NANYA

2023
TNFD · TCFD Report

Task Force on Nature and
Climate-related Financial Disclosure Report

CONTENTS

About this Report

Nanya Technology Corporation (Nanya) not only complies with international and government regulations, but also voluntarily adopted the Task Force on Climate-Related Financial Disclosures (TCFD) framework developed by the Financial Stability Board (FSB) in 2018, followed by formal registration as a supporter in 2021 and the release of a TCFD Report each year since 2022. Nanya has released two TCFD Reports so far. The framework recommended by the Task Force on Nature-Related Financial Disclosures (TNFD) was formally released in September 2023, and Nanya became the first memory company to register as an early adopter of TNFD. Nanya implemented the LEAP methodology (Locate, Evaluate, Assess, Prepare) to identify material nature-related issues of its operations, and integrated the TCFD and TNFD frameworks to jointly carry out climate change and nature-related risk assessment processes. Nanya also took corresponding management measures to increase its nature and climate resilience.

The scope of this report includes Nanya and subsidiaries, in which the data of GHG, energy use, and identification of the location of nature-related operations, does not include the design house in Hsinchu, Taiwan, overseas design houses, and sales offices (including San Jose, Houston, and Burlington in the US, Dusseldorf in Germany, Shenzhen in China, and Tokyo in Japan). Since the locations do not engage in any production, the impact of their environment related use and consumption is insignificant with Nanya's 12-inch fab in New Taipei City, Taiwan). The Company has begun compiling an inventory of GHG emissions from subsidiaries in 2022, and plans to formally disclose the inventory after verification in 2024.

Date of Publication

Nanya publishes a TCFD Report annually and integrated TNFD this year.

Current edition: June, 2024
Last edition: June, 2023
Next edition: June, 2025

Information Disclosure Timeframe

From January 1, 2023 to December 31, 2023

Scope of Data

Nanya's operations system include Nanya and its subsidiaries

Data Quality Management

Financial data: KPMG Taiwan

Organization GHG inventory ISO 14064-1 and GHG Protocal: SGS

Sustainability Information AA1000AS V3: bsi

Management System Verification

Quality Management ISO 9001, IATF 16949: LRQA

Environmental Management ISO 14001: LRQA

Information Security Management System: ISO 27001: SGS

Energy Management ISO 50001: LRQA

Safety and Health ISO 45001/TOSHMS: LRQA

Responsible Business Alliance RBA VAP: SGS

Guidelines and Standards for Drafting

TNFD

TCFD

GRI 101: Biodiversity 2024

Rules Governing the Preparation and Filing of Sustainability Reports by TWSE Listed Companies

Contact Window

Sustainability and Risk Management Division, President Office

Email: NTCESG@ntc.com.tw

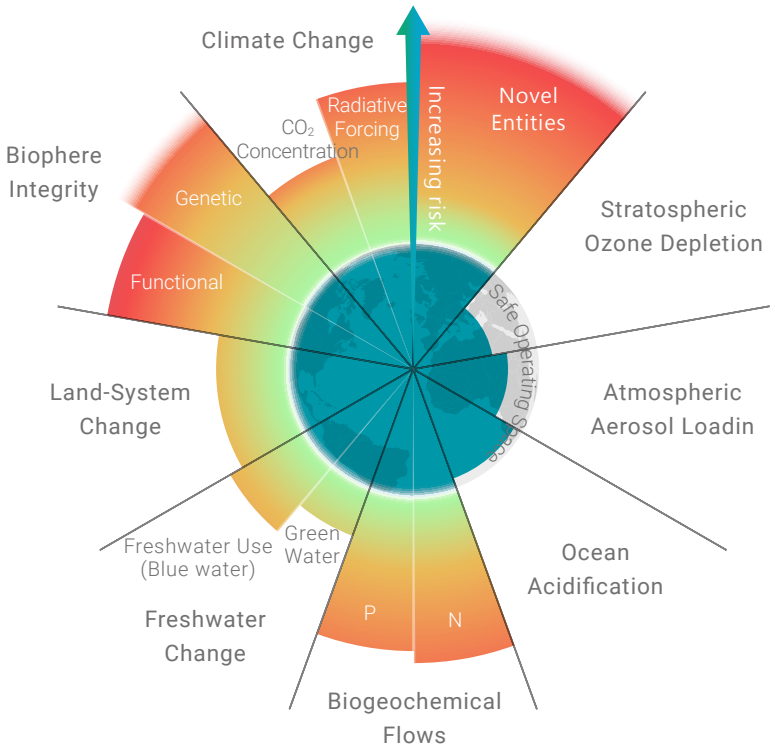
Links Between the Theory of Planetary Boundaries and Nature-related Issues

Many scientific studies have pointed out that human activities have gradually changed Earth's systems, such as global warming and large-scale surface and ecosystem changes. This has further aggravated climate change and the loss of biodiversity. In the light of this, some scientists have proposed that the Earth is gradually moving away from the Holocene, which lasted for more than ten thousand years, and is slowly moving towards a new geological age: Anthropocene. The proposal of the Anthropocene means that the severity of human activities is sufficient to change Earth's systems.

According to the Planetary Boundaries (PBs) assessment proposed by the Stockholm Resilience Center, six key systems of the world have exceeded the threshold for security and stability. Exceeding these thresholds also means that human society will face new risks in the history of civilization, and will bring a high degree of uncertainty to the development of human civilization. Therefore, in such a highly uncertain natural environment, business operations and human society will face a future environment that is more volatile than any time in history.

Nanya believes that business operations in the Anthropocene will not only face existing industrial development risks and risks brought by human society, but also contain development opportunities brought by environmental changes. Therefore, mitigating climate change and the uncertainty brought by the natural environment, and seizing opportunities for sustainable operations are key issues for Nanya's sustainable operations.

2023 Assess representative indicators of nine Earth environmental systems, six of which have met thresholds for increased risk (thresholds)



(PBs theory 2009-2023 evaluation results, 2023, Stockholm Resilience Center[Note1])

Note1:Stockholm Resilience Center, 2023

1 Nature and Climate Vision

01 Nature and Climate Vision

1.1 President's Message

To Nanya's Stakeholders:

In 2023, the World Economic Forum (WEF) published the Global Risks Report, emphasising that six of the top ten risks in the next decade are related to climate change and natural resources shortages[Note]. In the face of the urgent challenges, the COP28 concluded the status quo with the first Global Stocktake to chart a better course towards the goals of the Paris Climate Change Agreement. Countries worldwide increasingly adopt laws and policies with more rigorous standards, among which Taiwan has passed the Climate Change Response Act in 2023 to set the goal of reaching net zero by 2050.

Nanya has been an active supporter of sustainability and climate change mitigation. In 2022, we adopted the Task Force on Climate-related Financial Disclosures Recommendations (TCFD) and released our first TCFD report. In 2023, we became an early adopter of the Task Force on Nature-related Financial Disclosures Recommendations (TNFD) and leveraged the Locate, Evaluate, Assess, Prepare (LEAP) approach. We identified nature-related dependencies, impacts, risks and opportunities of Nanya and our supply chain, and integrated with our climate change actions and financial performance, which are fully disclosed in this TCFD-TNFD report.

With the ultimate goal of enhancing corporate resilience against the volatility of the world, we continuously invest in innovation, green manufacturing and supply chain management. Creating sustainable values for our stakeholders, Nanya strives to be the Best DRAM Partner in the Smart World.

Note: The "Global Risks Report 2023" emphasised that the top ten risks over the next 10 years include "Failure to mitigate climate change," " Failure of climate-change adaptation," "Natural disasters and extreme weather events," " Biodiversity loss and ecosystem collapse," "Natural resource crises," and "Large-scale environmental damage incidents."

Innovation and Green Manufacturing

DRAM is the key to the evolution of smart generations. The development of Nanya's advanced and greener products can be divided into two parts: product design and green manufacturing. We incorporate elements of green product from the very beginning of the lifecycle, and the whole process of product development is supervised by our Green Product Promotion Committee. In 2023, energy-saving products accounted for around 90% of our total revenue and enabled our customers to save over 500 million kWh of electricity. In the same year, we unrolled 36 action plans and saved 5,337 MWh within the year.

All our products are manufactured in green factories. We also aim to increase the use of renewable energy from 3.2% of total energy consumption (24.49 million kWh) in 2023 to 25% by 2030. The sevenfold percentage point increase represents an advancement that is even more ambitious than the goal set in the Global Renewable and Energy Efficiency Pledge by the COP 28.

Climate Change Adaptability

To enhance the resilience of our fab and ensure in-time recovery in the case of natural disruptions, Nanya has implemented comprehensive measures with particular focus on water resources. Nanya's water conservation system could effectively respond to drought and water shortage risks. Our water recycling and reuse systems enable us to strengthen water efficiency. In 2023, we started to adopt the Alliance for Water Stewardship (AWS) standards to further optimise our water management.

Biodiversity Strategies

Nanya is located amidst hills and slopes with unique landscape and rich biodiversity in Taishan District. From 2013, Nanya started to regularly conduct terrestrial ecology surveys on mammals, amphibians, reptiles, butterflies, birds and plants. In 2023, based on the ten-year record, we released the Biodiversity Policy and adopted the TNFD framework. We identified the interplay between our operation and the environment, our dependencies and impacts on natural resources to build a comprehensive risk assessment process and measures. We also invited external stakeholders, including universities, to explore the connection with nature and enhance positive environmental impacts.

Supply Chain Management

In 2023, Nanya launched a carbon reduction project subsidised by the Ministry of Economic Affairs with 10 contractors and raw material suppliers, which aims to reduce 6,300 tons of CO_2e within 2 years. We also seek to build consensus with suppliers for sustainable manufacturing through regular communication. In 2023, we organised the fourth annual supplier seminar, which featured biodiversity, carbon management and LCA hotspots analysis. The seminar was also the kick-off meeting to start exploring how nature interrelates with our supply chain and will be followed by a series of strategy-making and goal-setting activities.

We are proud to be recognised by prominent entities around the globe:

- Selected into 'A' lists by CDP in both Climate Change and Water Security
- Included in the Dow Jones Sustainability World Index and the Emerging Markets Index (Ranked the first among memory companies in the S&P Global Corporate Sustainability Assessment)
- Awarded the Top 10 Taiwanese Sustainable Manufacturing Companies by the Taiwan Institute for Sustainable Energy
- Silver Award of Taiwan Circular Economy Outstanding Enterprises by the Ministry of Environment
- Received the Outstanding Business of National Quality Award by the Ministry of Economic Affairs

The consolidation of sustainability standards leads to a more rigorous examination of ESG performance. Nanya will work with business partners to create more positive impacts and enhance resilience for a more sustainable future.

1.2 Key Milestones of Nature and Climate-related Transformation

2013
- Carry out environmental and ecological monitoring every year and establish a platform for communication between Nanlin Technology Park and external stakeholders

2017
- Complied the Life Cycle Assessment of products
- Compiled an inventory of Scope 3 GHG emissions
- Defined product green management rules

2018
- Established the Sustainable Development Committee and Sustainability and Risk Management Division
- Introduction of ISO 50001 Energy Management System
- Introduction of TCFD framework
- Included sustainability performance in supplier assessments

2019
- Introduction of visualized energy management platform
- Introduction of AI application system and talent development plan
- Participation in CDP survey for disclosure on carbon management and water security

2020
- Establishment of the Board of Directors' Risk Management Committee
- Organized the 1st supply chain seminar
- Launched the supply chain energy conservation project
- Purchased 362 T-RECs

2021
- Signed contract for supply of 10.4 million kWh in renewable energy
- Commitment to the SBTs
- Became a TCFD Supporter

2022
- Elevated the Sustainable Development Committee to a board-level committee
- Signed contract for supply of 250 million kWh in renewable energy
- Passed the SBTi WB2D carbon reduction path and plan certification
- Published the first TCFD Report in 2021
- Subsidized employee purchases of electric scooters
- Participated in the Semiconductor Climate Consortium (SCC)

2023
- Published the second TCFD Report in 2022
- Introduction of TNFD framework
- Announced the biodiversity policy
- Implement Sustainable Water Management System and received the Platinum Certification of Alliance for Water Stewardship (AWS)
- Used 24.49 million kWh of renewable energy in 2023, accounting for 3.2% of total electricity consumption
- Jointly published the "Guanyinshan Environmental and Ecological Education Annual Report" with Ming Chi University of Technology

2 Nature and Climate Governance Framework and Functions

02 Nature and Climate Governance Framework and Functions

2.1 Sustainable Context of Nature and Climate

The 2023 evaluation results of the PBs theory show that among the nine Earth system functions, six Earth systems, including climate change, biosphere integrity, land system changes, freshwater resource changes, biochemical flows, and emerging pollutants, are at high risk. This shows that human civilization activities have affected the Earth's systems to a certain extent, and have further affected the global ecosystem. Nanya Technology Corporation (Nanya) believes that the implementation of sustainable development, environmental governance, and climate change response efforts will mitigate the impact of its operations on these six Earth systems.

In response to the PBs theory, Nanya is actively reducing GHG emissions to mitigate climate change. We are actively reducing the discharge of wastewater, waste and air pollution to slow down emerging pollutants from entering the environment. We have also dedicated efforts to recycling water resources and enhancing water use efficiency to reduce the water supply burden on the freshwater system. To maintain biosphere integrity and reduce land system changes, we monitor the environment and avoid damaging the ecological environment in the development process, in hopes of mitigating the impact of human activities on the environment through these sustainability actions.

Message from Senior Executives

Pei-Ing Lee
President

"The international trends of TNFD and biodiversity assist Nanya in establishing sustainable development policies and future prospects, drive Nanya's efforts in environmental protection and emission reduction, and establish the competitiveness of operations and product lines. At the same time, we will communicate with customers and cooperate with suppliers to build a better industrial structure.

Lin-Chin Su
Executive Vice President

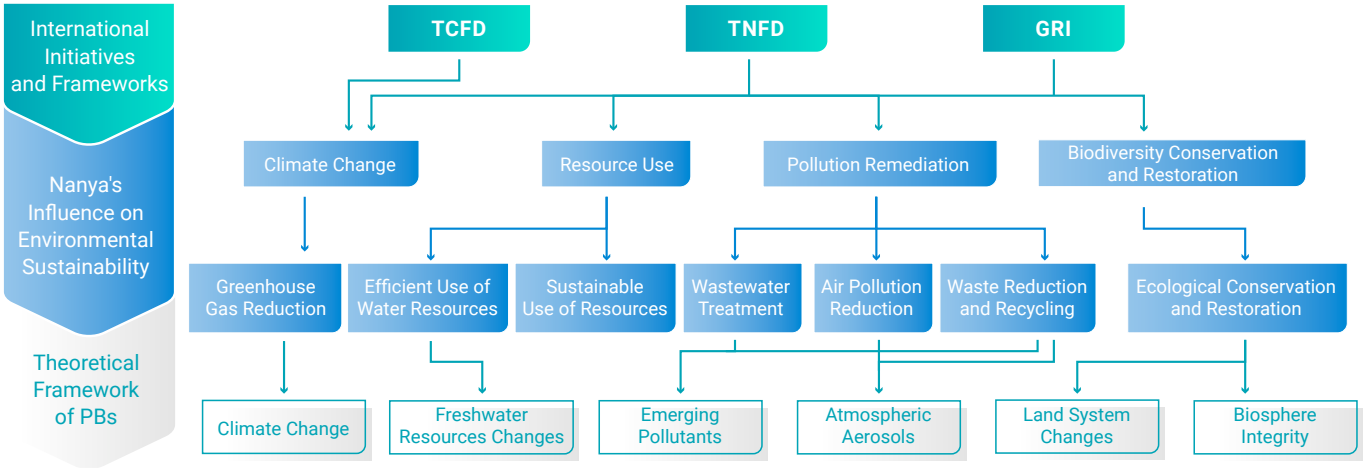
"Nanya cherishes water resources through process improvements and various water-saving measures within the plant. Additionally,Nanya has implemented the Sustainable Water Management of AWS Certification to actively assess and manage water usage risks.

Joseph Wu
Vice President (CSO)

"Nanya actively implements energy-saving projects and is committed to the SBTi; At the water resources management level, we have exerted great effort to water resource recycling, so as to not compete with the public for water. Nanya's past sustainability practices have shown preliminary results. In the future, Nanya will link its operations with the global trend of environment sustainability, in line with international trends and the United Nations framework. Nanya commits to Science Based Targets initiative (SBTi),aligning with the global net-zero trend through strategies such as energy conservation and procurement of renewable energy,while integrating our business operations into global natural environmental sustainability trends.

Nanya integrated international frameworks, such as GRI (Global Reporting Initiative), TCFD, and TNFD, with the PBs theory, and established long-term science-based goals for the natural environment. The specific framework planned is as follows:

Long-term Science-based Goals for the Natural Environment



Nanya has set SBTs related to climate change and passed the SBTi review in 2022. After publishing the TNFD Report in 2023, we began to study methods for setting SBTs related to the environment other than climate change, and simultaneously aligned them with the methodology of the Science Based Target Network (SBTN). We attempted to develop SBTs for water resources use and other environment-related SBTs, formulating long-term strategies and vision for Nanya's environmental governance.

2.2 Management Responsibilities and Risk Management Framework

Message from Senior Executives

Pei-Ing Lee
President

"Nanya's independent directors fully serve their functions, supervise corporate sustainability-related performance, and also review and communicate with executive units on non-financial performance before each board meeting.

Lin-Chin Su
Executive Vice President

"Starting from August 2022, Nanya elevated the Sustainable Development Committee to a functional committee under the Board of Directors and lead a task force. Environment-related issues are discussed during board meetings, such as TCFD, carbon issues, and other environmental issues of concern to TNFD: Improvement measures related to water resources, pollution prevention, and ecological conservation. There are all discussed during board meetings.

Joseph Wu
Vice President (CSO)

"Nanya's Sustainable Development Committee is currently a board-level committee with at least two formal meetings a year, covering all non-financial content in the sustainability report; The task force prepares reports on special topics, such as TCFD and human rights due diligence, for committee members and ask for their opinions. Major policies, including: biodiversity policies, human rights policies, and the code of ethics of corporate management, are also reported during board meetings.

Board Participation and Supervision

Nanya's board of directors performs its duties according to related laws and resolutions of the shareholders' meeting, upholding the principle of sustainable operation to maximize interests of shareholders. The main duties of the board of directors are to ensure information transparency, correctness, and compliance, appoint senior executives, formulate earnings distribution proposals, and supervise and provide guidance for the Company's operations. The Board of Directors supervises and provides guidance on nature and climate-related issues. Nanya convened 5 board meetings in 2023 and discussed the 2022 Sustainability Report, TCFD Report, second plan to purchase renewable energy, GHG inventory progress and planning, biodiversity policy, and performance in sustainability assessments.

- Functional Committees of the Board of Directors

Nanya's Board of Directors has three functional committees. The committees help the board perform its duties and also serve the following functions on nature and climate-related topics:

Audit Committee

Supervises the Company's business execution and financial position, assists directors in performing supervisory duties, and perform tasks under relevant laws and regulations and international standards (such as the Renewable Energy Development Act and Greenhouse Gas Reduction and Management Act).

Remuneration Committee

Establish and periodically reviews director and manager performance evaluation and remuneration policies, systems, standards, and structures. Salary adjustments, bonuses and other compensation for senior executives take into account their contribution and performance in the economic, environment and social aspects.

Sustainable Development Committee

Reviews sustainable development and risk management policies, strategies, and management approaches;Supervises sustainable development and risk management-related matters and implementation plans, including nature and biodiversity, climate change, and GHG management. Reviews material information on sustainable development disclosed in the Sustainability Report, TCFD and TNFD, and reports results to the Board of Directors.

The Sustainable Development Committee under the Board of Directors if formed by the chairman, 4 independent directors, and 2 executive directors. Committee members jointly appoint the president as the chairman. The committee convenes at least 2 meetings each year, and discusses sustainable development work plans, risk management evaluation, and response to regulations. The committee reports to and discusses with the Board of Directors to elevate the level of sustainability governance, strengthen internal reforms, and move towards the vision of sustainable development. The Board of Directors established the Sustainable Development Steering Center with the responsibility of managing internal sustainability affairs, and also established the Risk Management Steering Center with the responsibility of identifying physical and transition risks brought by nature and climate. Controllable risks are included in daily operations, and uncontrollable risks are monitored for resilient response, thereby minimizing Nanya's overall operational risks.

2023 Sustainable Development Committee
Work items related to Nature and Climate Change

- Review and approve the publication of the 2022 Sustainability Report.
- Report the 2022 GHG inventory and verification results and 2023 work schedule according to the Sustainable Development Roadmap of TWSE/TPEx-listed Companies announced by the FSC.
- Review and approve the announcement of the Biodiversity Policy.
- Discuss the implementation of the TNFD methodology and plan the issuance of the first "Nature and Climate-related Financial Report" in 2024.
- Report the performance of ISO 50001 Energy Management System and energy action management improvement projects.
- Report the LCA (Life Cycle Assessment) inventory mechanism and hotspot improvement following the inventory.
- Report the progress of the sustainable supply chain mutual benefit initiative (including emission of Scope 3, product carbon footprint, and low-carbon transformation project with large enterprises leading small enterprises).

Responsibility of Managers

Nanya set up two main management platforms to respond to the challenges of international trends and seize opportunities. Each platform is headed by business managers and regular meetings are held to examine their performance and progress, in order to implement nature and climate governance.

• Sustainable development quarterly meetings

The Company has a Sustainable Development Steering Center, in which the vice president holds the position of director. Meetings are held quarterly and progress reports are made to the board of directors by the Sustainable Development Committee twice a year. A Sustainability and Risk Management Division was set up under the President's Office responsible for the planning and management of action plans in response to sustainability ratings, trends, and initiatives. The task force also draws up nature and climate-related promotion strategies and targets, integrates and supervises their progress and results (e.g., ISO 14001 and ISO 50001 management systems), and ensures the effectiveness of horizontal and vertical communications within the organization, so that sustainable development can be put into practice. Material risks related to nature and climate are identified each year, and identification results are submitted to the Risk Management Steering Center for risk assessment.

2023 Results

- Implemented 36 energy conservation projects (energy savings of up to 5,337 MWh)
- 35 raw material improvement plans (annual savings of up to NT$102 million)
- CDP's double A list of Climate Change and Water Security
- Renewable energy use (RE 3.2%).

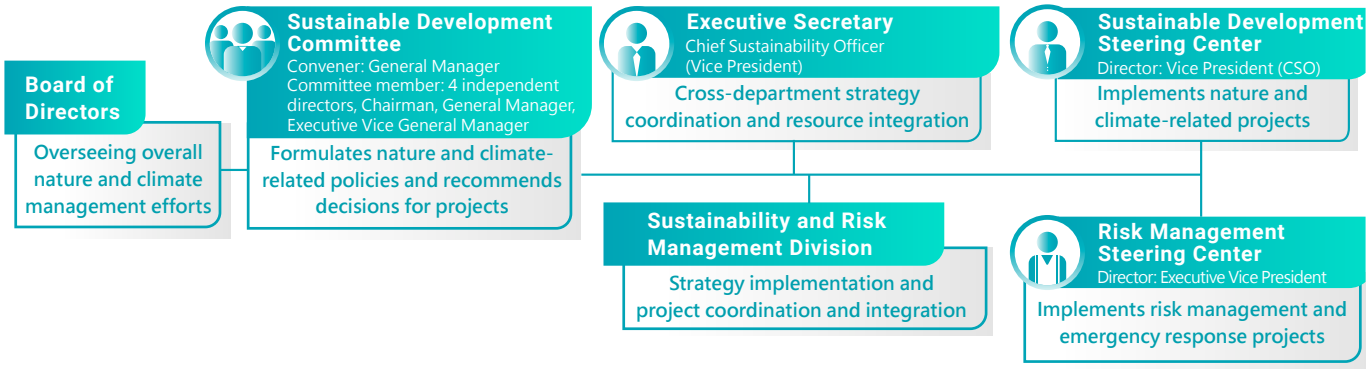
• Risk management quarterly meetings

The Company established the Risk Management Steering Center responsible for the promotion and supervision of each risk management team's activities and overall risk management. The executive vice president holds the position of director. Meetings are held quarterly and progress reports are made to the board of directors by the Sustainable Development Committee twice a year. The Company established the Sustainability and Risk Management Division under the President's Office to review the operational performance and business continuity plans of each risk management team, in order to ensure the applicability, suitability, and effectiveness of the ongoing operations of these risk teams.

The Risk Management Steering Center coordinates and integrates all risks of the Company, and considers risk factors, such as potential risks in operations, technology, customers, finance, EHS, information security, legal, climate, nature, and biodiversity, in accordance with the CNDBA-0001 Risk Management Procedures. It selects the most relevant risk factors, evaluates various risk issues, formulates management indicators, and manages targets.

2023 Results

Management reviews were conducted for 168 risk items including climate change compliance risk, low-carbon energy transformation and other emerging risks, as well as physical risks due to natural disasters.



In addition to monitoring the Company's implementation status through the Sustainable Development Committee, the Company also arranges courses on economics, corporate governance, risk management, sustainable development, climate change, carbon credit trading and carbon management, and compliance, in order to raise the sustainability governance awareness of the Sustainable Development Committee. In 2023, the Company's directors received 82 hours of continuing education. In addition to having different professional backgrounds, Nanya's Directors have experience as senior managers, government officials, or public representatives, so they possess diverse abilities required to perform the duties of Directors. We continue to plan the participation of directors in training courses on sustainable development, corporate governance, or risk management, in order to respond to development trends in sustainability topics and corporate governance.

Nanya continues to enhance its climate governance ability and qualifications. We participate in international initiatives and evaluations to keep track of the trends for key indicators and quantify the results of our action plans. Nanya was selected as a constituent stock of the DJSI World Index for the third time and the Emerging Markets Index for the fifth time (Ranked first among global memory manufacturers) in 2023. The Company is also promoting the importance of climate change and risk management. Hence, the Company included climate change issues into employee performance evaluations in 2018, in which climate change accounts for approximately 7% of evaluation items for entry-level personnel and 2nd-level and above supervisors. Considering that the decisions made by the CEO can have profound effects on climate change, the importance of climate change issues was increased to 10% in their performance evaluation.

Stakeholder Negotiation Platform

• Engagement with Local Stakeholders

Nanya has established a platform for Nanlin Technology Park to engage external stakeholders in nature-related issues. The platform convenes quarterly meetings and routinely reports on the results of environmental and ecological monitoring. Its members cover a wide range of stakeholders, including senior managers, department heads, local community representatives, and academic researchers, so that they communicate different aspects and achieve effective engagement.

• Engagement with Supplier

Nanya communicates with suppliers through a variety of channels. In addition to signing the Supplier Code of Conduct and the sustainability risk assessment process, Nanya regularly organizes training and sustainable supply chain seminars to discuss ESG trends, and determines the direction for project cooperation during these events, jointly carrying out carbon reduction actions in the value chain.

• Engagement with Investor

Nanya understands investors' concerns about ESG issues through the requirements of international ratings on sustainability issues and annual surveys on material issues in sustainability reports. We actively improve the quality of information disclosure in sustainability-related reports, making it an effective medium for communication.

• Engagement with Customer

Nanya actively meets customers' needs on information to respond to climate change issues, and cooperates with online meetings, physical visits or questionnaire surveys. The contents cover SBTs, low-carbon energy use, and low-carbon product provision, and compiles and inventory of potential needs. We evaluate customers' sustainability reports and other externally disclosed information, and incorporate customer needs into the strategic direction of Nanya's low-carbon actions.

• Engagement with Industry Association

As a member of the global semiconductor industry, Nanya not only pursues the greatest achievement on its core business, but also actively participates in external engagement activities, in order to cooperate with other enterprises in the industry in moving towards common good. We established the Public Affairs Participation Group under the Sustainable Development Steering Center to evaluate and review decisions on participating in public affairs. In accordance with the Company's "Public Affairs Participation Guidelines", we review whether participating public associations are consistent with the goals pursued by the Paris Agreement every year. Nanya is committed to controlling global warming to well below 2 degrees Celsius through industrial cooperation. By supporting and participating in international initiatives and industry organizations, Nanya hopes to cooperate with partners from all sectors, expand its influence, and accelerate the industry's transition towards sustainability.

List of associations that Nanya participates in

SEMI Sustainable Manufacturing Committee

Participated in 2022, and serves as the chairman of the committee

Mission and goals:

- Integrate global green manufacturing resources
- Strengthen supply chain partnerships for transition towards sustainable
- Promote innovative technologies through strategic R&D collaboration

Taiwan Net Zero Emissions Association(TNZEA)

Began participating and serving as a director in 2021

Mission and goals:

Launched the Net Zero 2030/2050 Initiative and drives net zero emissions through action, assisting the government in achieving carbon neutrality

Semiconductor Climate Consortium (SCC)

Participated in the SCC and became a founding member in 2022

Mission and goals:

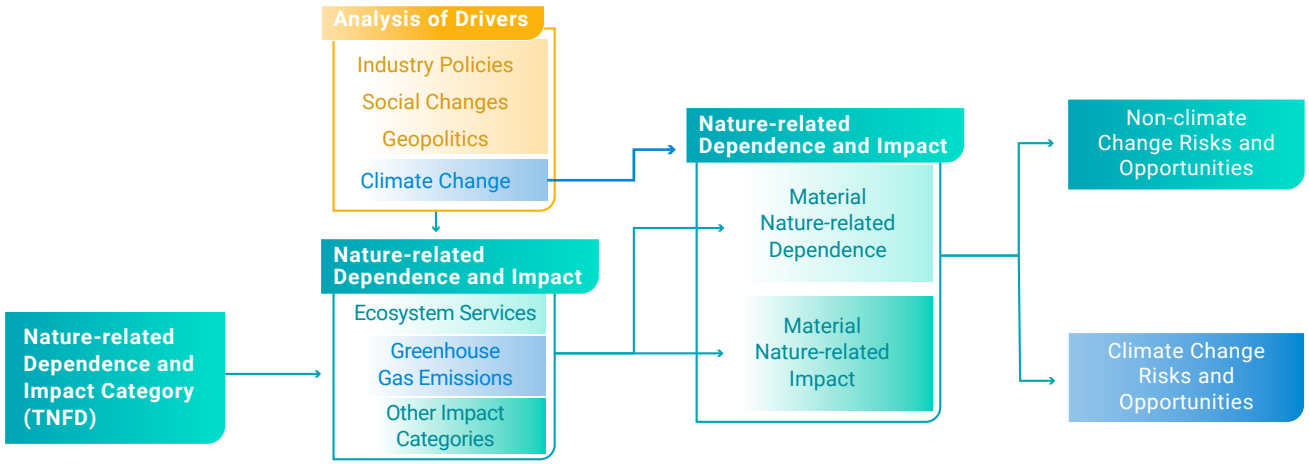
- Cooperation: Continue to reduce GHG emissions through a common approach, technological innovation, and close communication
- Transparency: Publish annual progress reports related to the three scopes of emissions every year
- Goal: Set short-term and long-term carbon reduction targets to achieve net-zero carbon emissions by 2050

2.3 Materiality Identification Process for Nature and Climate-related Issues

Nanya has published a TCFD report for two consecutive years. The report describes the method of identifying and assessing climate change in the operation and production process. In response to the release of the formal TNFD framework in 2023, the LEAP (Locate, Evaluate, Assess, Prepare) method was implemented in areas within a 2 km radius of direct operating locations, upstream (locations of significant suppliers), and downstream (shipment and warehousing locations), in order to identify the importance of nature and climate. We collected external drivers related to industry policies, social changes, geopolitics, and climate change, and included them as materiality analysis issues of nature-related dependence and impacts. Since climate change is regarded as an issue of the natural environment, this method can be used to identify climate change and non-climate change related risks and opportunities.

Nanya engaged in industry-academia collaboration with the National Taipei University of Technology research team (Taipei Tech Research Team), and explored how to implement the TNFD framework in the corporate Sector. We collected 9 nature-related maps from Taiwan's existing geographic information systems for cross referencing, and organized education training and workshops. We engaged in communication and cooperation with relevant authorities to establish the method for identifying Nanya's material nature and climate-related issues.

Materiality Identification Framework for Nanya's Nature and Climate-related Issues



The Process of Materiality Identification for Nanya's Nature and Climate-related Issues

In the first year of implementing the TNFD, Nanya initially implemented the LEAP methodology and the operations of each step. For the upstream value chain - focusing on trialing the introduction of "Locate" and "Evaluate" for significant suppliers, as well as introducing "Locate" for the downstream value chain. After publishing the first integrated report, we will discuss and optimize the identification process with the Taipei Tech Research Team, expand the scope of suppliers, establish more in-depth nature-related indicators, and improve management measures.

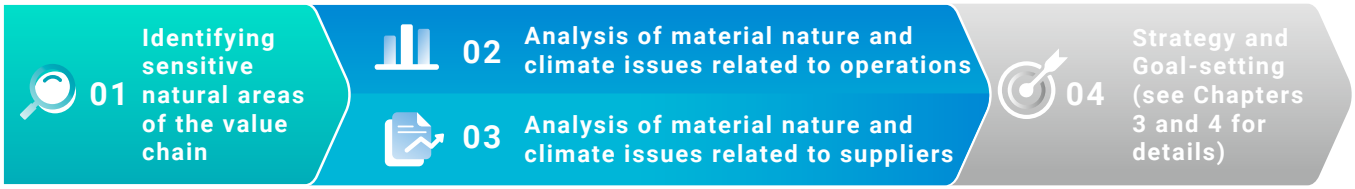
Identification of Natural Dependencies and Impacts along Nanya's Value Chain

L Locate
Analyze the relationship between operating locations and critical nature areas

E Evaluate
Identify nature-related dependencies and impacts

A Assess
Identify nature-related risks and opportunities

P Prepare
Formulate strategies and goals based on identification results and disclose them



Item	Locate	Evaluate	Assess
Nanya's operating locations	●	●	●
Upstream (locations of significant suppliers)	●	●	●
Downstream (domestic shipping locations)	●		

01 Identifying biosensitive areas of the value chain

Implementation method:
Nanya uses the maps disclosed by Taiwan's government to analyze the environment within a 2 km radius based on the coordinates of actual locations of operating,significant suppliers and shipment and warehousing.A total of 9 maps of highly sensitive biodiversity areas were compared in 2023, including areas specified in regulations and not specified in regulations.

List of Graphics Materials Used

Properties	Areas specified in regulations		Areas not specified in regulations
Government Agency	Ministry of the Interior	Ministry of Agriculture	Ministry of Agriculture
Item	• Coastal conservation zone • National park • Important wetland	• Major wildlife habitat • Wildlife refuge • Nature reserve • Nature conservation area	• Conservation belt • Key biodiversity area

02 Analysis of material nature and climate issues related to operations

Implementation method:

Nanya covers climate in a broad sense of nature-related issues, and starts with the analysis of nature-related dependence and impact categories in the TNFD. We invite departments within the Company to participate in training in the form of workshops. In the process, everyone's work experience and knowledge is gathered together through brainstorming to explore nature-related dependencies and impacts that the Company may face.

Implementation process:

Training and Workshops

Supervisors and employees who participated in the workshop carried out materiality identification based on the degree of impact and probability of occurrence, and selected the issues most relevant to Nanya. Nanya referenced the SEEA (System of Environmental Economic Accounting)[Note] and three service categories recommended by the TNFD for analyzing nature-related dependencies. Analysis of nature-related impacts was carried out after referencing items recommended by the TNFD.

Analysis of External Drivers

Nanya analyzes the external drivers that may be encountered in the process of operations through systematic thinking. In addition to climate change, which is the main factor leading to changes in the natural environment, Nanya also considers changes in industrial policies, social environment, and broader geopolitical factors.

Focus of Issues

Linked nature-related dependencies and impacts directly and indirectly related to climate change,Nanya analyzed the risks of each nature-related dependency and impact.

Note: SEEA (system of environmental and economics account) is a set of methodologies established by the United Nations for estimating the value of all natural resources and ecosystem services within an economy.

03 Analysis of material nature and climate issues related to suppliers

Implementation method:

By inviting suppliers to fill out an online questionnaire for nature and climate-related issue identification, Nanya investigate whether suppliers already have relevant management measures and conduct performance evaluations on nature dependence and impact issues, and then review the responses of questionnaire and analyze the materiality of suppliers' nature-related issues.

Implementation process:

Exposure to dependencies and impacts

A higher ratio of suppliers that are concerned about a nature-related dependence or impact means that more suppliers are concerned about the issue, and the dependence or impact is more likely to occur in its operating environment.

→

Risk level of nature-related dependence

Suppliers conduct self-assessments on nature-related dependencies of concern, and evaluate the impact on their operations after the dependence disappears. We also survey suppliers' disaster response ability. After integrated analysis, this becomes the supplier's risk level for the nature-related dependence. A higher value indicates a higher potential impact, and means lower self-assessed management response ability.

→

Risk level of nature-related impact

For nature-related impacts of concern to suppliers, suppliers will conduct self-evaluations on management measures and performance in mitigating impacts. A lower value indicates lower impact on the supplier and lower risk.

→

Output of Analytical Results

Finally, the maximum value of impacts and dependencies is standardized and 70% is used as the criterion for selecting the nature-related dependence and impact of suppliers.

What is nature-related dependence? What is nature-related impact?

- The nature-related dependence of companies: Environmental assets and ecosystem services that the organization depends on for operations[Note]. For example, business operations may depend on services provided by the natural environment, such as water flow, water quality regulation, pollination and carbon sequestration.
- The nature-related impact on companies: The process of business operations leads to changes in the state of nature, which in turn changes the abilities that can be provided by the environment to social or economic activities. The term "impact" is a neutral term that may refer to negative impacts (such as cutting down trees and water pollution discharge) or positive impacts (such as planting trees and lake remediation). Impacts may also be direct, indirect, or cumulative impacts.

This definition is modified from the first edition of the TNFD Glossary released in September 2023.

List of nature-related dependence categories (ecosystem services and abiotic flow)	
Main services	**Item (SEEA/TNFD)**
Provisioning services	Biomass provisioning
	Genetic material
	Water supply (abiotic)
Regulating and maintenance services	Global climate regulation
	Rainfall pattern regulation (subcontinent scale)
	Local (micro and meso) climate regulation
	Air filtration
	Soil quality regulation
	Soil and sediment retention - soil erosion control services
	Soil and sediment retention - Landslide mitigation
	Solid waste remediation
	Water purification (water quality regulation) retention and decomposition of nutrients/ pollutants
	Water flow regulation - Baseline flow maintenance services
	Water flow regulation - Peak flow mitigation services
	Flood mitigation - Coastal protection services
	Flood mitigation - River flood mitigation services
	Storm mitigation
	Noise attenuation
	Pollination
	Biological control - Pest control services
	Biological control - Disease control services
	Nursery population and habitat maintenance
	Other regulating and maintenance services
Cultural services	Recreation-related services
	Visual amenity services
	Education, scientific and research services
	Spiritual, artistic and symbolic services

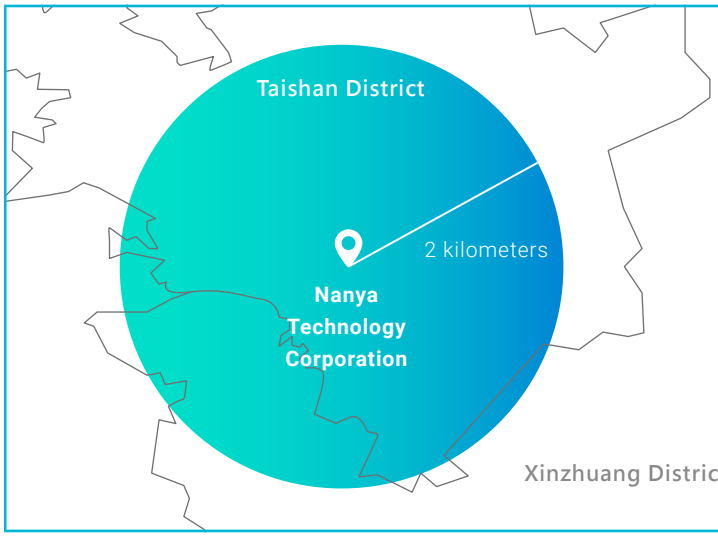
List of nature-related dependence categories (ecosystem services and abiotic flow)	
Main services	**Item (SEEA/TNFD)**
Abiotic flow	Metallic minerals
	Nonmetallic minerals supply shortage
	Fossil fuel

List of nature-related impact categories	
Main impact	Item
Ecosystem changes	Terrestrial ecosystem use
	Freshwater ecosystem use
	Marine ecosystem use
Resource use	Use of water resources
	Mineral use
	Fossil energy use
	Indirect energy use
	Biomass use
Climate change	Greenhouse gas emissions
Pollution	Non-GHG pollutant emissions
	Water pollution
	Soil pollution
	Solid waste
Invasive species and other	Invasive Species
	Disturbances

Note: Ecosystem services: Refers to the benefits or contributions of ecosystems to economic activities and other human activities (UN SEEA 29th Edition, 2021), which is divided into the following three categories:
- Provision services: Refers to items that can derive benefits from the extraction or harvesting of ecosystems
- Regulating and maintenance services: The ability to maintain environmental conditions, including processes affecting climate, hydrology, and biochemical circulation
- Cultural services: Ecosystems can provide a series of experiences or items that create cultural value

2.4 Identification of Biosensitive Areas in the Value chain

Biosensitive areas where Nanya operates directly



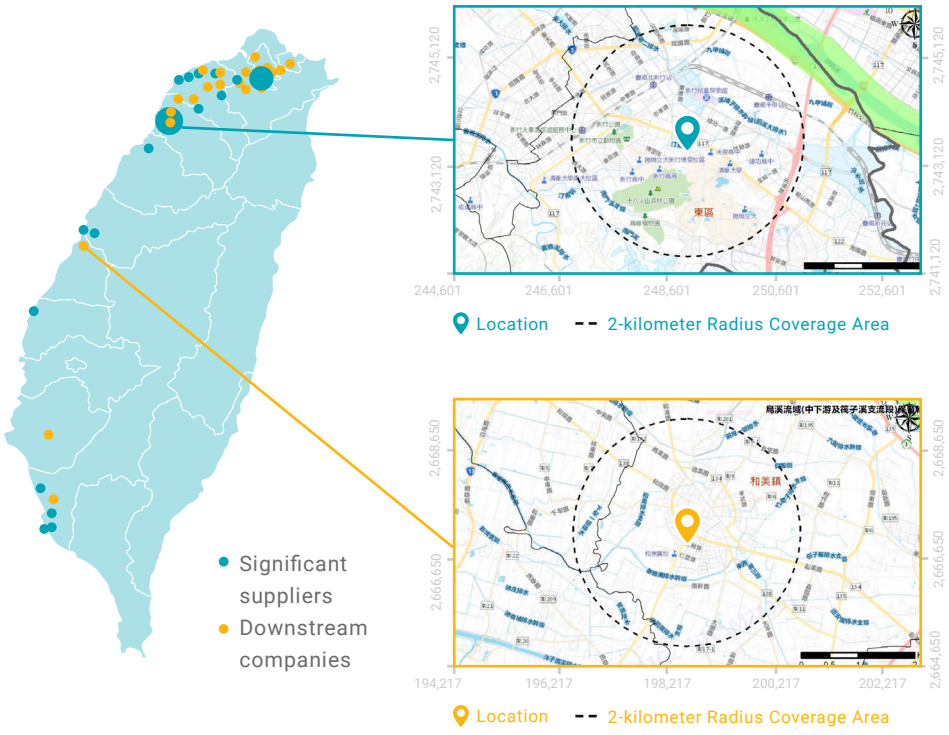
Based on comparative analysis of **9** types of highly sensitive biodiversity area maps, we determined that there are

no highly biosensitive areas within a 2 km radius Nanya's operational locations.

Biosensitive areas of Nanya's upstream and downstream operating locations

Based on the comparative analysis of the 9 maps of highly sensitive biodiversity areas, we determined that within a 2 km radius of the location of Nanya's significant suppliers in 2023, the majority of high risk suppliers are in Taoyuan City. Since some suppliers in Taoyuan are located in the Dayuan Industrial Park, which is close to an important wetland. However, within a 2 km radius, all significant suppliers do not actually operate directly in biosensitive areas specified by regulations.

Among the 26 customers surveyed, there are 10 customers within a 2-kilometer radius that may intersect with protected areas specified by Taiwan's regulations, and there are only 3 customers according to the IUCN classification standards. Further analysis shows that these 10 customers do not actually operate in any biosensitive areas.



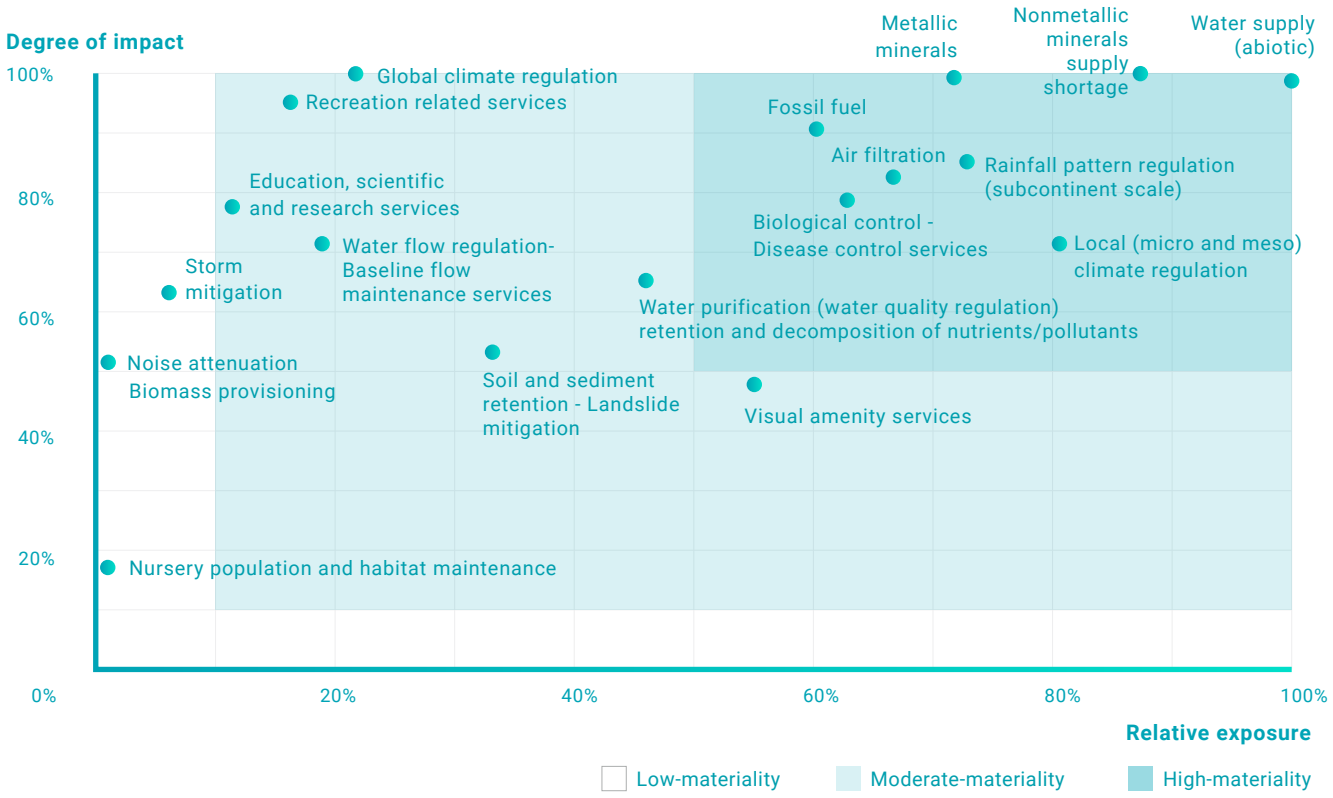
2.5 Nanya' s Nature and Climate Materiality Identification Results

1. Identification Materiality Results of the Nature Dependencies

Nanya conducts materiality analysis based on exposure and potential degree of impact. Exposure is weighted sum of the proportion of issues of concern across departments that participated in the workshop and the probability of occurrence. The degree of impact on operations is determined by assuming that the supply of ecosystem services or abiotic flows that the company depends on disappears. The highest score of the two indicators above is used as the standardized parameter to obtain Nanya's relative score in a nature-related dependence issue. Issues with a relative score of 50% and above in both exposure and degree of impact are listed as high-materiality issues; issues with both indicators below 10% are listed as low-materiality issues; issues in the middle are listed as moderate-materiality issues.

For the 8 high-materiality and 7 moderate-materiality nature-related dependence issues, Nanya used the dependency pathway recommended by Natural Capital and TNFD to conduct an in-depth analysis of the impact of each dependency issue on Nanya.

Identification Materiality Results of the Nature Dependencies



List of Identification Materiality Results of the Nature Dependencies

Main services	Subcategory (SEEA/ TNFD)	Materiality	Analysis of importance to Nanya (dependency pathway analysis)	Analysis of external drivers			
				Climate change	Industry policies	Social environment	Other issues
Provisioning services	Water supply (abiotic)	H	The government's water rationing policy due to high turbidity caused by drought, water shortage or typhoon results in insufficient water supply for Nanya and impacts processes, which ultimately affects product delivery and revenue.	●	●	●	

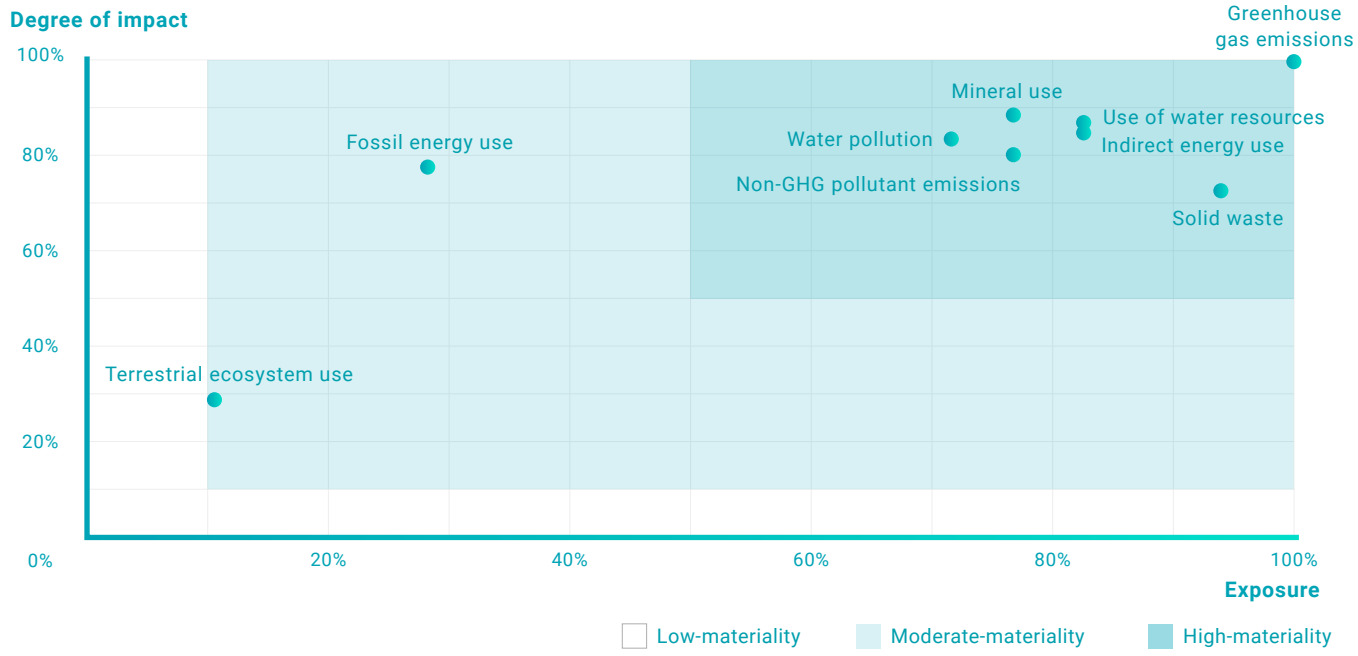
Main services	Subcategory (SEEA/ TNFD)	Materiality	Analysis of importance to Nanya (dependency pathway analysis)	Analysis of external drivers			
				Climate change	Industry policies	Social environment	Other issues
Regulating and maintenance services	Global climate regulation	M	Climate change causes the Panama Canal or a portion of shipping and air routes to be affected by bad weather, causing flight delays and affecting delivery times. In addition, the gradually warming atmosphere will more easily cause arctic oscillation to occur, which may lead to colder cold waves in winter.	●			
	Rainfall pattern regulation (subcontinent scale)	H	Insufficient rainfall and prolonged drought periods may result in insufficient water supply from water sources, ultimately affecting operations.	●			
	Local (micro and meso) climate regulation	H	Record-breaking high temperatures each year due to climate change have increased Nanya's demand for electricity and water, high temperatures in the long-term may lead to drought periods, and may also increase the probability of wildfires in surrounding areas. Gradually rising temperatures can also harm employee productivity and health.	●			
	Air filtration	H	Nanya's production lines require clean fabs, if the air quality deteriorates, clean fabs consumables will need to be more frequently replaced, causing costs to increase. In addition, air quality will also have a negative impact on employee health, especially those who need to be outdoors for long periods of time during the factory expansion phase.	●	●	●	
	Soil and sediment retention - Landslide mitigation	M	The Nanya's fab is located in hilly land of Taishan District, New Taipei City, where there is the possibility of landslide. If an extreme weather event occurs, there is the risk of slopeland collapse.	●	●	●	
	Water purification (water quality regulation) retention and decomposition of nutrients/pollutants	M	Water quality is a key item in the production of the semiconductor industry. Excessive turbidity or pollutants in the source water will increase the load of Nanya's water purification equipment, causing costs to increase.	●	●	●	
	Water flow regulation - Baseline flow maintenance services	M	Stable flow of rivers is an important indicator of whether the area can have stable water supply. If the baseline flow of the river is unstable, it might dry out during drought periods, affecting local farming and residents' water use.	●	●	●	
	Biological control - Disease control services	H	Some studies have pointed out that climate change may lead to cross-species transmission of diseases from wild animals to humans, leading to outbreaks similar to COVID-19. Such infectious diseases pose significant risks to company operations.	●		●	
Cultural services	Recreation related services	M	The greening and planting environment around Nanya provides an important recreational environment for local residents (such as hiking and flower viewing).		●	●	
	Visual amenity services	M	Fab greening helps employees relax physically and mentally		●	●	
	Education, scientific and research services	M	The ecological surroundings of Nanya are important area for conducting environmental education activities and parent-child education activities organized by the company.		●	●	

Main services	Subcategory (SEEA/ TNFD)	Materiality	Analysis of importance to Nanya (dependency pathway analysis)	Analysis of external drivers			
				Climate change	Industry policies	Social environment	Other issues
Abiotic flow	Metallic minerals	H	Metal materials shortage will affect production and may lead to an increase in equipment maintenance costs. It may also lead to an increase in product production costs and even the risk of production suspension.		●		●
	Nonmetallic minerals supply shortage	H	There is the risk of supply shortage or price hikes in the market due to geopolitics and conflicts. Nanya depends on gas as a main material for production. A special gas supply shortage will affect Nanya's production process or increase procurement costs, thus increasing operating costs.		●		●
	Fossil fuel	H	Fossil fuels are still an important energy source for Nanya's operations and are also the main source of electricity in Taiwan. External geopolitical risks will lead to an increase in the cost of fossil fuels, which will indirectly lead to an increase in electricity costs.		●	●	●

2. Identification Materiality Results of the Nature Impacts

The materiality identification for nature-related impact categories is the same as dependence, and all involve the standardization of exposure and degree of impact. Issues with a relative score of 50% and above in both exposure and degree of impact are listed as high-materiality issues; issues with both indicators below 10% are listed as low-materiality issues; issues in the middle are listed as moderate-materiality issues.
In 2023, Nanya identified a total of 9 moderate and high materiality nature-related impacts, in which the 7 high-materiality nature-related impacts include: GHG emissions, water resource use, water pollution, solid waste, indirect energy use, non-GHG air pollutant emissions, and mineral use. The impacts are analyzed and summarized in the following table according to each impact path:

Identification Materiality Results of the Nature Impacts



List of Identification Materiality Results of the Nature Impacts

Nature-related impact category	Subcategory	Materiality	Impact path analysis	Potential damage identification		
				Climate change	Human health	Biodiversity
Ecosystem changes	Terrestrial ecosystem use	M	The development process of the fab will directly change land use characteristics, which may lead to the loss of biodiversity and the reduction of carbon sinks in the area.	○	X	○
Resource use	Use of water resources	H	Water resources are an ecosystem service that Nanya depends on. Semiconductors will be even more severely impacted due to the large amount of water resources used. This not only includes the problem of neighboring communities and companies competing for water, but also the damage to the ecosystem caused by excessive use of water resources.	X	○	○
	Mineral use	H	The use of minerals may lead to lower mineral production, insufficient supply, and ultimately higher prices in the future, resulting in an increase in the Company's procurement costs. The use of minerals may also indirectly lead to the loss of biodiversity at mining sites.	X	X	▲
	Fossil energy use	M	The use of fossil fuels will directly cause the acceleration of climate change, and the emission of air pollutants may also harm human health. The use of fossil fuels can lead to a loss of biodiversity where they are extracted.	○	○	▲
	Indirect energy use	H	The fab uses large amounts of electricity, which may result in the impact of regional power shortages, while also increasing emissions of GHG and air pollutants and loss of biodiversity around the fab.	▲	▲	▲
Climate change	Greenhouse gas emissions	H	GHG emissions cause global warming, which ultimately causes human society to be impacted by systemic extreme weather events. In addition, as governments around the world formulate policies and regulations related to mitigating climate change, GHG emissions have become an important issue to Nanya, whether it may be compliance or market competitiveness.	○	▲	▲
Pollution	Non-GHG pollutant emissions	H	Air pollutants such as VOCs are discharged during Nanya's operations. These pollutants may not only affect human health, but may also attract attention from other stakeholders (e.g., the community), leading to reputational risks for the company.	○ Note 1	○	○
	Water pollution	H	Nanya's operations discharge wastewater. Despite the wastewater complying with regulatory standards, if the total volume discharged exceeds the area's environmental load capacity, it will still result in a loss of biodiversity.	X	X Note 2	○
	Solid waste	H	Business operations generate a large amount of solid waste, including business and general waste. Waste disposal not only requires careful selection of qualified clearance companies, but also whether the waste is handled properly and will impact the environment.	▲	▲	▲

○ : Impact directly caused by Nanya

▲ : Impact not direct caused by Nanya, but is caused by suppliers or electricity suppliers

X : No impact or very low impact caused by Nanya, and exposure risk is determined to be very low

Note 1: Air pollutants cause suspended particles in the atmosphere to reflect solar radiation, thereby mitigating global warming.
Note 2: The wastewater discharged by Nanya currently complies with regulatory standards, so there is no potential risk to human health.

Summery of Identification Results

Nanya is heavily dependent on water resources, climate regulation services, and mineral or non-mineral raw materials, as well as the impacts caused by their related uses and GHG emissions. Based on the above identification results, Chapter 4 will focus on the corresponding strategic management and measures.

Nanya and Taipei Tech Research Team organized at least three training sessions and workshops.

Identification of Material Climate Change Issues

Nanya Technology Corporation sets out from material topics of concern to stakeholders. The topics are then evaluated by internal business managers and employees to select topics related to company development and plan corresponding strategies, ensuring that the topics are aligned with corporate sustainability and business development. In 2023, Nanya Technology Corporation collected 15 topics from international organizations, reports, government policy and regulations, news media, and experience from contact with stakeholders. The level of concern and impact on stakeholders is then analyzed to generate a materiality matrix, in which 10 key topics are selected and converged into 3 strategies. This is used as the theme for the Company's long-term development and response to climate change.

Collect Information on Issues

- Major international conferences (COP, WEF)
- International reports (TCFD, CDP, SBT)
- Experience from contact with stakeholder
- Trends in government regulation
- Prepare a list of 15 topics

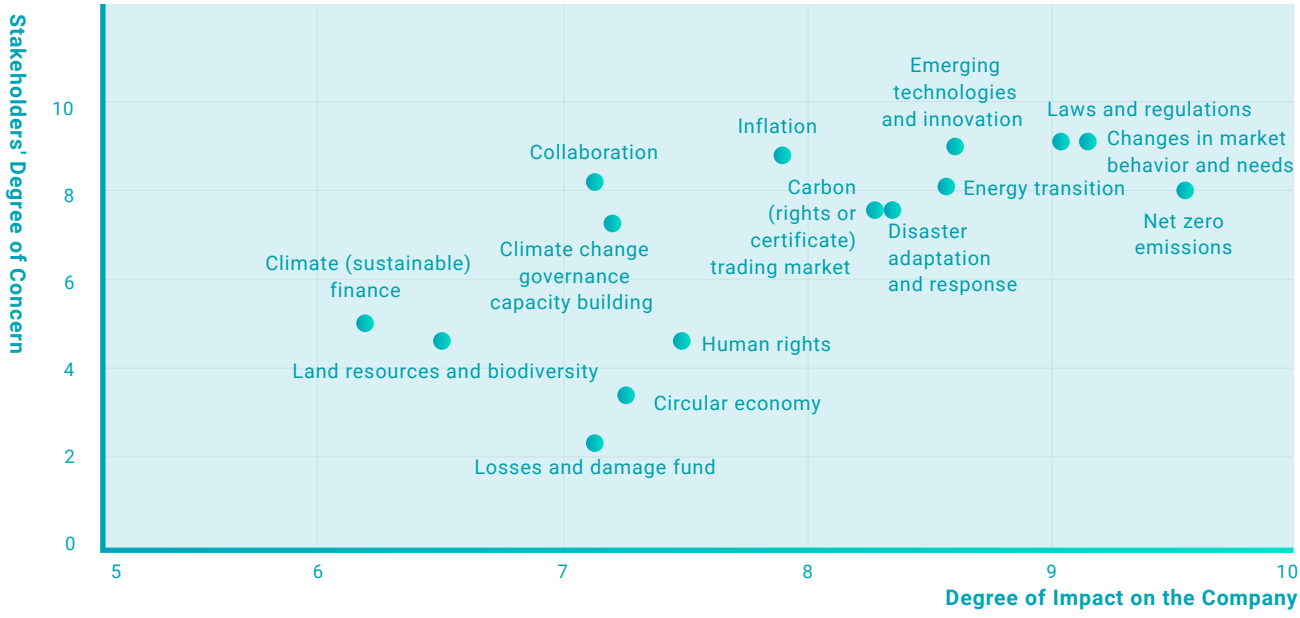
Identify Material Topics

- Distribute questionnaires to senior managers and experts in the Company to analyze the level of concern and impact of the 15 topics. A total of 42 questionnaires were distributed.
- The material topics matrix is prepared according to results, the topics are ranked, and then 10 key topics are selected.

Climate Change Strategy

- Employees related to a topic are called together and 5 strategies for climate change are then formulated based on the contents of the 10 material topics.
- Related risks are identified from the contents of material topics, and risk management and improvements are carried out according to the 3 strategies.

Climate Change Topic Materiality Matrix



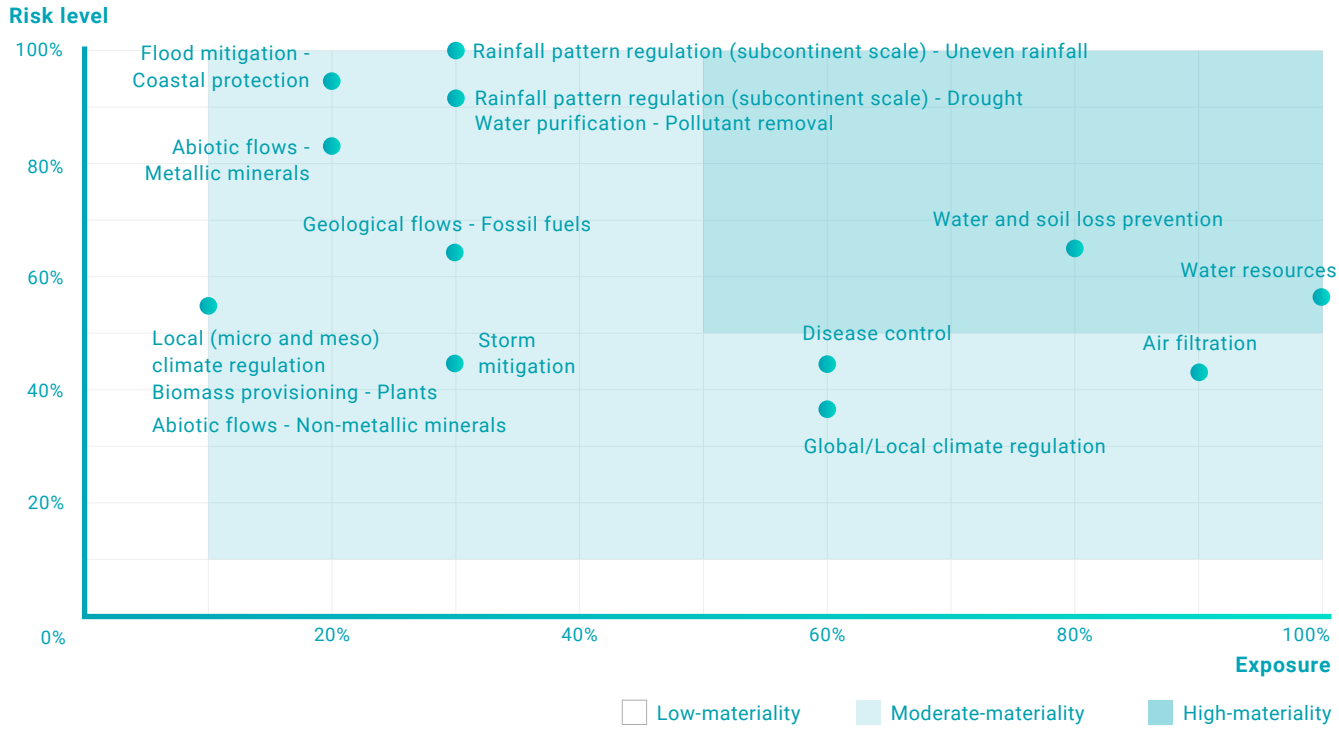
2.6 Nanya' s Suppliers' Nature and Climate Materiality Identification Results

1. Identification Materiality Results of the Nature Dependencies Related to Suppliers

Nanya distributed a total of 50 questionnaires to significant suppliers this year, and collected 29 valid questionnaires. The suppliers were mainly in chemical manufacturing-related industries, followed by the electronics industry. Analysis results show that the dependence categories in which suppliers have high risk and high exposure are "water and soil loss prevention " and "water resource supply services," and issues of high concern are "air filtration," "disease control," and "global climate regulation." The item with greater impact but fewer suppliers exposed was "Rainfall pattern regulation (subcontinent scale) - Uneven rainfall."

This shows that Nanya's management of suppliers' nature-related issues should identify areas with high risk of water and soil loss due to typhoon, and examine if suppliers have a response plan for nature-related risks. Nanya also established a corresponding nature-related early warning mechanism for the water risk that may be brought by drought, managing the risk of broken supply chains due to natural disasters. Supply chain management is described in Sections 4.2.

Nanya' s Suppliers' Nature Dependencies Materiality Identification Matrix

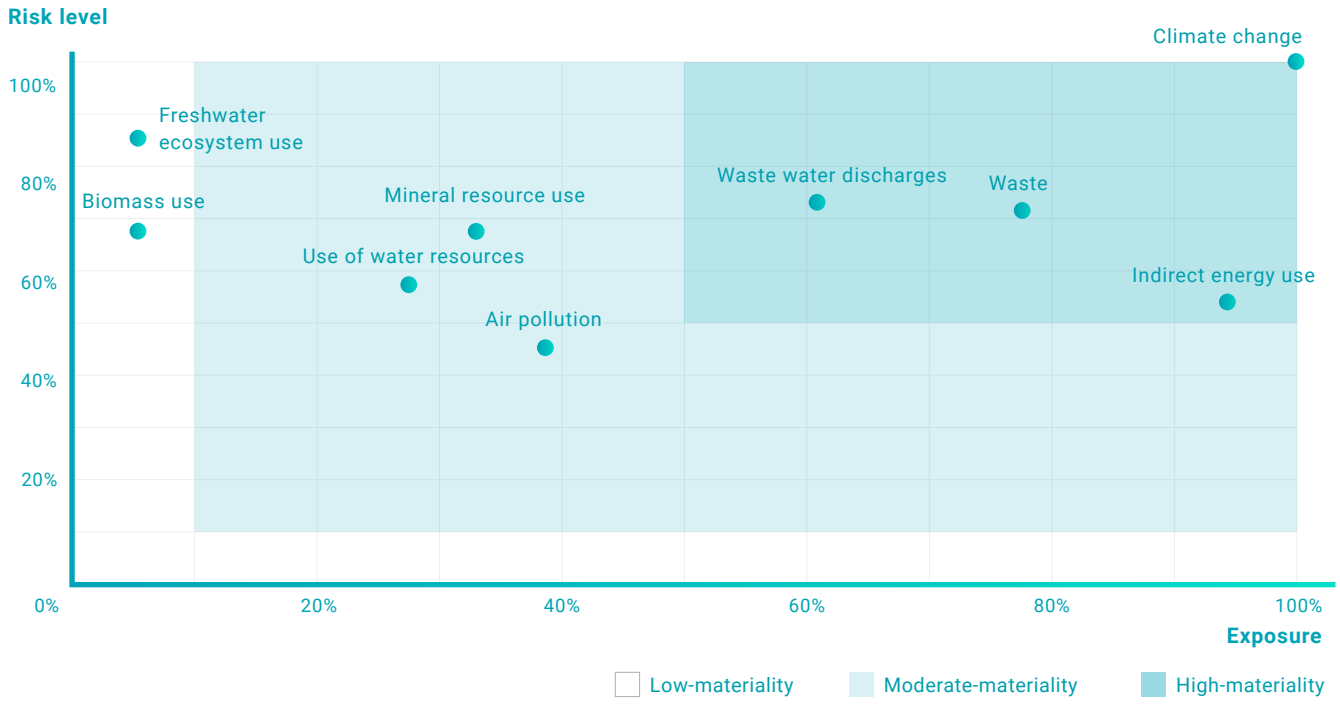


2. Identification Materiality Results of the Nature Impacts Related to Suppliers

The main nature-related impacts caused by Nanya's significant suppliers are "climate change," followed by "indirect energy," "waste," and "wastewater discharge."

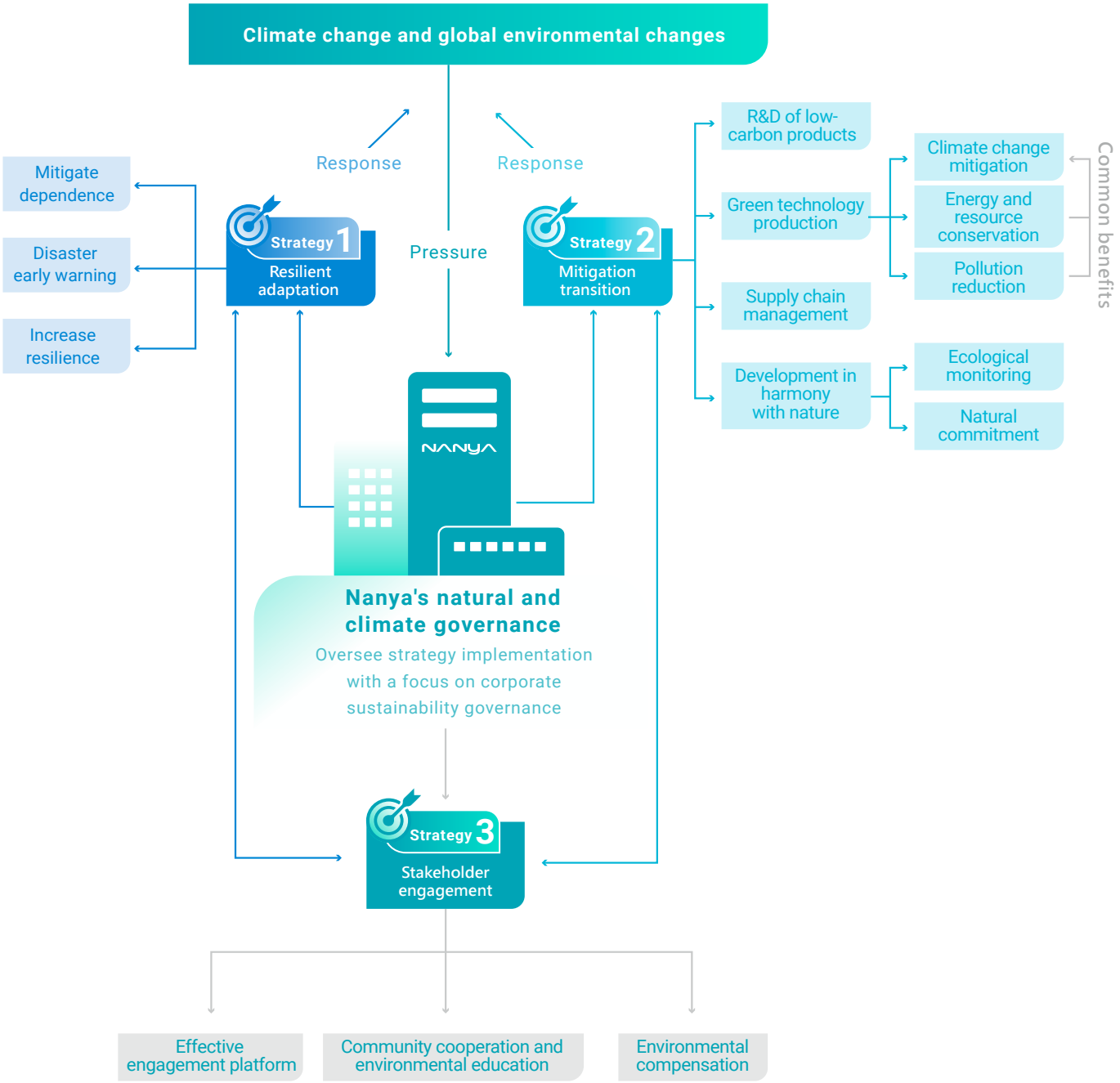
This identification result is consistent with the Company's current supply chain sustainability management strategy. Ever since Nanya passed the SBTs, we have actively worked with suppliers to reduce carbon emissions in the supply chain. We will include "indirect energy use," "waste management performance," and "wastewater discharge" as supply chain sustainability audit items in the future based on our supply chain carbon management experience, in order to reduce the upstream value chain risks caused by pollution.

Nanya' s Suppliers' Nature Impacts Materiality Identification Matrix



2.7 Nature and Climate Strategies

In response to climate change and changes in the global natural environment, Nanya will supervise the implementation of various strategies with "corporate sustainable governance" as the core. The response strategies include three aspects: resilient adaptation, mitigation transition and stakeholder engagement. Resilient adaptation and mitigation transition are important actions for Nanya to effectively respond to nature and climate-related issues. Stakeholder engagement will help Nanya consider the perspectives of different stakeholders, implement just transformation, and avoid damaging stakeholders' interests in the adaptation and transition process.



Strategy 1 Resilient Adaptation

Resilient adaptation is the first major strategy of Nanya in response to climate change and changes in the global natural environment. It is divided into three aspects: mitigate dependence, disaster early warning, and increase resilience:

Mitigate dependence	Disaster early warning	Increase resilience
Reduce Nanya's dependence on important ecosystem services, and avoid short, medium and long-term physical risks caused by changes in the external environment in the future.	To diversify Nanya's materials and energy supply risk, a complete disaster early warning mechanism must be established.	Improve overall fab resilience, whether it is the ability to withstand natural disasters, and also build the ability to quickly recover from disasters.

Strategy 2 Mitigation Transition

Mitigation transition is an effective way for Nanya to reduce its impact on nature and the climate environment. The achievement of this strategy relies on four major directions: R&D of low-carbon products, green technology production, sustainable supply chain management, and development in harmony with nature:

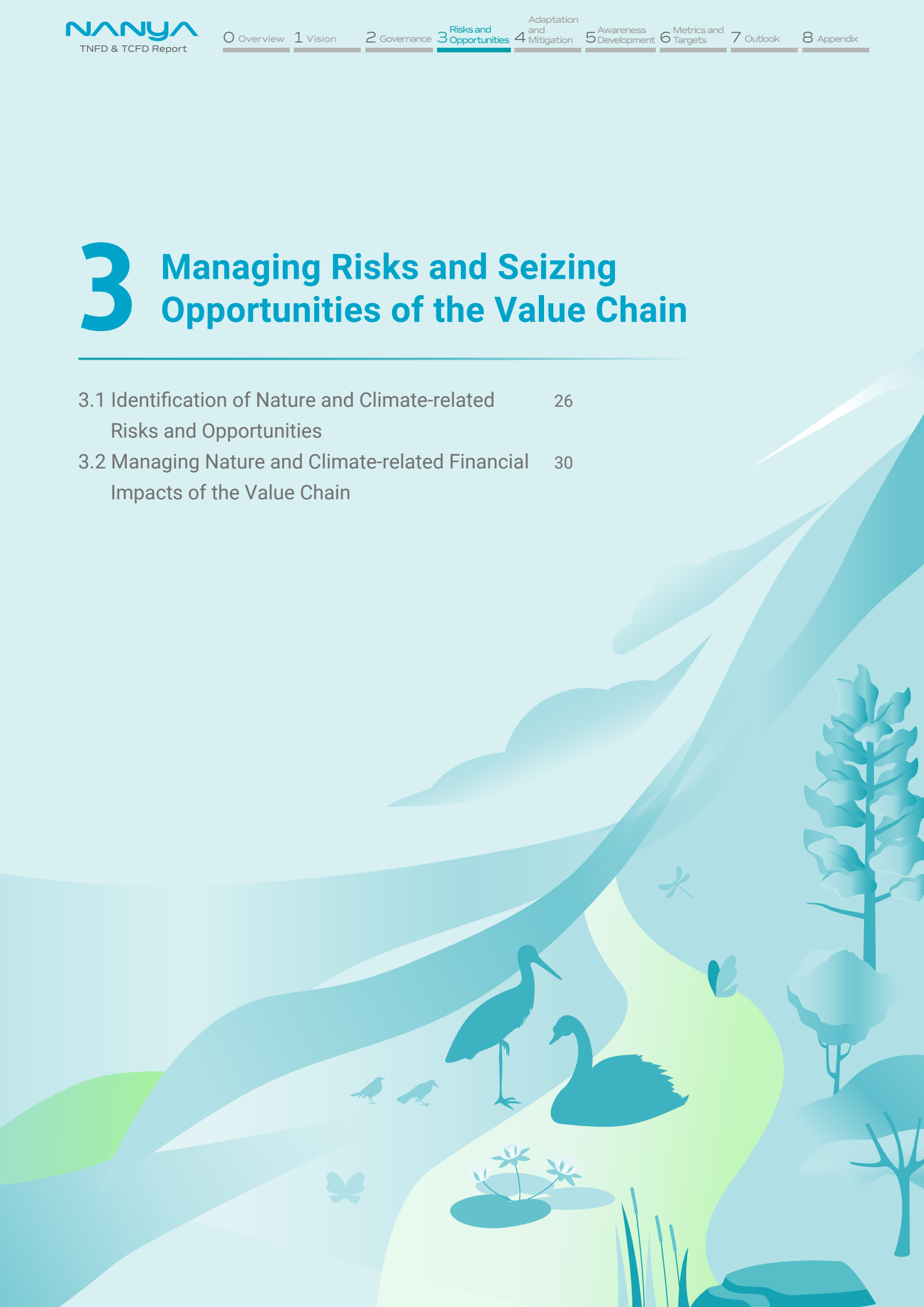
Development of Low-carbon Products	Green technology production	Supply chain management	Development in harmony with nature
Provide customers with products with high efficiency, low energy consumption, low embodied carbon, and low environmental impact.	Assist Nanya with GHG reduction through the implementation of carbon pricing. At the same time, it will also improve the group's production and energy efficiency, and reduce the emissions of various pollutants.	It is closely related to emission reduction in Nanya's value chain and R&D of low-carbon products. It will also strengthen the relationship between Nanya and suppliers to manage nature and climate-related issues through collaboration projects.	Focusing on ecological monitoring and restoration around Nanya, the company strives to avoid damage to key local areas as it expands its fab and will continue to engage in ecological restoration for environmental compensation in the future.

Strategy 3 Stakeholder Engagement

Nanya's strategies for responding to nature and climate change fully considers the views of external stakeholders to achieve harmonious development with neighboring residents and society. Strategies are divided into three aspects: value chain engagement platform, community cooperation and environmental education, and environmental compensation:

Value chain engagement platform	Community cooperation and environmental education	Environmental compensation
Nanya collects opinions from external stakeholders through different platforms, and actively participates in industry associations, co-organizing nature and climate-related initiatives and sharing Nanya's practical experience.	We are actively working with Ming Chi University of Technology, which shares its environmental sites, to jointly organize community environmental education, environmental public welfare, and cultural preservation activities, bringing us closer to local residents. We communicate our sustainability concepts with stakeholders through related activities.	We actively plan and discuss potential environmental compensation methods. In the future, we will protect and restore natural habitats near Nanya to jointly create a better community environment.

3 Managing Risks and Seizing Opportunities of the Value Chain



03 Managing Risks and Seizing Opportunities of the Value Chain

3.1 Identification of Nature and Climate-related Risks and Opportunities

Risks and opportunities brought by nature-related dependencies and response strategies

The ecosystem services that Nanya depends on may be subject to varying degrees of physical risks due to a variety of external factors. For example, insufficient water supply due to climate change results in the long-term physical risk of water shortages. Nanya brainstorms with dedicated personnel of departments through workshops to summarize different physical risks, and formulate risk response management measures. Nanya explores potential opportunities to achieve low-risk sustainable operations.

Risk type	Item	Responsible department	Nature-related dependence (Ecosystem services)	Analysis of financial impacts	Potential opportunities	Response strategies
Long-term physical	Seasonal water shortage	• Facility Div. • Factory Office	• Water supply	Revenue: Climate change causes seasonal water shortages, affecting production capacity and impacting revenue.	Company performance: Improve water saving performance. Sustainable resource use: Improve the Company's ability to resist drought and improve technical capabilities of water recycling	• Green technology production • Mitigate dependence
	High temperature	• Facility Div. • Factory Office • Human Resource Div.	• Local (micro and meso) climate regulation	Operating costs: High temperatures in summer might increase the load on air conditioners and electricity demand.	Company performance: Enhance the Company's energy use efficiency	• Disaster early warning
Immediate physical	Torrential rain and flooding	• Facility Div. • Factory Office • Sustainability and Risk Management Div.	• Rainfall pattern regulation (subcontinent scale)	Capital expenditures: Torrential rain causes flooding in the fab and affects production. Operating costs: Torrential rain causes construction delays.	Company performance: Reduce mid-term and short-term risks of operations and reduce damages	• Disaster early warning • Increase resilience
	Shipping is blocked	• Materials & Assets Div. • Warehousing & Shipping Department	• Global climate regulation[Note1]	Purchasing costs: Climate change causes drought or insufficient water in key waterways, impeding shipping and significantly increasing shipping costs.	Company performance: Improve the Company's response ability	• Disaster early warning
	A large-scale epidemic occurs	• Human Resource Div. • Safety & Hygiene Div.	• Biological control - Disease control services	Operating costs: Suspension of operations due to epidemics will lead to an increase in the Company's overall operating costs.	Company performance: Reduce mid-term and short-term risks of operations	• Disaster early warning
	Air quality deterioration	• Safety & Hygiene Div. • Factory Office • Facility Div.	• Air filtration	Capital expenditures: Rising costs of maintaining air filtration in fabs	Company performance: Reduce mid-term and short-term risks of operations	• Disaster early warning
	Landslide risk	• Eng. Affairs Div.	• Soil and sediment retention - Landslide mitigation[Note 2]	Capital expenditures: If a landslide occurs, it will cause damage to the Company's equipment. Operating costs: Landslide causes operations to be suspended and results in higher operating costs.	Company performance: Improve the Company's response ability Reputation: Implementing slopeland maintenance will lower the probability of nearby residents being injured by falling rocks in the mountains, and improve the Company's reputation.	• Disaster early warning

Note 1: Although "Global Climate Adjustment Services" is a dependency of Nanya with moderate materiality, climate change issues involve sustainability issues of global and the Company's concern. Hence, all of the risks it generates must be included in the management approach.

Note 2: "Soil and sediment retention - Landslide mitigation" is also a dependency with moderate materiality. However, since the company is located in a shallow mountain area, and is currently going through expansion, landslides are included as a key risk management item.

Risk type	Item	Responsible department	Nature-related dependence (Ecosystem services)	Analysis of financial impacts	Potential opportunities	Response strategies
Long term/immediate physical	Poor water quality caused by typhoon	• Facility Div.	• Water purification (water quality regulation) retention and decomposition of nutrients/ pollutants	• Operating costs: More chemicals are needed to treat high turbidity water sources • Capital expenditures: Need to add new treatment equipment	• Company performance: Improve the Company's response ability • Sustainable resource use: Use of water resources	• Disaster early warning
	Supply chain shortage	• Materials & Assets Div.	• Nonmetallic minerals supply shortage • Metallic minerals • Fossil fuel	• Purchasing costs: Shortages or rising prices of certain minerals and fuels due to geopolitics and conflict	• Company performance: Save on material and energy costs • Resources efficiency: Improve the efficiency of material and energy use of enterprises.	• Disaster early warning
Long term/ physical	Community perception and employee working environment	• Human Resource Div. • Eng. Affairs Div.	• Visual amenity services	• Operating costs: A poor working environment for employees can lead to higher turnover. • Reputation risks: Insufficient greening around operations may lead to complaints from community residents	• Lower turnover rate • Ecological conservation: Improve reputation	• Increase resilience

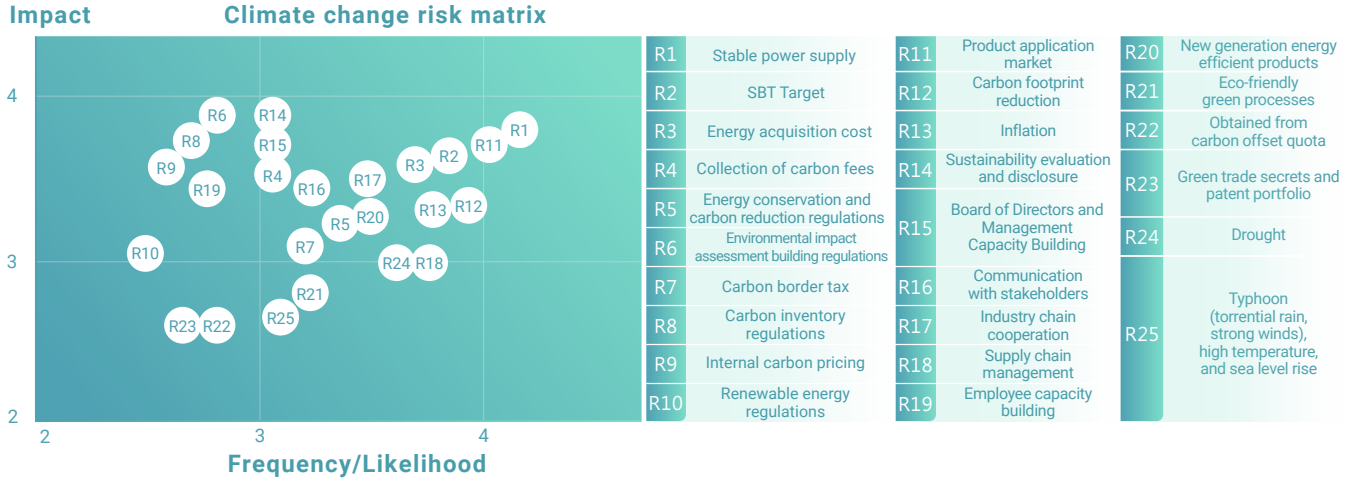
Risks and opportunities brought by nature and climate related impacts and response strategies

Nanya's nature and climate-related impact risks are mainly divided into four categories: regulations, reputation, market, and technology.

- Regulatory risks : Responding to government requirements related to climate change issues and sustainability information disclosure.
- Reputation Risk: Addressing risks related to negative evaluations from stakeholders (including investment institutions, community residents, employees, etc.).
- Market Risk: Responding to customer demands on Nanya regarding natural environment requirements as countries invest in environmental governance.
- Technological Risk: Managing associated risks in operations where competitors might develop more environmentally efficient products and services.

Risks related to climate change, including energy control and carbon fee issues, are all expected to occur within 2 years and are short-term risks. Higher requirements for sustainability information disclosure, collection of water conservation charge, pressure from customers to reduce carbon emissions, and rising costs of key materials due to the Russo-Ukrainian War and US-China geopolitics are all short-term risks that have already occurred. Following the trend of sustainability and stakeholders paying more attention to environmental issues, the tightening of regulations related to pollution prevention and control may become a medium-term risk in the next five years. Meanwhile, carbon credits is an issue still being studied and developed worldwide, and has been analyzed as a long-term risk. Different nature and climate-related risks may have varying degrees of impact on sustainable operations. Due to the trend of sustainability, Nanya has identified potential transformation risks and opportunities in response to natural and climate-related impacts.

Identification Results of Nature and Climate Change Risks and Opportunities



Due to the new trend of sustainability, all nature-related impacts may bring transformation challenges to Nanya. Such challenges are often accompanied by risks and opportunities. Nanya has identified potential transformation risks and opportunities caused by different nature-related impacts, and summarized them in the table below:

Nanya's Transformation Risks and Opportunities

Risk type	Risk subcategory	Nature-related impact Properties	Description	Financial impacts	Opportunities	Boundaries of impact	Time scale of occurrence	Response Measures
Regulation	Information disclosure requirements	All nature-related impacts	• Meeting sustainable information requirements will lead to higher labor costs	Increase in operating costs	• Comply with sustainability rating	• Internal operation	Short-term	• Sustainability governance
	Collection of carbon fees	• Greenhouse gas emissions	• Carbon fees will increase fab operating costs • Suppliers' operating costs are passed on to Nanya	Increase in operating costs Increase in purchasing costs	• Reduce carbon fee collection	• Internal operation • Upstream suppliers	Short-term	• Green technology production • Supply chain management
	Collection of water conservation charges	• Use of water resources	• The collection of water conservation charges will increase fab operating costs	Increase in operating costs	• Reduce water conservation charges • Comply with sustainability rating	• Internal operation	Short-term	• Green technology production
	Energy related regulations	• Indirect energy use • GHG emissions	• Obligated capacity and regulatory requirements on renewable energy installation • Renewable energy purchasing cost	Increase in capital expenditures Increase in purchasing costs	• Reduce carbon fee collection • Comply with sustainability rating • Meet customer requirements	• Internal operation	Short-term	• Green technology production
	Regulations related to pollution emissions: Air pollution, water pollution and waste	• Non-GHG pollutants • Air pollutants • Water pollutants • Solid waste	• Compliance costs	Increase in operating costs	• Reduce outsourcing cleaning costs • Comply with sustainability rating • Reduce air pollution fees • Avoid water pollution fines	• Internal operatio	Mid-term	• Green technology production
Reputation	Poor sustainability performance ratings	• All related impact categories	• There is no chance of being included in specific indices with poor sustainability ratings.	Damage to corporate image and increase in social capital	• Opportunity to be included in specific sustainable investments	• Internal operation	Medium- and long-term	• Sustainability governance
	Insufficient cooperation between supply chain and industry chain	• Greenhouse gas emissions • Use of water resources • Other emerging environmental issues	• Insufficient emissions reductions by suppliers damage the Company's image • Broken supply chains will cause the Company's overall operating costs to increase • Lack of cooperation with other peers will cause an increase in overall operating costs	Damage to corporate image and increase in social capital Increase in operating costs	• More resilient and lower-risk supply chains • Industry peers work together in initiatives to reduce audit costs	• Upstream suppliers	Mid-term	• Supply chain management
	Insufficient climate awareness among stakeholders	• Greenhouse gas emissions	• It is difficult to implement related projects within the Company • Obstacles in external communication	Increase in operating costs	• Build strong employee relationships • Establish sound corporate governance capabilities	• Internal operation	Long-term	• Community cooperation and environmental education
	Community residents have a bad impression of Nanya	• All related impact categories	• Community residents' perception of business operations	Damage to corporate image and increase in social capital	• Avoid deterioration in the perception of community residents and maintain corporate image	• Internal operation	Long-term	• Environmental compensation • Community cooperation and environmental education

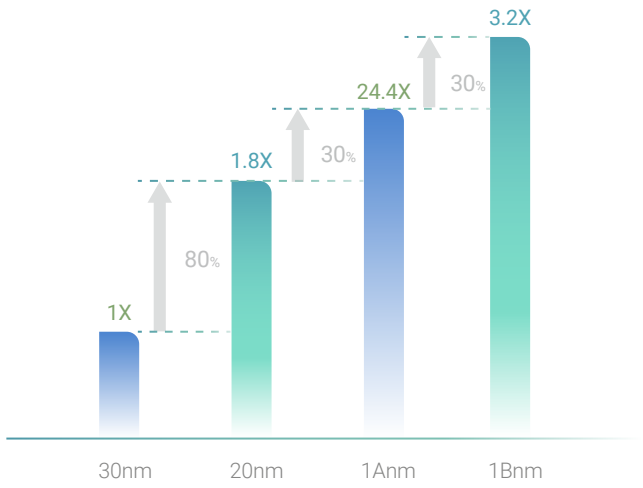
Risk type	Risk subcategory	Nature-related impact Properties	Description	Financial impacts	Opportunities	Boundaries of impact	Time scale of occurrence	Response Measures
Market	Low carbon and renewable energy requirements for products and services	• Greenhouse gas emissions • Indirect energy use	• Investment in R&D • Renewable energy purchasing cost • Poor market competitiveness of low-carbon products or market is not yet mature • Mineral use	Increase in operating costs Decrease in revenue	• Development of the low carbon products market • Build closer relationships with customers	• Internal operation • Downstr-eam cus-tomers	Short-term	• R&D of low-carbon products
	Increase in procurement costs of key materials	• Mineral use	• The cost of purchasing key minerals may increase due to climate change and geopolitics	Increase in purchasing costs	• Reduce supply chain volatility • Comply with sustainability rating	• Internal operation • Upstream suppliers	Short-term	• R&D of low-carbon products • Supply chain management
Technology	Emerging technologies and innovative R&D	• All nature-related impacts	• Purchase of new process equipment • R&D cost	Increase in capital expenditures Increase in operating costs	• Maintain customer relationships	• Internal operation	Short-term	• R&D of low-carbon products
	More stringent emission reduction technologies	• All nature-related impacts	• Purchase new pollution control equipment • Treatment costs	Increase in capital expenditures Increase in operating costs	• Comply with sustainability rating • Market development for new technologies	• Internal operation	Mid-term	• Green technology production
	Carbon credit issues	• Greenhouse gas emissions	• Carbon credit technology acquisition	Increase in operating costs	• Opportunities to apply for carbon credits and participate in carbon finance	• Internal operation	Long-term	• Development in harmony with nature • Environmental compensation

Product opportunities brought by nature and climate-related trends

Mitigation transition strategy: Development of Low-carbon Products

Nanya upholds the core philosophy of "innovation", leveraged its extensive R&D experience and outstanding technical team to make the successful transition to innovative R&D and technological independence in 2017. Product verification for Nanya's 1st generation 10 nm technology (1A) was completed in 2022. This is the first 10 nm DRAM technology in Taiwan, and proves that Taiwan's DRAM technology development ability is among the top companies across the world. Product verification of 1B nm technology is expected to be completed in 2024. This is the second generation 10 nm DRAM technology independently developed by Nanya, and product development will focus on 16 Gb DDR5 and 16Gb LPDDR5/LPDDR4. Nanya's R&D and improvements for every generation of process technology greatly increases the unit output per wafer. Our 20nm process increased its unit output per wafer by more than 80% compared to 30nm. In the future, every generation of the 10 nm process should increase unit output per wafer by more than 30%. The 1B process is expected to more than double the unit output per wafer compared to the 30nm process, further increase unit output per wafer by 30% compared to current 1A technology, allow the fab to more efficiently use energy resources at the same production capacity, and its GHG emissions per unit capacity is estimated to be approximately 302 (kg CO_2e/thousand dies), in order to further achieve energy conservation and carbon reduction goals.

Bit output from a single wafer for each generation



Low-energy product development approach

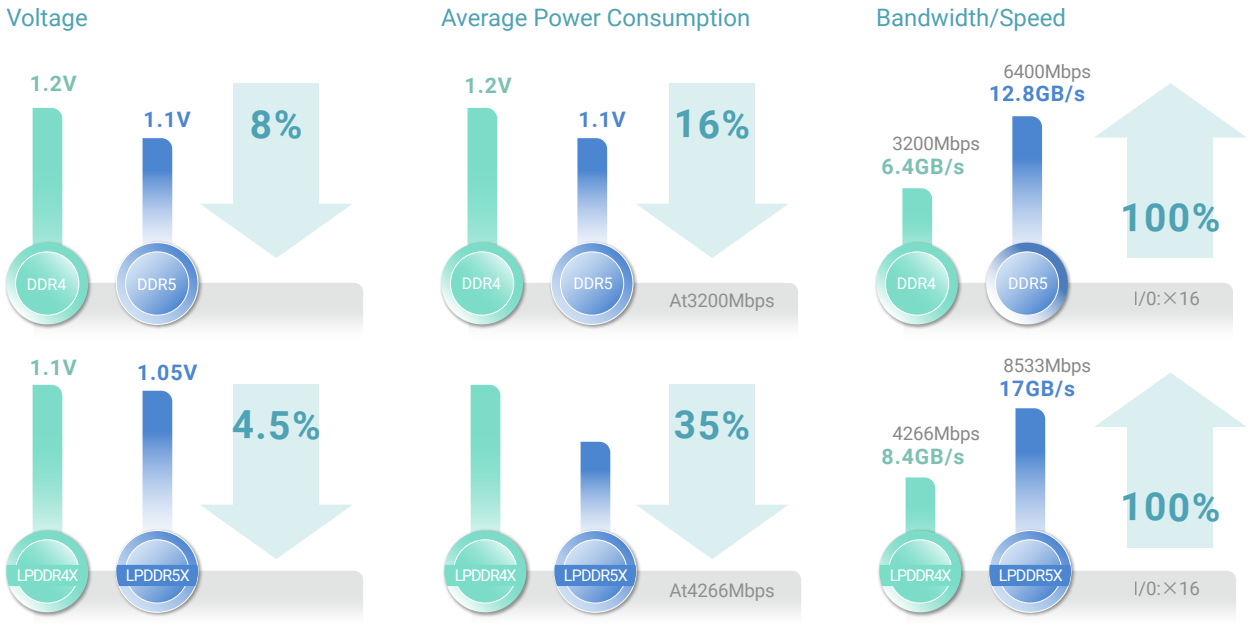
Nanya continues to develop advanced manufacturing processes, so the energy consumption of new generation products developed with new processes is reduced by 15% compared with the previous generation

Nanya cooperates with major chip customers, adopting the method of multi chip package (MCP) to reduce back-end assembly and testing as well as energy consumption

Nanya strengthens the development of low energy consumption product lines and enlarges product portfolios in order to satisfy the need of various mobile devices and electronic products

Demand from 5G communications, artificial intelligence (AI) and smart phone memory upgrades means that next-generation memory products (e.g. DDR5 and LPDDR5) will become the preferred type if they can provide low voltage, low power consumption and faster transmission rates. A comparison of DDR5 and LPDDR5 against DRR4 and LPDDR4 showed a reduction of 16-35% in average power rating but a doubling in bandwidth/speed. Being able to handle high-speed transfers while using less energy will bring very significant energy savings for the customer. Compared to 30nm process products, the low-power DRAM and 20nm consumer DRAM products sold by Nanya in 2023 generated a total sales revenue exceeding NT$26.2 billion and resulted in energy savings of over 514,150,000 kWh, equivalent to reducing 254,508 tons of CO_2e emissions.

DDR5&LPDDR5X provided specifications that save more electricity with high bandwidth/high speed



3.2 Managing Nature and Climate-related Financial Impacts of the Value Chain

Analysis of Nature and Climate Scenarios for Nanya's Operations

1. Scenario Analysis of Transformation Risks

The imposing of carbon levies (fees) is a common way of internalizing the external costs of GHG during global efforts to mitigate climate change. Cost is used to pressure GHG emitters into agreeing to reducing their carbon emissions. Nanya used three scenarios to analyze the impact of carbon levies (fees) on future operations. The carbon tax in Taiwan is expected to be around NT$100-$300 per ton of CO2e emissions. The impact on operations will therefore be less than 0.2%. At the same time, the global nature of Nanya's operations meant that we also assessed the carbon tax (levy) scenario published by the International Energy Agency (IEA) in its World Energy Outlook (WEO). The impact of carbon costs on company revenues will be far greater if the targets of the 2°C (Announced Pledge Scenario (APS) and 1.5°C Net Zero Scenario (NZE) are to be met.

The use of low-carbon energy therefore shows the greatest potential for reducing GHG emissions. A scenario analysis was therefore conducted by Nanya based on the use of low-carbon energy and the carbon reduction path of SBT. In the scenario where national targets and international carbon reduction targets are both achieved, the impact on Nanya's revenues will be around 1%-2.1%. If this is compared against the impacts of carbon taxes (levies) and renewable energy use however, assuming that high carbon taxes (levies) will be imposed, then we can see that early investment in low-carbon electricity such as renewables will reduce costs and reduce the impact on operations.

Scenario Analysis of Transition Risks for Nanya's Operations

Financial parameters	Scenario	Revenue impact (NT$ million)	Evaluation method
Collection of carbon taxes (fees)	National target	35-106	Estimate based on NT$100-NT$300 per ton of carbon
	2℃ Target	568-747	Estimate based on IEA WEO 2021 APS of US$100 per ton of carbon
	1.5℃ Target	687-867	Estimate based on IEA WEO 2021 NZE of US$130 per ton of carbon
Using Low-carbon Energy	National target	299-359	Investment in clean energy required for 10% reduction compared to 2020
	SBT 2℃ Target	359-508	Investment in clean energy required for 25% reduction compared to 2020
	SBT 1.5℃ Target	478- 628	Investment in clean energy required for 42.5% reduction compared to 2020

2. Scenario Analysis of Physical Risks

To understand the physical disaster risks brought by climate change, Nanya referred to the Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP) and analyzed the climate data from the future climate model. Nanya's business locations and water catchments were analyzed to determine the operating risk for Nanya in the middle of the century (2040-2060) using the climate data for scenarios RCP 2.6-RCP 8.5. This included the impact of increased temperatures, increased rainfall, and increase in non-rainy days.

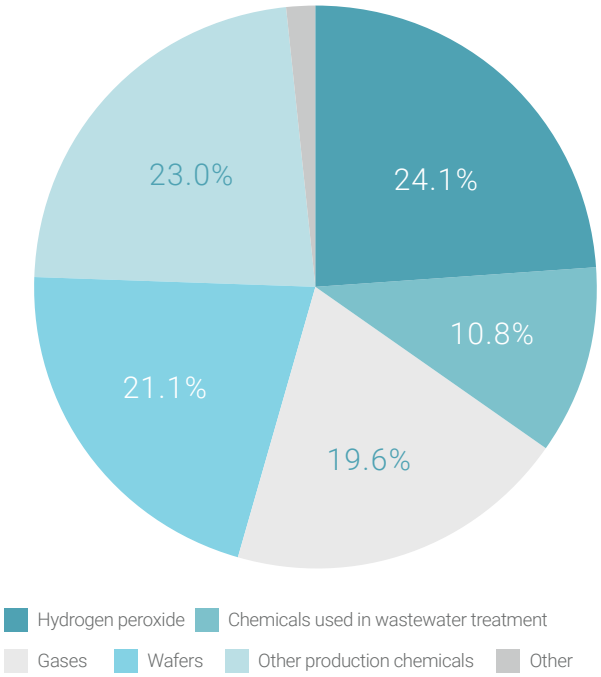
Scenario	Mid-Century Risk	Potential Impact	Operational and Financial Impact
RCP2.6	• Average days of no-rain increased by 1.2 days • Flow decreased 6% during dry season	• Impact on operations from water shortages or rationing	• The factory now has a fully-fledged management framework and emergency response plan for water resources that can be implemented in the event of a water shortage.
	• Average temperature increased by 1.2°C • Average duration of heat wave increased by 2.7 fold	• 3% increased in electricity consumption by air conditioning • Increased load on factory and Taipower electrical systems	• The increase in electricity costs increased costs by NT$29.3 million (accounting for less than 0.1% of revenue).An AI chiller system has been installed and controls air conditioning based on optimal conditions, and will reduce energy consumption by 18% • UPS and diesel generators have been installed as backup to ensure continuity of production
	• 15% increase in average maximum rainfall • Average days of heavy rain increased by 0.09 days	• Increased flooding • Construction delays due to torrential rain	• Factory is located on high ground so is immune to large-scale flooding from rain that impact on operations or production. • Plants have construction regulations and weather is taken into consideration during scheduling, so there should not be any delay.
RCP8.5	• Average days of no-rain increased by 2 days • Flow decreased 4% during dry season	• Impact on operations from water shortages or rationing	• The factory now has a fully-fledged management framework and emergency response plan for water resources that can be implemented in the event of a water shortage.
	• 1.9°C increase in average temperature • Average duration of heat wave increased by 3.9 fold	• 5% increased in electricity consumption by air conditioning • Increased load on factory and Taipower electrical systems	• The increase in electricity costs increased costs by NT$29.9 million (accounting for less than 0.1% of revenue) • UPS and diesel generators have been installed as backup to ensure continuity of production
	• 19% increase in average maximum rainfall • Average days of heavy rain increased by 0.12 days	• Increased flooding • Construction delays due to torrential rain	• Factory is located on high ground so is immune to large-scale flooding from rain that impact on operations or production. • Plants have construction regulations and weather is taken into consideration during scheduling, so there should not be any delay.

Analysis of Nature and Climate Scenarios for Nanya's Suppliers

1. Transition Risk

Similar to Nanya, the operations of upstream suppliers may also be impacted by climate change policies and regulations, such as implementation of carbon taxes (fees), mandatory use of renewable energy, and impact of carbon tariffs on exports. Nanya is actively reviewing and understanding the impacts on suppliers. By analyzing Scope 3 emissions and product life cycle, we learned about GHG emission hotspots and chose key suppliers for cooperation.

Raw material procurement as a percentage of Nanya's carbon footprint



Risk Scenario Revenue Impact Assessment Form

Risk scenario	Impact on revenue (NT$ million)	Evaluation method
Major electricity user clauses for renewable energy	2.99	Supplier passing on the costs of complying with Taiwanese government's requirement that 10% of installed capacity should be renewable energy
Increase in energy costs	149.45	Supplier passing on the costs from rising fossil fuel prices and changes in energy structure is expected to increase market electricity costs by another 50% in 2030
Collection of carbon fees	2.99	Estimated from the current carbon tax of NT$100 to NT$300 per ton with supplier passing on the costs Note 1
Investment in GHG reduction	2.99	Estimate based on a minimum 25% reduction in GHG emissions by 2030 from suppliers participating in the SBTs. Suppliers passing on costs Note 2

Note 1: Comparable to the Taiwan NDC scenario.
Note 2: Comparable to the IEA APS scenario.

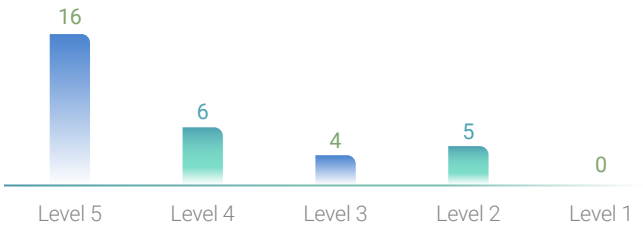
Evaluation and analysis found that the impact of transition risks at each supplier on the operating costs of Nanya was negligible (less than 0.1%). To reduce the carbon footprint of products and achieve climate goals, Nanya has engaged senior managers of suppliers to discuss renewable energy, product carbon footprint, and circular economy. Nanya's sustainability officer visited 8 suppliers, including wafer, chemical and gas suppliers and contractors, and received very positive feedback, helping to better understand the industry's challenges in net zero strategies. Nanya will continue to share its experience and sustainability information, help vendors obtain external resources, and participate in industry associations to resolve common issues.

2. Physical Risk

In addition to the transition risk that the supply chain will face, the increasing severity of natural disasters due to climate change may impact supplier production and disruption of supply. Nanya is therefore working actively to establish the disaster potential of climate change at suppliers' operating locations. Nanya prioritized the assessment of suppliers' production and supply locations (31 sites in total) in Taiwan. Cross-referencing with the IPCC AR5 RCP8.5 scenario database published by the Disaster Risk Adaptation (DR.A) platform of the National Science and Technology Center for Disaster Reduction (NCDR) found that 22 suppliers' production locations were at high risk of flooding and drought (Level 4 and 5), and the locations were concentrated in central and southern Taiwan.

Nanya has now drawn up emergency response plans for high-risk supplier locations. The physical risks to Taiwanese suppliers from climate change were therefore assessed by Nanya to be low and should not disrupt production. We will continue to manage the high-risk suppliers mentioned above. We will conduct climate change risk assessments for production locations outside of Taiwan in our supply chain, as well to ensure the security of production and supply of the overall supply chain.

Distribution of Supplier Flood Risk Level (Number of suppliers)

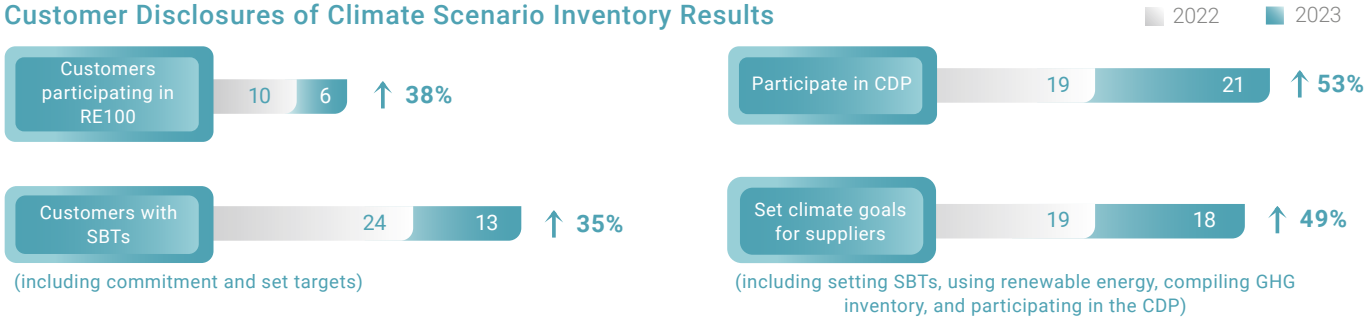


Analysis of Nature and Climate Scenarios for Nanya's Customers

1. Transition Risk

Results in 2023 show that customers are becoming more actively involved in climate change issues, and 16 customers participated in RE100; 37 customers set SBTs and 40 customers participated in the CDP. After customers began participating in the SBTs, they also started to more actively engage their suppliers (including Nanya) to set goals and carry out climate action; 37 customers are currently participating.

Customer Disclosures of Climate Scenario Inventory Results



(including commitment and set targets)

(including setting SBTs, using renewable energy, compiling GHG inventory, and participating in the CDP)

Nanya's sales personnel continues to communicate with customers, and sends weekly projections of the customer's future demand forecast back to the Company. Demand forecasts reported by global sales are converted through the production and sales system into production plans. The Document Management System (DMS) and Customer Requirement System (CRS) then distribute the information to the relevant departments for assessment and implementation. Continuous adjustments are based on weekly feedback from sales personnel to ensure customer expectations are met.

2. Physical Risk

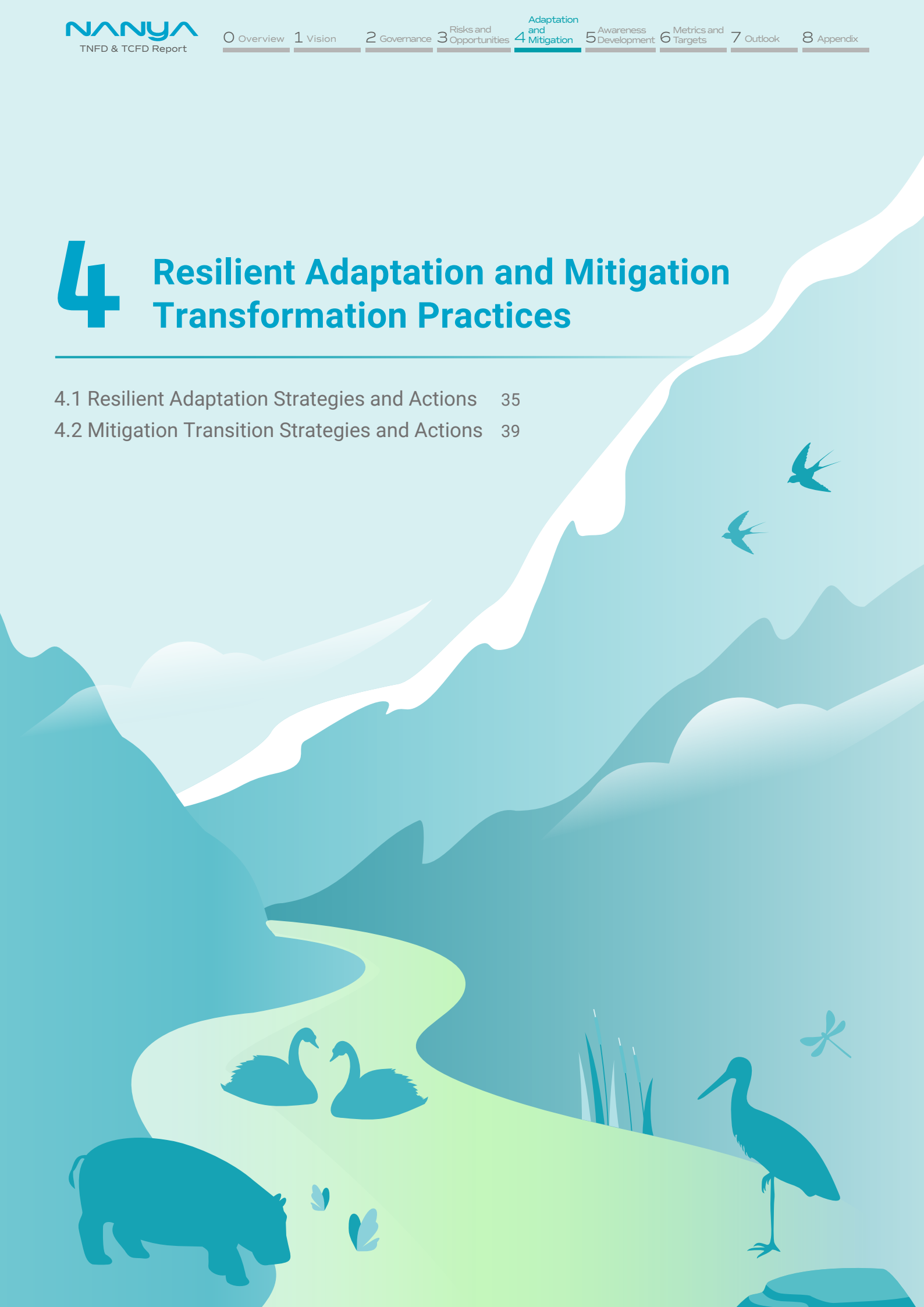
Nanya conducts climate change risk assessments for delivery locations. The DR.A databaseNote of NCDR was used to analyze the climate change risk level (flooding) of 18 shipping locations in Taiwan; 12 out of the 18 destinations were determined to be high risk. Nanya has now defined the Incoming and Outgoing Product Management Process and Rules Governing the Product Transportation, Storage, Packaging and Delivery. Emergency response plans have also been devised for scenarios (including natural disasters) where shipping may be impacted to ensure that Nanya's products can be successfully delivered to the hands of our customers. In the future, Nanya will expand the scope of our inventory, continue to cooperate with customer's requirements and monitor the conditions at the shipping location to ensure the intact delivery of our products.

Climate Change Risk Rating for Shipping Location

Level 5	Level 4	Level 3	Level 2	Level 1
11	1	4	1	1

Note: The database was analyzed using the IPCC AR5 RCP8.5 scenario. (Unit: Vendors)

4 Resilient Adaptation and Mitigation Transformation Practices



04 Resilience Adaptation and Mitigation Transition Practices

As the leader of Taiwan's DRAM industry, Nanya Technology Corporation responds to the nature and climate-related goals of international society and Taiwan by becoming a manufacturer that uses green technologies. The Company collected topics of concern to stakeholders, determined the materiality of topics through an internal identification process by employees, and formulated five strategies for promoting nature and climate adaptation. We support the Paris Agreement by becoming an early adopter of the TNFD, and actively work with stakeholders to fulfill our commitment to "no net loss in operating activities" and "reduce GHG by 25%" by 2030.

4.1 Resilience Adaptation Strategies and Actions

Facing nature and climate-related risks and opportunities, Nanya strengthens infrastructure to resist natural disasters, improves disaster response mechanisms, and adopts three strategic directions, including dependence mitigation, disaster early warning, and resilience improvement, as the course of action for nature and climate-related resilience adaptation.

• Mitigate dependence

The core principle of mitigating dependence is do not put all of your eggs in one basket, and specific actions are based on risk diversification. Nanya reduces water use and reduces its dependence on water supply from the external environment through water conservation and water recycling efforts, which helps Nanya maintain stable operations during the dry season. At the same time, energy conservation and effective use of resources can also significantly reduce resource dependence on external suppliers, while responding to the risk of power shortages in Taiwan.

• Disaster early warning

Disaster early warning is the second major direction of Nanya's resilient adaptation strategy. Its core is to improve Nanya's adaptability to changes in the surrounding environment, especially early warning measures before disasters occur. Early warning measures can help Nanya avoid the impact of natural disasters, such as typhoon preparations at the fab before a typhoon arrives. At the same time, Nanya will also gradually establish an early warning mechanism for torrential rains and other extreme weather events in the future, so as to prevent disasters before they happen.

• Increase resilience

Increasing resilience is how Nanya builds the ability to quickly recover from disasters. This relies on the establishment of a complete response mechanism and regular safety drills each year. This not only increases the resilience of Nanya's overall operations, but also protects the safety of employees working at Nanya.

Response measures for nature and climate-related physical risks

Risk type	Risk item	Response Measures	
		Disaster early warning	Increase resilience (response mechanisms)
Long-term physical	Seasonal water shortage	• Formulate business continuity plans (BCP) • Gradually establish an early warning mechanism for weather forecasts • Product R&D and innovation	• Establish drought response mechanisms • Implement the AWS management framework to strengthen water resource governance • Increase process water recycling equipment to improve water use efficiency • Develop multiple water sources and increase backup water sources and storage tanks • Reduce process water consumption through R&D and innovation
	High temperature	• When there is insufficient power supply, the load of non-production equipment is reduced to reduce power consumption. • Formulate emergency response plans to respond quickly in case of abnormal power supply. • Improve building adaptability	• Set up emergency generators and DUPS • Machinery must comply with SEMI-F47, which lowers the sensitivity of machinery to voltage drop and prevents circuit breaker tripping. • Power supply of fabs use a dual circuit design to lower the risk of abnormal power supply from any single circuit • Implement ISO 50001 energy management system to enhance energy efficiency and reduce overall electricity consumption • Implement green building design methods to reduce the impact of high temperatures

Risk type	Risk item	Response Measures	
		Disaster early warning	Increase resilience (response mechanisms)
Immediate physical	Torrential rain and flooding	• Formulate emergency response plans. • Gradually establish an early warning mechanism for weather forecasts	• Drainage flow planning • Permeable pavement design
	Shipping is blocked	• Establish regulations for emergency response to abnormalities and strengthen response ability	• Increase the ratio of local supply chain • Add a second source to avoid having only one source of materials
	A large-scale epidemic occurs	• Dedicated epidemic prevention unit • Epidemic prevention supporting system	• Pandemic Response Task Force, epidemic prevention director, audit team, epidemic prevention mailbox • Establish epidemic prevention levels and countermeasures • Epidemic prevention propaganda, such as announcing influenza virus response measures, placing large posters in fabs to promote and test employees' understanding of epidemic prevention, and distributing health self-management notice and rules. • Regulations governing epidemic prevention management for contractors and visitors
	Air quality deterioration	• Formulate emergency response plans. • Gradually establish an early warning mechanism for weather forecasts	• Establish an external air monitoring and early warning mechanism • Increase the number of layers of filters in the external air conditioning box to improve the air quality in factory buildings • Increase the frequency of replacing air filters
	Landslide risk	• Landslide early warning mechanism • Slope management and prevention • Strengthen fab infrastructure	• Continue to improve the ability to monitor landslides around fabs • Periodic slope maintenance to reduces the probability of earth and rock collapse • Pre-expansion water and soil conservation planning • Strengthen factory structure
Long term/ immediate physical	Poor water quality caused by typhoon	• Establish good emergency response abilities	• The typhoon season increases the water storage of water purification plants. The current raw water treatment system is equipped with a rapid settling tank that can treat raw water with a turbidity of 10,000 NTU. • Develop multiple water sources (establish a business continuity plan) • Innovative R&D to reduce water consumption
	Supply chain shortage	• Increase the use of low-carbon fuels and renewable energy • Innovative R&D to reduce or replace fossil fuel use	• Evaluate the switch to low-carbon fuels (carbon-neutral natural gas, hydrogen) and increase the proportion of renewable energy • Reduce or replace the use of fossil fuels through innovative R&D and process improvements • Evaluate circular economy plans for new fabs in the future
Long term/ physical (Reputation)	Community perception	• Mutual benefit with local residents • Promote local renaissance	• Since 2013, we have commissioned a third party to monitor the environmental quality around fabs, and the monitoring results were all in compliance with laws and regulations. • The Good Neighbor Project provides free water supply to residents without running water pipes around fabs • Protecting Biodiversity - Removing Mikania micrantha from Wugu Wetland • Organize volunteer environmental protection and mountain cleanup activities in Taishan District each year • Taishan Renaissance, utilize local resources to promote local cultural features • Convey the effectiveness of water recycling through shorts on social media (YouTube)
	Employee working environment	• Increase employees' identification with the Company • Continue to green the working environment	• Species survey: Cooperate with the Society of Wilderness to lead colleagues and their families to understand the species observed in the Company's fabs • Maintain the forest ecology and trails around the Company

Resilient adaptation Actions

Adaptation Measures for Warming

In the temperature rise scenario, hot weather will also increase the use of energy. In response, Nanya continues to improve energy efficiency through the ISO 50001 platform and smart management system. Nanya's production and operating locations have all obtained green building and green factory certifications. New fabs built by Nanya in the future will also adopt green building standards (the new Fab 5A will obtain a green building candidate certificates) , and strengthen building insulation and fab energy efficiency. These will reduce the sensitivity of electricity supply to weather changes.

綠建築標章
GREEN BUILDING

Nanya's existing and future sites will have green factory and green building marks

Adaptation to Torrential Rain and Flooding

Increased number of rainy days may result in on-site flooding. The current design of Nanya's site infrastructure is based on past extreme weather events with a certain safety margin. Planning of drains, for example, used the maximum precipitation in the last 25 years plus a 20% safety margin. When combined with permeable paving of green building design, flood risk by the mid-century remains low. Regular cleaning of the drains is, however, necessary to ensure their proper function. In the future, we will continue to conduct rolling reviews on the latest scientific data and the operational state of the site to determine whether the drains need to be widened.

Adaptation Measures for Drought

The company's production process requires a large amount of water, approximately 11,000 m^3(tons) of water per day. If the frequency of water shortages or droughts increases, the risk of operational interruptions may increase. Nanya used the Aqueduct tool for evaluating water resources from the World Resources Institute (WRI) and Taiwan Climate Change Estimation Information and Adaptation Knowledge Platform Project (TCCIP)'s climate change and water resource hazard map and other scenario analysis, which indicated that Nanya's water source is a low to medium risk area in the short-term, and the average number of consecutive days without rainfall in the northern region may increase by 1.2 to 2 days in the future.

Therefore, Nanya continues to strengthen its own water resources management system and increase the amount of water recycling and reuse in accordance with international water security and water resources management requirements. In terms of strengthening its adjustment capabilities, the company has established a complete emergency response plan to ensure to avoid the immediate impact caused by short-term water shortage or drought, the factory has set up a storage tank with a capacity of 43,000 m^3 (tons), two detention tanks of 4,060 m^3 (tons) and seven wells, which can effectively recover rainwater during the rainy season. Nanya has collaborated with nearby Formosa Plastics factories to establish a water shortage emergency response organization, and the organization can allocate emergency water resources to each other to support each other. The Shimen Reservoir in the catchment area has also completed an improvement project. The possibility of water outage due to turbidity of raw water caused by heavy rains has been reduced. The company's own raw water turbidity treatment capacity is 10,000NTU, which can overcome most situations. Through mechanisms such as adaptability and water recycling and reuse, Nanya can operate continuously for more than 22 days without relying on external supplies.

From 2022 to 2023, Nanya has obtained the highest level A List rating from the CDP Water Security Questionnaire for two consecutive years. In 2022, it also launched the Alliance for Water Stewardship (AWS) - the international water resources management standard certification program, which has been verified in 2023 and obtained platinum certification in 2024. In the future, Nanya will continue to improve its ability to utilize and control water resources. New factories will also be equipped with a water recycling center, detention basins, and backup water supplies to prepare for the uncertainties of climate change.

Nanya's Complete Process Water Recycling System



Acidic and alkaline wastewater system



Organic wastewater recycling system



Hydrofluoric wastewater recycling system

Water Shortage Stress Test

Nanya's Risk Management Steering Center conducts sensitivity analysis and stress testing on major financial and non-financial risks every year. The results of the stress testing on nature-related risks are as follows:

Risk Item	Sensitivity analysis or stress testing
Water resources	• We reviewed the Company's internal and external water supply and water storage systems, and simulated various phases of water rationing. With self-owned backup wells that could provide 5,500 CMD, water tanks with capacity of 43,000 tons, and allocatable well water of 3,600 CMD from wells of the Chang Gung Golf Club, the Company could maintain 22 days of normal production at the plants under the situation that raw water supply was totally cut off. • Possible scenarios[Note] under the simulations of phase-one, two, and three water rationing: If raw water suppliers were cut off for two, three, four, or five days per week, all these would not impact our production.

Note: : According to the water restriction announcement issued by the Water Resources Department of the Ministry of Economic Affairs, it is divided into one to three levels. The first level is nighttime decompression water supply, the second level is a 20% reduction in water supply for large water users, and the third level is a regional rotation or a scheduled stoppage of the entire district.

Water resource and water conservation charge collection mitigation and impact response

Nanya assessed water risk impact based on the WRI Aqueduct Tool, and the short-term water stress assessment result was medium to low risk (10-20%); long-term stress to 2050 is also low to medium risk (10-20%), meaning that it is a non-water stress area. In addition, according to the climate change water resource hazard map of the Taiwan Climate Change Projection Information and Adaptation Knowledge Platform (TCCIP), there is no risk of water shortage in scenario RCP 8.5 in the middle of the century (Y2036-Y2065). In response to the "Regulations on Water Conservation Charge," we have dedicated our efforts to improving the separation, treatment, recycling and reuse of wastewater in recent years. Collection of water conservation charge formally started in 2023. Nanya's water recycling rate has been certified by an impartial third party to reach 95.8%, which is better than the industry benchmark value announced by the government. (50%-85%), and qualifies for minimum charge rate announced. Therefore, annual water fee is only estimated to increase about 3%, and only has low impact on operating costs.

Improving resilience to energy transition risks

The pressure on the power grid has significantly increased in recent years due to industrial development and changes in the power supply structure. Taiwan Power Company may need to lower the voltage or frequency and even implement a demand response plan. Even tiny changes in power may impact sophisticated semiconductor production processes. To maintain our yield and the stability of production lines, Nanya has prepared emergency response plans, including:

- prepared 18 emergency generators and 26 DUPS in its fabs, which can supply approximately 60% of electricity when there is a power shortage.
- Furthermore, all machinery in the fabs must comply with SEMI-F47, which lowers the sensitivity of machinery to a drop in voltage and prevents circuit breaker tripping.
- Power supply of fabs use a dual circuit design to lower the risk of abnormal power supply from any single circuit. Maintenance and testing is periodically carried out to ensure stable power supply of fabs.

4.2 Mitigation Transition Strategies and Actions

Nanya's mitigation transition strategy can be divided into low-carbon product R&D, and seizing opportunities in the future low-carbon market. At the same time, we are implementing green technology production in our operations, developing surrounding areas of our fab in harmony with the environment, and managing the sustainability of our value chain. We are committed to not limiting Nanya's transition, and are also driving the overall value chain towards the sustainability vision of low carbon and low impact on nature.

- Development of Low-carbon Products

Nanya introduces Life Cycle Accesment (LCA) and green product design, and in its efforts to develop advanced and highly efficient environmentally friendly products, it continues to assist customers in developing products with low energy consumption design and low environmental impact. (See chapter 3.1 for details)

- Green Technology Production

The main goal of Nanya's green technology production strategy is to hope the company can become a green enterprise with low carbon, low pollution and efficient use of resources.

Specific actions of this strategy can be divided into energy and water conservation, climate change mitigation, strengthening pollution prevention and control technology. Energy and water conservation can effectively reduce unnecessary waste and improve operational efficiency. Climate change mitigation includes how to take specific actions to effectively reduce Scope 1 and Scope 2 emissions, including the direct removal of PFC gases and long-term planning for renewable energy use. Strengthening pollution prevention and control technologies is the active implementation of waste reduction and establishment of stricter emission standards, which are not limited to meeting regulatory requirements.

- Development in Harmony with Nature

Nanya has been conducting ecological monitoring surveys every year since 2013, and accumulated information on species in Nanlin Technology Park over a long period of time. We use the number of dominant species in the area to determine whether they will be impacted by interference from construction. As biodiversity issues attract growing attention, Nanya's focus on nature not only covers animals and plants, but also the entire operating environment from the perspective of ecosystem services. In addition to planning and using ecological monitoring survey results to engage and communicate with stakeholders, we also cooperated with Ming Chi University of Technology to compile an inventory of waste in the surrounding river, and jointly developed strategies for the sustainability of nature and mutual benefit with communities.

- Valued Chain Management

To manage nature and climate-related risks of the value chain, Nanya requires suppliers to sign the "Nanya Corporate Social Responsibility Guarantee" and conduct supplier nature and climate-related risk assessments. In 2023, we identified the nature and climate-related risks of significant suppliers through a questionnaire, and collected a total of 29 questionnaires. We plan to optimize this risk assessment process next year to gain a better understanding of suppliers' nature-related dependencies and impacts, in hopes of establishing strategies and indicators based on assessment results.

Green Technology Production

Water Resource and Energy Management

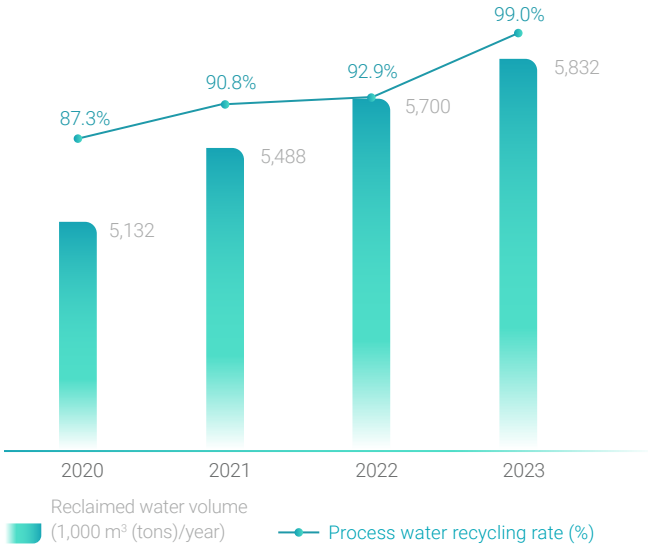
1. Water Resource Management

Nanya's water management not only involves the design of water saving processes, and chiefly emphasizes water reduction and recycling. We currently have acid-alkaline wastewater, hydrofluoric wastewater, and organic wastewater recovery systems, with a total water recovery volume of 5,832 thousand m^3 (tons). Along with the implementation of various water saving measures, the process water recycling rate has increased each year. To manage Nanya's water efficiency, the Company's long-term (2025) water resources management goal is to reduce the cumulative water consumption per unit capacity in 2025 by 39% compared with 2017, and for process water recycling rate to reach 93% and above. We hope to improve water efficiency and recycled water volume through the improvement of production processes and equipment. In recent years, 7 water-saving improvements have been completed with water-saving benefits of 567,925 tons/year.

2023 Water Resource Management Improvement Project

Item No.	Description	Water-saving benefits (m^3(tons)/year)
1	FAB 3AN cooling water tower front-end water quality improvement	36,500
2	FAB 3AN hydrofluoric waste water recycling system equipment improvement and expansion	156,950
3	Newly built hydrofluoric waste water COD and total nitrogen treatment system (includes water recycling system)	365,000
4	Cooling tower sand filter reduces water consumption	8,632
5	Burn Box sprinkler adjustment water saving improvement	205
6	EBARA NST Tool Idle Mode DI parameter adjustment	101
7	AMAT LK NST Tool Idle Mode DI parameter adjustment	537

Process water recycling rate and volume



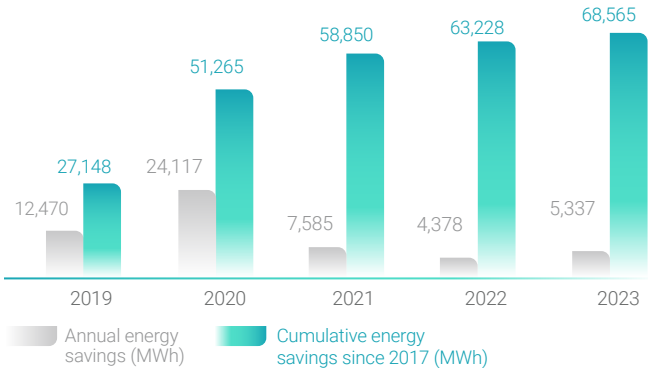
2. Energy Management

Nanya has set energy-saving goals: Cumulative energy-saving benefits from 2017 to 2025: 75,000 MWh/year. In 2023,Nanya has completed 36 energy-saving management plans with a total investment of NT$14.67 million. The total energy-saving benefits reached 5,337 MWh/year. In the past five years (2019~2023), a total of 148 energy-saving management plans were implemented, with a total investment amount of NT$196.19 million, a total energy-saving benefit of 53,887 MWh/year, and a carbon emission reduction of 26,675 metric tons/year.

List of energy saving projects and benefits

Year	Number of energy saving projects	Energy saving benefits (MWh/year)	Carbon reduction volume (Metric tons CO_2e)	Investment (NT$10,000)
2019	29	12,470	6,173	3,367
2020	25	24,117	11,938	6,255
2021	33	7,585	3,755	4,403
2022	25	4,378	2,167	4,127
2023	36	5,337	2,642	1,467

Energy saving results over the years



Energy consumption real-time monitoring platform

We invested NT$21.8 million in 2019 to establish a real-time energy consumption monitoring platform and obtained ISO 50001 certification. With the platform's real-time monitoring, visualized data, and smart energy saving functions, we have completed dual chilled water systems, heat recovery and reuse from freezers, equipment automation, efficiency upgrades to equipment, as well as improvements to production management and scheduling to date. A total of 172 energy conservation projects were implemented between 2017 and 2023 to save more than 68.56 MWh in electricity.

Smart Chiller Upgrade Project

Air-conditioning equipment is one of the most energy-consuming equipment (accounting for 20% of total electricity consumption). We introduced an intelligent management system to first collect complete data and analyze the improvement potential of air conditioning operations. Through big data analysis and modeling, the air conditioning equipment can determine the optimal schedule and control based on external temperature conditions. After improvements in 2020, the electricity consumption of the ice water system can be reduced by an average of 18.17%, saving up to 1.55 million kWh of electricity per month

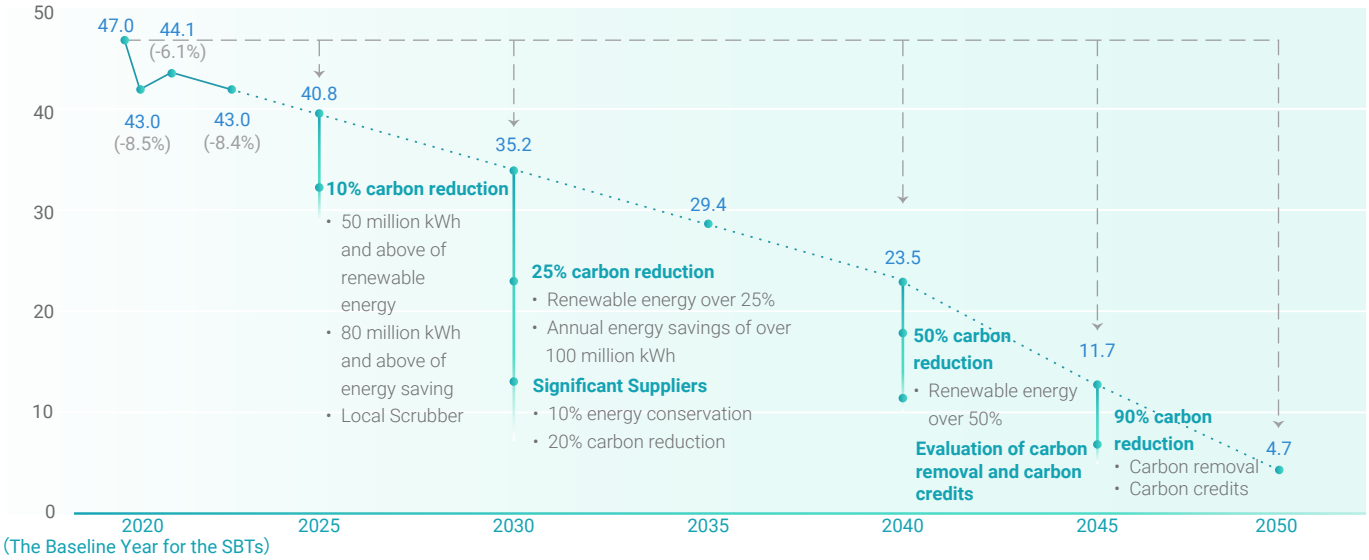
Climate Change Mitigation Action

In line with the Paris Agreement's goal of controlling the earth's temperature rise to no more than 2°C before the end of the century and pursuing 1.5°C, Nanya has formulated its climate strategy after referencing IPCC, AR6, and IEAWEO reports. Nanya passed the SBTs and set targets based on the scenario of well below 2℃ using 2020 as the baseline year.

Scope 1+2 emissions	Annual average reduction by 2.5%, and reduce emissions in the current scope by 25% by 2030
Scope 3 emissions	Under the premise of total emissions not increasing, our goal is to reduce emissions per unit product by 27% by 2030

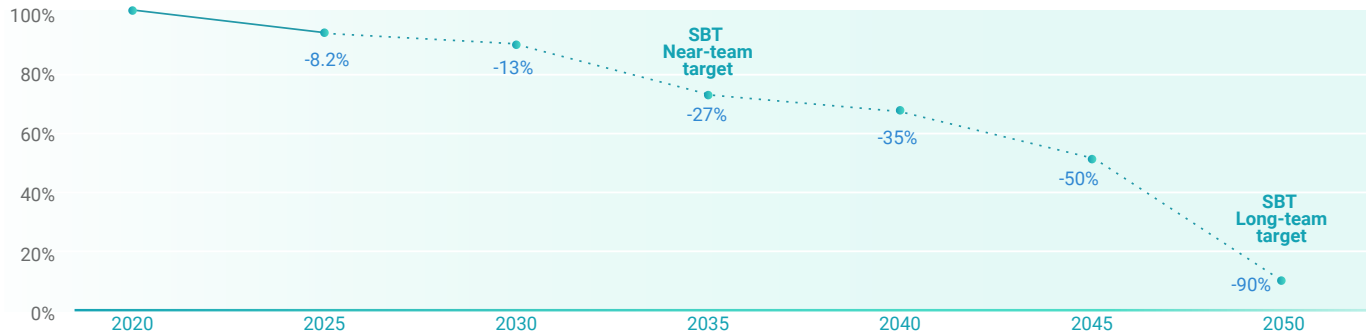
Nanya's Pathway to Net Zero Emissions

The Pathway to Scope 1+2 Reduction



(The Baseline Year for the SBTs)

The Pathway to Scope 3 Reduction



- Counseling significant suppliers inventory GHG and product carbon footprint
- Comprehensive inspection scope 3 and passed the verification
- Develop high-efficiency and low-energy consumption products
- Green logistics

- 50% significant suppliers engagement
  -Energy saving target:10%
  -Carbon reduction:20%
- Counseling significant suppliers on GHG reduction
- Third generation 10nm products reached standards for shipment and develop Furth generation 10nm product

- 100% significant suppliers engagement
  -Energy saving target:10%
  -Carbon reduction:20%
- EUV and HKMG technology introduction
- Increase the proportion of sustainable raw materials

- Carbon removal
- Carbon credits

Scope 3 emissions encompass the product and supply chain aspects. Nanya has therefore set targets for product innovation and is investing in the R&D of 10nm products and process technologies. Our goal is to start mass production of Gen 3 10nm products in 2025 in order to provide DRAM products with higher performance and lower power consumption. Our supply chain management targets and joint initiatives with supplier partners are also aiming for a 20% reduction in carbon emissions and 10% reduction in energy consumption in 2030 compared to 2020. At the same time, Nanya is strengthening fab facilities, increasing its resilience to natural disasters, and set adaptation targets with the goal of business continuity and zero occupational injuries. We also participate in DJSI, CDP, climate advocacy and education to raise the profile of these topics and respond to stakeholder expectations. Reduction measures are described below:

1. Process Improvements

By developing new process recipes, reducing process time, extending service life, and other improvement methods, we have reduced process usage. From 2021 to 2023, we completed a total of 97 improvement projects, reducing the use of various chemicals, photoresist, and slurry by a total of 1,719 tons, saving NT$219,873,000.

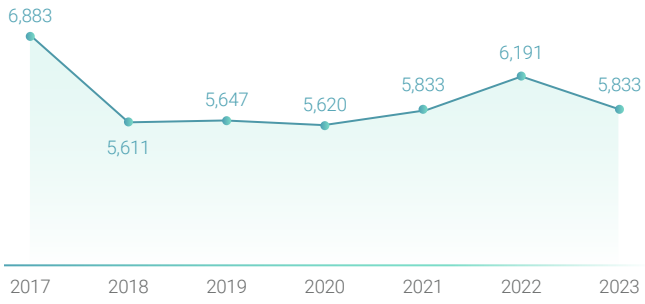
Process improvement year	2021	2022	2023	Total
Completed item	38	24	35	97
Annual reduction (ton)	628	400	691	1,719
Annual benefits (NT$1,000)	84,840	32,622	102,411	219,873

Key Directions for Process Improvements

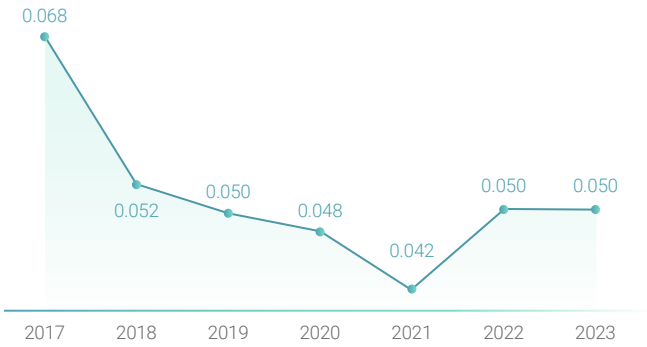
2021	The thin film area used the same raw materials to integrate different processes, and effectively improved the efficiency of raw material use; reducing the use of SOD (Spin on Dielectric) by approximately 20L (9%) and cleaning solution HC-100 by approximately 1,000L (7%) each month.
2022	Improvement to the photoresist verification and management method for the yellow light area effectively improved photoresist usage efficiency, and reduced consumption of photoresist SHB1736/SH114A by approximately 47 kg (6%), which was the greatest benefit.
2023	The main improvement was the recycling and reuse of the chemical triethanolamine in single-wafer cleaning machines, which reduced the consumption of a single wafer from 2.4L to 0.13L, which can reduce consumption by 296 tons per year.

Raw materials consumption significantly increased in recent years due to new processes and trial production of new products. However, Nanya has completed 182 projects to improve the use of raw materials between 2017 and 2023, and process gas usage per unit capacity decreased from 6,883m3/k-pcs to 5,833m3/k-pcs between 2017 and 2023, a decrease of 10.1% over 7 years. Chemical usage per unit capacity also dropped by 26.4% compared to 5 years ago.

Gases used per unit die produced (m^3/kpcs)



Chemicals per unit die produced (Metric tons/kpcs)



2. Local scrubber

Based on the high global warming potential of perfluorocarbons (PFCs) and their role, Nanya actively plans and implements GHG reduction projects for PFCs. During plant planning, we procured high-reduction efficiency process exhaust treatment equipment, Local Scrubber (LS), primarily used in etching and thin film processes. This equipment reduces final emissions through high-temperature destruction generated by combustion, achieving a reduction performance of approximately 518,000 tons of CO_2e in 2023. Simultaneously, we initiated discussions with exhaust treatment equipment manufacturers to optimize the management of these devices, ensuring their efficiency remains consistent and improving the accuracy of GHG inventory and management results. Nanya established PFC reduction acceptance standards for local scrubber, in which CF_4 treatment efficiency must reach 90% and above, the reduction rate of C_3F_8, C_4F_6, C_4F_8, CHF_3, CH_2F_2, and SF_6 must reach 95% and above, and the reduction rate of NF_3 must reach 99% and above.

Year	2019	2020	2021	2022	2023
PFCs reduction performance (Metric tons CO_2e)	569,563	589,870	597,952	631,790	518,370

• Local scrubber optimization

Nanya implemented an optimization project for local scrubbers in response to the Greenhouse Gas Reduction Initiative of Taiwan Semiconductor Industry Association (TSIA), and to reduce the impact of GHG emissions on the environment. Nanya installed automatic energy saving devices in process machines and waste gas treatment equipment in fabs controlling the ignition timing when natural gas is input. This reduces energy consumption of process machines at low utilization or during maintenance, thereby reducing CO_2 emissions. Nanya also applies AI methods for improvement and imports multi-feature parameters into AI machine learning models to establish health indicators, which can predict the remaining service life, avoid unexpected failures, and extend the maintenance period. After implementation, an average of 1,078 metric tons of CO_2e can be reduced every year.

The automatic energy-saving device of the Local scrubber activates only when the main machine introduces process gas, enabling combustion operation to save raw material usage.

• Local scrubber Management optimization

In order to ensure the GHG reduction rate of the local scrubber, FTIR planning was carried out based on the characteristics of process gases treated by existing and newly purchased local scrubbers.

To ensure the reduction efficiency of Local scrubber in mitigating GHG emissions from manufacturing processes, management optimization is carried out based on the characteristics of the processed process gases for both existing and newly purchased Local scrubber.

1. Optimization of existing Local scrubber includes maintenance procedures, followed by adjustment of air-fuel ratio gas flow post-maintenance to maintain optimal combustion efficiency. Additionally, annual sampling of existing Local scrubber ensures the effectiveness of exhaust gas treatment in older machines.
2. During process transitions, if new GHG emissions are introduced by existing process machinery or if GHG flow exceeds original FTIR[Note] detection specifications, retesting is required.
3. Expansion and addition of new Local scrubber necessitate inspection if the process or machine type differs, ensuring the processing efficiency of new equipment.
4. Strengthening FTIR detection conditions ensures confirmation of the optimal combustion ratio.

Note: FTIR, Fourier-transform infrared spectroscopy

3. Renewable energy

Nanya promotes renewable energy use in the following three phases:

Phase 1 Self-development evaluation and trial implementation.

Nanya purchased 362 T-RECs through the renewable energy trading platform in 2020, and evaluated the installation of renewable energy in fabs. Nanya completed the installation of 27.36 kW of solar panels on the rooftop of the new building in 2022, and the solar panels generated 30 MWh of electricity in 2023. The installation of renewable energy facilities will also be evaluated and planned in new fabs in the future.

Phase 2 External cooperation

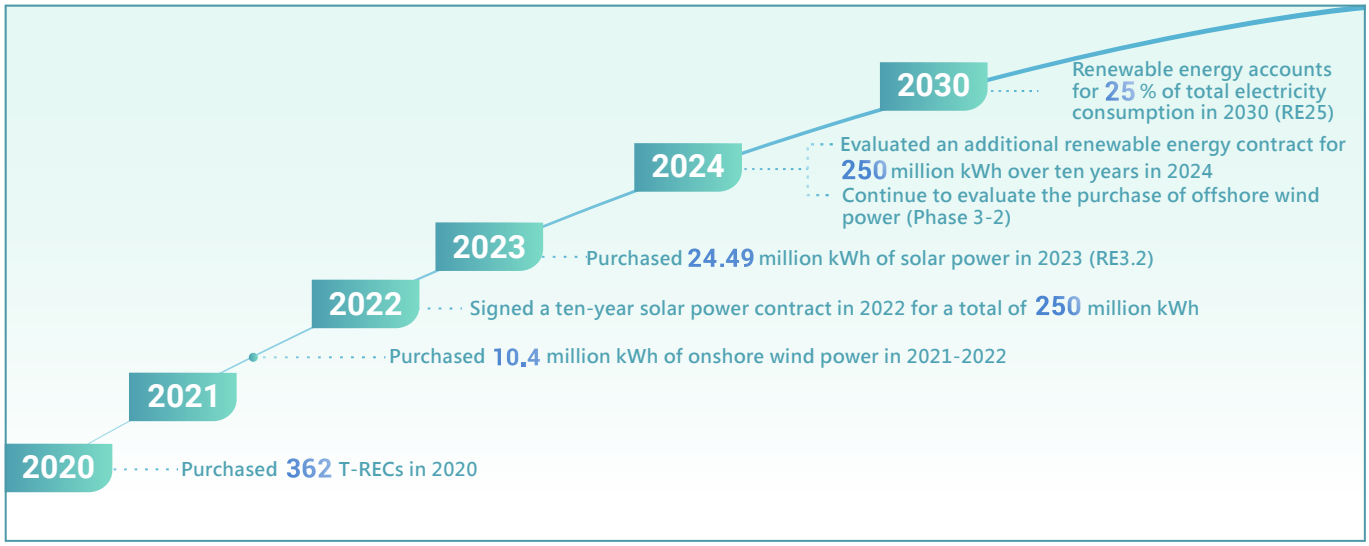
Nanya cooperates with renewable energy based electricity generation and selling companies to obtain more electricity, and is expanding the use of renewable energy based on regulatory requirements. Nanya used 24,490MWh of solar power in 2023, accounting for 3.2% of the Company's electricity consumption. Nanya plans to sign solar power contracts for another annual 25,000 MWh in 2024.

Phase 3 Alignment with international trends

Nanya set the goal for renewable energy use to account for 25% by 2030 to achieve the SBT or RE100. Nanya will target large renewable energy plants, and will dedicate efforts to further increase its renewable energy consumption.

Renewable energy use in 2020-2023

Renewable Energy Planning for 2030



4. Greenhouse Gas Emissions

Nanya referenced ISO 14064-1 and requirements set forth by the Ministry of Environment, Executive Yuan in the Climate Change Response Act, Greenhouse Gas Inventory Registration and Management Regulations, Greenhouse Gas Verification Guidelines, Greenhouse Gas Registration Guidelines, and WBCSD/WRI Greenhouse Gas Protocol, and sets the boundaries of the organization at 100% control of operations. At present, verification of Scope 1, Scope 2, and Scope 3 emissions is carried out by a third party verification institution according to international standards.

The scope of Nanya's inventory covers all production locations in Taiwan. The main sources of GHG emissions were purchased electricity and steam (accounting for about 86.83%) and process emissions (accounting for about 9.09%). GHG emissions in 2023 totaled 430,324 metric tons CO_2e. Scope 1 emissions totaled 56,654 metric tons CO_2e, and there was no GHG emissions from biomass fuel; Scope 2 emissions totaled 373,670 metric tons CO_2e. GHG emission factors were based on the GHG emission factor management table announced on the company GHG emission information platform of Taiwan's Ministry of Environment, the IPCC 2006, emission factors released by Taiwan's Bureau of Energy, Ministry of Economic Affairs, and emission factors made public by the company-owned steam plant of Nan Ya Plastics Corporation's utility plant. The GWP value is cited from the IPCC AR5.

2020 to 2023 Greenhouse Gas Emissions (Scope 1 and Scope 2)

Year	Scope 1 (Metric tons CO_2e)	Scope 2 (Metric tons CO_2e)	Scope 1+2 (local emission standards) (Metric tons CO_2e)	Scope 1+2(market emission standards)(Metric tons CO_2e)
2020	90,327	379,417	469,744	469,744
2021	56,409	373,639	431,353	430,048
2022	59,788	381,166	444,965	440,954
2023	56,654	373,670	442,354	430,324

Note 1: The Company's PFCs emissions include carbon tetrafluoride (CF_4), perfluoropropane (C_3F_8), hexafluorobutadiene (C_4F_6), tetrafluorocyclobutane (C_4F_8), trifluoromethane (CHF_3), difluoromethane (CH_2F_2), monofluoromethane (CH_3F), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).
Note 2: Other direct emissions included CO_2, CH_4, N_2O of process gas, HFCs, and SF_6 of non-process gas, such as fire extinguishing equipment, refrigerators, freezers, and high-voltage power panels.
Note 3: Indirect energy emissions include electricity and steam usage. The carbon emission coefficient for electricity is based on the figure of 0.494 kg CO_2e/kWh published by the Energy Administration, MOEA on April 26,2024.
Note 4: Since 2021, N_2O reduction equipment has been installed for thin film process exhaust gases, resulting in a decrease in Scope 1 emissions.

To improve the completeness of the GHG inventory of our value chain, Nanya has compiled its inventory of other indirect emissions (Scope 3) in accordance with the Greenhouse Gas Protocol since 2018. Based on the significance identification results of Scope 3 emission sources, we compiled an inventory of 10 Scope 3 emission sources. In 2023, the total amount of Scope 3 emissions reached 816,878 metric tons CO_2e. The top three primary emissions were "use of sold products" which at 487,767 metric tons CO_2e (60%), followed by "emissions from processing sold products" at 107,112 metric tons CO_2e (14%), and "purchased goods and services" emissions at 100,956 metric tons CO_2e (13%). Among these, emissions from seven categories, including purchased goods and services, fuel and energy-related activities not included in Scope 1 or Scope 2, upstream transportation and distribution, employee commuting, business travel, operational waste, and product usage, totaling 676,388 metric tons CO_2e, were verified. Continuous reduction of Scope 3 emissions will be achieved through innovative product development and supply chain management. Additionally, the company actively engages with external experts to establish methodologies and databases, ensuring regular inventory data updates to reflect supplier reduction achievements.

Scope 3 Emissions

Scope 3 category	Source of calculation	Scope 3 (Metric tons CO_2e)
★ Purchased goods and services	Carbon emissions from the main material purchased and auxiliary materials in the process	100,956
★ Fuel- and energy-related activities	Carbon emissions from the ton-km for transporting fuel used in the factory and energy transported to the factory	82,395
★ Upstream transportation and distribution	Carbon emissions from the ton-km for transporting main materials and auxiliary materials purchased from suppliers to the fab and packaging plant	1,946
Downstream transportation and distribution	Carbon emissions from the ton-km for transporting products from the plant to customers	2,375
Emissions from processing sold products	Carbon emissions according to capacity allocated in the packaging and testing section	107,112
★ Employee commuting	Carbon emissions from company cars and commuting	2,068
★ Business travel	Carbon emissions from employees traveling overseas on business trips	50
★ Waste generated by operations	Carbon emissions from waste generated in the production process, including waste transport and disposal	1,206
★ Use of sold products	Carbon emissions from electricity consumption of products used by customers	487,767
Assets and equipment	Investments in equipment and property	31,003
Total		816,878

Note: ★ Seven emissions categories have been evaluated with a total emission of 676,388 ton-CO_2e

To mitigate operational transition risks at Nanya, we continuously leverage our expertise and influence to implement reduction measures in our operational processes, aiming to minimize GHG emissions and environmental impact. Aligned with international standards, Nanya achieved its Science-Based Targets (SBT) goals for existing operational sites in 2022. By 2023, total emissions had decreased by approximately 8.4% compared to 2020, surpassing SBT annual reduction targets for two consecutive years. Moving forward, we will continue to implement SBT targets, reducing our company's GHG emissions and mitigating the impacts and losses caused by climate change-related transition risks.

Item \ Year	2017	2020	2021	2022	2023
GHG emissions per unit capacity ($kg\text{-}CO_2e$/thousand die)	606	420	383	405	430

Note: The calculation of production capacity was the output of Good Electronic Chip (GEC), and the output of various products was converted into around 4Gb product particle numbers, using per thousand die (k-pcs) as the calculation unit.

5. Internal carbon pricing

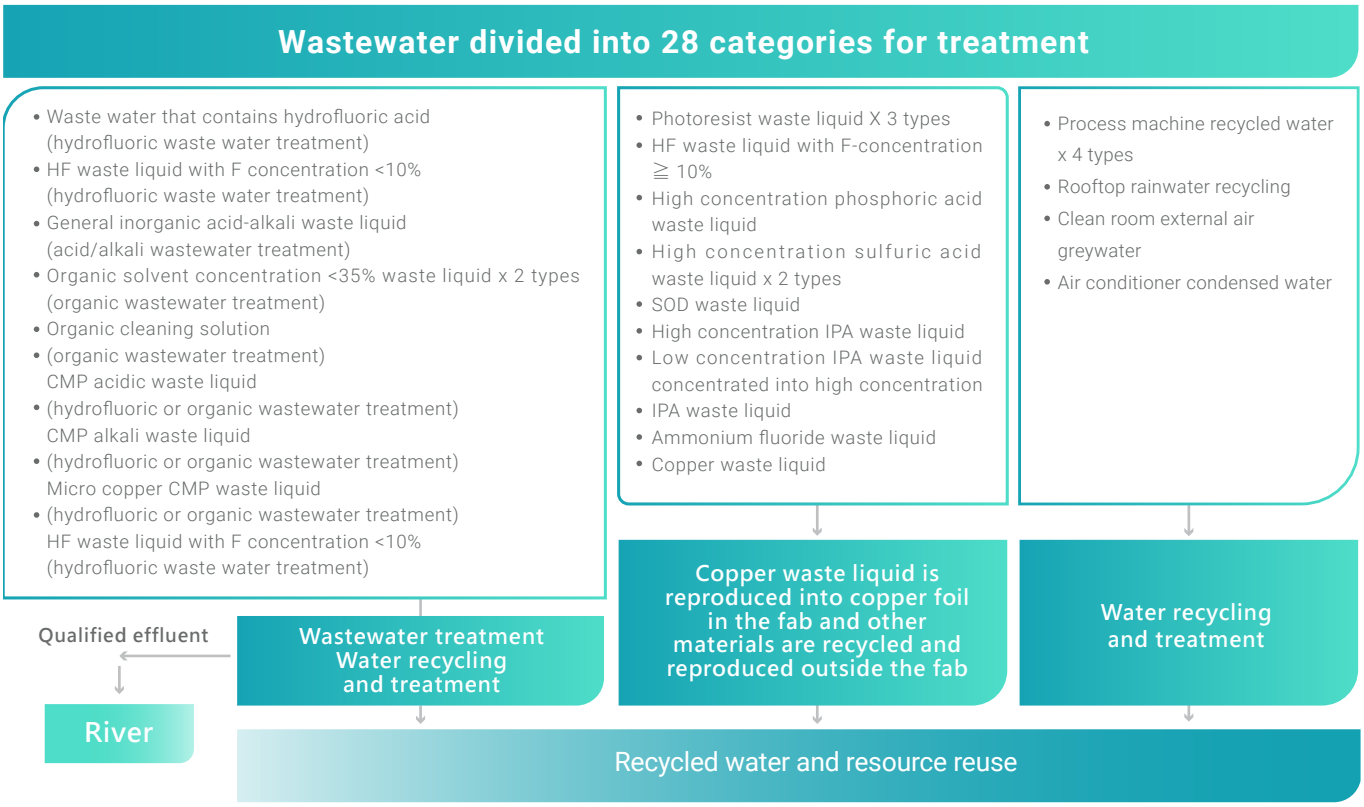
In response to climate change and the global trend towards net-zero carbon emissions, the Taiwanese government declared in 2022 its goal to achieve net-zero transformation by 2050. In 2023, the "Climate Change Response Act" was enacted, providing the legal basis for carbon fee imposition on emission sources. Aligning with international trends and Taiwanese regulations,Nanya has implemented an internal carbon pricing mechanism since 2022. Carbon emissions are priced at NT$100 per metric ton, with the related carbon costs incorporated into internal management profit and loss statements. This serves as the basis for implementing carbon risk management, aiming to raise awareness of carbon reduction among all employees and achieve energy-saving and carbon-reducing effects. In 2023, carbon emissions totaled 430,324 metric tons, resulting in carbon emission costs of NT$43,032,412 under the internal carbon pricing mechanism.

Pollution Emission Reduction Management

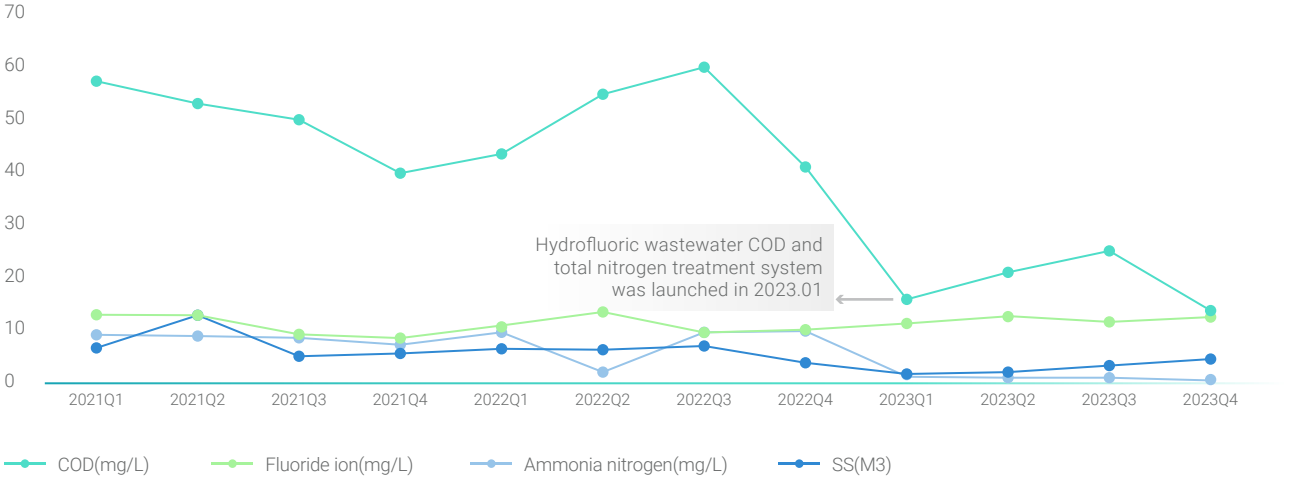
1. Water pollution reduction performance and measures

Nanya established 28 systems for process wastewater with different components and concentrations, and carries out subsequent treatment, recycling, and reuse. To ensure that the quality of discharged wastewater meets standards, besides simultaneously monitoring the quality of effluents through a connection to the Environmental Protection Department, we outsource the sampling, analysis, and testing of wastewater each month to strengthen the management of wastewater quality.

To reduce the amount of wastewater discharged and improve the quality of effluent, Nanya continued to build a recycling system and expand the wastewater treatment system in recent years. In addition, to solve the problem of high COD and total nitrogen in hydrofluoric waste water discharged from machines, Nanya has invested NT$430 million to build a new hydrofluoric waste water COD and total nitrogen treatment system, which was officially launched in 2023, and mainly uses biological treatment methods with Membrane Bio-Reactor (MBR). The COD value of effluent dropped from 50 mg/L to 20 mg/L after its use, which not only improved the quality of effluent and wastewater treatment efficiency, but also reduced the water pollution control fees by about NT$1 million per year.



Nanya's effluent quality inspection (2019~2023)



To reduce water pollution, in addition to clear wastewater diversion, increasing recycling systems to reduce emissions, and enhancing the efficiency of wastewater treatment systems, Nanya Technology has achieved Platinum-level certification from AWS (Alliance for Water Stewardship) through third-party verification in 2023 and obtained the Platinum-level certification in 2024. The standardized framework scrutinizes water management practices, engaging stakeholders to understand water usage, basin conditions, and risks faced. Through processes involving stakeholders, water governance, balance, quality, and significant water-related areas are reviewed to devise and promote measures for water resource management and protection.

2. Air pollutant emission reduction performance and measures

Nanya has always placed significant emphasis on air pollution prevention, consistently complying with (or achieving levels below) government environmental regulations regarding air pollutant emission standards over the years. To maintain optimal processing capabilities of treatment equipment, continuous optimization of operating parameters for air pollution prevention equipment is carried out annually. Furthermore, through environmental management planning, the emissions of volatile organic compounds (VOCs) are reviewed. This includes a investment of 23 million NT dollars in 2022 to upgrade two VOC exhaust treatment systems in the 3A plant, transitioning the zeolite adsorbent material from ceramic to fiberglass to enhance processing capacity. Upon completion in 2023, third-party verification confirmed that the equipment achieved an efficiency of over 98%. VOC emissions decreased by 70% compared to 2022.

In 2022, in order to reduce the emission of particulate pollutants in the entire fab, the particulate pollutants generated by process equipment of Fab 3A were collected and processed in the air pollution control equipment, and a dust removal tower was added to reduce the emissions through atomized water washing and collision interception. After completion in 2023, a third party verified that particulate pollutants was reduced by 77%.

Air pollutants	Before improvement	After improvement
VOCs emission (metric tons) from emission pipe P131 of Fab 3A	8.06	2.36
Total suspended particulate matter (mg/m^3) from emission pipe P106 of Fab 3A	79	18

3. Waste Management Performance and Measures

Nanya reduces waste from the source, regularly reviews the reasonableness and appropriateness of raw material use, and streamlined the production process to reduce the use of raw materials and further achieve waste reduction. Nanya completed 8 improvement proposals regarding the use of raw materials in 2023, including improvements to reduce process time, extend use cycle, and reduce process consumption. The most significant reduction benefit is that the amount of sulfuric acid and hydrogen peroxide used for the wet etching area was effectively reduced by reducing the acid cleaning time, reducing the amount of sulfuric acid used each month by 7,650 liters and hydrogen peroxide by 3,825 liters.

Performance of raw material consumption improvement proposals in 2023

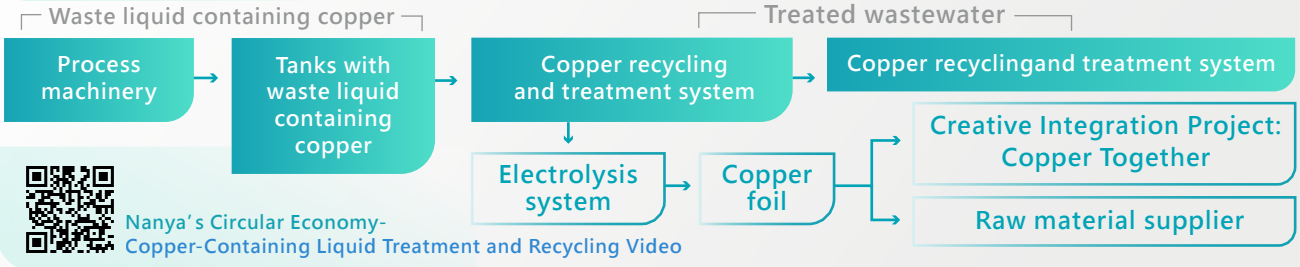
Proposals	Number of cases	Benefits (NTD/year)
Extended the gas cylinder replacement time and reduced the stable flushing time	2	111,034
Reduced the use of natural gas, chemicals, special gases, and grinding fluid, through process optimization and improving productivity	6	9,735,513

Waste Reduction Technology-Copper Waste Liquid Electrolysis Regeneration System

Nanya invested NT$8.19 million to build a copper waste liquid electrolysis regeneration system, which uses resin adsorption and regeneration to produce high-concentration copper sulfate waste liquid, which is electrolyzed to produce copper foil for recycling. Nanya worked with Ming Chi University of Technology and Chuang Ching-Tai, a local artist of New Taipei City, through "Copper Together" project, and remade waste copper foil into art works, which improved communication with stakeholders. Nanya also produced the waste copper foil into industrial-grade raw materials for reuse, achieving resource circulation. A total of 500 kg of copper foil was produced in 2023.

Flowchart for treatment of waste liquid containing copper

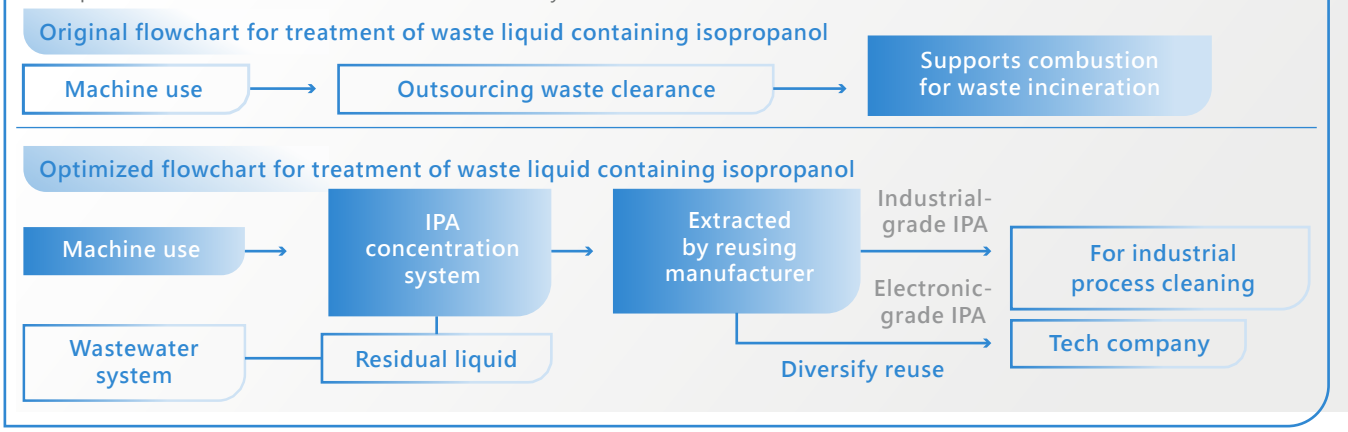
Flowchart for treatment of waste liquid containing copper utilizing regeneration technology



Nanya's Circular Economy-Copper-Containing Liquid Treatment and Recycling Video

Resource circulation - Isopropanol recycling system

Nanya invested NT$20 million in 2017 to introduce an isopropanol(IPA) recycling system, which increases the concentration of IPA discharged from the process, effectively reducing the clearance amount (reducing 130 trips/month and saving NT$21,000 thousand/month in waste clearance costs). Wastewater containing isopropanol that cannot be concentrated is used as the carbon source required for ammonia nitrogen wastewater treatment, replacing purchased methanol.
Nanya adheres to the spirit of corporate sustainability by actively minimizing waste generated and maximizing resource recycling. This project won the Silver Award in the Resource Circulation Division of the 2023 Outstanding Enterprises in Resource Circulation of the Ministry of Environment.



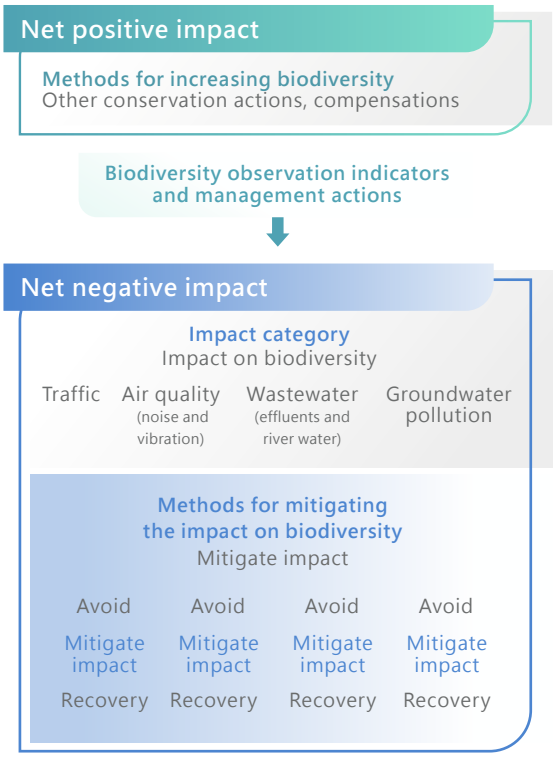
Nanya's total waste volume in 2023 was 22,403 metric tons, and the overall waste recycling rate reached 98.8%. All waste recycling and reuse is outsourced (no on-site reuse). The main output is hazardous industrial waste (acidic waste liquid, including sulfuric acid, phosphoric acid, and hydrofluoric acid), 100% is processed by the contractor and recycled as other industrial raw materials.

Nanya periodically audits waste contractors to determine if the contractors are in compliance with waste disposal regulations, verifying their legitimacy and ensuring that all waste is properly processed or recycled, preventing a second impact on the environment. Nanya did not ship any hazardous waste to other countries in 2014-2023, and output of all hazardous industrial waste was outsourced to certified domestic waste disposal contractors; a total 28 certified domestic waste disposal contractors was commissioned in 2023.

Development in Harmony with Nature

Nanya's Fab 3A and new Fab 5A were reconstructed in their original site, and are not new land development projects. However, we fully understand that current operating activities may impact the ecological environment. Nanya applies the biodiversity impact management framework to manage and mitigate its impact on biodiversity and ecosystems. The mitigation hierarchy includes avoid, minimize, restore, and offset. "Avoid" and "minimize" are the Company's most important measures. For example, the Company has analyzed the impact of the new factory development plan on surrounding plant ecology, habitats, and water environment, and taken measures to avoid and mitigate impact. If operations or development will still damage the ecosystem after taking measures to avoid and mitigate impact, the Company will take "restore" measures in the damaged areas, and will take "compensate" measures (e.g. zero net deforestation) if restore measures still cannot reduce losses, in order to compensate for the impact on biodiversity. After establishing a natural risk assessment process, Nanya released its biodiversity policy, striving for sustainable business operations, and is committed to promoting biodiversity measures and continuous improvement.

Biodiversity impact management framework



It is necessary to work together with external partners to have a positive impact on biodiversity. Hence, the Company is actively working with ecological monitoring companies and NGOs to better understand the impact of Nanya's operations on biodiversity, and formulate more effective methods to manage biodiversity.

- Cooperation with ecological monitoring company: Nanya began working with a professional ecology company in 2008, and it helps the Company conduct surveys on ecological resources, such as animal and plant ecology in water and on land. Ecological monitoring is conducted on a monthly basis during the factory development period, and conducted on a quarterly basis during the operation period; the ecological company recommends response measures for abnormal situations. The Company conducts comprehensive reviews and formulates improvement measures based on recommendations from the ecology company, in order to lower the impact on biodiversity.
- Cooperation with NGOs: Nanya and Common Wealth Magazine have jointly supported the Tamsui River Convention since 2020, and also worked with the NGO – The Society of Wilderness in co-organizing ecological environment conservation activities, such as removing Mikania micrantha from Wugu Wetland, organizing parent-child camps (understanding the rich ecology in areas surrounding the factory), and admiring swallow and understanding the biodiversity of Wugu Wetland. The activities allow participants to understand the relationship between the Company and biodiversity in surrounding areas, and improve employees' understanding and awareness of the ecological environment. In 2023, Nanya has planned to participate in the next year's river waste investigation action conducted by the Society of Wilderness, adopting the river basins surrounding Nanya to contribute more efforts to the upstream wetlands.

1. Ecological Monitoring Project Performance

To understand the impact of development activities on the surrounding ecological environment,we spent nearly NT$10 million each year on environmental and ecological monitoring services since 2013 according to the biodiversity management cycle that we established.We commissioned a professional ecology company to conduct air quality (including noise and vibration), wastewater monitoring (including effluents and river water), groundwater sampling, traffic volume, and ecological survey (not only includes production bases, but also extends 500 m outward) during our operations. Surveys are conducted on a quarterly basis during normal operations, and changed to monthly surveys during construction periods. Categories of the ecological survey include plants on land, mammals, birds, reptiles, amphibians, and butterflies.

According to survey results over the past decade, there are stable records of the mammals Callosciurus erythraeus and Pipistrellus abramus. The distribution of amphibians is easily affected by temporary changes in water habitat and temperature, with more records of Fejervarya limnocharis and Duttaphrynus melanosticus. Reptiles are ectotherms, and their activity is easily affected by changes in environmental factors. Commonly recorded species include Hemidactylus bowringii and Gekko hokouensis. Among butterflies, 4 species are relatively stable, including Zizeeria maha okinawana, Pieris rapae crucivora, Eurema blanda arsakia, and Graphium sarpedon connectens. Bird records mainly include common bird species, such as Passer montanus and Zosterops simplex. As for land plants, Acacia confusa is the most dominant species among woody plants, followed by two species: Schefflera octophylla and Macaranga tanarius. Bidens pilosa var. radiata and Panicum maximum are the more dominant species of herbaceous plants.

Overall, the composition of land animals and plants remains stable. Species differences are mainly affected by changes in environmental factors, and there has not been any significant growth or decline.

Nanya engages in long-term ecological monitoring and conducts surveys during the day and night based on the habits of wildlife in surrounding areas.

The scope of survey extends 500 meters from the project base.

Valued Chain Management

1. Supply Chain Management Strategies and Actions

• Establishing a supply chain management system

Nanya has now compiled the Supply Chain Security Management Handbook and Supply Chain Security Emergency Response Management Procedure to govern internal risk assessment on interruption to supply of raw materials. Regular rehearsals of the emergency response management procedure are conducted as well to ensure that our inventory of raw materials and emergency backup suppliers are sufficient to cope with unexpected natural disasters and international inflation.

Externally, Nanya established a sustainable supply chain management process. We use regulations, risk surveys, on-site audits/improvement measures, and supplier capability development to strengthen suppliers' sustainability performance. The “Nanya Supply Chain Code of Conduct Questionnaire" is sent to key suppliers every year to provide a basis for sustainability risk management, and the potential impacts of climate change management/GHG/water resource management are included in the assessment, including whether the vendor has implemented an environmental management policy, GHG management policy, energy management policy, and emergency response plan. High-risk suppliers are then selected for on-site audits and guidance is provided for improvement.

The questionnaire is used by Nanya to conduct a risk assessment for all suppliers. Emergency response plans have now been drawn up for high-risk production locations to ensure continuity of supply for Nanya in the event of natural disasters, such as flooding and water shortages. We conduct on-site audits of key raw materials suppliers every three years starting in 2020, and examine related documents to ensure that there are no issues with the supply of raw materials used in Nanya's production, so that the supply will not be disrupted due to hazards derived from sustainability issues. We completed the sustainability audit (once every three years) in 2023 and did not find any deficiencies related to the risk of climate change and natural disasters.

• Sustainable Supply Chain Management Practices

For risk management, Nanya requires suppliers to sign the "Supplier Corporate Social Responsibility Commitment," and established a sustainable supply chain management process. We use regulations, risk surveys, on-site audits/improvement measures, and supplier capability development to manage supply chain sustainability risks and strengthen suppliers' sustainability performance. Water resources management and TCFD items are included in the supplier risk assessment questionnaire (SAQ). We cross referenced maps in scenario RCP8.5 of the IPCC AR5 published by the Climate Change Disaster Risk Adaptation Platform (DR.A) of the National Science and Technology Center for Disaster Reduction (hereinafter referred to as NCDR), and reviewed water resources risks of 31 suppliers of concern, ensuring that they have water resources management measures and emergency response plans for water shortages. We conduct on-site audits of high-risk and key suppliers, and provide guidance to make improvements for deficiencies. Therefore, we have assessed that the physical risks of climate change will have limited impact on Taiwanese suppliers, and are not risks to disrupting production.

• Promoting Shared Value

Nanya aims to collaborate with supply chain partners to address sustainability issues. Since 2020, it has organized an annual "Sustainable Supply Chain Seminar," with the theme for 2023 being " Mutually Benefiting Nature and Climate" Topics discussed during the seminar included net-zero initiatives, digital carbon management platforms, TNFD trends, and future directions for collaboration with the supply chain. Additionally, through regular meetings and interactions, Nanya engages with suppliers to deepen their understanding of sustainability issues. In 2023, the company conducted 2 sessions of water resource management guidance, involving 39 suppliers. Among them, 9 suppliers successfully completed water-

saving plans, achieving annual water savings of 1.7 million cubic meters. We expect to provide guidance to 30 suppliers in 2024, which is expected to save 1 million cubic meters of water each year. We hope that Nanya's experience will improve the entire supply chain's water management measures, and drive raw material suppliers and packaging and testing plants to compile the carbon footprint inventory of their products. Nanya compiled the environmental footprint inventory of its products in 2022 to find the top 30 raw materials suppliers and packaging and testing plants causing an increase in the Company's product carbon footprint, including major suppliers of wafers, packaging and testing, and chemicals and special gases. We are participating in the low carbon footprint inventory and carbon reduction project of the Industrial Development Administration, Ministry of Economic Affairs under the guidance of the Industrial Technology Research Institute. Nanya aims to jointly reduce carbon emissions by 6,300 metric tons together with 10 supply chain partners.

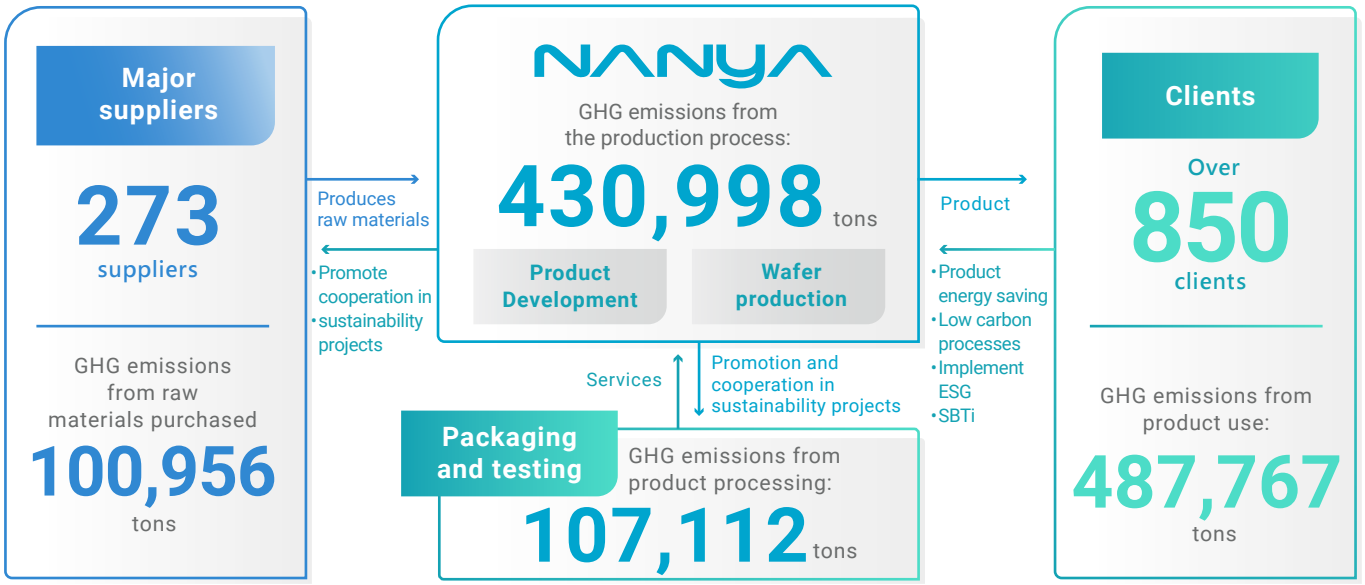
Nanya Technology, along with leading global semiconductor industry players, initiated the Semiconductor Climate Consortium (SCC) and became a founding member. Through initiatives such as greenhouse gas inventories, sustainable perspectives exchange, innovation technology empowerment, and policy influence, the consortium collectively pursues net-zero carbon goals. The company also participates in Taiwan SEMI's Sustainable Manufacturing Committee, integrating industry resources to shape the semiconductor industry's sustainable vision and actions.

2. Carbon Reduction Linkage in the Product Value Chain

Our vision of becoming "The Best DRAM Partner for Smart World" guides Nanya's focus on the DRAM industry. We leverage our innovative R&D capability to develop advanced processes and products, enhance our low-power product portfolio, and upgrade packaging methods. We continue to supply high-performance, energy-efficient products in accordance with our R&D strategy of focusing on low-power products. Aggressive energy conservation and carbon reduction through green production processes also reduce the carbon footprint of the products we supply with flow-on benefits for the customer's end product. Nanya has set goals for carbon reduction and renewable energy use, and the use of new processes can effectively lower the carbon footprint of each product. The development of new generation products will improve Nanya's Scope 3 GHG emissions. The SBT of reducing GHG emissions per unit product by 27% and above will be achieved by 2030.

Nanya knows that climate change topics are of high concern to many customers. In addition to regular disclosures of related information through the sustainability report, we also participate in domestic/overseas initiatives or evaluations related to sustainable development or climate change such as TCFD, SBT, and Taiwan Alliance for Net Zero Emission. We continue to take part in international evaluations, such as DJSI and CDP. Our comprehensive customer service management system provide customers with an up-to-date picture on the green carbon reduction initiatives of Nanya.

Nanya's product value chain meets customers' needs for low-carbon products through sustainable supply chain management and its own green technology production. Nanya's high-performance products also help the entire society transition towards a low-carbon economy. This process will benefit avoided emissions in the social transition process. Avoided emission is a carbon emission issue that Nanya has recently begun to pay attention to, and we are currently looking into methodologies in the WBCSD's avoided emission guidance document, in order to effectively quantify the contribution of Nanya's products to the transition and reduction of carbon emissions in the overall society.



In terms of improving sustainability, Nanya hopes that suppliers can join us in promoting energy conservation and carbon reduction initiatives as well. In 2022, we called on suppliers to jointly declare the "Nanya Sustainable Development Mutual Benefit Initiative," in hopes of creating development opportunities in future climate issues. Nanya is setting renewable energy, electricity conservation, and energy conservation targets for suppliers to accelerate improvements to the environmental performance of our supply chain. Suppliers are expected to have 3% of their actual electricity usage come from renewable energy by 2025, introduce the ISO 50001 energy management system and ISO 14064 GHG inventory by 2030, and cut their electricity consumption and carbon emissions by 10% and 20% respectively by 2030 compared to 2020.

Nanya co-founded the Semiconductor Climate Consortium (SCC) with other members of the semiconductor industry, working together with the industry chain in GHG inventory, education, innovative technologies, and policy to achieve net zero emissions. Nanya participates in the SEMI Sustainable Manufacturing Committee, integrated industry resources, and jointly planned the vision and actions for a sustainable semiconductor industry.

5 Raising Awareness and Communication of Nature and Climate-related Issues

05 Raising Awareness and Communication of Nature and Climate-related Issues

Nanya is not only raising the nature and climate awareness of internal employees and management but also strives to communicate natural and climate awareness with stakeholders. Adopting TNFD this year, the company is enhancing its sustainability impact by actively expanding actions beyond the value chain focusing on community collaboration, environmental education, and environmental compensation.

5.1 Nature and Climate-related Training

Nanya not only emphasizes cultivating natural and climate awareness among the board of directors and senior management but also places significant importance on educating and training employees across various units during corporate operations. Additionally, effective communication with the supply chain and investors is prioritized.

1. Operations level

The promotion of climate change is not just the responsibility of the management or dedicated unit. Nanya hopes that all employees can be part of the effort too. Orientation training for new employees include courses on “Introduction to GHG Inventory and Carbon Footprint”, “Introduction to Green Product Management System and RBA,” and "Introduction to the Sustainability of Nanya" to provide employees with a basic knowledge of climate change topics and company actions. This will help employees take climate change into account in their work.

At the same time, the company irregularly organizes workshops and internal training courses related to nature and climate, or offers courses such as "Energy-saving Design of Equipment and Greenhouse Gas Reduction Solutions" and "Industrial Technology Development in Global ESG Trends" to meet the needs of employees. The courses provide employees with the latest industry information. The Company also organizes educational activities in coordination with environment-related holidays, such as "Eco-Quiz" organized in response to Earth Day, which promotes climate change-related issues within the Company for four consecutive weeks and promotes various climate change-related terms, information and knowledge, ranging from extreme climate, climate neutrality, greenhouse gases, to net zero emissions. Employees were encouraged to take the online quiz, and a total of 133 employees received perfect scores in the activity.

The Company updates employees on the latest business accomplishments through press releases and e-newsletters as well. These let employees take pride in the Company's performance and encourage them to play a party in mitigating or take an interest in nature and climate-related topics.

2. Value chain level

- Supply chain

In order to respond to trends in corporate sustainability, raise sustainability awareness in the supply chain, and expand our influence to the entire product value chain, the Nanya has held the “Sustainable Supply Chain Seminar” for four consecutive years starting in 2020, and invited experts, scholars, and key suppliers to engage in exchanges on the latest corporate sustainability topics that year. Nanya's sustainable supply chain management strategy was promoted during the seminar, and issues of concern were shared with suppliers. Suppliers shared their implementation of sustainability issues for other suppliers attending the event to learn from each other, working together for mutual benefit. In 2023, experts and scholars were invited to share insights on TNFD trends, formally integrating natural issues into supply chain sustainability management.

Year	Highlights of the seminar
2023	The ESG development trend of net zero, digital carbon management and carbon reduction hotspot analysis technology, why nature and biodiversity are important - TNFD trend analysis, and direction for future supply chain cooperation on nature and climate-related issues
2022	Sustainability trends in the semiconductor industry, Nanya's inclusive supply chain planning, supplier one-carbon products, and circular economy results sharing
2021	Sharing of sustainable supply chain trends, Nanya's sustainable supply chain strategy, renewable energy planning of suppliers, and the outcomes of the foreign worker human rights project
2020	Sharing of sustainable supply chain trends, energy conservation accomplishments, new energy technologies

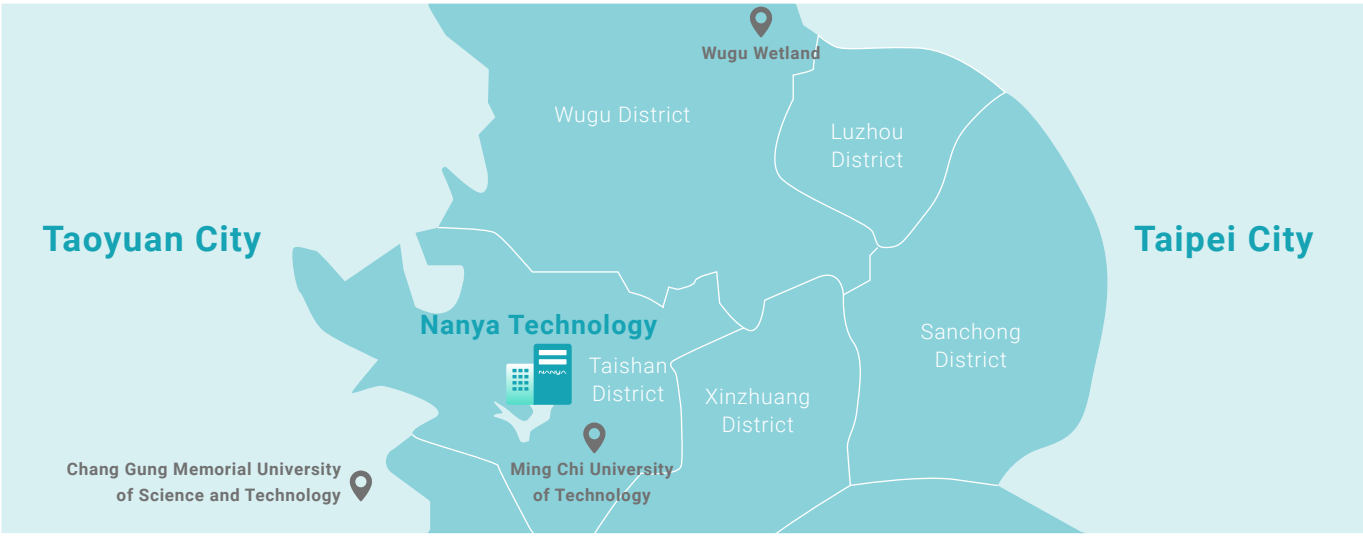
- Investors

Following the rising awareness of sustainable finance, investors not only attach importance to business performance, but also expect companies to disclose complete, transparent, and up-to-date ESG sustainability information, showing the impact of sustainability issues on company operations to evaluate the company's long-term value and sustainability. Nanya actively engages investors through three major channels: "sustainability and finance-related information disclosure, long-term two-way communication, and active participation in sustainability evaluations." In terms of sustainability and finance-related information disclosures, besides issuing annual sustainability reports, Nanya issued the first TCFD Report in 2021. This year, we included environmental issues, such as biodiversity, to explain the financial impact of climate change and biodiversity issues on our operations through the identification of risks and opportunities, and also described our management strategies in response.

We also engage in two-way communication with investors through multiple channels. In addition to organizing quarterly investor conferences to explain the Company's operating results and sustainability performance, we also irregularly participate in investor forums to learn about external investors' expectations for the Company's sustainable development. We communicate sustainability information with investors through press releases, ESG newsletters, Facebook, and YouTube.

We actively participate in domestic and overseas ESG sustainability evaluations and initiatives, such as: DJSI, CDP, MSCI, and SBTi, and use third-party evaluation channels to quantify the Company's ESG performance and provide investors with more objective and credible reference indicators. We use the evaluations to review our sustainability system, and adjust sustainable development strategies and goals in response to international trends, which enhance the Company's sustainable resilience.

Neighbors that share nature



Nanya is located in the shallow mountains of Taishan District, New Taipei City, and shares the natural environment with Ming Chi University of Technology. Starting from 2022, Nanya and Ming Chi University of Technology jointly offer "Design Thinking," a required course for freshmen. In the creative integration stage of the design thinking course, the course leads students to explore how to improve environmental issues (climate change, carbon emissions, water resources, etc.) and prepare a report to share the results. The theme in 2023 was "Climate Change," and nearly a thousand students were taught for a total of 128 hours. We combined the results of industry-academia collaboration with Ming Chi University of Technology in environment and humanities, covering projects such as Design Thinking, Taishan Renaissance, Creative Art Co-creation, and held the "CSR x USR Special Exhibition on Industry-Academia Collaboration" in the Company, working together with the school to implant the DNA of sustainability education into the hearts of Company employees and visitors. The two-week special exhibition saw about 200 visitors. Apart from the exhibition, in 2023, the Company participated in the "Ecological Annual Report" published by Ming Chi University of Technology every year, and shared ecological protection and education achievements together with 15 organizations, including campuses and water inspection teams in surrounding areas.

During the "2023 Formosa Plastics Group Special Exhibition on Mutual Benefit with the Environment and Sustainability" held in the Formosa Plastics Group Museum in Chang Gung University, Nanya used "Action" as the core concept for showing how the Company gradually "greens" the life cycle of chip products, and the process of realizing a circular economy. We hope to lead the visitors on a journey of chip sustainability through the exhibition. For volunteers providing guided tours of the special exhibition to better understand the Company's sustainability strategies, we organized a visit in August for the museum's 35 volunteers to engage in sustainability exchanges at Nanya.

Climate and nature awareness requires long-term cultivation and accumulation. Nanya believes that linear cooperation in nature-related issues will gradually become more comprehensive through multiple communication methods, and connect all stakeholders to achieve the vision of mutual benefit with nature.

CSR X USR special exhibition implants the DNA of sustainability into the next generation

2023 Formosa Plastics Group Special Exhibition on Mutual Benefit with the Environment and Sustainability

Visit by volunteers of Formosa Plastics Group Museum

5.2 Working with Communities to Benefit Nature

The "Guidance on Engagement with Indigenous Peoples, Local Communities, and Affected Stakeholders" emphasizes that engagement with the stakeholders above is the key to assessing nature-related issues. Nanya places great emphasis on employees rights and has established its human rights policy and labor and ethics policy. The Company complies with relevant international human rights standards, including the behavioral guidelines of Responsible Business Alliance (RBA), Social Accountability 8000 Standard (SA8000), International Labour Organization (ILO),The Universal Declaration of Human Rights, The UN Guiding Principles on Business and Human Rights, General Data Protection Regulation (GDPR) and local government regulations, promoting human rights risk assessment and management in the value chain.

This chapter will focus on local community engagement projects in 2023, and divided into "ecology" and "humanities":

Ecology protection action

We uphold the spirit of "community harmony" and "environmental conservation," protect the environment we share with local communities, and actively participate in public affairs of neighboring communities. Access roads of Nanya's fab is an important road section to employees of Nanlin Technology Park and Nanya commuting from Taishan District. However, this road section is narrow and has high driving risk during peak hours. To improve the safety of road users, we covered and dredged the ditches in 2023, and organized routine mountain cleanup activities, calling on employees in the volunteer team to clean hiking trails and important road sections along mountainous areas, taking away garbage that does not belong to the beautiful mountains and forests. At the same time, the volunteers cleared the ditches of fallen leaves, maintaining smooth drainage, as well as the cleanliness and road safety in the mountains.

Besides commissioning a professional team to conduct ecological monitoring for ten years, Nanya also cooperated with the Society of Wilderness to conduct a "Species Survey" starting in 2023, inviting employees to learn about the natural ecology in the surrounding environment. The mobile app iNaturalist uses AI to identify animals and plants, and educates employees and their families to respect natural ecology, fostering the spirit of scientific survey among citizens. A total of 243 observation records were uploaded that day, covering 76 species. We contribute to biodiversity surveys through the establishment and accumulation of an ecological database for areas around Nanya.

Since Wugu Wetland is downstream of the river basin near Nanya, we have monitor the biodiversity in Wugu Wetland over the years. We began removing the world-class malignant weed - Mikania micrantha in Wugu Wetland in 2020. Mikania micrantha has been classified by the International Union for Conservation of Nature (IUCN) as one of the top 100 invasive species in the world. We removed Mikania micrantha from Wugu Wetland to maintain biodiversity and protect habitats, so that native species can continue to survive in the habitat without being harmed. This year, in addition to planning an event for volunteers and their families to remove Mikania micrantha, the president of Nanya directed the attention of 73 senior managers to the ecological environment of Wugu Wetland and the impact of invasive species on ecological damage. They took action to remove invasive species from Wugu Wetland to show concern for biodiversity, and removed a total of 184.3 kg of Mikania micrantha.

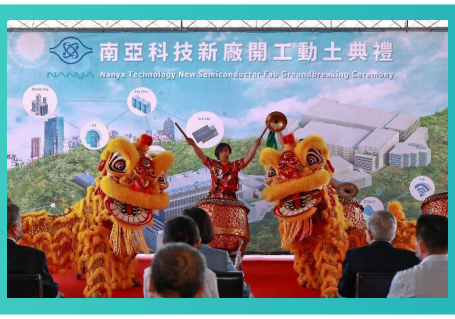
1. Volunteers and their families search for trash that does not belong in the mountains and forests to protect the environment and natural ecology
2. Mountain cleanup activities are organized every year to understand the Company's surrounding environment and keep it clean
3. Understand the surrounding environment of fabs through the iNaturalist app
4. Nanya's volunteer team works with the Society of Wilderness every year to remove Mikania micrantha from Wugu Wetland, maintaining biodiversity and protecting the wetland.

Taishan Renaissance

Taishan District has many precious local traditional cultures. In order to carry forward these cultures, we worked together with Ming Chi University of Technology in organizing various traditional events, and utilized the concept of regional revitalization to integrate new and old cultures, raising the sustainability awareness of local communities and their identification with this land. Nanya works with local art groups and organizations to organize a series of activities, such as "Taishan Renaissance" and "Taishan Lion Dance Culture Festival," through cultural education methods, guided tours, and various experiential activities, allowing the public to understand the heritage of local temples and places in Taishan starting with the most representative temple in Taishan District - "Taishan UpTemple." Nanya takes action to support Taishan's community empowerment and create new "memories" for precious local traditional "skills."

As an important cultural event in Taishan District, the "New Taipei City Taishan Lion Dance Culture Festival" organized by Taishan District Office and co-organized by Nanya every year. The event starts with the celebration of the birthday of "Master Xianying", the primary deity of Taishan UpTemple and Lower Taishan Temple (18th day of the 9th month of the lunar calendar). Since most temple celebrations have lion dance performances, it developed into the "Taishan Lion Championship." As the sacrificial event grew, the local cultural event became Taiwan's iconic lion dance competition "Taishan Lion Championship" in 2006, which has been held for 17 consecutive years. Nanya has sponsored and supported this local traditional event for five consecutive years. Furthermore, we also collaborated with Ming Chi University of Technology and culture and history organizations in organizing the Taishan Lion Workshop, which introduced employees to the traditional culture of Taishan District through handicraft.

Nanya will deepen its connection with the human rights of local communities. In addition to the activities above, we identified the high dependence of our operations on water through TNFD LEAP framework in 2023. Therefore, we incorporated water resource issues when planning future human rights engagement and the direction for raising nature and climate awareness, carrying out courses and project activities, and laying the basis for establishing a new platform for cooperating with communities.



5.3 Environmental compensation - Nature protection and restoration beyond the value chain

With the rise of TNFD issues and the global emphasis on biodiversity, how companies achieve net-zero emissions or net positive impact on nature through compensation mechanisms beyond the value chain has gradually become the key to promoting sustainability within companies. This will help to more extensively achieve the reduction of global GHG emissions by half in 2030, and provide more capital for climate and nature-related solutions, achieving the goal of systemic transition.

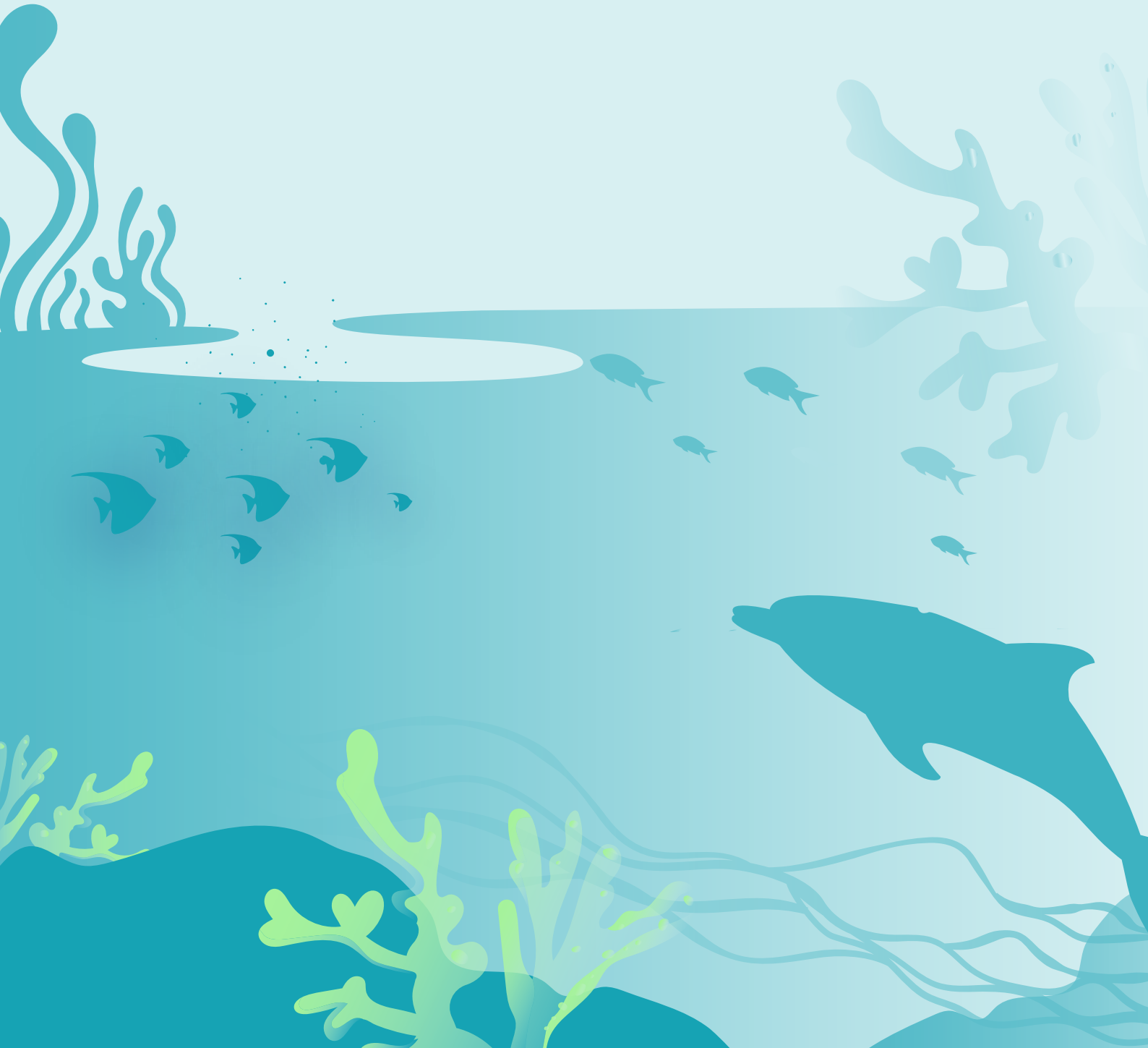
Nanya will refer to the guidelines recommended by the SBTi in Beyond Value Chain Mitigation (BVCM) in February 2024 and ISO 14068-1: 2023 Carbon Neutrality, and has begun planning projects related to high-quality carbon credit mechanisms and nature restoration.

- Continue to promote the goal of net zero emissions
- Improve environmental compensation plans outside the value chain
- Carry out environmental compensation actions outside the value chain
- Continuously disclose the performance of environmental compensation actions outside the value chain

In order to improve environmental compensation actions outside the value chain, Nanya continues to carry out its own net-zero carbon reduction actions, and will focus on the following two tasks to achieve its short-term goals:

- High quality carbon credits: Carbon credits are the last mile for companies to achieve net-zero emissions. Nanya has begun to formulate carbon credit-related guidelines, and has also begun to study the carbon credits guidelines established by leading companies such as Apple, Microsoft, and TSMC. Nanya will also reference international literature and regulations of various countries to establish screening criteria for Nanya to purchase carbon credits in the future.
- Nature restoration project: Nanya focuses on maintaining the natural environment and wild habitats around its operating locations. Since this topic is relatively new, the Company will cooperate with external experts and use long-term monitoring data as the basis for future restoration projects for the surrounding environment.

6 Metrics and Targets



06 Metrics and Targets

6.1 Setting Nature and Climate-related Indicators

Nanya Technology Corporation implements the management of risks and opportunities brought by climate change through five major strategies, including setting goals for developing low-carbon products, deploying green technology production, adapting to nature and climate change risks, working together with sustainability partners, and advocating and raising awareness of nature and climate. Due to the introduction of the LEAP methodology in 2023 in accordance with the TNFD principles (the data period is from January 1, 2023 to December 31, 2023), we are currently establishing a value chain risk assessment process and making rolling adjustments. We have begun to look into nature-related science-based targets. Even though we have already announced our biodiversity policy and included nature-related issues into sustainable governance, we aim to become aligned with the methodology of the Science Base Target Network (SBTN) and formulate specific long-term strategies for Nanya's environmental governance.

6.2 Table of Indicators and Goals

Goal achieved Goal not achieved

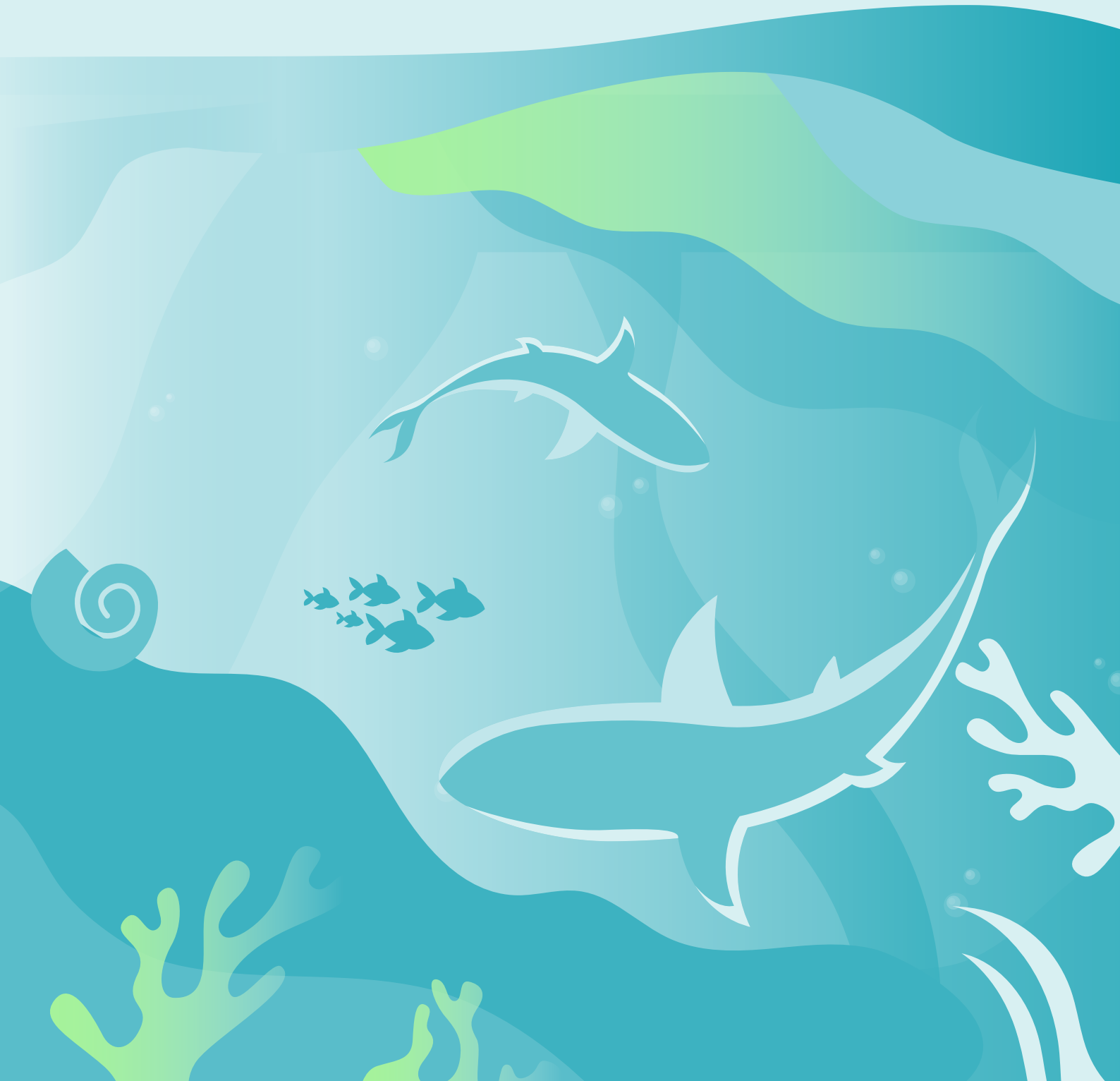
Issue	2023 Goals	2023 Performance	Target achievement status	2024 Goals	2025 Goals	2030 Goals
Focus on Development of Low-carbon Products	Second generation 10nm DRAM process 8Gb DDR4 products reach shipment verification standards	Completed the verification of the Second generation 10-nm DRAM process 8Gb DDR4 process and component technology reliability	Note1	Second generation 10-nm DRAM process 8Gb DDR4 products reach shipment verification standards	Third generation 10nm DRAM process and 16Gb DDR5 products reached standards for shipment	Fourth-generation 10nm DRAM process and 16G DDR6 product development. EUV and HKMG technology introduction.
	Complete design of second generation 10nm 16Gb DDR5 products and have pilot-run wafers outputs	Completed design of second generation 10nm 16Gb DDR5 products and had pilot-run wafers outputs		Second generation 10-nm 16Gb DDR5 products reach shipment verification standards		
Strategy for Green Technology and Production	Scope 1+2 GHG emissions in 2023 was reduced by 7.5% compared to 2020	Decreased 8.4%		Decreased 10.0%	Decreased 12.5 %	Decreased 25.0%
	Scope 3 GHG emissions per unit product in 2023 was reduced by 8.1% compared to 2020	Decreased 20.4 %		Decreased 10.8%	Decreased 13.5 %	Decreased 27 %
	Reduction rate of PFCs emissions during process reaches a minimum of 93%	Reduction rate reach 93%		≧ 93 %	≧ 93 %	≧ 93 %
	Cumulative energy saved with energy conservation measures from 2017 to 2023 reached 67,500 MWh (2.43x108 MJ).	68,565 MWh (2.47x108 MJ)		72,500 MWh (2.61x108 MJ)	≧ 75,000 MWh	≧ 103,000 MWh
	Annual renewable energy use reached 25,000 MWh (9x107 MJ)	24,490 MWh (8.8x107 MJ)	Note2	≧ 25,000MWh	≧ 45,000MWh	Renewable energy consumption of up to 25% of total electricity consumption

Issue	2023 Goals	2023 Performance	Target achievement status	2024 Goals	2025 Goals	2030 Goals
Adaptation to Nature and Climate Change Risks	Number of days production was suspended due to climate change disasters maintained at 0 days	Maintained at 0 days		Maintained at 0 days	Maintained at 0 days	Maintained at 0 days
	Accumulated water consumption per unit production capacity decreased >38.5% compared to 2017	Decreased 37.5 %	Note3	Decreased 38.5% for the year	Decreased 39 %	Decreased 40 %
	Other losses in production caused by restricted water supply: 0 wafer	0 wafer		0 wafer	0 wafer	0 wafer
Partners in Sustainability	Use of non-conflict minerals: 100%	100%		100%	100%	100%
	100% completion rate of deficiency improvements by suppliers with high sustainability risk in audits	100%		100%	100%	100%
	Implement at least 2 supplier sustainability guidance projectsNew	2 cases		2 cases	2 cases	3 cases
	Low-carbon carbon footprint inventory and carbon reduction project"	Proposed and approved by the Industrial Development Administration, Ministry of Economic Affairs		Jointly achieved carbon reduction of 6,300 metric tons together with 10 suppliers.		It will be adjusted on a rolling basis according to the cooperation project with the supply chain
Nature and climate-related issues and raising awareness	Climate change-related activities of all employees	Earth Hour		Earth Day 365	Earth Day 365	Earth Day 365
	Nature-related topic volunteer project	At least three projects (mountain cleanup, removal of Mikania micrantha, species survey)		At least three	At least five	At least five

Note 1: The second-generation 10nm DRAM process 8Gb DDR4 products were originally scheduled to meet shipping verification standards by the end of 2023, but the design is currently being improved due to functional integrity, yield and system compatibility issues, and the products are expected to meet product shipment verification standards in the second half of 2024.
Note 2: The power generation of the outsourced solar photovoltaic project site was lower than expected during the winter, and renewable energy use fell short of the target by 2%.
Note 3: Product production capacity in 2023 was approximately 8% lower compared to 2022, resulting in water consumption per unit capacity not reaching the target.

7 Nature and Climate Sustainability Outlook

64



07 Nature and Climate Sustainability Outlook

Nanya Technology Corporation implemented the TCFD framework in 2018, established a complete management cycle for climate change risks and opportunities, and formulated the strategies to "focus on development of low-carbon products," deploy green technology production," "adapt to nature and climate change risks," and "work together with sustainability partners." Nanya formulated related indicators and indicator management, and continues to increase climate resilience through energy management and water management.

Before TNFD released the official version of the guidelines in 2023, the Company established a method and process for identifying nature-related dependencies and impacts through cross-departmental workshops and questionnaire surveys, in order to implement the LEAP methodology internally. In addition to our own operations, we introduced identification methods for nature-related issues to suppliers of concern, and also conducted surveys on the relationship between suppliers' locations of operations and nature. As this version of the report is released, we will continue to optimize the risk assessment process and use the results of more than a decade of ecological monitoring surveys as a solid foundation for formulating Nanya's biodiversity strategies.

In response to the dependence on water resources and in line with the human rights engagement framework of concern to the TNFD, Nanya plans to jointly conduct a watershed survey with surrounding communities and schools in 2024. Besides monitoring, we also begun to carry out environmental education projects for water resources, in hopes of raising stakeholders' nature awareness.

Nanya used its experience with including climate issues into sustainability governance and announced the biodiversity policy in 2023 for nature-related issues, formally included it into matters of the Sustainable Development Committee under the Board of Directors. This report was prepared by Nanya using a systematic disclosure framework to communicate the efforts made by Nanya in managing nature and climate change issues to all stakeholders. Guided by the spirit of sustainability, Nanya is now partnering with the rest of society on net zero emissions so that we can become “the best DRAM partner” in the "smart generation" and "nature and climate generation."

8 Appendices

Appendices

Appendix 1-Table of TCFD & TNFD Indicators

TCFD Index

Aspect	Information Disclosed	Chapter index	Page
Governance	Describe the board of directors' oversight of climate-related risks and opportunities.	2.2	p8-9
		2.5, 2.6	p16-22
	Describe management's role in assessing and managing climate-related risks and opportunities.	2.2	p8, p10
		2.3	p11-14, p16-18, p21-22
Strategy	Describe the short, medium and long-term climate-related risks and opportunities identified by the organization.	3.1	p26-29
		2.2	p8-10
	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	3.1	p26-29
		6.1, 6.2	p61-62
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios (including 2˚C or stricter scenarios).	3.2	p30-33
		6.1, 6.2	p61-62
Risk Management	Describe the organization's processes for identifying and assessing climate-related risks.	2.5, 2.6	p16-22
		6.1, 6.2	p61-62
	Describe the organization's processes for managing climate-related risks.	2.3	p11-14, p16-18, p21-22
	Describe processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management system.	2.2	p8-10
Metrics and Targets	Disclose the metrics and targets used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	6.1, 6.2	p61-62
	Disclose Scope 1, Scope 2, and if appropriate, Scope 3 GHG emissions, and related risks.	4.2	p45, p46
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance of those targets.	4.2, 6.1	p45, p46, p60

TNFD Index

TNFD		This Report	
Aspect	Information Disclosed	Chapter	Page
Governance	Describe the board of directors' oversight of nature-related dependencies, impacts, risks and opportunities	2.2	p8, p10
	Describe the role of management in assessing and managing nature-related dependencies, impacts, risks and opportunities.	2.2	p9, p10
	Describe the organization's human rights policy and participation in activities when assessing and responding to nature-related dependencies, impacts, and risks, as well as the board of directors and management's oversight and opportunities for indigenous peoples, local communities, affected persons, and other stakeholders.	2.2, 2.3, 2.4, 5.1, 5.2, 5.3	p10
Strategy	Describe the short, medium and long term nature-related dependencies, impacts, risks and opportunities identified by the organization.	3.1	p26-29
	Describe the impact of nature-related dependencies, impacts, risks and opportunities on the organization's business model, value chain, strategic and financial planning, and any transition plans or analysis.	2.7, 3.2, 4.1, 4.2	p23-24
	Consider different situations and describe the adaptability of the organization's strategies to nature-related risks and opportunities.	3.2	p30-33
	Disclose the location of assets and/or activities within the organization's direct operations and, where possible, upstream and downstream of the value chain that meet the criteria for priority locations.	2.4	p12, p15
Risk Management	• Describe the organization's process for identifying, assessing, and prioritizing nature-related dependencies, impacts, risks, and opportunities within its direct operations. • Describe the organization's process for identifying, assessing and prioritizing nature-related dependencies, impacts, risks and opportunities across the upstream and downstream of its value chain	2.5, 2.6	p16-22
	Describe the organization's process for monitoring nature-related dependencies, impacts, risks, and opportunities	2.3	p11-14, p16-18, p21-22
	Describe how the process of identifying, assessing, prioritizing, and monitoring nature-related risks is integrated into and provides information for the organization's overall risk management process.	2.2	p8-10
Metrics and Targets	Disclose the metrics used by the organization to assess and manage nature-related risks and opportunities in accordance with its strategy and risk management processes.	6.1, 6.2	p61-62
	Disclose the metrics used by the organization to assess and manage its nature-related dependencies and impacts	6.1, 6.2	p61-62
	Describe the organization's targets for managing nature-related dependencies, impacts, risks, and opportunities and its performance in these targets	6.1, 6.2	p61-62

Appendix 2-GRI Index

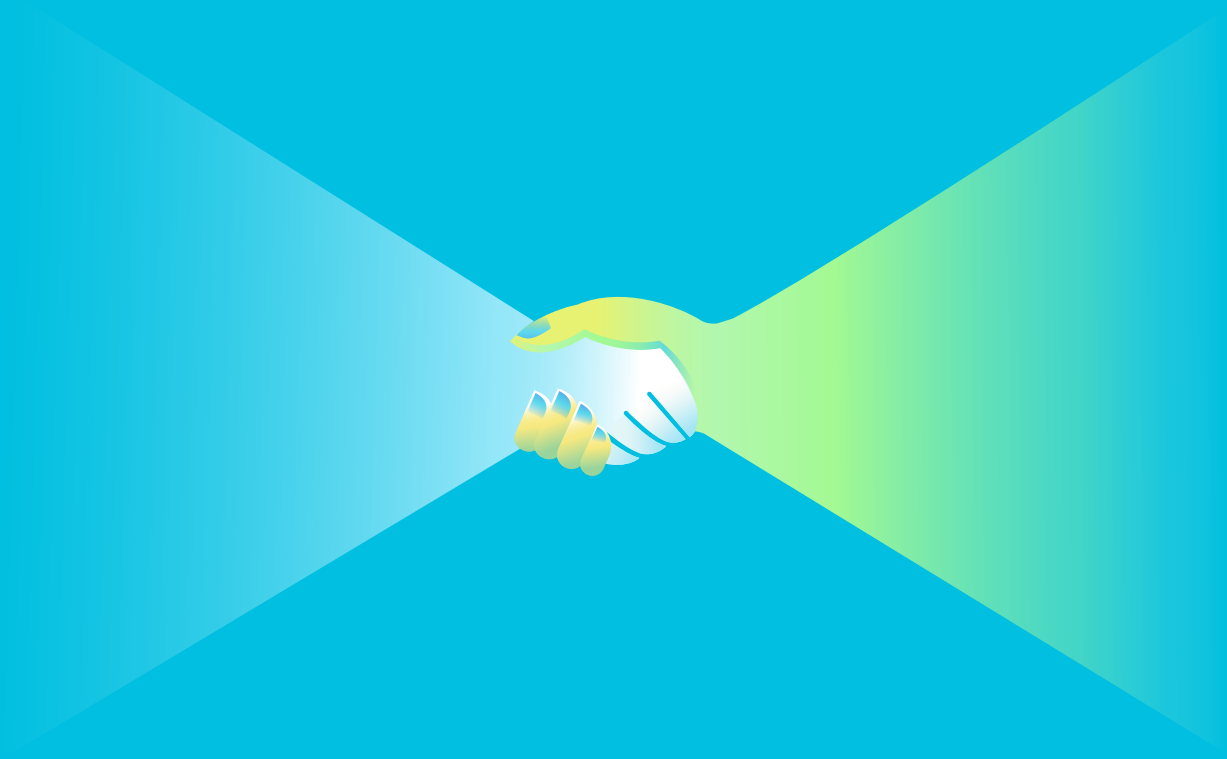
GRI 101 Biodiversity 2024 Index

Aspect	Information Disclosed	Chapter	Page
Topic management disclosure	Disclosure 101-1 Policies to halt and reverse biodiversity loss	1.1, 2.2, 4.2	p04
	Disclosure 101-2 Management of biodiversity impacts	2.4, 4.2	p04
	Disclosure 101-3 Biodiversity access and benefit	N/A	N/A
Topic disclosure	Disclosure 101-4 Identification of biodiversity impact	2.4	p13
	Disclosure 101-5 Locations with biodiversity impact	2.4	p13
	Disclosure 101-6 Drivers of biodiversity loss	2.5	p19
	Disclosure 101-7 Changes in biodiversity status	Nanya's new fab was reconstructed from an existing fab and does not directly change the local ecosystem	p49
	Disclosure 101-8 Ecosystem services	2.3	p14, p16-18

Appendix 3-References

This report was written after referencing a number of external documents, including:

- Richardson, K., Steffen, W., Lucht, W., Bendtsen, J., Cornell, S. E., Donges, J. F., ... & Rockström, J. (2023). Earth beyond six of nine planetary boundaries. Science advances, 9(37), eadh2458.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., ... & Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. Science, 347(6223), 1259855.
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., ... & Foley, J. A. (2009). A safe operating space for humanity. nature, 461(7263), 472-475.
- Taskforce on Nature-related Financial Disclosure. (2024) https://tnfd.global/
- Science based targets network. (2024) https://sciencebasedtargetsnetwork.org/



NANYA

No. 98, Nanlin Rd., Taishan Dist, New Taipei City 243, Taiwan (R.O.C.)

Tel: +886-2-2904-5858