



# 5

## Green A Producer via Green Technology

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**93%**  
The reduction rate of perfluorocarbon (PFC) emissions during industrial processes

**74,078MWh**  
Total energy savings from energy conservation measures completed between 2017 and 2024

**Outperformed SBT Annual Reduction Target**  
2024 Scope 1+2 emissions reduced by 12.9%  
Scope 3 emissions reduced by 19.4%

Committed to *Creating Shared Value*, Nanya Technology actively inventories potential environmental impacts from its operations, and address topics such as nature, climate, energy, resources, pollutant emissions, and circular utilization. By focusing on product design and advanced technological R&D at the source, we aim to provide consumers with more effective, lower-carbon products. In addition, we have adopted standards that exceed regulatory requirements and align with global sustainability frameworks to prevent or reduce the risks of impacts. Sustainability performance indicators have also been formulated to review progress, so as to ensure that we fulfill our commitment to green production.



## Strategy and Performance of Material Topics

◆ Exceed    ◆ Achieved    ◆ Partially Achieved

Material Topics & Strategy	2024 Goals	2024 Performance and Goal Achievement	2025 Goals
<p><b>Greenhouse Gas (GHG) Management</b></p> <ul style="list-style-type: none"> <li>• SBT target 25% reduction of Scope 1+2 GHG emissions by 2030 compared to the 2020 baseline (469,744 tCO<sub>2</sub>e, 100% coverage), and 27% reduction of product unit emissions by 2030 compared to the 2020 baseline (1,151,865 tCO<sub>2</sub>e, 100% coverage).</li> <li>• Energy savings and carbon reduction Setting short-, medium-, and long-term reduction targets and actively implementing relevant management measures.</li> <li>• Low-carbon manufacturing Advancing production technologies to reduce GHG emissions during the manufacturing process.</li> </ul>	10.0% reduction in Scope 1+2 GHG emissions compared to 2020	◆ Reduction by 12.9%	12.5% reduction in Scope 1+2 GHG emissions compared to 2020
	10.8% reduction in Scope 3 GHG emissions per product unit compared to 2020	◆ Reduction by 19.4%	13.5% reduction in Scope 3 GHG emissions per product unit compared to 2020
	Reduction rate exceeding 93% in process perfluorocarbon (PFC) emissions	◆ Reduction rate reached 93%	Reduction amount exceeding 93% in process perfluorocarbon (PFC) emissions
	0 days of production interruption due to climate change-related disasters	◆ Keep at 0	0 days of production interruption due to climate change-related disasters
<p><b>Energy Management</b></p> <ul style="list-style-type: none"> <li>• Implementation of energy conservation measures Systematic energy management via ISO 50001 to improve energy efficiency.</li> <li>• Innovative applications Acquiring the latest energy conservation technologies and methods through external collaboration and training.</li> </ul>	Implementation of energy conservation measures that resulted in a cumulative energy savings of 72,500 MWh (2.61x10 <sup>8</sup> MJ) from 2017 to 2024.	◆ 74,078 MWh (2.67x10 <sup>8</sup> MJ)	Implementation of energy conservation measures that result in a cumulative energy savings of 75,000 MWh (2.7x10 <sup>8</sup> MJ) from 2017 to 2025.
	Renewable energy usage of 25,000 MWh (9x10 <sup>7</sup> MJ)	◆ 35,230 MWh (1.268x10 <sup>8</sup> MJ)	Renewable energy usage of 45,000 MWh (1.62x10 <sup>8</sup> MJ)
<p><b>Water Management</b></p> <ul style="list-style-type: none"> <li>• Risk response Establishing backup water sources as well as water reservoirs and coordinating water usage via inter-facility emergency response organizations.</li> <li>• Wastewater reclamation and reuse Building categorized treatment systems and implementing multi-stage reuse mechanisms to improve reclamation rates.</li> <li>• Water usage reduction Reducing water usage through daily management.</li> </ul>	>38.5% reduction in total water consumption per unit of production capacity compared to 2017	◆ 35.1% <sup>Note1</sup>	>35.5% reduction in total water consumption per unit of production capacity compared to 2017 <sup>Note2</sup>
	Production losses due to water restrictions: 0 wafers	◆ 0 wafers	Production losses due to water restrictions: 0 wafers
	Average percentage in key water pollution indicators exceeds regulatory standards by 50% or more	◆ 61%	Average percentage in key water pollution indicators exceeds regulatory standards by 52% or more
<p><b>Waste and Pollution Prevention</b></p> <ul style="list-style-type: none"> <li>• Circular economy Increasing reuse rate of waste for more efficient resource utilization.</li> <li>• Source reduction Continuously promoting waste reduction and increasing recycling rates.</li> <li>• Volatile organic compounds (VOCs) Continuously enhancing prevention equipment.</li> </ul>	Number of environmental regulation violation cases: 0	◆ 0 cases	Number of environmental regulation violation cases: 0
	On-site audit and guidance rate for waste treatment vendors >90%	◆ 100%	On-site audit and guidance rate for waste treatment vendors >98%
	Volatile organic compounds (VOCs) reduction rate >91%	◆ >96.4%	Volatile organic compounds (VOCs) reduction rate >92%

Note 1: Product capacity in 2024 decreased by approximately 1.7% compared to 2023, and non-conforming MBR membrane in wastewater treatment led to a decrease in water recovery, resulting in unit production water consumption failing to meet the goal.

Note 2: The original 2025 target for reducing water consumption per unit of production capacity was >38.5%. This was adjusted to >35.5% due to product and capacity conditions.

Note 3: The original 2023 targets for reducing GHGs, perfluorocarbons, and VOCs emissions per chip were removed due to sensitivity to economic fluctuations, which hinders objective comparison of reduction performance.

# 5.1 Nature and Climate Management

Numerous scientific studies have shown that Earth's ecosystems have already been altered by human activities. For example, global warming has led to climate change and biodiversity loss. In response, Nanya Technology acknowledges the dependencies and risks that our operations (production site: Nanlin Technology Park) and value chain pose to nature and climate. In 2023, we became an early adopter of the Task Force on Nature-related Financial Disclosures (TNFD). Following the TNFD and the Task Force on Climate-related Financial Disclosures (TCFD) recommendation guidelines, we announced a biodiversity policy and established a robust LEAP operational mechanism to assess nature- and climate-related dependencies and risks across our operations, upstream suppliers, and downstream customers. We also formulated response strategies and actions, set management targets and indicators, and aim to mitigate impacts of risks.

Nanya Technology identifies material topics related to nature and climate through interviews with executives and relative personnel. These issues are managed through a robust corporate governance framework that facilitates two-way engagement between the Board of Directors and executive management, which in turn supports the implementation of nature and climate-related governance. This section summarizes key points based on the TNFD and TCFD frameworks. For full details, please refer to our [2025 Task Force on Nature- and Climate-related Financial Disclosures Report](#).

## 1. Adaptation

In line with the disclosure framework, we developed strategies and actions to address nature- and climate-related issues in four aspects—governance, strategy, risk management, and indicators and targets. We aim to reduce the impacts of dependencies and risks, and our 2024 efforts are outlined below:

Aspect	Management Strategies and Actions	2024 Implementation Status
 <p><b>Governance</b></p>	<ul style="list-style-type: none"> <li>At the Board of Directors' governance level, nature and climate are listed as Board of Directors topics, and a Sustainable Development Committee was established to implement relevant management practices.</li> <li>At the executive level, management participates in quarterly sustainable management and risk management meetings to review performance and resolve action items. A cross-departmental Sustainability and Risk Management Division under the President Office is responsible for coordination.</li> <li>Efforts are underway to strengthen governance capabilities on nature and climate among the Board of Directors, management, and all employees.</li> </ul>	<ul style="list-style-type: none"> <li>In 2024, 6 Board of Directors meetings and 2 Sustainable Development Committee meetings were held to review topics such as the <i>Sustainability Report</i>, the <i>TNCFD Report</i>, greenhouse gas emissions, carbon fees and self-determined reduction plans, IFRS Sustainability Disclosure Standards implementation, and sustainability rating performance.</li> <li>Each year, the Risk Management Steering Center evaluates the identified material nature- and climate-related risks. In 2024, response measures were implemented for 164 risks based on their risk levels, and the risks are continuously monitored.</li> <li>In 2024, Board members completed 96 hours of training, with courses covering a diverse range of topics such as ESG governance, economics, corporate governance, sustainable finance, green finance, climate change, TNFD, AI, and legal compliance.</li> </ul>

Aspect

Management Strategies and Actions

2024 Implementation Status



Strategy

**Resilience and adaptation**

- Conducting biodiversity sensitivity analysis of operational sites.
- Identifying nature- and climate-related dependencies and impacts of operations.
- Assessing nature- and climate-related management across the value chain.

**Mitigation and transition**

- R&D of low-carbon products, production via green technology, sustainable supply chain management, and development in harmony with nature reduce Nanya Technology's impact on nature and the climate effectively.

**Stakeholder engagement**

- Gathering and consolidating feedback from external stakeholders through various platforms.
- Organizing nature- and climate-related events to communicate Nanya Technology's sustainability principles to relevant stakeholders.

**Resilience and adaptation**

- Making use of geographic information systems and publicly available government data and assessing whether Nanya Technology's operational sites fall within a 2-kilometer radius of biodiversity-sensitive areas.
- Gathering stakeholder concerns on nature- and climate-related issues, and holding cross-departmental workshops to identify short-, medium-, and long-term risks and opportunities. In total, 14 high-dependency factors and 9 material impact factors were identified.
- Simulating nature- and climate-related risk scenarios to assess their impacts on operations, strategy, and financial planning. (1) Transition scenarios: National decarbonization pathways (NDC), IEA WEO net-zero pathways (APS, NZE); (2) Physical scenarios: AR5 RCP2.6, 4.5, 6.0, and 8.5.
- 50 questionnaires were distributed to key suppliers. The analysis identified 2 high-risk, high-exposure dependency factors and 5 factors of high concern to suppliers.

**Mitigation and transition**

- Considering the risks and opportunities associated with various climate transition and physical scenarios, as well as the characteristics of Nanya Technology's operations, strategies have been formulated around green product R&D, green manufacturing, adaptation enhancement, and collaboration with sustainability
- Conducting annual ecological monitoring and restoration efforts to minimize the impact on critical local areas during operational expansion. We also plan to continue with ecological restoration as a form of environmental compensation.

**Stakeholder engagement**

- Actively participating in industry associations to jointly lead nature- and climate-related initiatives and sharing Nanya Technology's practical experiences.
- We collaborate with local organizations to coordinate environmental education, environmental protection initiatives, and cultural preservation events that strengthen ties with the local community. Since 2023, we have actively explored possible environmental compensation measures, and will work to protect and restore natural habitats near operational sites to help foster a better community environment.

Aspect

Management Strategies and Actions

2024 Implementation Status



Risk Management

- In line with the Company's Risk Management Procedure, we assess the materiality of risks and opportunities arising from various scenarios related to natural factors and climate change. Relevant response plans are formulated, integrated into the Enterprise Risk Management (ERM) framework, and regularly confirmed by senior management. A comprehensive contingency plan was formulated for nature- and climate-related risks.
- Carbon fee forecast: The Ministry of Environment announced the fee-charging rates of carbon fees in 2024. The carbon fee program took effect as of January 1, 2025, with collection of fees beginning in 2026.
- GHG emissions for Scopes 1, 2, and 3 are inventoried and verified annually to identify emission sources and prioritize management efforts.
- Promoting product life cycle assessments and addressing emission hotspots.

- Key risks identified are primarily transition risks, including changes in the national energy structure, customer demand for low-carbon products, and the impact of fulfilling SBT commitments. These three mid-term risks are estimated to have a financial impact equivalent to approximately 3-4% of the Company's annual revenue.
- Pertaining to the collection of carbon fees in 2026, if carbon fees are calculated at NT\$300/tCO<sub>2</sub>e, the estimated payment would be NT\$145 million; at NT\$100/tCO<sub>2</sub>, the estimated payment would be NT\$40 million—equivalent to 0.5%-1.6% of annual revenue.
- Major opportunities identified include product technology and new market development. As the net-zero trend continues, smart clean energy technologies are expected to drive growth in DRAM demand. According to IEA scenario analysis, the clean technology market is projected to triple by 2030. The Company will seize this opportunity by continuing to invest in innovative R&D resources, which accounted for 22.5% of total revenue in 2024.
- The WRI Aqueduct Tool was used to assess the Company's short- and long-term (2050) water stress levels, which were found to be medium-to-low risk (10-20%), indicating that it is not located in a water-stressed region. According to Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP)'s Climate Change Water Hazard Map, the Company will not face the risk of water scarcity under the RCP 8.5 scenario in the middle of this century (2036-2065). Since the introduction of water conservation charges in 2023, our efforts in water conservation and reclamation have qualified Nanya Technology for the lowest rate, which limits the annual water cost increase to only about 3% with minimal impact on operational costs.
- GHG emissions in 2024 will be fully inventoried and verified by May 2025. A 100% product environmental footprint inventory has been completed. Management plan improvements have been launched for the top three carbon footprint hotspots identified in 2024.



Indicators and Targets

Emission risk

- Scope 1: Uncertainty in the development of new abatement technologies may reduce the removal efficiency of fluorinated process gases. This could lead to tighter air pollution control and emissions standards in the semiconductor industry, and increase VOCs treatment costs.
- Scope 2: Growing electricity demand will raise the share of renewable energy and carbon fee expenses, and increase operational costs.
- Scope 3: The main emission sources come from goods and services purchased in the upstream value chain, which increases supplier management costs.

Mitigation goals

- Conducting annual inventory and verification for Scope 1, 2, and 3 GHG emissions.
- Setting GHG management and energy/resource recycling targets.
- SBT reduction target: 25% reduction of Scope 1+2 GHG emissions by 2030 compared to the 2020 baseline (469,744 tCO<sub>2</sub>e, 100% coverage), and 27% reduction of Scope 3 product unit emissions by 2030 compared to the 2020 baseline (1,151,865 tCO<sub>2</sub>e, 100% coverage).

Adaptation goals

- Enhancing the Company's drought resilience and increasing water reclamation rates.
- Promoting certifications for green and smart factories.
- Participating in CDP's climate change and water security projects, disclosing related information, and engaging with stakeholders.

Mitigation indicators

- The 2024 inventory and verification of Scope 1, 2, and 3 GHG emissions was completed and covered 100% of revenue.
- 2024 market-based GHG emissions: 409,000 tons; unit emissions: 416 kg per 4Gb kpcs—a 1% reduction from 2020.
- 20 raw material usage proposals were completed via the Kaizen Proposal System in 2024.
- NT\$36.17 million was invested in 2024 to complete 27 energy conservation programs, achieving 5,513 MWh of energy savings, 2,613 tCO<sub>2</sub>e of carbon reductions, and NT\$16 million in electricity cost savings.
- Renewable energy strategy: 35.23 million kWh of renewable energy was used in 2024, accounting for 4.4% of total electricity consumption.
- A self-determined carbon fee reduction plan is scheduled for submission to the Ministry of Environment in June 2025. The plan is in line with benchmark reduction rates, and the need to increase renewable energy procurement was determined after assessment.
- 2024 SBT implementation results: Scope 1+2 emissions reduced by 12.9%; Scope 3 emissions reduced by 19.4%.

Adaptation indicators

- Volume of reclaimed and reused water in 2024 totaled 5.59 million cubic meters.
- Achieved Alliance for Water Stewardship (AWS) Platinum Certification in 2023.
- Included in CDP's Climate Change and Water Security A List in 2024.

## 2. Mitigation

The main sources of greenhouse gas emissions in semiconductor fabs are electricity and perfluorocarbons (PFCs). Electricity is essential for operations and production, powering all machinery and equipment in the facility; perfluorocarbons (PFCs), used in manufacturing processes, are high global warming potential (GWP) greenhouse gases.

### Greenhouse Gas Inventory

The Company conducts its GHG inventory with reference to ISO 14064-1, Ministry of Environment's Climate Change Response Act, Regulations for the Management of the Inventory, Registration, and Verification of Greenhouse Gas Emissions, Greenhouse Gas Emissions Inventory Guidelines, and the WBCSD/WRI GHG Protocol. Organizational boundaries are defined using the 100% operational control approach. At present, all Scope 1, Scope 2, and Scope 3 GHG emissions are verified by SGS, a third-party certification institution, in accordance with international standards.

The inventory covers all of Nanya Technology's production sites and 100% of revenue. The main sources of GHG emissions are purchased electricity and steam (approximately 87.45%) and process emissions (approximately 8.89%). In 2024, total GHG emissions amounted to 409,138 metric tons of CO<sub>2</sub>e (tCO<sub>2</sub>e). Scope 1 emissions were 39,063 tCO<sub>2</sub>e, with no emissions resulting from combustion of biomass fuel. Scope 2 emissions were 370,075 tCO<sub>2</sub>e.

GHG emission factors were based on those announced by Taiwan's Ministry of Environment in February 2024, as well as Taiwan's Energy Administration of the Ministry of Economic Affairs and Nan Ya Plastics' own emission factors for steam at their own facilities. Global Warming Potential (GWP) values were drawn from the IPCC Fifth Assessment Report. Compared to 2020, GHG emissions in 2024 decreased by 12.9%, and the number of wafers produced decreased by approximately 22.8%. In terms of emissions per unit wafer, the 2024 emissions intensity was 0.88 kgCO<sub>2</sub>e/wafer area (cm<sup>2</sup>), lower than in 2023. In terms of emissions intensity per unit of wafer output, the 2024 GHG emissions per kilopieces were 416 (kgCO<sub>2</sub>e/kpcs), representing a 1% reduction compared to 2020.

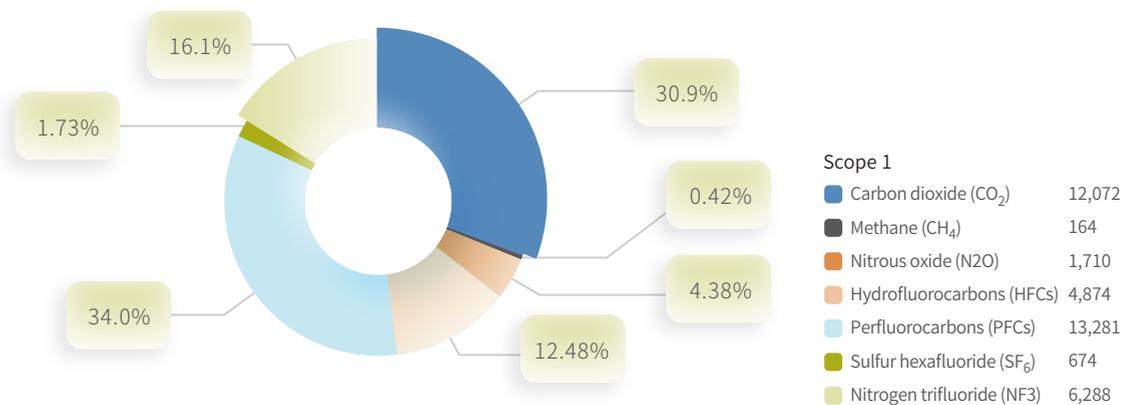
Note 1: GHG emissions per unit area of wafer output.

Note 2: This inventory was conducted in accordance with the Ministry of Environment's 2024 Greenhouse Gas Emissions Inventory Guidelines.

Percentages of 2024 Scope 1 and Scope 2 Emissions by Category

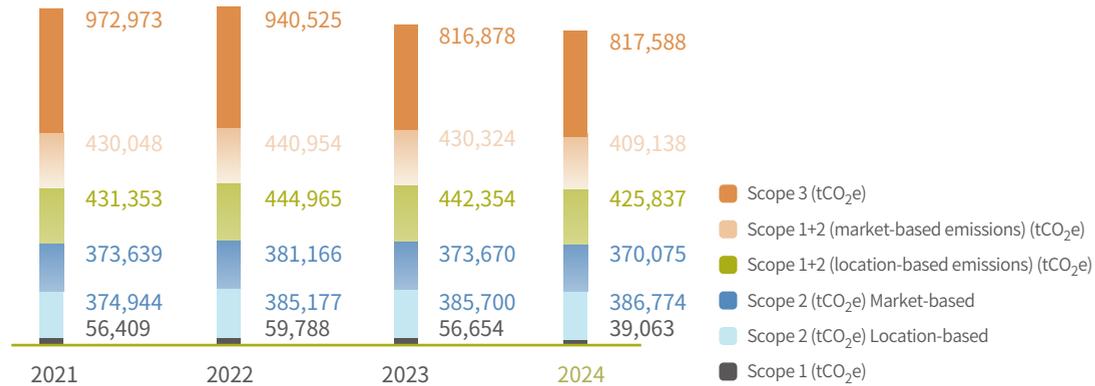


2024 Percentages of Scope 1 Greenhouse Gas Emissions



Scope 1	
Carbon dioxide (CO <sub>2</sub> )	12,072
Methane (CH <sub>4</sub> )	164
Nitrous oxide (N <sub>2</sub> O)	1,710
Hydrofluorocarbons (HFCs)	4,874
Perfluorocarbons (PFCs)	13,281
Sulfur hexafluoride (SF <sub>6</sub> )	674
Nitrogen trifluoride (NF <sub>3</sub> )	6,288

### Greenhouse Gas Emissions by Scope



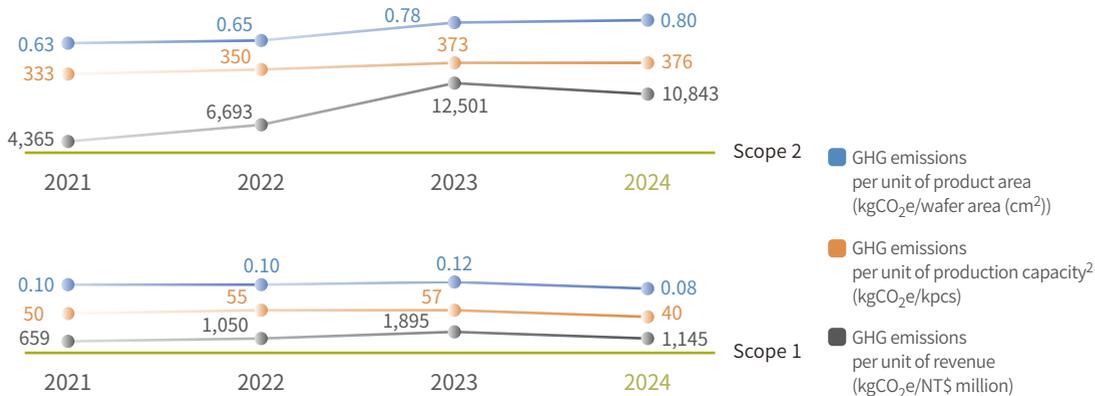
Note 1: There are 9 types of PFC emissions in total, including the process gases from carbon tetrafluoride (CF<sub>4</sub>), perfluoro-propane (C<sub>3</sub>F<sub>8</sub>), hexafluoro-butadiene (C<sub>4</sub>F<sub>6</sub>), octafluorocyclobutane (C<sub>4</sub>F<sub>8</sub>), trifluoro-methane (CHF<sub>3</sub>), difluoromethane (CH<sub>2</sub>F<sub>2</sub>), fluoromethane (CH<sub>3</sub>F), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).

Note 2: Other direct emissions include CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O from processes, and HFCs and SF<sub>6</sub> from non-process sources, such as fire extinguishers, refrigerators, freezers, and switch gear.

Note 3: Energy indirect emissions include electricity and steam consumption. The carbon emission factor for electricity is based on the Energy Administration of the Ministry of Economic Affairs' published value of 0.474 kgCO<sub>2</sub>e/kWh, as of April 14, 2025.

Note 4: In accordance with the GHG Protocol Scope 2 Guidance (2015), GHG emissions are calculated and disclosed using both "Location-based" and "Market-based" methods respectively since we purchased renewable energy. In the above table, the location-based Scope 2 GHG emissions are calculated by multiplying the total electricity used in each area by the average emission factor for that area. On the other hand, market-based emissions are calculated by multiplying contracted renewable energy by their corresponding emission factors.

### Scope 1+2 Greenhouse Gas Emission Intensity



Note 1: This table includes GHG emissions from Scope 1 and Scope 2.

Note 2: Production capacity is calculated using the output of good electronic chips; with the output of various products converted into the equivalent number of 4Gb chips. The unit of measurement is per kilopieces (kpcs).

To make value chain GHG inventories more comprehensive, we conducted Scope 3 inventory in accordance with the Greenhouse Gas Protocol and achieved ISO 14064-1 certification. In 2024, emissions from 7 Scope 3 categories were verified. Among all emission categories, the highest GHG emissions came from the use of sold products, followed by purchased goods and services, and subsequently fuel- and energy-related activities not included in Scope 1 or 2.

### Scope 3 Emissions in 2024

Scope 3 Category	Calculation Basis	Scope 3 Emissions (tCO <sub>2</sub> e)
Purchased goods and services*	Carbon emissions from purchased primary materials and auxiliary materials used in the production process	157,262
Fuel- and energy-related activities not included in Scope 1 or 2*	Upstream GHG emissions from purchased fuels and energy, covering extraction through delivery (B2B)	77,817
Upstream transportation and distribution*	Carbon emissions from transport of main and auxiliary materials from suppliers and packaging plants to the Company's facilities, calculated by ton-kilometers	2,372
Downstream transportation and distribution	Carbon emissions from product delivery from the Company's facilities to its customers, calculated by ton-kilometer	2,272
Investment	Carbon emissions from the investment associate company, Formosa Advanced Technologies, calculated based on equity ownership	35,841
Employee commuting*	Carbon emissions from company shuttles and employee commuting	1,723
Business travel*	Carbon emissions from employees' international business travel by air	130
Waste generated during operations*	Carbon emissions from waste generated during production, including transportation and treatment of waste	1,328
Use of sold products*	Carbon emissions from electricity consumed during customers' use of products	501,684
Capital equipment	Investments related to procurement of equipment and construction	37,159
<b>Total</b>		<b>817,588</b>

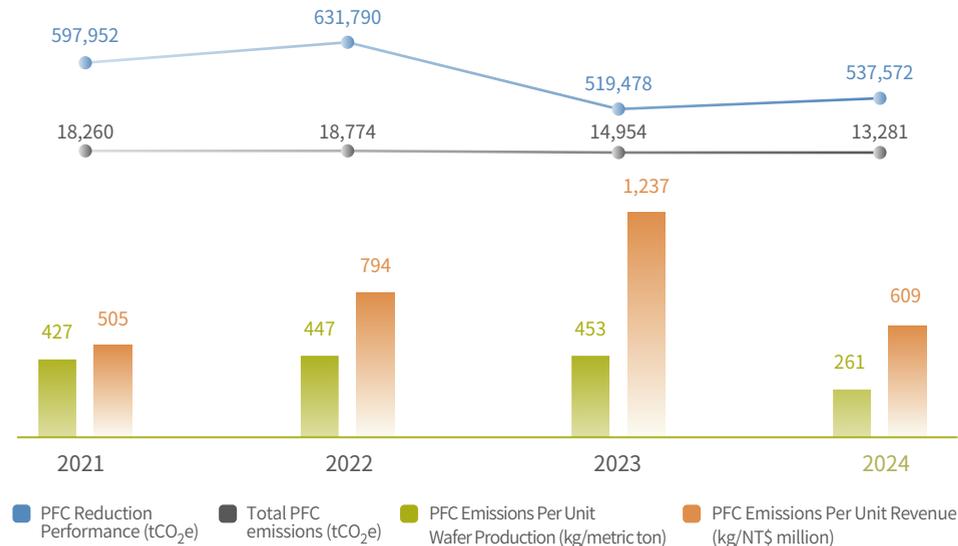
Note: The main emissions factor sources for each Scope 3 category are as follows: For purchased goods and services: SimaPro 9.4.0.2 database (IPCC 2021 GWP 100). For fuel- and energy-related activities, upstream and downstream transportation and distribution, employee commuting, operational waste, and use of sold products: Product Carbon Footprint Platform. For business travel: ICAO Carbon Emissions Calculator. For investments: GHG emissions allocated based on equity share in investees.

Note: Those marked with \* indicate verified items.

## Greenhouse Gas Reduction

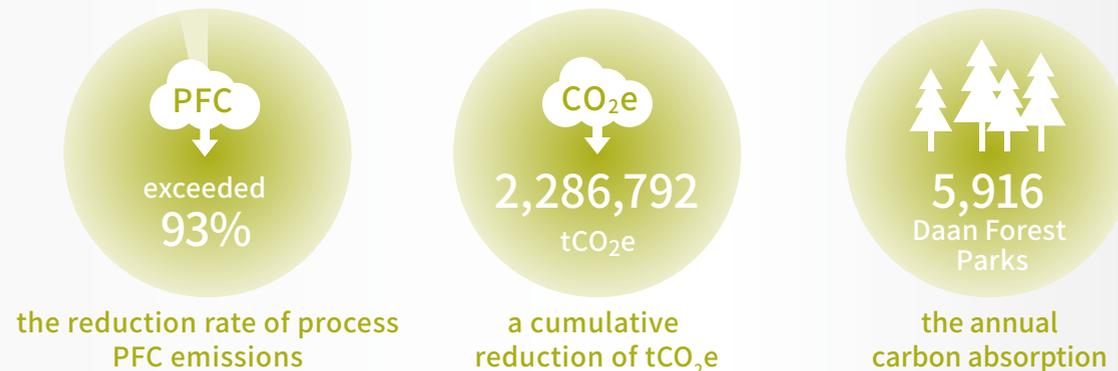
The Company actively promotes voluntary emission reductions and participates in the annual voluntary GHG reduction program launched by the Industrial Development Administration, Ministry of Economic Affairs. Given the high global warming potential (GWP)<sup>1</sup> of perfluorocarbons (PFCs), we have implemented phased GHG reduction plans since 2006. During facility planning, we procured high-efficiency local scrubbers<sup>2</sup>. Currently, the thin-film and etching areas use burn-type PFC local scrubbers, which use high temperatures from combustion to destroy PFCs. To reduce fugitive PFC emissions, Nanya Technology established local scrubber acceptance criteria for PFC reduction rates: CF<sub>4</sub> gas treatment efficiency must exceed 90%, reduction rates of C<sub>3</sub>F<sub>8</sub>, C<sub>4</sub>F<sub>6</sub>, C<sub>4</sub>F<sub>8</sub>, CHF<sub>3</sub>, CH<sub>2</sub>F<sub>2</sub>, and SF<sub>6</sub> must exceed 95%, and NF<sub>3</sub> reduction must exceed 99%. After installation, all local scrubbers undergo PFC abatement verification using FTIR<sup>3</sup> to align with future reduction trends.

### PFC Emissions Trend



By installing high-reduction-rate local scrubbers for PFCs during facility planning and implementing process PFC reduction initiatives, we set a reduction target of at least 90%. From 2021 to 2024, the reduction rate of process PFC emissions exceeded 93% each year, achieving a cumulative reduction of 2,286,792 tCO<sub>2</sub>e—equivalent to the annual carbon absorption of 5,916 Daan Forest Parks.

Note: Based on the estimation published by the Energy Administration, Ministry of Economic Affairs, that one Daan Forest Park absorbs 386.5 metric tons of CO<sub>2</sub> annually.)



Note 1: Global Warming Potential (GWP) refers to the warming impact of a gas relative to CO<sub>2</sub> (with CO<sub>2</sub>'s GWP set at 1). In this context, high GWP refers to gases with a GWP greater than 675. (Based on GWP values from the IPCC Fifth Assessment Report (FAR))

Note 2: Local exhaust gas treatment unit.

Note 3: Fourier-transform infrared spectrometer.

## Carbon Disclosure Project

Upholding the principle of transparent disclosure, we have participated in the Carbon Disclosure Project (CDP), a nonprofit initiative, since 2009, annually disclosing data related to GHG emissions and reduction. From 2021 to 2024, we consistently achieved Leadership level ratings in the CDP Climate Change project. In addition to disclosing carbon emissions-related information through CDP and this report, Nanya Technology also voluntarily reports GHG emissions and reduction data through the Responsible Business Alliance (RBA) greenhouse gas reporting system, and provides product carbon emission data to enable customers to calculate the carbon footprint of their products.

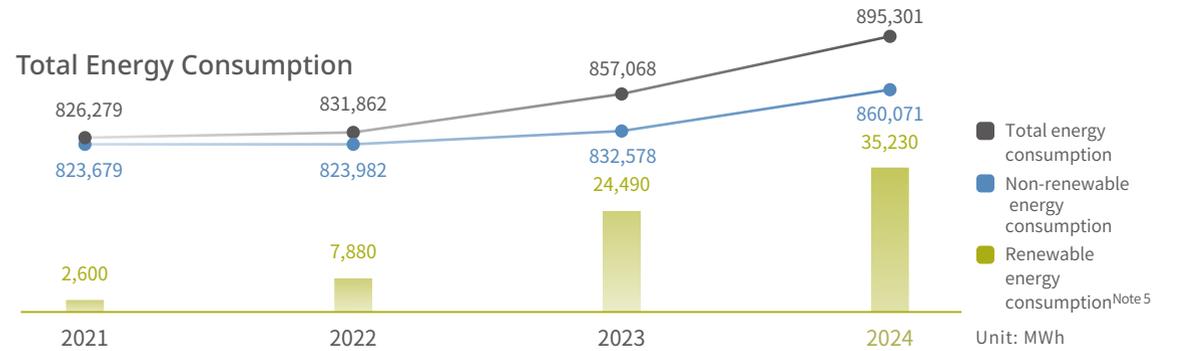
# 5.2 Energy Resource Management

## 1. Energy Management

### Energy Structure

The environmental impact and finite availability of fossil fuels have become critical concerns, making effective energy management an urgent priority. Nanya Technology primarily uses purchased electricity, steam, and natural gas, and does not generate energy in-house. Indirect energy use which results in GHG emissions includes raw material transportation within facilities, raw material suppliers' production activities, waste transportation/treatment, employee business travel, and commuting. In 2024, the primary energy sources used by Nanya Technology were purchased electricity (89.5% of total energy consumption), natural gas (6.6%), and steam (3.9%). Aside from a portion of purchased electricity sourced from renewable energy, the rest were non-renewable. Diesel was also used, but its consumption was extremely low—less than 0.03% of total energy consumption—so it was excluded from energy consumption statistics. We began purchasing renewable energy (electricity) in 2020. By 2024, renewable energy (electricity) accounted for 3.94% of the Company's total energy consumption, accounting for 4.4% of total electricity consumption. In 2024, production capacity<sup>Note 1</sup> decreased by 1.7% compared to 2023. However, due to the continued implementation of advanced process technologies, total energy consumption increased. Thus Nanya Technology's total energy consumption (electricity + natural gas + steam) in 2024 reached 895,301 MWh (3.223x10<sup>9</sup> MJ), including 860,071 MWh (3.096x10<sup>9</sup> MJ) of non-renewable energy and 35,230 MWh (1.268x10<sup>8</sup> MJ) of renewable energy—a 4.46% increase from 2023. Electricity consumption was 801,326 MWh (2.885x10<sup>9</sup> MJ)<sup>Note 2</sup>, comprising 35,230 MWh (1.268x10<sup>8</sup> MJ) of renewable energy and 766,096 MWh (2.758x10<sup>9</sup> MJ) of non-renewable energy. Natural gas usage was 58,923 MWh<sup>Note 3</sup> (2.121x10<sup>8</sup> MJ, 5,630,508 m<sup>3</sup>), and steam usage was 35,051 MWh<sup>Note 4</sup> (1.262x10<sup>8</sup> MJ, 46,340 metric tons). In terms of energy intensity, energy consumption per unit of production capacity in 2024 was 0.91 MWh/kpcs, a 6.2% increase from 2023.

Nanya Technology has developed an Energy Review Management Procedure to effectively manage its energy use and consumption. This procedure allows the Company to assess conditions of energy use and consumption, identify major energy-consuming operations and energy-saving opportunities, establish controls, and set measurable improvement targets to achieve energy conservation benefits. The process begins with creating an energy review checklist, calculating energy consumption by equipment unit, identifying major energy-consuming equipment, establishing energy baseline data, and setting suitable performance indicators to achieve specific energy-saving goals. The effectiveness of energy-saving initiatives is then regularly evaluated. In addition, monthly meetings are held to audit energy reviews. After



### 2021-2024 Electricity Consumption

	2021	2022	2023	2024
Renewable electricity (MWh)	2,600	7,880	24,490	35,230
Non-renewable electricity (MWh)	728,787	736,419	741,952	766,096
Electricity consumption per unit of production capacity (MWh/kpcs)	0.65	0.68	0.77	0.81

### 2021-2024 Natural Gas Consumption

	2021	2022	2023	2024
Natural gas consumption (m <sup>3</sup> )	4,682,857	4,780,740	5,228,039	5,630,508
Natural gas consumption (MWh)	48,702	50,030	54,711	58,923
Natural gas consumption per unit of production capacity (m <sup>3</sup> /kpcs)	4.2	4.4	5.2	5.7

### 2021-2024 Steam Consumption

	2021	2022	2023	2024
Steam consumption (metric ton)	61,066	49,620	47,482	46,340
Steam consumption (MWh)	46,190	37,532	35,915	35,051
Steam consumption per unit of production capacity (metric ton/kpcs)	0.054	0.046	0.047	0.047

Note 1: Production capacity is calculated using the output of good electronic chips; with the output of various products converted into the equivalent number of 4Gb chips. The unit of measurement is per kilopieces (kpcs).

Note 2: Based on the Energy Product Unit Heating Value Table updated in 2024 by the Energy Administration, Ministry of Economic Affairs for unit conversion, 1 kWh = 860 kcal = 3.6 megajoules; 1 MWh = 3,600 megajoules.

Note 3: The electric energy of natural gas is calculated as 1 m<sup>3</sup> = 10.465 kWh (based on the Energy Product Unit Heating Value Table updated by the Energy Administration, Ministry of Economic Affairs, in 2020; 1 kWh = 860 kcal, 1 m<sup>3</sup> = 9,000 kcal).

Note 4: The steam used on-site is converted into saturated steam at 132.88 °C. According to the saturated steam table, 1 metric ton of steam equals to 650,500 kcal/metric ton, which is equivalent to 756.4 kilowatt-hours of energy (based on the conversion rate of 1 kWh = 860 kcal).

Note 5: Renewable energy used on-site is green electricity purchased from external sources. In 2020, only certificates were purchased; from 2021 onward, electricity and certificates are purchased in bundle.

we evaluate factors such as cost of improvements, energy-saving potential, equipment lifespan, regulatory requirements, and implementation difficulty, priorities are set and energy-saving plans are launched accordingly. Results are reported and future goals are approved at annual executive review meetings. Furthermore, the Company continually explores new energy-saving technologies and applications through external seminars and training, internal forums, and other means. We continue to invest in R&D to introduce innovative energy-saving solutions and to reduce energy consumption. For example, in 2021, we completed the implementation of smart controls for our chilled water system, investing NT\$49.9 million and significantly reducing power consumption by 18%. In 2024, we invested NT\$23 million to replace the ceramic zeolite rotor of the VOCs air pollution and exhaust gas treatment system with fiberglass rotors, resulting in a significant 50% reduction in natural gas consumption.

## Renewable Energy and Usage Planning

In terms of renewable energy usage, Nanya Technology implements planning and execution in the following three key phases.



### Phase 1: In-house evaluation and pilot implementation

In 2020, Nanya Technology purchased 362 Taiwan Renewable Energy Certificates (T-RECs) via the renewable energy trading platform. The Company began assessing available space at existing facilities and installed a 27.36 kW rooftop solar PV system on a new building, which was completed and commissioned in 2022. The system generated 27 MWh in 2024 (sold to Taipower). Future new facilities will fully utilize land resources and consider the installation of green energy equipment.



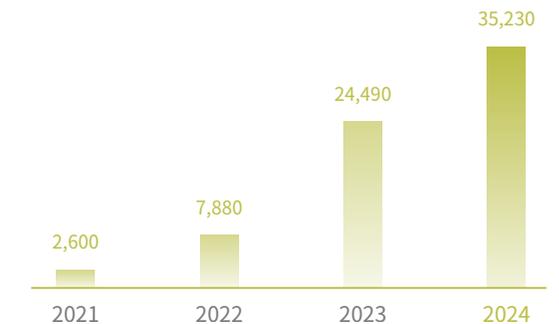
### Phase 2: External collaboration

Through external partnerships, Nanya Technology collaborated with renewable energy sellers to obtain larger electricity supply. We adhered to regulatory requirements, and the usage gradually soared. In 2024, the Company used 35,230 MWh ( $1.268 \times 10^8$  MJ) of externally purchased solar power, accounting for 4.4% of the Company's total electricity consumption. Total investment amounted to NT\$179.5 million, and carbon emissions were reduced by 17,404 metric tons<sup>1</sup>.



### Phase 3: Aligning with international standards and achieving net zero

In alignment with global initiatives such as SBT and RE100, Nanya Technology has set a target for renewable energy to account for 25% of total electricity consumption by 2030. The Company will pursue transfer supply contracts from large-scale renewable energy projects as it moves toward 100% renewable energy use.



Note 1: CO<sub>2</sub>e emissions from electricity use are calculated using the most updated emission factor in 2023 published by the Energy Administration, Ministry of Economic Affairs: 0.494 kgCO<sub>2</sub>e/kWh.

## Enhancing Energy Usage Efficiency

To effectively reduce the environmental impact of the greenhouse effect, Nanya Technology integrated energy conservation into its facility design from the outset, adopting energy-saving technologies such as a dual-temperature chilled water system, waste heat recovery and utilization in freezers, and more. Over the years, we continue to introduce various energy-saving technologies, improving equipment through various mindsets including automated controls, enhanced equipment performance, energy recovery, and improved production management. Additionally, energy conservation is prioritized during the equipment design and procurement phases. Nanya Technology implemented the ISO 50001 Energy Management System in 2018 and completed its certification. To strengthen employee awareness of energy conservation, we provide training programs to equip designated energy management personnel in each department. These trained

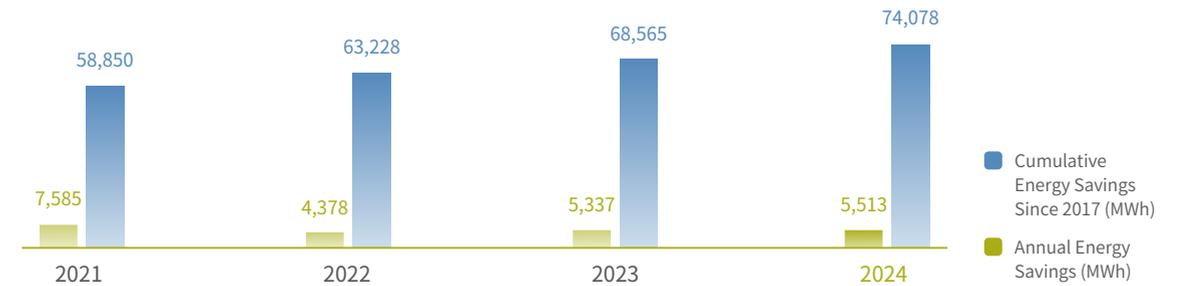
individuals support the implementation of departmental energy management tasks and energy-saving initiatives. Currently, there are 119 qualified energy management personnel, and a total of 347 participants have completed training over the years.

In 2020, the Company invested NT\$21.8 million to build an energy management platform—the Energy Consumption Real-Time Monitoring Platform, which enables statistical analysis and smart energy-saving management of system operations. It also supports energy consumption management and improvements across various organizations and machineries. In 2023, energy baseline data was added to optimize the system's functionality, enabling more timely analysis of equipment energy consumption and stronger oversight. Optimization was completed in June 2024. In addition, water and energy conservation experts

are assigned with the help from the Energy and Water Conservation Service Team within participating companies of the Group and collaborate with specialists from other Group companies to provide on-site guidance and conduct inspections at various facilities, including those of the Company. These efforts span Formosa Plastics Group's facilities in northern, central, and southern Taiwan, with the goal of enhancing water and energy conservation performance across all facilities through expert audits and targeted support.

Nanya Technology's energy-saving target for 2030 is a cumulative energy savings of 103,000 MWh/year from 2017 to 2030. In 2024, NT\$36.17 million was invested in 27 energy-saving projects, generating a total energy-saving benefit of 5,513 MWh/year (1.985x10<sup>7</sup> MJ/year).

### Historical Performance in Energy Conservation



### Energy Consumption Real-Time Monitoring Platform



### Energy Conservation Programs

**Energy Conservation Programs Completed in 2024**

- Energy conservation from process equipment management: **17** programs
- Energy conservation from non-process equipment management/improvement: **2** programs
- Improvements to process equipment: **2** programs
- Energy conservation from lighting improvement and management: **4** programs
- Energy conservation from air pollution treatment equipment: **1** program
- Energy conservation from wastewater treatment equipment: **1** program

**Energy Conservation Benefits**  
**5,513 MWh/year** (1.985x10<sup>7</sup>MJ/year)  
**Carbon Reduction (tCO<sub>2</sub>e)** **2,613**

**Planned Energy Conservation Programs for 2025**

- Energy conservation from process equipment management: **8** programs
- Energy conservation from improvements to process equipment: **6** programs
- Energy conservation from CDA equipment: **1** program
- Energy conservation from lighting improvement and management: **5** programs
- Energy conservation from non-process equipment management: **6** programs
- Energy conservation from improvements to non-process equipment: **2** programs
- Energy conservation from chillers: **1** program
- Energy conservation from air conditioners: **1** program

**Estimated Energy Conservation Benefits**  
**3,301 MWh/year** (1.188x10<sup>7</sup>MJ/year)  
**Carbon Reduction (tCO<sub>2</sub>e)** **1,565**

Note 1: Energy consumption reductions are primarily calculated based on the measured consumption of equipment before and after improvement. Where measurements are not feasible, calculations are based on the difference in rated power multiplied by operating hours.

## Energy Conservation Program Highlights



Replacing the zeolite rotor concentrator of VOCs exhaust gas treatment system

**Natural gas savings of 129,210m<sup>3</sup> per year**

The VOCs air pollution and exhaust gas treatment system originally used ceramic zeolite rotor concentrators. After prolonged use, their efficiency declined. A comparison of ceramic zeolite rotors versus fiberglass rotors under equal airflow showed that fiberglass rotors offer higher efficiency and concentration ratio, with natural gas consumption significantly reduced to half that of ceramic rotors. After we replaced two sets of zeolite rotor concentrators with fiberglass ones, efficiency was greatly increased—VOCs treatment capacity improved from 150 ppmv to 300 ppmv, saving 129,210 m<sup>3</sup> of natural gas per year.



Energy management optimization: Lam EOS chiller deactivated and replaced with PCW cooling,

**saving 350,000 kWh per year**

- In the Lam EOS system, the iCDS (HF 1:300) chemical tank relies on a dedicated chiller to regulate circulation temperature. The primary energy consumption comes from the compressor in the chiller.
- Testing and verification confirmed that using the facility's PCW alone can adequately control iCDS temperature.
- The chiller's internal compressor was shut down, and internal piping within the chiller was modified so that the PCW pipeline bypasses the compressor and connects directly to the iCDS chemical tank, thereby reducing the energy consumption associated with compressor operation.
- Energy consumption is reduced by 345,600 kWh per year.

## 2. Water Resource Management

Due to global climate change, rainfall in different regions of Taiwan has become increasingly polarized, resulting in both flooding and water shortages occurring simultaneously. Therefore, as a key member of the semiconductor industry, Nanya Technology has long been attuned to the water scarcity risks brought about by global climate change and deeply understands the impact that climate change and water can have on operations. To mitigate its environmental impact and the risks associated with water shortages, Nanya Technology continues to advance water conservation initiatives and is further committed to water reclamation and reuse. In 2023, the Company adopted the Alliance for Water Stewardship Standard (AWS), and was awarded AWS's highest certification level in 2024, Platinum, following its 2023 assessment. From the source of every drop of water to its use and final discharge, Nanya Technology practices pragmatic and effective water management to protect the ecosystem. Cherishing every drop of water, we continue to improve water usage efficiency while actively aligning with the international AWS standards and implementing the Five Outcomes to achieve sustainable water management in a systematic and ongoing manner.

Nanya Technology's efforts in water resource management have been recognized by international environmental evaluation bodies. From 2022 to 2023, the Company received an "A" leadership rating in the CDP Water Security category for two consecutive years. From 2022 to 2024, we also received the Taiwan Corporate Sustainability Award's Water Resource Management Leadership Award for three consecutive years. In 2024, the Company was awarded Platinum-level certification by the Alliance for Water Stewardship Standard, affirming its commitment to tackling climate change and water resource management while contributing to global sustainability goals.

### Nanya Technology's Water Management Policy

**A**

Through employee training, organizational planning, and the implementation of water conservation and emergency response systems, we continuously optimize water resource management across our facilities.

**B**

We disclose quantifiable water performance indicators, with a core objective of continuously enhancing water usage efficiency.

**C**

Aiming to improve effluent quality, we continuously enhance our water treatment systems to reduce the impact of our operations on local basins.

**D**

Through environmental education and continuous monitoring, we strive to safeguard the health of vital water-related areas.

**E**

We have implemented comprehensive environmental hygiene measures and drinking water quality systems across our facilities to reduce the risk of infectious disease.

Nanya Technology's water resource management policies and requirements apply to all operational, R&D, and manufacturing sites. Matters related to water usage, conservation, and risk assessments are compiled annually and reported to the Board of Directors for review.



Actively managing water indicators and implementing conservation in operations to maximize the use of water resources.



Assessing risks and opportunities under climate change to mitigate the impact of water scarcity.



Engaging relevant stakeholders to promote awareness and conservation of water resources.



Implementing a categorized wastewater treatment system as well as multiple reclamation and reuse processes to maximize water utilization efficiency.

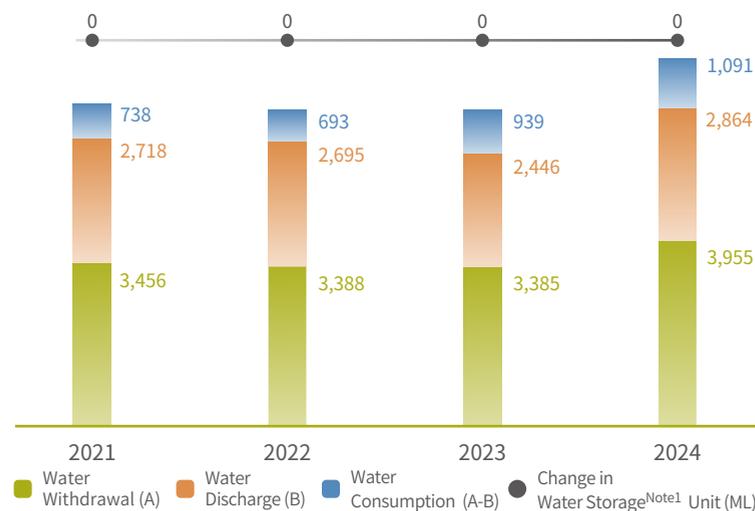


Complying fully with regulations and continuing to strengthen water treatment facilities to reduce the risk of environmental pollution.

## Water Resource Structure

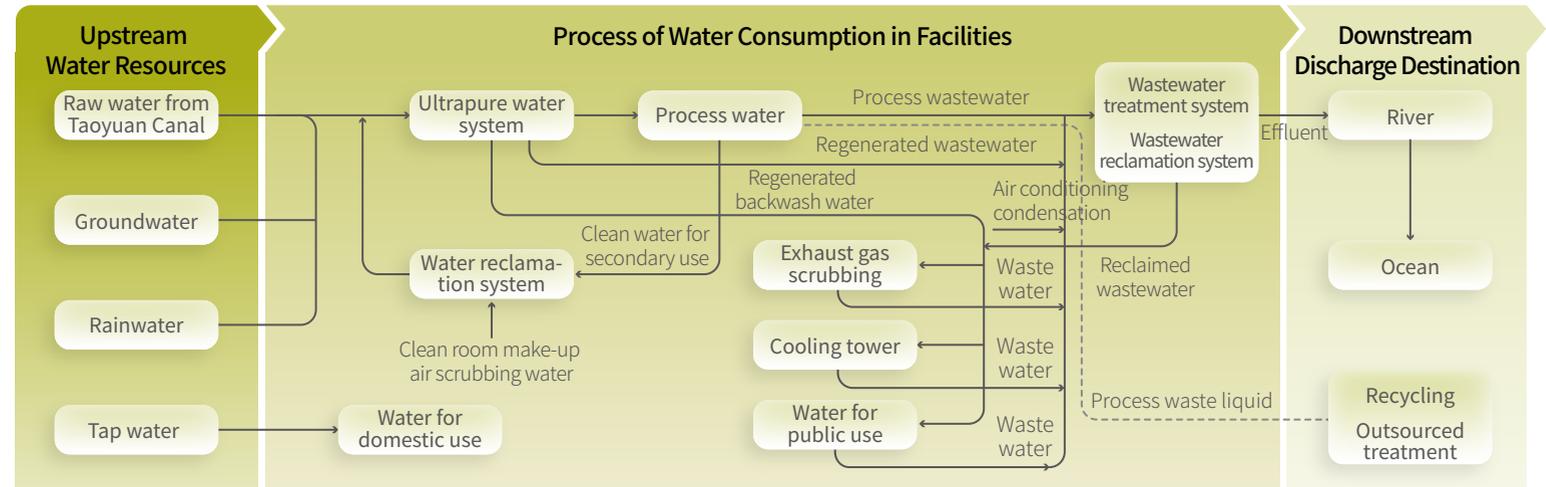
In 2024, Nanya Technology's total water withdrawal was 3,955 million liters, primarily sourced from Taoyuan Canal (approximately 91.5%, or 3,619 million liters), followed by well water (approximately 7.9%, or 314 million liters), and tap water (approximately 0.6%, or 22 million liters). Rainwater has been recycled and reused over the years, but it was temporarily suspended in 2024 due to equipment changes for the expansion of new facilities. Nanya Technology's total water withdrawal in 2024 increased by 16.9% compared to 2023. Despite this, production capacity in 2024 decreased by 1.7% from 2023. In terms of water usage intensity, water consumption per unit of production capacity was 4.02 kiloliters/kpcs, an 18.8% increase from 2023. Total ultrapure water consumption in 2024 was 3,484 million liters, a 2.5% increase compared to 2023. In terms of water usage intensity, ultrapure water consumption per unit of production capacity was 3.54 kiloliters/kpcs, a 4.3% increase from 2023.

### Nanya Technology's Water Consumption

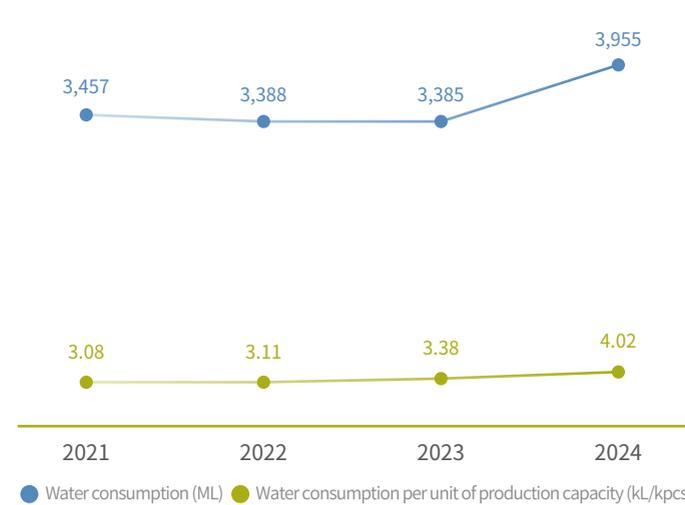


Note 1: Change in water storage = storage on 12/31 of the year - storage on 1/1 of the same year

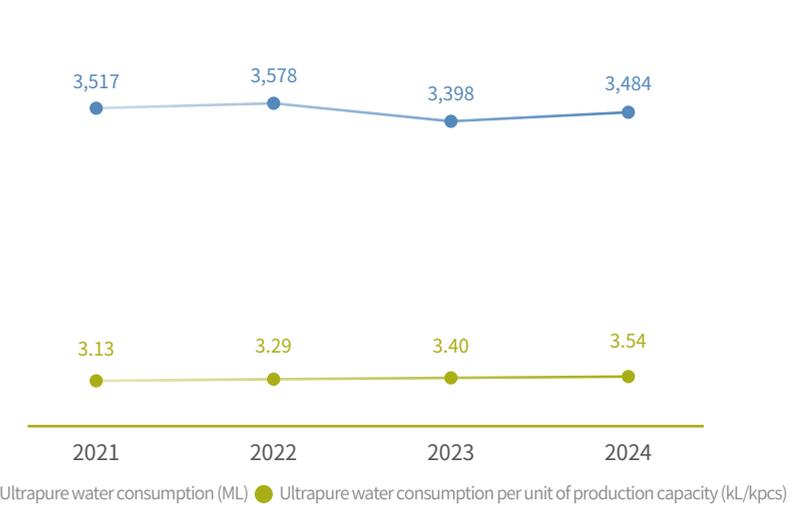
### Nanya Technology's Water Usage Structure



### 2021-2024 Water Consumption Trend



### 2021-2024 Ultrapure Water Consumption Trend



## Water Resource Risk Management

Water Risk Factors	Assessment Boundaries	Stakeholders Considered	Assessment Methodology	Assessment Results and Responses
 <p>Water-related dependencies and impacts</p>	<ul style="list-style-type: none"> <li>Nanya Technology's operational sites</li> <li>Upstream supply locations</li> <li>Downstream shipment locations</li> </ul>	<ul style="list-style-type: none"> <li>Local residents</li> <li>Government agencies</li> <li>Suppliers</li> <li>Customers</li> </ul>	<ul style="list-style-type: none"> <li>The WRI Aqueduct Tool of the World Resources Institute (WRI).</li> <li>The IPCC AR5 RCP8.5 scenario maps published by the Disaster Risk Adaptation (hereinafter referred to as "DR.A") platform of the National Science and Technology Center for Disaster Reduction (hereinafter referred to as "NCDR").</li> <li>We referred to the System of Environmental-Economic Accounting (SEEA) as we identified dependencies and impacts based on provisioning, regulating and support, and cultural services through interdepartmental workshops.</li> </ul>	<ul style="list-style-type: none"> <li>A risk simulation analysis of water sources found that 91.5% of the Company's water supply comes from the Taoyuan Canal, which is fed by Shimen Reservoir. The current water stress level is low. Both the short-term and long-term (up to 2050) water stress risks are categorized as medium-to-low (10-20%), indicating that it is not located in a water-stressed region.</li> <li>An assessment of 31 Taiwan-based supplier locations showed that 22 are situated in high-risk areas for flooding and drought (levels 4 and 5), mainly concentrated in central and southern Taiwan.</li> <li>Among 23 shipment locations assessed for climate change risk (flooding), 15 were identified as high-risk.</li> <li>Water is a critical ecosystem service on which Nanya Technology depends. The substantial water use in semiconductor manufacturing can also lead to additional impacts—from the competition for water with nearby communities or businesses to possible ecological degradation from overconsumption.</li> <li>Nanya Technology discharges wastewater during its operations. Even if the wastewater discharged is compliant with regulations, it may still exceed the local environmental capacity, leading to biodiversity loss.</li> <li>A supplier water resource sharing meeting was held in September 2024 to assist suppliers in water management and conservation measures. Around 30 suppliers attended the event.</li> <li>In 2024, a total of 19 suppliers underwent on-site audit and guidance. 9 of them completed water conservation programs, resulting in annual water savings of 272 million liters. In 2025, 25 suppliers are expected to receive audits and support, with estimated annual water savings of 100 million liters.</li> </ul>
 <p>Future Water Availability</p>	<ul style="list-style-type: none"> <li>Nanya Technology's operational sites</li> </ul>	<ul style="list-style-type: none"> <li>Local residents</li> <li>Government agencies</li> </ul>	<ul style="list-style-type: none"> <li>According to the TCCIP Climate Change Water Hazard Map, the Company will not face the risk of water scarcity under the RCP 8.5 scenario in the middle of this century (2036-2065).</li> </ul>	<ul style="list-style-type: none"> <li>In northern Taiwan, the annual average rainfall is projected to increase by 12%, while spring rainfall may decrease by 5%. The Company's backup water supply exceeds the projected reduction in rainfall. Even if the water supply from the Shimen Reservoir declines during spring due to reduced precipitation, assessments show that production needs can still be met, with no risk of water shortage.</li> <li>The Shimen Reservoir, which supplies water to Nanya Technology, provides about 800 million liters per day. The Company's daily water consumption is approximately 11 million liters, representing a regional water impact level of 1.38%.</li> <li>We coordinate and communicate with the Irrigation Agency and the Northern Region Water Resources Branch of the Water Resources Agency. In times of water scarcity, we cooperate with government contingency plans to ensure effective utilization of water resources, reduce the impact of water shortages in supply basins, and maintain supply stability.</li> </ul>

Water Risk Factors	Assessment Boundaries	Stakeholders Considered	Assessment Methodology	Assessment Results and Responses
<p>Future Water Quality</p>	<ul style="list-style-type: none"> <li>Nanya Technology's operational sites</li> </ul>	<ul style="list-style-type: none"> <li>Local residents</li> <li>Government agencies</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of sustainable water management (AWS)</li> </ul>	<ul style="list-style-type: none"> <li>All wastewater is separately collected and discharged to the appropriate wastewater treatment facilities. Over 20 distinct pipelines are used to segregate and convey different types of wastewater. To ensure that the quality of discharged water meets standards, real-time monitoring is conducted in coordination with the Environmental Protection Department, with sampling and analysis conducted every quarter by external contractors to further strengthen our wastewater quality control.</li> <li>During typhoon season, sediment buildup during reservoir discharge increases turbidity in the Shimen Reservoir, which can affect water supply. However, the reservoir's multi-level intake project was completed in 2021, significantly mitigating high turbidity. In addition, a rapid sedimentation tank has been installed at our facility, capable of treating raw water with high turbidity (&lt;10,000 NTU). Therefore, the risk of future water supply disruptions caused by water quality and high turbidity is considered low.</li> </ul>
<p>Local Stakeholders</p>	<ul style="list-style-type: none"> <li>Nanya Technology's operational sites</li> </ul>	<ul style="list-style-type: none"> <li>Local residents</li> </ul>	<ul style="list-style-type: none"> <li>The Shimen Reservoir, which supplies water to Nanya Technology, provides about 800 million liters per day. The Company's daily water consumption is approximately 10 million liters, representing a regional water impact level of 1.25%.</li> </ul>	<ul style="list-style-type: none"> <li>The Company's production water primarily comes from the Taoyuan Canal, drawn directly under a water supply agreement with the Irrigation Agency, which manages the Irrigation Aqueduct. The agreement stipulates the volume of water to ensure supply stability and permits withdrawals beyond contract levels in emergencies, increasing water-use flexibility.</li> <li>The Environmental Quality Supervision Committee: Every quarter, Nanya Technology commissions a third-party organization to conduct monitoring surveys on the local ecology, hydrology, and air quality around the facilities. The survey results are then reported to the Environmental Quality Supervision Committee.</li> <li>Nanya Technology, in collaboration with nearby Formosa Plastics Group facilities, has established an emergency response organization for water shortages. Through this organization, facilities can coordinate emergency water allocation and support. To date, there have been no incidents of production losses due to water shortages.</li> </ul>
<p>Water-Related Regulations</p>	<ul style="list-style-type: none"> <li>Nanya Technology's operational sites</li> </ul>	<ul style="list-style-type: none"> <li>Local residents</li> <li>Government agencies</li> </ul>	<ul style="list-style-type: none"> <li>Regulation on water conservation charges.</li> </ul>	<ul style="list-style-type: none"> <li>In 2024, the Company achieved a water reclamation rate of 95.9%<sup>Note</sup>, verified by a third-party certification body. This exceeds the government's industry benchmark range of 50%-85% and qualifies for the lowest announced rate. The estimated annual water fee increase is only around 3%, posing a minimal impact on operational costs.</li> <li>Nanya Technology communicates with local residents and the public by disclosing information related to its water management, including real-time monitoring of effluent discharge, to address public concerns.</li> </ul>

Note: The water reclamation rate for water conservation charge calculation is based on the formula specified by the Industrial Development Administration, Ministry of Economic Affairs.

Nanya Technology mainly sources its water from Shimen Reservoir, drawing it through the Taoyuan Canal for production use following treatment. The water is drawn independently using a gravity-fed system, which operates by gravity flow, ensuring no impact on the water resource ecology or other usage. Additionally, rainwater is collected for production use, and tap water is supplied for domestic purposes. Nanya Technology currently operates a single manufacturing facility located in New Taipei City, Taiwan. Due to the highly uneven geographic and seasonal distribution of rainfall in Taiwan, regional and seasonal droughts are common. Using the World Resources Institute's Aqueduct Tools, Nanya Technology assessed its water source—the Taoyuan Canal, which is fed by the Shimen Reservoir and supplies 91.5% of the Company's water. The current water stress level is low, and both the short-term and long-term (up to 2050) water stress risks are categorized as medium-to-low (10–20%). According to the Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP), under the RCP 8.5 scenario for the mid-century period (2036-2065), northern Taiwan is expected to see a 12% increase in annual average rainfall, though spring rainfall will decrease by 5%. In summary, the water sources at Nanya Technology's operational sites are located in areas with medium-to-low short-term risk, while the number of consecutive dry days in northern Taiwan may increase by 1.2-2 days on average in the future. The Company uses a large amount of water for its manufacturing processes—approximately 11 million liters of water daily. An increase in water shortage or droughts can elevate the risk of operational disruption.

In line with international water security and management standards, Nanya Technology continues to strengthen its water management system and expand its water recycling capacity. The Company has established a robust contingency plan to mitigate the immediate impacts of short-term drought. The facility has a

43-million-liter water reservoir, a 0.5-million-liter detention basin for effective rainwater reclamation during the rainy season (temporarily suspended during FAB 5A construction), and seven wells. Nanya Technology also formed an emergency response organization for water shortages with neighboring plants of Formosa Plastics Group for mutual water-sharing support. Improvement work has been completed at the Shimen Reservoir watershed. The risk of service disruption due to turbidity from heavy rainfall has decreased. The Company can handle raw water turbidity up to 10,000 NTU, enabling it to manage most conditions. In terms of water reclamation and reuse, the effective treatment of acidic/alkaline wastewater, hydrofluoric wastewater, and organic wastewater using dedicated reclamation equipment led to the total volume of reclaimed water reaching 5,590 million liters in 2024. Through internal adaptation capacity and water recycling systems, Nanya Technology can operate for up to 21 days without an external water supply. As of now, there have been no production losses due to water shortages.

Nanya Technology continues to improve standard procedures and processes. It assesses water-related risks through its environmental and operational risk management frameworks, promotes related improvement measures, and formulates contingency plans. These are regularly reviewed by the Sustainable Development Steering Center and the Risk Management Steering Center at quarterly meetings. Moving forward, Nanya Technology will continue to enhance our capacity for water use and management. Newly constructed plants will include water regeneration centers, storage reservoirs, and backup water sources to address the uncertainties of climate change.

## Diversified Water Sources to Reduce Production Risks

As part of the FAB 5A expansion, the Company has submitted a new application to the Taiwan Water Corporation for municipal water to be supplied for processes, with a daily volume of 11 million liters. Plans are also in place to construct 8 additional groundwater wells outside the facilities, providing 7.2 million liters per day. In addition, the municipal water supply from the Taishan facility will be integrated, along with upgrades to related equipment and pipelines, contributing another 2 million liters daily. The Company continues to monitor government initiatives for regenerated water. As there are currently no suitable regenerated water programs available in the vicinity of our facilities, we will remain attentive to future plans and adopt such initiatives when feasible.

### Nanya Technology's Drought Response Mechanism

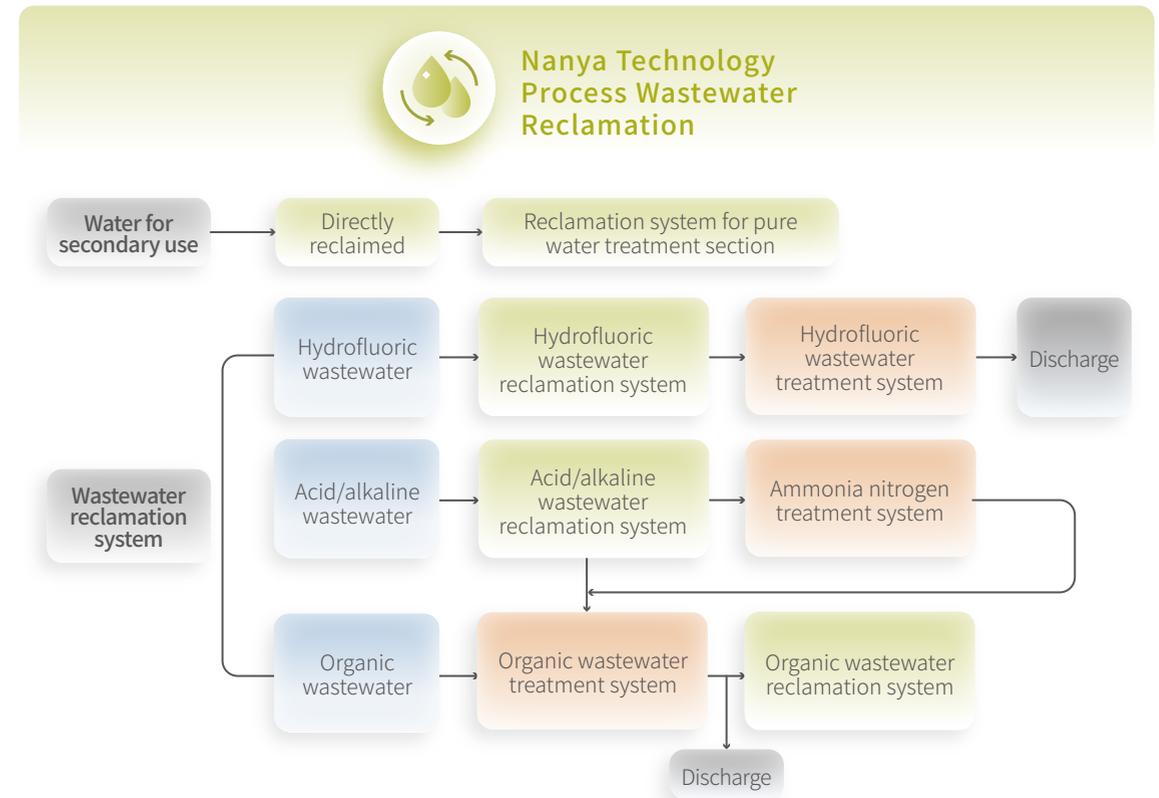


## Water Resource Conservation

In terms of water management, Nanya Technology prioritizes reducing water consumption and enhancing reclamation and reuse, while also designing water-saving processes. To improve water use efficiency, Nanya Technology has set a long-term water resource management goal to reduce water consumption per unit of production capacity by 37% by 2030 compared to 2017 levels. It is hoped that improvements to production processes and equipment can enhance water usage efficiency and water reclamation volume, as well as reduce water consumption. Water conservation efforts span all operational, R&D, and production sites, with the current focus outlined as follows:



Nanya Technology actively implements a variety of water-saving measures and has intensified its water reclamation efforts in recent years. Our facility currently has reclamation systems in place for acidic and alkaline wastewater, hydrofluoric wastewater, and organic wastewater, complemented by various conservation initiatives. The reclamation rate continues to improve annually. In 2023, improvements and expansions to the hydrofluoric wastewater reclamation system at FAB 3AN were completed, along with the construction of a new COD and total nitrogen treatment system for hydrofluoric wastewater, which includes water reclamation functionality. We estimate these efforts will increase annual reclaimed water volume by 522 million liters. In 2024, the combined reclaimed water volume from wastewater reclamation systems, process reclamation systems, and pure water process wastewater reclamation reached a total of 5.59 billion liters, accounting for 141.3% of total water withdrawal.



In 2024, six water conservation programs were completed, yielding an annual water savings of 22,258 kiloliters. These include 1 involving switching to reclaimed water for certain equipment to boost reclaimed volume, 1 for domestic water conservation, 2 to reduce equipment operation, and 2 to improve water conservation efficiency for equipment.

**Water Conservation Programs Completed in 2024**

annual water savings of **22,258** kiloliters

In 2024, **6** water conservation programs were completed

- **1** involving switching to reclaimed water for certain equipment to boost reclaimed volume
- **1** for domestic water conservation
- **2** to reduce equipment operation
- **2** to improve water conservation efficiency for equipment

Project Description	Water Saving Effectiveness (kL/Year)	Share of Annual Water Savings
Replacing the hydrochloric acid scrubber in the ultrapure water system with reclaimed water	18,250	82.0%
Installing water-saving valves on sensor-activated faucets	1,196	5.4%
Water-saving initiatives through equipment parameter adjustments (2 programs)	466	2.1%
Water-saving initiatives through reduced equipment operation (2 programs)	2,346	10.5%

**Water Conservation Programs to be Implemented in 2025**

The estimated water-saving benefit is **61,160** kiloliters/year

In 2025, a total of **8** water conservation programs will continue to be implemented

- **4** involving equipment and operational parameter adjustments
- **3** for reducing equipment water usage
- **1** expanding the application of reclaimed water to further increase reuse volume

Project Description	Estimated Water Saving Effectiveness (kL/Year)
Introduction of OWWR-II reclaimed water into the pure water system to increase reclaimed water use	45,000
Scrubber equipment parameter adjustment (4 programs)	13,103
Improvement of water-saving measures in cleaning empty chemical barrels (2 programs)	867
Water-saving improvements in acid exhaust scrubber tower	2,190

## Collaboration and Dialogue

In addition to ongoing internal water resource management and evaluations, Nanya Technology actively enhances water use efficiency and promotes water conservation and reclamation. The Company engages in communication, dialogue, and collaboration with various stakeholders through a variety of channels. It also communicates with government agencies to learn about national water policies and infrastructure plans, facilitating further collaboration and fulfilling corporate responsibility. Nanya Technology also shares experiences with suppliers and provides guidance to encourage water conservation across the supply chain and create shared social value. Furthermore, we also communicate with local residents and the public, and disclose information about its water management to alleviate their concerns.

Subject	Communication, Dialogue, and Collaboration
 <p>Government Agencies</p>	<ul style="list-style-type: none"> <li>• We engage with the Semiconductor Industry Association and regularly attend Water Resource Diversification Management and Cooperation Platform meetings held by the Water Resources Agency to exchange ideas, communicate, and collaborate on water-related policies.</li> <li>• We coordinate and communicate with the Irrigation Agency and the Northern Region Water Resources Branch of the Water Resources Agency. In times of water scarcity, we cooperate with government contingency plans to ensure effective utilization of water resources, reduce the impact of water shortages in supply basins, and maintain supply stability.</li> <li>• We attend meetings on road surface improvement and pipeline coordination meetings hosted by Taoyuan City Government's Office of Road and Accessory Maintenance to learn whether construction interfaces might affect water supply.</li> <li>• In coordination with the Irrigation Agency, we participate in the Flow Monitoring Implementation Project by installing electronic flow meters with RS-485 transmission interfaces at the Taoyuan Canal intake point. These devices transmit real-time and cumulative water flow data to the Agency's cloud network, enabling real-time monitoring and accurate tracking of water usage. This facilitates precise water allocation by reservoir authorities and helps prevent water resource waste.</li> </ul>
 <p>Suppliers</p>	<ul style="list-style-type: none"> <li>• Suppliers are required to sign a Corporate Social Responsibility Commitment. The Supplier Risk Assessment (SAQ) includes sections on water resource management and TCFD-aligned physical risk identification. A cross-comparison was conducted using IPCC AR5 RCP8.5 scenario maps published by the National Science and Technology Center for Disaster Reduction (NCDR) through its Disaster Risk Adaptation (DR.A) platform. Water resource risks were assessed for 19 significant suppliers to ensure they have water management measures and contingency plans in place for water shortages. On-site audits were conducted for high-risk and key suppliers, with corrective guidance provided to address any identified deficiencies. As a result, the Company has determined that physical risks of climate change pose limited impact to Taiwanese suppliers and are unlikely to cause production disruptions.</li> <li>• Through meetings with suppliers, the Company shares knowledge, engages in dialogue, and offers guidance on water management and conservation measures. Suppliers are encouraged to implement water conservation initiatives and enhance their water management measures. In September 2024, approximately 30 suppliers participated in such a session, aiming to draw from Nanya Technology's experience and jointly enhance water management practices across the supply chain.</li> <li>• Annual targets are set, and together with the ESG team, on-site audits and guidance visits are conducted at suppliers' facilities. In 2024, a total of 19 suppliers underwent on-site audits and guidance visits, with 9 suppliers completing water conservation projects, resulting in an annual water savings of 272 million liters. In 2025, 25 suppliers are expected to receive audits and support, with estimated annual water savings of 100 million liters.</li> </ul>

Subject

Communication, Dialogue, and Collaboration



Local Residents

- Since its establishment, Nanya Technology has collaborated with the local community to form the Environmental Quality Supervision Committee. Every quarter, Nanya Technology commissions a third-party organization to conduct monitoring surveys on the local ecology, hydrology, and air quality around the facilities. The survey results are then reported to the Environmental Quality Supervision Committee.
- The Company engages with the Environmental Quality Supervision Committee to understand community concerns and incorporates relevant issues into its ISO 14001 management system for regular evaluation.
- To ensure that effluent water quality falls within normal parameters and to address concerns among residents in the discharge basin, Nanya Technology has implemented a real-time effluent monitoring system that is directly connected to the Environmental Protection Department, enabling joint real-time monitoring to ensure effluent water quality remains normal.



Corporations and the General Public

- By participating in various community activities, Nanya Technology can share its water management experience, for example, by hosting green factory tours and engaging in knowledge exchange with visiting officials and companies regarding Nanya Technology's water management practices and water-saving achievements.
- Water and energy conservation experts are assigned with the help from the Energy and Water Conservation Service Team within participating companies of the Group and collaborate with specialists from other Group companies to provide on-site guidance and conduct inspections at various facilities, including those of the Company. These efforts span Formosa Plastics Group's facilities in northern, central, and southern Taiwan, with the goal of enhancing water and energy conservation performance across all facilities through expert audits and targeted support.
- Since 2019, the Company has operated a YouTube channel, using content such as vlogs, animations, and edited videos to present topics including corporate image, sustainability, manufacturing processes and products, employee well-being, and social engagement—enhancing the richness and immediacy of communication. Among the content, the animated video *Environmental Sustainability—The Source of Water* communicates Nanya Technology's commitment to water resources and recycling. This video stood out among nearly ten thousand global entries and was honored with the 2021 iF Design Award in Germany.
- Since 2023, Nanya Technology has also published its *Alliance for Water Stewardship Report* via its official website (Corporate Sustainability ESG) (<https://www.nanya.com/ESG/storage/file/f4723d72-7a43-4f49-9979-f3f00b1c49af?v=1709694452>).

### 3. Raw Material Reduction and Reuse

#### Raw Material Reduction

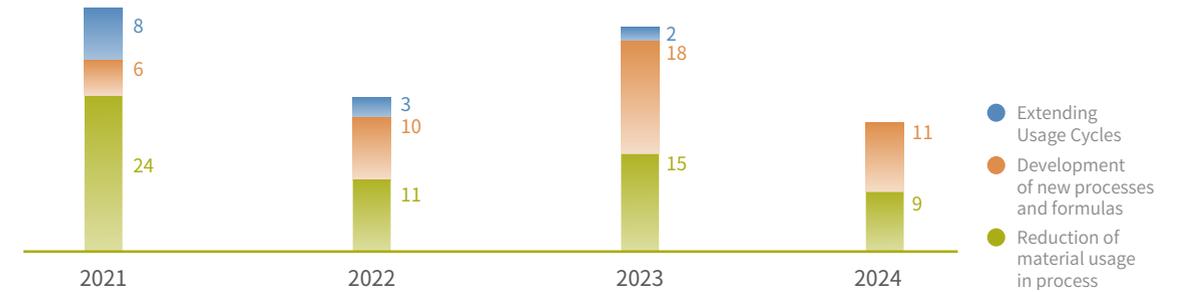
Nanya Technology regularly reviews the rationality and appropriateness of raw material usage in production, and simplifies manufacturing processes to reduce material consumption. The Company's designated team sets annual raw material reduction targets and regularly reviews overall performance in raw material reduction. In 2024, a total of 20 proposals for raw material usage improvements were completed via the Kaizen Proposal System, including the development of new processes and formulas as well as reducing process duration to reduce consumption. Among the 2024 improvement proposals, process parameter optimization and volume reduction improved slurry usage efficiency in the CMP area, achieving a maximum annual reduction of 135.4 metric tons in consumption.

#### 2024 Performance of Raw Material Usage Improvement via Kaizen Proposal System

Category	Number of Proposals	Items Proposed	Benefit (NT\$/Year)
Development of new processes and formulas	11	Optimizing process conditions and developing high-productivity processes and formulas reduced the use of photoresists, chemicals, and slurry (11 proposals)	21,117,596
Reduction of material usage in processes	9	Improving production efficiency and optimizing equipment parameters reduced the use of photoresists, specialty gases, and chemicals (9 proposals)	12,108,222

Plans and Measures	Reduction (Metric tons/Year)
Waste slurry: process condition optimization	135.4
Waste chemicals: process condition optimization	34.5
Waste photoresist reduction: process condition optimization	0.4
<b>Total reduction</b>	<b>170.3</b>

#### Performance in Raw Material Consumption



#### Raw Material Consumption and Output

Raw Materials for Production	Usage	Renewable	Non-Renewable
Raw wafers (kpcs-12 inches)	665	—	V
Process chemicals (metric tons)	51,670	—	V
Process gases (million cubic meters)	7,255	—	V
Electricity (million kWh)	801	—	V
Freshwater (ML)	3,955	V	—
Wafer packaging material (metric tons)	55	V	—

Product	Capacity
Raw wafers (kpcs-12 inches)	637

Exhaust gas	Emissions
Greenhouse gases (tCO <sub>2</sub> e)	409,138
Volatile organic compounds (metric tons)	14.24
Sulfides (metric tons)	1.66
Nitrogen oxides (metric tons)	11.21

Wastewater	Emissions
Wastewater volume (ML)	2,864

Waste	Capacity
General industrial waste (metric tons)	5,881
Hazardous industrial waste (metric tons)	16,522
Electronic waste (metric tons)	4.4

Each year, Nanya Technology conducts a materiality assessment of environmental impacts in accordance with the ISO 14001 Environmental Management System. High-risk items are prioritized for management planning. After a comprehensive evaluation, feasible items are selected for implementation that year. To implement source reduction, manufacturing processes are streamlined to minimize raw material usage and reduce waste generation.

Waste Impact Assessment Results

Upstream

Nanya Technology

Downstream



Sources of Impacts

- Extensive use of small gas cylinders results in more residual gas.

- Raw materials and associated materials contain hazardous substances.
- Large volumes of acidic and alkaline chemicals are used.
- Extensive use of monitor wafers in production.

- Products require a large amount of packaging materials.
- Products contain hazardous substances.



Potential Impacts

- Resource waste: Volume of residual gas.
- Increased carbon emissions: More frequent transport increases internal and external carbon emissions.

- Violating international regulations and customer specifications could lead to product returns, contract penalties, as well as potential soil contamination or wastewater pollution due to hazardous material discharged via waste.
- Large amounts of waste are generated, with limited disposal locations and capacity, while the waste that undergoes treatment or recycling still requires landfilling.

- Solid waste pollution: Packaging waste such as EPE cushioning material and cardboard boxes may result in solid waste pollution if improperly handled.
- Resource waste: Excess packaging waste could result in unnecessary consumption of resources, as some packaging materials are recyclable and reusable. Discarding such materials as waste constitutes resource waste.



Mitigation Measures

- Replacement of small gas cylinders with large cylinders to reduce residual gas and cylinder usage.

- Establishment of a hazardous substance free management system to ensure that wafers, IC packaging, and DIMM module products comply with international regulations and customer-specific requirements for hazardous substance management.
- a. 24 raw material usage improvement proposals were completed via the Kaizen Proposal System.
- b. In-plant regeneration, such as converting copper sulfate waste liquid into copper foil.
- c. Outsourced recycling and reuse of waste acid, such as sulfuric and phosphoric acids.
- d. Monitor wafers recycled and reused 8 to 11 times.

- Promoting the return of packaging materials from customers for reuse by NTC.
- Disposal of waste electronic equipment must comply with EU environmental directives such as WEEE, RoHS and EuP.

## 4. Recycling and On-Site Resource Recovery

### Ratio of Recycled Materials Used as Raw Materials for Production

During the production process, monitor wafers are required to check process conditions. These wafers, after use, are reprocessed and reused. Each monitor wafer can be reused approximately 8 to 11 times, depending on the specific process. This not only reduces the cost of purchasing brand-new monitor wafers but also significantly lowers waste generation.

By raising the yield of reclaimed wafers that were returned to each supplier, the amount of reclaimed wafers will increase, thereby raising the proportion of reclaimed wafers used in internal production. Defects are regularly reviewed with suppliers, who then implement process improvements and revise specifications. Since 2021, suppliers have adjusted their manufacturing processes to reduce scrap caused by defects, raising the average yield of returned products from 80% to 85%. As a result of the stable yield of returned products, reclaimed wafer input rate increased from 79% in 2021 to 83% in 2023, and remained steady at 83% in 2024; it is projected to reach 85% in 2025.

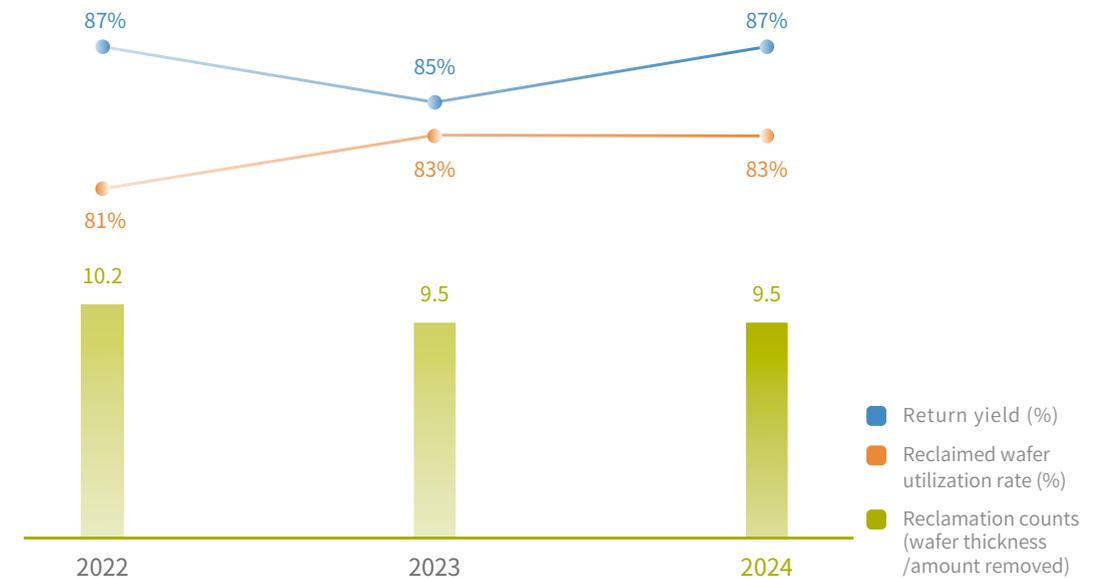
### Reuse of Packaging Materials for Product Testing and Shipment

Packaging materials used for shipping products to external testing or packaging facilities—including cartons, shipping boxes, cushioning material, and wafer carriers—are actively recovered and reused internally. Wafer carriers used for raw wafers are also collected and reused for product shipments, achieving a reuse rate close to 100%. These practices minimize packaging usage and reduce waste generation. This approach reduces the use of approximately 12,000 brand-new 12-inch wafer carriers annually, reducing around 55 metric tons of plastic.

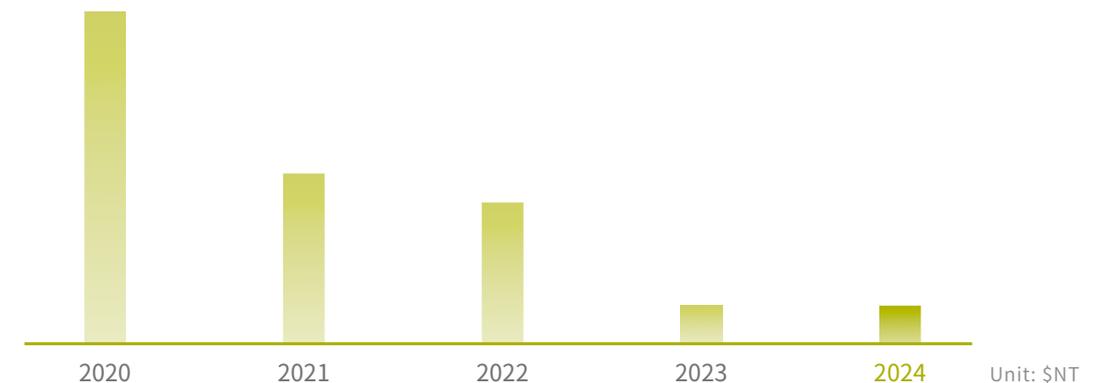
### Reduction of Product Packaging Materials

To support recycling and waste reduction efforts, the finished goods warehouse began taking steps to reuse recyclable packaging materials. Reusable packaging materials from returned products are repurposed for storing goods, contract manufacturing operations, or fulfilling product exchanges resulting from customer complaints. This approach helps reduce the frequency of issuing new packaging materials and submitting procurement requests, thereby promoting reuse, reducing packaging material consumption, and lowering associated costs. In 2024, this initiative saved NT\$14,962. Although the monetary savings are modest, this initiative makes a meaningful contribution to environmental protection and resource recovery. Specific results are as follows:

Reclaimed Wafer Return Yield And Usage Trend (2022-2024)



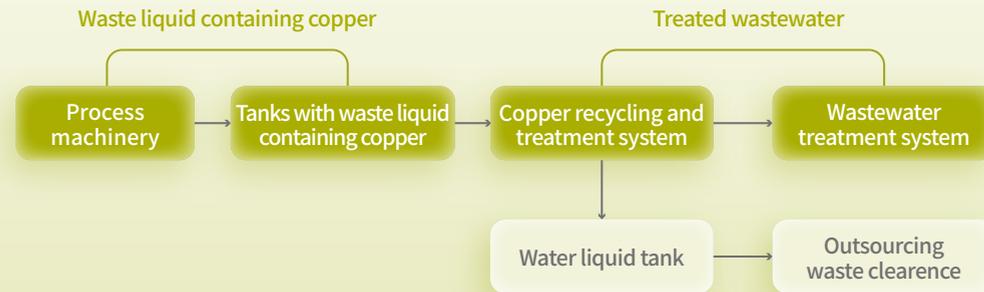
Cost Savings



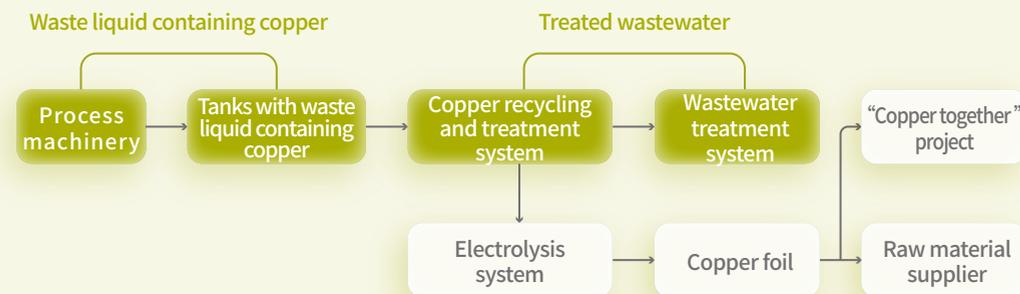
## Waste Reduction Technology and Copper Waste Liquid Electrolytic Regeneration System

Nanya Technology invested NT\$8.19 million to build an electrolytic regeneration system for copper waste liquids. After resin adsorption and regeneration, the system produces high-concentration copper sulfate waste liquid, which is then electrolyzed to recover copper foil. Through the Copper Together project, the Company collaborated with Ming Chi University of Technology and New Taipei City-based artist Ching-Tai Chuang to turn recycled copper foil into artwork, enhancing engagement with stakeholders. The copper foil is also reused as industrial-grade raw material, achieving the benefits of resource circularity. In 2024, a total of 1,070 kilograms of copper foil was produced.

### Original Copper-Containing Waste Liquid Treatment Flowchart



### Copper-Containing Waste Liquid Treatment Flowchart After Addition of Regeneration Technology



## Isopropanol Recycling System for Resource Circularity

In 2017, Nanya Technology invested NT\$20 million to implement an isopropanol recycling system, increasing the concentration of isopropanol in process discharge to reduce disposal volumes (cutting 130 disposal trips per month and saving NT\$21 million monthly in disposal fees). Isopropanol wastewater that cannot be concentrated is repurposed as a carbon source for ammonia nitrogen wastewater treatment, replacing externally purchased methanol. Nanya Technology actively minimizes waste while maximizing resource circulation, embodying its commitment to corporate sustainability. In 2024, the Company reduced IPA disposal volume by 635,420 kg.

### Original Isopropanol Waste Liquid Treatment Flowchart



### Isopropanol Waste Liquid Refining Treatment Flowchart After Optimization



## 5.3 Environmental Pollution Prevention

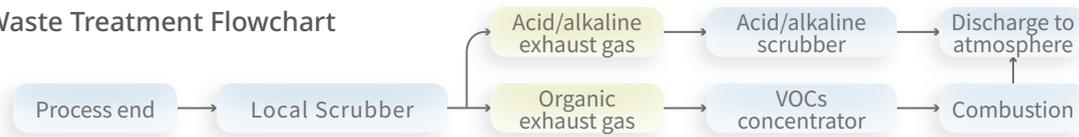
In alignment with our commitment to environmental protection and environmental impact assessments, Nanya Technology regularly monitors key environmental impact factors within our development sites, such as air quality, noise and vibration, surface and underground water quality, traffic flow, as well as the ecosystem for animals and plants. Since 2014, there have been no recorded violations of environmental regulations. Nanya Technology also collaborates with regulatory authorities to confirm that our development sites are not located in environmentally sensitive or areas with designated purposes. Through its environmental, safety, and health policies, the Company is fully committed to waste reduction and resource reuse initiatives to meet legal requirements and fulfill environmental protection commitments. Each year, we evaluate opportunities for waste reduction, as well as the types and quantities of recyclable waste and wastewater. Based on this evaluation, we establish annual goals and incorporate these plans into our annual budget and work schedule.

### 1. Air Pollution Control

Since the establishment of its facilities, Nanya Technology has placed great emphasis on pollution prevention. In addition to implementing environmental management programs to effectively reduce raw material consumption and lower the concentration of exhaust emissions, Nanya Technology uses air pollution control equipment that meets regulatory standards. These include local scrubbers, acid/alkaline exhaust gas scrubbers, VOCs zeolite rotor concentrators, and afterburners ("VOCs" refers to volatile organic compounds; local scrubbers are point-source gas treatment devices). Testing has confirmed that pollutant emissions have consistently complied with, or been lower than, the limits set by government environmental regulations. The Company does not emit ozone-depleting substances (ODS). To maintain the optimal performance of treatment equipment, each unit undergoes regular maintenance and inspection. Operators receive thorough training to ensure the systems function properly and that emissions do not pose a threat to the surrounding environment.

The primary air pollutants generated by Nanya Technology include acidic, alkaline, and organic exhaust gases. Since trichloroethylene is not used as a raw material, no hazardous air pollutants (HAPs) are emitted. Based on the characteristics of each exhaust type, appropriate treatment processes and equipment are used. After being generated at the process level, emissions pass through local scrubbers to remove specific substances. Acidic and alkaline gases are routed to respective scrubbing towers before being discharged into the atmosphere. Organic exhaust is adsorbed by a zeolite rotor, concentrated, and then destroyed in afterburners, with combustion efficiency reaching 99%, well above regulatory standards. The overall VOCs (volatile organic compound) reduction rate is maintained at above 90% to meet regulatory requirements. In 2024, the VOCs emission intensity per unit of production capacity was 12.9 g VOCs/kpcs 4Gb eq.

Waste Treatment Flowchart



### Emission Trends

	2021	2022	2023	2024
Volume of VOCs generated (metric ton)	15.68	17.31	14.24	12.72
VOCs emissions per unit wafer area (kg/wafer area m <sup>2</sup> )	0.27	0.29	0.30	0.27
VOCs emission per unit of production capacity (g/kpcs)	14.0	15.9	14.2	12.9
VOCs emission per unit of revenue (g/NT\$ million)	183	304	476	373

### Trends in Other Air Pollutant Emissions

	2021	2022	2023	2024
NOx (metric ton)	10.34	10.50	11.21	12.65
SOx (metric ton)	1.66	1.66	1.66	2.12

### Air Pollution Reduction

To reduce emissions of inorganic acidic gases, Nanya Technology has continued optimizing the operating parameters of its existing air pollution control equipment annually. In 2024, the Company plans to invest NT\$55 million in its 3A and 3A-N plants to install additional scrubbers downstream of the current central scrubbers. This two-stage scrubbing process is expected to enhance the removal of inorganic acids from emissions, with completion anticipated by the end of 2025 and a projected reduction efficiency of over 80%.

Air Pollutant	Before Improvement	After Improvement
VOCs emissions from 3A Plant P131 duct (metric ton)	8.06	2.36

In 2022, Nanya Technology added a dust removal tower to the plant's air pollution control system to reduce particulate matter emissions at the 3A Plant. Using atomized water scrubbing and impact interception, the system reduces particulate emissions. Third-party verification confirmed that reduction efficiency can reach up to 77%. In 2024, we planned to invest an additional NT\$30 million to install a dust removal tower at the 3A-N Plant to reduce particulate matter emissions, with completion expected by the end of 2025.

Air Pollutant	Before Improvement	After Improvement
Total suspended particulates in 3A Plant P106 duct (mg/m <sup>3</sup> )	79	18

To effectively monitor VOCs emissions, Nanya Technology conducts monitoring not only at VOCs emission ducts but also at acidic and alkaline exhaust ducts. This ensures that air pollution control equipment operates at optimal condition.

## 2. Water Pollution Control

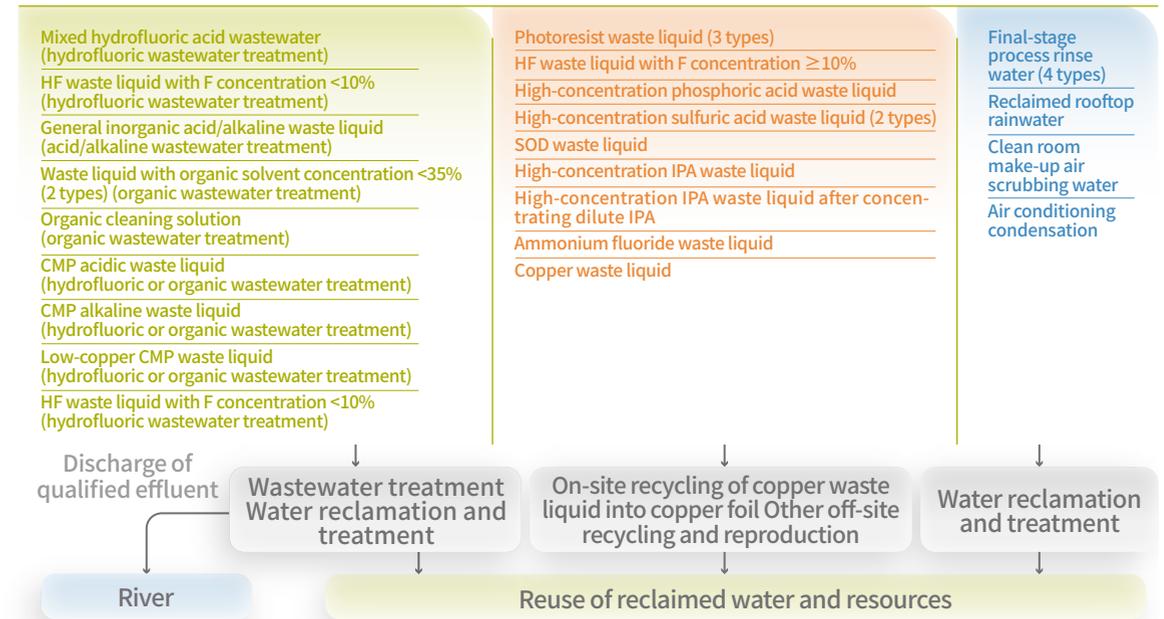
All wastewater at Nanya Technology is collected and categorized before being discharged to the appropriate treatment facilities. Since its establishment, Nanya Technology has collaborated with the local community to form the Environmental Quality Supervision Committee. Every quarter, we commission a third-party organization to conduct monitoring surveys on the local ecology, hydrology, and air quality around the facilities. The survey results are then reported to the Environmental Quality Supervision Committee. Nanya Technology engages with the Environmental Quality Supervision Committee to understand the concerns of local residents, incorporating those issues into the Company's ISO 14001 management system for regular evaluation. To ensure that effluent water quality falls within normal parameters and to address concerns among residents in the discharge basin, Nanya Technology has implemented a real-time effluent monitoring system that is directly connected to the Environmental Protection Department, enabling joint real-time monitoring to ensure effluent water quality remains normal.

After meeting discharge water quality standards, 100% of the effluent is discharged on land into Dake Creek. The water quality complies with Class D surface water standards, making it suitable for irrigation, secondary industrial use, and environmental conservation. The creek ultimately flows into the Tamsui River before being discharged into the ocean. To prevent serious environmental pollution and ecological impacts resulting from non-conforming effluent quality, we have remained committed to water pollution prevention, and continue to upgrade and invest in wastewater treatment facilities. 28 distinct pipelines are used to segregate and convey the different types of wastewater within the facility, primarily categorized into organic wastewater, general acidic/alkaline wastewater, hydrofluoric wastewater, high-concentration waste liquids, and water that can be directly reclaimed, processed, and reused for secondary uses. Different types of wastewater are treated separately according to their specific characteristics. In addition to meeting regulatory discharge standards, wastewater suitable for reuse is recovered through the reclamation system and reused to reduce the overall discharge volume. In addition, our site was redeveloped on an existing lot within our facility, so no large-scale removal of vegetation surrounding the designated construction area was required. Wastewater is properly treated before being discharged into Dake Creek, and the receiving water body and surrounding habitats are not designated as national or international protected areas. Investigations also found no impact on the habitats of protected species or risk of habitat destruction.

In 2024, total wastewater discharge reached 2,864 million liters. Due to non-conforming handling of the membrane bioreactor (MBR) system during wastewater treatment, the volume of water reclaimed decreased, leading to an increase in wastewater discharge. As a result, total wastewater discharge in 2024 rose by 17.1% compared to 2023, and wastewater discharge per unit of production capacity increased by 19.1% for the year. Due to the Ministry of Environment's phased tightening of discharge limits for ammonia nitrogen in effluent, a new regulation was introduced in 2013 requiring the ammonia nitrogen concentration in effluent to be below 70 mg/L. This limit was further tightened to 30 mg/L in a second phase in 2015. In response to these regulatory changes and rising environmental awareness, Nanya Technology implemented multiple improvement

measures. Wastewater sources were managed through a diversion strategy, including segregated collection of effluent from equipment using ammonium fluoride to prevent high-concentration ammonia nitrogen from directly entering the wastewater treatment system. The existing final sedimentation tank was converted into an aerobic nitrification tank, and a membrane bioreactor (MBR) system was added as the final treatment unit. These improvements significantly reduced ammonia nitrogen concentrations to well below regulatory limits, lowered effluent turbidity, and improved overall effluent water quality. Since the chemical oxygen demand (COD) of effluent is also a key concern for regulatory authorities, Nanya Technology installed an IPA concentration system in 2018. Previously, equipment discharging low-concentration IPA would send wastewater directly into the treatment system, resulting in excessive COD loads. With the new system in place, low-concentration IPA wastewater is collected and concentrated into high-concentration IPA using a high-temperature negative-pressure process, and then transported off-site by a contractor. This approach reduces COD levels in raw water and effectively enhances control over effluent water quality. In anticipation of increased pollutant loads due to future production expansion—and to further reduce discharge pollutant concentrations—Nanya Technology invested NT\$430 million in 2018 to build a new hydrofluoric wastewater COD and total nitrogen treatment system. The system was completed and operational in 2023. It keeps ammonia nitrogen discharge consistently below 10 mg/L and COD below 30 mg/L, significantly reducing environmental impact. After a series of improvements, ammonia nitrogen test results in 2024 ranged from 0.2 mg/L to 11.1 mg/L, with an average of 4.3 mg/L. COD ranged from 15.3 mg/L to 31.7 mg/L, with an average of 23.1 mg/L—all well below regulatory limits.

### Sorting and Processing 28 Types of Wastewater



### Nanya Technology's Wastewater Discharge by Receiving Water Body and Volume

Total discharge volume (ML <sup>Note 1</sup> )		2021	2022	2023	2024
By discharge destination <sup>Note 1</sup>	Surface water	2,718	2,695	2,446	2,864
	Groundwater, seawater, water from third parties, or water provided to other organizations by third parties <sup>Note 2</sup>	0	0	0	0
Total water discharge	Freshwater (total dissolved solids ≤ 1,000 mg/L)	2,718	2,695	2,446	2,864
	Other water (total dissolved solids >1,000 mg/L)	0	0	0	0
By wastewater treatment level	Untreated	0	0	0	0
	Treated on-site in compliance with Ministry of Environment effluent standards	2,718	2,695	2,446	2,864

Note 1: Nanya Technology discharges wastewater into Dake River (surface water), which is not located in a water-stressed area.

Note 2: Includes municipal water suppliers and wastewater treatment plants, public or private utility companies, and other entities involved in supplying, transporting, treating, disposing, or using water and wastewater.

### Wastewater Discharge Trend (2021-2024)



### 2024 Effluent Water Quality Test Results

Testing item	Unit	Regulatory standard	Testing result			Compliance with standards
			Minimum	Average	Maximum	
FAB 3A	pH	6-9	7.1	7.4	7.6	Yes
	Chemical oxygen demand (COD)	<100	15.3	23.1	31.7	Yes
	Suspended solids (SS)	<30	1.25	3.5	6.5	Yes
	Fluoride ions	<15	9.89	11	11.6	Yes
	Ammonia nitrogen	<30	0.2	4.3	11.1	Yes

## 3. Waste Management

### Waste Generation Profile

In 2024, Nanya Technology generated a total of 22,732 metric tons of waste, of which 22,419 metric tons (98.6%) were recycled and reused through external service providers, with no in-house recycling. The total amount of waste directly disposed of was 4,816 metric tons, including 4,504 metric tons (19.81%) reused after treatment, 285 metric tons (1.25%) incinerated, 21 metric tons (0.09%) either solidified and landfilled or directly landfilled, and 6 metric tons (0.03%) treated through other methods such as physical recycling or refining for reuse.

In 2024, Nanya Technology's waste generated per unit wafer production capacity was 23.10 kg/kpcs 4Gb eq, an increase of 3.17% compared to 2023. The volume of general waste outsourced for treatment was 6,060 metric tons, with a unit wafer production capacity of 6.16 kg/kpcs 4Gb eq, an increase of 4.76% compared to 2023. The volume of hazardous waste outsourced for treatment was 16,671 metric tons, with a unit wafer production capacity of 16.94 kg/kpcs 4Gb eq, an increase of 2.6% from 2023. The Company's primary hazardous industrial waste consists of acidic waste liquids, including sulfuric acid, phosphoric acid, and hydrofluoric acid. In recent years, the Company has partnered with recycling organizations to apply for various reuse projects, shifting away from conventional chemical treatment (acid-base neutralization) followed by final disposal. Instead, these waste acids are now processed by third-party vendors and recycled into other industrial raw materials. For example, sulfuric acid is converted into aluminum sulfate solution for use in wastewater treatment or as a raw material, and hydrofluoric acid is refined into industrial-grade sodium fluorosilicate or sodium fluoride. In 2024, 13,017 metric tons of waste sulfuric acid and 1,266 metric tons of hydrofluoric acid were recovered and reused, achieving a 100% recovery rate for acidic waste liquids. The Company will continue to reduce waste, increase recycling volumes, and promote circular use to achieve effective reuse of waste and reduce landfill as part of its sustainability targets.

General and hazardous industrial waste at Nanya Technology is managed in a centralized manner by the respective departments responsible for their generation. Activities include storage, removal, inspection, and reduction initiatives. Annual training is provided to relevant personnel to ensure familiarity with regulations and compliance. In 2024, a total of 27 employees were trained as seed instructors. In addition, the Company conducts irregular audits of waste contractors to ensure that removal and treatment practices comply with regulations. Annual reviews and execution of waste or source reduction projects are conducted to verify legality and ensure that all waste is properly handled or reused to prevent further environmental impact. In 2024, through the waste review process, we identified and completed 6 proposals to reduce raw material consumption through the Kaizen Proposal System. These included reducing process duration, extending usage cycles, and cutting down process consumption. The most impactful improvement came from shortening pickling time in the wet etching area, effectively reducing the use of sulfuric acid and hydrogen peroxide by 12,064 liters and 6,032 liters per month, respectively. From 2014 to 2024, Nanya Technology did not engage in any transboundary movement of hazardous waste. All hazardous industrial waste was handled by qualified domestic contractors, with a total of 43 certified waste treatment vendors engaged in 2024.



All waste generated by Nanya Technology is **100% outsourced for processing**, and is reprocessed by contractors into industrial-grade raw materials, construction materials, or other raw materials.



This also includes resource recovery through incineration as fuel. In 2023, **the overall waste recovery rate reached 98.6%**, with a 99.8% recovery rate for hazardous waste.

### Nanya Technology's Off-Site Resource Recovery List

- 01.** Low-Concentration Isopropanol Wastewater: Waste is collected and treated via a concentration system to generate high-concentration isopropanol wastewater. The wastewater is subsequently recovered by external vendors and refined into industrial-grade isopropanol.
- 02.** Waste Photoresist Solution: External vendors recover and recycle the solution to produce industrial-grade PGMEA (propylene glycol monomethyl ether acetate) and EBR (edge bead remover).
- 03.** Waste Sulfuric Acid: External vendors recover and recycle the waste acid to produce industrial-grade sulfuric acid.
- 04.** Waste Phosphoric Acid Recycling vendors process and recycle the waste acid to produce industrial raw materials such as ammonium sulfate.
- 05.** Calcium Fluoride Sludge: Hydrofluoric acid wastewater undergoes a chemical process to generate inorganic calcium fluoride sludge. External vendors then recover and reuse the sludge as industrial flux material or as a raw material for cement production.
- 06.** Copper-Containing Waste Liquid: The liquid is processed in-house via electrolysis equipment to produce copper foil. External vendors then collect and recycle this material to manufacture copper wire and other finished products.
- 07.** Organic Sludge: Organic wastewater is collected and treated through a biological treatment system to produce organic sludge. External vendors then recover and thermally treat the sludge for its application as a raw material in ready-mix concrete and other construction materials.
- 08.** Inorganic Sludge: Inorganic river sand sludge, generated from raw water filtration, is sent to brick factories, where it is mixed and fired into bricks for use as building materials.
- 09.** SOD Waste Liquid: Waste SOD is collected and processed by recovery vendors into finished products such as banana oil (amyl acetate).

### Summary of Nanya Technology's Outsourced Waste Recycling and Reuse

Category/Year	2021	2022	2023	2024
Total amount of waste processed by outsourcing (metric tons)	24,586	23,981	22,403	22,732
Amount of waste recovered (metric tons)	23,321	22,089	22,123	22,419
Waste recovery rate (%)	94.9	92.1	98.8	98.6
Amount of general waste processed by outsourcing (metric tons)	7,113	6,383	5,881	6,060
Amount of general waste recovered (metric tons)	6,452	4,951	5,626	5,775
General waste recovery rate (%)	90.7	77.5 <sup>Note</sup>	95.7	93.5
Amount of hazardous waste processed by outsourcing (metric tons)	17,473	17,598	16,522	16,671
Amount of hazardous waste recovered (metric tons)	16,870	17,137	16,497	16,644
Hazardous waste recovery rate (%)	96.5	97.4	99.8	99.8

Note: The drop in the general waste recycling and reuse rate was due to organic sludge being thermally recovered in 2021 and categorized as recyclable waste, whereas in 2022 it was incinerated without recovery.

### Nanya Technology Corporation's Waste Generation Overview in 2024

Hazardous Waste	Amount Generated	Recycled and Reused	Disposed Directly
Waste acid solution	14,718	14,092	626
Waste solvent	1,925	103	1,822
Containers	11	0	11
Electronic waste	6	0	6
Others	11	0	11
<b>Subtotal</b>	<b>16,671</b>	<b>14,195</b>	<b>2,476</b>

General Waste	Amount Generated	Recycled and Reused	Disposed Directly
Sludge	5,285	3,586	1,699
Packaging materials	170	6	164
Employee domestic waste	250	0	250
Mixed metal scrap	22	1	21
Mixed waste plastic	191	0	191
Others	143	127	16
<b>Subtotal</b>	<b>6,060<sup>Note2</sup></b>	<b>3,720</b>	<b>2,340<sup>Note2</sup></b>

	Amount Generated	Recycled and Reused	Disposed Directly
<b>Total Amount</b>	<b>22,732<sup>Note2</sup></b>	<b>17,915</b>	<b>4,816</b>

Note 1: In response to updates in GRI indicator requirements, waste categories have been further subdivided and regrouped. This has caused a shift in recycling ratios compared to previous years, but the total annual waste output in metric tons remains unchanged.

Note 2: Slight discrepancies between total output and the sum of individual items are due to rounding.

### Nanya Technology Corporation's Waste Recycling and Reuse Overview in 2024

Hazardous Waste	On-Site	Off-Site	Total Amount
Reused for original purpose	0	14,092	14,092
Recycled and reused <sup>Note1</sup>	0	0	0
Other ways of recycling	0	103	103
<b>Subtotal</b>	<b>0</b>	<b>14,196<sup>Note2</sup></b>	<b>14,196<sup>Note2</sup></b>

General Waste	On-Site	Off-Site	Total Amount
Reused for original purpose	0	6	6
Recycled and reused <sup>1</sup>	0	0	0
Other ways of recycling	0	3,713	3,713
<b>Subtotal</b>	<b>0</b>	<b>3,720<sup>Note2</sup></b>	<b>3,720<sup>Note2</sup></b>

	On-Site	Off-Site	Total Amount
<b>Total Amount</b>	<b>0</b>	<b>17,915<sup>Note2</sup></b>	<b>17,915<sup>Note2</sup></b>

### Nanya Technology Corporation's Waste Treatment Overview in 2024

Hazardous Waste	On-Site	Off-Site	Total Amount
Incinerated and used as energy	0	2,449	2,449
Incinerated without heat recovery	0	11	11
Solidification and landfill	0	9	9
Other disposal operations <sup>Note1</sup>	0	6	6
<b>Subtotal</b>	<b>0</b>	<b>2,476<sup>Note2</sup></b>	<b>2,476<sup>Note2</sup></b>

General Waste	On-Site	Off-Site	Total Amount
Incinerated and used as energy	0	2,055	2,055
Incinerated without heat recovery	0	273	273
Solidification and landfill	0	12	12
Other disposal operations <sup>Note3</sup>	0	0	0
<b>Subtotal</b>	<b>0</b>	<b>2,340</b>	<b>2,340</b>

	On-Site	Off-Site	Total Amount
<b>Total Amount</b>	<b>0</b>	<b>4,816</b>	<b>4,816</b>

Note 1: Other disposal operations for hazardous waste include physical treatment, chemical treatment, etc.

Note 2: Slight discrepancies between total output and the sum of individual items are due to rounding.

Note 3: Other disposal operations for general waste refer to physical treatment (e.g., re-crushing and sorting), etc.

## 4. Environmental Costs and Benefits

Nanya Technology introduced the environmental accounting system in 2008, followed by an environmental benefit accounting system in 2009, which was fully implemented in 2010. By adopting the environmental accounting system, the Company can monitor environmental expenditures, evaluate their effectiveness, and provide specific and correct disclosures on its environmental efforts to stakeholders. Environmental accounting, based on regulations set by the Ministry of Environment, categorizes and calculates environmental expenditures for internal management and helps external stakeholders understand the Company's efforts in environmental initiatives. According to aggregated statistics, the Company invested NT\$247.399 million in environmental capital expenditure and spent approximately NT\$900.544 million in environmental expenditure, totaling NT\$1,147.943 million in 2024. With a total revenue of NT\$34.132 billion in 2024, environmental expenditures accounted for 3.36%.

### Environmental Accounting Expenditures (NT\$ thousands)

	2021	2022	2023	2024
Environmental capital expenditure	151,394	498,249	124,328	247,399
Environmental expenditure	722,020	722,904	741,346	900,544
<b>Total</b>	<b>873,414</b>	<b>1,221,153</b>	<b>865,674</b>	<b>1,147,943</b>
Environmental expenditure/percentage of revenue (%)	1.43	2.14	2.90	3.36

### Environmental Accounting Expenditures in 2024 (NT\$ thousands)

	2021	2022	2023	2024
Energy (electricity) conservation programs	18,166	11,680	16,278	22,052
Waste reduction programs	3,759	0	0	0
Programs to reduce raw material usage in processes	4,973	8,233	4,145	3,795
Tangible benefits from recycling and reusing industrial waste	5,118	13,195	13,014	24,948
Electricity savings from low-power use and process improvements	969,353	1,081,896	1,568,178	2,468,680
<b>Total benefit</b>	<b>1,001,369</b>	<b>1,117,026</b>	<b>1,601,615</b>	<b>2,519,475</b>
Violations of environmental regulations	0	0	0	0
Fines for violations of environmental regulations	0	0	0	0
Unpaid fines for violations of environmental regulations	0	0	0	0

### ISO 14001 Management Program Results over the Past Four Years (NT\$ thousands)

Cost Categories	Description	Environmental Expenditure	Environmental Capital Expenditure
Corporate operational costs	Pollution prevention costs: Cost of control measures for air pollution, water pollution, and other types of pollution.	584,974	247,399
	Global environmental protection expenses: (1) Expenses related to climate change prevention (2) Other expenditures associated with global environmental protection.	189,055	0
	Resource and energy conservation and recycling costs: (1) Improving resource utilization efficiency (2) Costs for waste reduction, recycling, and reprocessing (3) Energy-saving expenses	114,658	0
Upstream and downstream costs associated with suppliers and customers	(1) Green procurement (2) Expenses incurred from providing environmentally friendly products	79	0
Management activity costs	(1) Cost of environmental education and training for employees (2) Expenses incurred for obtaining external certifications (3) Expenses incurred for measuring environmental impacts (4) Others	11,368	0
R&D costs	Expenses incurred for product research and development for the sake of environmental protection	0	0
Social activity costs	Expenses for environmental improvements such as nature conservation, afforestation, and beautification	347	0
Environmental taxes and regulatory fees	(1) Expenses from air pollution (2) Audit fees and certification fees for pollution control	63	0
<b>Total</b>		<b>900,544</b>	<b>247,399</b>
<b>Total</b>		<b>1,147,943</b>	

Internal Management System's Audit Records over the Past Four Years



	2021	2022	2023	2024
<b>ISO 14001</b>	<p>Number of Deficiencies <b>2</b></p> <p>Resolution Rate <b>100%</b></p> <p><b>Deficiency Type  </b> A total of 2 issues, which included deficiencies in the management of temporary waste storage sites and failure to conduct regular follow-ups on the management plan. All issues were resolved.</p>	<p>Number of Deficiencies <b>9</b></p> <p>Resolution Rate <b>100%</b></p> <p><b>Deficiency Type  </b> A total of 9 issues, which included outdated labeling at waste storage sites, incorrect entries in environmental aspect review records, and incomplete or outdated significance evaluations. All issues were resolved.</p>	<p>Number of Deficiencies <b>7</b></p> <p>Resolution Rate <b>100%</b></p> <p><b>Deficiency Type  </b> A total of 7 issues, which included incorrect entries in comprehensive assessment forms on the operational aspect, incomplete or outdated significance evaluations, and deficiencies in the management of temporary waste storage sites. All issues were resolved.</p>	<p>Number of Deficiencies <b>7</b></p> <p>Resolution Rate <b>100%</b></p> <p><b>Deficiency Type  </b> A total of 7 issues, which included outdated labeling at waste storage sites, incorrect entries in environmental aspect review records, and incomplete or outdated significance evaluations. All issues were resolved.</p>
<b>ISO 45001</b>	<p>Number of Deficiencies <b>6</b></p> <p>Resolution Rate <b>100%</b></p> <p><b>Deficiency Type  </b> Issues included incomplete hazard identification forms and regulation identification forms, as well as deficiencies found during the inspection and maintenance of environmental detectors, totaling 6 cases. All issues were resolved.</p>	<p>Number of Deficiencies <b>29</b></p> <p>Resolution Rate <b>100%</b></p> <p><b>Deficiency Type  </b> Issues included incomplete hazard identification forms, insufficient training, outdated documents, inadequate risk control measures, deficiencies during drills not incorporated for procedure revisions, and insufficient follow-up on non-conforming events, totaling 29 cases. All issues were resolved.</p>	<p>Number of Deficiencies <b>26</b></p> <p>Resolution Rate <b>100%</b></p> <p><b>Deficiency Type  </b> Issues included incomplete hazard identification forms, insufficient training, outdated documents, inadequate risk control measures, deficiencies during drills not incorporated for procedure revisions, and insufficient follow-up on non-conforming events, totaling 26 cases. All issues were resolved.</p>	<p>Number of Deficiencies <b>11</b></p> <p>Resolution Rate <b>100%</b></p> <p><b>Deficiency Type  </b> Issues included incomplete hazard identification forms, insufficient training, outdated documents, inadequate risk control measures, deficiencies during drills not incorporated for procedure revisions, and insufficient follow-up on non-conforming events, totaling 11 cases. All issues were resolved.</p>