THE WINBOND STORY

2050 NET ZERO
Net Zero Strategy and Action Plan

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Winbond Declares Its Goal to Achieve Net-Zero Emissions by 2050

Winbond is Dedicated to the Sustainability of the Earth and the Enterprise Guided by the Board of Directors, Winbond establishes our sustainable strategy and demonstrates our commitment towards sustainable development

With our vision to be the 'hidden champion in providing sustainable semiconductors to enrich human life', our Chairman is dedicated to driving sustainable innovation by leveraging the company's core capabilities. Carbon footprint is used as a key measure of innovative value, and every team member is empowered to become a carrier of corporate sustainability. Winbond's sustainable culture is shaped through collective wisdom, AI, and green technology to drive green product design innovation, green smart manufacturing, and sustainable supply chain strategies (see Figure 3). Winbond built a carbon accounting system and implemented data governance by leveraging its core competency and designing green products (see Figure 4). We established an ESG performance management system to incentivize and reward team members for sustainable innovation. Through systematization, a long-term tracking mechanism monitors and manages sustainability-related risks and opportunities. Winbond advances sustainability by influencing its supply chain and engaging all stakeholders, both internal and external. In 2023, Winbond achieved its GHG reduction targets, as depicted in Figure 5. For further accomplishments, please see the Sustainable Practices section.

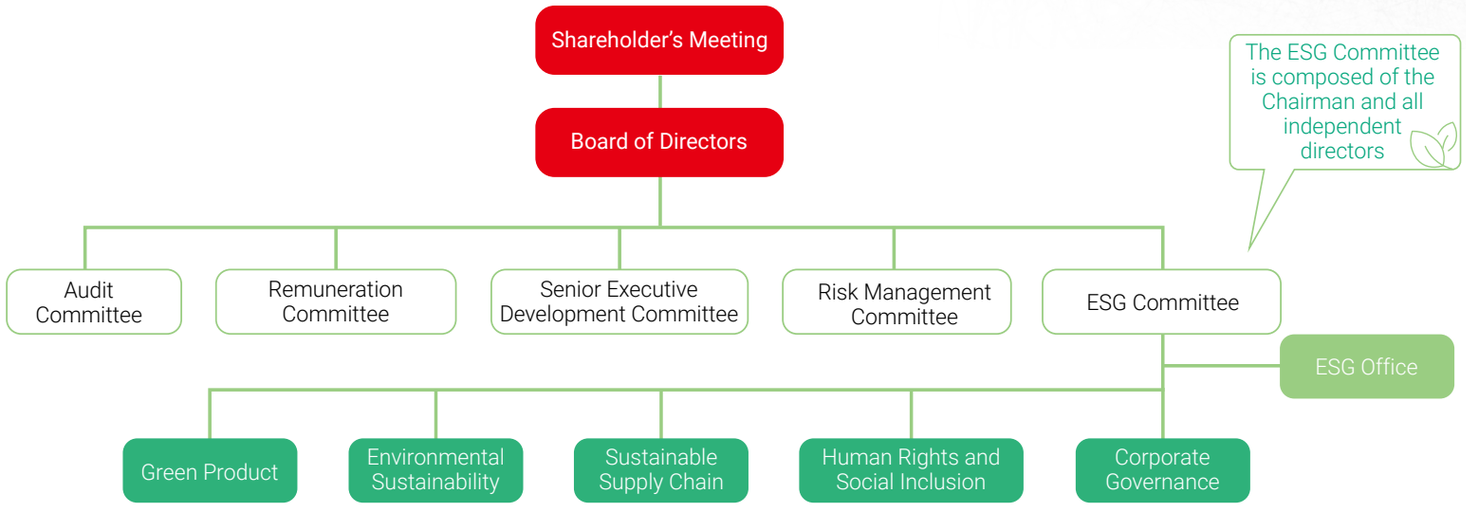

Figure 2 ESG Committee

Global risks ranked by severity over the 10-year period

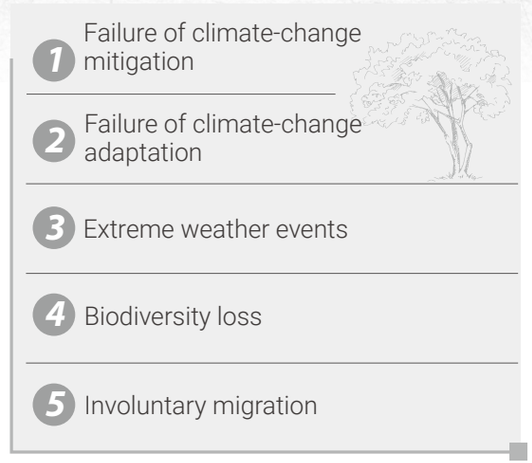

Figure 1 Global risks ranked by severity over the 10-year period
Source: World Economic Forum (2023)

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Leveraging Core Capabilities for Sustainable Innovation

Carbon Footprint as KPI for Innovation and Value Creation
ESG Management: Monitoring Sustainability Risks & Opportunities

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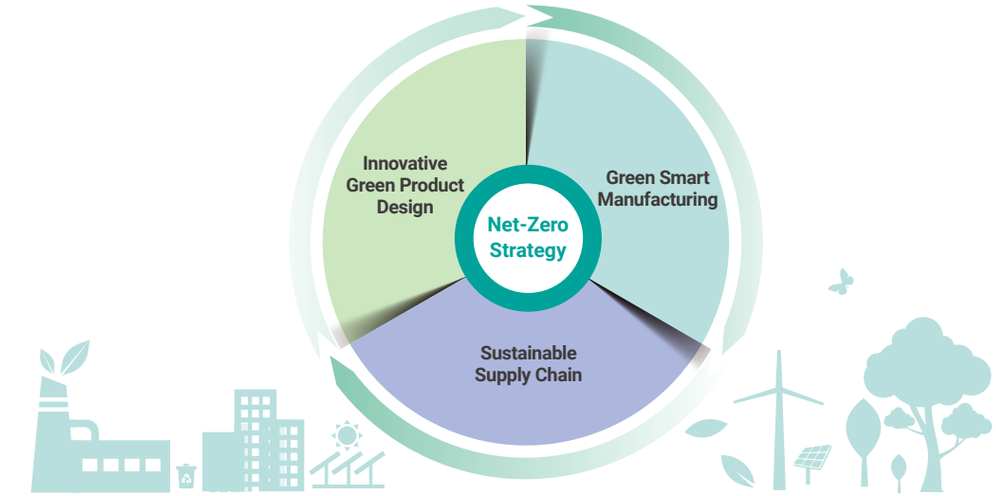

Figure 3 Net-zero strategy

NET ZERO Leveraging Core Capabilities for Sustainable Innovation

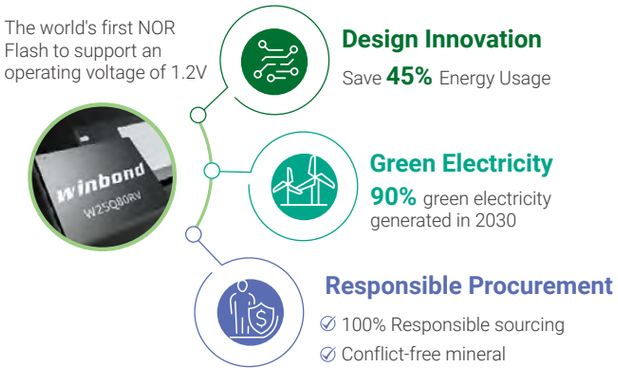

Figure 4 Green Product Innovation

NET ZERO Highlights

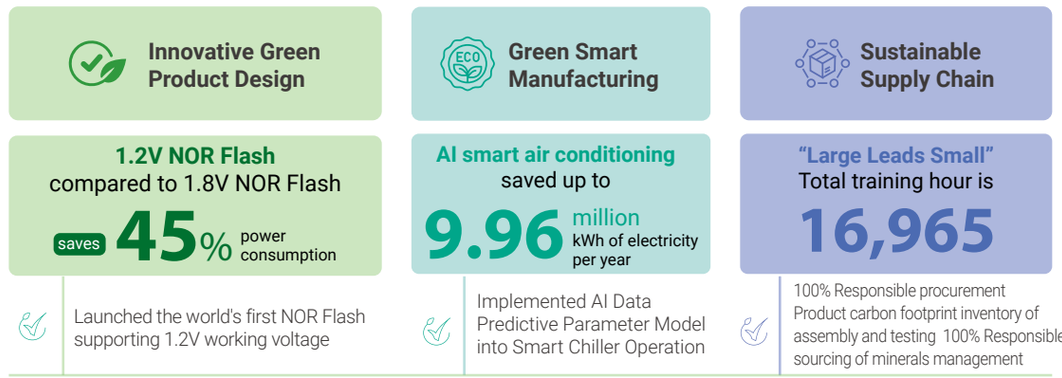

Figure 5 Performance of Carbon Reduction

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- To steadily advance towards sustainability, Winbond has combined its corporate sustainability strategy and ethos to establish short-term (by 2030), medium-term (by 2040), and long-term (by 2050) net-zero goals. Additionally, Winbond has developed a roadmap to achieve net-zero emissions by 2050 (see Figure 6) and is undertaking comprehensive actions towards achieving net-zero emissions by 2050.

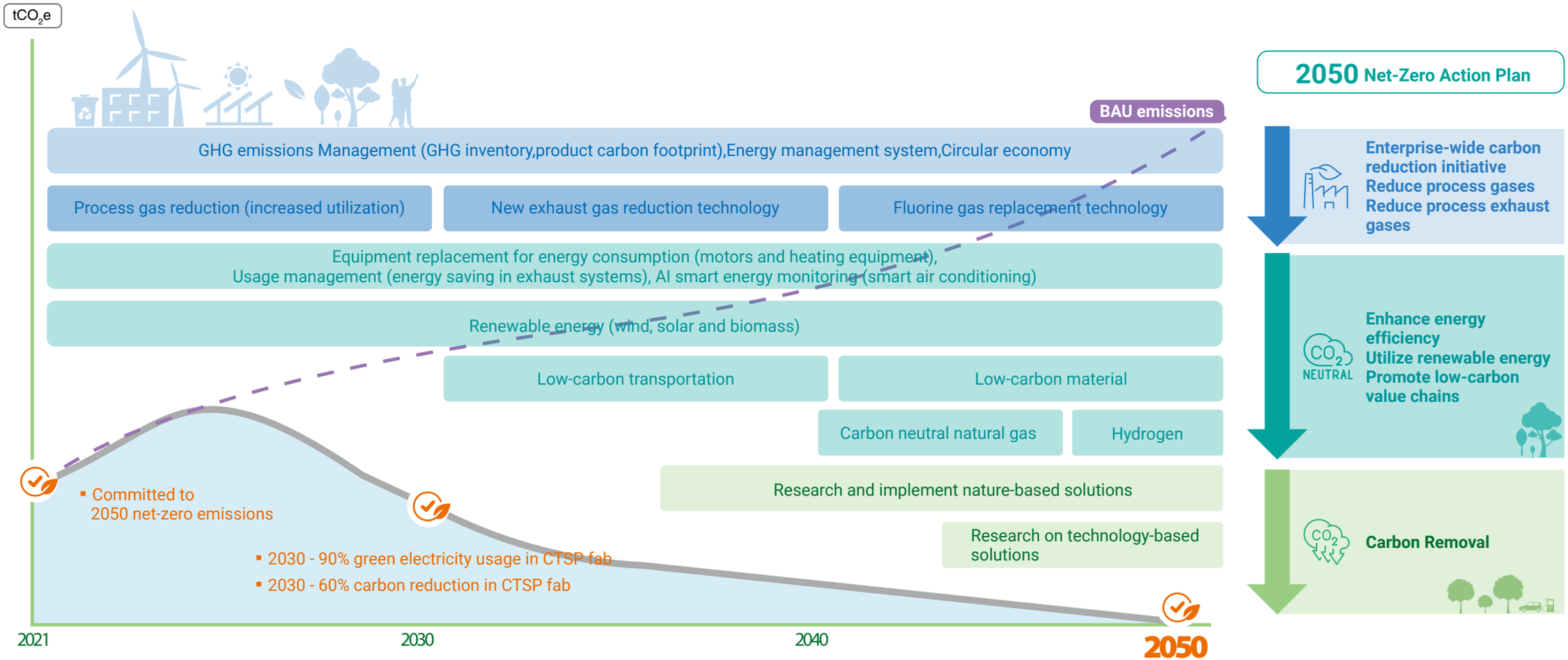

Figure 6 2050 Winbond Net-zero Roadmap

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①Direct emissions reduction ② Renewable energy use ③ Carbon removal

①Direct emission reduction

- Promoting a Net Zero Culture: We encourage all colleagues to collectively reduce carbon emissions. As of 2023, we have cumulatively reduced approximately 2.28 million tCO_2e emissions, which is equivalent to the annual carbon sequestration of 5,907 Daan Forest Parks.
- Extending this initiative to our subsidiaries and branches progressively.

To achieve our goal of reducing direct emissions, Winbond advocates breaking free from traditional linear thinking. We foster an innovative culture, harness collective wisdom, and encourage colleagues to rethink the entire product lifecycle from a cradle-to-cradle design perspective. By setting targets, implementing data governance, establishing carbon accounting systems, managing institutional processes, and allocating capital expenditures, we drive a net zero culture. We are gradually expanding this approach to our subsidiaries and branches. Since 2006, Winbond has actively participated in reducing greenhouse gas emissions of perfluorocarbons in collaboration with the Taiwan and World Semiconductor Associations. Our collective efforts have resulted in a reduction of approximately 2.28 million tCO_2e emissions, equivalent to the annual carbon sequestration of 5,907 Daan Forest Parks (Note). Simultaneously, we have established long-term mechanisms to ensure the achievement of sustainable development goals. These measures contribute significantly to our progress in reducing direct emissions.

Note Based on data from the Forestry and Nature Conservation Agency, Ministry of Agriculture, and the Taipei City Government's Department of Land Administration, Daan Forest Park covers 25.93 hectares and has a carbon fixation rate of 14.9 tCO_2e per hectare per year. As a result, the park contributes to the annual absorption of approximately 386 tCO_2e.

②Renewable energy use

- Commitment to 90% Use of Renewable Energy at the CTSP fab by 2030
- Investment of NT$955 Million in Green Energy
- Procurement of Green Energy: Onshore Wind Turbines 3.6MW, Solar Power 27MW

Winbond has committed to achieving 90% usage of renewable energy at the CTSP fab by 2030 and actively participated in renewable energy project planning with investments totaling NT$955 million. Concurrently, the company actively engages in green energy procurement. The first procurement of 3.6MW onshore wind power was completed in September 2023, securing approximately 2.1 million kWh of green electricity (with an expected annual generation of about 8.5 million kWh). Starting from April 2024, an additional 27MW of solar power has been acquired.

③Carbon removal

Nature-based Solutions (see "Net-zero case study" for details)
- Green Carbon - 30-year Afforestation Carbon Reduction Plan Removing 1,380 tCO_2e
- Blue Carbon - Investing in the World's Largest Blue Carbon Project
- Seed Conservation and Breeding

To gradually achieve the net-zero target, Winbond has begun researching how to remove carbon from the atmosphere. Scientists have found that capturing and storing carbon dioxide from the atmosphere is an indispensable key element for the success of net-zero, which can be stored in land, oceans, and rock formations. Winbond explores nature-based solutions, starting with green carbon and blue carbon. Through industry-academia collaboration and tripartite cooperation among industry, government, and academia, afforestation and tree adoption are implemented. Additionally, investments in blue carbon and seed conservation and breeding are utilized to remove carbon from the atmosphere while promoting biodiversity benefits.

In 2023, Winbond was invited to participate in the launch ceremony of the Taiwan Carbon Solution Exchange (TCX)'s foreign emission reduction quota trading platform. This indicates the company's active participation in the international carbon trading market to address the carbon neutrality demands in corporate operations, creating diverse sustainable benefits. Such participation not only helps reduce carbon emissions but also contributes to climate change, biodiversity, and employment opportunities.

1 Direct emission reduction
- Promoting net-zero culture
- Driving digital transformation
- Developing green products
- Promoting green manufacturing
- Promoting green supply chain procurement

2 Renewable energy use
- Purchasing renewable energy
- Investing in renewable energy

3 Carbon removal
- Nature-based solutions -afforestation
- Purchasing carbon credits
- Researching on technology-based solutions

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Net Zero Case Study — Nature-Based Solutions (NBS)

Winbond is dedicated to carbon removal while preserving biodiversity

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

①Green Carbon Project: Planting 9,000 Trees to Remove 1,380 tCO_2e in 30 Years

Based on expert advice, Winbond has systematically planned new planting and afforestation operations, following the steps of suitable land, seeds, seedlings, timing, methods, and dimensions (Figure 7). We have invested time and effort in designing the tree planting area, cultivating seedlings, preparing the land, and implementing new planting and tending operations to create a sustainable forest management plan, selecting native tree species with high carbon sequestration capabilities to increase Taiwan's forest carbon sink. Winbond planted five native tree species at the Kaohsiung Fab, Bischofia javanic, Palaquium formosanum, Acacia confuse, Melia azedarach, Fraxinus griffithii. We cooperated with National Chung Hsing University on a 30-year afforestation plan, sequestering an estimated 390 tCO_2e. We have eradicated alien species and planted native tree species to create green spaces in the factory area, achieving carbon sequestration, environmental beautification, air purification, and stabilizing the natural ecological environment.

Meanwhile, Winbond participated in the tree adoption and conservation program of the Forestry and Nature Conservation Service of the Ministry of Agriculture, adopting state-owned forest lands in Tainan City and Chiayi County, and planting four native tree species on 29,400 square meters of land, sequestering an estimated 990 tCO_2e. Over 7,700 trees have been planted on the land, and through afforestation work, we aim to restore the vegetation cover of the hillside, maintain local vegetation, increase biodiversity and species habitat, and provide ecosystem services such as forest soil and water conservation, disaster reduction, soil fertility maintenance, and water flow regulation.

②Blue Carbon - Investing in the World's Largest Blue Carbon Project

Blue carbon refers to the carbon dioxide absorbed and stored by coastal wetlands, including mangroves, salt marshes, and seagrasses. These ecosystems not only store carbon dioxide in their biomass, such as terrestrial forests, but also capture carbon dioxide flowing from upstream sources, acting as a natural filter to trap carbon dioxide in expansive river deltas. With this dual carbon dioxide capture process, coastal wetlands can remove carbon dioxide at a rate forty times faster than terrestrial forests, making blue carbon one of the most effective and valuable carbon removal systems available. Winbond's investment supports a large-scale project to restore mangroves and wetlands in the Indus River Delta region of Pakistan. Spanning 350,000 hectares, the project is expected to reduce carbon emissions by more than 142 million tCO_2e over its 60-year duration from 2015 to 2075. Additional benefits of the project are illustrated in Figure 8.

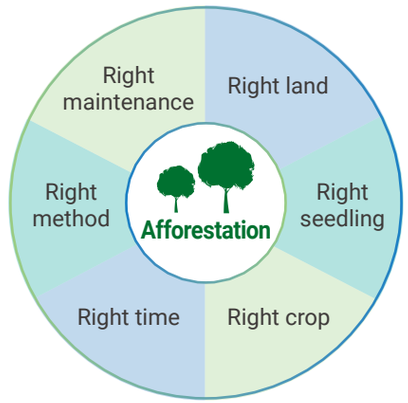

Figure 7 Nature-based solution – Afforestation

- Protect and restores **350,000** ha in the Sindth Indus Delta Region
- Over **42,000** residents are benefits from this projects
- **15,100** people benefit from the health condition improved by this project
- Expected to remove **142** million tCO_2e over the project's 60-year lifetime
- **400** people daily are provided with clean drinking water through the rehabilitation and management of reverse osmosis plants
- **34,600** people benefits from the increasing fishing

Figure 8 Benefits of the Mangrove and Wetland Afforestation and Restoration Project in the Indus River Delta Region of Pakistan.

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Net Zero Case Study — Nature-Based Solutions (NBS)

③Conservation and Breeding Program of Tree Species

- The program focuses on the 42 species of Theaceae plants found in Taiwan, 27 of which have already been collected and cultivated. Of these, 1 species is critically endangered, 1 is endangered, 6 are vulnerable, and 3 are near threatened.

In 2021, Winbond launched the Baoshan Park Species Conservation and Breeding Program, leveraging group resources to cultivate native tree species in Taiwan. The initial focus is on Theaceae plants, with the collection and cultivation of native plant species in Taiwan, as shown in Figure 9. In collaboration with National Chung Hsing University, the program aims to achieve species conservation and breeding, ecological education, and sustainable forestry. The goal is to preserve a forest garden with conservation, education, and cultural value amidst rapid social development and expansion.

Theaceae plants, the main tree species in evergreen broad-leaved forests, are easily destroyed by environmental development. They also have various economic values, making them vulnerable to human hazards such as theft for grafting rootstock or horticultural plants, or for their high-value tea leaves. Hybridization with foreign tea species has also caused confusion in the wild sources of native Theaceae. These factors have harmed Taiwan's native Theaceae populations, and the slow growth of Theaceae plants makes recovery difficult. In response, Winbond is dedicated to protecting Taiwan's native plants and preserving Theaceae species, with the goal of conserving all 42 species of Theaceae plants found in Taiwan. We have cultivated 27 species, including 1 species that is classified as critically endangered, 1 as endangered, 5 as vulnerable, and 3 as near threatened, as listed in the IUCN Red List of Threatened Species.

Figure 9. The conservation and breeding program of Theaceae Plant Species

Creating a Native Wildflower Garden with Ecological Landscaping

- This garden features 20 species of native Taiwanese plants, including 1 critically endangered, 3 endangered, and 3 vulnerable species

In 2023, Winbond's Zhubei Building unveiled a native wildflower garden, designed with the Wild Gardening aesthetic. The design was eco-friendly, energy-efficient, and focused on creating a thriving native plant ecology within the city. This garden featured 20 species of native Taiwanese plants, including 1 critically endangered, 3 endangered, and 3 vulnerable species, as listed in the IUCN Red List of Threatened Species. Spanning approximately 5 square meters, the garden showcases the beauty of the changing seasons, while providing ecological benefits such as air purification, microclimate regulation, and dust absorption. The use of native Taiwanese tree species aligns with SDG 15, protect, restore and promote sustainable use of terrestrial ecosystems. Furthermore, by protecting endangered species, the garden will serve as an educational purpose, raising awareness for conservation efforts.

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

Spiranthes spp., once a thriving and abundant plant on the plains of Taiwan (as depicted in Figure 10), has experienced a significant reduction in its habitat in recent years due to habitat loss, fragmentation, and the decline of native green spaces on the plains. This has resulted in its inclusion in the Convention on International Trade in Endangered Species of Wild Fauna and Flora. The green spaces at Winbond's CTSP Fab and Tainan building, which were free of pesticides, were found to be suitable habitats for the expansion of Spiranthes populations. To conserve Spiranthes populations, Winbond postponed weeding during the plant's flowering and fruiting period, allowing it to reproduce naturally. After the flowering period, maintenance was performed on the greenway to ensure that Spiranthes had the opportunity to continue reproducing through rhizomes and seeds. Wild plants are an essential component of biodiversity. We educated our colleagues on the importance of conserving wild plants and encouraged them to join this initiative. Conservation is urgent. Winbond is committed to preserving Taiwan's biodiversity and ecology by protecting endangered wild plants and contributing to the conservation of this land.

Figure 10 Endangered wild plant – Spiranthes

THE WINBOND STORY

Sustainable Impact

Winbond's Value Creation and the Six Capitals: Inputs and Outputs

Adhering to the principles set forth by the International Integrated Reporting Council (IIRC) in its Integrated Reporting Framework, Winbond discloses its capital inputs, capital outputs, and sustainable management practices. The 2023 summary is as follows:

Capital	Value Creation	Key Project	Outcome
Financial capital	Maintain the foundation of the daily operations, production and services through operations and investments	▪ Strengthening financial structure, expanding cost-competitive production capacity and adjusting product portfolio. ▪ Operating expenses: NT$24 billion.	▪ Consolidated revenue: NT$75 billion. ▪ Consolidated net profit after tax: NT$ 34 million.
Manufactured capital	Including the investment and maintenance of wafer manufacturing integrated factories, production and R&D equipment, and providing products that meet customer needs	▪ Capital expenditures for the acquisition of production machinery and process development equipment: NT$13.8 billion.	▪ The annual production capacity is approximately 828 thousand 12-inch wafers and approximately 536 thousand 6-inch wafers.
Intellectual capital	Knowledge-based intangible assets owned by company. Enhance digitalization to provide more convenient and secure services based on innovative technology	▪ R&D expenses accounted for 23% of revenue. ▪ Promote smart manufacturing using four major digital transformation systems of industrial AI (artificial intelligence) technology. ▪ Digital platform.	▪ Obtained 390 patents globally and domestically, and the accumulated patented granted is 4,900. ▪ Topics of project development includes "Data analysis efficiency", "quality improvement", "output improvement", "energy saving analysis" . ▪ Complete 35 digital transformation activities and trainings; the paperless inventory system can save 1,016 hours of manpower per year.
Natural capital	Committed to minimizing the negative impact of operations on the environment	▪ Implemented a 30-year reforestation plan. ▪ Implemented of ISO 46001 water efficiency management systems. ▪ Process improvements included replacing energy-efficient equipment, installing exhaust treatment equipment, executing energy-saving projects, and utilizing renewable energy.	▪ A total of 9,000 trees will be planted, which is expected to absorb approximately 1,380 tCO_2e from 2023 to 2053. ▪ The water recovery rate of the entire plants: 82.2%. ▪ Cumulative power savings from 2019 to 2023: 456 million kWh.
Human capital	Support employees by enhancing competitiveness, workplace diversity and inclusion, and improving quality of life	▪ Expenditure on employee education and training: NT$25.26 million. ▪ Employee compensation and benefits: NT$16,774,873 thousand. ▪ Conducted the Employee Core Values and Engagement Survey in 2023.	▪ The average training hours for global employees will be 50 hours (mainly core, professional, data science, and management). ▪ Global employee retention rate of 94% in 2023. ▪ 97% of colleagues are committed to staying on and are willing to make full use of their talents in Winbond in the next five years.
Social and relationship capital	Relationships with communities and other stakeholder groups, as well as investment and planning related to social participation	▪ The total amount of investment in social welfare: NT$18.11 million. ▪ Cumulative employee childcare subsidies exceed NT$330 million. ▪ Conducted customer satisfaction surveys.	▪ Public welfare activities implemented three core strategies - "talent cultivation", "nature-based solutions", and "social welfare and environmental protection". ▪ A total of 1,847 employees' children benefited from childcare subsidies from 2011 to 2023. ▪ Customer satisfaction rate: 85%.

Winbond's Three Major Value Chain Stages of Impact 1

Winbond recognizes that alongside business growth and profitability, it must also prioritize the external impact of its operational footprint on society and the environment, and create long-term value for stakeholders. Therefore, Winbond examines the direct and indirect positive (value creation) and negative (cost) impacts of activities at each stage of the value chain on the economy, environment, and society. This helps in understanding the external influence of the three major stages of the value chain (upstream procurement, operations, and customer usage). Positive impacts mainly arise from the economic value generated by operational activities and employee development, while negative impacts primarily stem from the social costs of carbon emissions generated by operational activities.

Value Chain Procurement Stage

- **100% compliance with responsible sourcing and conflict-free mineral usage**
- **Accumulated more than 9,000 hours on supplier ESG workshops**
- **Worked with 13 suppliers and outsourcers on carbon reduction plan**

In the upstream supply chain, Winbond's procurement needs contributed to an increase in the output value of the supply chain, indirectly creating employment opportunities and salary income for employees. However, its environmental footprint also led to various social costs, including greenhouse gas emissions, wastewater emissions, and other forms of pollution derived from the supply chain.

Regarding supply chain sustainability, Winbond actively promoted responsible practices, collaborating with suppliers to identify improvement opportunities and driving sustainable industry transformation. In 2023, we participated in the post-epidemic low-carbon transformation subsidy program of the Industrial Development Administration of the Ministry of Economic Affairs. We worked with 13 suppliers and outsourcing manufacturers to develop carbon reduction plans, with regular reviews of progress planned annually. Implementation is anticipated to commence in 2025, aiming to reduce approximately 5,866 metric tons of carbon dioxide equivalent annually and extend carbon reduction benefits to the sub-industry supply chain.

Winbond also remained committed to responsible sourcing, ensuring the exclusion of conflict minerals to align with market and regulatory expectations. In 2023, our supplier ESG learning workshops exceeded 9,000 hours, further fortifying the resilience of the overall supply chain.

Winbond embraced the government's 'Large Leads Small' policy by driving the upgrade and transformation of the supply chain, earning recognition from the Ministry of Economic Affairs.

Value Chain Operation Stage

- **Global average training hours per employee reached 50 hours**
- **Overall compensation ranked within the top 25% of the industry**
- **Operating income of NT$75 billion in 2023**

Throughout its operational process, Winbond creates various value streams for stakeholders, including net operating profit (for customers/shareholders/investors), remuneration and benefits (for employees), taxation (for the government), and depreciation and amortization (for suppliers). In 2023, Winbond generated NT$75 billion in revenue, contributing to its economic dimension.

In the societal dimension, in 2023, Winbond contributed a total of NT$18.2 billion in tax payments and employee salaries, making significant contributions to national finances and social welfare, enhancing quality of life, and driving economic growth momentum. Additionally, Winbond is committed to fostering employee experiences and skills. Apart from boosting productivity and company revenue, this effort also strengthens each employee's employability. In 2023, Winbond's global employees accumulated a total training time of 189,725 hours, with an average training time per employee of 50 hours. Winbond's salary structure, including "average employee salary," "total employee compensation," and "salary growth rate," all possess market advantages, leading to its inclusion in TWSE RAFI® Taiwan High Compensation 100 Index. This underscores Winbond's dedication to employee care. In 2023, the average annual salary for non-supervisory full-time employees at Winbond was NT$1.59 million.

As a leader in the memory industry, Winbond actively implements green manufacturing practices. Apart from enhancing resource efficiency, Winbond also endeavors to reduce environmental impact by minimizing greenhouse gas emissions, wastewater, waste generation, and chemical usage. Furthermore, Winbond undertakes green investments, such as afforestation and increasing renewable energy sources, to mitigate the ecological footprint of its operations and value chain activities.

Value Chain Customer using stage

- **1.2V HyperRAM saves 33% in power consumption compared to 1.8V HyperRAM**
- **1.2V NOR Flash reduces power consumption by 45%**

Winbond understands that product design and process improvement are the essential ESG missions in the semiconductor industry.

In 2023, through advancing innovations in DRAM and Flash process technologies, we provided energy-efficient product solutions for our customers, aiming to reduce the energy demand during the use of electronic products. This effort not only helps in reducing greenhouse gas emissions but also mitigates the social carbon costs and health impacts associated with electricity consumption of end products. We led industry development by introducing the world's first NOR Flash supporting 1.2V operating voltage, which reduces total power consumption by 45% compared to the widely used 1.8V NOR Flash. Additionally, our Flash division launched the new generation of low-capacity 3V Serial NOR RV series flash memory products, significantly reducing the die area per chip and supporting smaller packaging. This innovation greatly lowers the carbon footprint during the wafer fabrication and packaging stages, with a 34% reduction compared to the previous generation. Simultaneously, our HyperRAM product in DRAM successfully reduced the voltage to 1.2V, cutting power consumption by 33% and extending the usage time of wearable devices. These advancements underscore our commitment to promoting energy-efficient, low-carbon products and highlight our determination to make significant contributions to the well-being of human society.

In the future, Winbond will continue to integrate green design concepts into product development, leveraging core competencies to fulfill its commitment to sustainable development. This includes developing ultra-low power designs and smaller size packaging technologies in Flash and DRAM products, such as Flash SON 2x3, 100BGA LPDDR4/4X. Additionally, Winbond will advance innovative CUBE (customized ultra-bandwidth elements) architecture, enhancing bandwidth with 3D stacking technology to reduce the power required for data transmission.

Winbond's Three Major Value Chain Stages of Impact 2