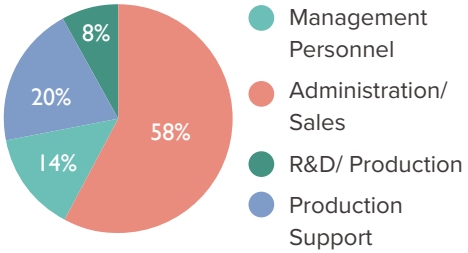
Ratio of Male to Female Employees



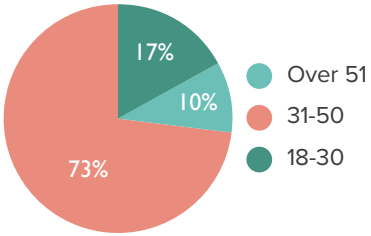
Distribution of Employees' Educational Backgrounds



Distribution of Employee Roles



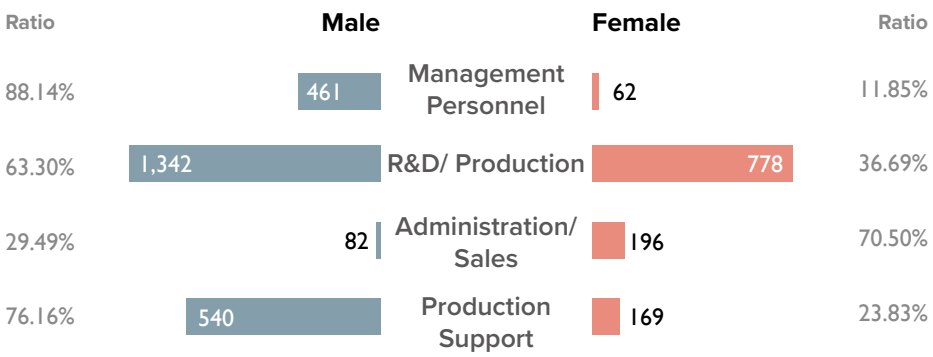
Employee Age Structure



Note The ratio is based on the total headcount of Taiwan headquarters as of December 31, 2022.

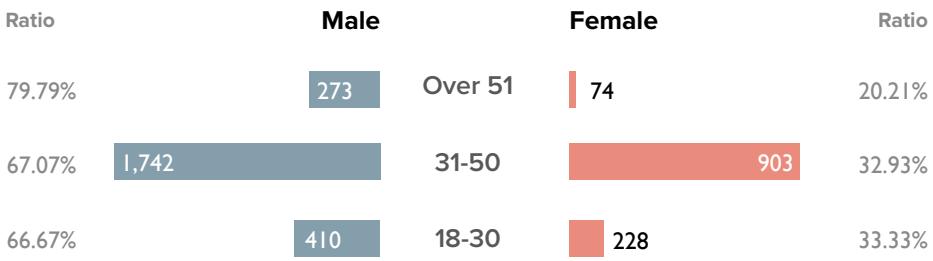
Distribution of Male and Female Employees

Due to the nature of the technology industry and factors in the job market, male employees constitute the majority at Winbond. At Taiwan headquarters, the total number of male employees is 2,425, while the total number of female employees is 1,205, resulting in a male-to-female ratio of approximately 2: 1. Winbond is committed to maintaining a certain proportion of female employees and ensuring equal treatment and job security for all employees. Winbond prioritizes talent and promotion opportunities based on merit, without any discrimination based on gender, to maintain a balanced gender composition among our workforce.



Age Distribution of Male and Female Employees

Winbond employees based at the head office in Taiwan are between the ages of 31 and 50. The ratio of male to female employees is 2:1.



Employee Type and Roles

At the headquarters of Winbond Taiwan, employees are categorized into two types: Fixed-term Contract and Indefinite Contract, with a total of 3,630 individuals. Based on job roles, there are 523 employees holding managerial positions and 3,107 employees in non-management roles.

— Distribution of Employee Employment Contracts —

Item	Male		Female		Total number of people	
	Number of People	Ratio	Number of People	Ratio	Number of People	Ratio
Fixed-term Contract	16	0.44%	25	0.69%	41	1.13%
Indefinite Contract	2,409	66.36%	1,180	32.51%	3,589	98.87%
Total	2,425	66.8%	1,205	33.2%	3,630	100%

— Distribution of Employee Employment Types —

Item	Male		Female		Total number of people	
	Number of People	Ratio	Number of People	Ratio	Number of People	Ratio
Full-time	2,425	66.8%	1,205	33.2%	3,630	100%
Part-time	0	0%	0	0%	0	0
Total	2,425	66.8%	1,205	33.2%	3,630	100%

Note Full-time employees are regular contract employees for indefinite periods, including engineering assistants and full-time employees on fixed-term contracts. Part-time employees are regular contract employees on fixed-term contracts.

— Distribution of Employee Roles —

Item	Male		Female		Total number of people	
	Number of People	Ratio	Number of People	Ratio	Number of People	Ratio
Management	461	12.7%	62	1.71%	523	14.4%
Non-Management	1,964	54.1%	1,143	31.49%	3,107	85.6%
Total	2,425	66.8%	1,205	33.2%	3,630	100.00%

Note Management refers to section chief or higher grades responsible for supporting and directing employees in their department.

— Distribution of Workers who are not Employees —

Year	Categories of workers who are not employees	Number of People		
		Zhubei	CTSP + Kaohsiung Fab	Total number of people
2022	Main Outsourcer (Security, cleaning, machinery support personnel, etc.)	28	139	167
2021	Main Outsourcer (Security, cleaning, machinery support personnel, etc.)	28	93	121
2020	Main Outsourcer (Security, cleaning, machinery support personnel, etc.)	29	93	122

Note The headcount calculation will be based on the data as of December 31, 2022.

4.2.2 Talent Recruitment and Performance Evaluation

Winbond offers a competitive salary and benefits package that exceeds legal requirements, adhering to the principle of equality to attract and retain exceptional talents. We conduct quarterly reviews of benefits, as well as compliance with gender-related regulations. Additionally, we regularly survey the industry market conditions to adjust our employee compensation and benefits standards. Furthermore, we combine this with a robust performance evaluation system to reward outstanding performers. Through strategic talent management and appropriate workforce planning, we continuously introduce fresh ideas and perspectives to Winbond, contributing to our overall development goals.

Diverse Recruitment Channels

Winbond values workplace diversity and actively recruits talent through various channels such as Winbond career site, campus recruitment, social media, industry-academia collaborations, and internal referrals attracting outstanding individuals from different regions and age groups, Winbond also has an internal transfer system that encourages employees to rotate and develop their skills, allowing exceptional talents to flourish in suitable positions. Additionally, in response to the demand for advanced technical expertise from different countries, we hire professionals from Japan, South Korea, India, the United States, Malaysia, Indonesia, and other nation. This fosters a diverse and interactive work environment where employees can stimulate new perspectives innovative thinking.

Since 2018, Winbond has begun implementing digitalization in various processes, such as automated recruitment and training reports, to expedite the entire talent recruitment and onboarding process. This streamlining has significantly reduced the consumption of

manpower and time, allowing us to focus more on enhancing the quality of recruitment and talent alignment. Additionally, we have introduced market-competitive compensation and a diverse rewards system as part of our efforts to retain talent, serving as compelling incentives for employees to stay with Winbond. Through our commitment to digital transformation and employee-centric practices, we position Winbond as an employer of choice, attracting and retaining exceptional talents within our workforce.

Recruitment channels	Explanation	Outcomes
Campus recruitment	• Through campus recruitment events and interactions with students, we provide on-site job consultations and engage in mutual exchange. • By leveraging social media platforms to promote our recruitment messages, we ensure that potential candidates have wider exposure to Winbond's job opportunities beyond geographical limitations.	Through campus recruitment efforts, Winbond successfully recruited 63 talented individuals who have joined the company and are now contributing their skills and expertise.
Internal recruitment	The human resource department announces internal job vacancies based on the recruitment criteria provided by the respective hiring departments. This process facilitates talent mobility within the organization and supports employees in pursuing diverse career paths, ensuring the right fit for each position and promoting a culture of appropriate talent placement.	Through our internal recruitment system, we have successfully facilitated the transfer of 5 employees within the company, allowing them to gain experience in different roles and fostering diverse.
Job search websites and social media	Job vacancies at Winbond is posted on th official career site, job portals, and various social media platforms. This approach aims to reach job seekers from different regions and age groups, enabling them to access comprehensive information about job opportunities at Winbond. Additionally, candidates have the convenience of engaging in real-time job consultations with the Winbond recruitment team through fan pages and social media, providing them with immediate access to the necessary guidance and information.	By actively promoting job vacancies on recruitment websites and social media platforms, Winbond attracted 27,100 candidates who proactively submitted their resumes.
Employee referral	Winbond invites its employees to recommend outstanding talent to join the company. By leveraging the employees' understanding and identification with the company, they can refer individuals who are a good fit for Winbond's corporate culture and job requirements.	Through employee referrals, Winbond successfully recruited 60 outstanding talents to join the company.
Summer internship program	In 2022, Winbond offered 12 summer internship positions, providing recent graduates the opportunity to join the company with full-time benefits and experience the real-life work and life in the workplace.	Winbond successfully matched 9 university and graduate students, providing them with a solid starting point for their career development.

New Hires and Turnover in 2022

Winbond is dedicated to creating a diverse and inclusive workplace, providing an equal working environment, and firmly believes in the value of a diverse management team and employee composition. This approach enables Winbond to effectively capture market trends, understand customer needs, foster innovative outcomes, and maintain a competitive advantage.

In 2022, Winbond recruited 719 new employees based at the head office in Taiwan and our annual new hire rate was 19.81%. Among the new hires, 46% were from the younger age group below 30 years old, while 53% were in the age range of 31 to 50 years old. This recruitment initiative aims to revitalize the organizational energy by injecting fresh talent and enhancing organizational effectiveness through the inclusion of experienced professionals. Furthermore, Winbond has seen significant progress in the recruitment of female employees with the new hire rate increasing from 6% in 2020 to 24% in 2022. This upward trend has gradually surpassed the new hire rate of male employees. Winbond warmly welcomes more outstanding female talents to join the semiconductor industry in the future.

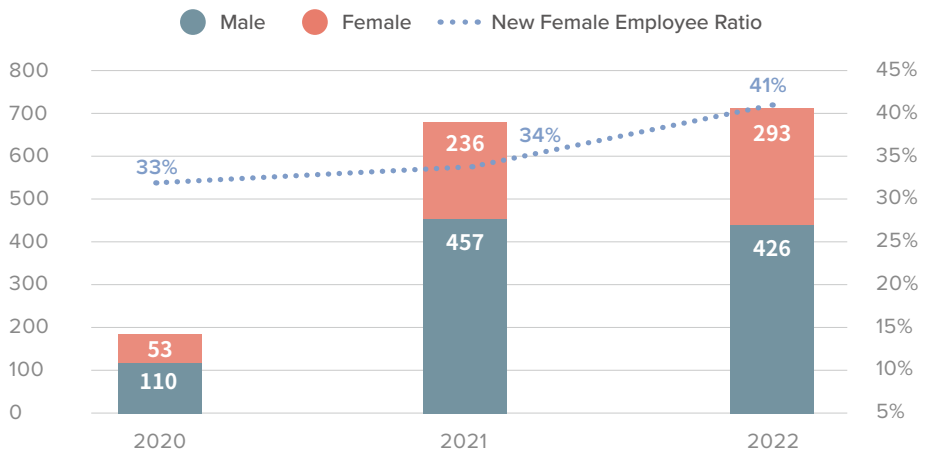
In 2022, the semiconductor industry experienced a thriving talent market with significant recruitment activities. Despite the competitive landscape, Winbond maintained a healthy employee retention rate. After analyzing the data, it was observed that approximately 50% of the employees who left the company had less than one year of tenure. This trend was primarily attributed to employees being in the early stages of their careers and exploring different opportunities. In response, Winbond proactively addressed this issue during the talent selection process by strengthening the job description and providing comprehensive information about the role. Internal support was also provided by experienced employees within the department to help new hires familiarize themselves with their responsibilities and understand the training and development plans tailored to their roles. These measures were implemented to facilitate a smoother onboarding process and enable new employees to quickly adapt to Winbond's corporate culture.

— New Hiring and Turnover Statistics —

Category	New Hires in 2022		Employee Turnover in 2022	
	Number of People	Proportion of employees in category	Number of People	Proportion of employees in category
Female	293	40%	144	38%
Male	426	60%	236	62%
Over 51 years old	6	1%	11	3%
31 to 50 years old	384	53%	234	62%
Under 30 years old	329	46%	135	35%

Note The percentage of new hires/resigned employees to that employee category is that gender or age group divided by the number of new hires/resigned employees in 2022.

— New Hire Statistics —

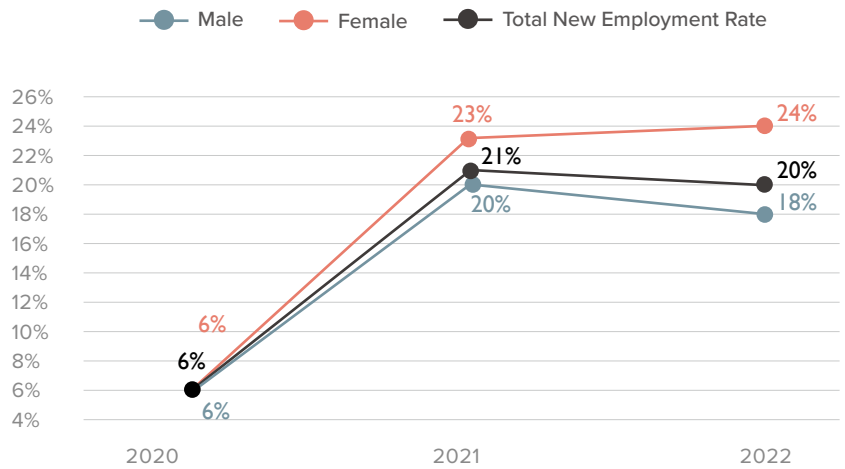


— New Hire Ratio —

Year	Male		Female		Total	
	Number of People	Ratio	Number of People	Ratio	Number of People	Ratio
2020	110	6%	53	6%	163	6%
2021	457	20%	236	23%	693	21%
2022	426	18%	293	24%	719	20%

Note The new hire rate is calculated as the number of new recruits for the year divided by the total number of employees of the same gender on December 31 of the same year.

— New Hire Statistics —

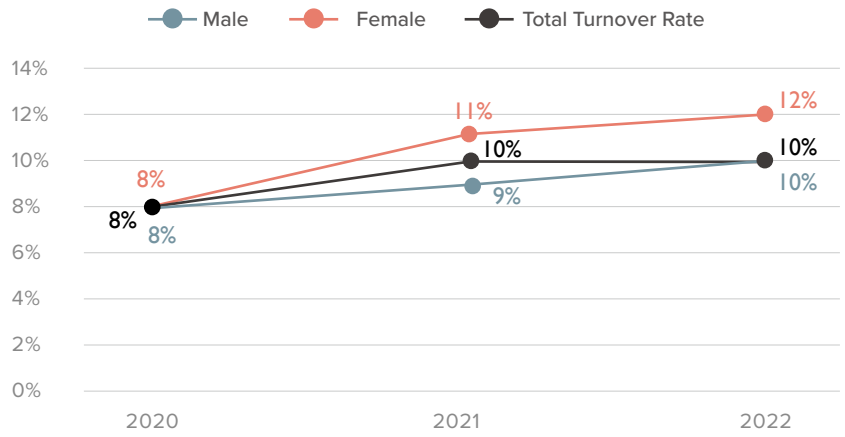


— Employee Turnover Statistics —

Year	Male		Female		Total	
	Number of People	Ratio	Number of People	Ratio	Number of People	Ratio
2020	166	8%	74	8%	240	8%
2021	207	9%	115	11%	322	10%
2022	236	10%	144	12%	380	10%

Note Turnover rate = Number of employees of that gender resigned from the company that year (including retirements) divided by the total number of personnel of the same gender on December 31 of the same year.

— Employee Turnover Statistics —



Hiring Individuals with Disabilities

Through the government employment support agencies, Winbond maintains continuous attention to the resumes of individuals with disabilities, aiming to improve their employment rate. As of the end of 2022, Winbond has employed 32 individuals with disabilities, and after accounting for weighted factors based on the severity of their disabilities, the total number stands at 47. This represents a remarkable 147% increase compared to the previous year, demonstrating a higher employment rate than mandated by the law..

Prior to reporting to work, Winbond provides assistance to employees with disabilities who are actively involved in the company's business operations. They assess each individual's physical and mental disabilities and help new employees understand the practical aspects of commuting, work processes, and other relevant details. After their arrival, suitable personnel assistance, equipment, and work environment are provided to create a friendly workplace environment, allowing them to work with peace of mind and leverage their strengths. Starting from 2022, Winbond has introduced the position of a visually impaired massage therapist, offering massage and therapeutic services to employees. This initiative effectively reduces fatigue, promotes employee health and well-being, while also creating employment opportunities for visually impaired workers.

— Number of Employees with Disabilities —

	Male		Female		Total number of people	Weighted by degree of disability
	Number of People	Ratio	Number of People	Ratio		
Hires	22	68.75%	10	31.25%	32	47

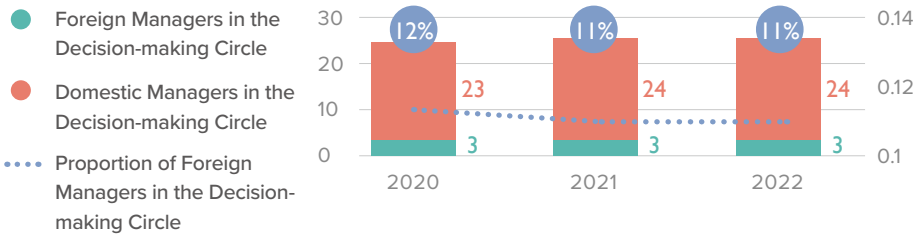
Recruitment of Foreign Experts

On the path of sustainability, Winbond recruits talent individuals from around the world, offering equal opportunities for professional development to candidates from different countries. Through various channels, Winbond continues to reach out to foreign talent and provides comprehensive services to newly hired international employees, assisting them and their families with relocation, settling into their new lives, and other necessary support.

In 2022, Winbond participated in SEMI International Talents EXPO, an online talent recruitment event supported by Industrial Development Bureau, Ministry of Economic Affairs. Additionally, they took part in the "Indonesia-Taiwan Connect" job fair organized by Indonesian Economic and Trade office to Taipei, providing an opportunity to interact with potential candidates face-to-face. During these events, Winbond not only presented and described the work environment and opportunities available upon joining the company but also engaged in interactive Q&A sessions with foreign candidates. The outreach efforts resulted in approximately 100 talented individuals from overseas expressing interest in joining Winbond.

After years of cultivating the foreign talent market, the number of new foreign hires at Winbond has shown a significant increase in the past three years (from 2020 to 2022). In 2022, the company welcomed a record of 11 new foreign employees from six different countries, reflecting the diversity of nationalities. As of the end of 2022, Winbond's foreign workforce represented a total of eight different countries, with a substantial presence from Japan and South Korea. The company has also actively recruited professional talents from Malaysia, Indonesia, Haiti, and other countries, who have studied in Taiwan and expressed a strong interest in contributing to the semiconductor industry, thus enhancing the diversity of the talent pool and fostering cultural integration to stimulate innovation. Notably, over 34% of all foreign employees hold managerial positions, with 19% of them serving as vice presidents or above, highlighting their significant contributions to leadership roles within the organization.

— Proportion of Foreign Managers in the Decision-making Circle —



Note Managers in the decision-making refer to managers above the rank of deputy director.

Podcast invitation interview - Global Talent in Taiwan

To enhance public understanding of diverse employers, the HR Manager of Winbond was invited to participate in a podcast hosted by "104 Career Clinic." The podcast's theme was "Global Talents in Taiwan," and during the episode, the HR Manager openly shared various insights into overseas recruitment, the challenges and rewards of retaining international talent, handling cultural impacts, and techniques for cross-departmental integration. By sharing exclusive experiences and expertise, the aim was to provide valuable references for the audience from all walks of life while strengthening Winbond's employer brand as a promoter of diversity.

The podcast has already been viewed more than 4,000 times on the 104 official website!

Global Talent in Taiwan

Recruitment of Indigenous People

Winbond's embraces diversity, and in 2022, the Taiwan headquarters had a total of 16 employees with indigenous backgrounds. To safeguard their rights to participate in cultural activities, Winbond offers the option to apply for indigenous festival leaves, demonstrating the company's commitment to preserving and respecting Taiwan's precious indigenous culture.

— Number of Indigenous Employees and Applications for Tribal Festival Leave —

Year	Number of Indigenous Employees	Applications for Tribal Festival Leave	
		Number of People	Percentage
2020	9	3	33%
2021	12	0	0%
2022	16	2	13%

Performance Management System

To align the company's objectives with those of the managers and frontline employees, Winbond has established a comprehensive performance management system. This system is designed to understand and assess the employees' job performance, support their personal development, and ultimately enhance the company's competitiveness and overall organizational performance. Through this process, Winbond aims to foster a culture of continuous improvement and growth, ensuring that individual talents are nurtured, and the organization thrives as a cohesive and high-performing team.

During the probationary period for new employees, Winbond has established a new employee evaluation mechanism to assess their performance. This evaluation process involves gathering feedback from both the new employees themselves and their respective supervisors to promptly determine their suitability for the position.

In our performance management approach, at the beginning of each year, performance goals are set for employees. These goals are then monitored and managed through a performance evaluation system every six months. Additionally, mid-year and end-of-year performance assessments are conducted to review employees' job performance. One of the key evaluation criteria is the demonstration of core company competencies, which includes integrity in business operations and contributions to sustainability. The results of these assessments serve as reference points for reward allocation, promotions, performance coaching, and other related activities. During the year 2022, both direct and indirect employees underwent a 100% participation in the performance assessment and evaluation process.

Winbond's Performance Management System goes beyond assessing the achievement of individual goals; it also incorporates competency evaluations. The core competency assessment aims to reinforce our company culture, while the management and professional competency assessments help us gauge talent capabilities and identify any skill gaps within the organization. We place a strong emphasis on the long-term and future development of our employees' abilities, ensuring that they are well-equipped for continuous growth and success.

4.2.3 Compensation and Benefits

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, we offer a highly competitive salary system and comprehensive benefits package, including generous base salaries, allowances, employee bonuses, and incentives. Employee performance evaluations are

based on a holistic assessment of their job performance and professional knowledge and skills. Accordingly, employees receive corresponding bonuses and rewards. We believe in immediate bonus distributions, sharing the success of our operations with our employees, and continuously boosting their morale and motivation in the workplace.

Compensation Policy

Employee compensation is guided by the principles of internal equity and external competitiveness, comprising both fixed components (e.g., base salary, allowances) and variable components (e.g., performance-based bonuses, employee incentives). These bonuses are promptly distributed, allowing colleagues to share in the fruits of our operational achievements, thereby attracting, motivating, and retaining talented individuals. Individual compensation is determined based on job responsibilities and professional expertise, while bonuses and incentives reward a holistic evaluation of personal job performance and contributions. Our commitment to human rights serves as an objective foundation, ensuring that compensation, benefits, evaluations, promotions, and other aspects do not discriminate based on gender, race, skin color, religion, political affiliation, sexual orientation, age, marital status, pregnancy, physical or mental disabilities, blood type, zodiac sign, or labor representation status.

In 2022, Winbond ensured that the basic monthly salary for inexperienced employees exceeded the statutory minimum wage, ranging from 1.4 to 1.7 times the legal minimum wage. Additionally, an annual market salary survey was conducted to review and adjust salaries based on performance, rewarding and retaining valuable talent. The ratio of the annual total compensation between the highest-paid individual and the median for regular employees was 22.7:1 (Note). Furthermore, the annual total salary remuneration change ratio for 2022 was 2:1.

Note The ratio of the total compensation (including both fixed and variable compensation) of the highest-paid employee within Winbond's organization to the median average of total compensation for other general employees over the past three years (from 2020 to 2022) is used as a benchmark.

— Ratio of Entry-Level Salary to Local Minimum Wage —

	2020	2021	2022
Direct Employee	1.3 times	1.4 times	1.4 times
Indirect Employee	1.7 times	1.8 times	1.7 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 —

2022	Minimum Starting Salary		Minimum Wage
Remuneration	Female	Male	
Ratio of Entry-level Salary	1.7	1.7	1

Note Standard salaries are not different based on gender.

— Salary Statistics of Full-time Employees in Non-Management Roles —

Item	2021	2022	Annual Difference
Number of Full-time Employees in Non- Management Roles	2,831 persons	3,312 persons	16.99%
Total Salary of Full-time Employees in Non- Management Roles	NT$6,600,515,000	NT$ 6,377,932,000	-3.37%
"Average Salary" of Full-time Employees in Non-Management Roles	NT$2,332,000	NT$1,926,000	-17.41%
"Median Salary" of Full-time Employees in Non-Management Roles	NT$1,858,000	NT$1,580,000	-14.96%

— Employee Salary Ratio —

Type of Personne	Female	Male
Management	1	1.2
Non-Management	1	1.1

Note Management refer to employees who hold a position at the department head level or above and provide assistance and guidance to other department staff.

Generous Benefits

Winbond offers comprehensive benefits and measures for all employees, encompassing various aspects of their well-being. These benefits range from performance-driven incentives and bonuses in the workplace to living allowances and employee vacations. Additionally, we provide diverse social clubs to foster a vibrant work environment. By availing these benefits, our employees gain motivation, achieve work-life balance, and find a sense of fulfillment in both their professional and personal lives.

In 2022, the total employee benefits note cost amounted to NT$19,705,663,000, including consolidated subsidiaries. This figure includes NT$18,829,173,000 for short-term employee benefits and NT$876,490,000 for post-employment benefits.

Note

1. All welfare items are handled in accordance with relevant regulations, with the data presented primarily from the Taiwan headquarters.
2. Short-term employee benefits refer to the employee benefits that are expected to be settled within the 12 months following the end of the period during which the employees render the related services (excluding severance benefits).
3. Employee benefits expense includes health insurance, club subsidies, retirement benefits, and equity.

In response to the COVID-19 pandemic in 2022, Winbond introduced the COVID-19 hospitalization medical insurance as a new addition to our group insurance plan. This coverage allows confirmed cases to apply for hospitalization claims and receive a one-time "Caring Benefit" payment. Additionally, we provide employees with a one-day "Paid Vaccination Leave" for getting vaccinated against COVID-19 themselves. Moreover, if employees have children aged 11 or below who receive COVID-19 vaccinations, they can apply for a one-day "Paid Pandemic Care Leave" to support their caregiving needs for their families. These measures are designed to assist our employees and their families during these challenging times and promote a safer working environment.

— Total Employee Care —

Bonuses	Festival Bonuses、Special Bonuses、Operating Performance Bonus、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
Club	Sports、Arts and Culture、LOHAS、Public Welfare

Bonuses

In 2022, Winbond utilized a diverse incentive bonus system to encourage employees to be innovative and enthusiastic learners. Three teams were recognized and rewarded with the "Winbond Star Bonus" for their outstanding achievements. The team themes were as follows: Accelerating the verification schedule of flash memory products using machine learning and data science, Construction and expansion of the Kaohsiung factory, and The establishment of D25S dynamic random-access memory and the construction of the Kaohsiung factory.

— Diverse Incentive Bonuses —

Item	Explanation
Winbond Star Bonus	Each quarter, individuals and teams who exemplify Winbond's work culture (Conduct business with integrity and ethical behavior, Accountable team work, Enthusiasm of learning, Aggressively innovate, Sustainable contribution) and have made significant contributions to the company are recognized and commended.
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	Winbond provides immediate rewards and recognition to employees who demonstrate outstanding performance in their job responsibilities or excel in special projects.
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.
Motivation 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.
Patent Bonus	Winbond encourages colleagues to engage in creative inventions and innovations related to product design, manufacturing, testing, application, marketing, and other areas.
NT$2,803,340,000 were awarded in 2022 through our diverse range of incentives and bonuses.	

Allowances/Insurance：Childcare Allowance

In response to government's encouragement of childbirth, Winbond has been implementing the "Childcare Allowance" policy since April 2011. Under this policy, each newborn child of Winbond employees receive a monthly allowance of NT$6,000, which continues until the child reaches the age of 4. This initiative has significantly contributed to improving the birth rate among our employees. Since the policy's inception in 2011 until 2022, a total of 1,667 employees' children have received the allowance. Winbond has become a strong supporter for employees in caring for their families. This initiative not only eases the financial burden for new parents but also increases the retention rate of employees who choose to continue their careers while raising their children. As a result, our employees' overall happiness and well-being have been positively impacted, fostering a more family-friendly and fulfilling work environment.

— Childcare Allowance Performance Statistics —

Item	Explanation
Effect	• Cumulative number of applications and subsidy amount for children: From the implementation in 2011 to the end of 2022, a total of 1,667 children of employees have benefited from this program, with a cumulative disbursement of NT$298,832,873. • Total allowances in 2022: NT$ 30,262,190

Allowances/Insurance：Group Insurance

In addition to complying with legal requirements to provide labor insurance and national health insurance to all employees, Winbond also offers a comprehensive group medical insurance system. This system includes regular life insurance, accident insurance, hospitalization medical insurance, and cancer insurance. The coverage extends not only to employees themselves but also includes their spouses and children. Furthermore, we offer optional self-paid group insurance plans that cover employees, their spouses, children, and parents. This approach allows employees to choose different coverage options based on their individual needs. With these comprehensive family group insurance plans, we aim to provide complete protection for both our employees and their families' healthcare needs, ensuring their peace of mind while working at Winbond. In 2022, the total premium payments for these insurance plans amounted to NT$22,247,000.

Allowances/Insurance：Pension Fund and Transfer Program

According to regulations, Winbond sets aside retirement reserves (under the old scheme) or contributes to retirement funds (under the new scheme) for each full-time employee. For the portion of retirement funds covered by the old scheme (Labor Standards Act), a contribution of 2% of the total monthly salary is allocated to the retirement reserve. The contribution rate is reviewed periodically every year. If the balance is insufficient to cover the retirement benefits for eligible employees who meet the statutory retirement conditions in the following year, the shortfall will be allocated to a dedicated account under the name of the Labor Pension Supervisory Commission, Taiwan Bank. As of the end of 2022, Winbond's planned fair value of assets (consolidated) amounted to NT$2,414,054,000. The amount required for future contributions as per the law has been recorded as accrued retirement benefit liabilities, resulting in a net defined benefit liability (consolidated) of NT$1,892,594,000.

Under the new retirement fund scheme (Labor Pension Act), Winbond contributes 6% of each employee's monthly salary to their individual retirement fund account, based on the salary grade table. Employees also have the option to voluntarily contribute to their personal retirement fund account within the 6% range, as per their preference and willingness. In 2022, the total expenses for confirmed retirement reserve (old scheme) and retirement fund contribution (new scheme) amounted to NT$734,000,000. For further details, please refer to Winbond's consolidated financial report for the year 2022.

In the event of significant operational changes, Winbond will comply with the regulations of each operating location and provide advance notice to employees. We will offer necessary assistance, such as internal transfers or support in applying for relevant government subsidies, to ensure a smooth transition during such changes.

Leave：LOHAS Holiday

To promote a healthy work-life balance for our employees, Winbond provides a "LOHAS Leave" system that exceeds the requirements of labor laws. From their first year of employment, employees are entitled to seven days of leisure leave per year (based on the proportion of time worked in that year). We also offer a flexible leave system where employees can take leave on an hourly basis, allowing them to plan their time off according to their needs. Furthermore, Winbond encourages employees to plan for longer vacation periods each year, enabling them to spend quality leisure time with their families and friends. This approach helps achieve a harmonious work-life balance and adds vibrant colors to their lives. In 2022, a total of 2,936 employees utilized the leisure leave, resulting in an 82% utilization rate.

Leave：Unpaid Parental Leave

To ensure that Winbond employees can strike a balance between family and career development while also promoting childbirth, we offer the benefit of extended unpaid leave for child-rearing. Through our flexible leave management system, employees can freely utilize leave to take care of their children and feel assured during their child-rearing journey. In 2022, a total of 18 employees applied for extended unpaid leave for child-rearing. Although the return-to-work rate for employees on child-rearing leave was 67% due to uncertainties related to the COVID-19 pandemic recovery, the retention rate for employees who returned to work in 2021 and were still employed after one year reached 86%. This demonstrates our commitment to supporting employees in their family responsibilities while fostering a supportive work environment for their long-term career development.

— Unpaid Parental Leave Statistics —

	Male	Female
Number of employees entitled to unpaid parental leave in 2022 Note 1	119	332
A: Number of employees on unpaid parental leave in 2022	6	12
B: Number of employees that should be reinstated in 2022	2	10
C: Number of employees actually reinstated in 2022	2	6
D: Number of employees reinstated in 2021	1	13
E: 2021 reinstatements - Number of employees still with the company after one year Note 2	1	11
Return to work rate (%) = C/B	100%	60%
Retention rate (%) = E/D	100%	85%

Note 1 Based on the government regulations that allow employees to apply for childcare leave for up to two years before their child reaches the age of three, an estimation was made based on the number of employees who took maternity leave or paternity leave since 2019.

Note 2 From the effective date of the employee's return to work, counting continuously for one year without any leaves, the calculation period will be until December 31, 2022.

Lifestyle Support：Foreign Employee Care

To enhance our processes and elevate the quality of our research and development talent, Winbond actively seeks to attract outstanding overseas professionals. When foreign employees relocate to Taiwan, they may initially face challenges adapting to their new living habits, language, and culture. When our colleagues and their families move to Taiwan, we ensure meticulous handling of their housing arrangements. We assign dedicated personnel to maintain close communication with the relocating individuals from pre-arrival to onboarding, enabling us to accurately understand the needs of our foreign colleagues and their families. We arrange airport pickups and accommodations in advance, and during the pandemic, we provide comprehensive guidelines for entry into Taiwan, ensuring real-time updates on epidemic prevention information. Winbond fully covers the costs of epidemic prevention hotels and offers flexibility for remote work in response to changing epidemic situations. Our goal is to ensure the well-being and health of our foreign colleagues throughout their transition and employment at Winbond.

Additionally, at Winbond, our dedicated team is always there to provide assistance to our foreign employees in every aspect of their life and work. This includes helping with residency permit applications, work document processing, arranging school enrollment for their children, assisting in finding accommodation in Taiwan, and providing guidance on company policies and government regulations. We take pride in being a solid support system for our foreign colleagues in this foreign land. As of the end of 2022, the average tenure of our foreign employees at Winbond is 7.61 years note, with 26 individuals having been with the company for 5 years or more. We cherish the contributions of our international workforce and remain committed to ensuring their well-being and success within our organization.

Note: Including duration spent working at Winbond subsidiaries.

Lifestyle Support：Health Promotion

In 2022, Winbond has been hiring professional masseurs to provide massage services for our employees. This initiative not only creates employment opportunities for people with disabilities but also enhances employee benefits by offering free massage services to our colleagues. Our aim is to help our employees alleviate fatigue, boost work efficiency, and create a more relaxed and productive work environment. To ensure convenience and efficiency, we have set up a user-friendly online reservation system for booking massage appointments. In 2022, a total of 3,405 employees enjoyed these massage services, which help to loosen muscles, alleviate shoulder and neck pain, and enable our employees to release work-related stress during their short breaks.

Provide employees with free visually impaired massage services

Club

Winbond has established a variety of diverse clubs to encourage employees to engage in activities that promote health and well-being, as well as participate in community service. We have implemented the "Employee Welfare Committee Club Subsidy Management Measures" to support and promote these clubs' activities. Through active club participation, we aim to foster emotional connections, improve mental and physical health, and enhance overall work efficiency. As of 2022, there are a total of 40 registered clubs, categorized into four types based on their activities: sports, leisure, arts and culture, and community service. Due to the impact of the COVID-19 pandemic in 2022, some clubs temporarily suspended in-person activities, while others shifted to online activities to continue their operations.

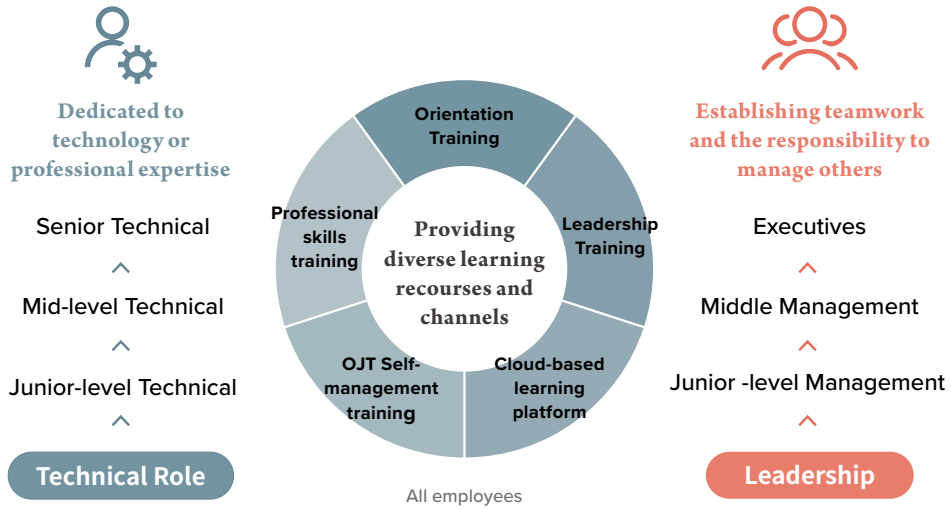
— Diverse Club Activities —

Club Type	Description
Sports Clubs	There is a total of 23 sports clubs, encompassing various ball sports, cycling, running, and other related activities, accounting for 57% of all clubs. Notably, several high-level executives actively participate in these clubs, setting an example and encouraging their departmental colleagues to engage in sports and foster a healthy lifestyle. Among these clubs, the CTSP Badminton Club and Softball Club have consistently achieved outstanding results in the "CTSP Cup Annual Ball Sports Competition" year after year. Volleyball club activities Pool club activity

Arts and Culture Clubs	There is a total of 4 cultural clubs, including the Biodiversity Club, Animation Club, Photography Club, etc., which account for 10% of all clubs. These cultural clubs make effective use of the company's existing resources to organize educational lectures, annual photography exhibitions, movie appreciation events, and more. Among the various club categories, these cultural activities have the highest participation rate of employees bringing their families along.
LOHAS Clubs	There is a total of 12 diverse clubs, including the Health and Wellness Club, Camping Club, Board Game Club, etc., which account for 30% of all clubs. These clubs offer a wide range of activities that allow employees to expand their horizons and cultivate their interests. Camping activities
Public Philanthropy Clubs	There is a total of 1 club, representing 2% of all clubs. Named "Silent Givers Club," its mission is to silently engage in charitable activities, focusing on activities such as caring for the underprivileged, providing social services, and promoting environmental sustainability. The club aims to fulfill its corporate social responsibility as a good corporate citizen. Since its establishment in 2010, the Silent Givers Club has organized various initiatives, including environmental cleanups in local communities, dream-fulfilling events, environmental repairs in childcare institutions, environmental engineering projects, and the Happy Children's Breakfast Program.

4.2.4 Talent development and learning outcomes

Winbond annually designs and implements various training and development programs based on the company's strategy, vision, business decisions, and core culture. These programs are tailored to different organizational levels, professional competencies, and specific target groups. The training initiatives are determined through surveys to assess training needs. Under the "dual-track" talent development system, employees have the flexibility to choose between enhancing their managerial skills or deepening their expertise in specific technical fields, based on their individual development goals and job requirements. Winbond provides a wealth of training resources, including both physical and online courses. In response to the COVID-19 pandemic in 2022, the company continued learning initiatives without interruption. Winbond continuously optimizes its cloud-based learning platform and increases the interactivity of live-streamed courses. By offering a diverse range of courses and learning methods, the company aims to empower employees to strengthen their competitiveness, achieve personal growth, and enhance their job performance.



Training Effectiveness Evaluation - 4 Levels of Training Evaluation

To track and ensure the effectiveness of training programs, Winbond employs a four levels education and training evaluation model based on the nature of the courses. This evaluation process examines whether the training align with their intended objectives. Moreover, Winbond encourages employees to apply what they have learned directly to their work. As part of this approach, certain training include assessments, post-training assignments, project presentations, and one-on-one interviews to reinforce the principle of adult learning, which emphasizes the immediate application of acquired knowledge and skills.

— Satisfaction with Talent Cultivation Courses in 2022 —

Average rating for courses held in person	★★★★☆ 4.4/5 points
Average rating for digital courses	★★★★☆ 4.2/5 points

Winbond provides a diverse range of training resources and activities aimed at enhancing the professional competence of its employees. For direct employees, the focus of training lies in on-the-job learning, machine operation training, and company culture or strategy promotion events. This approach ensures continuous improvement and development. For indirect employees, professional training is tailored according to their job functions and respective hierarchical levels. Given that a higher proportion of female employees work in administrative support units, their required professional knowledge and skills are primarily acquired through on-the-job learning. As a result, the average training hours for male employees are slightly higher than for female employees.

— Number of Employees Receiving Professional Training and Number of Hours —

Course Type	Number of Courses Held	Total number of trainees	Total training hours
Core	129	9,843	11,093
Professional Specialization	1,637	85,580	89,181
Data Science	606	11,988	23,745
Management	259	10,115	18,691

— Total Number of Education and Training Hours Sorted by Gender and Employee Type —

Total employee education and training (hours)	Management	Non-Management	Total training hours
Female	3,652	31,589	35,242
Male	21,552	85,917	107,469
Total training hours	25,204	117,506	142,711

— Number of Employees Receiving Training Categorized by Employee Gender and Type —

Category	Management	Non-Management	Total number of people
Female	60	1,034	1,094
Male	454	1,842	2,296
Total number of people	514	2,876	3,390

— Average Employee Training Hours Sorted by Gender and Employee Type —

Category	Management	Non-Management	Total average training hours
Female	61	31	32
Male	47	47	47
Total average training hours	49	41	42

Note Management refers to section chief or higher grades responsible for supporting and directing employees in their department

Orientation Training

In 2022, Winbond used an online learning platform to provide new employees with online training courses when they reported to work, including life guidance, culture promotion and introduction of various company policies. 21 courses were provided in total. The average satisfaction rating for all training courses in 2022 was 4.22 (out of 5) and the completion rate was 95.5%.

Winbond organizes a two-week "New Recruits Boot Camp" for new employees with less than three years of professional experience. The program aims to provide them with comprehensive training, including knowledge and skills acquisition, sharing of experiences from senior colleagues and supervisors, and immersive cultural experiences. The boot camp is designed to foster a sense of organizational identity and enhance employee retention. In 2022, in addition to holding one physical boot camp in Kaohsiung, Taichung, and Hsinchu, we made efforts to balance epidemic prevention measures with the effectiveness of the program. For the first time, we conducted the boot camp in Kaohsiung with two separate groups (Group A and Group B), overcoming space limitations. In total, there were four boot camp sessions held in 2022, with an average satisfaction rating of 4.5 (maximum 5).

Cultivating Management Talent and Leadership Succession

The well-established leadership talent development program enables smoother management operations within the company. In 2022, Winbond continued to prioritize the cultivation of management talent, focusing on nurturing grassroots supervisors in the new factory area. The systematic development of key talent pipelines was also carried out during this period. Looking ahead to 2023, the company plans to extend this talent development initiative from the factory units to include personnel within the product business group. By doing so, Winbond aims to further enhance leadership capabilities across different departments, ensuring a more seamless and effective approach to managing its operations.

Nurturing Management Talent for New Plant Locations

To achieve Winbond's expansion and operational goals in Kaohsiung, the organization and leadership talent deployment at the Kaohsiung plant are crucial. Under the Winbond management competency framework, cultivating grassroots supervisors is essential for effective team building and improved communication and coordination skills. In 2022, the company implemented a development training program for entry-level talent at the Kaohsiung plant, following the framework of "Assess → Learn → Practice → Evaluate" This initiative helps supervisors make informed talent selection decisions through a systematic selection process. It also assists them in setting effective goals for their subordinates, building their confidence and sense of responsibility, and promoting optimal performance within the performance management cycle. Additionally, given the large-scale recruitment of new employees for the new plant, creating a positive and trusting work environment and enhancing a sense of belonging and responsibility are key training focuses for Winbond in 2023.

Continuous Development of Key Talent Cohorts

Winbond places great emphasis on the selection and long-term development of mid to senior-level executives and key talent, considering the organization's globalization and expansion needs. Over the years, the company has continuously collaborated with renowned external professional consulting teams. Through management competency assessments and personality trait evaluations, 95% of mid to senior-level executives have gained insights into their strengths and areas for development, facilitating discussions and planning for their personal development plans. In 2019, Winbond also implemented th SuccessFactor Learning Management System as part of its talent development mechanism. This system assists business unit leaders in identifying the depth of bench strength, personnel turnover risks, and the impact of key positions and talents. Through various development approaches such as management training programs (e.g., Carnegie), job rotations, project experiences, and external training at renowned international institutions (such as Stanford, Singularity University, INSEAD), Winbond nurtures and strengthens its leadership pipeline.

In 2022, Winbond placed a strong emphasis on cultivating talent pipelines within our factory units. By the end of 2022, we had implemented rotation and development programs for 32% of middle and senior-level management talent. Looking ahead to 2023, we plan to gradually conduct talent pipeline assessments across various business groups to identify and develop future leaders.

Differences Lead to Outstanding Achievements

In 2022, Winbond implemented various language subsidy initiatives to encourage diverse interactions among employees from different language backgrounds. We offered language assistance for English, Japanese, and Korean, providing a 50% subsidy for language training costs once employees reached the proficiency standards. Additionally, employees who achieved language proficiency certification could apply for an additional subsidy of 10,000 NT dollars, further incentivizing the autonomous learning of multiple languages. Furthermore, Winbond is committed to promoting training programs that aim to eliminate unconscious biases in the workplace. Through a comprehensive range of digital courses, we provide employees with insights into the benefits of diverse teams, fostering attitudes of respect and empathy.

In 2023, Winbond will continue to uphold its commitment to sustainable development and foster a diverse and inclusive workplace environment. The company recognizes the significance of female influence as an essential element of diversity and inclusion. As part of its initiatives, Winbond plans to organize courses and seminars to promote gender equality, empowering female colleagues to recognize their importance in the workplace, build self-confidence, embrace challenges, and learn how to expand their influence. Through these efforts, Winbond aims to encourage more female professionals to thrive and grow in their careers, ultimately creating a win-win situation for both the company and its employees.

4.3 Employer-Employee Relations

Winbond conducts regular market surveys to adjust its employee's salary and benefits standards in line with industry trends. This, combined with a robust performance evaluation system, allows the company to offer a competitive compensation package that exceeds legal requirements, aiming to attract and retain exceptional talent. Additionally, Winbond embraces a balanced approach to workforce planning, facilitating a strategic turnover of personnel to infuse the organization with fresh ideas and perspectives.

Open Employer–Employee Communications

While Winbond does not have a labor union, we believe in fostering open and transparent communication channels between labor and management. We hold regular labor-management meetings every quarter, providing diverse avenues for our employees to voice their opinions and concerns. These channels include physical suggestion boxes, a dedicated hotline (75234 - "I want to complain"), a Care Complaints mailbox, and a Sexual Harassment Employee Complaint Committee. Additionally, we conduct various functional meetings on a regular basis, such as labor-management meetings, supervisor management discussions, employee welfare committees, environmental and safety committees, production management meetings, and quality retraining meetings.

At Winbond, employees have access to various communication channels to express their opinions or provide suggestions, whether anonymously or with their names. We actively respond to feedback received, promote communication, and make the response content publicly available on the company's intranet homepage. Additionally, we collect employee opinions regularly or irregularly through focus groups and individual interviews, using them as a basis for improving management policies and service quality. We also provide training courses for all new employees to ensure that they are well-informed about these communication channels. Winbond strictly prohibits bullying, and if any related complaints are received, we follow workplace misconduct handling procedures and internal complaint policies. This includes initiating investigations, gathering information, and conducting interviews. We also hold misconduct review meetings to address the issue. After the resolution of the complaint case, we provide regular follow-up care to employees to prevent any retaliatory actions.

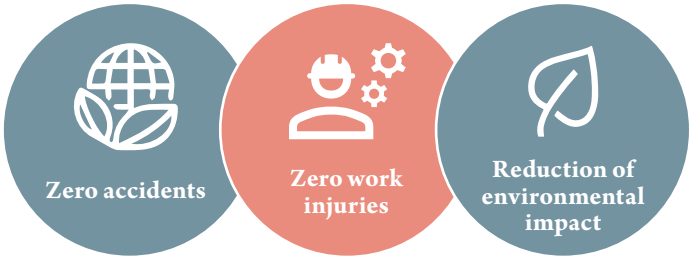
In 2022, Winbond received and addressed a total of 9 proposals through the suggestion box (both physical and online channels). The company diligently provided feedback to the relevant business units for improvement and communicated the responses back to the employees who submitted the suggestions, ensuring an open and effective internal communication channel. Regarding the "75234 Employee Complaint and Care Line," 7 cases were handled in accordance with the internal complaint procedure. Among these cases, 5 were related to communication issues between colleagues in the workplace, and 2 involved workplace misconduct. All cases underwent thorough investigation, review, and decision-making processes. For the workplace misconduct cases, a dedicated investigation team was established in accordance with national workplace misconduct guidelines. Once the decisions were made, communication was carried out with both the complainant and the accused to reach a consensus on the resolution. If any employee was found to have violated company regulations during the process or after the decision, appropriate disciplinary actions were taken in accordance with the company's rules and regulations. The effectiveness of the implemented solutions was continuously monitored, and the well-being of the employees who submitted complaints was closely followed up within three months to prevent any retaliatory actions. Currently, all 7 cases have been resolved following the proper procedures, and the individuals involved have been provided with appropriate care. In cases involving management issues or negative work attitudes and behaviors, announcements were made on the company's internal website or within the office premises. Additionally, the management was informed to provide employee education and training on work attitudes and rules. Through communication, training, and policy announcements, efforts were made to reduce negative impacts, improve the work environment, and prevent similar incidents from happening. Furthermore, 12 labor-management meetings were held, during which representatives from both the management and labor sides were appointed or elected. All employees participated in the election of labor representatives, and labor-related laws were regularly reviewed to ensure that work rules were in compliance with regulations and reported during labor-management meetings for joint review. Lastly, 4 manager management discussion meetings were conducted, with a total of 1,973 participants and an average attendance rate of 87%.

Diverse Channel for Employee Feedback

Suggestion Boxes	Near the employee cafeteria and production line restrooms, there are suggestion boxes provided for all employees to share their feedback and suggestions related to work and life.
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 Communication and Discussion Meetings	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 suggestions 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.

4.4 Occupational Safety and Health

Winbond Occupational Health and Safety Goals



4.4.1 Occupational Safety and Health Management System

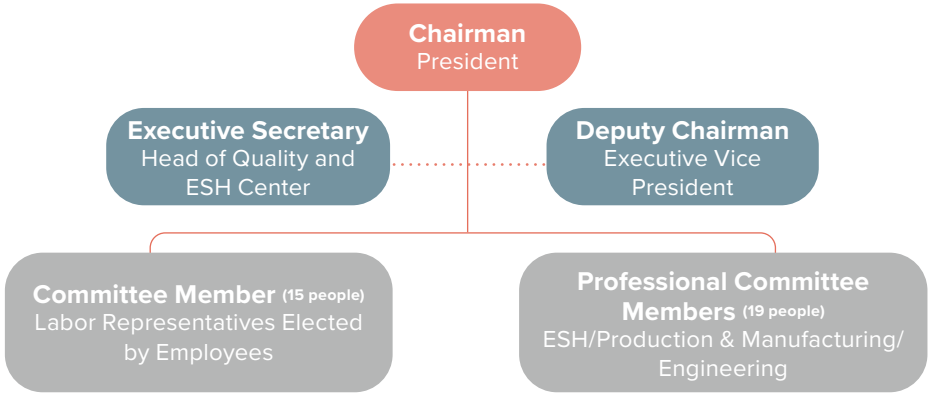
The Winbond endeavors to meet the advanced international safety, health and environmental standards and is committed to providing employees with a complying and healthy working environment through respect, caring and counseling, and participation mechanisms. Continuous improvement will be used to promote employee safety, eliminate hazards, reduce environmental, health, and safety, and asset risks, being committed to zero accidents, zero work-related injuries, and reducing environmental loads. Through the optimization of prevention and improvement measures, we will gradually reduce the rate of personnel injury, implement the concept of safety and health, and become a green enterprise with sustainable development.

— ESH Committee —

Member	A total of 34 members, consisting of management representatives, representatives elected by employees of each unit, labor representatives voted by employees, and safety, health, environmental protection and health management personnel, among which labor representatives voted by employees, 15 of them in total, account for more than 1/3
Frequency	Regular meetings are held every quarter to discuss safety, health and environmental protection issues
Responsibi-lities	Provide adequate channels for employees and managers to communicate face-to-face on safety, health and environmental protection issues; each department has a safety, health and environmental protection officer, who mainly assists, consults and promotes related safety, health and environmental protection business, so as to make all employees aware

The participation of front-line workers is also important. Winbond has established relevant procedures to ensure that labor representatives can participate in ESH policy revisions and related safety proposals and communications. In the composition of the Winbond Occupational Safety and Health Committee, the proportion of labor representatives is better than the legal requirements, reaching 44%. The relevant proposals and communications in 2022 mainly fell into three categories: safety, health and environmental protection. The business management unit made responses in the meeting, which were confirmed by the Chairman; and all cases were closed.

Winbond has taken relevant front-line workers into consideration at the beginning of planning the safety and health plan, such as: The risk and hazard identification officers are all trained workers of such units, and labor representatives are also required to participate in the semi-annual environmental testing or abnormal accident discussions.



Occupational Safety and Health Management System

Winbond has already obtained ISO 45001 Occupational Health and Safety Management System and Taiwan Occupational Health and Safety Management System (TOSHMS) certification. Internal audits are conducted every 6 months and external audits are conducted by an international certification company every year to ensure that the system is operating normally. Also, all workers have been 100% included, including the Kaohsiung Fab that was established in 2022, the ISO 45001 and TOSHMS certification of which were completed at the end of 2022. In order to comply with the goal of zero accidents in the ESH policy, Winbond continues to use quantitative indicators such as the annual Disabling Injury Frequency Rate (FR) and Disabling Injury Severity Rate (SR), along with the independent inspections by on-site unit supervisors, supervisor safety observations, on-site safety proposals and false alarm report incentives, to gradually reduce the personnel injury rate; and by setting medium and long-term goals, expecting to reach half of the industry average, and including relevant contractors into the relevant risk assessments, to avoid transferring high-risk operations to non-employees only.

— Number of Employees Covered by the Occupational Health and Safety Management System —

2022	Number of People Covered by Management System		Total Organization Personnel		Ratio (%)	
	Employees	Non-employees	Employees	Non-employees	Employees	Non-employees
Not audited	0	0	0	0	0%	0%
Passed internal audit	3,508	167	3,508	167	100%	100%
Audited or verified by external body	2,783	167	2,783	167	100%	100%

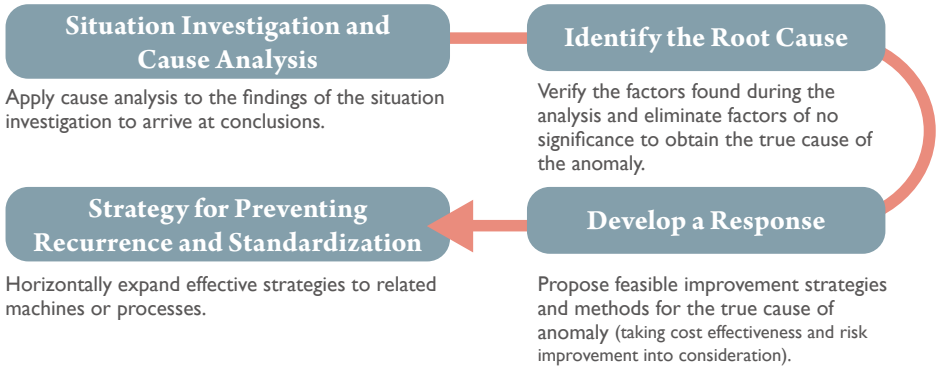
Note: The number of persons is based on data from December 31, 2022.

Accident Investigation and Injury Prevention

A complete standard operating procedure (SOP) on accident investigation has been established by Winbond to reduce accident damage and risk. The SOP is applicable to all Winbond employees, contractors, and visitors. In the event of an accident, different levels of investigation are carried out based on the severity and type of the accident. The level of investigation also determines the composition of the investigation team.

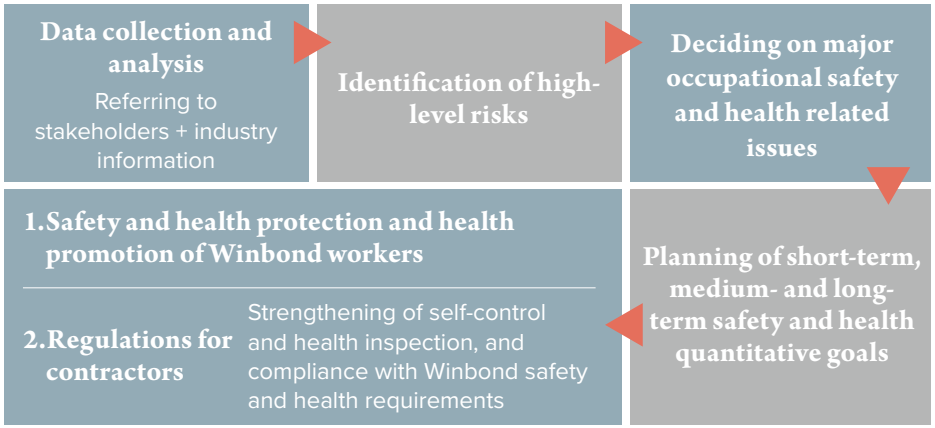
The operation of the ESH management system undergoes routine internal audit, review and update every 6 months. An external audit is also conducted every year so that Winbond can continue to ensure a safe working environment for employees, control potential risk factors and make continuous improvements.

— Standard Accident Investigation Process —



Analysis of Occupational Injuries and Work-Related Diseases in 2022

— Winbond ESH Policy Analysis and Management Process —



In 2022, the main accident-causing items were 1 case of crushing injury caused by falling objects,1 case of chemical splash injury, and 1 case of personnel fall accident; and there was no accident regarding the contractors; during 2020-2022, there was no death due to occupational disease or occupational disease or work-related disease confirmed by a specialist in occupational medicine.

For Winbond's statistical analysis information on occupational injuries, based on the important disabling injury statistical indicators announced by the Ministry of Labor, the Disabling Injury Frequency Rate (FR) and the Disabling Injury Severity Rate (SR) are selected for analysis. The statistics do not include off-site traffic accidents. In 2022, there were 3 cases of employee disability injuries, the SR was 4, and the FR was 0.43, both were lower than the industry average, but the FR had not yet reached the set goal.

All three accidents in 2022 occurred in the Kaohsiung Fab. The Kaohsiung Fab is a newly built fab completed in 2022, and the safety awareness of its internal employees is still being strengthened. Among them, two accidents occurred during non-working hours. Therefore, in addition to strengthening various operations to prevent reoccurrence, the supervisors of each unit are also asked to convey the importance of safety awareness to the front-line employees through activities such as supervisor inspection and safety observation.

— Work-related Injuries Statistics for Employees —

Year	Total Hours of Work	Occupational Injury			Ratio of deaths due to work-related injuries	Ratio of severe work-related injuries	Ratio of work-related injuries on record
		Number of employees with severe work-related injuries	Number of Fatalities	Number of employees with work-related injuries on record			
2020	5,816,552	0	0	3	0	0	0.52
2021	6,056,008	0	0	0	0	0	0
2022	6,956,696	0	0	3	0	0	0.43

— Work-related Injuries Statistics for Non-Employees —

Year	Total Hours of Work	Occupational Injury			Ratio of deaths due to work-related injuries	Ratio of severe work-related injuries	Ratio of work-related injuries on record
		Number of employees with severe work-related injuries	Number of Fatalities	Number of employees with work-related injuries on record			
2020	880,000	0	0	0	0	0	0
2021	842,000	0	0	0	0	0	0
2022	334,000	0	0	0	0	0	0

In terms of supply chain / value chain impact management, Winbond has established relevant management regulations for contractors. After receiving orders, vendors will provide relevant fab codes of conduct, and monthly communication, counseling, and implementation of education and training with vendors will be conducted through engagement organizations. Last year, a total of 5,971 persons were trained on hazard notification in the fab area, and 1,439 persons were professionally certified for special operations personnel, and the evaluation results of each vendor were calculated through the evaluation method in the contracting procedure, which will be announced in the engagement organizations and relevant safety meetings, providing reference for the responsible unit head of each project to select contractors. When necessary, the chairman or vice-chairman of the Environmental Safety and Health Management Committee of the fab may request the supervisors of relevant units to report in the meeting.

— Analysis and Statistics of Occupational Injury Types in 2022 —

Occupational Injury Type	Item	Number of Cases	Subject	Description of the Incident	Handling Process	Improvement Measures
Occupational Injury	Injury caused by falling objects	1	Employees	The employee placed the tablet on the trolley, and the tablet accidentally fell and injured the employee's right ankle	The employee went to the infirmary to report ankle discomfort, and after receiving medical treatment, the accident was handled according to the reporting procedure in the fab	Strengthen the improvement of the trolley fixing project and carry out the education and training of personnel skills
	Chemical splash injury	1	Employees	When organizing chemicals, due to negligence in the operation, the chemical was sprayed, causing the right ear and left arm to be injured	Rinsed contact area in accordance with emergency response procedure. After simple treatment in the infirmary, the employee was the transferred to the hospital for diagnosis of the affected part, and then the accident was processed according to the reporting procedure in the fab	Carry out education and training of staff operating techniques and strengthen protection promotion of chemicals
	Employee fall accident	1	Employees	When walking on the ground of the construction area, the employee misstepped and fell down accidentally	The employee went to the infirmary to inform the landing on the right side (knee, elbow). After observation of the medical staff, there was no obvious swelling or deformation, and simple medical treatment was done. The employee then went to the hospital for evaluation accompanied by colleagues from the unit, after that, the accident was handled according to the reporting procedure in the fab	In addition to requiring that the existing construction fences be expanded to control the scope, education and training on the concept of personnel safety will be strengthened, and non-construction personnel shall avoid approaching the construction area

Occupational Health and Safety Education and Training and Injury Prevention

Occupational health and safety education and training is conducted by Winbond every year to reduce the incidence of occupational injuries and to strengthen employees' understanding of safety and health regulations; multiple channels have been established for online and physical courses, and employees can also watch relevant training videos through the learning system. The feedback is surveyed through questionnaires, including: satisfaction, the gap in understanding before and after the course, to ensure that the lecturers pass the corporate lecturer certification of the human resources division. According to statistics, in 2022, a total of 13,205 people were trained, and the training hours were 17,931 hours.

For contract management, Winbond requires all 100% vendors to pass the fab entering hazard notification before they can apply for construction permits. To perform high-risk operations, a special operation education and training course shall be taken and the assessment shall be passed to obtain certification before performing the operation.

— Occupational Health and Safety Training Performance —

Gender	Male		Female		Total	
Employees	Number of Participants	Hours of Training	Number of Participants	Hours of Training	Number of Participants	Hours of Training
Management	1,434	1,828	160	201.5	1,594	2,029.5
Non-Management	7,880	10,796.5	3,731	5,105	11,611	15,901.5

— Occupational Nurse Training Performance —

Item	Content	Number of Employees Trained in 2022
CPR and AED Training	Regularly conduct first aid training for all employees and the medical staff of the emergency response team so that there is no time difference in first aid	In response to the epidemic, the employees are divided into groups, and 961 employees completed the training
Advocacy of Unlawful Infringement Prevention in the Workplace- Management Training	Management regulations and relevant education and training were put into place to help all employees understand preventive measures and introduce them to the company's internal complaints and reporting mechanisms. Promotion measures are provided for all employees every year as well	A total of 82 people have completed the management level training course
Crisis Response - Management Training	Advanced courses on crisis response impart correct concepts managers may need to assist in emergencies or at-risk employees (special cases, mental illness, emotional breakdown, suicide risk, employees with pending complaint) in the workplace.	A total of 110 people have completed the management level training course

In terms of occupational health services and worker health promotion, Winbond has nurses in place that are better than the regulations to provide health management and health promotion services. The service targets, including employees and non-employees, can all contact the fab nurse for consultation on health care and emergency medical assistance if necessary. For relevant non-employee workers, employers will also be required to provide relevant safety and health management in accordance with laws and regulations. The relevant health management performance in 2022 is as follows:

— Injury Prevention Management Performance —

Item	Content	2022 Performance
Prevention and Management of Ergonomic Hazards	Caring for employees with musculoskeletal soreness: • Introduce e-questionnaire: Arrange fab employees to fill out questionnaires every 3 years, and arrange interview with occupational medicine specialist for persons with potential risk • Automated process development, employee muscular endurance and other health promotion	• Medical treatment improved 2 employees with suspected potential risk • The injury / disease benefits for occupational musculoskeletal injuries and diseases is 0 for three consecutive years
Preventing and Managing Abnormal Workload-triggered Disorders	• The system automatically reminds supervisors and employees to pay attention to working hours on a daily and monthly basis • Annual questionnaire survey of all employees to conduct risk identification and risk level of employees with abnormal workload	• Winbond arranged interviews with professional doctors to guide 76 employees with potential risk • All employees received a health education e-mail from the nurse, providing expert consultation on stress relief and sleep improvement / referral to the Employee Assistance Program Center (EAPc) according to individuality
Management of Unlawful Infringement Prevention in the Workplace	• Review the company's internal workplaces every year, and evaluate and improve from the two aspects of "physical environment" and "workplace design" • Conduct hazard identification and risk assessment for workplace unlawful infringement prevention every 3 years	• There were no new potential risks, and for the identified risk factors, relevant control and protection measures have already been established • Conducted every 3 years
Maternal Health and Management for Female Employees	• Interviews with medical staff explaining hazard identification, risk assessment, work content confirmation, and postpartum health education during pregnancy • Taking the initiative to provide information about subsidies and allowances	21 pregnant female employees received maternal health protection

— Health Services and Promotion —

Employee health protection service	• Uninterrupted health services: The number of nurses exceeds the number required in the regulations, and the health budget exceeds NT$24 million • First aid: Work with teaching hospitals around the fab area on the green channel • Health examination: Provide additional special check-up items for newcomers' health examination results, and health examination items better than that required by laws and regulations to in-service employees
Employee health improvement	• Professional consultation services: Cooperate with the employee consultation center to provide career and work, family and parent-child, male-female relations, physical and mental stress, legal, finance, workplace management consultation • Winbond employee health website: The infirmary cares for the re-examination of the employees and assists in making appointments with doctors for consultation in the company 100% care completion rate in 2022 • Education and training / health lectures: Plan a series of courses such as stress relief and sleep, high blood pressure prevention, CPR & AED for all, traffic safety and defensive driving promotion and locomotive security inspection activities. In 2022, a total of 15 sessions were held, with 6,686 participants

Employee Health examination

4.4.2 Environmental Safety and Health Risk Assessment

The "ESH Risk Assessment Operating Procedure" was defined by Winbond to ensure the personal safety of employees in the workplace and to minimize risks. The procedure involves the identification of ESH risks and opportunities to the environment, personnel and hygiene from activities, products or services.

Risk level is calculated based on past operational history and the current situation. The potential situation, effect or impact (e.g. personnel injury, environmental impact, production disruption, or financial loss) and probability are assessed. 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.

Internal audit is conducted by Winbond at least once a year along with annual reviews to ensure the effective implementation of the "ESH Risk Assessment Operating Procedure"; any major changes to production processes, facilities and operational content will all trigger a new assessment.

System Assessment and Management

Winbond combines the management system and online system to improve the transparency and availability of relevant statistical data. In 2022, the number of medium and high-risk operations (safety and health risks) was zero. By Winbond's internal proposal system, employees can reflect their needs through multiple channels, such as: hidden dangers and suggestions, to ensure the follow-up of the proposal and the reply of the management unit. In the education and training, it's reminded that if a hazardous situation is found during the operation, the workers can immediately stop the operation and report. The priority is to protect the life safety and health of the workers, and they will not be punished for exercising the right of withdrawal.

In the assessment of class A dangerous workplaces, being better than the general practice, Winbond fully uses the HAZOP method to evaluate the workplace equipment; in the face of abnormal accident conditions, FMEA or 5-Why will also be used to find key risk factors. In addition, Winbond independently develops a chemical management system

for hazard management. After reviewing the safety data sheet and hazard label content provided by the vendor, and confirming whether it is a prohibited and restricted substance in Winbond's commitment, we conduct storage, supply, waste gas / liquid treatment assessment, related risk assessment, and propose countermeasures based on the results. A total of 1,662 chemicals are currently under management.

As for the exposure assessment of hazardous substances, Winbond independently conducts additional environmental monitoring on related allowable concentration, or the internationally established threshold limit value, which is better than the legal requirements. To pass the monitoring, it must be lower than 1/10PEL to meet Winbond's standard, which is also stricter than that in the regulations; and re-monitoring is conducted every six months.

4.4.3 Emergency Response Measures

Winbond has defined emergency response procedures for internal anomalies and external natural disasters such as fire alert/alarm, gas leak alarm, chemical spills, earthquakes, and odors. The procedures are used by internal units as the basis for developing corresponding response processes, response teams, drills and training.

— Occupational Health and Safety Risk Identification and Response Strategies —

Risk Type	Risk identification	Strategy/Action Adopted
Operational Risks	• Fire • Power Outage • Chemical Spill • Abnormal Emissions of Air Pollution/ Wastewater Emissions	• The design of the fire protection system and its installation is based on international standards (NFPA, FM) and domestic fire safety regulations. It includes the fire detection and alarm system, various automatic fire suppression systems, and fire compartmentalization. • Installation of emergency generators and uninterruptible power systems. • Plant facilities and protection are designed and constructed to international industrial standards. Machinery and equipment must also conform to international safety standards (SEMI-S2, FM4910). • 24-hour monitoring system for emissions/ wastewater treatment facilities.
Natural Disaster Risk	• Earthquake • Water Shortage	• Plant buildings are designed to withstand earthquakes up to 7.0. Machinery and equipment incorporate shock-resistant design. • Installation of reserve water tanks.
Regulatory Risk	• Occupational Safety and Health Act • Fire Services Act • Environmental Protection Act	• Regularly carry out compliance inspections. • Identify and respond to the impact of new regulations or amendments • Make regular inspections and reports as required by law.

Emergency Response Team Organizational Structure and Duties

An Emergency Response Team (ERT) is stationed in each area throughout the sites. The ERT is commanded by a division or higher level manager. ERT team members are required to undergo regular training and drills. In the event of an emergency, the mission of the ERT is to minimize casualties, financial losses and disruption to production.

Commander — Coordination of emergency response (command and dispatch)

Deputy commander
- Collection ot tactory attairs intormation and liaising
- DiscUssIOn of action plans and logistics resupplys

Company Spokesperson
Internal and external communic ations

Equipment Support Team
Dispatching and replenishing protective equipment and materials

Factory Affairs
- Affairs Assist with emergency rescue and environmental monitoring at the scenes
- Provision incident informations
- Monitoring of fire alarms, toxic gas spills and other incidents

Control Team
- Evacuation and counting of personnel, and access control
- Guiding support units and traffic control
- Situation records and liaison

Medical Team
- First-aid and arranging of medical evacuation
- Transportation of first-aid equipment and record-keeping

Rescue Team
- Search for source of leakage
- Leak/disaster prevention
- On-site decontamination
- Environmental monitoring
- Site management/cordon
- Assist personnel with gearing up or gear removal, equipment transport and record-keeping

Long-Term Preventive Emergency Measures

Winbond deliberates in safety-related meetings at all levels (such as monthly safety meetings in the fab and quarterly safety and health committee meetings), and also conducts relevant tracking through the company's internal ESH management electronic system to ensure that relevant corrective and preventive measures can be 100% achieved. In 2022, there were 19 false alarm accidents. At the monthly safety meeting, Winbond provides prizes to those who actively report as a reward for reporting false alarm accidents.

A total of 157 emergency drills were conducted by Winbond for fire, chemicals leaks, gas leaks, massive water leaks, and other events in 2022. In addition to the relevant drills organized by employees and non-employees within the fab area, we also cooperated with the joint response team of the Science Park, and worked with the park bureau to expand the joint defense drill to surrounding factories and residents.

— 2022 Emergency Response Drills —

4.5 Social Impact

Winbond has been involved in charity for many years. “Care for the disadvantaged, care about environmental sustainability, and fulfill corporate social responsibility” are Winbond’s permanent commitments on corporate social responsibility. To put the beliefs in social care, public service and friendly environment in actions, Winbond gathers internal resources and our employees with their passion and love, focusing on areas such as “caring for youth and children”, “supporting the disadvantaged”, “academic cooperation”, and “promotion of charity and environmental education”. In the meantime, Winbond leverages core competencies of the industry, promoting digital work and constructing a field for scientific and technological innovation exchanges with concrete actions, to stimulate industrial development.

— Social Impact in 2022 —

Type	Amount Invested in 2022(Unit: NTD)	Ratio of Total Investment
Care for youths and children	4,658,000	26.86%
Supporting the disadvantaged	115,000	0.66%
Academic sponsorship	11,210,000	64.65%
Promotion of charity and environmental education	1,357,211	7.83%
Total	17,340,211	100.00%

Note For the social impact in 2022, the investment amount included the amount of community investment, the amount of employee donations, and other project expenses disclosed in the company’s consolidated statements.

— Ratio of Total Investment —

Academic Cooperation

Research and development sponsorship for industry upgrading

Through long-term support for International Symposium on VLSI-TSA and VLSI-DAT, Winbond can accelerate the upgrade of Taiwan’s information and communications industry and increase the exchange of industrial technologies domestically and abroad. We assist in promoting the exchange platform of leading-edge technologies for researchers related to semiconductor technology and design to enhance Taiwan’s semiconductor technology.

Care for Youths and Children

Happy Breakfast Program for School Children in Rural Areas

To help improve the breakfast of school children in rural areas, since 2011, senior management has been making voluntary donations through a non-profit organization to fund the happy breakfast program for rural elementary schools in Hsinchu and Taichung. By breakfasts and support for rural schools, sustaining the basic needs and health of school children, so they can be physically and mentally equipped to explore the world. Winbond provided NT$530,000 in breakfast funding in 2022 to continue supporting healthy learning for school children. At the same time, our employees also conducted on-site visits to understand the benefits of the program for further evaluation and enhancement.

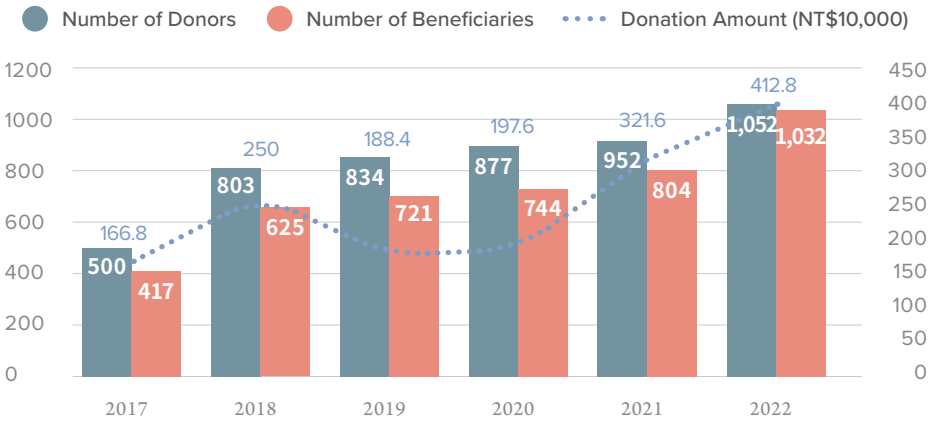
Happy Breakfast Program for School Children in Rural Areas

Supporting the Disadvantaged

Fundraising for Impoverished Students Education Financial Aid

To supplement education resources for children from impoverished families and help them to attend school on a regular basis, Winbond has been working with Taiwan Fund for Children and Families since 2017 by inviting employees to raise education financial aid. From the president to entry-level employees, our colleagues responded enthusiastically and 1,052 employees raised $4,128,000 in 2022, supporting 1,032 elementary school students for a whole year.

— Result of Fundraising for Impoverished Students Education Financial Aid —



Fundraising for Impoverished Students Education Financial Aid

Promotion of Charity and Education Protection

2022 Southern Taiwan Science Park Charity Picnic

Winbond set up a booth at the “2022 Southern Taiwan Science Park Charity Picnic” for a charity sale, and the proceeds of NT$15,000 were all donated to charity. In addition, another NT$100,000 was donated to the Tainan City Government Bureau of Social Affairs to improve the basic life and learning quality of disadvantaged families around the Southern Taiwan Science Park, giving priority to assisting disadvantaged families in Sinshih, Shanhua, and Anding Districts where the Southern Taiwan Science Park is located, and Luzhu, Gangshan, and Yong-An Districts where Kaohsiung Science Park is located. A total of nearly 3,500 persons and nearly 1,000 disadvantaged families have received assistance.

2022 Southern Taiwan Science Park Charity Picnic

Sponsoring Houfeng Bikeway

Winbond joined the ranks of sponsoring public recreational facilities in 2022, and worked with the Tourism and Travel Bureau, Taichung City Government in the Houfeng Bikeway enterprise sponsorship. Winbond is responsible for regular road cleaning, tree thinning, etc. President Pei-Ming Chen of Winbond led more than 500 employees and their families to participate on-site to maintain the appearance and safety of the Houfeng Bikeway, working together to keep the cleanliness of public recreational facilities in Taichung City and improve the quality of recreation, fulfilling corporate social responsibility and the spirit of common good with the local environment.

Volunteering at Houfeng Bikeway

Adoption ceremony of Houfeng Bikeway

Guard Fazi River: Do Sports for Charity, Stay Healthy for the Earth

Let our energy drive vitality! In 2022, Winbond invited employees to participate in the "Do Sports for Charity, Stay Healthy for the Earth" activity. The total number of calories consumed and accumulated by Winbond employees in their daily exercise was 2,422,660 kcal, converted to NT$605,655. In 2023, the amount was donated to sponsor the "The Society of Wilderness" to organize activities for Fazi River protection and environmental conservation. Winbond continues working with the The Society of Wilderness, and the future donations will be used in environmental education actions such as know the environment, bird surveys, and river cleanup, calling on employees and their families to protect the rich ecology of Fazi River and feel the beauty, and encouraging employees to exercise to become healthy while experiencing the beauty and power of life.

— Fit for Nature —

Calories accumulated by Winbond colleagues in daily exercise → Converted donation amount → River protection and environmental conservation

Fa-Zi River Cleaning Activity

Fazi River Facebook Fanpage

Emergency Aid

Emergency Care for Employees:

Winbond has set up employee emergency aid and loan programs to help employees in financial distress when the employee or his/her family suffers sudden calamity, such as injury, disability, death, or accident, to make sure they can continue to work and live with assurance that their livelihood is secure.

Blood Donation Activity

Winbond also calls employees to donate blood in the annual blood drive which illustrates the Winbond's belief in the value of life in actions. In 2022, 5 blood donation events were held, attracting a total of 219 participants, donating 362 bags of blood.

5.1 Corporate Governance
5.2 Business Integrity
5.3 Productivity and Business Performance
5.4 Risk Management
5.5 Green Investment
5.6 Sustainability-Linked Loan
5.7 Climate Change Management

5. Corporate Governance

"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 corporate governance evaluation. Winbond will continue to embrace the corporate culture founded on business integrity to establish our trustworthy and reputable company reputation.

2022 Performance Highlights

- Publish the first independent **TCFD report**
- Renewable energy investment **NT$555 million**
- The carbon emissions generated on Family Day were retired through the **purchase of blue carbon credits**
- Signed a **NT$ 20 billion** sustainability-linked loan, and maintained sustainable performance such as carbon reduction, power saving and corporate governance
- **100%** coverage of integrity and ethics education and training
- Winbond invested in the world's largest blue carbon project, and obtained **1,000** tons of CO_2e blue carbon credits

5.1 Corporate Governance

5.1.1 Board Operation

Board of Directors

For the operation of Winbond's Board of Directors, the power and authority are exercised in accordance with relevant laws and regulations and the resolutions of the shareholders' meeting. The directors create the maximum benefit for shareholders in line with the principle of sustainable operation. Winbond has established "Conflict of Interest Reporting and Recusal Instruction", "Insider Trading Prevention Procedure", "Instruction for Personal Finance Reporting by Employees at Specific Positions and Business Related Personnel and Suppliers", "Rules for Receiving or Providing Gifts and Entertainment", "Technical and Classified Data Management Instruction", "Anti-Trust Code of Conduct", etc. to prevent unethical behaviors. Winbond also has established "Ethical Management Violation Handling Instruction", which describes explicitly the methods and channels for filing a complaint, and vigorously promotes and implements the Instruction, which has been regularly reviewed and revised, while meting out disciplinary action against violators.

— Board Composition —

Composition of Board of Directors	The 12th Board of Directors consists of 11 directors, including 4 independent directors and 2 female directors. Directors who do not hold managerial positions of the Winbond and its subsidiaries make up more than two-thirds of board members. There are 3 persons having a spousal relationship or a familial relationship within the second degree of kinship with the directors, which is less than half of the board members and is in compliance with Article 26-3 of the Securities and Exchange Act. Winbond's Chairman serving concurrently as CEO is to lead the management team to effectively implement the decisions of the Board of Directors. In response to the aforementioned circumstances, the number of independent directors on the Winbond Board of Directors has been increased from three to four, and more than half of the Board of Directors is not held by the company's managers.
Major Shareholders	Institutional directors Walsin Lihwa Corporation and Chin-Xin Investment Co., Ltd are major shareholders of the Winbond. Among them, Walsin Lihwa Corporation is a founder of the Winbond, also the largest shareholder and a director since Winbond's inception
2022 Board Attendance	In 2022, 7 meetings of the Board of Directors were convened, with an average attendance rate of 100%. Including actual attendance (99%) and proxy attendance (1%) According to the material topics in 2022, the total number of key major events communicated with the highest governance unit was 16 (business integrity, R&D innovation, productivity and business performance, energy and greenhouse gas, sustainable development and other topics).
Election of the Directors	• The composition of the Board of Directors is independent and diverse. The nomination of directors follows a rigorous selection process, adopting a candidate nomination system and voting at the shareholders' meeting. Shareholders fully exercise their election rights. • The members of the Board of Directors all have rich experience in industry management. Their knowledge and professional experience cover different fields; being cross-generational and recruiting elites from different fields to uphold the goals of innovation and diversification • Wide age distribution • More than half of the independent directors serve no more than 3 consecutive terms • Participation of female directors For more information about the members of the Winbond Board of Directors, please scan the QRCODE

Note For Board and Committee proposals that involved the interests of the directors themselves, the directors had explained the reasons for recusal at the meeting and refrained from discussing and voting on such proposals to ensure the avoidance and mitigation of conflicts of interest. For relevant information, please refer to pages 21 and 24 of Winbond's 2022 Annual Report.

— 12th Members of the board (term 2020/6~2023/5) —

Title	Name	Gender	Age distribution	Individual director background					Diversified fields			Independent director Ratio	Proportion of directors concurrently serving as managers of the parent company or subsidiaries
				Business management	Leadership and decision making	Knowledge of the industry	Finance and accounting	IT	Environment	Economy	People		
Chairman	Arthur Yu-Cheng Chiao	Male	60-70	●	●	●	●	●	▲	▲	▲	36%	27%
Vice Chairman	Tung-Yi Chan	Male	60-70	●	●	●		●	▲	▲	▲		
Director	Yung Chin	Female	60-70	●	●	●	●	●	▲	▲	▲		
Independent Director	Allen Hsu	Male	60-70	●	●	●	●			▲	▲		
Independent Director	Stephen T. Tso	Male	70-80	●	●	●		●	▲		▲		
Independent Director	Francis Tsai	Male	70-80	●	●	●	●	●		▲	▲		
Independent Director	Jerry Hsu	Male	40-50	●	●	●	●			▲	▲		
Director	Walsin Lihwa Corporation (Representative:Fred Pan)	Male	60-70	●	●	●	●		▲	▲	▲		
Director	Chin-Xin Investment Co., Ltd (Representative:Yuan-Mou Su)	Male	60-70	●	●	●	●	●	▲	▲	▲		
Director	Jamie Lin	Male	40-50	●	●	●	●	●		▲	▲		
Director	Wei-Hsin Ma	Female	50-60	●	●	●	●	●	▲	▲	▲		

Professional Excellence of Directors

The 11 directors all have extensive business operations experience. The ages of board members cover different generations, and their professional background covers different industries. All board members possess the ability to perform their duties, supervise, and give constructive feedback and strategies. The directors take classes outside themselves or participate in multi-faceted training courses organized by Winbond. Training hours for director education and training and environmental sustainability related courses (carbon credit, climate change, sustainable finance) were 24.5 hours and for courses related to corporate governance (corporate governance, risk management) were 9 hours. The total training hours from 2021 to the end of 2022 were 49.5 hours. In 2022, the directors obtained a certificate of study with an average of 10.41 hours.

— Directors' Remuneration and Evaluation of Board Performance —

01

The Remuneration Committee reviews the performance evaluation system for the Board of Directors on a regular basis

Winbond established the "Rules for Remuneration of Directors and Performance Assessment of the Board of Directors"

02

A self-evaluation is conducted by the directors in December every year. It is submitted to the Remuneration Committee and the Board of Directors

A self-evaluation is conducted on the performance of the Board as a whole, the performance of individual Board members, and the performance of the Functional Committees. Relevant results of the evaluation were submitted to the Remuneration Committee and the Board of Directors

03

A performance evaluation of the Board of Directors is conducted by an external professional institution once every 3 years

In May 2022, an external organization "Taiwan Corporate Governance Association" was authorized to conduct the performance evaluation of the Board of Directors

04

Result of the Board of Directors performance evaluation is taken into consideration when nominating directors

On December 14, 2022, the Board of Directors reported the external evaluation results and Winbond's improvement plan

The results of the 2022 evaluation were submitted to the Remuneration Committee and the Board of Directors on March 14, 2023.

- **2022 self-evaluation results of the overall performance of the Board of Directors:**
  The scores of the "election and continuing education of the directors" had dropped significantly compared to that in 2021
- **Strengthening in 2023 is aimed at:**
  Continued provision of multi-faceted development courses

Note Information on performance evaluation of directors: Please see the 2022 external evaluation results of Winbond's Board performance

5.1.2 Operations and Main Duties of the Functional Committees

In order to improve the supervision function of the Board of Directors and strengthen the management function, the Winbond's Board of Directors has set up an Audit Committee, a Remuneration Committee, a Risk Management Committee and a ESG Committee. Each Functional Committee is responsible to the Board of Directors and submits proposals to the Board of Directors for resolution.

— Remuneration Committee —

- **Composed of 4 independent directors, the convener is Mr. Stephen T. Tso**
- **In 2022, 4 meetings of the Remuneration Committee were convened, with an actual attendance rate of 100%.**

Responsibilities: Responsible for setting and reviewing the performance evaluation and remuneration policy, system, standard, and structure as well as individual compensation for Winbond directors and managers. The "Rules for Remuneration of Directors and Performance Assessment of the Board of Directors" and "Guidelines for Managers' Remuneration and Performance Evaluation Management" were also drawn up to maximize the long-term effectiveness of the Board and to ensure a close linkage between the managers' compensation and the company's sustainability performance (economic, environmental, social)

Note Winbond established the"Rules for Remuneration of Directors and Performance Assessment of the Board of Directors", which specifies the basis for directors' remuneration, and submits it to the Remuneration Committee every year for review to see if adjustments are required. Both the Audit Committee and the Remuneration Committee of Winbond is composed of all independent directors and are independent. Winbond does not have a remuneration clawback mechanism. For information on the remuneration of directors, President and Vice President, please refer to page 17 ~ page 19 of Winbond's 2022 Annual Report.

— Audit Committee —

- **Composed of 4 independent directors, the convener is Mr. Allen Hsu**
- **In 2022, 7 meetings of the Audit Committee were convened, with an average attendance rate of 100%. Including actual attendance (96%) and proxy attendance (4%)**

Responsibilities: Supervises the fair presentation of the company's financial statements, appointment (dismissal) of the CPA as well as the CPA's independence and performance, and assists the Board of Directors in performing supervisory duties such as: Control of compliance with relevant laws and regulations and existing or potential risks by the company

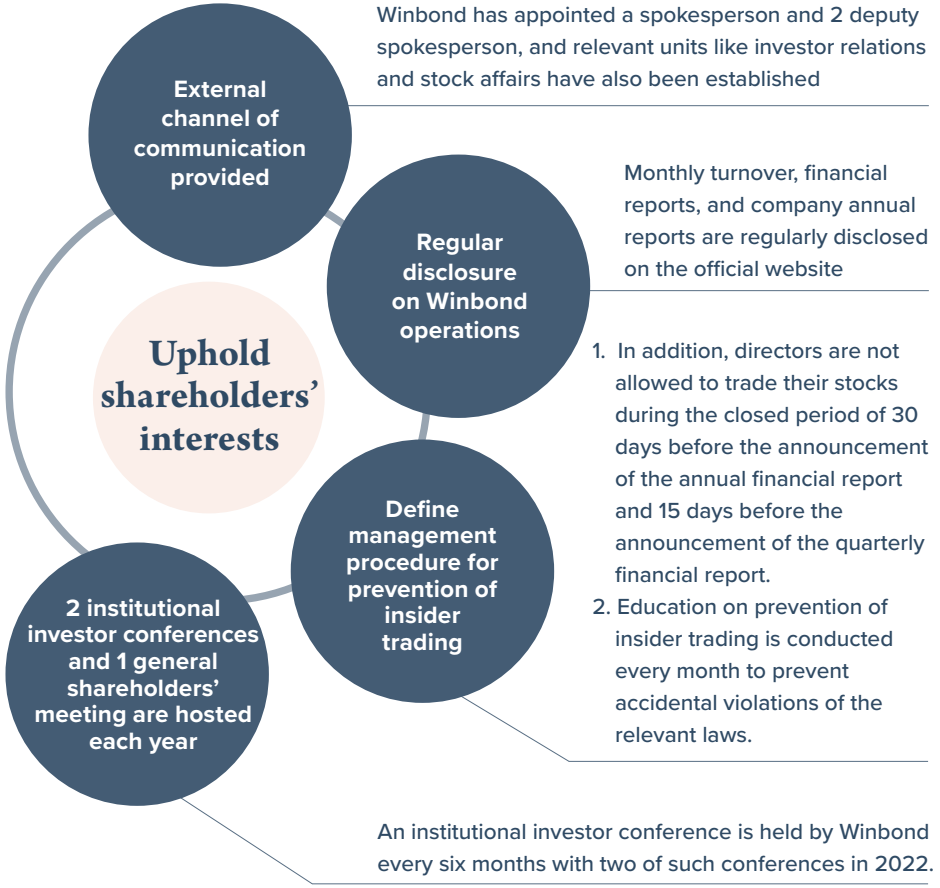
— ESG Committee —

- **The committee consists of three directors, the President and five to seven senior executives of relevant departments, convened by the Chairman himself**
- **In 2022, 1 meeting of ESG Committee was convened, with an attendance rate of 100%.**

Established the ESG office and five task forces, including Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance, regularly report to the Board of Directors every year (fourth quarter) on the implementation results of ESG Committee, thereby ensuring the promotion and implementation of works related to corporate sustainability. Regular meetings of ESG Committee are held every quarter, and the promotion centers governed by it report the implementation progress (results) of the current year and submit the implementation plan for the next year.

5.1.3 Shareholder Relations and Rights

To maintain shareholder relations and rights, Winbond mainly manages through the following four measures to ensure that the communication process with shareholders is smooth and in line with due process, the information is open and transparent, and the active and positive interaction between the company and shareholders is effectively maintained:



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

5.1.4 Internal Controls and Audits

Winbond's internal audit unit is directly under the Board of Directors. The appointment and dismissal of the audit chief shall be approved by the Audit Committee and the Board of Directors. In addition to reviewing and verifying the self-evaluation results of the internal control system for each unit and subsidiary, the internal audit unit also evaluates the control operations of various operating activities of Winbond's internal control system to measure the effectiveness and compliance of the existing internal control and its impact. The frequency and content of each periodic audit are determined according to the laws and regulations as well as the risk assessment; other important procedures or special cases may be audited by the auditing personnel at any time or irregularly.

The audit unit conducts audits according to the annual audit plan approved by the Board of Directors to determine the effectiveness of the internal control system's design and implementation. Audit findings are followed up until corrective actions have been completed to ensure the appropriate measures were taken by the relevant units timely. The audit chief reports to the independent director (convener of the Audit Committee) monthly after the completion of audit reports and the follow-up reports and delivers them to the independent directors for examination before the end of next month following the completion of the audit. The audit chief reports to the Board of Directors and Audit Committee quarterly. 2022 audit plan has been implemented in accordance with regulations, and audit results and follow-up improvements have been reported to the Audit Committee and the Board of Directors.

Illegal Business Activities Reporting Mechanism and Procedures

Winbond has established a complaint channel for stakeholders. The internal and external individuals may report to this channel anonymously or non-anonymously if employees engage in illegal activities, such as unfair business practices, bribery or earning illegal profits, fraud, and coercion. Reported cases are directly accepted by the audit unit of the Winbond and sent to the Audit Committee at the same time. The handling process is in accordance with the "Ethical Management Violation Handling Guidelines".

5.1.5 Tax Management

A unit responsible for tax governance has been established by Winbond to handle all tax reporting under the local tax laws and regulations. We also support government policies on business innovation, research and development, and tax credits by following the government's special law on the repatriated offshore funds and use the funds for investment in the Kaohsiung Fab so as to increase the investment in Taiwan.

Winbond is committed to improving the transparency of tax information within the group. In order to stay in line with the global anti-tax avoidance trend, we actively update relevant tax knowledge and retain and consult external professional tax consultants to ensure proper compliance with tax regulations and reporting obligations.

Six Principles of Taxation Policy

1. **Comply with local tax laws, report tax returns honestly, pay taxes on time, and fulfill our social responsibilities as taxpayers.**
2. **Local and international tax reforms are thoroughly assessed to determine the impact and develop a swift response.**
3. **Tax information is regularly disclosed in the financial statements and annual report to ensure information transparency.**
4. **Transactions between affiliated enterprises are based on the Arm's Length Principle, comply with the internationally accepted Transfer Pricing Guidelines defined by the Organization for Economic Cooperation and Development (OECD).**
5. **Winbond has built a relationship based on mutual trust and honest communications with the tax authorities.**
6. **All material transactions and decisions made by the company take the effect of tax and leases into account.**

5.2 Business Integrity

"Business integrity" is Winbond's highest ethical standard. The human resources unit is responsible for the establishment and development of the corporate culture of business integrity, and making colleagues familiar with the content of business integrity through the formulation of regulations, continuous improvement, supervision and control, and education and training; regulations are also formulated, such as "Corporate Governance Best Practice Principles," "Ethical Corporate Management Best Practice Principles," "Sustainability Development Best Practice Principles," "Corporate Social Responsibility Manual," "Code of Ethics for Directors" and "Employee Code of Conduct," 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 in the fourth quarter of 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.

2022 Business Integrity Management Performance

- In 2022, the online course "Promotion of Ethics for Employees" was hosted, covering "business integrity" (insider trading prevention, fair trading, advertising and competition, identity protection, preventing retaliation, etc.) and labor rights, which was promoted to bases around the world. A total of 3,824 global employees have been trained, with a total of 1,530 hours. All directors and employees have completed the training.
- There were no economic or environmental violations at Winbond, nor were there any cases of corruption, anti-competitive behavior, or violations related to marketing and labeling.
- No complaints on violation of business integrity were submitted through the complaint channel in 2022.

5.3 Productivity and Business Performance

In 2022, Winbond's consolidated revenue amounted to NT$94.53 billion, a slight decrease of 5% from 2021; our consolidated net earnings after tax reached NT$15 billion, and our after-tax EPS was NT$3.25. We paid a consolidated income tax of NT$4.03 billion, which accounted for 4.26% of our total revenue. For explanation and analysis of other categories of financial performance, please refer to Winbond's 2022 Annual Report.

— 2022 consolidated financial performance (Unit: NT$ million) **—**

Item	2020	2021	2022
Election of the Directors	60,683	99,570	94,530
Non-operating revenue (expense)	185	(205)	1,512
Direct economic value [A]	60,868	99,365	96,042
Operating cost	43,643	57,089	51,479
Employee remuneration and benefit expenses (personnel expenses)	10,600	17,325	19,706
Payments to investors	788	1,175	4,482
Payments to the government	123	274	3,799
Community investment	10	6	7
Direct economic value distributed [B]	55,164	75,869	79,473
Residual economic value [A-B]	5,704	23,496	16,569
Net profit before tax	1,812	18,223	18,046
Net profit	1,519	15,000	14,987
Earnings (loss) per share (NT$)	0.33	3.42	3.25

— 2022 Market Distribution —

	Asia	Europe	America	Other
Sales ratio (100%)	90.1%	3.8%	5.7%	0.4%

— Product categories and revenue ratios of their applications in 2022 —

	Dynamic random access memory (DRAM) products	Flash memory products	Logic products	Other
Sales ratio (100%)	23.20%	31.59%	44.05%	1.16%

Note Total wafer production was 2.1 (thousand pcs), while total die production was 3,397,345 (thousand pcs)
Note For Winbond's financial performance and sales volume in 2022, please refer to our 2022 Annual Report.

Investing in Taiwan

Winbond's headquarters and the first fab were established in the Central Taiwan Science Park. Echoing the programs for investing in Taiwan, in 2020, we applied for the "Action Plan for Welcoming Overseas Taiwanese Businesses to Return to Invest in Taiwan" for the first time to increase investment in the Central Taiwan Science Park (CTSP) Fab to expand production capacity and upgrade technology, implement intelligent automation equipment and provide high value-added products. Construction of Winbond's second fab was completed in the Kaohsiung Science Park in 2022. In March 2023, Winbond was granted the second approval of the "Action Plan for Welcoming Overseas Taiwanese Businesses to Return to Invest in Taiwan", which was binding to the syndicated loan contract signed in April 2023. The funds will be used to expand the production capacity of the Kaohsiung Fab and the CTSP Fab, upgrade advanced manufacturing process, purchase advanced equipment and develop our own innovative technologies to cope with the long-term growth trend of the memory industry. The Kaohsiung Fab will continue to recruit employees and encourage local talents born in southern Taiwan to return to their hometown to work. In addition to gathering semiconductor supply chain in the Kaohsiung area, we will further implement the concept of investing in Taiwan.

5.4 Risk Management

Winbond belongs to the semiconductor manufacturing industry. Natural disasters, accidents, man-made accidents, changes in international political and economic situations, the introduction of new technologies in the industry, and changes in policies and regulations, etc., may all cause serious impacts on our operations and finances. Therefore, Winbond has set up a Risk Management Committee under the Board of Directors, and organizes existing departments or risk responsible units to carry out risk management on the areas of operation they are responsible for. In addition to formulating sound internal management regulations and operating procedures, Winbond actively manages the three types of risks faced by contemporary enterprises: “operation”, “finance” and “information”, develops a comprehensive plan and process for pre-assessment, risk avoidance, loss prevention and crisis management, and regularly reports to the management and governance units to ensure that all corporate risk control goals are achieved.

Winbond has included climate change risk into the long-term operation and management of the enterprise, and in order to understand its impact on the environment and operations, since 2021, Winbond has adopted the Task Force on Climate-Related Financial Disclosures’ (TFCD) framework, and based on the observation on international regulatory trends and market outlook, every year, we regularly identify and disclose the financial impacts of climate-related risks and opportunities (both quantitative and qualitative), providing comments on the situation as well as proposing a management strategy. Winbond will continue to monitor the impact of risks brought by the climate, strengthen the company’s operational capabilities, promote various carbon reduction plans, improve energy efficiency, and steadily move towards sustainable development.

Risk identification >

Combined with the annual operating plans and goals of each unit, provide material risk items and measurement methods and suggested risk appetite, and obtain the approval of the responsible supervisor with the same year’s budget.

Risk analysis >

Calculate risk value of the identified material risks. In addition to the annual estimate, the risk value shall be revised quarterly, and those with significant changes shall be submitted for approval along with the quarterly report.

Risk assessment >

Each unit shall evaluate the material risk items according to the appropriate operating frequency, compare them with the approved risk appetite at all times, and report to the management unit.

Risk response >

When the actual situation exceeds the approved risk appetite, each unit shall immediately put forward a risk response proposal, and respond after obtaining approval in accordance with the risk management policy and procedure and the guidelines for responsibility hierarchy.

Supervision and review

In accordance with the risk management policy and procedure, include relevant risk management regulations in the follow-up items of the audit system, so as to facilitate the setting of control points, self-assessment operations and audit operations.

— Business Management Risk Analysis Table —

	Items for risk and opportunity identification	Description of impact assessment	Response measures	Performance management
I. Operational risk management	**Abnormalities in product quality**	Loss of customer trust and cancellation of product orders	When a product or manufacturing process fails to meet the requirements, employees responsible for corrective measures must be immediately notified to make sure that the defective product will not be shipped out to customers. Any products that may potentially be defective must be checked for defects and isolated. The responsible units shall analyze the cause of the defects and their adverse impact on the manufacturing process, as well as implement improvement measures	During the manufacturing process, products are subject to strict quality controls to improve product quality, which also helps us maintain long-term working relationships with our customers and improve customer satisfaction

	Items for risk and opportunity identification	Description of impact assessment	Response measures	Performance management
I. Operational risk management	**Rights Violations**	Serious rights violations may constitute illegal behavior, and lead to the Winbond's management taking on civil or criminal liability. In less serious cases, violations may lead to financial or goodwill losses for the Winbond	· Proactive Prevention When conducting product design and development, the RD department will closely work together with the intellectual property rights department to conduct relevant search, analysis and research on intellectual property rights. If necessary, it will obtain legal authorization or adopt methods such as design around, and strive to avoid infringement of intellectual property rights · Effectively resolve violations after they happen: Upon alleged infringement in rare cases, the legal department will immediately clarify the facts with relevant units and actively protect the rights and interests of the company and customers	From 2016 onwards, Winbond has avoided becoming involved in any litigation or disputes over violations of intellectual property rights (prior to 2016, Winbond has been involved in an extremely few number of litigation cases, which have all been resolved without major adverse impact on Winbond)
	Patent Risk	Unsuccessful patent licensing negotiations increase the risk of patent litigation.	We proactively consult external lawyers to discuss and establish response measures to any potential events where a rights-holder asks for unreasonably high patent licensing fees or files a patent lawsuit against the Winbond, regardless if these actions are to protect intellectual property rights, purely based on business interests, or for any other unknown reason.	Acting under the principle of looking for a win-win resolution, and by showing mutual respect and taking reasonable actions when interacting with the rights-holder, Winbond has effectively managed patent risk, and there has not been any patent risk incidents which have adversely impacted the Winbond.
	Geopolitical risk	Under the co-opetition of world powers, policy and regulatory measures such as relevant restrictions or tariffs may have an impact on revenue.	Gradually construct local marketing talents to get closer to the market and provide customers with more timely services.	Due to strategic adjustments such as marketing, we are able to respond to changes in the division and reorganization of the global industrial chain in a timely manner
	Export control	The rapid changes in the export of high-tech technologies and entity lists in various countries may affect shipments.	Establish an Internal Compliance Program (ICP) that incorporates the entity list, Export Control Classification Number (ECCN) and red alert management procedures for abnormal transactions	Incorporated relevant management regulations of the Taiwan Bureau of Foreign Trade and the US Bureau of Industry and Security (BIS) into the Internal Compliance Program to improve the overall delivery speed and management quality
	Pandemic Risk	The pandemic can lead to employee health impacts, or cause losses through interruptions to business operations.	· Implement pandemic prevention management regulations, such as practicing separate warehouses and different working shifts or work from home according to changes in the pandemic situation, maintaining indoor air circulation and regularly cleaning and disinfecting the environment · Regular / irregular pandemic prevention meetings are chaired by senior executives, and rolling reviews are conducted on pandemic prevention management measures	In 2022, the pandemic has not impacted employee health, or caused losses through interruptions to business operations
II. Financial Risk Management	**Exchange Rate Risk**	The Winbond's foreign exchange gains and losses are mainly incurred from the foreign currency derived from import and export business operations, as well as the derivative financial products which are used to hedge against the exchange rate risk incurred from this foreign currency.	· Transactions in derivative financial products are carried out with the purpose of hedging against the operational risks brought about by the Winbond's business operations, and derivative financial products have been chosen with this main goal in mind. Additionally, trading counterparties have been selected for their credit-worthiness, in order to avoid situations where counterparties are unable to fulfill contract obligations, leading to losses for the Winbond. In addition, low credit risk financial institutions with good relationships with the Winbond and the ability to provide the Winbond with professional information will be chosen as trading counterparties. · The Winbond keeps abreast of financial market information, predicts market	In 2022, risks from exchange rate changes and foreign exchange gains and losses remained within a controllable range

	Items for risk and opportunity identification	Description of impact assessment	Response measures	Performance management
II. Financial Risk Management			trends, familiarizes itself with financial products and related regulations and trading techniques, and provides complete and timely information to Winbond management and relevant Winbond departments for reference. ・The Winbond sets the limit of unrealized loss on all financial derivatives contracts to 20% of the contract value or 3% of stockholders' equity, whichever is lower. The Winbond's finance unit evaluates the Winbond's position on financial derivatives twice every month, and produces a report based on this evaluation which is submitted for review to the head of finance and senior management authorized by the Board of Directors, with hopes to predict the risk and potential losses from each transaction.	
	Interest Rate Risk	Mainly arises from long-term borrowings with floating exchange rates, which have been made to meet operational needs such as manufacturing process upgrades or capacity expansions.	Strive to obtain favorable interest rate conditions based on the current market situation, in order to reduce the impact of interest rate fluctuations. Winbond issues New Taiwan Dollar-denominated corporate bonds at fixed interest rates, which are accounted at amortized cost and will therefore not affect cash flows or fair value during interest rate fluctuations.	・In 2022, the Winbond's consolidated interest income was NT$154,580 thousand, and the consolidated interest expenses were NT$94,874 thousand ・Winbond shall closely monitor the effect of interest rate trends on cash flow in order to evaluate whether the impact of interest rate changes on the Winbond's operations remain within a controllable range
III. Information Risk Management	**Information Security**	Threat detection, monitoring and early warning	Improve information security awareness: ・Monthly issuance of information security advocacy ・Quarterly information security education and training (social engineering training) ・Annual personal data protection education and training ・Information security current affairs or major event advocacy from time to time	・In 2022, the implementation rate of social engineering education and training courses reached more than 97%, and those who have not completed the training will be denied access to the Internet. ・A total of 7 information security advocacy were issued
			Information security monitoring and abnormal event notification handling: ・Provision of weekly monitoring records and analysis reports ・Conduct weekly information security monitoring meeting to discuss, review incidents and take countermeasures	・Strengthened the notification mechanism, automated the anti-virus notification and abnormal logins to cloud services, directly notifying the parties concerned to handle to speed up the processing time ・No major information security incidents and impacts in 2022
			Weakness and vulnerability management: ・The on-premises host performs vulnerability scanning operations on a quarterly basis, and regularly schedules downtime operations every month for major Microsoft update patching ・For external services, monitor risk with SSC cloud scanning tool	・Material risk vulnerabilities of the on-premises host have been patched as scheduled ・The average total score of the SSC cloud monitoring platform is > 90 points (level A); a total of 69 risks were patched, 30 of which were high / material risks

	Items for risk and opportunity identification	Description of impact assessment	Response measures	Performance management
III. Information Risk Management	Information Security	Threat detection, monitoring and early warning	Identity access control: ・Cloud services use conditional access and multi-factor authentication. And only compliant devices and specific programs are allowed ・Remote connection uses identity recognition + multi-factor authentication + device whitelist, only when the conditions are met can the connection be made	For cloud login and remote access information daily reports, device unregistered and attempted logins were analyzed and investigated, and there were no material / high-risk events in 2022
			Code security: ・The application department will perform code security checks during program development and will patch the high-risk codes to improve program security when launched	A total of 7 new systems were launched in 2022, the high-risk code correction and improvement rate was 100%, and the program coverage rate of source code scanning was 100%
			Mail security: ・Enhanced mail server security settings; DKIM settings can prevent emails from being forged and tampered with and DMARC settings can identify unauthorized domains	All emails must be verified by legitimate email servers, and the success rate of external delivery is 100%

5.5 Green Investment

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 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

In 2022, Winbond carried out a comprehensive renewable energy usage plan for the future electricity consumption of the enterprise itself, and had an in-depth understanding of the status of various types of renewable energy industries and whether they could be applied to Winbond's electricity usage. In addition, in May 2022, Winbond invested in solar energy fields to slow down the occurrence of climate change with practical actions.

5.5.1 Investment in Green Energy

In May 2022, Winbond acquired a 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, Taiwan Cement Corporation, 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.

5.5.2 Obtaining the Carbon Credit of the World's Largest Blue Carbon Project

In response to the international trend of carbon neutrality and the goal of net zero in 2050, Winbond obtained carbon credit from the Pakistan Mangrove Restoration Project in November 2022. This mangrove restoration project is a Delta Blue Carbon - 1 project, the largest blue carbon project in the world.

The Delta Blue Carbon - 1 project (DBC-1) is a reforestation and restoration project of mangroves and wetlands in the Indus Delta region of Pakistan. The project covers an area of 350,000 hectares and is expected to reduce carbon emissions by more than 142 million tons of carbon dioxide equivalent during the 60-year project period from 2015 to 2075.

The Indus Delta consists of a richly landscaped system of channels, low-lying islands, intertidal zones and mangroves. The mangroves here are the largest arid climate

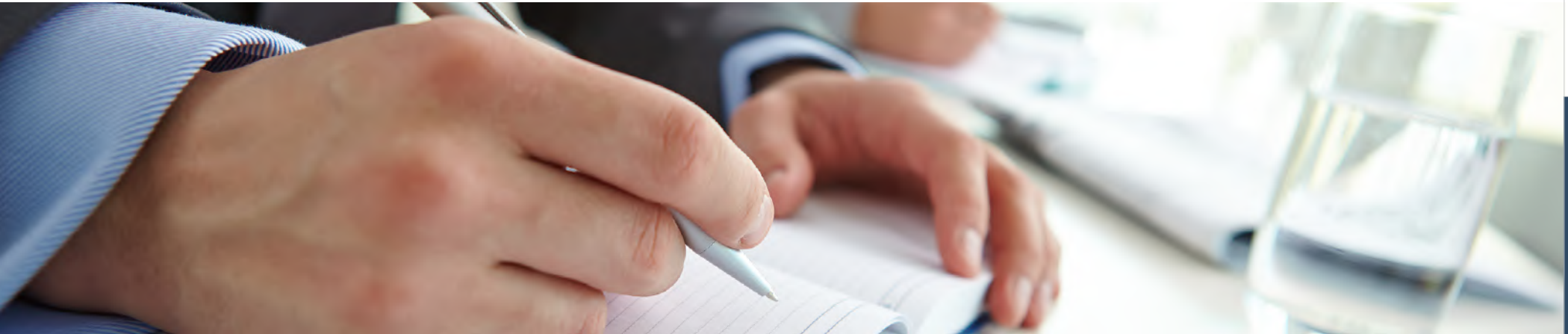
mangroves in the world and lie on the main migration routes of thousands of bird species. These mangroves have faced increased logging hazards in recent years, with major inducement of mangrove deforestation in the region being the use of mangroves as a source of fuel wood, fodder, and pasture for grazing, etc. Over 42,000 people live in the 60 coastal villages within the project area, over 70 percent of whom live below the poverty line, with many communities lacking access to clean drinking water, basic education, sanitation and sanitary facilities, and relying on agriculture as their primary income source; the depletion of freshwater has increased the salinity of mangrove and delta soils, and agricultural and coastal fisheries have gradually reduced their yields.

The DBC-1 project hopes to alleviate these problems and prevent biodiversity loss in this critical biodiversity area by regenerating mangroves and controlling the causes of mangrove deforestation and degradation, which will be achieved through the reforestation of more than 224,000 hectares of mangroves and by involving local communities in the planning and implementation of the project's activities. Local residents participate in conservation activities in various ways, including the mangrove supervision agreement, in which local residents are hired as supervisors, and the local residents also work as partners on the project in mangrove forest restoration, protection and sustainable management; other program actions include increasing education, sources of safe drinking water and health care, improving law enforcement, developing local businesses, microfinance programs, promoting gender equality, preserving historic heritage, and developing revenue streams.

While focusing on the semiconductor industry, Winbond hopes to invest continuous and stable resources to participate in global activities related to carbon emission reduction and contribute our strength to the sustainable survival and development of the earth.

5.6 Sustainability-Linked Loan

In April 2023, Winbond secured a NT$20 billion sustainability-linked syndicated loan with 11 banks. It was the first syndicated loan linked to sustainability indicators arranged by Winbond with great support from the banks, representing the banks' confidence and recognition on Winbond's sustainability actions. In this project, the achievement of sustainability-linked indicators such as carbon reduction, electricity saving and corporate governance are assessed periodically, and the performance is directly linked to credit spread reduction. These all show that Winbond is willing to engage sustainability with practical actions and indicators, and strengthens its commitment and determination to the environment and society. At the same time, to strive on the sustainable society and environment with banks' finance vision and support on the sustainability-linked syndicated loan.



5.7 Climate Change Management

2021: Winbond introduced the Task Force on Climate-related Financial Disclosures (TCFD) framework for the first time 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, which was strengthened and refined in 2022.

2023: Winbond released its first TCFD Report, which examines Winbond's operational resilience in the face of climate issues and strengthens its response to and practice of climate change.

— Climate Change Management Framework (TCFD) Implementation Overview —

Aspect	Winbond strategy / and actions	2022 implementation status
Governance	· 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. It regularly reports to the Board of Directors every year on the implementation results of the ESG Committee related to climate change, etc., so as to ensure the promotion and implementation of the work related to the sustainable development of the enterprise	· Winbond restructured the "Winbond Corporate Social Responsibility (CSR) Implementation Committee" into the "ESG Committee" in May 2022. The level of committee was raised to the level of the Board of Directors · The Board of Directors passed a number of important climate-related proposals and reports to actively respond to the risks and challenges brought about by climate change, including investment in CHIA-HO Green Energy Corporation, carbon credit trading planning and renewable energy planning proposals
Strategy	· 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 probability of occurrence · Scenario analysis for major transition risks and physical risks	· 4 major climate risks and 7 minor climate risks were identified, as well as 5 major climate opportunities and 4 minor climate opportunities · Qualitative or quantitative analysis of the financial or operational impact of major risks and opportunities · In terms of transition risks, three scenarios were used to simulate, including: (1) National Net-Zero Pathway ; (2) SSP1-1.9 scenario of IPCC AR6; (3) Science-Based Targets Net-zero path. Regarding physical risks, Winbond 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 rainfall under the four warming scenarios of RCP 2.6, RCP 4.5, RCP 6.0 and RCP 8.5
Risk Management	· Manage climate-related risks and integrate processes into the company-wide risk management framework · Establish a climate risk identification process with reference to the TCFD framework · For major risks and opportunities with high impact and high probability of occurrence, relevant units are asked to review and develop mitigation and adaptation measures	· 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 interdepartmental TCFD was established by appointing relevant members from five task forces under the Windbond's ESG Committee, including Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. The TCFD discussed the financial qualitative and quantitative impact of climate risk through 4 workshops · Disclosed the climate risk and opportunity-related assessment results and response practices in the TCFD report for review by the Winbond ESG Committee and representatives of various department heads, as the basis for promoting climate mitigation and adaptation actions

Aspect	Winbond strategy / and actions	2022 implementation status
Metrics and Targets	• Set the corporate goals for renewable energy use and net-zero emissions • Promote climate risk mitigation and adaptation actions in terms of green products, sustainable supply chains, energy and greenhouse gas management, water resource management, etc. and set relevant management goals • Every year, statistics are gathered on the greenhouse gas emissions and water consumption of the CTSP Fab, and in 2022, the Kaohsiung Fab was included. In addition, the key performance indicators (KPI) - greenhouse gas emissions per unit of product and water recovery rate are set. Among them, the greenhouse gas emissions are verified by a third-party unit every year (ISO 14064-1)	• The goal was to use 90% of renewable energy in the CTSP Fab (based on the electricity consumption in 2021), and achieve net zero emissions in 2050 • Invested in process research and development to reduce power consumption and increase productivity • Planned and implemented sustainable procurement strategies and activities, sustainable risk 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. In 2022, new measures saved about 35.9 million kWh of electricity per year • In 2022, the greenhouse gas emission per unit of product was 13.2 kg CO_2e/layer, and the company-wide water recovery rate was 80.5%, both meeting the self-defined target value

5.7.1 Climate Governance Framework

Winbond belongs to the semiconductor manufacturing industry. Natural disasters, accidents, man-made accidents, changes in international political and economic situations, the introduction of new technologies in the industry, and changes in policies and regulations, etc., may all cause serious impacts on our operations and finances. The Risk Management Committee and ESG Committee are set up under the Board of Directors to review the policy and structure of risk management and sustainable development

— Risk Management Committee —

Convener	Risk management is carried out by the existing department or risk responsible unit for the scope of work it is responsible for
Frequency	Regularly report to management and governance units
Responsibilities	The Winbond has established sound internal management guidelines and operating procedures, and has developed comprehensive plans and processes for pre-assessment, risk avoidance, loss prevention and crisis management

— ESG Committee —

Convener	Chaired by the Chairman
Frequency	Convened at least 2 times a year
Responsibilities	Under the ESG Committee, Winbond established the ESG Office and five task forces including Environmental Sustainability, Green Product, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance, thereby ensuring the promotion and implementation of works related to corporate sustainability.

5.7.2 Identification Process for Climate Change Risks and Opportunities

In 2022, Winbond established a TCFD with more than 40 members, of whom more than 60% were above the department managerial level. The members of the task force were grouped according to the nature of their business, and each group discussed the climate change issues based on their business relevance. Through 4 workshops and educational training, 4 major climate risks and 7 minor climate risks were identified, as well as 5 major climate opportunities and 4 minor climate opportunities.

01 Form a TCFD
Composed of personnel from more than 20 units, and the participating units include R&D, sales, facility, supply chain management, environmental safety, finance, legal, and human resources.

02 Work with external experts to create a list of climate risks and opportunities

03 Define the evaluation criteria
Evaluate from three aspects: impact degree, possibility of occurrence and time of occurrence.

04 Generate risk matrix and opportunity matrix of each group
Each group identifies short-, medium-, and long-term major risks and opportunities based on the degree of impact and possibility of occurrence, while considering their own business relevance.

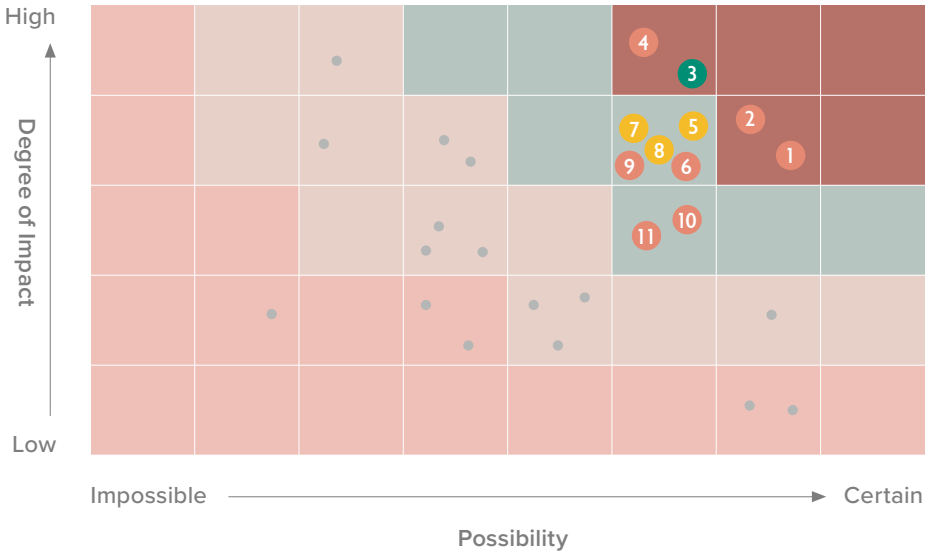
05 Develop the consolidated risk matrix and opportunity matrix
Compile the identification results of each group to produce the Winbond climate risk / opportunity matrix.

06 Assess the financial impact of major risks and opportunities
Scenario simulation of the possible impact on the company's financial aspects for major risks and opportunities with high impact and high probability of occurrence.

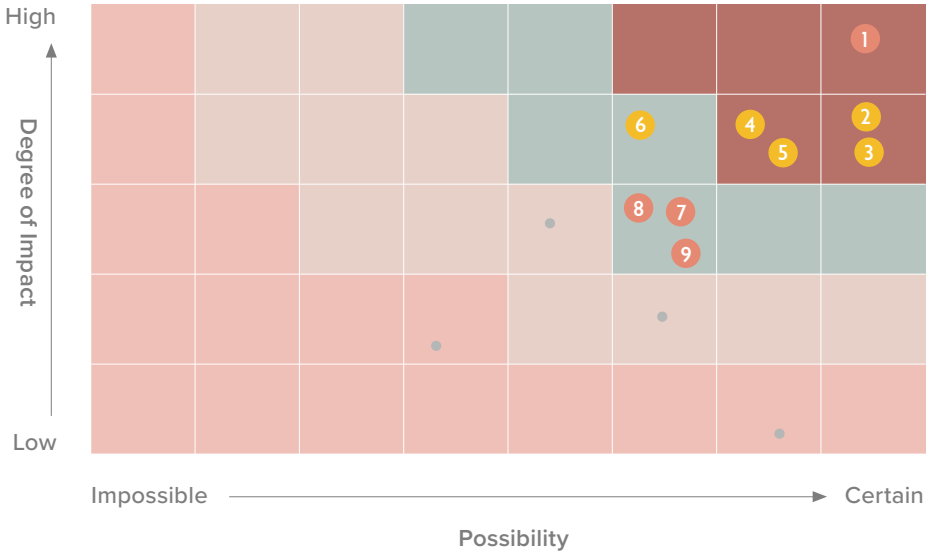
07 Discuss how to respond
For major risks and opportunities, relevant units are asked to review and formulate countermeasures.

5.7.3 Major Climate Change Impacts and Responses

— Climate Risk Matrix —



— Climate Opportunity Matrix —



Major Risks

1. Demand for renewable energy
2. Carbon tax/carbon fee
3. Unstable electricity supply
4. Extreme rainfall and drought

Minor Risks

5. Changes in customer behavior
6. Greenhouse gas emissions regulations
7. Changes in rainfall patterns and distribution
8. Demand for low-carbon products and services
9. Changes in natural resource availability
10. Signing of Voluntary agreements
11. Fuel tax/energy tax

Short-term 1-3 years **Medium-term** 3-5 years **Long-term** more than 5 years

Major Opportunities

1. Changes in customer behavior
2. Participation in renewable energy projects
3. Process optimization and R&D innovation
4. Development of low-carbon products and services
5. Improvements in energy efficiency

Minor Opportunities

6. Water resource management
7. Use of recycled materials
8. Exploration of alternative and diverse resources
9. Participation in carbon credit markets

Short-term 1-3 years **Medium-term** 3-5 years

— Major Climate Risks —

Type	Cimate Risk	Time of Occurrence	Potential Financial or Operational Impacts (−) *represents a negative impact* (+) *represents a positive impact*	Response Measures
Transition Risks	**Demand for renewable energy**	Medium-term	• Higher green electricity prices result in increased production costs (−) • Reducing carbon emissions leads to a decrease in carbon tax/fees (+) • Suppliers pass on their renewable energy expenditures, leading to increased procurement costs (−) • Limited production due to difficulty in acquiring renewable energy (−)	• 90% green energy target for CTSP Fab in 2030 • Planning to procure renewable energy electricity and evaluation of the purchase of T-RECs • CTSP Fab has installed a 499kW rooftop renewable energy generation system and continues to assess the feasibility of installing additional renewable energy generation systems • Investment in Chia-ho Green Energy Corporation in 2022, with ongoing evaluation of other renewable energy projects • Planning to establish a Customer Green Energy Demand Survey System to accurately understand our customers' green energy demand • Annual environmental surveys on key suppliers to identify carbon emissions sources, reduction plans, and management, with continuous monitoring
	Carbon tax/ carbon fee	Medium-term	• Increase in indirect costs (−) • Suppliers pass on their carbon tax/fee expenditures, leading to increased procurement costs(−) • Limited capacity expansion(−)	• Company-wide target of net-zero emissions in 2050 • Development of carbon emissions information platform for ongoing management and tracking, with plans to develop a carbon accounting system • Planning to procure renewable energy electricity and evaluation of the purchase of T-RECs. • Joining Singapore CIX platform to participate in carbon credit market and continuous monitoring of carbon offset mechanisms • Implementation of ISO 50001 energy management system with 21 energy-saving measures completed in 2022, resulting in a savings of 35.9 million kWh of electricity and a reduction of 16,485 tons of greenhouse gas emissions • Hold focused ESG exchanges to communicate supply chain decarbonization goals and encourage suppliers to reduce their carbon emissions
	Unstable electricity supply	Long-term	• Production impacts lead to reduced revenue(−) • Supplier supply disruptions affect Winbond's production(−)	• Planning for diversified power sources to mitigate the risks associated with electricity procurement and usage • Installation of emergency power generator systems and uninterruptible power supply systems to establish backup power sources for at least 80% of the fab's electricity consumption • Communicating electricity management measures to suppliers, including the need to establish emergency power distribution equipment and progressively increase the proportion of green energy
Physical Risks	**Extreme rainfall and drought**	Medium-term	• Production impact leading to reduced revenue (−) • Continuous operation of automated production lines with increased labor costs due to overtime payments in compliance with regulations (−) • Supplier supply disruption affecting Winbond's production (−) • Increased cost of natural disaster insurance (−)	• Promoting water conservation measures and installing water storage equipment • Adopting automation in production processes to reduce the need for manual operations. • Utilizing digital tools to enhance efficiency in remote work • Communicating relevant response measures to suppliers, such as strengthening facility infrastructure and drainage systems, conducting regular flood response drills, increasing water recycling rates, and preparing alternative water sources

— Major Climate Opportunities —

Climate Opportunity	Time of Occurrence	Potential Financial or Operational Impacts	Response Measures
Changes in customer behavior	Medium-term	• Product portfolio changes that accelerate positive development across entire supply chain • Obtaining orders and expanding revenue • Increased order stability and reduced revenue fluctuations • Improved company reputation	• Promoting the introduction of new product designs (design in) to meet customer needs • Increasing the portfolio of green or low-energy consumption products • Establishment of carbon information platform to assess product carbon footprints and hotspots, and formulation of reduction pathways and optimization plans • Evaluating and responding to customer requests for energy efficiency and carbon reductions, as well as requirements for renewable energy use • Participation in domestic and international sustainability evaluations to enhance transparency and reputation in terms of sustainability practices
Participation in renewable energy projects	Short-term	• Reduction in carbon emissions leading to a decrease in carbon tax/fee expenditures (+) • Diversified sources of electricity to mitigate risks • Support for compliance with renewable energy regulations and achieving corporate goals	• Planning to procure renewable energy electricity and evaluation of the purchase of T-RECs • Investment in Chia-ho Green Energy Corporation in 2022, with ongoing evaluation of other renewable energy projects • CTSP Fab installed a 499kW rooftop renewable energy generation system and continues to assess the feasibility of installing additional renewable energy generation systems
Process optimization and R&D innovation	Short-term	• Reduction in carbon emissions leading to a decrease in carbon tax/fee expenditures (+) • Reduction in water consumption leading to lower production costs • Obtaining orders and expanding revenue	• Continuing investment in process development to reduce carbon emissions and water consumption • Supporting packaging suppliers in innovating and optimizing their processes to reduce product carbon footprint, thereby enhancing Winbond's product competitiveness
Development of low-carbon products and services	Short-term	• Increased product prices • Expansion in market share and increase in revenue	• Investment in the design of green or low-energy consumption products, continuing research and development of innovations based on product carbon footprint analysis and verification • Acceleration of process evolution to increase the portfolio of green or low-energy consumption products • Understanding customer needs and evaluating the possibility of customization to provide low-carbon/green products
Improvements in energy efficiency	Short-term	• Reduced production and operational costs	• In 2022, a focus on energy-saving initiatives in four major areas: new technology adoption, usage management, component replacement, and equipment upgrades • Planning of multiple energy-saving projects for 2023, including the continuing replacement of natural gas boilers with electric boilers, replacement of rotating equipment, and implementation of energy-saving measures in the MAU water-washing system • Implementation of ongoing energy-saving measures in office areas, such as adjusting the operating hours of air conditioning and exhaust systems and adjusting air conditioning according to space usage

Transition Climate Risk Scenario Analysis

Conduct transition risk simulations in three scenarios, including (1) National net-zero pathway, mainly assessing domestic regulatory risks; (2) The SSP1-1.9 very low GHG emission scenario in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report; (3) Implement the annual 4.2% reduction rate required in the Science-Based Targets Net-zero (SBT-NZ).

External Scenario	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	

It is expected that the issue of climate change may have a financial impact on Winbond in terms of regulations, technology, market and reputation. Among them, the introduction of carbon tax / fee and the use of renewable energy power due to the application of the terms for intensive electricity users are estimated to cause a financial impact of about 0.1~2% of revenue in 2030.

Carbon tax imposition		
External scenario	**Assumption**	**Financial impact on revenue in 2030**
National Net-Zero Pathway	Estimated at US$2~10 per ton CO_2e from 2021 to 2050 by referring to SSP2-4.5	<0.1%
SSP1-1.9	It will reach about US$650 per ton CO_2e in 2050 by referring to SSP1-1.9	1-2%
SBT-NZ		

Carbon fee imposition		
External scenario	**Assumption**	**Financial impact on revenue in 2030**
National Net-Zero Pathway	Estimated at NT$1,500 per tCO_2e	<0.1%

Use of renewable energy power		
External scenario	**Assumption**	**Financial impact on revenue in 2030**
National Net-Zero Pathway	Procurement costs are estimated based on the average wholesale price of Taipower's renewable energy power plus power supply costs	<0.01%
SSP1-1.9		
SBT-NZ		

Physical Climate Risk Scenario Analysis

Winbond follows the IPCC climate risk model to assess the risks of flooding, debris flows and landslides under extreme rainfall conditions. By referring to the data of 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 simulation has been conducted with multiple climate models to avoid deviations in output results.

The results show that before the end of the 21st century, the risk value of Winbond's main fab areas and offices (including CTSP Fab, Kaohsiung Fab and Zhubei Building) under the four temperature rise scenarios is 0, that is, the possibility of flooding, debris flows and landslides is extremely low.

Appendix

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Appendix 1 About this Report

About this Report

Winbond Electronics Corporation ("Winbond") began publishing the "Corporate Social Responsibility Report" in 2015. In 2022, it is renamed as "Corporate Sustainability Report" according to the government regulations. The report provides transparent and complete disclosure on the impact of our business operations in the Environmental, Social and Governance (ESG) aspects as well as our actions on sustainability topics. The report shows that in addition to Winbond's focus on sustainability, topics such as social justice, community welfare, employee development and environmental protection are important to the company as well. Related measures have been implemented through the promotion and spread of business activities as a response to stakeholder expectations and requirements of Winbond's sustainability and management.

Scope

The scope of information of Windbond disclosed in this report covers from January 1, 2022, to December 31, 2022. The report boundary includes Taiwan headquarters (the Kaohsiung Fab was included in 2022). In addition to the presentation of data from Winbond, the report also includes material information on suppliers, demonstrating Winbond's influence and sense of responsibility towards the value chain. For the scope of information and data in the report, the financial information consolidates all entities of Winbond, which is consistent with the disclosure of the financial statements. There are no restatements of information in this year's "2022 Corporate Sustainability Report" compared to the "2021 Corporate Sustainability Report" last year.

Management Method

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 task forces, including Environmental Sustainability, Green Products, Human Rights and Social Inclusion, Sustainable Supply Chain, and Corporate Governance. Meetings are convened regularly at least 2 times a year and chaired by the Chairman to report to the Board of Directors on the implementation results of the ESG Committee.
External Audit	• The financial data was audited and verified by the accounting firm Deloitte Taiwan. The default currency is New Taiwan Dollars. • Independent verification of this report was conducted by BSI Taiwan in May 2023 in accordance with the AA 1000 APS 2018 Addendum Type I Assurance Standard. Please refer to the independent assurance declaration included in the appendix of this report for more details on the results. • ISO 14064-1 GHG emissions and ISO 27001 Information Security Management System (ISMS) were verified by BSI Taiwan and DNV Taiwan. • IATF 16949, ISO 14001, ISO 45001 and TOSHMS certification were approved by DQS Taiwan Inc.

Editorial Principles and Guidelines

Winbond compiles and researches material economic, environmental and social topics in Taiwan and abroad. The topics of concern to stakeholders are then determined through materiality analysis. All the relevant departments are interviewed to establish their implementation performance and to set the relevant topics as the core disclosures of this report. This report was compiled following the GRI Standards issued by the Global Reporting Initiative, the industry standards issued by the Sustainability Accounting Standards Board (SASB), and the TCFD framework issued by the Task Force on Climate-related Financial Disclosures (TCFD) established by the Financial Stability Board (FSB).

Publication Time

The Winbond Sustainability Report is published annually and this is the 9th 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.

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Feedback

If you have any questions or suggestions regarding this report, please do not hesitate to contact us. Our contact details are as follow:

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Appendix 2 Participation in Industry Associations

Participation in Industry Associations	2022 Participation
Taiwan Climate Partnership (TCP) 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.	**Chairman Arthur Yu-Cheng Chiao served as the director**
Taiwan Electrical and Electronic Manufacturers' Association (TEEMA) 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.	**Chairman Arthur Yu-Cheng Chiao served as the strategy consultant**
Taiwan Semiconductor Industry Association (TSIA) 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.	**President Pei-Ming Chen served as the director**
The Allied Association for Science Park Industries The Association serves as a bridge for communication of policies and feedback between the government and industry. It coordinates industry efforts and promote the stable development of science park industries.	**Vice President Wen-Hua Lu served as the supervisor** **Vice President Hsiang-Yun Fan served as the director** (2023/05/25)
Taiwan High-Tech Facility Association The Association provides a communication platform for direct dialogue and collaboration between academia and industry, business owners and cooperating vendors, so as to work together to improve the technology and management of Taiwan's high-tech factory facilities.	**TECHNOLOGY EXECUTIVE Ming-Jun Lu served as the director**
Cross-Strait CEO Summit During the Cross-Strait CEO Summit, working with all members and members of the industrial collaboration promotion team, it's hoped to develop a new picture and new vision for cross-strait industrial cooperation, so as to promote the mutual benefit and common prosperity of the cross-strait economies.	**Chairman Arthur Yu-Cheng Chiao served as the executive supervisor**

Appendix 3 GRI Standards Disclosures Comparison Table

Usage statement : Winbond Electronics Co., Ltd. has followed the GRI guidelines to report the content from January 1, 2022 to December 31, 2022.
GRI used: GRI 1 : Foundation 2021
Applicable GRI Industry Standards : There is no applicable GRI Industry Standards during the reporting period of this report

GRI 1 Foundation 2021 | **GRI 2 General Disclosures 2021**

*material themes

GRI Standards	Disclosure	Corresponding Section	Page	Remarks
The Organization and its Reporting Practices				
2-1	Organizational details	Company Profile	7	
		5.1 Corporate Governance	108	
		Appendix 1 About this Report	128	
2-2	Entities included in the organization's sustainability reporting	Company Profile	9	
2-3	Reporting period, frequency and contact point	Appendix 1 About this Report	128	
2-4	Restatements of information	Appendix 1 About this Report	128	There were no restatements of information
2-5	External assurance	Appendix 7 Independent Third-Party Assurance Opinion Statement	141	
Activities and Workers				
2-6	Activities, value chain and other business relationships	Company Profile	7	No significant changes during the reporting period
		3.1 Supply Chain Composition and Overview	71	
		5.3 Productivity and Business Performance	113	
2-7	Employees	4.2.1 Workforce Structure	82	
2-8	Workers who are not employees	4.2.1 Workforce Structure	82	
Governance				
2-9	Governance structure and composition	5.1 Corporate Governance	108	
2-10	Nomination and selection of the highest governance body	5.1 Corporate Governance	108	
2-11	Chair of the highest governance body	II. Sustainable Development Governance	27	
		5.1 Corporate Governance	108	
2-12	Role of the highest governance body in overseeing the management of impacts	Message from the Chairman and CEO	4	
		III. Materiality Analysis and Stakeholder Engagement	34	
		5.1.3 Shareholder Relations and Rights	111	

GRI 1 Foundation 2021 | **GRI 2 General Disclosures 2021**

GRI Standards	Disclosure	Corresponding Section	Page	Remarks
2-13	Delegation of responsibility for managing impacts	II. Sustainable Development Governance	27	
		5.1.2 Operations and Main Duties of the Functional Committees	110	
		5.2 Business Integrity	112	
		5.4 Risk Management	115	
2-14	Role of the highest governance body in sustainability reporting	III. Materiality Analysis and Stakeholder Engagement	33	
		Appendix 1 About this Report	128	
2-15	Conflicts of interest	5.1.1 Board Operation	108	
2-16	Communication of critical concerns	5.1.1 Board Operation	108	
2-17	Collective knowledge of the highest governance body	5.1 Corporate Governance	110	
2-18	Evaluation of the performance of the highest governance body	5.1.1 Board Operation	110	
2-19	Remuneration Policy	5.1.2 Operations and Main Duties of the Functional Committees	110	
2-20	Process to determine remuneration	5.1.2 Operations and Main Duties of the Functional Committees	110	
2-21	Annual total compensation ratio	4.2.3 Compensation and Benefits	89	
Strategy, Policies and Practices				
2-22	Statement on sustainable development strategy	Message from the Chairman and CEO	4	
		III. Materiality Analysis and Stakeholder Engagement	32	
2-23	Policy commitments	4 Human Rights and Social Inclusion	78	
		3.2 Sustainable Supply Chain Management Framework	71	
2-24	Embedding policy commitments	4.1 Human Rights Due Diligence Inclusion	79	
		3.2 Sustainable Supply Chain Management Framework	71	
2-25	Embedding policy commitments	III. Materiality Analysis and Stakeholder Engagement	37	
		5.4 Risk Management	115	

GRI 1 Foundation 2021 / GRI 2 General Disclosures 2021

GRI Standards	Disclosure	Corresponding Section	Page	Remarks
2-26	Mechanisms for seeking advice and raising concerns	5.1.4 Internal Controls and Audits	112	
2-27	Compliance with laws and regulations	2 Environmental Sustainability	58	
		4 Human Rights and Social Inclusion	78	
		5.2 Business Integrity	112	
2-28	Membership associations	Appendix 2 Participation in industry associations	130	
Stakeholder Engagement				
2-29	Approach to stakeholder engagement	III. Materiality Analysis and Stakeholder Engagement	33	
2-30	Collective bargaining agreements	4.3 Employer-Employee Relations	96	There are no collective bargaining agreements as no union has been formed

GRI 3 Material Topics 2021

GRI Standards	Disclosure	Corresponding Section	Page	Remarks
3-3	Management of material topics	III. Materiality Analysis and Stakeholder Engagement	32	
Productivity and Business Performance*				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	5 Corporate Governance	107	
GRI 201 Economic Performance 2016	201-1 Direct economic value generated and distributed	5.3 Productivity and Business Performance	113	
	201-2 Financial implications and other risks and opportunities due to climate change	5.7 Climate Change Management	120	
	201-3 Defined benefit plan obligations and other retirement plans	4.2.3 Compensation and Benefits	91	
	201-4 Financial assistance received from government	5.1.5 Tax Management	112	
Business Integrity and Corporate Governance*				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	5 Corporate Governance	107	

GRI 3 Material Topics 2021

GRI Standards	Disclosure	Corresponding Section	Page	Remarks
GRI 205 Anti-corruption 2016	205-1 Operations assessed for risks related to corruption	5.1.4 Internal Controls and Audits	112	
		5.2 Business Integrity	112	
	205-2 Communication and training about anti-corruption policies and procedures	5.2 Business Integrity	113	There were no incidents of corruption
	205-3 Confirmed incidents of corruption and actions taken	5.2 Business Integrity	113	
GRI 206 Anti-competitive Behavior 2016	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	5.2 Business Integrity	113	There were no incidents of anti-competitive behavior
Energy and Greenhouse Gas Management*				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	2 Environmental Sustainability	58	
GRI 302 Energy 2016	302-1 Energy consumption within the organization	2.1.1 Energy Management	60	
	302-3 Energy Intensity	2.1.1 Energy Management	60	
	302-4 Reduction of energy consumption	2.1.1 Energy Management	59	
	302-5 Reductions in energy requirements of products and services	1.1 Research, Development and Innovation	47	
GRI 305 Emission 2016	305-1 Direct (Scope 1) GHG emissions	2.1.2 Greenhouse gas management	62	
	305-2 Energy indirect (Scope 2) GHG emissions	2.1.2 Greenhouse gas management	62	
	305-3 Other indirect (Scope 3) GHG emissions	2.1.2 Greenhouse gas management	62	
	305-4 GHG emissions intensity	2.1.2 Greenhouse gas management	62	
	305-5 Reduction of GHG emissions	2.1.1 Energy Management	59	
	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	2.4 Air Pollution control	68	
Water Management				
GRI 303 Water and Effluents 2018	303-1 Interactions with water as a shared resource	2.2.2 Water Usage	64	
	303-2 Management of water discharge-related impacts	2.2.4 Wastewater Management	66	

GRI 3 Material Topics 2021

GRI Standards	Disclosure	Corresponding Section	Page	
	303-3 Water withdrawal	2.2.2 Water Usage	65	
	303-4 Water discharge	2.2.4 Wastewater Management	66	
	303-5 Water consumption	2.2.2 Water Usage	65	
Waste Management				
GRI 306 Waste 2020	306-3 Waste generated	2.3 Waste Management	67	
	306-4 Waste diverted from disposal	2.3 Waste Management	67	
Human Resources Management *				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	4 Human Rights and Social Inclusion	78	
GRI 401 Employment 2016	401-1 New employee hires and employee turnover	4.2.2 Talent Recruitment and Performance Evaluation	86	
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	4.2.3 Compensation and Benefits	88	
	401-3 Parental leave	4.2.3 Compensation and Benefits	91	
GRI 403 Occupational Health and Safety 2018	403-1 Occupational health and safety management system	4.4.1 Occupational Safety and Health Management System	97	
	403-2 Hazard identification, risk assessment, and incident investigation	4.4.1 Occupational Safety and Health Management System	99	
		4.4.2 Environmental Safety and Health Risk Assessment	102	
	403-3 Occupational health services	4.4.1 Occupational Safety and Health Management System	101	
		4.4.2 Environmental Safety and Health Risk Assessment	102	
	403-4 Worker participation, consultation, and communication on occupational health and safety	4.4.1 Occupational Safety and Health Management System	97	

GRI 3 Material Topics 2021

GRI Standards	Disclosure	Corresponding Section	Page	
	403-5 Worker training on occupational health and safety	4.4.1 Occupational Safety and Health Management System	101	
	403-6 Promotion of worker health	4.2.3 Compensation and Benefits	92	
		4.4.1 Occupational Safety and Health Management System	101	
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	4.4.1 Occupational Safety and Health Management System	99	
		4.4.3 Emergency Response Measures	103	
	403-8 Workers covered by an occupational health and safety management system	4.4.1 Occupational Safety and Health Management System	98	
	403-9 Work-related injuries	4.4.1 Occupational Safety and Health Management System	99	
	403-10 Work-related ill health	4.4.1 Occupational Safety and Health Management System	99	There were no incidents of occupational diseases
GRI 404 Training and Education 2016	404-1 Average hours of training per year per employee	4.2.4 Talent development and learning outcomes	94	
	404-2 Programs for upgrading employee skills and transition assistance programs	4.2.4 Talent development and learning outcomes	93	
	404-3 Percentage of employees receiving regular performance and career development reviews	4.2.2 Talent Recruitment and Performance Evaluation	88	
GRI 405 Diversity and Equal Opportunity 2016	405-1 Diversity of governance bodies and employees	4.2.1 Workforce Structure	82	
		4.2.2 Talent Recruitment and Performance Evaluation	87	
		5.1.1 Board Operation	108	
	405-2 Ratio of basic salary and remuneration of women to men	4.2.3 Compensation and Benefits	89	
Supply Chain Management*				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	3 Sustainable Supply Chain	70	

GRI 3 Material Topics 2021

GRI Standards	Disclosure	Corresponding Section	Page	
GRI 308 Supplier Environmental Assessment 2016	308-1 New suppliers that were screened using environmental criteria	3.2 Sustainable Supply Chain Management Framework	72	
	308-2 Negative environmental impacts in the supply chain and actions taken	III. Materiality Analysis and Stakeholder Engagement	32	
		3.3 Low Carbon Supply Chain	73	
GRI 414 Supplier Social Assessment 2016	414-1 New suppliers that were screened using social criteria	3.2 Sustainable Supply Chain Management Framework	72	
	414-2 Negative social impacts in the supply chain and actions taken	III. Materiality Analysis and Stakeholder Engagement	32	
Product and Service Quality				
GRI 417 Marketing and Labeling 2016	417-2 Incidents of non-compliance concerning product and service information and labeling	5.2 Business Integrity	112	No incidents of non-compliance concerning product and service information and labeling
	417-3 Incidents of non-compliance concerning marketing communications	5.2 Business Integrity	112	No incidents of non-compliance concerning marketing communications
Information Security and Personal Information Protection				
GRI 418 Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	1.4 Customer Relationship Management	56	No substantiated complaints regarding concerning breaches of customer privacy and losses of customer data
Green Product*				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	1 Green Product	43	
Self-defined Topics Green Product	-	1 Green Product	43	

GRI 3 Material Topics 2021

GRI Standards	Disclosure	Corresponding Section	Page	
Research, Development and Innovation*				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	1.1 Research, Development and Innovation	44	
Self-defined Topics Research, Develop-ment and Innovation	-	1.1 Research, Development and Innovation	44	
Risk Management*				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	5 Corporate Governance	107	
Self-defined Topics Risk Manage-ment	-	5.4 Risk Management	115	
Regulatory Compliance*				
GRI 3	3-1 Process to determine material topics	III. Materiality Analysis and Stakeholder Engagement	32	
	3-2 List of material topics			
	3-3 Management of material topics	5 Corporate Governance	107	
Self-defined Topics Regulatory Compli-ance	-	2 Environmental Sustainability	58	
		4 Human Rights and Social Inclusion	78	
		5 Corporate Governance	107	

Appendix 4 Sustainability Accounting Standards Board (SASB) Reference Table

Topic	Code	Category	Metric	2021	2022	Remarks
Greenhouse Gas Emissions	TC-SC-110a.1	Quantitative	(1)Gross global Scope 1 emissions	38,760 metric tons CO_2e	44,373 metric tons CO_2e	• Not subject to Scope 1 related emission controls • Please refer to 2.1.2 Greenhouse gas management (P62)
			(2)mount of total emissions from perfluorinated compounds	12,86 metric tons CO_2e	13,071 metric tons CO_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 2.1.2 Greenhouse Gas Management • Winbond' s goal is to use 90% renewable energy in the CTSP Fab by 2030. Currently, the CTSP Fab has installed solar energy, and the Kaohsiung Fab is in the active evaluation stage. The future plan is to collaborate with other companies on building new solar energy fields and purchasing T-RECs, etc. • In 2022, the target of greenhouse gas emission intensity per unit product (kg CO_2e / layer-wafer photomask) was ≦ 13.3; the actual situation in 2022 was 13.2, reaching the target for the year		• Please refer to 2.1.2 Greenhouse gas management (P62-63)
Energy Management in Manufacturing	TC-SC-130a.1	Quantitative	(1) Total energy consumed	About 2,232,751 GJ	About 2,807,178 GJ	• Please refer to 2.1.1 Energy Management (P60)
			(2) Percentage grid electricity	89.0%	88.3%	• Please refer to 2.1.1 Energy Management (P60)
			(3) Percentage renewable	-		• No renewable energy has been used
Water Management	TC-SC-140a.1	Quantitative	(1) Total water withdrawal	3,293 megaliters	4,131 megaliters	• Please refer to 2.2.2 Water Usage (P65)
			(2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress	-		Locations of operations in Taiwan are all located in low-risk areas of water resource pressure
Waste Management	TC-SC-150a.1	Quantitative	Amount of hazardous waste from manufacturing, percentage recycled	• 3,509 metric tons of hazardous waste • Hazardous waste recycling rate 88%	• 4,608 metric tons of hazardous waste • Hazardous waste recycling rate 84%	• Please refer to 2.3 Waste Management (P67)
Employee Health & Safety	TC-SC-320a.1	Discussion and Analysis	Description of efforts to assess, monitor, and reduce exposure of employees to human health hazards	• The "ESH Risk Assessment Operating Procedure" has been formulated by Winbond to identify the ESH risks and opportunities to the environment, personnel and hygiene from activities, products or services • Risk level is calculated based on past operational history and the current situation. The potential situation, effect or impact and probability are assessed. 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 • Internal audit is conducted at least once a year along with annual reviews; any major changes to production processes, facilities and operational content will all trigger a new assessment		• Please refer to 4.4 Occupational Safety and Health (P97-103)

Topic	Code	Category	Metric	2021	2022	Remarks
Employee Health & Safety	TC-SC-320a.2	Discussion and Analysis	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 2022		
Recruiting & Managing a Global & Skilled Workforce	TC-SC-330a.1	Discussion and Analysis	(1) Percentage of employees that are foreign nationals	1.2%	1.3%	・Please refer to 4.2.1 Workforce Structure (P82)
			(2)Percentage of employees that are nationals located offshore	0.0%	0.0%	・Please refer to 4.2.1 Workforce Structure (P82)
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 (3) laptops	No production of servers, desktops or laptop products		
Materials Sourcing	TC-SC-440a.1	Discussion and Analysis	Description of the management of risks associated with the use of critical materials	・A sustainable supply chain team is set up under the ESG committee to be responsible for developing supplier management policies and related sustainable development issues 2022 Supplier Sustainability Management Results: ・Percentage of suppliers who have signed agreements with Winbond to uphold its Ethics and Integrity Policy: 100% ・Percentage of suppliers who have signed the Winbond Supplier Code of Conduct Commitment Letter: 100% ・Percentage of suppliers who have signed agreements not to use prohibited materials: 100%		・Please refer to 3.2 Sustainable Supply Chain Management Framework (P71-72)
Intellectual Property Protection & Competitive Behavior	TC-SC-520a.1	Quantitative	Total amount of monetary losses as a result of legal proceedings associated with anti-competitive behavior regulations	There were no violations of anti-competitive regulations in 2022		・Please refer to 5.2 Business Integrity (P113)
Activity Indicator	TC-SC-000.A	Quantitative	Total production	・Total wafer production was 1.1 thousand pcs ・Total die production was 5,602,364 thousand pcs	・Total wafer production was 2.1 thousand pcs ・Total die production was 3,397,345 thousand pcs	・For financial performance and sales volume in 2022, please refer to Winbond's 2022 Annual Report
	TC-SC-000.B	Quantitative	Percentage of output from self-owned factories	100 %	100 %	

Appendix 5 Sustainability Indicators - Semiconductor Industry Comparison Table

No.	Indicator	Indicator type	Annual disclosure	Page
I	Total energy consumption, percentage of purchased electricity and utilization rate of renewable energy	Quantitative	・The total energy consumption is about 2,807,178 GJ ・100% purchased electricity ・No renewable energy has been used	60
II	Total water withdrawal and total water consumption	Quantitative	・The total water withdrawal is 4,131 thousand m^3 ・The total water consumption is 960 thousand m^3	65
III	Weight and recycling percentage of hazardous waste generated	Quantitative	・4,608 metric tons of hazardous waste ・Hazardous waste accounted for 84% of waste recycling	67
IV	Description of the type, number and rate of occupational accidents	Quantitative	・Occupational accident types: crushing injury caused by falling objects, chemical splash injury, personnel fall accident ・Number of employees with work-related injuries on record: 3 entries ・Ratio of work-related injuries on record: 0.43	99
V	Disclosure of life cycle thinking management: including the weight of end-of-life products and electronic waste and the percentage of recycling (Note 1)	Quantitative	Please refer to 2.3 Waste Management ・Produced waste: 9,584 metric tons ・The overall waste recycling rate reached 90.1%	67
VI	Description of the risk management related to the use of critical materials	Qualitative description	Please refer to 3.2 Sustainable Supply Chain Management Framework A sustainable supply chain team is set up under the Sustainability ESG Committee to be responsible for developing supplier management policies and related sustainable development issues 2022 Supplier Sustainability Management Results: ・Percentage of suppliers who have signed agreements with Winbond to uphold its Ethics and Integrity Policy: 100% ・Percentage of suppliers who have signed the Winbond Supplier Code of Conduct Commitment Letter: 100% ・Percentage of suppliers who have signed agreements not to use prohibited materials: 100%	71-72
VII	Total pecuniary damages resulting from legal proceedings related to anti-competitive conduct regulations	Quantitative	There were no violations of anti-competitive regulations in 2022	113
VIII	Output of main products by product category	Quantitative	・Total wafer production was 2.1 thousand pcs ・Total die production was 3,397,345 thousand pcs	114

Note 1 Including the sale of leftovers or other recycling, relevant descriptions shall be provided

Appendix 6 Climate-Related Information Disclosure Comparison Table

Risks and opportunities brought by climate change to the company and related countermeasures taken by the company(Please refer to 5.7 Climate Change Management or TCFD independent report)

Item	Implementation Status	
1. Description of the Board of Directors' and management's oversight and governance of climate-related risks and opportunities	・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. It regularly reports to the Board of Directors every year on the implementation results of the ESG Committee related to climate change, etc., so as to ensure the promotion and implementation of the work related to the sustainable development of the enterprise	
2. Description of how the identified climate risks and opportunities affect the business, strategy and finances of the company (short-, medium- and long-term).	**Climate risk** (1) Demand for renewable energy (medium-term): ・The price of renewable energy is higher, and the production cost increases ・Reduce carbon emissions and reduce carbon tax / fee expenditures ・Suppliers pass on their renewable energy expenditures, increasing procurement costs ・Renewable energy is difficult to obtain, limiting the production (2) Carbon tax / carbon fee (medium-term): ・Increased indirect costs ・Suppliers pass on their carbon tax / fee expenditures, increasing procurement costs ・Limited capacity expansion	**Climate opportunities** (1) Changes in customer behavior (medium-term): ・Changes in product portfolio, accelerating the positive development of the overall supply chain ・Acquire orders and expand revenue ・Improve order stability and reduce revenue fluctuations ・Enhance company reputation (2) Participation in renewable energy projects (short-term): ・Reduce carbon emissions and reduce carbon tax / fee expenditures ・Diversify electricity risk ・Helps comply with renewable energy regulations and achieve corporate goals
3. Description of the financial impact of extreme weather events and transition actions.	(3) Unstable electricity supply (long-term): ・Affect production, reduce revenue ・Affect suppliers' supply and affect Winbond's production (4) Extreme rainfall and drought (medium-term): ・Affect production, reduce revenue ・The automated production line has no down time, and overtime pay is paid according to law, which increases labor costs ・Affect suppliers' supply and affect Winbond's production ・Increase in natural disaster insurance premiums	(3) Process optimization and R&D innovation (short-term): ・Reduce carbon emissions and reduce carbon tax / fee expenditures ・Lower water consumption and lower production costs ・Acquire orders and expand revenue (4) Development of low-carbon products and services (short-term): ・Increased product unit price ・Expanded market size and increased revenue (5) Improvement in energy efficiency (short-term): ・Reduced production and operating costs
4. Description of how the identification, assessment, and management processes for climate risks are integrated in the overall risk management system.	・In 2022, Winbond established a TCFD with more than 40 members, of whom more than 60% were above the department managerial level. The members of the task force were grouped according to the nature of their business, and each group discussed the climate change issues based on their business relevance. ・Through 4 workshops and educational training, 4 major climate risks and 7 minor climate risks were identified, as well as 5 major climate opportunities and 4 minor climate opportunities.	

Item	Implementation Status
5. If scenario analysis is used to assess resilience to climate change risks, the scenarios, parameters, assumptions, analysis factors and major financial impacts used shall be explained.	**Conduct transition risk simulations in three scenarios, including** ・National net-zero path, mainly assessing domestic regulatory risks ・The SSP1-1.9 very low GHG emission scenario in the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report ・Implement the annual 4.2% reduction rate required in the Science-Based Targets Net-zero (SBT-NZ) **External scenarios / assumptions / Financial impact on revenue in 2030** (1) Imposition of carbon tax ・National net-zero path / estimated at US$2~10 per ton CO_2e from 2021 to 2050 by referring to SSP2-4.5 / <0.1% ・SSP1-1.9 / reaching about US$650 per ton CO_2e in 2050 by referring to SSP1-1.9 / 1~2% ・SBT-NZ / reaching about US$650 per ton CO_2e in 2050 by referring to SSP1-1.9 / 1~2% (2) Imposition of carbon tax ・National net-zero pathway / estimated at NT$1,500 per ton CO_2e / <0.1% (3) Use of renewable energy power ・Government net-zero path / procurement costs are estimated based on the average wholesale price of Taipower' s renewable energy power plus power supply costs / <0.01% ・SSP1-1.9 / procurement costs are estimated based on the average wholesale price of Taipower' s renewable energy power plus power supply costs / <0.01% ・SBT-NZ / procurement costs are estimated based on the average wholesale price of Taipower' s renewable energy power plus power supply costs / <0.01%
6. If there is a transition plan for managing climate-related risks, describe the content of the plan, and the indicators and goals used to identify and manage physical risks and transition risks.	**Transition plan for climate-related risks** (1) Green product: ・Increase productivity ・Reduce the power consumption of the products ・Reduce power dissipation and extend battery life ・Support low-temperature soldering process that is environmentally friendly and low production power consumption (2) Sustainable supply chain: ・Sustainable procurement strategy and activities ・Sustainability risk assessment and management ・Winbond Supplier ESG Interactive Website (3) Energy and greenhouse gas management: ・Implement electricity conservation measures ・Renewable energy use planning ・Introduce greenhouse gas management process ・Greenhouse gas emission strategies and goals in terms of production and manufacturing ・Create a carbon emission information platform (4) Water resource management: ・At present, all locations of operations in Taiwan are all located in low-risk areas of water resource pressure **Climate-related management indicators and goals** (1) GHG emissions: ・In 2023, the CTSP Fab will reduce another 15,700 tons CO_2e ・In 2030, the CTSP Fab will reduce by 60% (with 2021 as the baseline year) (2) Renewable energy power percentage: In 2030, 90% of CTSP Fab will use renewable energy power (3) Fab-wide water recycling rate: ≧ 80% (4) Supply chain carbon reduction: Reduce carbon emissions from our supply chain by 10% by 2030. (with 2021 as the baseline year) (5) Disruption of operations due to weather disasters (number of days): 0 days
7. If internal carbon pricing is used as a planning tool, the basis for the price setting shall be stated.	Winbond has not used internal carbon pricing
8. If climate-related goals are set, information such as the activities covered, the scope	**TActivities for climate-related goals** ・Process gas reduction, process tail gas reduction ・Energy efficiency improvement, zero carbon energy, low carbon value chain ・Carbon offset

Item	Implementation Status
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.	**2021-2050 net zero emission path** • 2030: 90% of the electricity in CTSP Fab uses renewable energy; 60% carbon reduction in CTSP Fab (including supply chain) • 2050: Annual net zero emissions
9. Greenhouse gas inventory and assurance situation	Please refer to Greenhouse Gas Inventory and Assurance Situation

— Greenhouse Gas Inventory and Assurance Situation —

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

	Total Emissions (metric tons CO_2e)	Intensity (metric tons CO_2e / thousand NTD)	Assurance Provider	Description of the Assurance Situation
			Scope 1	
Winbond	44,373	0.0009	• BSI Taiwan • DNV Taiwan	For the 2022 greenhouse gas inventory, verification opinion has been obtained on 6, 30, 2023
Total	44,373	0.0009		
			Scope 2	
Winbond	353,523	0.0069	• BSI Taiwan • DNV Taiwan	For the 2022 greenhouse gas inventory, verification opinion has been obtained on 6, 30, 2023
Total	353,523	0.0069		
			Scope 3 (voluntary disclosure)	
Winbond	443,204	0.0087	• BSI Taiwan • DNV Taiwan	For the 2022 greenhouse gas inventory, verification opinion has been obtained on 6, 30, 2023

bsi.

By Royal Charter

INDEPENDENT ASSURANCE OPINION STATEMENT

Winbond 2022 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 purpose 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 2022 Sustainability Report.
2. The evaluation of the nature and extent of the Winbond's adherence to AA1000 AccountAbility Principles (2018) in this report as conducted in accordance with type 1 of AA1000AS v3 sustainability assurance engagement and therefore, the information/data disclosed in the report is not verified through the verification process.

This statement was prepared in English and translated into Chinese for reference only.

Opinion Statement

We conclude that the Winbond 2022 Sustainability Report provides a fair view of the Winbond sustainability programmes and performances during 2022. The sustainability report subject to assurance is free from material misstatement 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 fairly 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 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 approach to stakeholder engagement. However, we had no direct contact with external stakeholders.
- 25 interviews with staffs involved in sustainability management, report preparation and provision of report information were carried out.
- review of key organizational developments.
- review of the findings of internal audits.
- 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 GRI Standards is set out below:

Inclusivity

This report has reflected a fact 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.

Materiality

Winbond has established relative procedure in organization level, as the issues which were identified by all departments have been prioritized according to the extent of impact and applicable criterion for sustainable development of organization. Therefore, material issues were completely analyzed and the relative information of sustainable development was disclosed to enable its stakeholders to make informed judgments about the organization's management and performance. In our professional opinion the report covers the Winbond's material issues.

Responsiveness

Winbond has implemented the practice to respond to the expectations and perceptions of its stakeholders. An Ethical Policy for 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 the organization. In our professional opinion the report covers the Winbond's impact issues.

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, 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

The 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 Lead 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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Statement No: SRA-TW-2022070

2023-06-14

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