

2018 CSR ECO-FRIENDLY DRAM PROVIDER REPORT

NANYA



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MESSAGE FROM THE PRESIDENT

Photo by CAITA 蔡世豪

Thanks to the great effort from our colleagues and the great support from our customers, suppliers, shareholders, and communities. Nanya Technology Corporation (NTC) has been profitable for six consecutive years through fluctuating DRAM market cycles. In our effort toward Corporate Social Responsibility (CSR), NTC is the only memory (DRAM) company in Taiwan to be included in the Dow Jones Sustainability Emerging Markets Index(DJSI) while obtaining A- rating in Carbon Disclosure Project's(CDP) Climate Change Evaluation. For the last two years, NTC has received up to 17 various of awards and recognition for CSR related qualification or competitions. We should be proud of being recognized as one of the best world class CSR company.

To further enhance our competitiveness in DRAM industry, our managers have jointly defined 2019 keyword as "Innovation", to emphasize NTC's strategic goal on pursuing the 20nm and 10nm generation technology, and to lay the foundation for advanced manufacturing and self-development. NTC has successfully play a key role in propelling DRAM as a critical electronic component driving our societies towards the smart era, widely applied to diverse areas of smart city, smart home, smart office, unmanned vehicles, internet of things (IoT), cloud, 4G/5G communication and artificial intelligence (AI).

In the implementation of CSR development, we have developed low energy consumption DRAM products, so our customers can reduce the energy consumption and carbon emissions. In 2018, over 60% of the NTC's products are built to be low energy consumption, assisting consumers save electricity of 701.02 million kWh and reducing carbon dioxide emissions of 388,368 tons.

Following the guidance from The United Nations' Sustainable Development Goals (SDGs) we are determined to make contribution in society responsibility beyond pursuing profits. We have defined six major goals targeting CSR achievements, which are: 1) Be a trustworthy company, 2) Be the best memory partner for our customers, 3) Be a promoter of shared value, 4) Be a producer of green technology, 5) Be an attractive employer for professional talent, and 6) Be an active participant in community and social welfare. We have also formulated NTC's 2021 sustainability vision, setting long-term goals, and reviewed the goals year after year. We are striving to reach the targets on economic, environmental and social dimensions.

NTC has taken great initiative as an industry leader in corporate sustainability. In addition to DJSI and CDP recognition, we have been selected as FTSE4Good Index Series, recognized as "Top 100 Global Technology Leaders" by Thomson Reuters, and awarded "Top 50 Corporate Sustainability" and "Corporate Sustainability Report Gold Award" by Taiwan Institute for Sustainable Energy(TAISE). Moreover, NTC has obtained Gold Certificate of "Talent Quality-management System (TTQC)," and won the "Distinguished Enterprise Innovation Award" in the 2019 National Industrial Innovation Award

held by the Ministry of Economic Affairs of Taiwan.

In recent years, many concerns have been raised on the extreme climate abnormalities, frequent disasters, the global economy slowdown, and talent lost due to unfair competitions. We have been building resilient organizational structures in response to global risks and challenges. In regard to the climate risk, NTC introduces ISO 50001 Energy Management System, ISO 14001 Environmental Management System, and ISO 14064 Greenhouse Gas Inventory. We also take the potential climate risk into consideration and have formulated response handling mechanisms.

Employees are the most important asset of the company and the key to sustainable development. We have comprehensive training programs and promotion system for employees, so that employees can get appropriate career development based on their attributes and expertise in managerial, technical, or professional fields. We treasure our talent so we have various programs and incentive measures as well as create a good working environment and job security. Meanwhile, we advocate the importance of work-life balance and encourage employees to take regular exercise by building a multi-use sports center in the company headquarters. We are determined to build up trust and common goal between our employees and the company, and to reduce talent lost due to unfair competitions.

We have diligently strived for corporate social responsibilities to drive positive change for our society and communities. We cultivate young people by internship programs and industry-academia cooperation. As to the protection of environment, we provide environment protecting resources and knowledge of energy-conservation and ecology by collaborating with non-profit organizations. We stimulate arts and culture by combining local arts and charitable organizations. We have become closer and closer to the community over the past year and integrated the company's resources with employee initiative in volunteer work to advocate hope and mutual benefit.

NTC is committed to be the best memory partner for smart world generations. Upholding the four core values of innovation, integrity, accountability, and efficiency. NTC collaborates with the stakeholders, including customers, suppliers and partners, to internalize the value of corporate social responsibility, and well organized to implement actions in our operation to make contribution in improving society welfare.

President Pei-Ing Lee
2019/04



PERFORMANCE HIGHLIGHTS

A Trustworthy Company**0** Cases of
Material Violations**NT\$84.72** Billion

Record-Breaking Consolidated Revenue

NT\$12.8 EPS

Profits for Six Consecutive Years

**The Best Memory Partner for
Our Customers****8Gb DDR4**First completed self-developed
8Gb DDR4 in Taiwan**5,056** Trade Secrets

Reaching Record High

1,451 Patents

Awarded in the Past Three Years

A Promoter of Shared Value**NT\$122.5** Billion inValue Created with
Industrial Chain Procurement**100%**Completion Rate of Supplier Assurance
Questionnaire/Quality Audit
Improvement Rate**100%**Supplier Sustainability Audit Ratio in
the Past Three Years**A Producer of Green Technology****100%**Completion Rate of Life-Cycle
Assessment (LCA) for Products**701.02** Million kWh ofElectricity Saved
Over 60% of Our Products Possess
Low Energy Consumption**97.9%**

Waste Recycling Rate

**An Attractive Employer for
Professional Talents****2,559**Employees (80%)
Participate in Stock Option Plans**85%**of Employees
Participated in Employee
Engagement Survey**100%**Completion Rate of Structured
on-the-Job Training (SOJT)**An Active Participant in Community
and Social Welfare****10**Times growth of
Social Participation Input in 2018
(Base Year: 2016)**7,423**Person-time
Employees participated in
Charity Events**1st**

Participation in Earth Hour

RECOGNITION AND AWARDS



MEMBER OF
**Dow Jones
Sustainability Indices**

In Collaboration with RobecoSAM

Membership in the Dow Jones
Sustainability Emerging
Markets Index



RobecoSAM Sustainability
Award- Bronze Class



Climate Change Scoring
Level: Leadership



Selected as FTSE4Good Emerging
Index component
Selected as FTSE4Good TIP Taiwan
ESG Index component



Selected as component
of MSCI ESG Index



"TOP 50 Taiwan Sustainable
Corporates" "Corporate
Sustainability Report Gold Award"



Constituent of Taiwan High
Compensation 100 Index
Constituent of Taiwan Employment
Creation 99 Index



Responsible Business
Alliance Certification



Gold Medal Certification in the
Talent Quality-management
System (TTQS)



"Top 100 Global Technology
Leaders" by Thomson Reuters
in 2018



Healthy Workplace Certification



Ranked First in Business
Performance in TOP5000 by China
Credit Information Service, Ltd.



"National Industrial Innovation
Award" by the Ministry of
Economic Affairs in 2019



Top 5% in the Fourth Corporate
Governance Evaluation of
Listed Companies



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Operation and Governance



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Company Overview

Nanya Technology Corporation ("NTC") is dedicated to the research, development, design, manufacture, marketing and sales of Dynamic Random Access Memory (DRAM). NTC serves the market through sales offices in the United States, Europe, Japan, China and Taiwan, with manufacturing and development facilities located in Nanling Technology Park, Taishan District, New Taipei City. The Company employed 3,200-plus headcounts, and awarded over 3,700 patents.

NTC is focused on research, development and manufacturing of memory products while establishing intellectual property and cultivating a strong development team. DRAM plays a key role that enables many smart devices which can be applied in cities, homes, offices, cars, the internet of things, the cloud and artificial intelligence. For the next generation of manufacturing development, NTC has 1X/1Y nanometer licensing rights from Micron, as the company continues to self develop 10nm-class process technology.

As a world class DRAM solution provider NTC is continuously optimizing its product portfolio to enhance product value and provide solutions to customers. The recently deployed DDR4 product line will provide leading edge solutions to the consumer and server market. Additionally, NTC will launch a series of low-power products such as LPDDR4X and other mainstream products focused on smart phones, wearable devices, smart speakers, low-power laptops, and high-speed SSD applications, and aim to be one of the Best DRAM Provider for Smart World.

The DRAM industry consolidation lead to an oligopoly market structure since 2013, where NTC undergone a business transformation resulted in financial performance improvement. NTC has delivered six consecutive years of profitability. In 2018, NTC delivered record-setting revenue of NT\$84.72 billion, net profits of NT\$39.4 billion and earnings per share (EPS) of NT\$12.80.

NTC has committed to enhance corporate governance; to comply with regulations; to create value for shareholders; to take care our employees; to actively participate in social welfare; and to promote green technology and environmental sustainability. NTC's success in these areas has been well recognized. NTC was selected to the "2018 DJSI Emerging Markets Index", ranked second among 78 semiconductor companies in the world and was recognized as "Top 100 Global Technology Leader" by Thomson Reuters. Along with the distinction of "Top 50 Corporate Sustainability" NTC was given the "Golden Award on Corporate Sustainability Report" by the Taiwan Corporate Sustainability Award. And was classified as one of the "Top 5% in Corporate Governance 4th Evaluation" by Taiwan Stock Exchange. The company garnered further recognition in receiving the Golden Certificate of "Talent Quality-management System (TTQS)" Enterprise Version from the Ministry of Labor. These important milestones symbolize NTC's commitment to corporate sustainability responsibility.



► Company locations (including overseas branch offices)



NTC Global Sales Regions:

United States, Europe, Japan, China, Taiwan, and Asia-Pacific Region

● 12-inch Wafer Fabrication Plant ● Sales Office & FAE ● Design Center

Participation in External Associations

The company actively participates in external activities related to its core business and sustainable development, and has formulated the NTC Public Affairs Participation Guidelines. Policy formulation of all participation in related industries and participation in industrial labor unions or chambers of commerce are executed in accordance with the Guidelines. Moreover, the Public Affairs Participation Group has been set up under the Sustainable Development Committee to assess and review the decisions of public affairs participation to ensure the company's rights and interests as well as responsibilities.

► Associations NTC Participates

Unit	2017 Annual Fees (NT\$)	2018 Annual Fees (NT\$)	Role
Taiwan Semiconductor Industry Association (TSIA)	NT\$ 320,000	NT\$ 320,000	Director
Taiwan IC Industry & Academia Research Alliance (TIARA)	NT\$ 100,000	NT\$ 100,000	Member
Taiwan IC Industry & Academia Research Alliance (TIARA)	—	NT\$ 280,000	Director

Major Products and Operation Performance

NTC Product Line-up

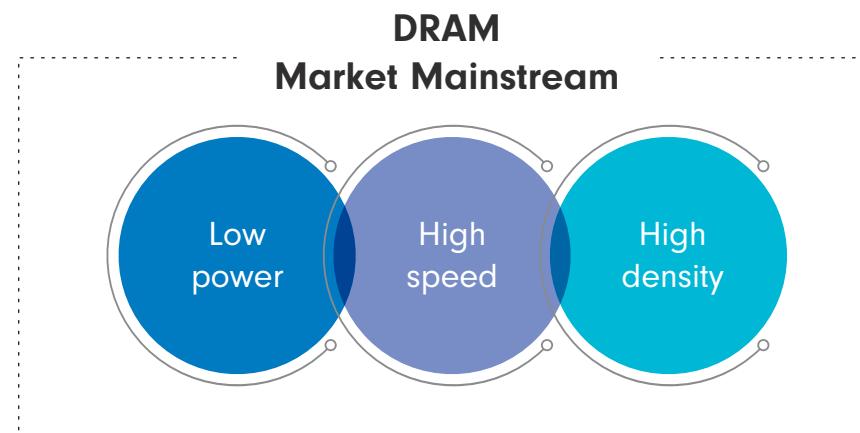
Nanya Technology Corporation (NTC) is a key player in specialty DRAM business, carrying products from consumer DRAM, mobile DRAM, automotive / industrial-grade DRAM, and customized DRAM. To enhance its R&D capability and cost competitiveness, NTC continues the efforts to deliver next generation products to stay competitive in the DRAM mainstream markets. 20nm-based products began mass production in the later part of 2017, shipping in 2018, and will enlarge the 20nm ratio over the product mix in 2019.

Market Overview

Worldwide top three DRAM suppliers are Samsung, SK hynix, and Micron Group, taking over the majority of market share in 2018, while NTC stably held around 3%. Other than the mainstream PC market highly competitive to the DRAM top three players, NTC also roots in the niche market for demands from consumer electronics, automotive / industrial-grade products to diversify its business operation.

Looking into the DRAM market in 2019, DRAMeXchange, a specialized DRAM research institute, estimates DRAM supply and demand year-on-year (yoY) bit growth close to 19.0% and 16.2% separately. The demand is powered by the Artificial Intelligence (AI)

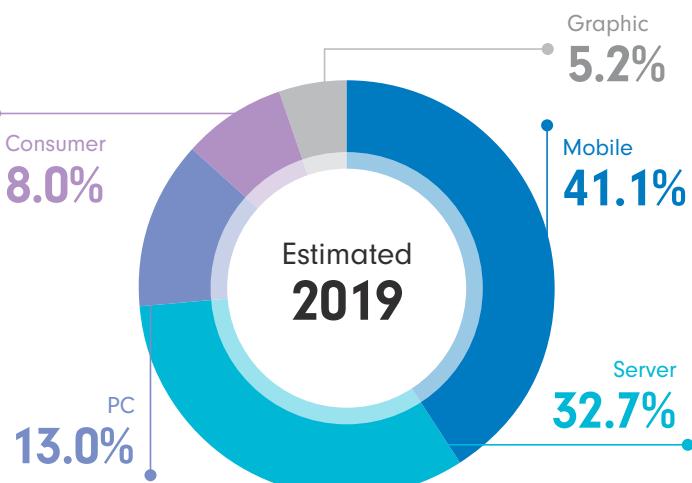
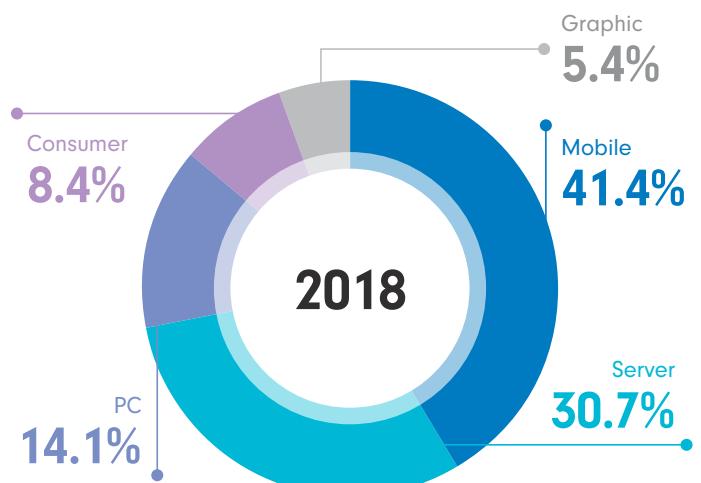
boom to grow steadily in server segment. As regard to smartphone segment, DRAM demand benefits from the content increase as phone brand makers push up the spec in flagship models. On top of the above factors, the uncertainty of macroeconomy suffers demand in the way like the trade conflicts between US and China. It is expected that the impact will minimize after the trade conflicts are closed within the year and the demand will resume as soon as 5G takes off in the near future.



► DRAM Application Trend

 Mobile Device	<ul style="list-style-type: none"> Smartphone market is gradually saturated after the rapid shipment growth in the past years. Most smartphones are similar in features such as AI and multi-lens in 2019. The lack of spec differentiation among brands discourages consumers for new device purchases. Accordingly, the phone replacement cycle is extended till 5G commercialization actualized in 2020. Given the above market conditions, smartphone shipment is estimated to remain weak in 2019. Smartphone offers 10~12GB/ per set in flagship models of 2019. This is positive to drive up DRAM content in mid to low end smartphones. With that, the demand will rely on DRAM content growth in 2019.
 Server	<ul style="list-style-type: none"> The boom of cloud computing and internet of things (IoT) creates stable server demand from North America and China CSPs, which makes DRAM growth in parallel. It is expected that next replacement cycle will come with the new server CPU launch in the second quarter of 2019. In the longer term, the new opportunity of server shipment expansion will emerge as telecom operators begin the build of 5G infrastructure.
 Personal Computer	<ul style="list-style-type: none"> PC demand is hampered by the CPU shortage issue. The issue was highlighted since the fourth quarter of 2018. Yet, the timeline to resume normal supply is pushed out to the third quarter of 2019.
 Consumer Electronics	<ul style="list-style-type: none"> Set-top box, smart speaker, Solid state drive (SSD), IP CAM, and wearable devices (smart watch & smart glass) bolster the annual shipment of 2019. DRAM demand continues to move upward due to the content per box grows steadily across most of the applications.

Major Applications of DRAM Market



Note:

- Consumer electronics include TV, STB, networking, storage device(HDD/SSD) etc.
- PC include desktop, notebook, upgrade module
- Mobile Devices include mobile Phone, tablet

(Source: DRAMeXchange, 2019 March)

Business Development

Short-term Goal	1 Focus on consumer and mobile applications as the major markets	Long-term Goal	1 Keep the continuous migration to advanced process nodes, and provide customers a complete choice of DRAM types and densities
2 Grow in server market by tight cooperation with key customers		2 Prioritize consumer, mobile and server markets as the major market domain	
3 Keep the completion of product line-ups by offering low, middle, and high density DRAM for customers' choices		3 Extend services to versatile packages from DRAM discrete, KGD (known good die), and MCP (multi-chip packages). Additional, offer automotive/ industrial-grade products and customization to add NTC's product values and to strengthen competitiveness to its peers	

Operating Performance

NTC's consolidated revenue amounted to NT\$ 84.72 billion in 2018, an approximately 54% increase over NT\$ 54.92 billion in 2017 and representing a record high. Net income after tax was NT\$ 39.36 billion for 2018, and earnings per share (EPS) reached NT\$ 12.80. The excellent performance was mainly due to increased selling prices and our migration to 20nm process technology, which increased the bit shipments.

In the first half of 2018, the market average selling prices (ASP) increased due to tight supply in the overall DRAM market while in the third quarter, the ASP remained stable. However, in the fourth quarter, end demand slowed down owing to the adjustments of tariffs and supply chains caused by US-China trade disputes, and the shortage of Intel's central processing units (CPU), resulting in a decrease in market ASP. Overall, ASP in 2018 still grew by about 15% compared with that in the previous year. In addition, thanks to constant improvements in yields of 20nm process technology and increases in wafer starts, the bit outputs were increasing quarter by quarter in 2018. The bit shipments also grew by approximately 35% compared with those in the previous year, so NTC delivered record-setting revenue in 2018.

In 2018, the bit outputs significantly grew, resulting in a decrease in the average unit

Description: The financial statistics used to represent operating performance are adopted from the consolidated financial statements, audited and verified by certified public accountants. For the subsidiaries included in the consolidated financial statements, please refer to NTC's official website, page 16 of the 2018 Consolidated Financial Report <http://www.nanya.com/en/IR/39/>.

cost compared with that in the previous year. The Increase in ASP and decrease in bit unit cost drove the gross margin up to 55% in 2018, an improvement over 45% in the previous year. Moreover, the operating profit amounted to NT\$ 39.36 billion in 2018 and also achieved a record high.

In terms of optimizing product portfolios, the Company increased product ASP by promoting high premium 8Gb DDR4 to commodity applications with huge volume shipments in 2018. Simultaneously, the product was also introduced to data center applications and qualified by tier one customers then small volume shipments in the fourth quarter.

The cash dividend per share increased from NT\$ 3.5 for 2017 to NT\$ 7.09 to 7.15 for 2018 (*1). This increase reflected the company's continuous growth. In the future, we will continue our efforts to maintain a stable dividend policy.

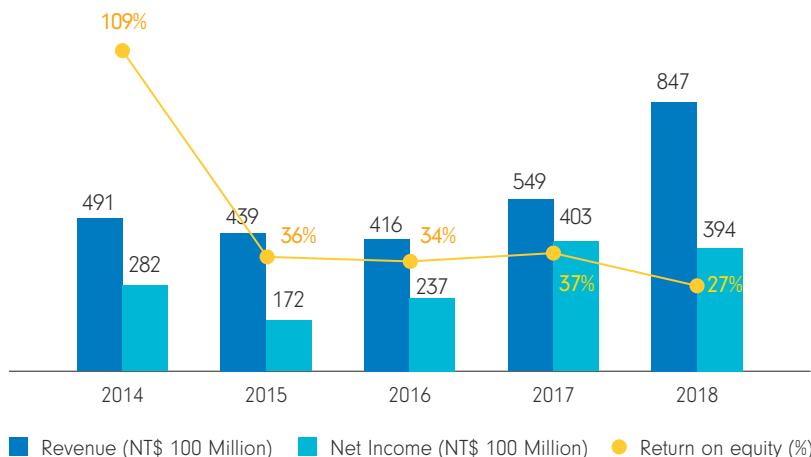


*1:If before the record date, the total outstanding shares increase because the company's employees exercise their employee stock option rights, the final cash dividend per share will need to be adjusted accordingly.

► Financial Performance During the Last Three Years

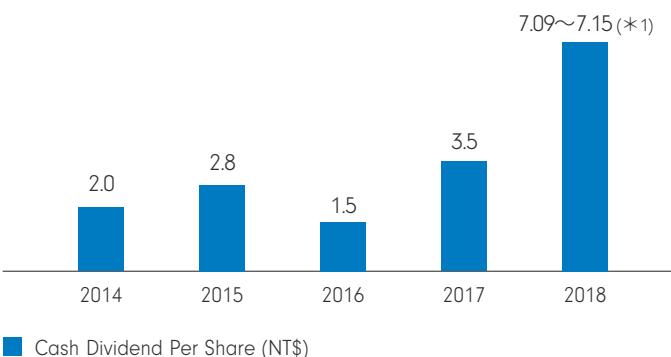
	2018	2017	2016	Unit	Note
Market Value	1,706.8	2,258.5	1,327.6	NT\$ 100 Million	Calculation based on the stock price at the end of each year
Revenue	84,722	54,918	41,633	NT\$ Million	
Net Operation Income	39,355	18,791	8,552	NT\$ Million	
Return on Equity	26.5	37.0	33.8	%	
Cash Dividend	21,700	10,879	4,123	NT\$ Million	Disclosure according to the attribution year of dividends; dividends are to be distributed in the next year
Cash Dividend Per Share	7.09~7.15 (*1)	3.5	1.5	NT\$	
Employee Welfare Expense	6,863	5,943	4,423	NT\$ Million	

► Financial Performance



Note: NTC has made profits in the past 6 years. The total equity increased year after year from NT\$ 10 billion at the end of 2013 to NT\$ 164.9 billion at the end of 2018, leading to a decrease in the return on equity.

► Cash Dividend

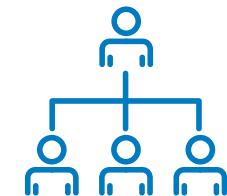


*1: If before the record date, the total outstanding shares increase because the company's employees exercise their employee stock option rights, the final cash dividend per share will need to be adjusted accordingly.

► Shareholding Structure

As of April 1, 2019

Shareholder Structure Shareholding	Government Agencies	Financial Institutions	Other Legal Persons	Individuals	Foreign Institutions and Foreigners	Total
Number of Shares Held (Share)	17,807,278	56,128,326	1,997,798,988	355,354,852	626,415,450	3,053,504,894
Shareholding Ratio (%)	0.58	1.84	65.43	11.64	20.51	100



Tax Policy and Information

NTC endorses tax policies that encourage innovation and sustainable operation. Our tax policies aim to control tax risks, pursue sustainable development, and fulfill the corporate social responsibility.

NTC Tax Policy

- 1** Full compliance with all applicable tax laws and regulations.
- 2** Disclosures in financial reports are made in accordance with applicable regulations and reporting requirements.
- 3** Forbid transactions solely conducted for tax avoidance.
- 4** Forbid transferring value to low tax jurisdictions through transfer pricing.
- 5** Forbid the use of secrecy jurisdictions.
- 6** Develop relationships of mutual trust and respect with tax authorities through sufficient communication and good faith.

► Tax Information in the Past Three Years

	2018	2017	2016
Net profit before tax	41,584	41,831	25,726
Consolidated income tax expense	2,223	1,536	1,997
Consolidated income tax rate	5.35%	3.67%	7.76%

Note: Quantities audited and verified by certified public accountants

► 2018 Income Tax Expense by Country

Country	Income Tax Expense (NT\$ Million)	%
Taiwan	2,204	99.15
U.S.	17	0.76
Germany	2	0.09
Total	2,223	100.00

02

Corporate Sustainability



19 Governance and Organization

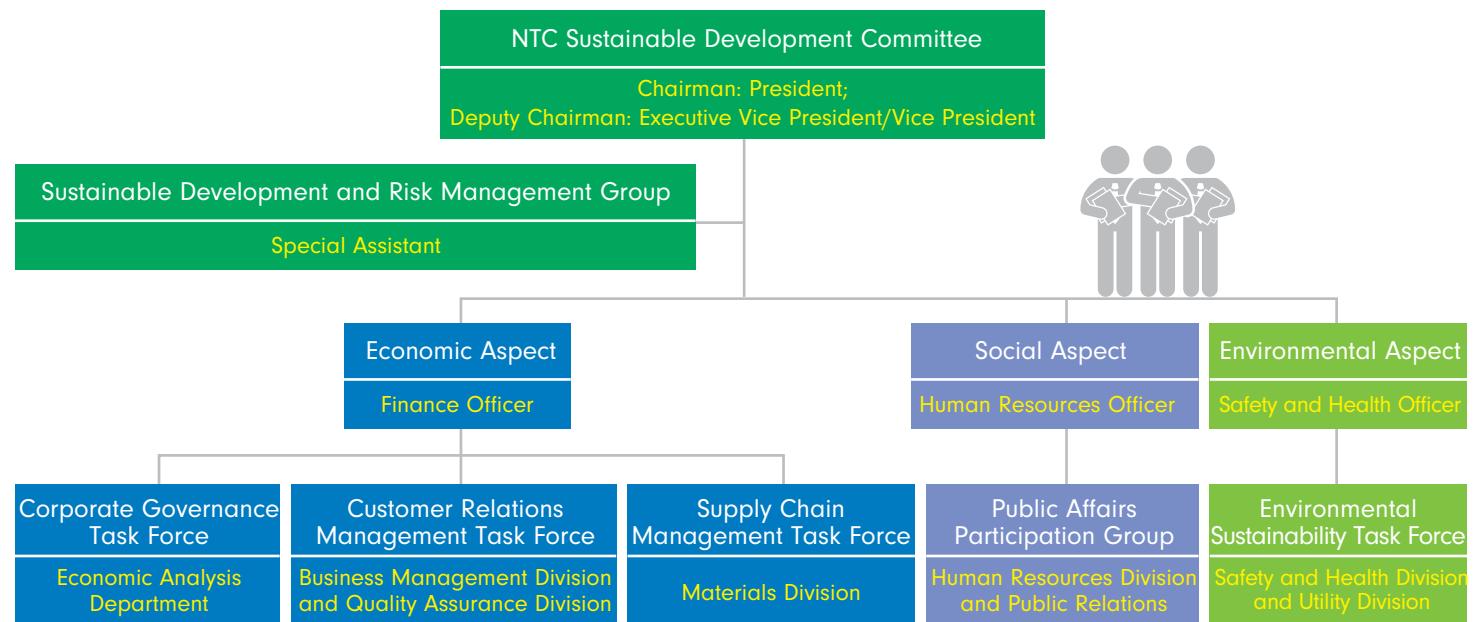
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Governance and Organization

In 2018, NTC officially established the Sustainable Development Committee, so we had entered into a new era in promoting sustainable development. The Committee, chaired by the President with senior management ranked Assistant Vice President and higher as committee members, reports to the Board of Directors annually on the strategies, visions, goals, policies and achievements relating to sustainable development, linking up organizations to promote corporate sustainability and relations with the Board of Directors. In the meantime, the president office set up a responsible organization, the sustainable development and risk management group, to serve as secretariat. The unit is responsible to convene the Sustainable Development Committee meeting quarterly, plan and control various action plans, and integrate and supervise the execution progresses and results on the aspects of economics, society, and environmental sustainability, ensuring the effectiveness of horizontal and vertical communication to specifically implement sustainable development.



Three Aspects

The economic, social, and environmental aspects are led by the finance officer, human resources officer, and safety and health officer respectively.

Four Meetings

The Committee reports to the President quarterly on the implementation and results of sustainable development affairs, planning key projects of work and performance indicators.

Five Task Forces

Five task forces are set up, including corporate governance, customer relations, supply chain management, public affairs participation, and environmental sustainability.





In 2018, NTC Sustainable Development Committee mainly conducted project reports and discussions relating to CSR work plan, risk management assessment, and legal and regulatory response, so the promotion of corporate sustainability would be actually deepened and reformed within the organization.

CSR Work Plan

- Evaluate waste water recovery rate
- Review noise improvement
- Intensify ISO50001 energy management system
- Continue to participate in the CDP evaluation
- Continue to establish LCA inventory mechanism (complete the inventory of all product groups)
- Deepen and truly execute the supplier sustainability assessment and guidance system
- Execute customer satisfaction evaluation through a third party
- Optimize corporate governance
- Taiwan Corporate Sustainability awards
- Participation in DJSI

Risk Management Assessment

- Sales and marketing risks
- Back-end packaging and testing risks of wafer manufacturing
- Operation supporting risks
- Human resources risks
- Quality risks
- Environmental safety risks
- Corporate strategy and finance risks
- Emerging Risks

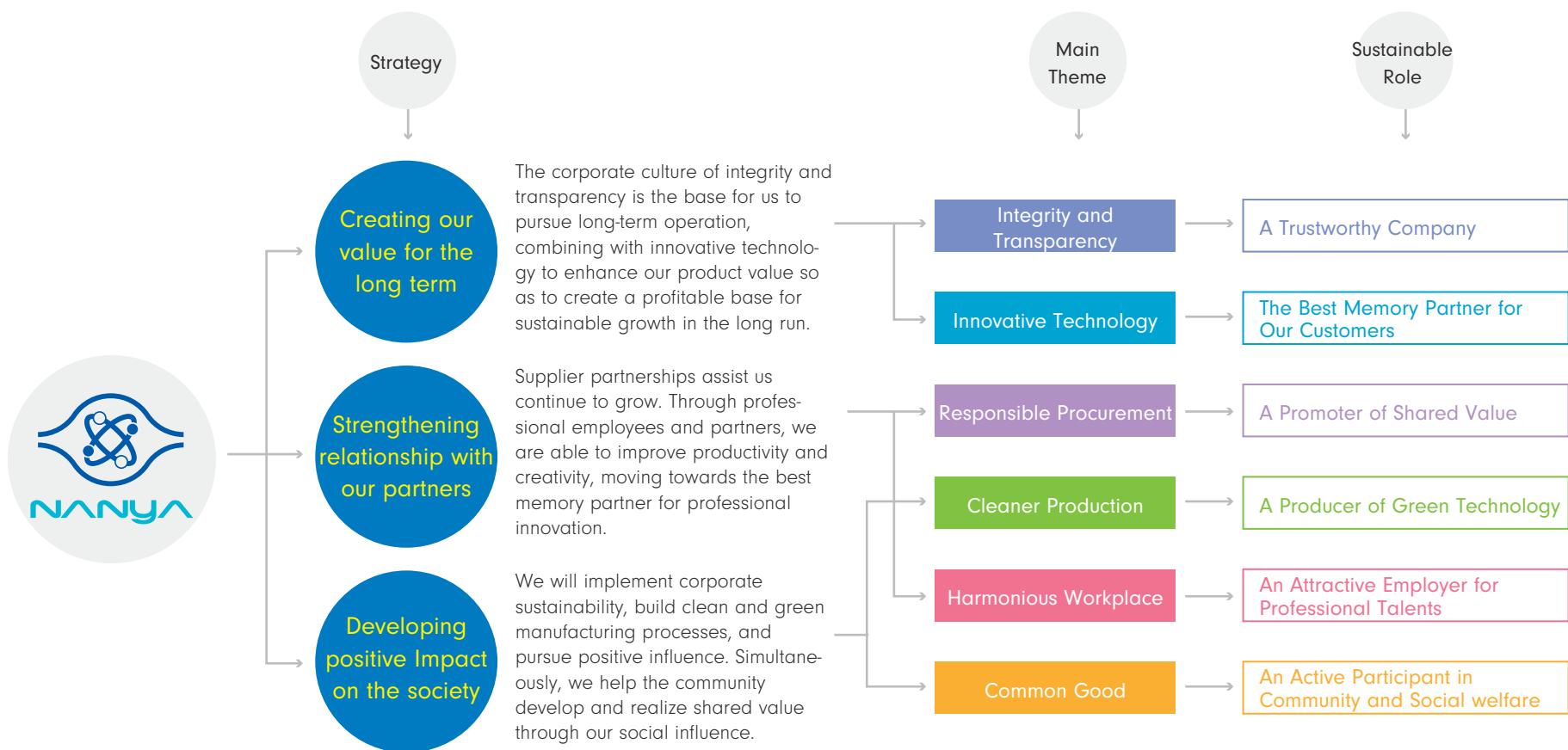
Review and response of legal and regulatory compliance

- Review known legal and regulatory compliance
- Propose response measures of new regulations



Sustainable Strategies

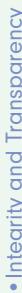
NTC has formulated three major strategies, which are creating our value for the long term, strengthening relationship with our partners, and developing positive impact on the society, to drive six main themes that will implement corporate sustainability management, laying foundations for six sustainable roles so as to create sustainable influence.



Materiality Analysis

Identification of material sustainable issues is a key process during the compilation of CSR report. NTC develops analytical methods for material issues in accordance with the Global Reporting Initiative (GRI) Standards, deciding material sustainable issues through six major steps as well as studying and drafting long-term sustainable goals. In 2018, NTC identified 17 relevant sustainable issues and investigated the stakeholders' concern level. We received feedback from 550 stakeholders and the evaluation made by internal 40 employees on the impact level of sustainable issues on revenue, customer satisfaction, cohesion of employees, brand image, and cost, to decide the matrix of material issues in 2018.

At last, in terms of the results of the stakeholders' concern level and the impacts of topics on operation, 14 sustainable topics were defined as material issues for NTC's 2018 CSR report, and short, medium, and long term goals were planned accordingly. In relation to disclosure standards, we adopted the GRI's value chain presentation to make the stakeholders understand the positive and negative impacts on the NTC's value chain resulting from different topics, while serving as the base for the company to strengthen its sustainable management. Regarding the data quality, we adopted the level of AA 1000 AS Type II, continuously improving the reliability and integrity of information disclosure.

Stakeholders	Significance to NTC	Ways of Communication	Communication Frequency	Topic of Concern	2018 Outcome of Communication	Reference Section
 Employees	<p>Employees are considered as the most important asset of NTC. We regard the employees' happiness as our responsibility, so we collaborate with our employees to implement the vision of healthy and happy workplace through comprehensive salaries and benefit, training and education, and bilateral communication system.</p>	<ul style="list-style-type: none"> Internal announcements Meetings: Convene regular meetings, such as all-hands meetings (every half year)/executive meetings (quarterly)/production line operator meetings (quarterly)/various training and education Bilateral communication platform: Living garden, NTC newsletter, and feedback Electronic questionnaire: Course satisfaction, activity satisfaction, and employee opinion survey 	<p>Meetings:</p> <ol style="list-style-type: none"> All-hands meetings are held twice a year Executive meetings and production line operator meetings are held quarterly Other meetings are held when necessary <p>Bilateral communication platform:</p> <ol style="list-style-type: none"> Newsletter is published every two months Feedback is replied within five days 	<ul style="list-style-type: none"> Occupational Safety and Health Talent Development Talent Retention and Employee Care 	<ol style="list-style-type: none"> Held 2 all-hands meeting Held 4 executive meetings Held 4 production line operation meetings Published 6 issues of newsletters 	 Common Good
 Shareholders	<p>Capital investment is a form of trust and support projected from the shareholders of NTC. The company has set up a dedicated unit for investor relations. Through providing transparent information on corporate operation and management strategies and financial policies to our investors, we achieve the goal of increasing the value of our shareholders' investment.</p>	<ol style="list-style-type: none"> Regular shareholders <ul style="list-style-type: none"> Shareholders' meeting is held annually. Annual financial report is published pursuant to regulations, and distributed at the shareholders' meeting Shareholders are able to inquire via phone or e-mail Institutional shareholders <ul style="list-style-type: none"> Investor conference and global conference calls are held quarterly Participate in domestic and overseas seminars held by investment institutions Participate in investor forums held by brokers irregularly Investor meetings on site or calls by request 	<ol style="list-style-type: none"> Market Observation Post System (MOPS) - updates irregularly Shareholders' meeting - at least once a year <ol style="list-style-type: none"> Investors conference - held once every quarter Participate in forums and seminars twice every quarter Irregular corporate visits on site or through phone 	<ul style="list-style-type: none"> Business integrity 	<ol style="list-style-type: none"> MOPS information updated over 400 items Held Shareholder's meeting once Held 4 investors conferences Participated 15 sessions in forums and seminars Irregular investors visits or calls for a total of 90 sessions 	 Integrity and Transparency

Stakeholders	Significance to NTC	Ways of Communication	Communication Frequency	Topic of Concern	2018 Outcome of Communication	Reference Section
 Customers	Customers are the best strategic partners of NTC. Through joint efforts to create new thinking and technology, we are able to grasp application trends of the industry and enhance the value of our products.	<ul style="list-style-type: none"> • Technical support service • Customer meetings and distributor meetings • Regular technical support • Annual customer satisfaction survey • Customer training 	<ol style="list-style-type: none"> 1. Services upon request 2. Meetings held once every other month per customer 3. Technical support once in one to three months per customer 4. Customer satisfaction survey annually 5. Training upon request 	<ul style="list-style-type: none"> • R&D and Innovation • Business integrity • Customer service 	<ol style="list-style-type: none"> 1.Completed 1,074 cases of customer platform parameter measurement service 2.Completed 88 sessions of technology exchanges and educational courses 3.Completed customer satisfaction survey with 100% coverage rate of customer and the score of satisfaction reached 90.5 points 	<ul style="list-style-type: none"> • Integrity and Transparency • Innovative Technology
 Suppliers	Suppliers form a significant link in the product production of NTC. Through mutual trust partnership and a supplier management system, NTC works with suppliers to build a sustainable value chain.	<ul style="list-style-type: none"> • Real-time supplier information platform • Regular face-to-face review reports or meetings • Supplier surveys, audits, and consultation are held in January, April, July, and October every year. • Annual supplier delivery stability and quality evaluation 	Besides the regular audits in January, April, July, and October, irregular communication is conducted when necessary.	• Supplier Sustainability Management	<ol style="list-style-type: none"> 1.In regards to delivery and stock management, regular and irregular review meetings were held every month - 80 key material suppliers. 190 non-critical material suppliers 2.Collected 270 SAQ questionnaires with 100% response rate 3.Conducted quality audits on 12 suppliers with 100% improvement completion rate 	<ul style="list-style-type: none"> • Responsible Procurement
 Government	NTC continuously pays close attention to the up-to-date regulations of the government. In the face of legal and regulatory requirements made by the government, we expect ourselves to exceed the regulated standards and actively respond to the policies proposed by the government.	<ul style="list-style-type: none"> • Documents • Legal and regulatory briefings • Financial reports • Submit related reports or responses as required by the competent authorities and regulations • Communicate with the competent authorities through the industrial park, computer associations, etc. 	Submit reports to the competent authorities as required, basically around once per month	<ul style="list-style-type: none"> • Business integrity • Greenhouse gas management 	<ol style="list-style-type: none"> 1.Periodically submitted related reports or responses in accordance with regulations of the government. 2.Actively responded to the policies proposed by the government and made recommendations through associations. 	<ul style="list-style-type: none"> • Integrity and Transparency • Cleaner Production



Stakeholders	Significance to NTC	Ways of Communication	Communication Frequency	Topic of Concern	2018 Outcome of Communication	Reference Section
Communities 	A happy society is the most important cornerstone of corporate sustainable development. Local prosperity and local value preservation should not be contradictory but complement each other. NTC expects itself to gain a firm foothold in business operation while it also actively engages in cultivating local connections, which will be combined with local community reconstruction. This is an important subject when NTC is considering social responsibility.	<ul style="list-style-type: none"> Announce relevant messages through the corporate website to inform the communities A charity club is set up in the company to participate in community volunteering activities. Organize charity drive activities and participate in the relief missions for the domestic major natural disasters An email box (audit@ntc.com.tw) is provided to the community residents for communication. A management office has been set up at the plant area to handle communication with the communities. 	<ol style="list-style-type: none"> Assist with environmental cleaning activities once per month Communicate and assist when necessary 	<ul style="list-style-type: none"> Greenhouse gas management Eco-friendly products Social engagement 	<ol style="list-style-type: none"> Participated in one mountain cleaning activity at the Taishan trail Sponsored a local school baseball team once Held a bazaar to sell bananas so as to support local banana farmers and agricultural products 	• Common Good • Cleaner Production
Media 	Media is an important external communication for NTC. NTC has a dedicated public relations unit and spokespersons with multiple communication channels to consistently deliver the company's latest messages to the media.	<ul style="list-style-type: none"> Press release Quarterly press conferences NTC official website Interviews with the spokesperson 	About once per month	<ul style="list-style-type: none"> Business integrity Social engagement 	<ol style="list-style-type: none"> 23 press releases Held 7 press conferences Completed 1 interview 	• Integrity and Transparency • Common Good



Step 1: _____
Define major stakeholders

We adopted the AA 1000 Stakeholder Engagement Standard (SES) and held the CSR consultation meetings to identify seven major stakeholder groups, including: employees, shareholders, customers, suppliers, the government, communities, and the media. In addition, we gathered and analyzed the concerned issues and identified the communication channels to respond to the shareholders' concerns.



Step 2: _____
Identify sustainability issues

In order to completely present the NTC's sustainability context, we gathered 17 related sustainability topics through various channels, including: communication processes of stakeholders, international guidelines/regulations/trends (GRI Standards, SBSC, SDGs), industry-specific topics (RBA, SASB), sustainable investment evaluation (DJSI, CDP, MSCI Sustainability Indexes, FTSE4GOOD Emerging Index), sustainability actions of the peers, and internal goals of organizations.



Step 3: _____
Investigate level of concern

In addition to the interactions with stakeholders through daily operation, before publishing the report, we conducted questionnaires based on the identified seven stakeholder groups. At last, we collected total 550 valid questionnaires, analyzing the topics concerned by different stakeholder groups.

40
Questionnaires

Step 4: Analyze operational impact

While information was being disclosed, the impacts on the organizational operation should be considered. We incorporated five major factors, including revenue, customer satisfaction, cohesion of employees, brand image, and cost, into our consideration, and asked our management team and employees to help evaluate the impacts that each topic might have on the operation. At last, we collected total 40 questionnaires for analysis, understanding the impacts that different sustainability topics might have on the operation.

14
Issues

Step 5: Determine material issues

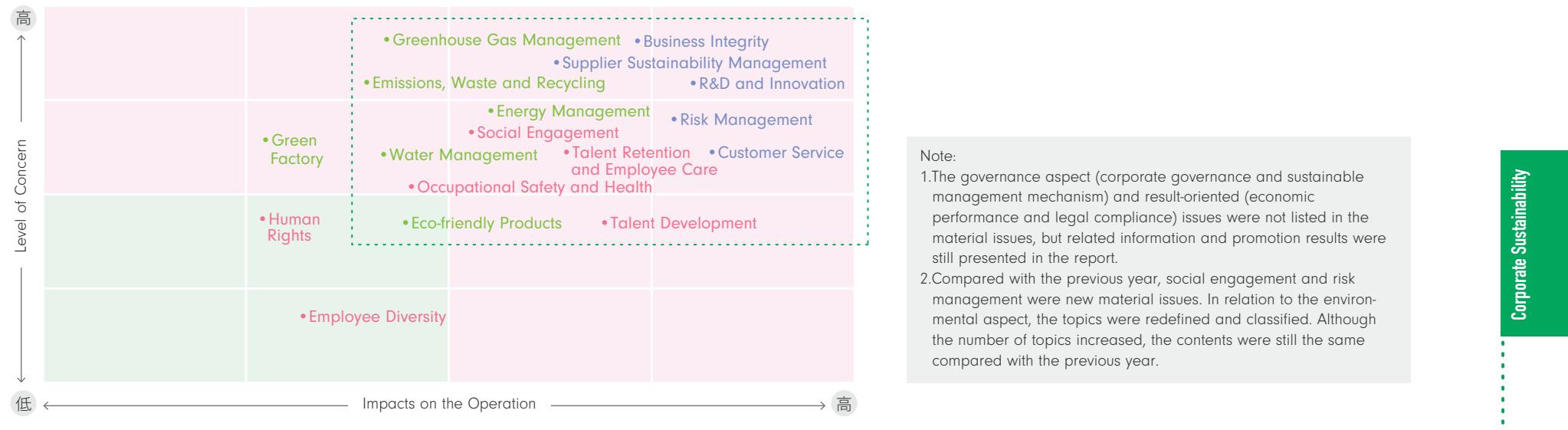
When combining the stakeholders' concern level and the impacts of topics on operation, we understood the distribution of sustainability topics in the material matrix. Our management team discussed these topics and finally decided 14 material issues, completing the NTC's material matrix of 2018. The following procedure was to decide the boundary of information disclosure and the planning of management policies.

17
Topics

Step 6: Review disclosure topics

According to the 14 material issues, our internal employees decided the stages that each topic might have significant impacts on within the NTC's value chain. These 14 material issues corresponded to the 15 topics in the GRI Standards and two specific topics belonging to Nanya Technology Corporation, making the total 17 topics to be the basis for report writings.

► NTC's Material Matrix



► Material issues, GRI topics, and impact boundaries

Degree of involvement: Direct relation (●), indirect relation (○), and commercial relation (✓)

Material Issues	GRI Topics	Value Chain				
		Product Design	Purchasing	Manufacturing	Testing	Customers
Integrity and Transparency	Business integrity	Anti-corruption (205) and anti-competitive behavior (206)		✓	●	●
	Risk management	Risk management *			●	●
Innovative Technology	R&D and innovation	R&D and innovation *	●			
	Customer service	Customer privacy (418)				✓
Responsible Procurement	Supplier Sustainability Management	Procurement practices (204), supplier environmental assessment (308), and supplier social assessment (414)		✓		
	Eco-friendly products	Energy (302) and emissions (305)			●	●
Cleaner Production	Emissions, waste, and recycling	Effluents and waste (306)		●	●	
	Water management	Water (303) and effluents and waste (306)		●	●	
	Greenhouse gas management	Emissions (305)		●	●	
	Energy management	Energy (302)		●	●	
Harmonious Workplace	Talent development	Training and education (404)		●	●	
	Talent retention and employee care	Market presence (202) and employment (401)		●	●	
	Occupational Safety and Health	Occupational safety and health (403)		●	●	
Common Good	Social engagement	Local communities (413)		○	○	

*Specific topics of Nanya Technology Corporation



Sustainability commitments and SDGs

NTC hopes that the promotion of corporate social responsibility can bring benefits to both corporate operation and social welfare. Based on the 14 material issues, we have made a commitment to sustainability till 2021 and set 46 goals, while responding to the United Nations' Sustainable Development Goals (SDGs) so as to implement the foundation of sustainable management. In the future, we will annually review the development and results of each goal, actively disclosing related information to the public in order to drive the power of change.

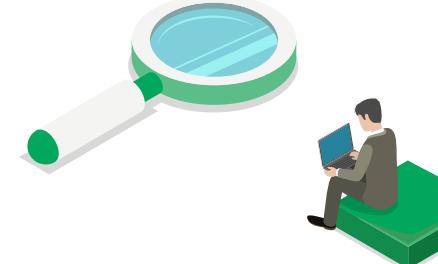
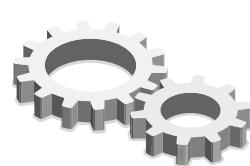


Main theme	Material issues	Significance to operation	Long-term goals (2021)
Integrity and transparency	Risk Management 	We will establish effective risk management mechanisms and constantly lower operation cost to ensure corporate profits, and create a quality working environment to achieve the goals of corporate sustainable development.	KPI 1: Regular quarterly meetings and annual reports to the Board of Directors: 4 times KPI 2: Annual risk assessment items: 200 items KPI 3: Stress test: 7 aspects each year KPI 4: Employees' training completion rate : 100%
	Business Integrity	We will build a sound corporate governance system and implement various business ethics policies and risk management mechanisms among suppliers, customers, and stakeholders to maintain the important cornerstone of corporate sustainable operation and value creation.	KPI 1: Material violations of regulations: 0 cases KPI 2: Corruption cases: 0 cases KPI 3: Employees' labor ethics training completion rate: 100% KPI 4: Employees' antitrust training completion rate: 100%
Innovative technology	R&D and Innovation 	In order to develop competitive advantages, we will research and develop advanced process technologies as well as design new products of the next generation, make forward-looking market plans while providing customers high value-added solutions, and establish high intelligent product lines to enhance efficiency.	KPI 1: Complete product verification of DDR5. KPI 2: Introduce 10nm technology into mass production KPI 3: Complete customer qualification for 10 major server customers KPI 4: Establish high-efficiency production lines with AI-assistance
	Customer Service	We will provide comprehensive customer service. Through regular communication and visits, we are able to understand customers' needs in order to enhance customer satisfaction and market image.	KPI 1: Customer satisfaction score: 88 points KPI 2: Customer platform parameters measurement services: 920 cases KPI 3: Customer technical exchange and courses: 80 sessions



Main theme	Material issues	Significance to operation	Long-term goals (2021)
Responsible procurement	 Supplier Sustainability Management	<p>We will promote sustainable performance of suppliers, improve resilience of supply chains, manage and control supply chain risks, and cooperate with suppliers to become the best partners in order to jointly move towards a sustainable future.</p>	KPI 1: Use of conflict-free minerals for wafer product lines: 100% KPI 2: Key suppliers' completion rate of the self-assessment questionnaire: 100% KPI 3: Unit waste output generated by local major suppliers to be reduced by 10% compared with that in 2017
Cleaner Production	 Eco-friendly Products	<p>We use complete advanced processes to provide competitive advantages of optimized energy consumption, efficacy, and chip sizes. In addition, we manufacture more advanced, more energy-saving, more eco-friendly, and hazardous substance free products for our customers, lowering the environmental impacts of the products.</p>	KPI 1: Ratio of 20nm and other advanced manufacturing process: more than 70% KPI 2: Product life cycle assessment: 100% KPI 3: Products meet hazardous substance free standards: 100% KPI 4: Materials contain zero perfluorooctanoic acid (PFOA) or related substances: 100%
	 Greenhouse Gas Management	<p>We will include climate change risks into the entire operation consideration, and predict the probability of risk occurrence and levels of influence, formulating risk response plans and crisis handling mechanism in order to issue warnings as early as possible to mitigate the impacts of climate risks on the corporate operation.</p>	KPI 1: Reduction of greenhouse emissions per unit of product: 10% (base year of 2017) KPI 2: Reduction of Perfluorinated emissions per unit of die: 30% (base year of 2015) KPI 3: Reduction rate of Perfluorinated emissions : more than 90%
	 Energy Management	<p>We will improve the efficiency of energy use, promote energy saving measures, reduce greenhouse gas emissions as well as lower environmental pollution to enhance corporate social image, and lower manufacturing cost while meeting the requirements of customers or the governmental policies.</p>	KPI 1: Per unit production capacity (GEC, equivalent to 4Gb chips) power consumption <0.6 MWh/kpcs KPI 2: Cumulative energy saved with new energy saving measures from 2017 to 2021: More than 50,000MWh
	 Water Management	<p>Through daily management, reductions and water recovery, we maximize the use of water resources and lower environmental pollution and production cost, while setting up response mechanisms for water shortage to mitigate the production impact risks resulting from water shortage.</p>	KPI 1: Per unit (GEC, equivalent to 4Gb chips) water consumption <2.8 ton/kpcs KPI 2: Annual average process water recovery ratio: More than 95%. KPI 3: Production loss due to water limitation: 0 wafer (pieces)
	 Emissions, Waste and Recycling	<p>We will recycle waste to improve the effective use of resources and reduce other problems deriving from pollution. Moreover, we will provide waste to other industries for reuse, achieving the advantages of environmental impact reductions and circular economy development.</p>	KPI 1: Continue the Isopropyl alcohol re-use program and is expected to increase its reuse by 85% compared to 2017. KPI 2: Maintain waste recycling rate above 97%

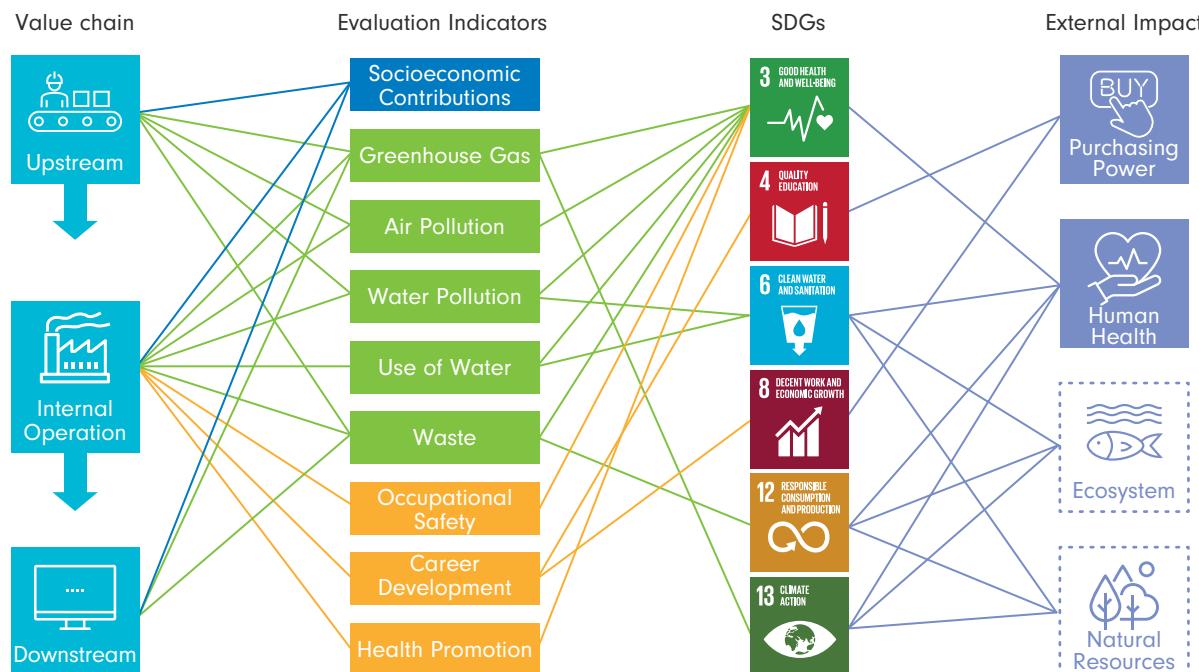
Main theme	Material issues	Significance to operation	Long-term goals (2021)
Harmonious Workplace	Talent Retention and Employee Care	We will build a diverse and inclusive company culture, so our employees are able to contribute various thoughts, experiences, backgrounds, and individual characteristics to enliven team atmosphere, stimulate creative thinking, and enhance work performance.	KPI 1: Retention rate of outstanding employees: 95% KPI 2: Voluntary turnover rate < 8.3% KPI 3: Employee engagement survey loyalty rate: 75%
	Talent Development	As a human-oriented company, we establish advantageous training development system, reinforcing our employees' core technological capabilities to achieve the annual strategic goals of the company and cultivate excellent high-tech semiconductor talent.	KPI 1: Human capital return on investment (ROI) \geq 15% KPI 2: Annual planned course completion rate \geq 98% KPI 3: Employees' average annual participation: 12 times KPI 4: Ratio of open positions filled by internal employees \geq 60%
	Occupational Safety and Health	Employees are our important assets. Through continuous improvements in providing employees with safe and healthy working environment, we aim to enhance the awareness of safety culture, strengthen self-inspection, and reduce employee occupational accidents.	KPI 1: Disabling injury frequency rate < 0.25 KPI 2: Disabling injury severity rate < 8 KPI 3: Self-inspection rate > 92%
	Social Engagement	Based on the NTC's core competencies and value, we are going to build a sustainable enterprise and technology homeland through the reinforcement of industry-academia cooperation and exchanges, humanistic care, environmental conservation, and community harmony.	KPI 1: Increase the total investment amount by 25% from 2018 KPI 2: Commercial initiatives account for 85% of the total investment amount KPI 3: Number of interns to reach 80 people KPI 4: Organize campus seminars and the percentage in northern colleges > 50%



Sustainable Impact

We adopt the Impact Valuation and conduct monetized valuation on the external impacts deriving from activities of value chain. We refer to the international standard ISO 14008, Impact Valuation White Paper, and cases of international enterprises, through the Impact pathway approach, mapping out the environmental and social impacts deriving from the value chain stage as well as the causal relationships. Moreover, we use the Profit & Loss principle to convert external impacts of different attributes into comparable monetized value so that the information can be provided to decision makers for consideration and comparison during the corporate sustainability promotion.

► NTC's Impact Valuation Framework



2 External Impacts

External impacts consider purchasing power and human health.

3 Major Stages

Upstream of value chain, internal operation, and downstream

6

SDGs links

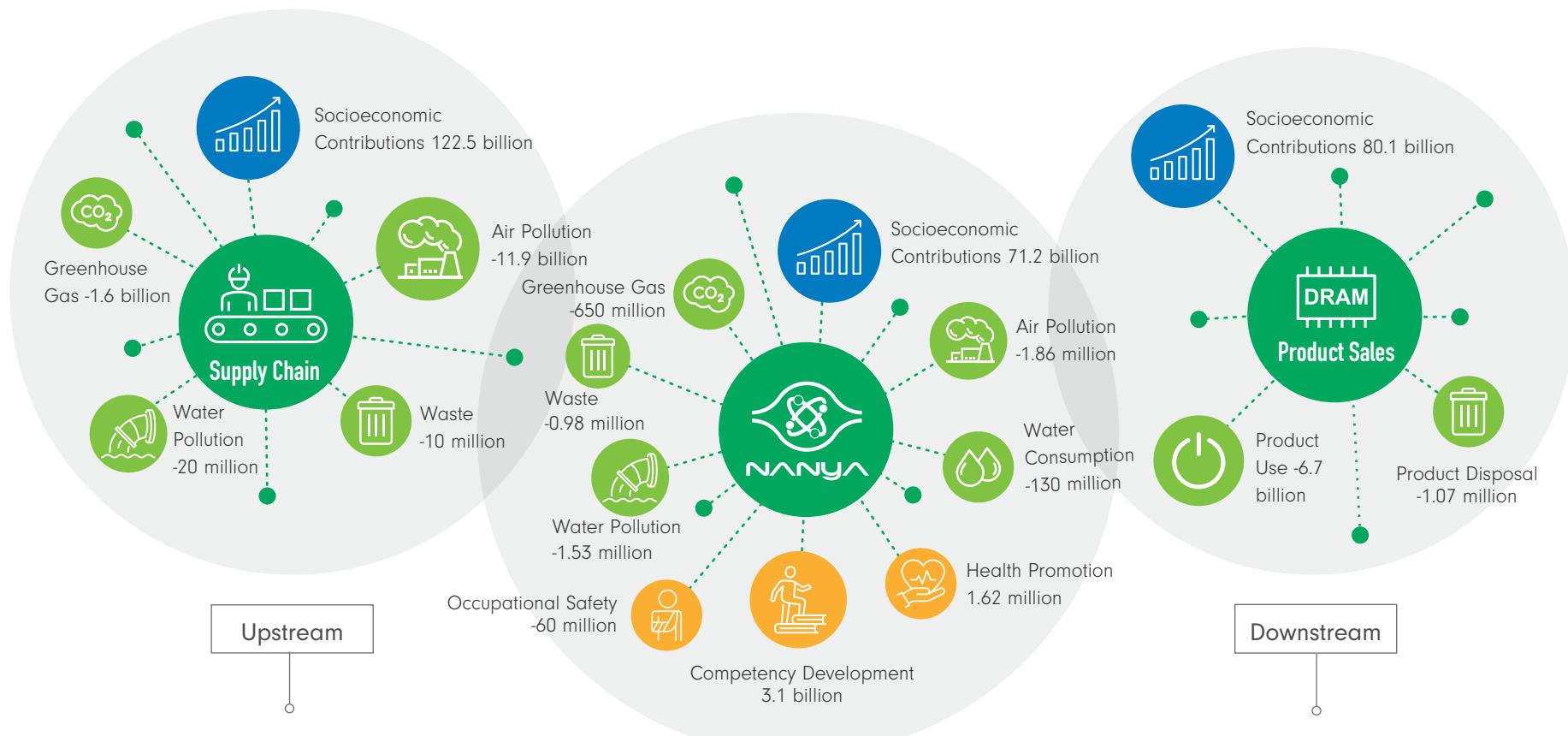
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One economic, five environmental, and three social indicators

 : Methodology is still in the making, so it is excluded in the assessment.

Scope	Evaluation Indicator	External Impact	Reference	Evaluation Methods
Upstream	Economic Aspect	Socioeconomics	Use input-output analysis to evaluate the economic value of the industrial chain and the social costs resulting from the potential pollutants release	Directorate-General of Budget, Accounting and Statistics (2015)*1 Directorate-General of Budget, Accounting and Statistics (2018a)*2 Directorate-General of Budget, Accounting and Statistics (2018b)*3 Bureau of Energy (2018)*4
Internal operation	Environmental Aspect	Socioeconomics	Economic benefits that corporate operation creates for the stakeholders	NTC's Annual Report
		Greenhouse Gas	Social cost caused by greenhouse gas emissions	US EPA (2016)*5 ReCiPe (2016)*6
		Air Pollution	Social cost of human health damage caused by the secondary pollutants, such as PM2.5 and photochemical ozone formed by the emissions of VOCs, SOx and NOx	UNEP & SETAC (2016)*7 PWC UK (2015)*8 Environmental Protection Administration (2017)*9
		Use of Water	Social cost resulting from the malnutrition to human health damage owing to water shortage	Database USEtox v2.1
		Water Pollution	Social cost of carbon generated by organic/inorganic matter in waste water and social cost of human health damage caused by heavy metals	
	Waste		Social cost of human health damage caused by greenhouse gases and toxic substances resulting from waste incineration and landfill	
Social Aspect	Occupational Safety	Production loss and social cost caused by occupational accidents	Ho Jiune-jye (2005)*11	
	Career Development	Salary increases and contributions to socioeconomics because of skills enhancement	Lee Chieh-hsien (2009)*12	
	Health Promotion	Avoid the social cost of cardiovascular diseases by promoting health improvement activities		
Downstream	Economic Aspect	Socioeconomics	Product Sales creates economic value for customers' industries.	Directorate-General of Budget, Accounting and Statistics (2018a)*2
	Environmental Aspect	Product Use	Human health damage value and social cost resulting from product energy consumption	Database ecoinvent v3.0

► 2018 NTC sustainable impact valuation results

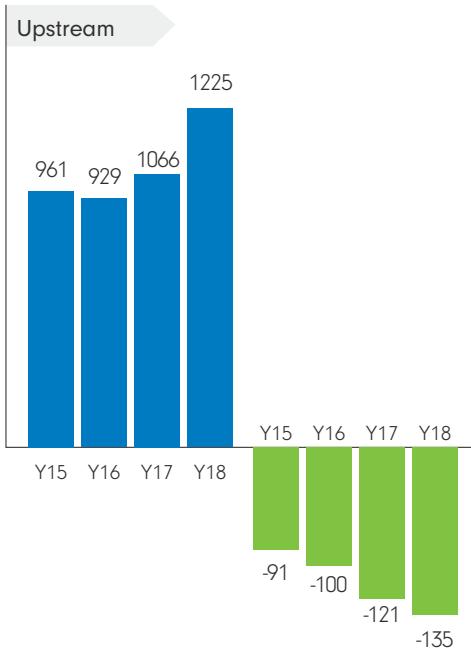


300 Billion
Socioeconomic benefits
created in 2018

21 Billion
Environmental external cost

Manufacturing Operation





- Economics: Economic value created with purchases in the industrial chain
- Environment: Greenhouse gases, air pollution, and effluents and waste

Note: Data of social aspect in upstream/downstream is excluded owing to difficulty in acquirement.

+14%

Growth rate of environmental external cost compared with 2017

The main reasons are the increases in supply chain purchasing demand and product sales amount. Among them, the most significant economic value lies in the nearly 4 times purchasing amount created in the upstream supply chain.

16%

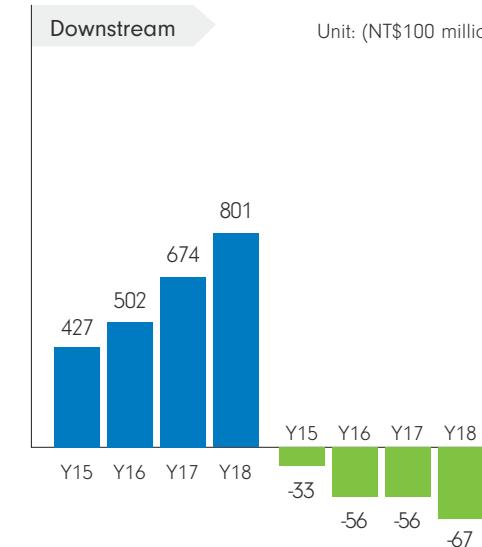
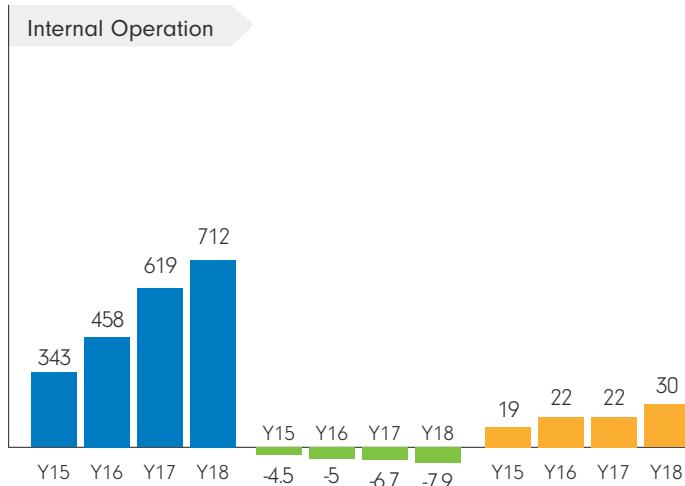
Growth rate of socioeconomic benefits compared with 2017

The air pollutant PM2.5 in the upstream is the most serious impact to human health, followed by the stage of product use in the downstream. The impacts might relate to our main source of energy supply, coal-burning electric generating plants, which emit granular substances harmful to the human health and heavy metals toxic to the human body.

99%

Greenhouse gas emissions and the use of water resources account for 99% of the environmental external cost of self-operation.

Because of the evolution of manufacturing processes and increases in demand for production capacities, energy consumption and water consumption increased. Therefore, in 2018, the social cost of carbon caused by greenhouse gas emissions increased by 23% compared with that in the previous year. However, due to 32% increase in process water recovery rate, the external cost of overall water consumption reduced by 2% compared with that in the previous year.



- Economics: Sales creates economic value for industry chain
- Environment: Environmental impacts of end-product use and disposal



03

Integrity and Transparency

A Trustworthy Company

Nanya Technology Corporation (NTC) complies with the laws and ethics, including the Company Act, Securities and Exchange Act, and relevant regulations. "Integrity" is one of NTC's four core values. NTC upholds the corporate spirit of "diligence, perseverance, frugality and trustworthiness" and uses ethical, honest, fair, transparent, and responsible business philosophies to pursue sustainable development.

Constituent of the FTSE4Good TIP Taiwan ESG Index

Continuously included in the FTSE4Good TIP Taiwan ESG Index, one of the sustainability indexes in Taiwan

100%

Training Completion Rate of "Labor and Ethical Code for Conduct Training" and "Antitrust Training"

6-20%

Top 6-20% in the 5th Corporate Governance Evaluation of listed Companies



35 Corporate Governance

39 Risk Management

48 Business Integrity

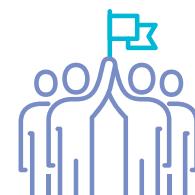
Strategy and Achievement

 Unachieved  Achieved  Surpassed

Material issues	Strategies	2019 Goals	2018 Targets	2018 Achievements	Target achievement status
Risk Management	<ul style="list-style-type: none"> Risk management: Establish effective risk improvement mechanisms and procedures Loss management: Operating stress test and lowering operating costs. Effectiveness: Mobilize all employees for risk management training and regular drills for operating risks. 	Regular quarterly meetings and annual reports to the Board of Directors	4 times	4 times	
		Annual risk assessment items: 200 items	200 items	210 items	
		Stress test: 7 aspects each year	6 items	7 items	
		Education and training: 100% of all employees	100%	100%	
Business Integrity	<p>Focus on both internal and external operations: Implement regular internal education and training sessions and expand them to include external entities. Provide sufficient reporting channels and protection to cultivate professional ethics and legal compliance culture.</p>	Material violations of regulations: 0 cases	0	0	
		Corruption cases: 0 cases	0	0	
		Employees' labor ethical training completion rate: 100%	100%	100%	
		Employees' antitrust training completion rate: 100%	100%	100%	

Corporate Governance

Nanya Technology Corporation (NTC) firmly believes that rigorous and effective corporate governance can enhance the Company's operations and protect the shareholders' interests. NTC shall strive to accomplish its missions for "continuous profits, sustainable operations, risk forecast, and precautionary measures" and ensure that the Company abides by relevant regulations, enhances financial transparency, and increases operating performances. NTC made significant progress in corporate governance in 2018 and received international recognition. The Company was first selected as a constituent stock in the Dow Jones Sustainability Emerging Markets Index that attracts global Investors' attention. Moreover, NTC was consecutively included in the Taiwan ESG Index and TWSE Corporate Governance 100 index as a constituent and ranked in the top 6-20% of listed companies in the 5th Corporate Governance Evaluation. NTC has obtained recognition of investors and external organizations in corporate governance.



Board of Directors and Diversity

NTC's Board of Directors complies with relevant laws and resolutions of the shareholders' meeting in its operations. All Directors have professional knowledge, skills, and qualifications required for the performance of their duties as well as the capabilities of business risk management. They shall maximize the shareholders' interests based on the principles of the Company's sustainable development. The Board of Directors consists of 12 members who serve three-year terms. Board members include 3 independent Directors and 2 female Directors (independent Directors and female Directors account for 1/4 and 1/6, respectively). As of May 2019, 3 Directors are aged 50-59 and other Directors are over 60 years old. The average tenure of the Directors is 9 years. A total of 6 meetings of the Board of Directors were held in 2018 and the average attendance rate was 92% which included actual attendance (78%) and attendance by proxy.

NTC's "Corporate Governance Principles" stipulate that board members are not restricted by their gender, race, and nationality. The Company also established the "the Codes of Ethics of Directors and Managers" to require related personnel to uphold moral principles in the performance of their duties and prevent acts that damage the Company and shareholders' interests. The main duties of the Board of Directors are to ensure information transparency and legal compliance, appoint senior managements, formulate earnings distribution proposals, and supervise and provide guidance for the Company's operations.

To strengthen the structure of the Board of Directors and corporate governance of Nanya Technology Corporation, not only female Directors but independent Directors were elected to participate in the Board's operations. NTC's "Rules for Election of Directors" stipulate that at least one independent Director shall have accounting or financial expertise. NTC also set up the "Regulations on the Scope of Duties of Independent Directors" to establish a good corporate governance and independent director system for the independent Directors to fulfill their functions in the Board meetings and the Company's operations. The Chairman does not hold any concurrent position as a senior manager, which promotes sustainable governance by a clear division of duties.

Title	Name	Major Experience	Number of Other Taiwanese Public Companies Concurrently Serving as an Independent Director	GICS Level 1
Chairman	Nan Ya Plastics Corporation Representative: Chia-Chau Wu	Chairman, Nan Ya Plastics Corporation	None	Materials
Director	Wen-Yuan Wang	Chairman, Formosa Chemicals & Fiber Corporation	None	Materials
Director	Susan Wang	Executive Director, Formosa Plastics Corporation	None	Materials
Independent Director	Ching-Chyi Lai	Chairman, Chunghwa Post Co., Ltd. Deputy Secretary General, Executive Yuan ROC	1	—
Independent Director	Shu-Po Hsu	Vice Chairman, General Chamber of Commerce of the Republic of China	None	Financials
Independent Director	Tsai-Feng Hou	President, Former Ta Chong Securities Co., Ltd.	None	Financials
Director	Pei-Ing Lee	President, Nanya Technology Corporation	1	Information Technology
Director	Formosa Taffeta Co., Ltd. Representative: Shih-Ming Hsie	President, Formosa Advanced Technologies Co., Ltd.	None	Materials, Information Technology
Director	Nan Ya Plastics Corporation Representative: Ming-Jen Tzou	President, Nan Ya Plastics Corporation	None	Materials
Director	Otto Chang	Senior Vice President, Nan Ya Plastics Corporation	None	Materials, Information Technology
Director	Nan Ya Plastics Corporation Representative: Wen-Yao Wang	Senior Vice President, Nan Ya Plastics Corporation	None	Materials
Director	Nan Ya Plastics Corporation Representative: Lin-Chin Su	Executive Vice President, Nanya Technology Corporation	None	Information Technology

To improve the Directors' professional competence and legal knowledge, the President Office organizes training courses for the Directors each year to strengthen their professional skills and operational management capabilities in order to monitor and guide the Company's operations more effectively. The Directors took an average of 7.5 hours of training courses in 2018. NTC shall plan training courses on sustainable operations management and risk management for its Directors to strengthen operations and management performances.

Name of Director	Program	Number of Hours
Wen-Yuan Wang/Chia-Chau Wu/ Tsai-Feng Hou/Shih-Ming Hsie Ming-Jen Tzou/Otto Chang/Lin-Chin Su	Benefits of Social Media for the Organization	3
	Focus on Corporate Ethics and Innovative and Sustainable Management	3
Pei-Ing Lee	The 12th Taipei Corporate Governance Forum	6
Wen-Yao Wang	Legal Issues for Directors and Supervisors of Public Companies	3
	How Directors and Supervisors of Public Companies Perform Their Duties	3
Ching-Chyi Lai	100% E-Voting and Enhancement of Corporate Value Forum	6
	2018 Insider Trading Prevention Seminar	3
	Seminar on Legal Compliance for Stock Transactions by Internal Personnel	3
	The 12th Taipei Corporate Governance Forum	6
Shu-Po Hsu	Benefits of Social Media for the Organization	3
	Focus on Corporate Ethics and Innovative and Sustainable Management	3
	2018 Insurance Industry Corporate Governance Seminar	6
	The 12th Taipei Corporate Governance Forum	6
Average training hours per Director		7.5



► Functional Committees and Main Duties

Audit Committee

- The Audit Committee consists of 3 independent Directors and Mr. Ching-Chyi Lai serves as the convener.
- A total of 5 Audit Committee meetings were held in 2018 and the average attendance rate was 100% which included actual attendance (87%) and attendance by proxy.
- Authority and responsibility: The Committee supervises the Company's business execution and finances and reviews the Company's finance books. It assists the Board of Directors in its supervisory duties and it is responsible for tasks specified in the Company Act, Securities and Exchange Act, and other relevant regulations.

Compensation Committee

- The Compensation Committee consists of 3 independent Directors and Mr. Shu-Po Hsu serves as the convener.
- A total of 3 Compensation Committee meetings were held in 2018 and the average attendance rate was 100% which included actual attendance (89%) and attendance by proxy.
- Authority and responsibility: The Committee establishes and periodically reviews the performance goals for the Directors and managerial officers and the policies, systems, standards, and structures of compensation.

Compensation of Senior Executives

The compensation of managerial officers of the Company includes monthly salaries and various bonus systems, pension systems, and evaluation systems approved by the Compensation Committee. They are reported to the Board of Directors for approval before implementation.

Pay adjustments, bonuses and other remunerations are proposed by the Human Resources Department, taking into consideration the industry's pay levels, the Company's performance, personal performance and contribution and the corporate governance indicators for sustainable development, including performance and contribution in the three aspects of economy, environment and society. After the related proposal is proposed by the Human Resources Department, it will be referred to the Compensation Committee, and then after the Committee reviews and deliberates, it will be submitted to the Board of Directors for approval.



► Management Shareholding

As of 2019/4/1

Title	Name	Shareholding (shares)
President	Pei-Ing Lee	683,098
Executive Vice President	Lin-Chin Su	269,601
Vice President	Joseph Wu	210,000
Vice President	Rex Chuang	193,000
Vice President	Yau-Ming Chen	0
Assistant Vice President	Wesley Chang	41,042
Assistant Vice President	Chi-Meng Su	0
Assistant Vice President	Mark Mao	96,000
Assistant Vice President	Jengping Lin	100,027
Assistant Vice President	Rex Chen	21,000
Assistant Vice President	Chuan-Jen Chang	53,048

Risk Management

Nanya Technology Corporation established a dedicated risk management unit to carefully control and reduce operational risks. The unit integrates the Company's long-term strategic objectives to establish risk management policies and procedures as the highest guiding principles. The contents include risk management strategies, risk management objectives, establishment of continuous risk management procedures, scope of review, and operation guidelines. We also regularly analyze potential risk factors in the internal and external environment on the Company's operations and continue to promote related response plans to reduce impact and ensure swift recovery. We review emerging risks in the next 3-5 years each year and follow up on these risks. The Company adopts long-term gradual planning to establish risk awareness for all employees and instill the awareness in the daily management of the departments to ensure the Company's normal operations.

Organization and Operations

Nanya Technology Corporation Risk Management Steering Committee is the highest authority for the Company's risk management and it bears the ultimate responsibility for the Company's risk management system. The Steering Committee is chaired by the President and it is responsible for overall risk management for the Company. The Steering Committee meets quarterly to review the performance of risk management operations and operational continuity plans of each functioning committee to ensure the suitability, relevance and effectiveness of its ongoing operations. The Committee reports to the Board of Directors each year and Corp. Audit audits the execution status of the Company's risk management policy at least once each year. Audit items include



the risk management framework, risk management operating procedures, and related operations. They provide timely recommendations for improvements and continue to follow up on the improvement results.

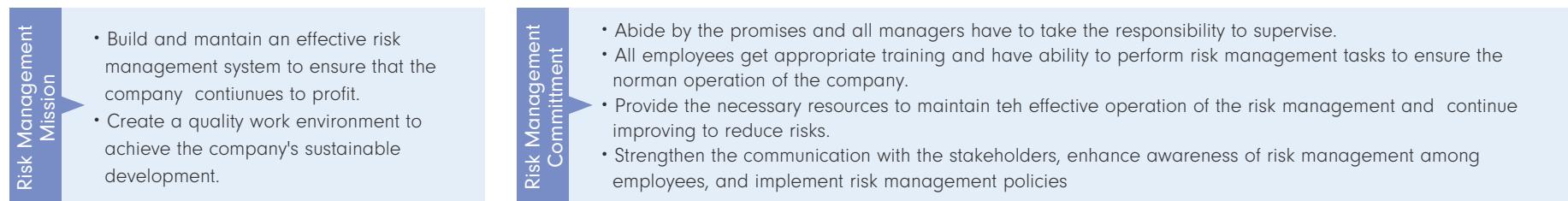
The risk management steering committee has set up five risk management committees for operations, safety, legal affairs, finance, and security, in accordance with the Company's operational goals. Each committee collects internal and external environmental risk information and performs daily risk monitoring. The risk level is assessed according to the assessed items and timely improvement measures are taken. The results are reported to senior managers each quarter. To actively implement risk management, the Company established the Sustainable Development and Risk Management Group in 2018 to assist the Risk Management Steering Committee in the implementation of related activities. It formulates management policies and supervises the operations of the committees to control risks.

Formulate risk management policy, framework, and organizational functions; establish qualitative and quantitative management standards; periodically report the implementation of risk management and necessary improvement recommendations to the Board of Directors.

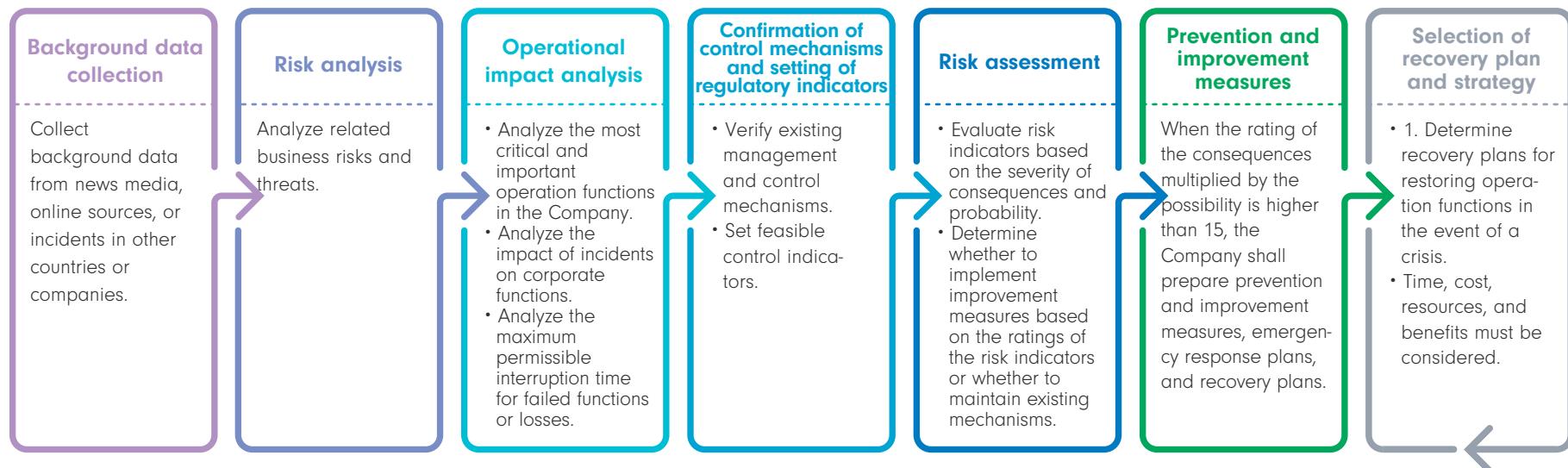


Risk Management Policy

Nanya Technology Corporation's risk management operations are used to identify and analyze the risks currently faced by the Company and to monitor risks in order to ensure normal operations of the company to create value for shareholders, employees, customers to achieve sustainable development goals.



► Nanya Technology Corporation Risk Management Procedures



Scope of Review for Risk Management and Operation Policies

I.Understand the Company's background and environment and determine issues that are related to the Company's operation strategy and would affect the Company's external and internal operations. External environment: The external environment includes politics, economy, culture, society, technology, competitive environment, finance, laws, statutes, and regulations. Internal environment: The internal environment includes the Company's strategy, culture, capacity, organization structure and duties, resources, and quality.

II.Understand the needs and expectations of stakeholders: Verify the needs and expectations of stakeholders that are related to business operations and affect the Company's provision of qualified products and services such as customers, end customers, distributors and agents, and the parent company.

III.Implement potential risk, threat, impact on operations, or opportunities analysis for key operations in the main procedures. They shall include the impact of risks related to the environment, changes in the external business environment including natural disasters, diseases, major global incidents, and other conditions that may affect the Company's operations and impact the customers.

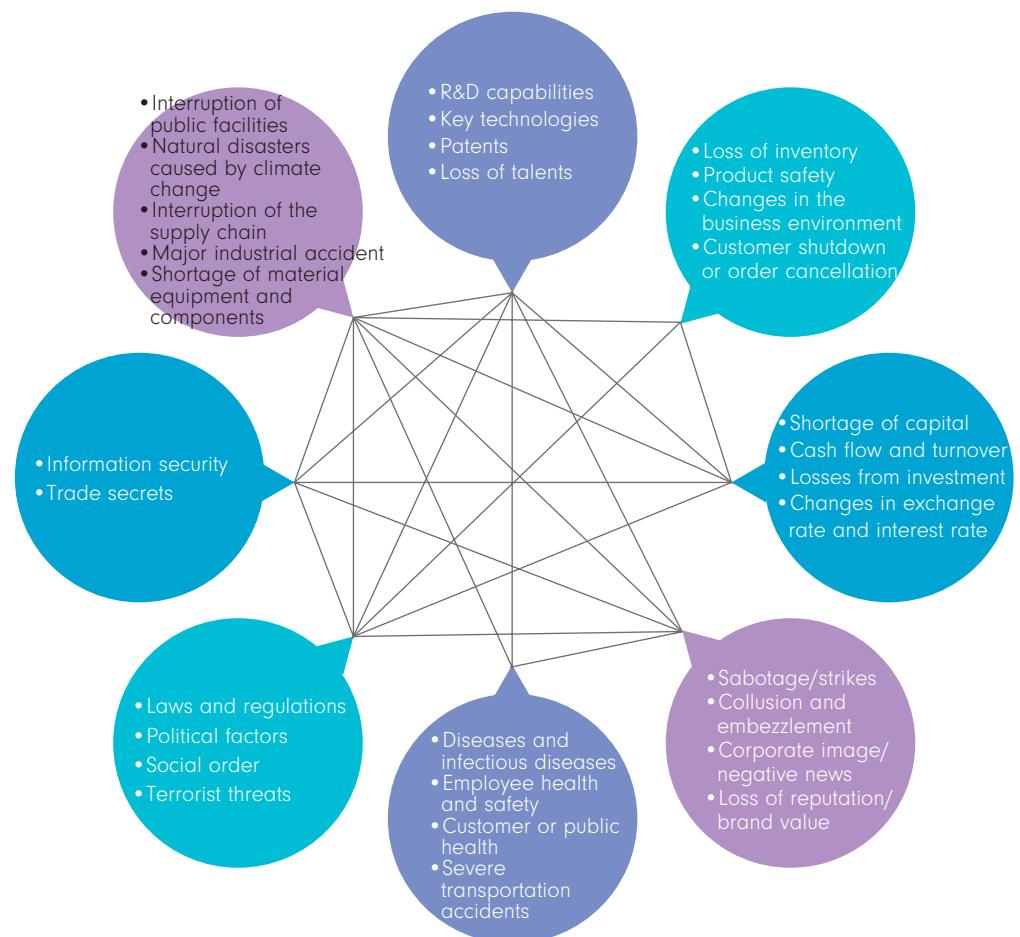
IV.Adopt appropriate improvement plans or implement necessary reforms for risks and opportunities. Measures for processing risks and opportunities can also include: Risk aversion, acceptance of risks to pursue opportunities, change the possibility or severity of risks, dispersion of risks, or risk retention.

V.Use the evaluation results for risks and opportunities to determine the boundaries and applicability of the risk management system in order to establish the scope of the risk management system or plan changes for the system.

VI.Report the evaluation results of risks and opportunities and the effectiveness of actions taken in response to risks and opportunities to senior executives as reference for the formulation of the Company's strategies and the annual business plan.

We confirm potential risks, threats, and various factors that may impact operations in the internal and external environment in accordance with

the risk management guidelines. We analyze risk factors with the highest level of relationship to be interruption of public facilities, natural disasters caused by climate change, interruption of the supply chain, major industrial accidents, and shortage of important equipment or components. These factors are shown to have the most profound and critical impact on the Company's overall operations. We therefore use quarterly meetings to discuss related prevention and improvement measures on a regular basis to enhance our standard operating procedures. We also conduct regular drills for emergency response measures to effectively minimize risks.



Emergency Response Mechanisms and Measures

To reduce risks and damage of emergency incidents, Nanya Technology Corporation has a complete set of operational norms and methods for handling emergency anomalies, covering manufacturing, supply chain and warehousing, information security, human resources and other aspects. We can immediately take response measures in the event of an emergency, mitigate the impact of the incident and quickly recover, and ensure normal operations to meet client needs. For example, raw material shortage, incidents that affect 10% of output (such as earthquakes, typhoons, toxic gases, fire alarms, labor shortages, etc.), abnormal utilities systems, abnormal automation systems, abnormal outsourcing capacity, and large number of customer returns, all have specific treatment steps and improvement measures.

In addition, the emergency response to personnel safety, such as fire alarm, gas leakage, leakage, odor, earthquake and radiation leakage, emergency response measures, notification procedures and command systems are all in accordance with safety and hygiene relevant regulations. The Company organizes at least one emergency evacuation drill and two fire safety drills each year to ensure the effectiveness of emergency response measures.

Central monitoring and control system operation regulations

The control center monitors the supply and quality of the public system as well as power supply, fire, leaks, odors, and earthquakes and sends out alerts

Anomalies emergency response regulations

Procedures for processing gas leaks, fire, chemical leaks, odors, radioactive leaks, earthquakes, and other anomalies and emergency response plans

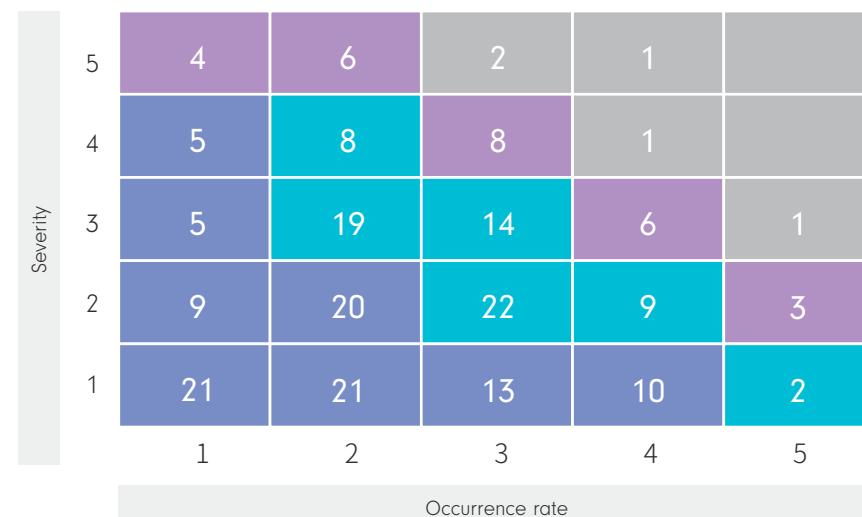
Material anomaly response regulations, public supply system anomaly and emergency response regulations

Response for anomalies in the public system, production system, and production line

Risk Identification and Stress Test

Risk Identification Results

Nanya Technology Corporation's five major Risk Management Committees for operations, EHS, legal affairs, finance, and information security proposed 210 risk items in 2018. The risk profile and the distribution of risk items are specified below after the assessment. According to statistics, 5 items need to be improved immediately, 27 items will be improved depending on the situation, 74 items are acceptable level, and 104 items are no actions required. The major risk items were information security and protection (2 items), raw materials supply chain, exchange rate fluctuations, and the EU's GDPR legislation. As the strategy was continuously implemented, the current level of those items has been reclassified to acceptable level or lower and long-term management planning and crisis management mechanisms were established. They are described as follows:



Assessment criteria of Severity : 1=Slight ; 5=Serious

Assessment criteria of Occurrence rate : 1=Rare ; 5=Almost certain

- █ No action required █ Acceptable risk █ Depending on the situation
- █ Immediate improvement

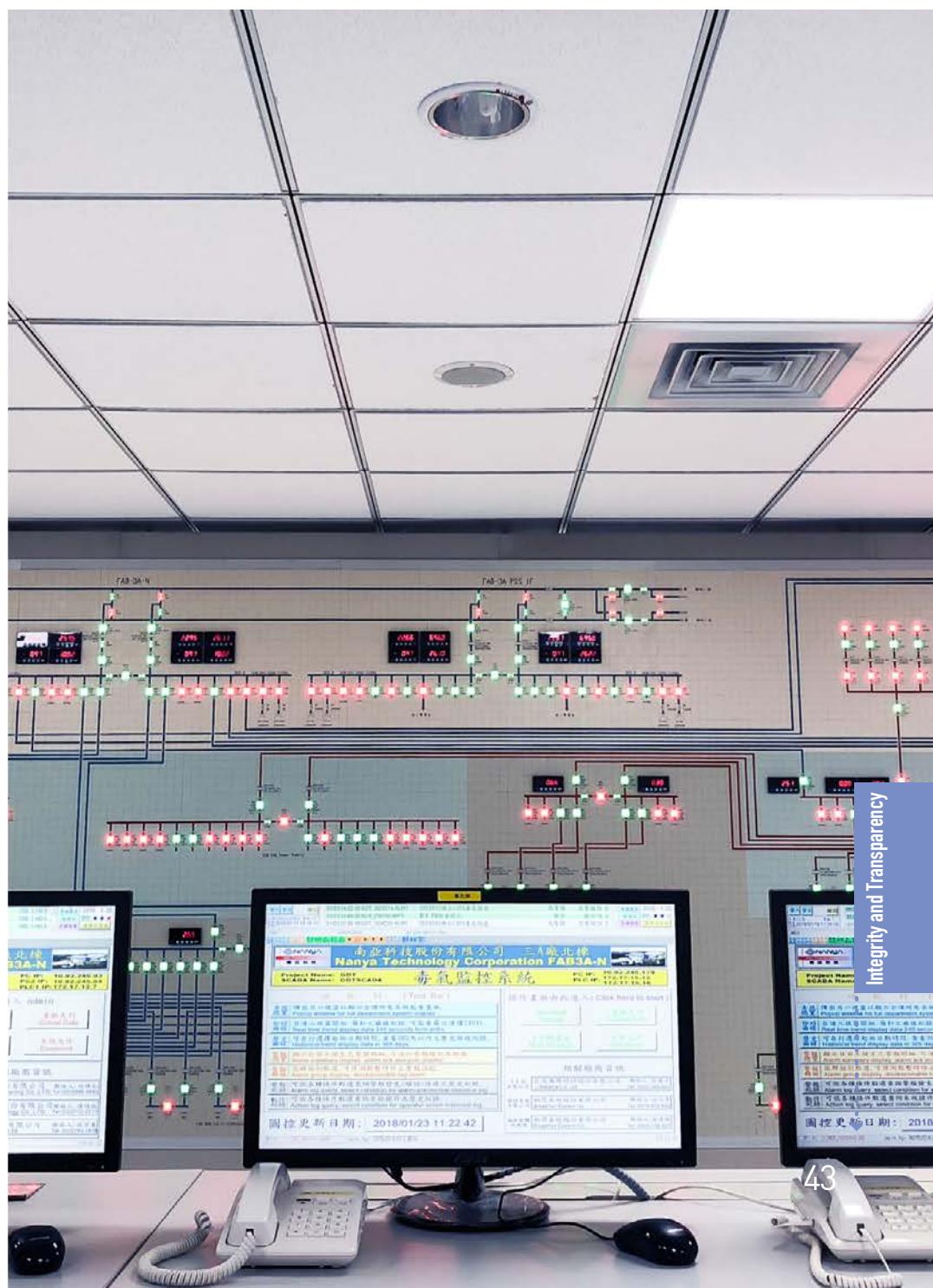
1. Product research and development and process technologies are the highest core value for the DRAM industry. To defend trade secrets and intellectual property rights, the Company established the information security group in 2017 to take charge of strengthening information security management. We established rigorous control measures for computer software and hardware confidential technology documents, Internet, printers, access, and mobile phones to protect the Company's long-term competitiveness and protect the rights of employees and all shareholders. The Company currently implements information security protection based on the "Information Security Operating Procedures" and we plan to introduce ISO 27001 in 2019 to establish an Information Security Management System (ISMS) to protect the confidentiality, integrity, and availability of information. The severity is reduced to depending on the situation.

2. The balance of supply and demand of helium on the market was lost when the supply from the United States Bureau of Land Management (BLM) declined drastically and the Qatar III helium project was delayed. We took an inventory of materials usage status and implemented savings plan. We also developed new helium suppliers and acquired supply quotas from existing suppliers. Production risks have been effectively mitigated. The severity is reduced to be acceptable.

3. The sales of the Company's DRAM products are mainly conducted in USD. According to the Company's USD positions as of the end of 2018, the amount affected by the appreciation (depreciation) of NT\$1 in exchange rate was NT\$ 1.44 billion. We have established offshore subsidiaries to drastically reduce the impact of the exchange rate on the Company's business interests. The severity is reduced to no action required.

4. In response to the European Union's General Data Protection Regulation (GDPR), the Company completed the signature of the cross-border agreement with our European subsidiary Company in 2018 and we have met EU regulations. The severity is reduced to no action required.

The Company has a complete set Business Continuity Planning (BCP) and Business Continuity Management (BCM) mechanisms. With sufficient planning, we can immediately take response measures in the event of an emergency, mitigate the impact of the incident and quickly recover to ensure the normal operations and meet client needs. The hazardous risk management and supply chain safety is implemented in accordance with the Company's existing OHSAS 18001 system. We shall continue to supervise the units' implementation of Enterprise Risk Management (ERM) to ensure the ongoing operations of the Company.



Stress Test

Nanya Technology Corporation has conducted sensitivity analyses and stress tests on potential risks including financial, climate change, water resources, operations, market, business, and legal compliance risks that may affect operations and are of high importance. We seek to learn about the impact of potential risk factors on the Company's finances and provide high-level managers with information for formulating response measures to mitigate risks and prevent impact brought to the Company by extreme events.



Finance

The sales of DRAM products are mainly conducted in USD. The Company held USD positions amounting to approximately USD 1.44 billion as of the end of 2018. Therefore, the amount affected by the appreciation (depreciation) of NT\$1 in exchange rate was NT\$ 1.44 billion. The Company continued to expand 20nm production capacity in 2018 and requires large capital expenditures in USD. The Company has established an offshore subsidiary company and reduced the impact of exchange rates due to USD positions held by the parent company. If the NTD to USD exchange in 2019 rises from 30.7 to 29.5, the maximum foreign exchange losses would only account for 2.5% of the operating profits in the entire year.

- We analyzed 18 risk factors on transitional risks (including legal/technology/market/reputation) and physical risks (including immediate/long-term) in accordance with the Task Force on Climate-Related Financial Disclosures (TCFD).
- Three items were classified as medium-high risk based on evaluation results. They are described below:
 1. Air pollution restrictions: We continue to pay attention to amendments of the Greenhouse Gas Reduction and Management Act promulgated by the Environmental Protection Administration and take response measures. We shall continue to purchase greenhouse gas processing facilities for production capacity expansion and we expect to reduce GHG emission intensity by 2% each year before 2020.
 2. Renewable energy regulations: The Company shall continue to pay attention to the legislation process of the Renewable Energy Act of the Ministry of Economic Affairs and related requirements. The draft currently stipulates 10% of renewable energy and the Company does not have space for setting up renewable energy equipment. We shall purchase renewable green energy certificates for the requirements. The price of certificates is currently NT\$ 1.1-2.2 for each kWh of electricity. We expect to pay approximately NT\$ 75-149 million each year for such purchases. If FAB 3AN capacity increases to 100%, the maximum expenses shall be NT\$ 194 million/year based on results of stress tests.
 3. International conventions or protocols: Continue to pay attention to the Paris Agreement and subsequent activities after GHG reduction actions. We shall also comply with national laws and regulations.



Climate change



Water resources

We inspected the Company's internal and external water sources and simulated water restrictions under different scenarios. With water supply from the backup wells (400m deep) and water tanks, we can maintain normal operations of the plants. If water sources from the river is completely cut off, we can maintain approximately 18 days of normal production. We shall complete two additional wells by August 2019 and they will supply 2,700 CMD of water. With 2,000 CMD of well water from Chang Gung Golf Club, we can maintain 143 days of normal production at the plants.



Operations

- Power interruptions severely affect the Company's production. We reviewed the Company's internal and external power supply system and conducted simulations for conditions where Taiwan Power Company reduces the contract capacity by 5%, 10%, 15%, or 20%. With emergency generators and DUPS support in our plants, we can maintain normal operations of the plants. If the external power supply is cut completely, it would cause losses from suspension of production. Based on actual revenue in 2018, the impact would be approximately NT\$ 7 billion/month.
- The balance of supply and demand of helium on the market was lost in October 2018 when the supply from the United States Bureau of Land Management (BLM) declined drastically and the Qatar III helium project was delayed. If other sources cannot be found, the shortage would impact 6% of the revenue totaling NT\$ 280 million/month.



Market

If DRAM products from China enter the market, it would lead to oversupply on the market and cause price competition. We simulated declines (10%, 15%, and 20%) in DRAM products in the next five years and analyzed the impact on the Company's cash flow, shareholders' equity, and returns. If the annual average price continues to decline by 20%, we expect the shareholders' equity to be negative by 2021 but we would still be able to maintain cash inflow and low debt ratio. The risks of interruptions of operations are low. Nanya Technology Corporation will continue to pay attention to supply and demand on the market and changes in prices. We shall also invest in new products and technology research and development to maintain competitiveness.



Business strategy

- Nanya Technology Corporation analyzed its market share for the next five years. To satisfy customer demands, we invested approximately NT\$ 20 billion in 2018 to expand 20nm equipment and develop the next-generation 10nm technologies. We improve process technology and capacity and we expect to achieve 15% bit growth in 2019. We shall also adjust the product portfolio and develop products with higher unit prices and higher margins.

Business
strategy

- The Company analyzed product gross margins and found that our profit margins to be lower than the leading companies of market share. If product prices decline drastically, leading companies may still be profitable while the Company may sustain losses. We must therefore reduce the cost of 20nm products and invest in research and development of 10nm technology. We must also develop niche products and optimize product portfolio to reduce the gap in gross margin with leading companies and maintain profitability.

Legal
compliance

- The Company's legal compliance: Corp. Audit executes internal audits of the Company and implements corporate governance and ethical corporate management principles. We amended the internal management system in accordance with regulations. In 2018, a few employees who had left the Company violated the Trade Secrets Act and were reported by the Company. They are now under investigations by prosecutorial agencies and the incident currently does not affect the interests of the Company. We have strengthened information security management and adopted rigorous audits and protection measures for confidential information.
- EHS regulatory compliance: We have not been penalized by the government for EHS affairs or environmental protection issues in 2018. The Company obtained ISO 14001/OHSAS 18001 Environmental Health and Safety Management System certification and continued to implement the system effectively. We expect to complete the certification for ISO 45001:2018 Occupational Health and Safety Management System before 2021. The risks of suspension of work or international trade sanctions are extremely low.
- Labor law compliance: The Company abides by the regulations in the Labor Standards Act of the Republic of China. We actively protect labor interest and labor relations. We allow employees to report overtime work due to business requirements based on the Company's regulations. By adopting self-inspection and risk prevention ideals, we have protected the rights of laborers and improved the quality of the work environment.
- Intellectual property rights and patents: The Company has always valued the protection of intellectual property rights and patents and we have established a comprehensive management system for trade secret protection and trademark development. We have accumulated 3,759 patents mainly for DRAM production, mutual licensing between companies, and defense of patent rights. The Company currently uses the patents of multiple silicon intellectual property companies for DRAM production. Reasonable licensing fees have been paid based on the contract between the parties and we have not experienced severe breach of contracts or disputes involving infringements. The licensing fees have little impact on the Company's financial risks.



Emerging Risks

Nanya Technology Corporation pays close attention to changes in the economic environment. We identify long-term risks and opportunities and adapt our business strategies to ensure sustainability and long-term operating performance. We assess emerging risks for the next 3-5 years every year and the Risk Management Committees collect related domestic and international information to evaluate potential risks in the Company's long-term operations. They used questionnaires or evaluations in meetings of senior executives to identify three issues with the highest level of potential impact in the future and review mitigation and response strategies. The issues and strategies are

reported to the Risk Management Steering Committee for resolution and used as important references for formulating future business strategies.

The Risk Management Committee collected and compiled 16 emerging risks in 2018. Members discussed and established five-point evaluation tables and questionnaires as investigation tools for identifying material emerging risks for senior executives (Assistant Vice President and above including the President). Nanya Technology Corporation has formulated response strategies and continues to implement improvements in hopes of mitigating related impact.



Emerging Risks	Rise of the Chinese DRAM industry	Bullwhip effect and related impact of the trade war between China and the United States	Domestic anti-nuclear energy policy and power supply instability or shortage with alternative energy sources used as base load
Possible impact	<ul style="list-style-type: none"> • Imbalance in supply and demand on the DRAM market and intense price competition lower profits and affect business performance. • Loss of customers in China and decrease in market share affect business performance. 	Global economic recession may cause oversupply in the DRAM industry and product prices to drop and affect the Company's profitability and business performance.	<ul style="list-style-type: none"> • During the implementation of the anti-nuclear energy policy, any power supply instability or shortage will direct affect production and even cause interruption of operations. • An increase in the cost of electricity affects profitability and business performance.
Response measures	<ul style="list-style-type: none"> • Continue the research and development of new technologies and development and investment in new products. • Actively expand the automotive, industrial, Internet communication, and other high value-added markets. 	<ul style="list-style-type: none"> • Continue to strengthen product portfolio, expand niche customers, and develop niche new markets. • Strengthen high-quality cost structure and enhance the Company's structure to survive risks. • Pay close attention to the development in the trade war between China and the United States. Discuss the impact on operations and response measures for trade protectionism and high tariffs. • In the event of a tech war, closely observe the differences in new forms of DRAM applications and adjust the management strategy. 	<ul style="list-style-type: none"> • Establish comprehensive plant power backup systems to mitigate the impact of a sudden drop in voltage or power blackout and reduce recovery time. • Introduce ISO 50001 system and complete certification. Establish real-time energy monitoring and implement energy conservation improvement plans. • Make an assessment of alternative future energy pathways in order to comply with the regulations.

Risk Culture Construction

In order to raise the awareness of risk among all employees of Nanya Technology Corporation and build a risk culture, two Executive Directors (the President and Executive Vice President) serve as the chairman and deputy chairman of the Risk Management Steering Committee to instill risk awareness in the management, enhance risk management, and review annually the implementation of annual risk management performance and emerging risks in the future. The Company has also included the results of risk management into annual performance evaluation items for the management (President and supervisors ranked Assistant Vice President and above), executed based on the approval of the Compensation Committee.

Nanya Technology Corporation has a variety of incentives provided to encourage employee proposals and innovation to uncover and improve potential risks. We conduct reviews and provide cash incentives based on the expected benefits, creativity, application scope, integrity, and quality contributions. The Company established 24-hour instant case report system, the information security line, employee feedback mechanisms etc. to provide employees with measures for immediate responses. We also use TV walls, posters, and computer wallpapers to instill the risk management culture and allow the risk management culture to take root in all employees.

	Unit: NT\$		
	2016	2017	2018
Number of proposals	44	47	51
Proposal bonus	64,300	62,400	128,350
Proposal benefits	22,348,891	28,791,634	28,995,875
Risk type			
Process and equipment risks	14	28	19
Productivity and quality risks	26	12	23
Environmental health and safety risks	2	6	4
Other risks	2	1	5
Total	44	47	51

Risk Management Training

Nanya Technology Corporation arranges board members to attend corporate governance and risk management courses held by institutions approved by the government and the Company also established risk management education materials for employees to read on the computer system to improve risk awareness of all employees. We completed training for all employees in risk management in 2018 with 1,560 hours in total training hours. We also established a goal to complete training for 100% of our employees each year. The Company also implements the spirit of risk management in daily management through various standard operating procedures and audits. We implement management functions and regularly perform self-inspection operations to identify potential risks as early as possible for prevention and improvement.



Business Integrity

Nanya Technology Corporation upholds the corporate spirit of "diligence, perseverance, frugality and trustworthiness" and uses ethical, honest, fair, transparent, and responsible business philosophies to strengthen legal compliance. The Company established "the Codes of Ethics of Directors and Managers" for the senior executives, the "Ethical Corporate Management Principles" and "Antitrust and Competition Law Compliance Manual" for the employees, the electronic trading platform for the suppliers, and a comprehensive audit system to implement ethical governance and prevent violations of laws.

Antitrust

To ensure employees understand and abide by the Antitrust Law, Nanya Technology Corporation established the "Antitrust Policy", "Antitrust and Competition Law Compliance Manual" and the "Procedure of Antitrust and Competition Compliance" to strictly require employees and managers to abide by laws and regulations and report the compliance status to the Board of Directors. We also organize regular training courses for related employees and require them to sign the Antitrust and Competition Law Compliance Manual. As of the end of 2018, there were two antitrust litigations. One of the antitrust litigations aforesaid is still in process; another litigation has been closed as all the terms and conditions of the settlement to such litigation have been performed with no material adverse impact on Company's operation. Please refer to page 130 of the Company's 2018 Annual Report on the Nanya Technology Corporation official website <http://www.nanya.com/en/IR/42/>.

Anti-corruption

All employees must abide by Nanya Technology Corporation's "Human Resources Management Regulations". Any abuse of powers, embezzlement, bribery, acceptance of commissions, once verified, shall result in termination of employment without exception. The direct supervisors shall also be punished accordingly based on the circumstances. To prevent violations, employees in operations, procurement, finished product warehouses, construction supervision, and budgeting roles shall be rotated periodically and they shall abide by principles for preventing conflicts of interests. We shall also formulate anti-corruption education materials to educate all employees in hopes that all employees can abide by ethical principles in both work and life and fulfill the corporate culture of "diligence". No cases of corruption or similar violations had occurred from 2016 to 2018.

Ethical Code of Conduct

Nanya Technology Corporation referenced the Code of Conduct of the Responsible Business Alliance and established the Labor Ethical Management Policy and Business and Ethical Code of Conduct as the basis for compliance by all employees (including managerial officers), employees of subsidiaries, customers, and suppliers in the business operations. The "Labor and Ethical Management Policy" and "Business and Ethical Code of Conduct" have been published on the internal website and we informed all employees through the online training system to strengthen their integrity and ethical awareness. The training completion rate of both regulation training is 100%. Employees may not provide (or accept) bribes or participate in insider trading or other actions that violate moral standards and damage the Company's reputation. In the event of a material or corruption violation (e.g. employees abuse their powers and accept bribery), they shall be immediately terminated once such violations are verified. Where such violations damage the interest of the Company or lead to severe violations, the Company shall pursue their legal liabilities.



To continue to optimize the workplace environment, Nanya Technology Corporation implements related training by setting labor and ethic goals each year. We implemented "zero corruption" and "zero sexual harassment" policies and promoted "Labor and Ethical Code of Conduct Course", "Anti-corruption Course", "Business and Ethical Code of Conduct Course" and "Senior Executive Ethical Corporate Management Course" in 2018 with training completion rates of 100%.

Ethical corporate management and labor ethical education results	2016	2017	2018	2019 goals
"RBA Labor and Ethical Code of Conduct Course" completion rate	100%	100%	100%	100%
"Business and Ethical Code of Conduct Course" completion rate	-	100%	100%	100%
"Anti-corruption Course" completion rate	-	99%	100%	100%
"Senior Executive Ethical Corporate Management Course" completion rate	-	-	-	100%

* : The "Senior Executive Ethical Corporate Management Course" was a course added in 2019 and completed before the end of February. Eleven individuals completed the training (completion rate: 100%). Prior to 2018, the course was included in the "Business and Ethical Code of Conduct Course" and "Anti-corruption Course" which were organized for all employees.

* : A total of 3,103 individuals completed the "Business and Ethical Code of Conduct Course" in 2018. A total of 2,434 individuals completed the "RBA Labor and Ethical Code of Conduct Course" in 2018.

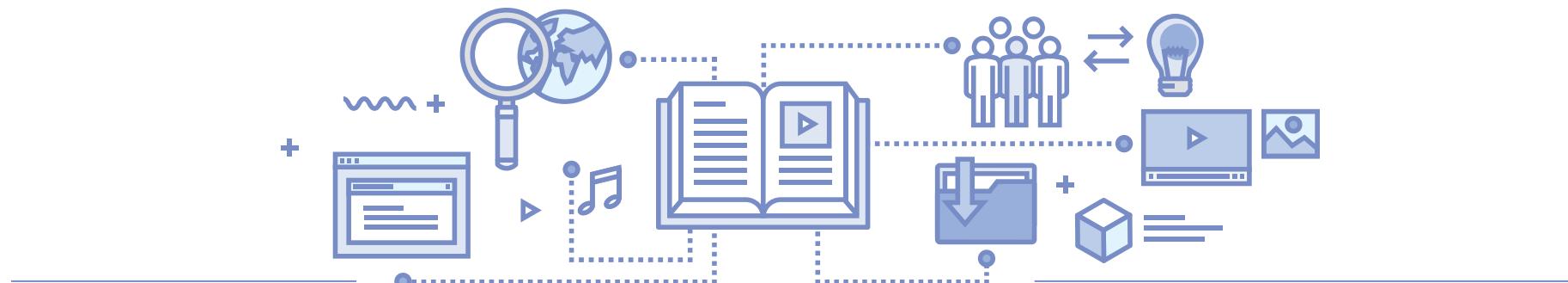
Personal Data Protection Act

To implement related personal data and risk assessments for the Company and identify potential risks in the collection, processing, and use of personal data, the Company established the "Personal Data Inventory and Risk Assessment Procedures" to execute various improvement measures based on risk assessment ratings. We set controlled access for personal data of employees or customers and apply strict restrictions on the use of such information. The European Union's General Data Protection Regulation (GDPR) entered into force in May 2018. As the Company has established a subsidiary company in the European Union, the legislation provides a certain level of regulations on measures for managing the personal data of European customers, clients, and suppliers. Nanya Technology Corporation has adopted response measures based on the requirements in the GDPR and implemented related systems in subsidiaries to increase employees' awareness for personal data protection and reduce the risks of violations. As the Company's personal data protection has been rigorously and effectively executed, there were no violations in 2018.

Response measures for GDPR

- Amendment of the "Personal Data Management Procedures" and "Computer Resource Management Guidelines"
- The Company established the Personal Data Management Committee and the Director of the Human Resources Division serves as the Data Protection Officer
- Strengthen the legitimacy of the collection, processing, and use of personal information
- Organize information sessions for personal data protection

* : We organized two GDPR education courses in 2018 with approximately 30 minutes in each course. The attendees included all employees of the Human Resources Division and the information security officer of each department. A total of 68 employees received the training.



Internal Control

Internal Control System

Nanya Technology Corporation established an effective internal control system based on the Company and its subsidiaries' overall operation activities and its industry in accordance with the "Regulations Governing Establishment of Internal Control Systems by Public Companies". The Company conducts reviews at any time to respond to changes in the Company's internal and external environment as well as to ensure that the system design and implementation remain effective.

The implementation of the internal control system is a continuous operation. We continue to inspect various business and management operations and detect deviations from company policies, operating procedures, existing goals, or standards. We use a feedback system to respond to the appropriate management level and take necessary corrective actions for the issues to ensure the Company's operations are implemented in accordance with the original plans. We use the internal control system to complete audits and prevent abuse in operations.

Internal Audit

Nanya Technology Corporation established Corp. Audit under the Board of Directors and appoints dedicated auditors who participate in related auditing courses organized by professional training institutions each year to improve their professional skills. We also established professional and independent internal audit operations framework to implement internal control in all levels of the Company.

Scope of Internal Audit



In addition to the audit report on the status of correction of defects and irregularities of internal control systems, the internal auditors shall follow up and provide reminders to ensure that relevant units to take appropriate improvement measures in a timely manner. They shall submit the measures to the Independent Directors for review before the end of the following month after the completion of the audit report. Internal audit is not merely the responsibility of the independent audit department. The Company's units must complete independent business inspections within the specified cycles for specific audit items. Independent audit units shall review the results of the self-inspections and implement review inspections regularly or from time to time to ensure the execution of the internal control systems of each unit.

► Internal audit items

	2016	2017	2018
Number of audit items	42	42	44
Number of anomalies discovered	4	9	7*
Anomaly improvement rate	100%	100%	100%

* : Seven anomalies include 1 for human resources, 3 for finance, 2 for production, and 1 computer anomaly. We completed all improvements.

Grievance and Complaint Channels

Nanya Technology Corporation has established the "Employee Complaint Guidelines" and "Reporting Regulations" to provide employees with channels for reporting any unlawful or unethical conduct. When employees discover a breach of laws or inappropriate conduct that affects the interests of individuals or the Company or other related material issues or where an individual attempts to gain unlawful interest by abusing the power of their office, they may file reports at any time for responsible dedicated units to take charge of processing. In addition, we also established a report hotline (02-29061001) on the Company's official website and a dedicated email (audit@ntc.com.tw) to provide complaint channels for stakeholders for infringements of their rights. We also assign dedicated personnel to take charge of processing the complaints. To protect the whistleblower, personnel responsible for processing cases shall conduct investigations based on the confidentiality principles and they shall be prohibited from disclosing cases to unrelated personnel. When investigating related individuals, the processing personnel shall only discuss parts that are relevant to the individuals to protect the identity of the whistleblower.

► Grievance and complaint cases

Grievance and complaint methods	2016	2017	2018
File written complaints (including anonymous reports)	3	4	1
Employee grievance report table	1	0	2
Complaint hotlines and mailboxes	0	0	1
Total	4	4	4
Confirmed cases following investigation	1	1	1
Processing and case closed	1	1	1
Case closure rate	100%	100%	100%

* : There were 4 cases in 2018 that each involved sexual harassment, supplier management, workplace bullying, and unit management. Only one case regarding unit management was accepted and we have requested the unit manager and employees to enhance communication with other units and improve the efficiency of business operations.

Earlier in 2019, NTC was informed that two employees were involved in insider trading case. In addition to proper punishments to the employees, the company will also strengthen its internal legal compliance program and internal training to prevent similar case from happening.



Information Disclosure

NTC uses various communication channels to disclose information to external stakeholders comprehensively. In 2018, NTC participated in 15 external investor conferences and also updated various information, financial data, and investor conference videos to the company's website and Market Observation Post System, in accordance with requirements of the competent authority to provide investors with updated, accurate, and transparent operation conditions and financial statistics.

► Communication Channels

	Channel	Frequency
General shareholders' meeting	Shareholders' meetings	Yearly
Website	Market Observation Post System	Periodically
	NTC official website	Periodically
	Investor conferences	Quarterly
	Financial reports	Quarterly
Investor relations	Investor forums	Periodically
	Road shows	Periodically
	Telephone conferences	Upon Request
	Investor visits	Upon Request
	Investor relations unit mailbox NTCIR@ntc.com.tw	Whenever necessary

Balanced Media Reports

Regarding media reports on the prosecutorial authorities' investigations in two cases of violation of the Trade Secrets Act by former employees of NTC in February and June, 2018, the Company immediately issued a press release to fully cooperate with prosecutorial authorities in follow-up investigation procedures. We also continued to investigate and prosecute any unlawful acts while strengthening information security management to protect the results of research and development by NTC R&D team and partners and uphold shareholder interests and fair competition.

04

Innovative Technology

The Best Memory Partner for Our Customers

"Innovation" is one of the driving forces for Nanya Technology Corporation's growth and competitiveness as well as one of our four core values. We shall strengthen product research, development, and manufacturing to satisfy customers' diverse demands and become one of the best DRAM provider for smart world.

5.7%

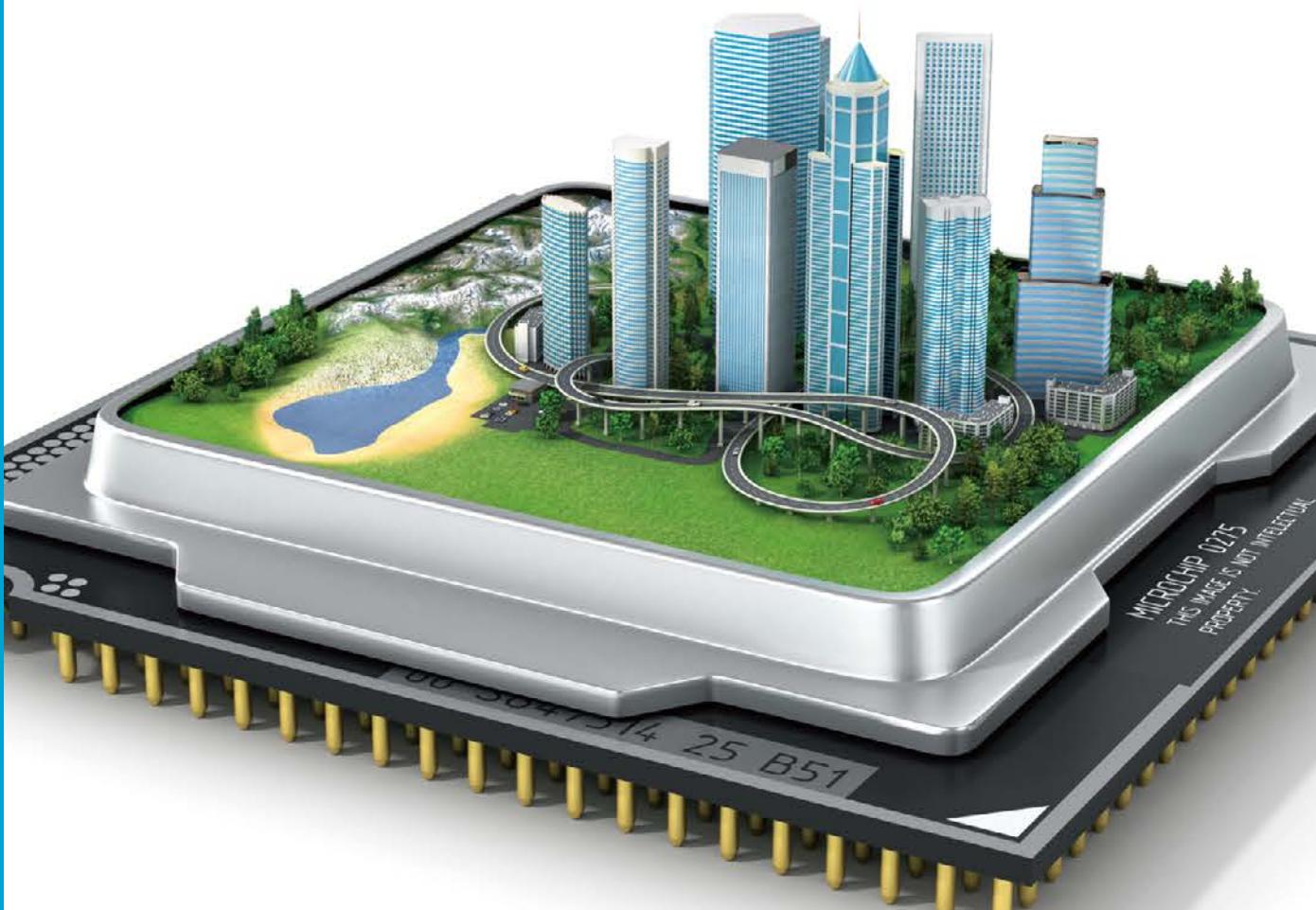
R&D expenses accounted for 5.7% of revenue, which demonstrates the importance of technology development is to NTC

90.5 points

The customer satisfaction rate score was 90.5 points which exceeded the target of 87 points set for the year

502 patents

Obtained 502 patents, a record high in recent years



53 R&D and Innovation

57 Customer Service

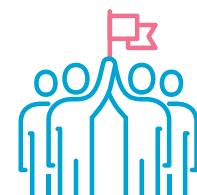
Strategy and Achievement

○ Unachieved ✓ Achieved ★ Surpassed

Material issues	Strategies	2019 Goals	2018 Targets	2018 Achievements	Target achievement status
R&D and Innovation	<ul style="list-style-type: none"> Design next-generation products Develop 10nm process technologies Entered the high-density server module market Smart factory 	Complete Critical Design Review of DDR5 products		New KPI in 2019	
		Complete verification of 10nm technology for product specifications and yield rate	Complete verification of yield rate for basic functions	Complete verification of yield rate for basic functions	✓
		Complete customer qualification for four main server customers.	1	1	✓
		Establish high-efficiency production lines with AI-assistance: Project completion rate: 40%	20%	20%	✓
Customer Service	<ul style="list-style-type: none"> Design and tests: Use global engineering support services to resolve customer design and test issues. Production and sales: Implement rigorous control of quality and improve delivery efficiency. After-sales services: Use the customer complaint management system to quickly resolve customers' issues 	Customer satisfaction score: 88 points	87 points	90.5 points	★
		Customer platform parameters measurement services: 920 cases	800 cases	1,074 cases	★
		Customer technical exchange and courses: 80 sessions	80 sessions	88 sessions	★

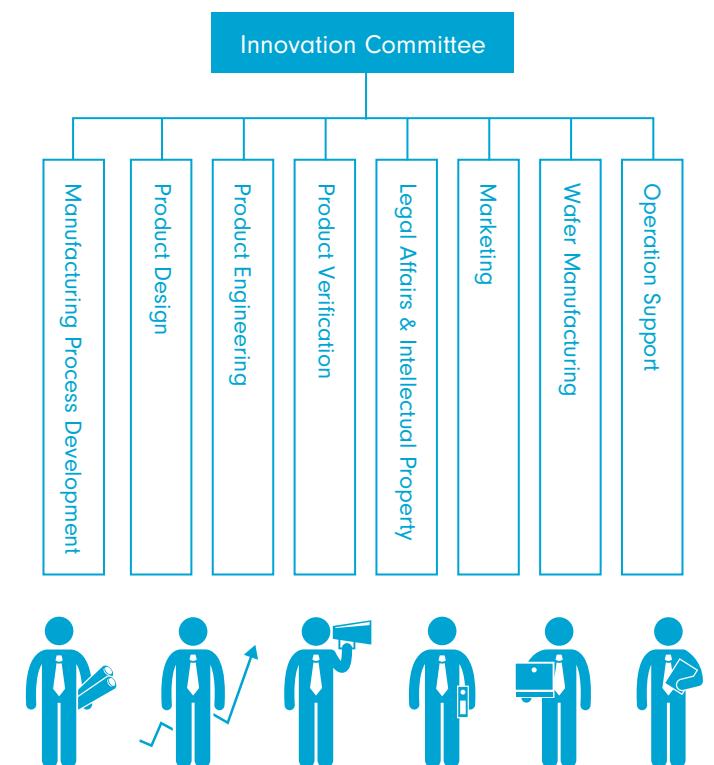
R&D and Innovation

Smart products have improved the quality of life for human beings and helped energy conservation & carbon reduction. Every year, NTC invests a lot of resources in technology development of new types of DRAM products, next generation processes, and advanced 3D stacked packaging, provides customers value-added services, and reinforces protection for intellectual property and trade secrets, accelerating the move towards product diversification and smart factory. Moreover, we have set a vision for innovative development to introduce 10nm DRAM process into mass production in 2021, develop next-generation DDR5 products, enter fast-growing markets (artificial intelligence (AI), data centers, automotive and the Internet of Things), and set up high-efficient production lines with an AI-aided system.



Innovation Committee

In order to implement innovation management, create a culture of innovation, and enhance the company's innovative energy and value, NTC especially set up the Innovation Committee, a cross-departmental unit, formed by the senior management and chaired by Executive Vice President (EVP). The Innovation Committee is positioned to coordinate and plan the overall innovation strategy, setting short, medium and long-term goals. The Committee holds regular meetings to review the progress of various major projects. Designs, mass production, and sales for three 20nm new products have been smoothly completed, and these products are the main products of the sales in 2018. In the meantime, the progress of 10nm DRAM development and verification of 20nm low power products have been achieved.



► Investment and Output of Innovative R&D

Unit: NT\$ billion

Item	2015	2016	2017	2018
Revenue (A)	43.8	41.6	54.9	84.7
Appropriation for Innovative R&D (B)	1.95	2.48	3.67	4.88
Investment in Innovative R&D	4.4%	6.0%	6.7%	5.7%
Total number of employees (C)	2,469	2,679	2,984	3,219
Total number of innovative R&D personnel (D)	289	312	430	501
D/C	11.7%	11.6%	14.4%	15.5%
Output of Innovative R&D	Number of patents awarded	259	478	471
				502

R&D of Low Power Consumption Products

At the stage of new product development that NTC starts considering the impacts on environment incurred by product life cycles, actively researching and developing new-generation low power DRAM products so as to reduce energy consumption of end electronic products and lower greenhouse gas emissions. If the 2-year new product life cycle is used to calculate the energy consumption of end electronic products in use, the low power DRAM products sold by the company in 2018 save approximately 701.02 million kWh on electricity consumption and reduce CO₂e emissions of 388,000 tons, making concrete contributions to a greener earth.

R&D Policy of Low Power Consumption Products

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

NTC continues developing advanced manufacturing processes, so the energy consumption of new generation products developed by new processes is less than about 15% than that of the previous generation.

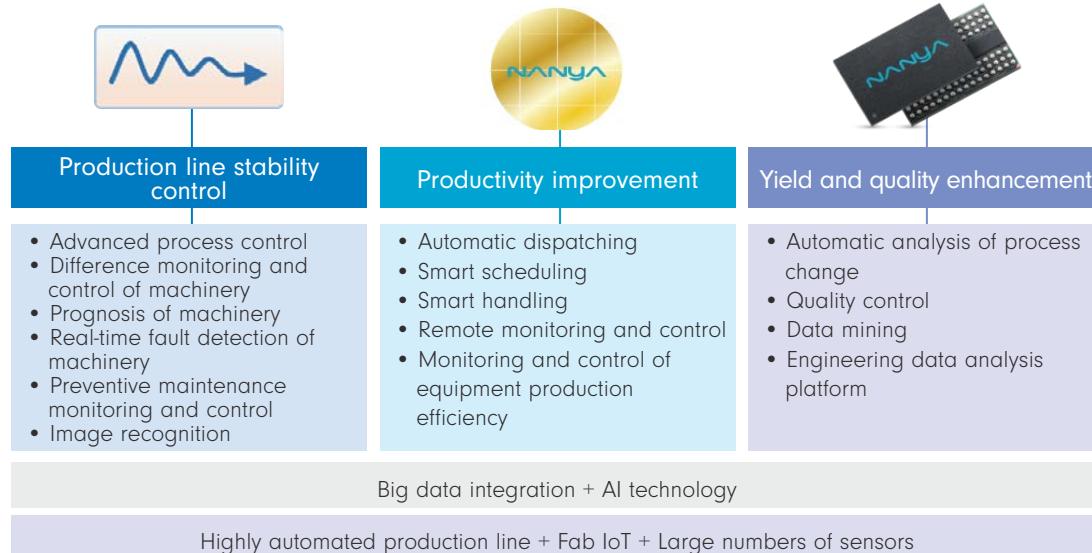
NTC Strengthens development of low power product lines and enlarges product portfolios in order to satisfy the need of various mobile devices and electronic products.

Smart Factory

In order to enhance manufacturing processes and capacity so that the production process and yields can be more smooth, currently, NTC has developed a number of innovative production line applications, including the prognosis of machinery, advanced process control, optimization of production schedules, projections of work in process, improvements in the efficiency of handling system, wafer probe testing, defect image recognition, and pattern recognition of wafer yield. These applications can effectively enhance the entire operational efficiency of production lines, so the efficacy of three important aspects, i.e. wafer output, yields, and qualities, is greatly enhanced. The current 12-inch wafer fabrication plant has all the necessary infrastructure that a smart factory requires, including highly automated production lines, Fab IoT, large numbers of sensors, big data integration, and AI technology.

In response to new-generation advanced processes and diverse product portfolios, NTC has set a three-year blueprint for AI development, planning long-term goals regarding five main topics: precision control of processes, optimization of production schedules, AOI quality inspection, yield analysis technology and prognosis technology of machinery, in order to enhance the overall efficiency and capacity of processes.

► NTC smart factory - three major applications

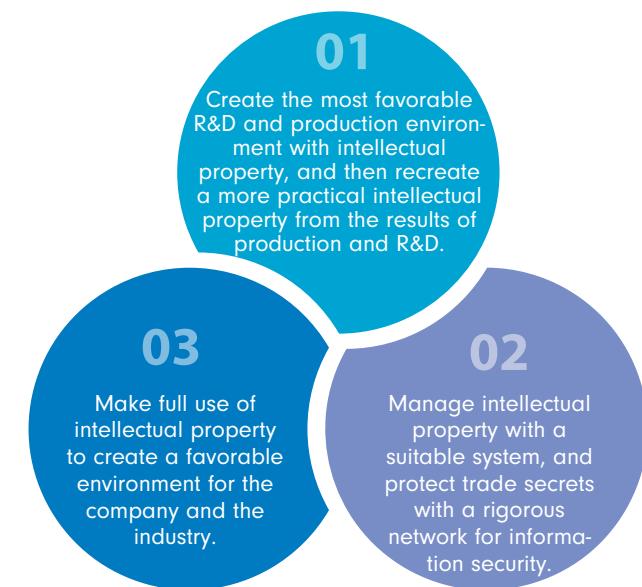


Nanya Technology has built a number of advanced intelligent systems, which are applied to three important links: production line stability control, productivity improvement, and yield quality improvement.

Status and Strategy of Intellectual Property

NTC has created many patents through the cooperation with world-class entities, technology transfer, and joint execution of R&D plans, and taken out these patents, which is hugely beneficial to R&D and production. Meanwhile, in relation to protection of our trade secrets and trademarks, we have also established a complete protection system. Moreover, regarding continuous profits and risk prevention, we have set up complete operating mechanisms.

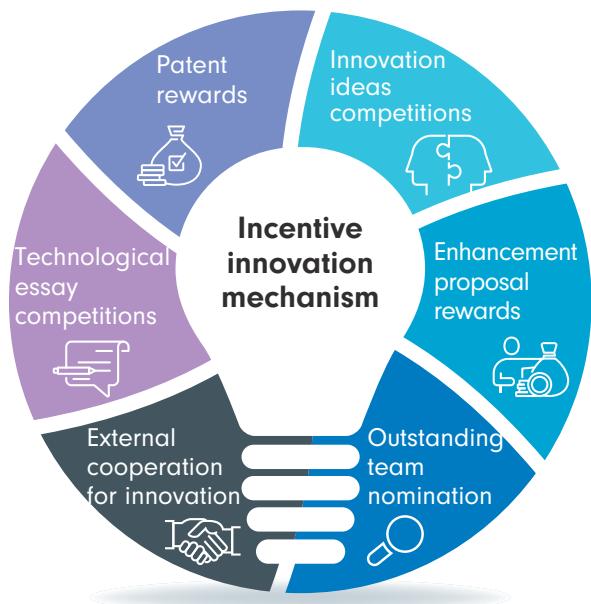
► NTC intellectual property strategy



In addition, in the face of increasingly intense business competition and challenges of globalization, the protection of trade secrets has become an increasing important subject for an enterprise to maintain its core competitiveness. Trade secrets include technology, methods, processes, recipes, programs, and design or other information that can be used in production, sales or operation, complying with the requirements for secrecy, economic value, and confidentiality measures that have been taken. In recent years, NTC has actively introduced advanced process technology, new product development, and innovative sales models, so the number of trade secrets has also increased year after year. In order to ensure NTC's long-term competitive advantages, NTC will introduce ISO 27001 Information Security Management system in 2019 to minimize the risk of leaks.

Incentives for Innovation

"Innovation" is the driving force for NTC's technological growth and competitiveness enhancement, serving as one of our core value as well. In recent years, we have constantly promoted various innovative activities, hoping that our employees will internalize the spirit of innovation. Every year, NTC holds innovative activities, such as patent rewards, creative competitions, rewards for improvement proposals, essay competitions, and the best team competitions, and cooperates with external entities on development of basic research and processes, launching open innovation programs annually in order to achieve the goals of product diversification and smart factory as soon as possible.



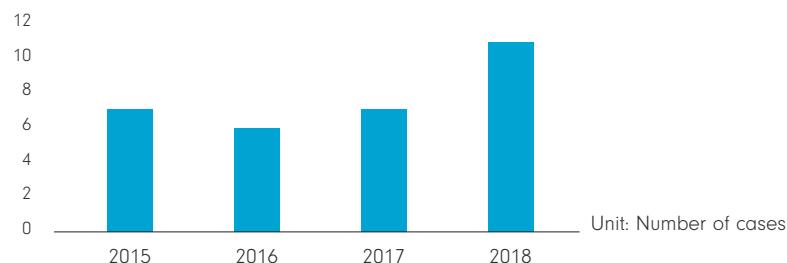
► Results of innovative activities

Unit of reward: NT\$

		2016	2017	2018	Description
Patent Rewards	Number of Patents Granted	478	471	502	NT\$ 50,000 for each granted patent.
	Rewards Issued	23,900,000	23,550,000	25,100,000	
Rewards for Improvement Proposals	Number of Proposals	44	47	51	After reviewed by the jury according to expected benefits, creativity, application range, level of completion, and quality contribution, rewards are issued based on the scores ranging from NT\$ 300~20,000.
	Rewards Issued	64,300	62,400	128,350	
Technological Essay Competitions	Number of Entries	47	46	58	1. The competition is held once a year, and each entry is award with NT\$1,000. 2. The competition is divided into two groups: technological essay group and practical creation group, and the top three and two honorable mentions are taken out from each group. The rewards for the top three are NT\$ 30,000, NT\$ 20,000, and NT\$ 10,000 respectively, while the reward for the honorable mention is NT\$ 5,000.
	Rewards Issued	180,000	177,000	196,000	
Best Team Competitions	Number of Entries	6	7	15	The competition is held once a year, and the top three and two honorable mentions are taken out. The rewards for the top three are NT\$ 90,000, NT\$ 50,000, and NT\$ 20,000 respectively, while the reward for the honorable mention is NT\$ 5,000.
	Rewards Issued	170,000	170,000	170,000	

We are also open to collaborative innovation, interact with external agencies to explore new territories. For example, professors from National Taiwan University, Chang Gung University and ITRI's Electronic and Optoelectronic System Research Laboratories worked together on the design of next-generation memory and foundation research, collaborated with manufacturers of masks and machine tools to develop processes and materials of the next-generation DRAM, teamed up with downstream system developers to expedite development of multiple application product through customization of wafer-class packaging. Over the past four years, 6-11 open innovation projects were launched. From 2018 onward, we will promote wider external collaboration in coordination with the development of 10nm-class process technology, product diversification and smart factories to ensure that our goals are achieved as planned.

► Open innovation program



Customer Service

NTC is committed to providing the best customer service and is convinced that quality and timely customer service are crucial to the maintenance of customer relationship. Good customer relationship will help us build customer loyalty, and the deeper the customer loyalty is the more business we are able to gain, helping to consolidate the good partnership with customers. Our vision is to become the best memory partner in the smart era as well as a service-oriented enterprise. Through close cooperation with MCU makers and customers, we strengthen product development and manufacturing in order to satisfy diverse requirements and provide customers comprehensive product and system solutions. We are committing ourselves to striding toward this goal.

► Customer Service Process



Product Design, Testing and Verification Stage

In order to improve the efficiency and frequency of customer service and effectively build close relationships with customers, the Field Application Engineering Division provides technical supports to customers in Taiwan, China, Southeast Asia, Europe, the United States, Japan and South Korea, organizing irregular technology exchange events to meet the technical needs of customers. In 2018, the Division held a total of 88 events, providing technical supports and assisting customers' engineering personnel to solve problems in design and testing.

In addition, through the highly efficient, intensive, and high-quality customer platform parameter measurement service, of which 1074 cases were completed in 2018, NTC assisted customers to understand the characteristics of their product platforms so that the new product development progress and verification cycles of customers were significantly accelerated, reducing investment risks and helping end products to be launched timely in the demand market.

Manufacturing and Sales Stage

NTC has been certified for ISO 9001:2015 and IATF 16949:2016 quality system. The Quality Assurance Division monitors and controls product quality as well as implements improvements, making sure that all production processes are fully optimized. Moreover, the Division includes each stage of production process into a good and tight control system so as to manufacture the products that meet customers' requirements. Sales personnel continuously communicate with our customers and weekly report customers' future forecasts to the headquarter. The head office consolidates the forecasts from global sales personnel before converting these projections into production plans through the production-sales system. Production plans are constantly adjusted based on the weekly feedback from our sales staff in order to make sure the production meets customers' needs.

After-sales Service Stage

NTC continue to enhance product quality and responding to customers' quality issues to meet their expectations. In order to accelerate the efficiency of problem analysis, NTC would fully understand the problems reported by customers first, provide failure analysis report to customers based on failure analysis plans, and replies customers with corrective actions and disposition when case closure. Through the cooperation among the divisions of Field Application Engineering, Quality Assurance, Product Engineering, and Manufacturing Process along with the process management conducted with a customer complaint handling system, over the years, NTC has been able to reply to over 90% of customers' complaints within target deadlines.

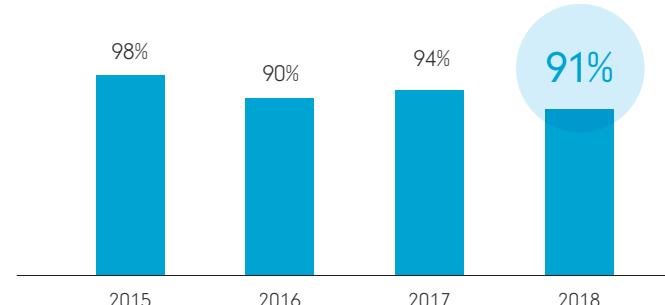
Customer Complaint Handling Process



TAT Meet Rate of RMA Cases

In 2018, NTC achieved to reply 91% of RMA cases within target deadlines. Those were not replied within deadlines mainly owing to new product technology, which increased the difficulty of failure analysis or required to work with customers for platform analysis, resulting in longer turnaround time. In the future, NTC will work with customers closely for continuous improvement.

► TAT Meet Rate of RMA Cases



Customer Privacy Protection

Customers are extremely important partners for NTC. Therefore, we are obligated to rigorously safeguard their privacy and confidential information as of our own. To ensure confidential information is well protected, NTC has formulated the Confidential Information Management Procedure. Regarding the documents provided by customers, after internal filing procedure and the confidentiality classification, these documents are archived in the document control center. In the future, if employees require access to these documents, they have to go through the document application procedure, and based on the level of document confidentiality and the purpose of use, receive approval from corresponding supervisors so that the document control center will authorize and distribute the documents to the applicants. In 2018, no case involving violation of customer privacy has happened. If a customer suspects or discovers evidences indicating leakage of information, a complaint can be lodged through the NTC Grievance Mailbox and Grievance Line.

Customer Satisfaction

NTC strive for continuous improvement, working in a practical way, with a spirit based on exceeding our customers' requirements in quality, delivery and service. In relation to customer satisfaction, NTC employs an impartial third-party consultancy company to conduct satisfaction survey for direct and end-customers through the internet or interviews, that NTC can understand customers' needs from a fair and objective perspective. The content of the survey includes the dimensions of "Product", "Delivery", "Quality", "Technical service", "Communication", "Commercial" and "Comparison with competitors". With regard low performance items, relevant departments are responsible to review and proposed corrective action. In addition, the results of customer satisfaction survey are submitted and reported at the top management meeting, while the sales personnel are going to reply customers with improvement results or continuous improvement plan, and continue to improve customer satisfaction. In order to improve customer satisfaction, NTC has established a review platform to give priority to handle and improve customers' requirements.

In addition to the customer satisfaction survey, Customers regularly conducts business and technical review meetings with NTC's service team, NTC is able to keep close relationships with customers and provide better service. We will commit ourselves to strengthening the collaborative cooperation among internal relevant divisions in response to urgent or sudden demands from customers. Moreover, we will continuously strive to improve product quality and the timeliness and efficiency of communication on quality issues with customers while keeping smooth communication with customers, making every effort to satisfy customers' requirements.

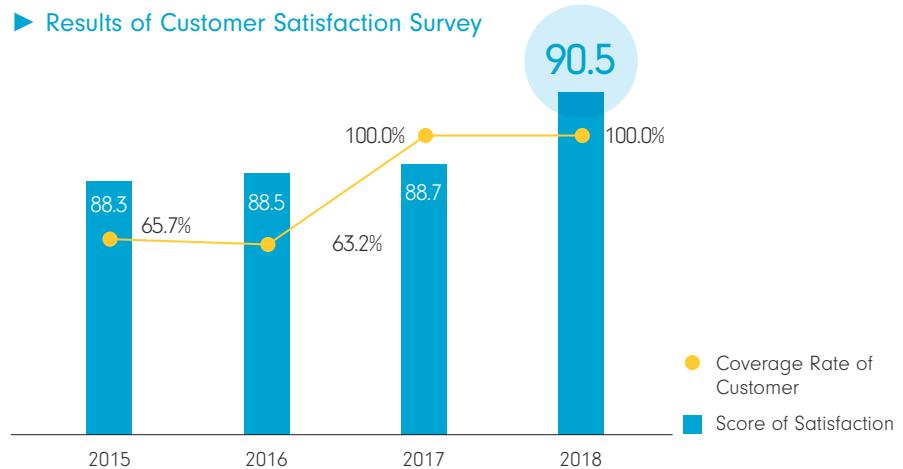
Procedure of Customer Satisfaction Survey



In 2018, the overall satisfaction average score is 90.5 points and exceeding the target of 87 points, the target score for 2019 is 88 points. The target setting of the customer satisfaction survey is to consider the fluctuation of the industrial characteristics and the annual regular review of the performance and benchmarking, and set a reasonable target, submitted to the President for approval by the Quality Assurance Division. In regard to the NTC's scores and the results of comparison with competitors, customers highly recognize the NTC's performance on delivery, technical service and communication, Mainly NTC assists the client in accelerating the verification of new products and technical exchanges during the product design, testing and verification phase.

In addition, there is still room for improvement in the performance of product technology capabilities and quality. Based on the supply and demand of the market and product application, we will strengthen customer communication and improvement with positive attitude, insisting on product quality control and improvement according to customers' feedback. This year, there was no product recall events.

► Results of Customer Satisfaction Survey



05

Responsible Procurement

A Promoter of Shared Value

Suppliers are NTC's most important partners. We aim to enhance cooperation to create greater value and share the value and benefits of cooperation towards the sustainable corporation.

100%

100% of key suppliers completed self-assessment questionnaire

8 outstanding suppliers

NTC evaluated suppliers of raw materials components and equipments, and hold annual supplier award ceremony.

100%

3TG minerals suppliers in the supply chain meet the requirements for conflict-free minerals.



61 Supplier Sustainability Management

68 Conflict Minerals Management

Strategy and Achievement

Unachieved Achieved Surpassed

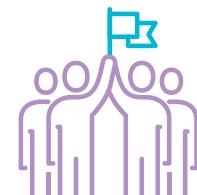
Material issues	Strategies	2019 Goals	2018 Targets	2018 Achievements	Target achievement status
Supplier Sustainability Management	<ul style="list-style-type: none"> Conflict Minerals Management: No conflict minerals have been used in any of NTC's products Supply chain risk management: Implement regular "quality, delivery, service, cost, technology, and sustainable management" evaluations for suppliers 	Use of conflict-free minerals for wafer product lines: 100%	100%	100%	
		Key suppliers' completion rate of the self-assessment questionnaire: 100%	100%	100%	

Supplier Sustainability Management

NTC Industrial Chain

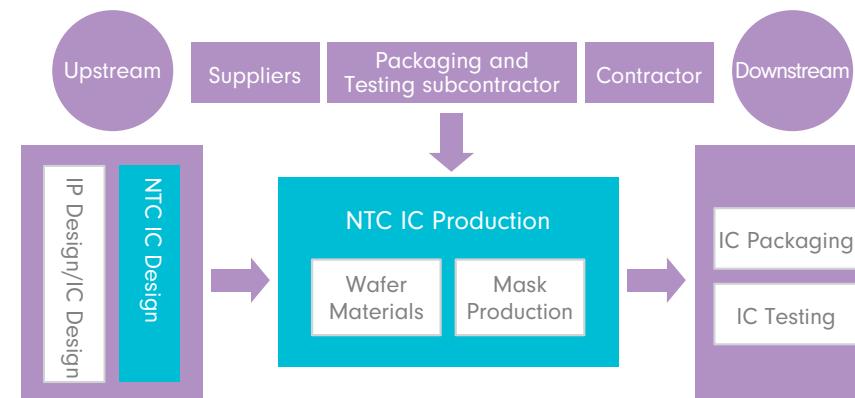
The IC industry (including DRAM) is categorized into upstream IC design, mask making/wafer materials, midstream IC production, and downstream IC packing and testing. NTC is committed to the research, development, design, production, and sales of IC products and we are primarily responsible for upstream IC design and midstream IC production in the industrial supply chain.

To reinforce the efficiency and frequency of customer service and to have a closer relationship with customers in the upstream product design and test verification stage, the head office, provides customers' technical solutions in various regions including Taiwan, mainland China, Southeast Asia, Europe, America, Japan and South Korea. We provide technical support and assist in solving the problems faced by the customer's engineering staff in design and testing.



The company continuously communicates with the customer in the midstream production and sales stage through weekly feedback of the customer's future demand forecast. The head office aggregates the needs of global business feedback and converts them into a production plan in the Company's production and sales system. It is continuously adjusted in accordance with weekly feedback from business staff to facilitate production and meet customer needs. We also integrate downstream suppliers in the industrial chain and form a comprehensive industrial value chain.

► Nanya Technology Corporation Industrial Chain



Supply Chain Overview

NTC's major suppliers can be categorized with "suppliers" and "Packaging and Testing subcontractors". Suppliers will be divided into two groups, providing production materials (direct/indirect/packaging materials) and non-production materials. Suppliers that provide production materials to the company are our major suppliers. There are 270 major suppliers in 2018 and 80 of them are key suppliers.

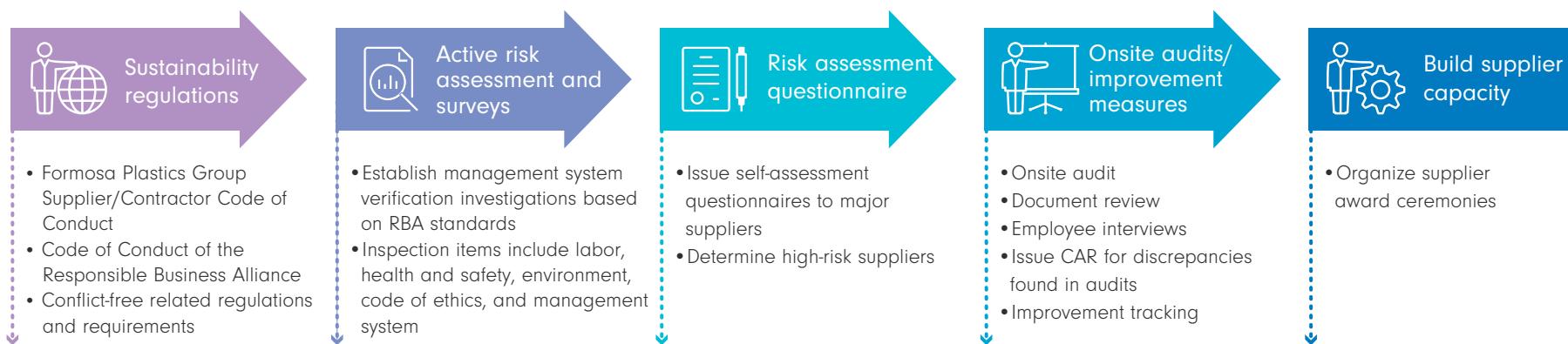
The procurement process is conducted through "open tenders" on the Formosa Technology E-Market Place which facilitate suppliers' online price inquiries, quotations, price negotiations, purchase orders, and delivery operations. NTC is committed to implementing sustainable business operations inside the company and working with suppliers outside the company to jointly construct a stable supply chain and achieve corporate sustainable development.

► Number of suppliers and proportion of procurement expenditures

	2017	2018
Number of major suppliers	350	270
Number of key suppliers	89	80
Proportion of key suppliers (%)	25.4%	29.6%
Proportion of procurement from key suppliers (%)	79%	77%

Sustainable Supply Chain Management

NTC believes that the sustainable management of supply chain requires complete and comprehensive mechanisms. We therefore established a supply chain management framework to use sustainability regulations, risk assessment, onsite audits/improvement measures and build supplier capabilities to promote sustainability of suppliers, improve the resilience of the supply chain, and manage supply chain risks. We seek to work with suppliers and become optimal partners for creating a sustainable future.



Signature of the "Letter of Compliance With Corporate Social Responsibility"

To demonstrate the importance of sustainable operations to suppliers/contractors, the company enacted the "Formosa Plastics Group Supplier/Contractor Corporate Social Responsibilities Letter of Compliance" (hereinafter referred to as the Letter of Compliance) and listed related sustainability regulations to ensure workplace safety of the supply chain, respect and dignity of workers, and accountability to the environment in business operations. The Letter of Compliance includes the Supplier/Contractor Code of Conduct established by Formosa Plastics Group, the RBA Code of Conduct, and related regulations and requirements for conflict-free minerals. Suppliers and contractors are required to acknowledge, understand, and abide by the corporate social responsibility regulations in the Letter of Compliance. We issued the Letter of Compliance to 270 (100%) major suppliers (including key suppliers) in 2018 and received back from 219 suppliers. The percentage of supplier signatures is 81.11%. Our target is 100% of the new suppliers and 80% of the existing suppliers in 2019.

	2017	2018	2019 goals
Major suppliers	Number of major suppliers	350	270
	Number of supplier signatures (cumulative)	211	219
	Percentage of supplier signatures (%) (2018 goal)	60.29%	81.11% (65%) 85%
New suppliers	Number of new suppliers	76	18
	Number of supplier signatures	18	18
	Percentage of supplier signatures (%) (2018 goal)	23.68%	100% (100%) 100%
Key suppliers	Number of key suppliers	89	80
	Number of supplier signatures	72	63
	Percentage of supplier signatures (%)	80.89%	78.75% 85%

Note: Major suppliers includes new and key suppliers

Supplier sustainability assessment

In terms of supplier selection, when suppliers that directly produce materials are introduced into NTC's supply chain, we implement rigorous evaluations and reviews in addition to related third-party certification for ISO 9001 and ISO 14001. We use digital supplier assessment and management system to conduct reviews on six major indicators including "quality, timely delivery, services, costs, technology, and sustainability management". The score for sustainability management indicators accounts for 10%. We seek to ensure compliance with the company's supply chain requirements, uphold sustainable development ideals, and jointly construct a sustainable supply chain with upstream and downstream suppliers by ensuring that suppliers meet all of the company's requirements for quality and sustainable development.

► Supplier sustainability assessment indicators



* : Sustainability contents

- Green environment evaluation items include the ISO 14001 certification, energy and resource conservation, greenhouse gas emissions reduction, and waste recycling ratio
- Corporate social responsibility evaluation items include compliance with local labor laws and regulations

Sustainability Risk Surveys and Assessment

NTC evaluates suppliers regularly each year for "quality, timely delivery, services, costs, technology, and sustainability management". We seek to discover potential discrepancies on the supplier's end and implement immediate improvements. The assessment results are provided to the procurement department for future procurement projects. We use quarterly reports and various ad hoc meetings to review annual assessment scores with suppliers and share various information to construct good and smooth communication channels. The Company also establishes online support and management systems as a platform for exchanging information with suppliers to ensure that suppliers completely adhere to the Company's requirements and standards. They include distribution of materials procurement and inspection regulations and designated personnel to respond to and process opinions reported by suppliers. We execute various continuous improvement projects for quality and develop qualified long-term suppliers. To prevent materials shortage and quality risks, NTC actively develops competitors for various materials. We also classify the impact of specific incidents such as earthquakes, fire, water/power shortage, materials/labor shortage, and quality issues on direct materials used for production (critical materials) into acceptable and unacceptable risks. We then use risk classifications to establish related recommendations for preventive and improvement measures to facilitate crisis response and take on the responsibilities for corporate sustainability.

To ensure the supply chain's implementation of internal management for sustainability, NTC distributes the "Nanya Technology Corporation Supply Chain Code of Conduct Questionnaire" to major suppliers in the fourth quarter of each year and requires all major suppliers to complete the questionnaire. Suppliers are required to report the implementation status of various sustainability issues and provide certification documents issued by related management systems. The results of the suppliers' self-assessment questionnaire shall be adopted as the basis of sustainability risk management and as reference for NTC's assistance to achieve supply chain sustainability. After the results of the questionnaires are analyzed, we screen 5% of high-risk suppliers for onsite audits. We request suppliers to explain the results of self-assessments and provide assistance for improvements.

We issued the self-assessment questionnaires to 270 major suppliers (including key suppliers) in 2018 and the completion rate is 100%. Based on our analysis, we identified 14 high-risk suppliers in 2018 and we have completed document review and onsite audits.

► Supplier sustainability risk assessment

		2017	2018	2019 goals
Major suppliers	Number of suppliers surveyed	350	270	
	Completion rate	63%	100%	100%
	Number of high-risk suppliers	5	14	
	Percentage of high-risk suppliers (%)	1%	5%	
Critical suppliers	Number of suppliers surveyed	89	80	
	Completion rate	64%	100%	100%
	Number of high-risk suppliers	4	1	
	Percentage of high-risk suppliers (%)	4.5%	1.25%	
Tier 2 key suppliers	Number of suppliers surveyed	43	32	40
	Completion rate	100%	100%	100%
	Number of high-risk suppliers	1	3	
	Percentage of high-risk suppliers (%)	2.3%	9.4%	

Note: Major suppliers includes critical suppliers

Supplier On-Site Audit

NTC has included RBA into the scope of the supply chain audit since 2015. We use self-assessment questionnaires and onsite visits to incorporate suppliers into the labor ethics system. We list suppliers that fail to reach qualification standards as high-risk suppliers based on the scores in their self-assessment questionnaires and we assign personnel to conduct onsite audits, provide assistance, and require improvements within a specified time. The annual RBA audits are conducted by audit teams that consist of human resources and EHS departments. They perform onsite compliance audits and document reviews.

In 2018 we conducted 25 suppliers'onsite audits.(14 suppliersfrom self-assessment questionnaire results, 12 suppliers from quality evaluation results, and one of them belongs to both.) We discovered 39 non-compliant items and issued Corrective Action Requests (CARs) for follow-up..In addition to suppliers, NTC also included packaging and testing subcontractors into the scope of the RBA audit. We completed the audit for all (4) packaging and testing subcontractors. The improvements are expected to be completed in 2019.

► Sustainability audit table

		2016	2017	2018	2019 goals
Numbers of audited suppliers		12	8	25	15
Average audit score	-	89.37	90.4		
Non-compliant audit item	3	20	39		
Category and number of violations	Labor ethics	-	<ul style="list-style-type: none"> • 1 instance of forced labor • 4 penalty records • 4 items involving work hours and wages • 3 items involving training and education • 1 item involving personal information protection • 2 items involving discrimination • 1 item involving the management system 	<ul style="list-style-type: none"> • 1 instance of forced labor • 2 penalty records • 7 items involving work hours and wages • 1 item involving training and education • 3 items involving discrimination • 3 items involving child labor/youth labor • 2 items involving information security • 1 item involving female night shift • 1 violation of labor regulations 	
EHS	3 violations of environmental regulations		<ul style="list-style-type: none"> • 2 violations of EHS regulations • 2 instances of operation management irregularities 	<ul style="list-style-type: none"> • 4 items involving fire safety • 8 items involving labor safety operation management • 6 items involving public website environmental information updates 	
Improvement rate	100%	100%	100% (Note 1)	100%	100%

Note 1: 100% improvement plans proposed; 89% plans completed

Supplier Quality Evaluation and Audits

Supplier Quality Evaluation

We evaluated the performance of suppliers in 2018 and 78 suppliers took part in the evaluation. The results were as follows: 52 suppliers were ranked as Class A suppliers (higher than 90 points); 23 suppliers were ranked as Class B suppliers ($80 \leq - < 90$ points); and 3 suppliers were ranked as Class C suppliers ($70 \leq - < 80$ points). To ensure the outstanding performance of NTC's raw materials suppliers in terms of quality, services, and process capabilities, the Company determines the list of suppliers for onsite audits based on the importance of materials, stability of quality, and results of annual evaluations.

Note:

1.Explanation for supplier performance evaluation ratings

Class A suppliers: Class A suppliers are listed as excellent suppliers as procurement references/ suppliers classified as Class A for three consecutive years may be excluded from the audit plans in the following year

Class B suppliers: NA

Class C suppliers: Request improvements (meeting, written, or audit)

Class D suppliers: Discuss whether to remove their qualifications as qualified suppliers in the MRB

2.Results of supplier performance evaluations in the most recent three years:

- We evaluated the performance of suppliers in 2018 and 78 suppliers took part in the evaluation. The results were as follows: 52 suppliers were ranked as Class A suppliers (higher than 90 points); 23 suppliers were ranked as Class B suppliers ($80 \leq - < 90$ points); and 3 suppliers were ranked as Class C suppliers ($70 \leq - < 80$ points).
- We evaluated the performance of suppliers in 2017 and 76 suppliers took part in the evaluation. The results were as follows: 35 suppliers were ranked as Class A suppliers (higher than 90 points); 35 suppliers were ranked as Class B suppliers ($80 \leq - < 90$ points); and 6 suppliers were ranked as Class C suppliers ($70 \leq - < 80$ points).
- We evaluated the performance of suppliers in 2016 and 74 suppliers took part in the evaluation. The results were as follows: 69 suppliers were ranked as Class A suppliers (higher than 90 points); 5 suppliers were ranked as Class B suppliers ($80 \leq - < 90$ points)

Supplier Quality Audit

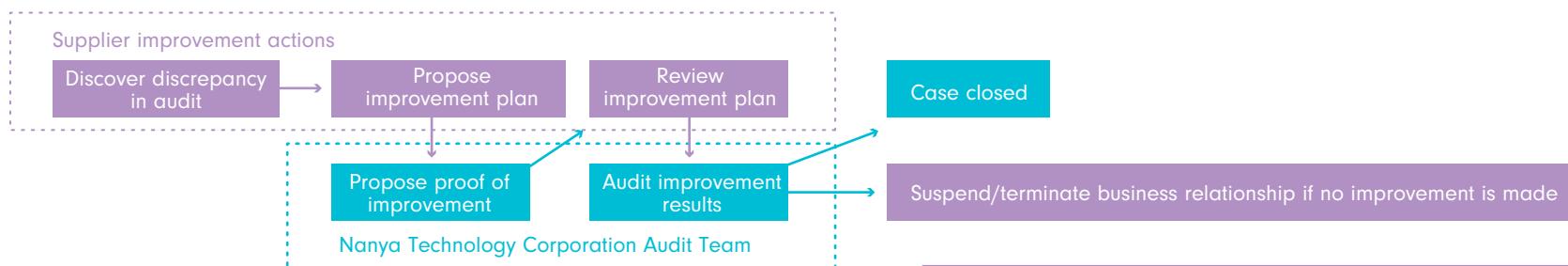
NTC will arrange annual quality audits in order to improve suppliers' quality and sustainability capabilities. We will also provide them with assistance and recommendations to enhance growth in the entire supply chain.

We completed onsite audits for 12 suppliers in 2018 focusing on 15 quality system-related aspects. We formed an audit team that consisted of the Company's employees (including personnel for quality management, materials, environmental safety, and engineering) and conducted onsite audits. We discovered 40 items that required improvements and all suppliers have completed the improvements.

► Quality audit statistics table

Results of audits in the past three years				
	2016	2017	2018	2019 goals
Number of audits	22	16	12	17
Average audit score	79.8	80.8	86.0	-
Number of defects discovered	101	61	40	-
Improvement rate	100%	85.2%	100%	100%
Common discrepancies	Poor instrument calibration traceability, failure to complete manufacturing process in accordance with standard procedures, and product appearances that did not match labels.			

► Supplier discrepancy improvement and management procedures (eCAR follow-up management system)



Building Supplier Capabilities

In order to implement sustainability requirements in daily management of the supply chain, we establish the Material Review Board(MRB), make evaluations, conduct audits, and hold annual award ceremony. The evaluation items include supply chain performance, quality system, customer satisfaction, delivery time, and environmental safety.

NTC will hold CIP Review Meeting with suppliers based on the evaluation results each year. In the meeting we will ask the suppliers to meet our requirements and advocate the related issues on sustainability. Moreover, we will hold Annual Supplier Award Ceremony to deliver our goals and requirements on quality, technology, delivery time, services, and costs. In 2018 we made supplier assessment for suppliers of raw materials, components, and equipment and presented awards to 8 outstanding suppliers.



2018 Supplier Award Ceremony

Sustainable Supply Chain Development Project

1.Sustainable supply chain - social aspect: Packaging and Testing subcontractors immigrant worker human rights risk assessment
4 subcontractors participated in the assessment and one of them is not qualified. The improvement plan is as followed.

Sustainable Supply Chain Strategy & Project

Sustainable Supply Chain Strategy

We are responsible corporate citizens and act proactively to ensure that operation meets professional and ethical standards. We also believe that long-term operation and success depend on the sustainable development. Suppliers are our important partners and we will cooperate with all suppliers to establish a stable and sustainable supply chain.

NTC's commitments:

- Use conflict-free minerals and all procurements are in accordance with green product specifications.
- Comply with the principle of fair trade and comply with relevant laws and regulations to protect human rights, emphasize on the importance of physical and mental health and safety of workers, protect the environment and carry on the social responsibilities.
- Uphold the principle of integrity and promise to take corporate social responsibility in procurement activities and pursue sustainable development.

Planned Schedule	Item
2019/1	Immigrant worker commission issue management
2019/2	Define and establish procedures for the ban on commission payments
2019/4	Reimburse all excess payments
2019/5	Complete RBA VAP

2.Sustainable supply chain - environmental aspect: Packaging and Testing subcontractors and supplier's product environmental footprint inventory

Packaging and Testing subcontractors are our most important partners. The company has advanced product environmental footprint inventory since 2018 and required 1 subcontractor and 1 supplier to complete the life cycle inventory of our memory products. In 2019 we will ask our key subcontractor to make the inventory constantly.

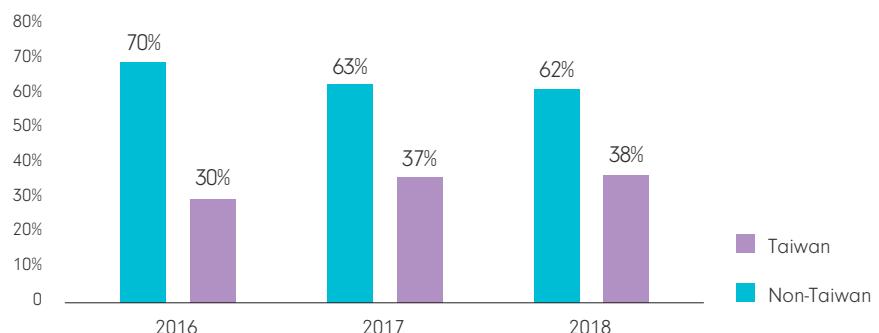
The results of the environmental footprint survey of subcontractors in 2018 show that most of the environmental impact is mainly from the use of power in the manufacturing, followed by the gold line in the raw material acquisition stage, solder ball, liquid nitrogen and tap water. It can be improved by the energy-saving mechanism. In 2019, we will require key subcontractors to conduct product environmental footprint inventory constantly.

The results of the company's 2017 product environmental footprint inventory indicated that the use of wafer is an important cause of environmental impact. For the company's key suppliers, we require them to cooperate in the product environmental footprint inventory in hopes of finding out the source of environmental impact in their plants and help reduce the impact on the environment.

Local Procurement

NTC prioritizes local procurement to facilitate stable development and cooperation with suppliers, provide faster service time, shorten delivery time, reduce unnecessary costs, and reduce the impact on the environment. However, as semiconductor equipment and technologies mostly involve foreign production or international collaboration, most of the materials used in the semiconductor industry are still produced in foreign countries. This has led to larger foreign procurement compared to domestic procurement. NTC shall continue to cooperate with local suppliers to expand procurement and employment opportunities in Taiwan and create greater value in partnerships with suppliers.

► Percentage of local materials procurement in 2016-2018



Conflict Minerals Management

NTC is committed to an accountable procurement management strategy for the ban on conflict minerals to satisfy current and future market, legal, and regulatory expectations. We aim to meet requirements for the ban on conflict minerals and bear responsibilities specified by the Responsible Business Alliance (RBA) and satisfy the Responsible Minerals Assurance Process (RMAP). NTC's four Subcontractors and six materials suppliers have completed investigations on conflict minerals in their supply chain and confirmed that 100% of the 43 minerals suppliers in the supply chain meet requirements for the ban on conflict minerals and made substantive contributions to the environment and the industrial supply chain.

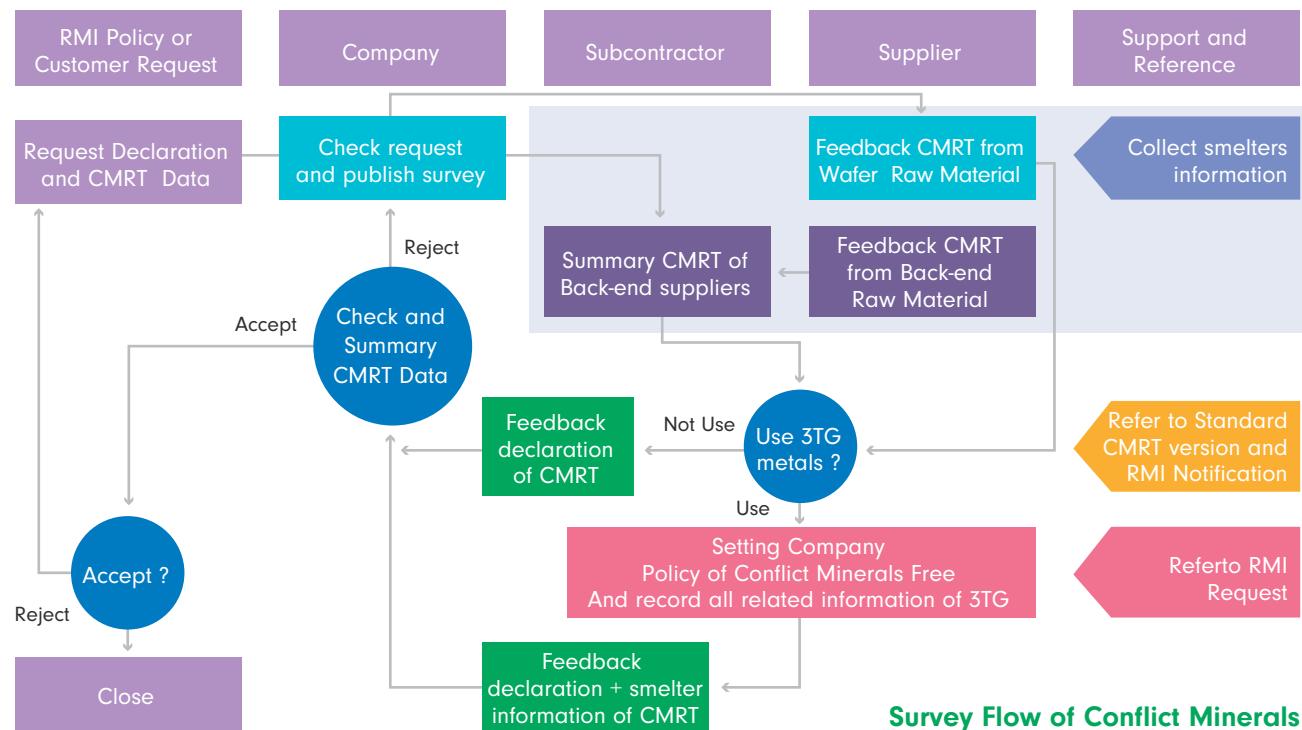
Suppliers that used raw materials containing 3TG shall comply with the Company's policies and use the Conflict Minerals Reporting Template (CMRT) as an investigation tool for 3TG investigation results to ensure that the supply chain does not participate in illegal financing of warlords or armed militants or violate basic human rights. Among the minerals used in our products, approximately 10% minerals sourced of the gold, tantalum, tin, and tungsten (referred to as 3TG) might come from the Democratic Republic of the Congo (DRC) or adjoining countries. They are also might source from recycled or scraps .

We do not directly purchase raw or unrefined 3TG minerals, nor do we purchase illegal minerals from the Democratic Republic of the Congo, neighboring countries or other conflict zones to ensure our supply chain does not directly or indirectly finance illegal organizations. All products of NTC have been confirmed, and the procurement process adheres to the principle of responsible mineral procurement, and no conflict minerals have been used.

► The Company's current 3TG applications are as follows:

Metal name	Applicable product	Application category
Gold	IC	Gold bonding wire
Tantalum	wafer	Wafer manufacturing target
Tin	IC	Solder paste, solder ball, tin wire
Tungsten	wafer	Wafer manufacturing target

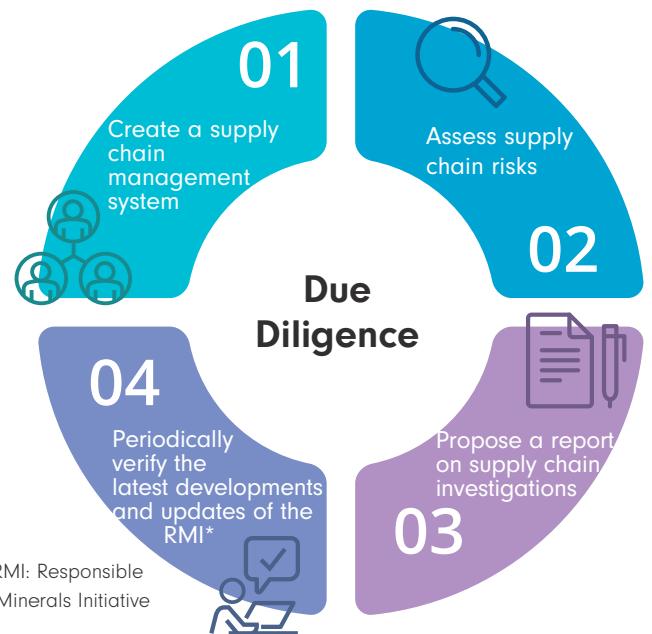
► Procedures for the Management of Conflict Minerals



Investigation Preparation

NTC's supply chain maintains multi-level supply chain relations with the raw ore. Before investigations, we shall inspect the supply chain materials and define the applicable classification of 3TG in the Company's products. We will screen out the suppliers that need to conduct conflict mineral investigations. use the standard survey tools defined by the Responsible Minerals Initiative (RMI) to obtain an up-to-date list through a series of surveys conducted by suppliers.

Due Diligence

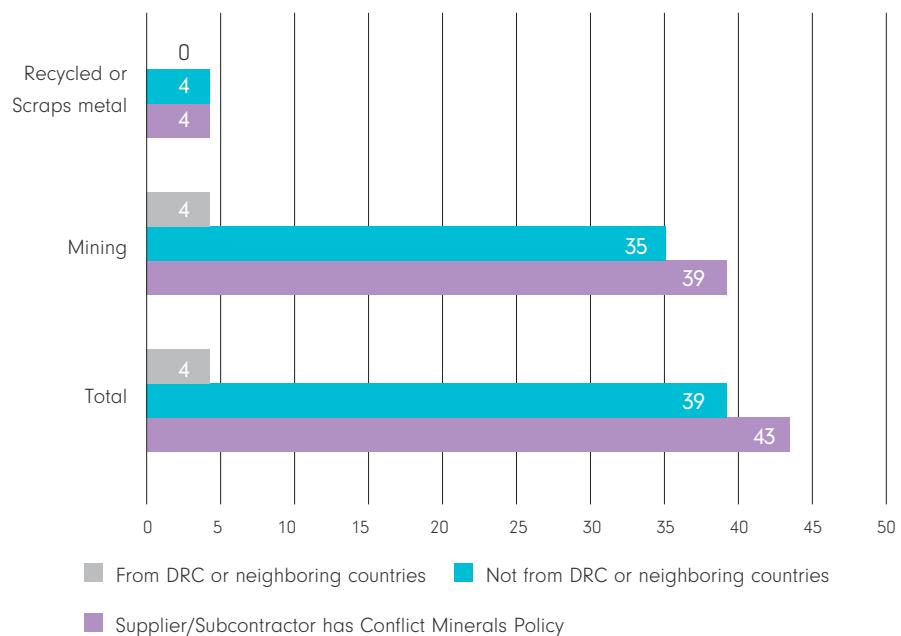


Corresponding Product Categories for 3TG Minerals and Investigation Data

NTC currently supplies Niche Type SDRAM product. According to due diligence investigations in the supply chain and comparison with the list of qualified smelters of the Responsible Minerals Initiative (RMI), and there are 43 suppliers of metal materials. (100%) Reply to the 3TG metal source.

And 43 smelter survey information was identified in the supply chain survey:

► Source of 3TG minerals procurement



NTC will continue to follow up the Responsible Minerals Assurance Process (RMAP) policy to conduct due diligence and reduce supply chain risks.



06

Cleaner Production

A Producer of Green Technology

Nanya Technology Corporation actively manages energy, resources, emissions, and waste. We also adopt higher standards than regulations to avoid or reduce the impact on the environment. We pursue sustainable business performance and fulfill our responsibilities for green production and environmental protection.

Leadership

Achieved A- rating in the CDP's Climate Change Evaluation

93.5%

Annual average process water recovery ratio

22%

Reduce greenhouse gas emissions by 22% for every NT\$1 million in revenue.



74 Eco-Friendly Products

80 Greenhouse Gas Management

86 Energy Management

88 Water Management

90 Emissions, Waste, and Recycling

Strategy and Achievement

○ Unachieved
 ✓ Achieved
 ★ Surpassed

Material issues	Strategies	2019 Goals	2018 Targets	2018 Achievements	Target achievement status
Eco-friendly products	<ul style="list-style-type: none"> Technology improvements: Mass production of 20nm process to reduce chip power consumption and extend mobile device usage time Consider product life cycle: Consider the environmental friendliness of products on the environment Hazardous substance management: Continue to promote replacement plans for hazardous substances in the production process 	Ratio of 20nm and other advanced processes: More than 70%	65%	68.7%	✓
		Product's Life Cycle Assessment: 100%	100%	100%	✓
		Products meet hazardous substance free standards: 100%	100%	100%	✓
		Materials contain zero perfluorooctanoic acid (PFOA) or related substances: 100%	100%	100%	✓
Greenhouse Gas Management	<ul style="list-style-type: none"> Energy conservation and carbon emissions reduction: Set short, medium, and long-term goals and actively implement related management measures. Low-carbon manufacturing: Commit to improvement in production technologies and reduce greenhouse gas emissions in the production process. 	Reduction of greenhouse emissions per unit of product: 5% (base year of 2017)	2.5%	2.5%	✓
		Reduction of Perfluorinated emissions per unit of die: 30% (base year of 2015)	30%	32%	✓
		Reduction rate of Perfluorinated emissions : more than 90%	90%	90%	✓
Energy Management	<ul style="list-style-type: none"> Implementation of energy conservation measures: Implement ISO 50001 Energy Management System for systematic management and improve the efficiency of energy usage. Innovative applications: Use external exchanges or training to obtain the latest energy conservation technology or energy-saving methodology. 	Per unit production capacity (GEC, equivalent to 4Gb chips) power consumption <0.66 MWh/kpcs	0.7MWh/kpcs	0.68MWh/kpcs	✓
		Cumulative energy saved with new energy saving measures from 2017 to 2019: More than 21,000MWh	14,000MWh	14,717MWh	✓
Water Management	<ul style="list-style-type: none"> Response to risks: Establish backup water sources and water storage tanks and use emergency response organization between company plants to coordinate water usage. Wastewater recycling and reuse: Establish wastewater collection processing and adopt different multiple recovery and reuse to improve the water recovery rate. Water usage reduction: Conserve water through daily management. 	Per unit (GEC, equivalent to 4Gb chips) water consumption <3 ton/kpcs	3.5 tons/kpcs	3.2 tons/kpcs	✓
		Annual average process water recovery ratio: More than 94.0%	90.0%	93.5%	✓
		Production loss due to water limitation: 0 wafer (pieces)	0	0	✓
Emissions, Waste, and Recycling	<ul style="list-style-type: none"> Circular economy: Increase waste recycling and reuse rate to use resources effectively. Source reduction: Continue to promote waste reduction and increase waste recycling rate. 	Apply the Isopropyl alcohol re-use program and is expected to increase its reuse by 85% compared to 2017.	80%	83%	✓
		Maintain waste recycling rate above 97%	97%	97.9%	✓

Eco-Friendly Products

NTC formulated performance indicators of environmental safety and hygiene, promoted various projects of waste reduction, resources reuse, and greenhouse gas reduction, and established Green Product Promotion Committee to conduct Green Product Management. Our aim is to jointly protect the green earth so we have developed advanced and highly efficient eco-friendly products, which not only have helped customers develop low energy consumption design, but also have engaged in hazardous product management and conflict minerals management through our influence on supply chains. In order to continue to enhance the environmentally friendly level of products, NTC introduced Life Cycle Thinking (LCT) and Design for Environment into the company, considering environmental impacts of purchasing, manufacturing, transportation, product use, and disposal/recycling from the start of product development, so as to identify improvement opportunities to increase environmental benefits.

► NTC green design matrix

	Purchasing	Manufacturing	Transportation	Product use	Disposal recycling
Energy efficiency	●	●	●	●	
Greenhouse gas	●	●	●	●	
Material reduction	●	●	●		
Conflict minerals	●				
Hazardous substances	●	●		●	
Waste reduction		●			●
Water resources reduction	●				



Environmental External Benefits

When new products are developing, impacts on environment of complete life cycles are considered. To electronic products, the energy consumption in use is one of the most significant indicators in environmental impacts. NTC actively researches and develops low energy consumption products, and assist customers lower demand for energy when they use electronic products, so that greenhouse gas emissions can be reduced.

701.02 million kWh electricity saved

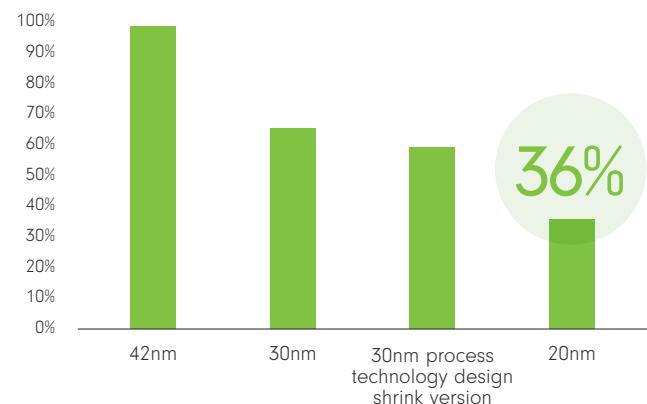
- Product: low power DRAM and 20nm consumer DRAM
- Scope: total sales volume of 2018
- Calculation: products are assumed to have 2-year new product life cycle as well as ways of use
- Benefits: electricity conservation and carbon reduction

Low Energy Consumption Design

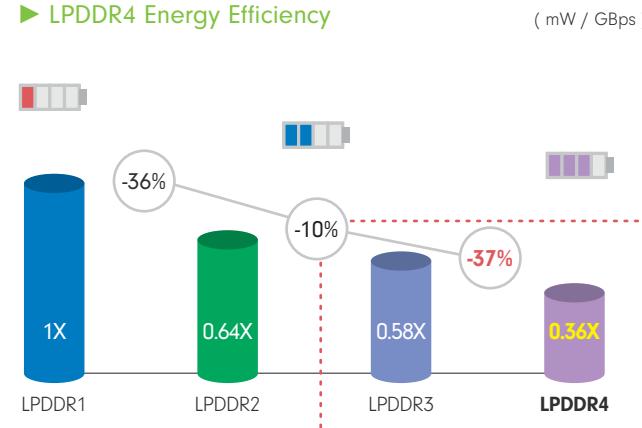
The products of low power DRAM and 20nm consumer DRAM sold by NTC in 2018 had lower working voltage and electric current than those the previous generation had, so the energy consumption was less than that of the previous generation. Based on the measurement of 2-year product life cycle and electronic product use, electricity consumption could be saved approximately 701.02 million kWh (2.5×10^9 Megajoules (MJ)) and CO₂ emissions could be reduced 388,368 tons yearly. If yearly CO₂ absorption of the Daan Forest Park was 389 tons (according to the Bureau of Energy, MOEA), the electricity consumption saved by the products was equal to CO₂ absorption of 998 Daan Forest Parks, located in Taipei.

Driven by the demand for smartphone memory upgrade, LPDDR4 (low power double data rate memory) became the mainstream supply for mobile DRAM in 2017, and in 2018, LPDDR4 series reached over 50% of the market share. Moreover, the price difference between LPDDR4 and LPDDR3 was below 5%, so it also accelerated the introduction of LPDDR4 series. In 2018, LPDDR4 officially replaced LPDDR3 as the mainstream adoption of mobile DRAM in 2017. In 2016, NTC started the plan of research and development as well as efficacy of LPDDR4, reinforcing product features, and developing high density products to meet specification requirements and product features of PC and consumer markets. In 2018, NTC successfully developed the only domestic DRAM plant with 20nm process technology, and designed the first product of 4Gb LPDDR4 Mobile DRAM with 20nm process technology domestically. In the past, LPDDR2 could save approximately 36% working voltage compared to LPDDR1, and LPDDR3 could further save 10% working voltage compared to LPDDR2. When compared to LPDDR3, LPDDR4 could save 37% working voltage. In general, LPDDR4 could save 64% working voltage compared to LPDDR1, which helped a lot with energy savings in mobile devices.

► Use advanced technology to optimize chip sizes



► LPDDR4 Energy Efficiency

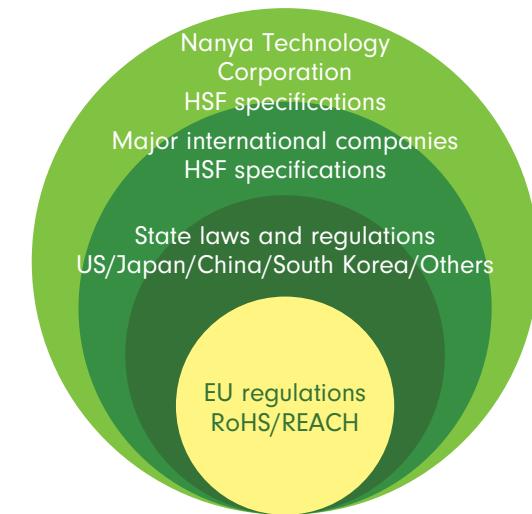


*Source : SEC

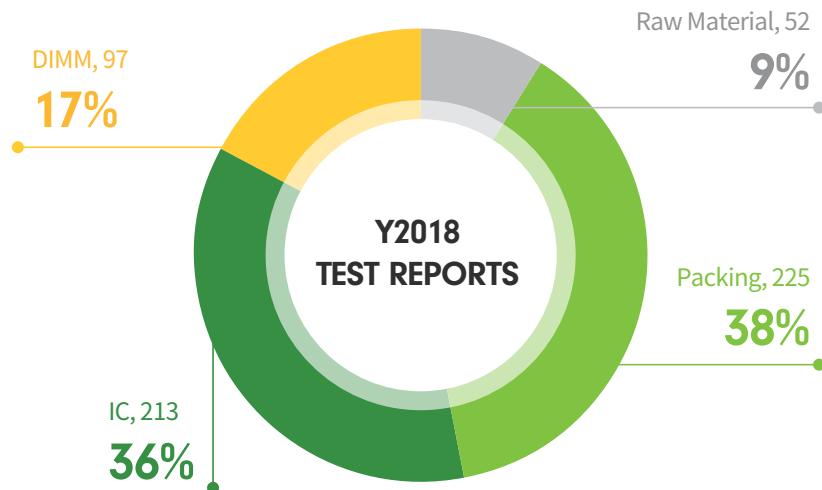
Note: 1. Left Chart – Based on the size of the 42nm process product. The higher level of advanced process technology is used, the smaller the chip size.
 2. Right Chart – Sources from the Micro-Electronics Magazine.

HSF product

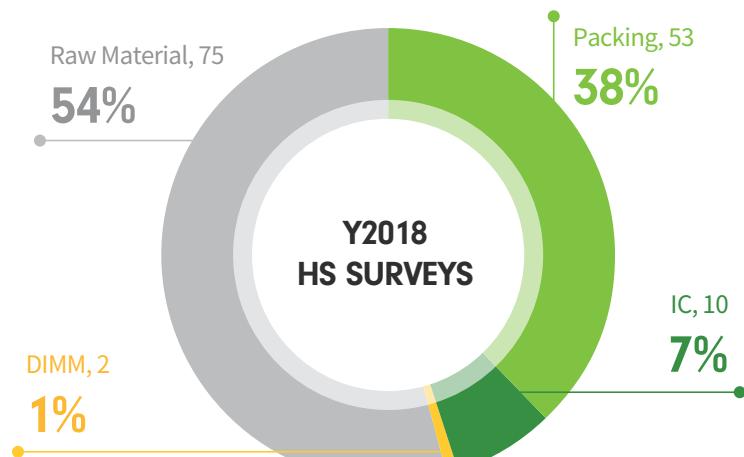
In 2005, NTC established the Green Product Promotion Committee (GPPC) to promote hazardous substance free (HSF) management. During the product manufacturing process, NTC continued to prevent pollution, save energy, reduce wastes, and avoid hazardous substances. Through concatenating suppliers of raw materials, process materials, Back-end IC Assembly materials and Product packaging materials, NTC built an effective green product supply chain with upstream and downstream suppliers in the supply chain so as to conform to the laws and regulations of current global environmental protection trend. Through GPPC, we referred to laws and regulations of the EU and countries in other regions and the hazardous substance management specifications of major international customers to stipulate the General rules for "Environment-related to be Controlled" substances in Parts and Materials, continuing to effectively control and manage the sources of raw materials and related materials in order to achieve the standards of green products and mitigate impacts on natural environment during manufacturing process of products. Under the instruction of the General rules for "Environment-related to be Controlled" substances in Parts and Materials, all of NTC's products needed to conform to international regulations such as RoHS, REACH, Directive of Packaging and Packaging Waste (PPWD) and WEEE as well as customer's requirements. Moreover, through the establishment of HSF management system of materials, we ensured that the wafers produced by the NTC and Back-end IC assembly products would conform to the international regulations and related specifications of customers towards HSF management.

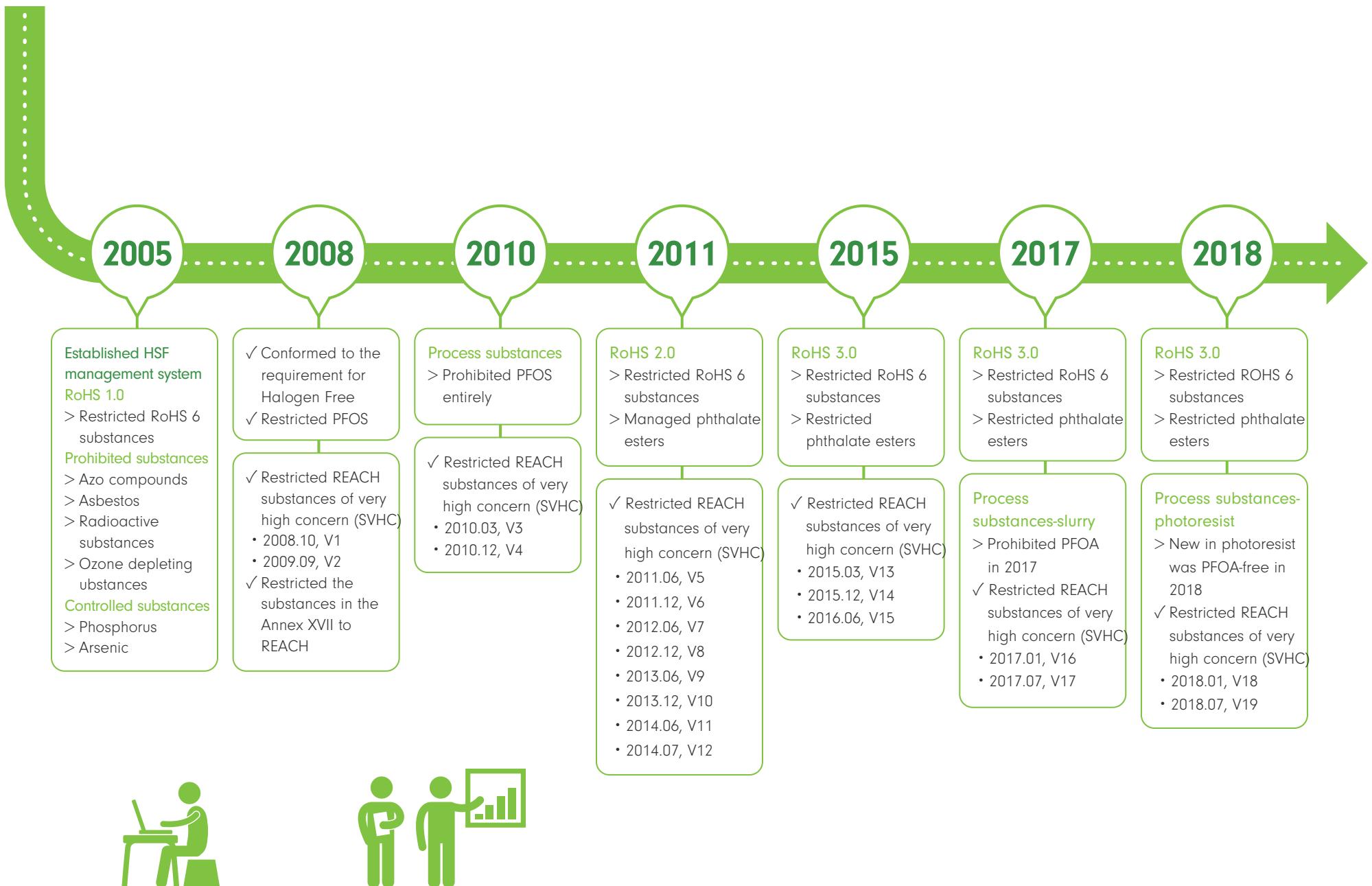


► RoHS report items of 5 Subcontractors and 42 raw material suppliers were reviewed while 587 RoHS reports were reviewed. The completion rate was: 100%



► Two versions of REACH SVHC item survey (REACH SVHC V.18, V.19) were completed while 140 hazardous substances survey reports were reviewed. The completion rate was: 100%





Use of Raw Materials

In addition to recycling raw materials for reuse, the company reviewed the rationality and appropriateness of raw material use as well. Moreover, through streamlining the manufacturing process, the company could reduce the use of raw materials. The responsible organization of the company set implementation goals for raw material reductions every year, and periodically reviewed the performance of reductions in the entire company's raw materials. Accumulative 20 entries in improvement proposals regarding the consumption of raw materials were completed in 2018, including formula development of new processes, reductions of process time, extensions to use cycle, and reductions of process consumption. Among the improvement proposals of 2018, the reformation of atomic layer deposition equipments yielded the most benefits through changing the timing process to the concurrent process, and using concurrent design to reduce the consumption of raw materials by 30%.

► Improved performance of raw material consumption



During the manufacturing process, control wafers were required to monitor process conditions, and used control wafers were repeatedly reused through re-fabrication. Each control wafer was expected to be reused for around 7.5~11 times (differences exist owing to various processes). Therefore, the cost of purchasing brand-new control wafers was saved while plenty of waste output was reduced. Packaging materials for product shipments to outsourced testing facilities or packaging facilities, such as cartons, outer cartons, cushioning materials, and wafer cassettes, were recycled and reused as many as possible. Moreover, wafer cassettes used by raw material for wafer were also recycled and reused in product shipment, and the reuse rate of these cassettes were nearly 100%. This approach could reduce the consumption of approximately 22,000 pieces of brand-new 12-inch wafer cassettes every year, equal to reduced consumption of 99 tons of plastics. In response to the action of recycling and reductions, the company's own warehouses of finished products started with recyclable packaging materials. Reusable packaging materials used in supplementing finished products were recycled to be used in product exchanges for customer complaints, product storage, and commissioned work to reduce the times of application and purchase, further achieving the action of recycling for reuse and reductions of packaging materials. In addition, the cost of packaging materials used could be reduced.

► Use and output of raw materials

The diagram illustrates the flow of raw materials. It starts with 'Production raw materials' listed in the 'Input' section, which then flows into a central circle labeled 'NTC FAB'. From 'NTC FAB', the flow continues to the 'Output' section, where it is categorized into 'Product' and 'Yield'.

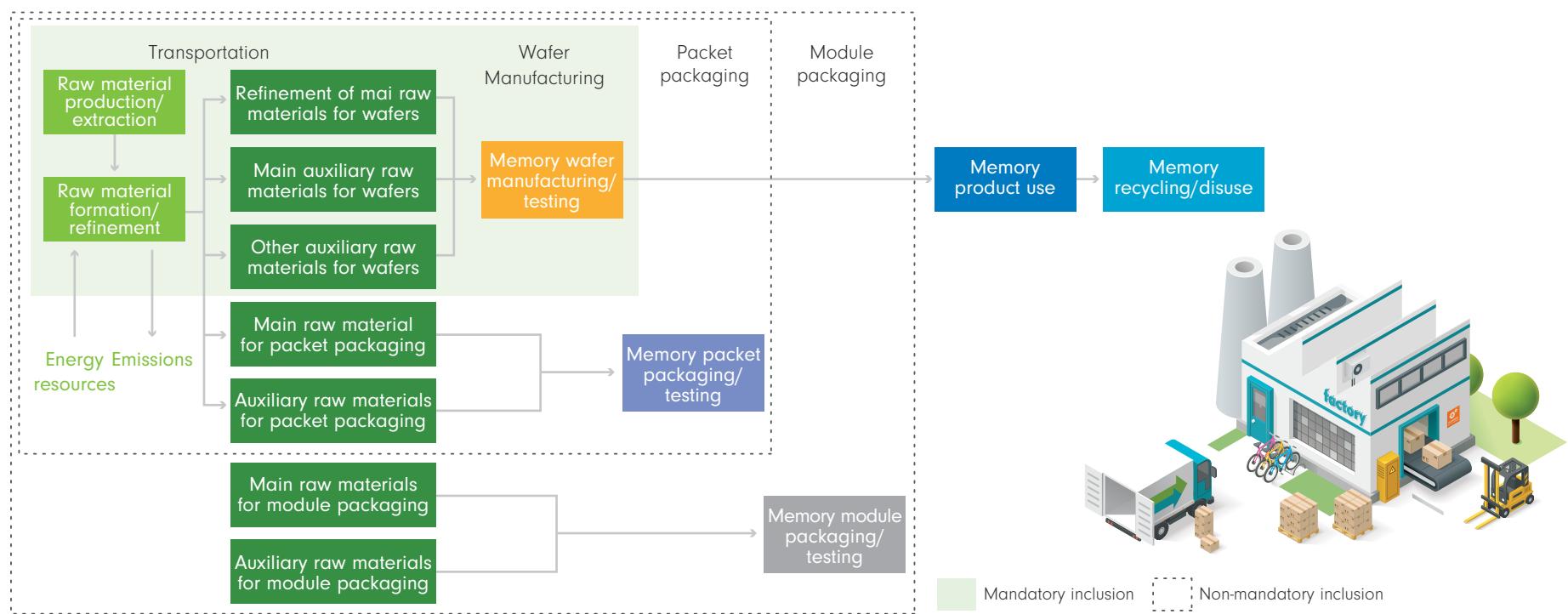
Input		
Production raw materials	Consumption	Renewable
Raw material for wafer (1,000pcs-12-inch)	819	●
Process chemicals (ton)	49,692	●
Process gas (million M3)	5,325	●
Electricity (million kWh)	645	●
Clean water (cubic meter)	2,999	●
Packaging materials for wafer (ton)	126	27% 73%

Output	
Product	Yield
Raw material for wafer (1,000pcs-12-inch)	799
Exhaust	Emission
Greenhouse gas (ton-CO ₂ e)	448,216
Volatile organic compounds (ton)	20
Sulfide (ton)	2.047
Nitrogen oxide (ton)	9.543
Waste water	Drainage
Waste water volume (cubic meter)	2,424
Waste	Output
General industrial waste (ton)	6,404
Hazardous industrial waste (ton)	13,937

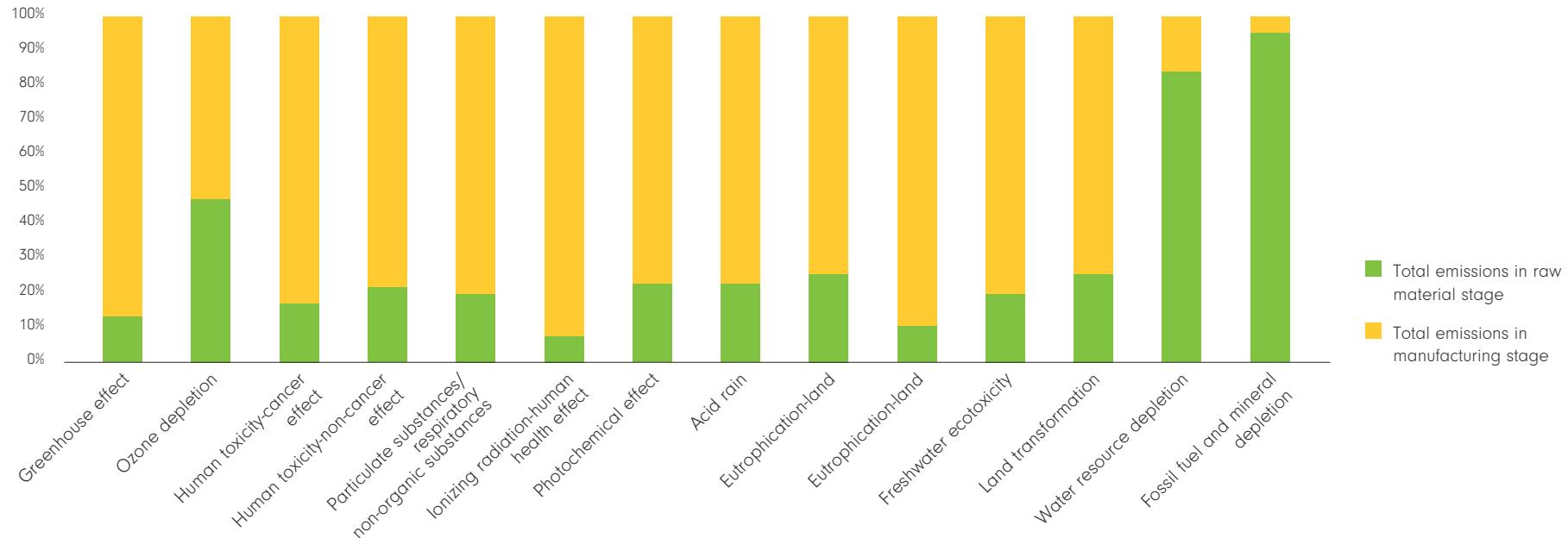
Life Cycle Assessment

Through life cycle assessment tool Simapro, we conducted assessments on product environmental impacts, and identified the improving directions of environmental footprints. In the meantime, the company would use the product environmental data and coefficients accumulated through analysis processes to build a decision support system for NTC's green product development. In the future, the system would expand to all of the new product development. From 2018, relating to the EU's new wave of requirements for environmental issues, the company gave multiple considerations on the requirements, and conducted quantitative assessments of the life cycle assessment on products manufactured in 2017 in each life cycle stage. Pursuant to the contents of quantifying and communicating requirements and guidelines for the Product Environmental Footprint of the life impact assessment under the ISO 14040s series, the company participated in product environmental footprint declarations, and referred to the regulations of ISO 14064-1 Greenhouse Gas Inventory and ISO/TS 14067 Carbon Footprint International Standard to execute the declarations. The analysis products were DRAMs, and system boundaries included raw materials manufacturing, transportation, wafer manufacturing and recycling/disuse, the environmental aspect and potential impact in whole boundaries, including energy use, resources consumption and pollution, etc. would be assessed. Because the company's main production was memory wafer manufacturing, other system boundaries were outsourced. Therefore, the main system boundary was wafer manufacturing. Among 14 items of environmental footprint sources, most of them came from the consumption of electricity at the stage of manufacturing process, followed by the main raw material of 12-inch production wafers at the stage of raw material acquisition, and CaCl_2 in the wastewater treatment at the stage of manufacturing process. The company internally promoted ISO 50001 Energy Management System and the CaCl_2 reduction project, meanwhile required suppliers with high environmental impact's raw materials to conduct product environmental footprints evaluation, so as to mitigate potential environmental impacts of products through a multiple-pronged method.

► Environmental footprint system boundaries of key products



► Ratio chart of environmental impacts in raw material and manufacturing stages



Greenhouse Gas Management

Management Organization and Strategy

NTC established a management team for climate change, which was coordinated by the president office and set reduction goals based on the ideal of sustainability to promote management measures such as energy conservation & carbon reduction. NTC adopts an open attitude towards carbon disclosure, and has attended the CDP Climate Change Evaluation since 2009, disclosing related information regarding greenhouse gas emissions and reductions every year, and obtaining A- rating in the Leadership level in 2018. In addition to participation in reply to the CDP questionnaire and public disclosure of related information regarding carbon emissions in this report, NTC also actively discloses its greenhouse gas emissions and reductions in the greenhouse gas report system of the Responsible Business Alliance (RBA), or provides related information with regard to carbon emissions so as to help customers establish the calculating basis for carbon footprints of their products. In 2018, the company introduced the Task Force on Climate-related Financial Disclosures Recommendation (TCFD) formulated by the international Financial Stability Board (FSB), and disclosed the company's measures in relation to governance, strategy, risk management, and indicators and goals. Through the internal quarterly operation risk management team, NTC continued to include possible impacts on climate change into the entire operation consideration, and predicted the probability of risk occurrence and levels of influence, formulating risk response and mitigation plans and crisis handling mechanism. Currently, the main climate risks identified included natural disasters, related regulations regarding product energy efficiency of various countries, and consumers' preferences for environmental friendly and climate friendly products. These risks would have more significant impacts than before. We used occurrence probability and factors of influence levels to analyze climate risks, and studied and drafted related measures, hoping to mitigate impacts of climate risks.

► The management organization and strategy in response to climate change based on TCFD guidance are as follows.



► The potential financial risks and opportunities related to climate change based on TCFD guidance are follows.

Category	Climate-related Risks	Potential Financial Impacts	Category	Climate-related Opportunities	Potential Financial Impacts
Transformation	Amendment to the Renewable Energy Development Act	Installation of renewable energy equipments, and the costs of purchasing renewable energy certificates	Resources efficiency	Green Building Mark (reduce greenhouse gas emissions and energy consumption, and enhance the positive images of the company)	More efficient buildings enhance the value of fixed assets (e.g. green buildings with good appraise)
	Related restrictions of environmental regulations on manufacturing processes	Rising operating costs incurred by the change of manufacturing processes or the addition/improvement of equipments		Increase in demand for energy saving products	Increase sales and profits of low power memory products
	Products and services to be replaced by low-carbon technology	Decrease in demand for products and services		Reduce the consumption of water resources, and make better preparations to face the changes or additions to the government's policies and regulations	Reduce resource costs, and improve corporate images
	Requirements of low carbon products requested by customers	Increase in operating costs and R&D expenses		Transfer production to decentralized energy resources to increase the flexibility of electricity consumption	Costs of using decentralized energy storage devices
	Changes in raw material prices (e.g. energy and water)	Increase in raw materials costs	Energy	Develop or expand low carbon products and services	Enhance product competitiveness, satisfy the need of high-end customers and markets, and increase revenues
	Increase in prices of greenhouse gas emissions	Increase in operating costs		Subsidies and incentives for energy saving products provided by the government	<ul style="list-style-type: none"> Development costs of energy-saving improvement plans Lower electricity consumption of products to acquire subsidies and incentives
	The Equator Principles (EPs) adopted by lending banks when issuing loans	Increase the difficulty of corporate loans		Amendment to the Renewable Energy Development Act (a certain percentage of renewable energy equipment installation is mandatory)	Install renewable energy equipments, save the costs of power generation or sell electricity to the Taiwan Power Company, and reduce the loss caused by the power supply instability
Physics	Industry stigmatization	Decrease in demand for products and services	Market	Green building installation	Increase the market value of fixed assets of buildings
	Increase in the severity of extreme climate events	Decrease or interruption in production capabilities (e.g. closing down of factories, transport difficulties, and supply chain interruptions)			
	Rise in average temperatures	Increase in air conditioning leads to increase in electricity consumption and operating costs	Products / Services		
	Climate abnormality-drought	Water shortage affects operation			
	Climate extreme events	Shutdowns caused by equipment damage of suppliers, shipment delay, production lines are affected, shipment cannot be delivered			

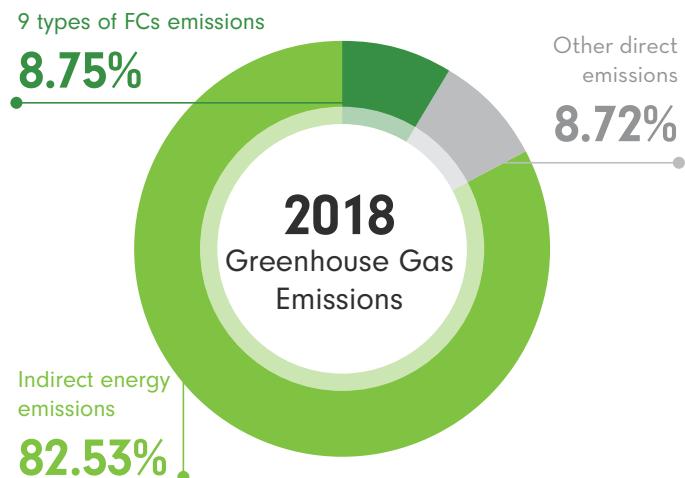
Greenhouse Gas Inventory and Reduction

The main sources of greenhouse gas emissions from semiconductor fabrication plants are electricity and perfluorocarbons (PFCs). Among them, electricity is necessary for manufacturing processes so the effect of electricity reduction is limited. Another emission source is the use of PFCs, which are PFCs and similar compounds, including CF_4 , C_3F_8 , C_4F_6 , C_4F_{10} , CHF_3 , CH_2F_2 , CH_3F , SF_6 , and NF_3 , used during manufacturing processes. These gases are all categorized into the greenhouse gases with high Global Warming Potential.

Greenhouse Gas Inventory

Starting from 2005, through calculations and inventory, the company made an inventory list and a report of greenhouse gases, and in the same year also introduced ISO 14064-1 Third Party Verification to ensure the integrity and credibility of inventory data on greenhouse gases. Currently, greenhouse gases are categorized into three scopes: scope 1 direct emission, scope 2 indirect energy emissions and scope 3 other indirect emission. In the emissions of 2018, only scope 1 and scope 2 were quantified. In addition, to further strengthen the integrity of greenhouse gas inventory, the company has evaluated the quantification of emissions in Scope 3 since 2017.

The company used operational control to generate the data of greenhouse gas emissions, and the inventory scopes were Taiwan FAB-3A and FAB-3A-N. The main sources of greenhouse gas emissions were outsourcing energy (around 83%) and PFCs used in manufacturing processes (around 9%). The greenhouse gas emissions of 2018 were 448,215.687 tons of carbon dioxide equivalent (ton- CO_2e). Scope 1 emissions were 78,311.5448 ton- CO_2e , and did not contain CO_2 emissions generated from the combustion of biofuels; Scope 2 emissions were 369,904.1421 ton- CO_2e .



► Greenhouse gas emissions from 2015 to 2018

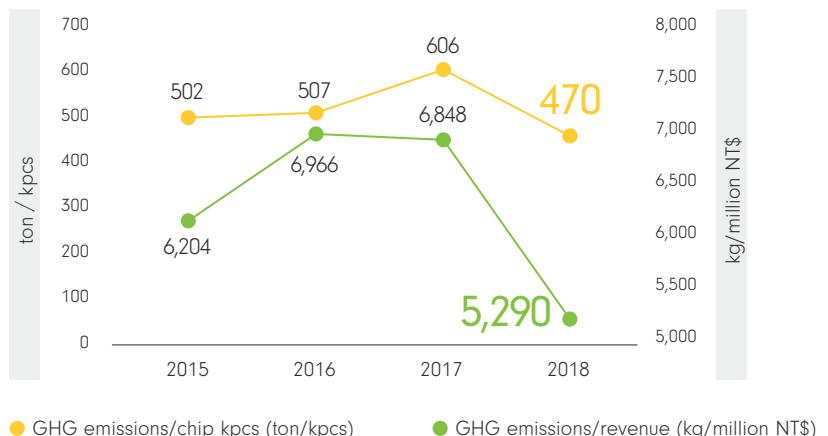
	Scope 1 (ton- CO_2e)	Scope 2 (ton- CO_2e)	Gross emissions (ton- CO_2e)
2015	50,668.687	221,557.796	272,226.483
2016	51,584.827	238,436.600	290,021.428
2017	59,751.301	316,442.280	376,193.581
2018	78,311.545	369,904.142	448,215.687

Note 1.9 types of PFCs emissions were process gases, including carbon tetrafluoromethane (CF_4), perfluoropropane (C_3F_8), hexafluorobuta-1,3-diene (C_4F_6), octafluorocyclobutane (C_4F_{10}), trifluoromethane (CHF_3), difluoromethane (CH_2F_2), methyl fluoride (CH_3F), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

Note 2.Other direct emissions included process gases of CO_2 , CH_4 , N_2O , HFCs, non-process gas of SF_6 such as fire extinguishing equipments, high-voltage power panels, refrigerators and freezers.

Note 3.Indirect energy emissions included the use of electricity and steam.

► GHG emissions

► Run chart of Y2015~Y2018 GHG emissions


NTC's FAB-3A officially started operating in 2008, and the greenhouse gas inventory was also calculated and verified in the same year. Therefore, the base year of greenhouse gas inventory was selected as 2008. However, the company enlarged the fabrication plant in 2017 and installed additional machinery and auxiliary equipments, making the operation totally different from that in 2008. Therefore, the company planned to change the base year from 2008 to 2017 to conform with the current situation. Compared with the base year, the greenhouse gas emissions in 2018 increased by approximately 19.07% from 2017, and the number of wafers produced increased by approximately 15.75%. In terms of emissions per unit of chip, the emission intensity in 2018 was 0.77 kg-CO₂e/wafer area cm² of product, which was higher than that in 2017. However, if using the per unit chip output as the denominator, GHG emissions/total chips in 2018 decreased by 22% than that in 2017. Along with the company's enlargement of process machinery and auxiliary equipments in 2018, the energy consumption increased a lot. In addition, with the increase in product output, the consumption of raw materials also increased, leading to the greenhouse gas emissions in 2018 increased than those in 2017.

*1 : Emission intensity: the amount of greenhouse gas emitted from per unit wafer area output.

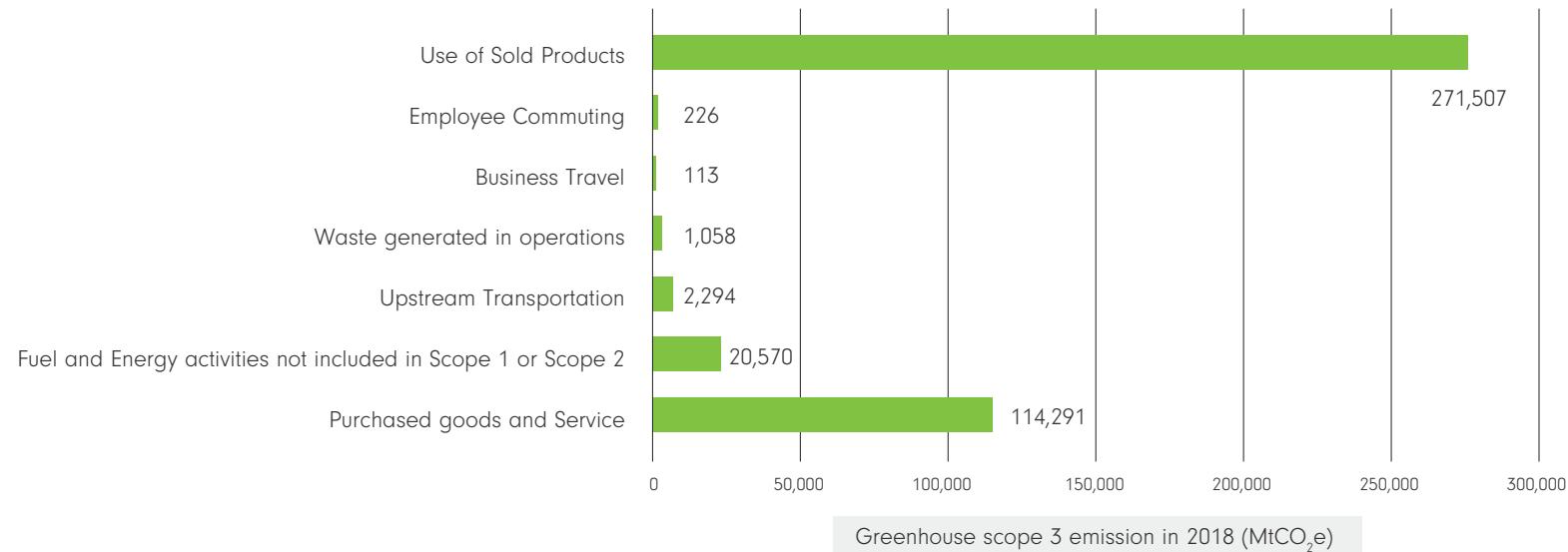


Scope 3 Greenhouse Gas Inventory

Since 2017, the company has begun the scope 3 emission inventory in accordance with the Greenhouse Gas Protocol and passed the external audit of a third-party organization with ISO 14064-1 verification.

Category	Description
1. Purchased Goods and Service	The carbon emissions generated from the main raw materials purchased by the production memory and the auxiliary raw materials in the process, but excluding the external commissioned service items.
3. Fuel and Energy activities not included in Scope 1 or Scope 2	Upstream carbon emissions from fuels and energy purchased.
4. Upstream Transportation	The upstream transports of the materials to the factory including air, land and sea transportation.
5. Waste Generated in Operations	Carbon emissions from waste in the production process, including waste transportation and disposal.
6. Business Travel	Carbon emissions from employees on business trips abroad.
7. Employee Commuting	Carbon emissions from transportation of all company shuttles.
11. Use of Sold Products	Carbon emissions caused by the use of electricity of the sold consumer products in 2018, including the products used in televisions, network devices, mobile devices and computers.

► Scope 3 Greenhouse Gas Emissions



Reduction of Greenhouse Gases

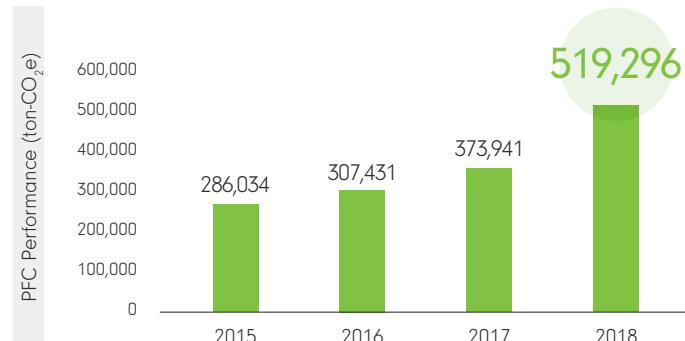
Since PFCs have the properties of high Global Warming Potential, the company has started planning greenhouse gas reductions since 2006. When planning to build fabrication plants, NTC has put aside a budget to purchase high reduction rate Local Scrubber; Currently, the PFC Local Scrubber used in the thin film and etching processes is Burn Type, destroying PFCs through the high temperature generated by combustion. In order to reduce the emissions of PFCs into the air, the company formulated the acceptance criteria of PFC reduction rate processed by Local Scrubber. The gas treatment efficiency of CF_4 should reach above 90%, and the reduction rate of processing C_3F_8 , C_4F_8 , C_4F_{10} , CHF_3 , CH_2F_2 , and SF_6 should reach more than 95% while the reduction rate of NF_3 should be over 99%. After the installation of Local Scrubber is completed, the FTIR will be used to detect the reduction rates of various PFC gases to meet the reduction trend in the future.

*2 : Global Warming Potential (GWP) is the warming intensity of the gases relative to carbon dioxide (set the CO_2 's GWP = 1); The Global Warming Potential referred in this article are the gases with a GWP value higher than 675. (Based on the GWP values of the IPCC Fourth Assessment Report (FAR))

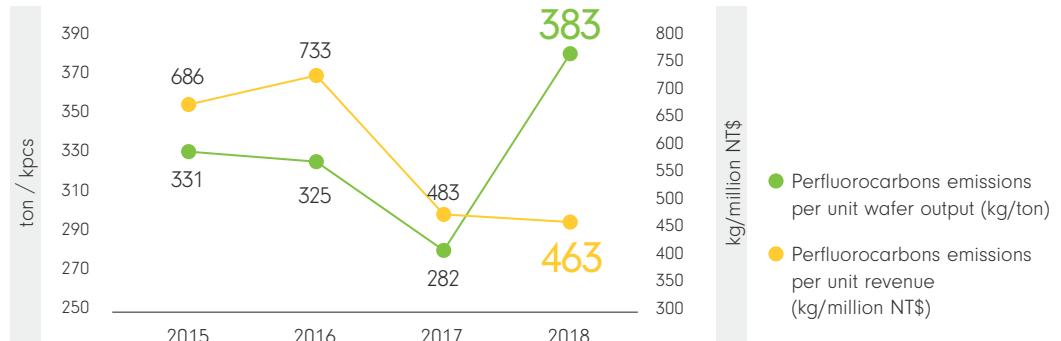
*3 : Local Scrubber: local exhaust processor.

*4 : FTIR: Fourier-Transform Infrared Spectrometer

► PFC reduction performance



► Run chart of 2015~2018 perfluorocarbons emissions



NTC actively promotes voluntary reductions and participated in the annual voluntary reduction promotion plan of industrial greenhouse gases implemented by the Industrial Development Bureau under the Ministry of Economic Affairs. In 2018, the greenhouse gas reduction program and the reduction plan to be implemented in 2019 were completed.

Carbon Disclosure Project (CDP)

NTC adopts an open attitude towards carbon disclosure, and has participated in the evaluation of the Carbon Disclosure Project (CDP), a non-profit organization, since 2009, disclosing related information regarding greenhouse gas emissions and reductions every year. Information of greenhouse gas emissions includes Scope 1: emissions directly generated from the plants and Scope 2: indirect emissions from outsourcing electricity and steam. Related information is directly disclosed on the CDP website. In 2018, the results of Investor and Supply chain module of the company's CDP climate change obtained the Leadership performance level (A- rating). In addition to the CDP and public disclosure of related information regarding carbon emissions in this report, NTC also actively discloses its greenhouse gas emissions and reductions in the greenhouse gas report system of the Responsible Business Alliance (RBA), or provides related information with regard to carbon emissions so as to help customers establish carbon footprints of their products.

Energy Management

Limited energy has been the most important issue on earth so efficient management is urgent. The energy that the NTC internally used mainly is outsourcing electricity and natural gas; Externally, other indirect energy consumption that generates greenhouse gas emissions includes raw materials transportation, production of raw materials suppliers, waste transportation/disposal, employee travel, and employee commutes. In order to mitigate the environmental impacts of greenhouse effect, when building fabrication plants, energy saving is the base for the plans, such as adopting a dual-temperature chilled water system and waste heat recovery and utilization in freezers. Over the past years, NTC has constantly introduced various energy saving technologies to reduce the energy consumption. Moreover, the company promotes energy management programs in offices and public areas to reinforce the concepts of our employees in energy saving. The company also continues to reduce the consumption of raw materials and increases the recycling amount of waste to mitigate the environmental impacts of greenhouse gases.

The production capacity of the NTC in 2018 increased by 53.7% in comparison to that in 2017, and the total electricity consumption in 2018 increased 69,494 MWh (2.5×10^8 megajoules) or increased by 12.1%, which was equivalent to an increase of 38,500 tons of CO₂e. The total natural gas consumed during the whole year increased 582,624 M3 (2.181×10^7 megajoules), or increased by 15.9%, which was equivalent to an increase of 1,096 tons of CO₂e. Total energy consumption costs for the whole year were NT\$ 1,491,100,000, increasing NT\$ 196,005,000 or increasing by 15.1% compared with the costs of 2017. The main cause was an increase in the production capacity, which led to the increase in energy consumption. Total energy consumption per unit production capacity of 2018 (electricity + natural gas) decreased 0.27 MWh/k-pcs (9.7×10^2 megajoules/k-pcs) compared with the consumption of 2017, reducing by 27.3%. The energy consumption per unit turnover decreased 3.1MWh/million NT\$ (1.1×10^4 megajoules/million NT\$), reducing by 27.6%. The energy cost per unit production capacity decreased NT\$ 0.5 thousand/k-pcs compared with the costs of 2017, reducing by 25.1%. The energy cost per unit turnover decreased NT\$ 6 thousand/million NT\$, reducing by 25.4%.

► 2015 to 2018 electricity consumption

	2015	2016	2017	2018
Electricity consumption (MWh)	402,445	429,719	575,893	645,387
Electricity consumption (Megajoules, MJ)	1.449×10^9	1.547×10^9	2.073×10^9	2.323×10^9

► Run chart of 2015~2018 electricity consumption



► 2015 to 2018 diesel consumption

	2015	2016	2017	2018
Diesel consumption (liter)	20,000	20,000	70,000	14,400
Diesel consumption (megajoules, MJ)	7.034×10^5	7.034×10^5	24.62×10^5	5.064×10^5

The diesel supply backup power system (DUPS and energy generators), it is unusual use, and the energy consumption is extremely low compared with that of the entire company. The energy consumption of the DUPS from 2015 to 2018 was less than 0.05% so the data was not listed in the statistical analysis of each figure.

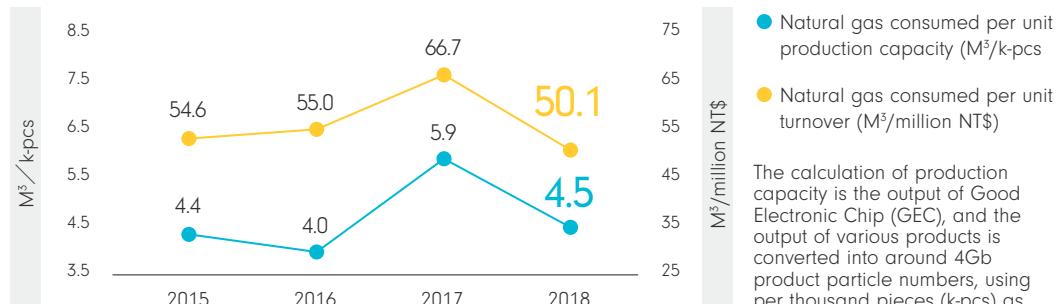
► 2015 to 2018 natural gas consumed

	2015	2016	2017	2018
Total natural gas consumed (M ³)	2,395,455	2,290,230	3,662,649	4,245,273
Total natural gas consumed (MWh)	24,913	23,818	38,092	44,151
Total natural gas consumed (mega joules, MJ)	8.969×10^7	8.575×10^7	1.371×10^8	1.589×10^8

1. Calculation: one cubit meter of natural gas = 10.4 kWh of electricity

2. Calculation: 1 kWh = 3.6 MJ

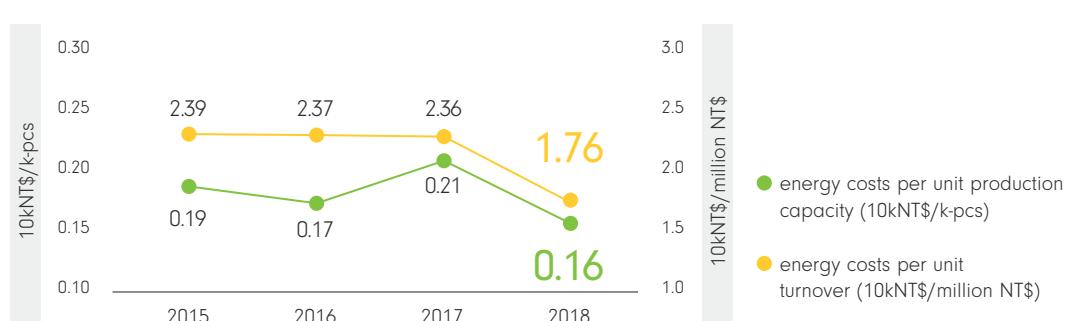
► Run chart of 2015~2018 natural gas consumption



► 2015 to 2018 energy costs

	2015	2016	2017	2018
Energy costs (10kNT\$)	104,804	98,726	129,510	149,110

► Run chart of 2015~2018 energy costs



The company introduced ISO 50001 Energy Management System and completed the verification in 2018, hoping to constantly improve energy use and management. Pursuant to standard-setting, supervision, measurement, documentation, improvement of energy intensity, and its estimated affects on reductions of greenhouse gas emissions, the company promoted the best practical methods of energy management and strengthen favorable management behaviors. In 2018, a total of 14 energy management programs were completed, and the total annual energy saved was 3,872 MWh (1.39×10^7 megajoules) with an annual benefit of NT\$ 8.91 million. In 2019, the company plans to implement 36 energy management programs and 1 improvement plan of energy management system. The estimated investment amount is NT\$ 169.68 million, and the estimated annual energy saved is 28,232 MWh (1.02×10^8 megajoules). The energy improvement plan of chilled system will introduce the external consultant program with investment amount over NT\$ 100 million, which is expected to save annual energy of 21,975 MWh (7.91×10^7 megajoules). A real-time monitoring platform will be built in the energy management system with an estimated investment amount of NT\$ 23.4 million, and is expected to be completed in 2019. The platform will be beneficial to energy consumption management and improvement of various organizations and machine groups.

Water Management

Water Reduction and Recycling

The main source of production water of NTC comes from the Shihmen Reservoir, diverted from the Taoyuan Canal and processed before supplied as production water. The gravity flow is used to independently divert water without affecting the ecology of water resources and any other purposes of usage. In addition, rainwater harvesting can supply production water and tap water for household use. In 2018, the water consumption was 3,022,362 tons, of which diverted from the Taoyuan Canal was 2,968,646 tons, accounting for 98.2% of the total water consumption. The total amount of rainwater harvesting was 30,287 tons, accounting for 1% of the total water consumption. The amount of tap water consumption was 23,429 tons, accounting for 0.8% of the total water consumption. Taiwan's rainfall is unevenly distributed between regions and seasons, which is more likely to cause regional and seasonal droughts. Therefore, to reduce environmental impacts and the risks incurred by water shortage, NTC continues to promote water saving measures and commits itself to water recycling so as to mitigate the impacts.

The amount of water needed by the production is huge, so water shortage will cause production interruption, affecting the output and delivery. In order to avoid the impacts of water shortage, NTC has conducted assessment and management for the risks of water shortage. A cistern built in the plant has the capacity of 43,000 tons, while additional two detention basins of each has the capacity of 4,060 tons, effectively harvesting rainwater during the rainy season, so as to respond to short-term water shortage. In addition, NTC is affiliated to the Formosa Plastics Group (FPG). In response

to the water shortage, NTC and the adjacent factories of the FPG have cooperated to set up an emergency response organization for water shortage. When water shortage occurs, the members of the emergency response organization can urgently deploy water resources to support each other so as to mitigate the impacts of water shortage. In addition to the design of water saving processes, the NTC's water management chiefly emphasizes water reduction and recycling.

Currently, NTC has set up acid-alkaline waste water, hydrofluoric waste water, and organic waste water recovery systems. Along with various promotions of water saving measures, the recovery rate has reached 93.5% (the recovery rate of process water is calculated with the formula approved by the environmental quality supervision and management committee of the Nanlin Technology Park, which meets the committed value of environmental impact assessment that the recovery rate of process water is 81.1%). In 2018, the wastewater recovery system, process recovery system and rainwater recovery system have a total of 2,775,463 tons of recycled water, accounting for 92% of the total water consumption.

Water saving improvements completed in 2018: Expand the hydrofluoric waste water recovery system of the 3AN plant, and increase the daily recovery amount of hydrofluoric waste water of **500** tons, with an investment of **NT\$ 45.5** million and an annual benefit of **NT\$ 2.04** million.

Currently, the main water saving directions promoted are as follows:

Reach the reduction effects through methods of conservation such as reduction and recycling.

Implement water saving results through work guidelines.

Promote water saving through daily management practices.

Build waste water classification treatment and adopt multiple recycling to maximize the use of water resources.



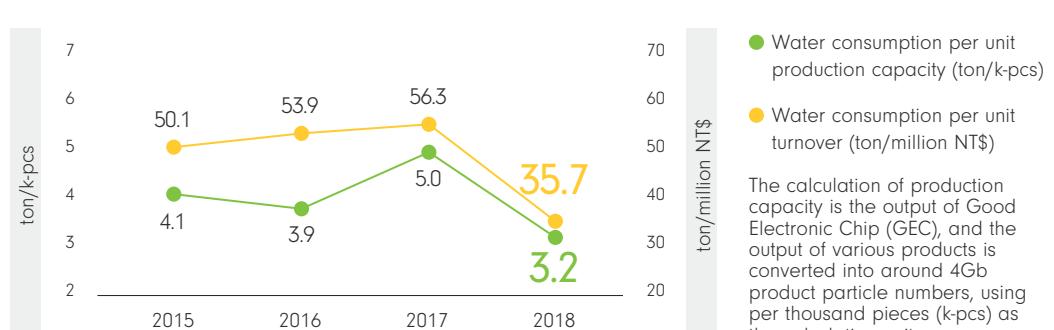
The output of particle numbers (approximately equivalent to 4Gb) of 2018 increase by 53.7% compared with that of 2017, but the total annual water consumption decreased 70,452 tons or by 2.3%. The annual water consumption intensity per unit production capacity decreased by 1.8 tons/k-pcs, a drop of 36.4%; the annual water consumption intensity per unit turnover decreased by 20.6 tons/million NT\$, a drop of 36.6%. The annual consumption of ultra-pure water increased 391,635 tons or by 15%. This mainly caused by the increase in production capacity so water consumption increased as well. The annual ultra-pure water consumption intensity per unit production capacity decreased 1 ton/k-pcs, a drop of 25.3%; the annual ultra-pure water consumption intensity per unit turnover decreased 12.2 tons/million NT\$, a drop of 25.5%.

Ongoing water saving improvements in the future: To coordinate with the production capacity expansion plan of the next phase, the company has planned to expand the hydrofluoric waste water recovery system again. The estimated investment is NT\$ 25 million and another 500 tons hydrofluoric waste water will be added to the daily recovery amount. In the future, to coordinate with the expansion plan of plant area, it is estimated that NT\$ 455 million will be invested in building new COD and total nitrogen treatment systems for hydrofluoric waste water, which not only will solve the problem of excessively high COD and total nitrogen in hydrofluoric waste water, but also recover the hydrofluoric waste water at the same time. It is estimated that additional 500 tons hydrofluoric waste water will be recovered daily. The systems are expected to be completed in 2021.

► 2015 to 2018 water consumption

	2015	2016	2017	2018
Water consumption (ton)	2,198,960	2,244,759	3,092,814	3,022,362

► Run chart of 2015~2018 water consumption



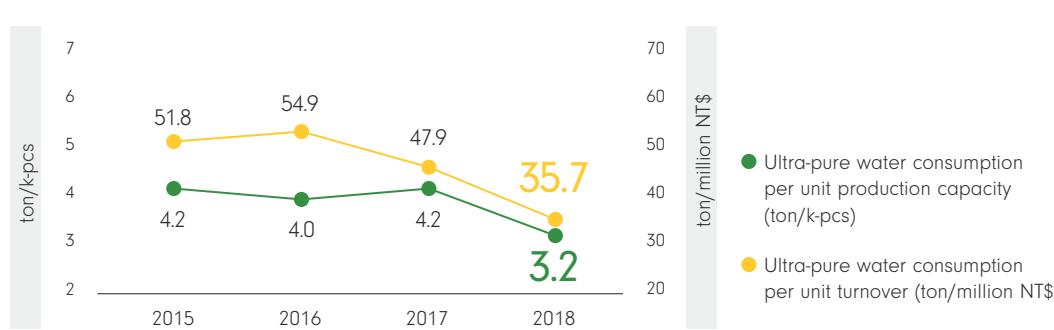
- Water consumption per unit production capacity (ton/k-pcs)
- Water consumption per unit turnover (ton/million NT\$)

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

► 2015 to 2018 ultra-pure water consumption

	2015	2016	2017	2018
Ultra-pure water consumption (ton)	2,271,030	2,287,149	2,630,671	3,022,306

► Run chart of 2015~2018 ultra-pure water consumption



- Ultra-pure water consumption per unit production capacity (ton/k-pcs)
- Ultra-pure water consumption per unit turnover (ton/million NT\$)

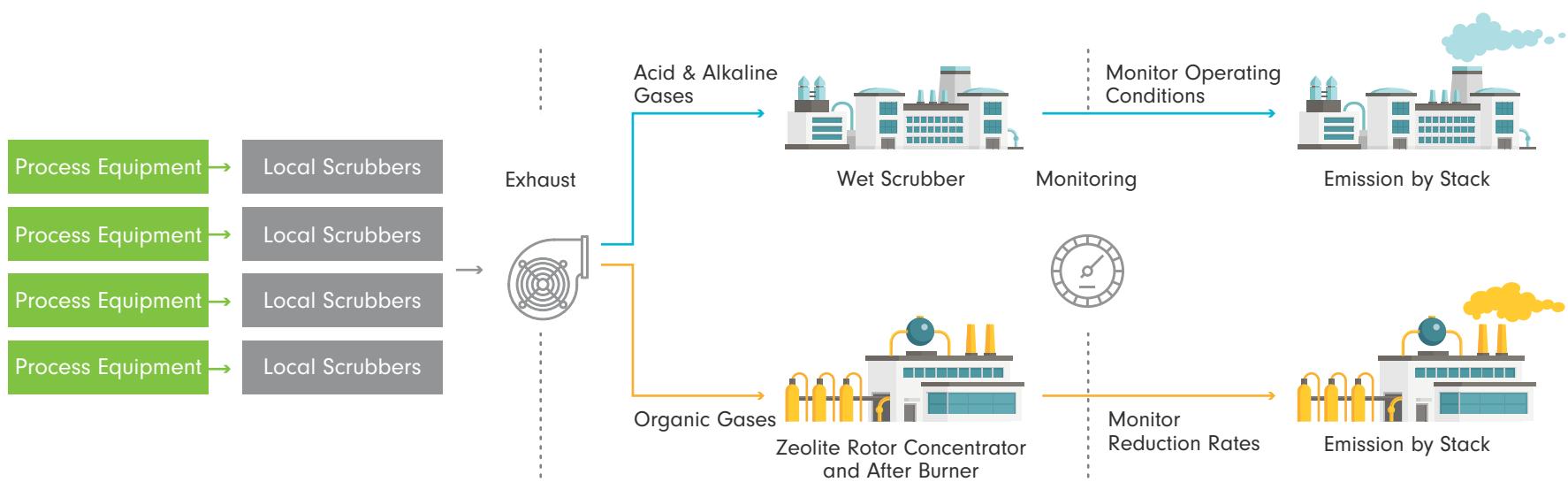
Emissions, Waste, and Recycling

Based on the environmental protection and commitments of environmental impact assessment, NTC regularly monitors environmental impact factors, such as air quality, noise and vibration, the quality of surface water and groundwater, traffic flow, and the ecosystem within the scope of development to truly appreciate its impacts on the environment. There is no violation of environmental regulations between 2014 and 2018. In addition, NTC has checked with the competent authorities that the NTC's developing areas are not at an environmentally sensitive location or a location with specific purposes. In the Environment, Safety and Hygiene Policy, NTC has promoted various waste reduction and resource reuse to comply with the relevant requirements of regulations and the commitments to environmental protection-related requirements signed by the company. Moreover, every year, NTC evaluates waste that can be reduced and recycled and the types and amount of recovered waste water, drafting annual plans and goals and including the plans into the annual budget and working plan.

Prevention and Control of Air Pollution

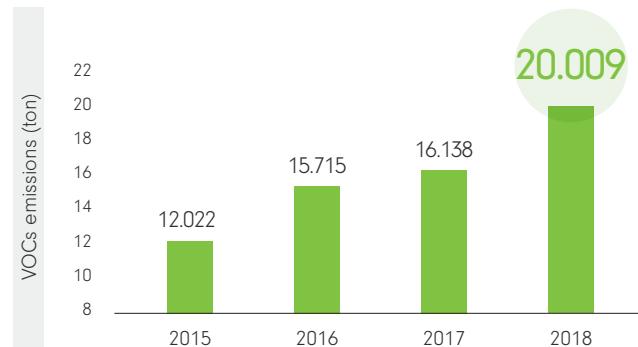
The main air pollutants of the NTC are categorized into acidic, alkaline and organic

exhaust gases. The exhaust gases are imported into appropriate treatment processes and equipments based on their properties. Detection over the years show that the company has met (or outperformed) the pollutant emission standards stipulated in the government's environmental regulations. From the production line, the exhaust gases are imported into the local exhaust gas treatment system to have specific substances removed. Acidic or alkaline exhaust gases are then treated by the acid/alkaline scrubbers. After the treatment, the exhaust gases are neutralized and can be released into the atmosphere. Organic exhaustgas is absorbed and concentrated by the zeolite rotor, and then imported into the combustion equipment to be directly broken down. The combustion efficiency rate reaches 99%, which is much better than the regulated standards. Moreover, the reduction rate of overall volatile organic gas emissions will keep above 90%, meeting the legal standard. To continue to maintain the best performance of treatment equipments, every equipment is maintained and inspected periodically. The operators receive complete training and education are to maintain the system in good operation and ensure that the exhaust gases emitted do not endanger the environment.



Also in 2018, the signal transmission improvement of exhaust duct was completed with an investment of NT\$ 100,000. Every exhaust ducts now can transmit signals to the control room individually, and the transmission modules are placed indoor so they are less likely to wear out. Therefore, the pipe monitoring data will be valid and kept from loss. From 2015 to 2018, the gross emissions of volatile organic compounds (VOCs) increased year after year, this was because the newly-built plant FAB-3A-N introduced new process technology and the production capacity of the plant continued to increase. In 2018, the output of chip numbers (approximately equivalent to 4Gb) increase by 53.7% compared with that in 2017. Although the entire company's gross emissions of VOCs increased by 24%, in terms of relative revenue and the output of chip numbers, the unit emission intensity of 2018 reduced by approximately 19%.

► 2015~2018 emissions of volatile organic compounds



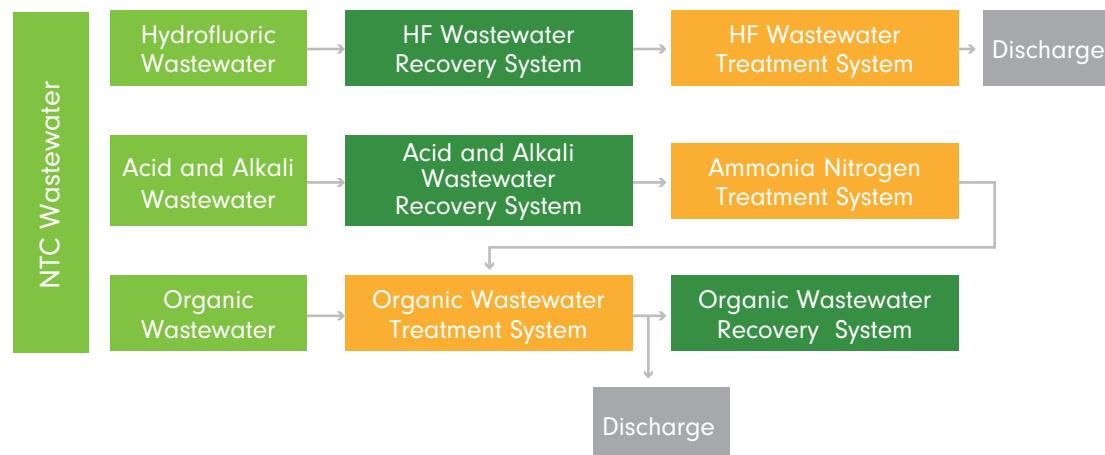
► Run chart of 2015~2018 VOCs emissions



Waste Water

One hundred percent of the NTC's waste water is discharged into the Dake River. To avoid environmental pollution and ecological impacts owing to abnormal quality of waste water, the company has spared no effort to prevent and control water pollution, gradually upgrading and investing in waste water treatment facilities. All waste water is collected according to property classification and sent to appropriate waste water equipments for treatment. The waste water will be discharged after the water quality is sure of complying with the discharge standards. The waste water treatment is carried out in over 20 different pipelines. The waste water is mainly classified into organic waste water, general acidic and alkaline waste water, hydrofluoric waste water, and outsourced high-concentration waste water. To ensure that the quality of discharged waste water follows the environmental regulation, the quality of discharged waste water is connected and monitored synchronously with the Environmental Protection Department. In addition, off-line sampling, analysis, and detection are outsourced every quarter to improve the waste water quality management and control. In relation to waste water treatment, NTC processes waste water according to the properties of waste water. Other than following the legal standards, NTC also reuses recyclable waste water that is treated by the recovery system to reduce the discharge amount of waste water. After treatment, waste water is discharge into Dake River. Investigation shows that the discharging area does not affect the habitat of protected animals, so there is little effect on the protected animals. The plant area was reconstructed on the existing plant space. No massive excavation of the peripheral vegetation of the designated land was made, so the habitat could be maintained and protected.

The gross volume of waste water discharge was 2,495,900 tons in 2018, reducing 78,579 tons compared in 2017, a drop of 3.1%. The annual waste water discharge intensity per unit production capacity decreased 1.5 ton/k-pcs, a drop of 36.6%; the annual waste water discharge intensity per unit turnover decreased 17.4 tons/million NT\$, a drop of 37.1%. Additional waste water and recovery systems were built in 2016 to coordinate with the expansion of the plant FAB-3A-N. Waste water systems are classified into the following systems: acidic and alkaline, organic, and hydrofluoric acid (HF). The acidic and alkaline waste water system already has a reclamation treatment system in place. In 2017, a reclamation treatment system with reverse osmosis (RO) was added, which could increase the reclaimed water of 288 tons every day. With the expansion of the new plant, the installation of additional organic waste water reclamation system was completed in 2017, which could increase the reclaimed water of 1,500 tons every day. In 2018, the installation of hydrofluoric waste water reclamation system was completed, which could increase the reclaimed hydrofluoric waste water of 500 tons. Because of the increase in the reclamation volume of waste water, the annual average process water recovery

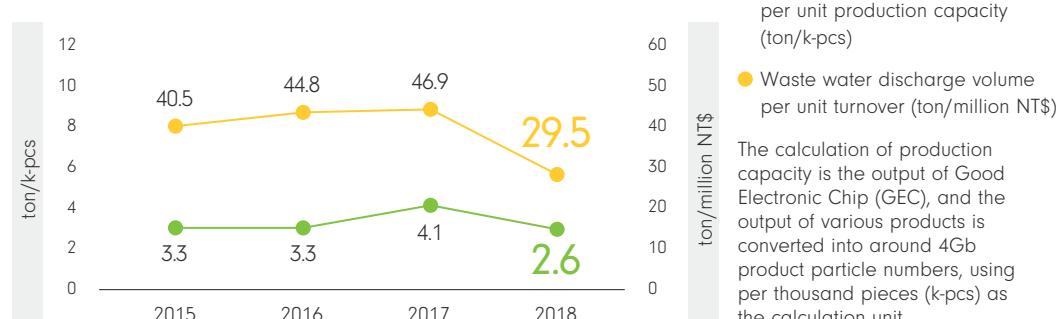


rate enhanced to 93.5% in 2018. To coordinate with the production capacity expansion plan of the next phase, the company has planned to expand the hydrofluoric waste water recovery system again. The estimated investment is NT\$ 25 million and another 500 tons hydrofluoric waste water will be added to the daily recovery amount. In the future, to coordinate with the expansion plan of plant area, it is estimated that NT\$ 455 million will be invested in building new COD and total nitrogen treatment systems for hydrofluoric waste water. This not only will solve the problem of excessively high COD and total nitrogen in hydrofluoric waste water, but also recover the hydrofluoric waste water at the same time. It is estimated that additional 500 tons hydrofluoric waste water will be recovered daily. The systems are expected to be completed in 2021. In response to the decrease in sludge treatment plants and the ever stricter acceptable criteria, in 2017, additional isopropanol-concentration system was built to reduce the load of waste water COD. Moreover, additional organic sludge dewatering equipments were installed, by the end of 2018, the sludge moisture content can be reduced from the original 84% to about 60%.

► 2015 to 2018 waste water discharge volume

	2015	2016	2017	2018
Waste water discharge volume (tons)	1,778,448	1,866,364	2,574,479	2,495,900

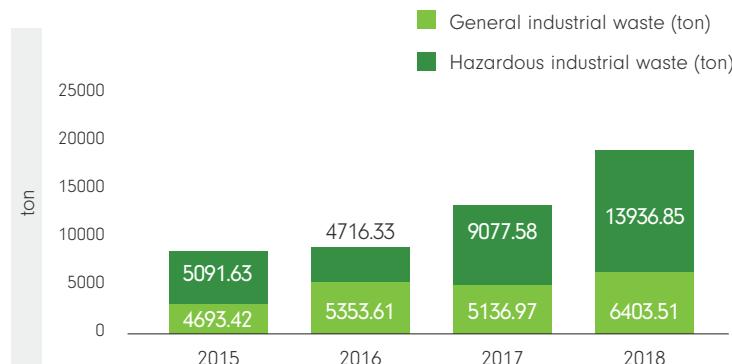
► Run chart of 2015~2018 wastewater discharge volume



Waste management

The general industrial wastes and the hazardous industrial wastes of the NTC are all managed by the output department in terms of storage, clearance, detections, and reduction promotions. In addition, the company periodically audits the waste contractors to see whether the contractors follow the regulations of waste disposal to handle the waste clearance, in order to confirm the legality of the contractors and to ensure that all wastes are well-processed or recycled. NTC did not ship any hazardous wastes to other countries from 2014 to 2018. The total waste of 2018 was approximately 20,340 tons, including 6,403.5 tons of general waste (including 209 tons of announced recycling projects), 13,936.9 tons of hazardous industrial waste, and 0.349 tons per wafer (m^2) of waste generation intensity per unit product. Compared with 2017, the total waste increased by approximately 43.1%, and the waste generation intensity increased by 24%. The main reason was that the NTC expanded the plant area in 2018 so the waste volume increased along with the construction period and the implementation of new processes.

► 2015 to 2018 waste output



► 2015~2018 Run chart of hazardous waste output



► NTC waste disposal methods in 2018

	Recycling	Incineration	Buried	Total
Hazardous (ton)	13,926.49	10.36	0	13,936.85
General (ton)	5,980.63	403.4	19.48	6,403.51
Total	19907.12	413.76	19.48	20,340.36

► Recycling rate of industrial waste over the years



Expenses and Benefits of Environmental Safety

NTC introduced the environmental accounting system in 2008 and the environment benefit accounting system in 2009, which was officially implemented in 2010. The introduction of the environmental accounting system made it possible to access information on the environmental expenses, assess the benefits of the expenses, and provide the stakeholders with concrete and accurate environmental protection acts. In accordance with the rules formulated by the Environmental Protection Administration, the NTC's environmental accounting categorizes the expenses of environmental protection and collects statistics accordingly. Other than used for the internal management, the statistics also let the public understand the efforts made by the company to protect the environment. Since 2013, expenses of industry safety and fire

► 2015 to 2018 Amount of Environmental Accounting Expenses (NT\$ thousand)

	2015	2016	2017	2018
Capital Expenditures	177,500	1,100	861,328	475,265
Environmental Expenditures	352,000	435,000	512,505	644,055
Total	529,500	436,100	1,373,833	1,119,320

protection and hygiene have been added to our environmental accounting data, so the cost of environment, safety and hygiene is all included in the statistics. According to the consolidated statistics, the capital expenditure of 2018 was NT\$ 475,265,000, and the environmental expenditure was approximately NT\$ 644,055,000, totaling NT\$ 1,119,320,000. In 2018, the total revenue was NT\$ 84.722 billion, and the environmental expenditure accounted for 1.32%.

► Amount of environmental accounting expenses in 2018 (NT\$ thousand)

Categories of Costs	Description	Recurring expenditures	Capital expenditures
Operating Costs	Pollution prevention expenses: costs of air pollution, water pollution and other types of pollution prevention	442,812	205,265
	Global environmental protection expenses: (1) expenses for climate change prevention (2) other expenses related to global environmental protection	20,450	270,000
	Resource and energy reduction and recycle expenses: (1) enhance the efficiency of resources utilization (2) costs of waste reduction, recycling, and reprocessing (3) energy conservation expenses	167,544	0
Related costs from upstream and downstream of suppliers and customers	(1) Green procurement (2) expenses incurred in providing products for the sake of environmental protection	984	0
Management Costs	(1) costs of personnel environmental training and education (2) expenses incurred in acquiring external verification (3) expenses incurred in measuring environmental impacts (4) Others	11,357	0
R&D Costs	expenses incurred in researching and developing products because of environmental protection	0	0
Social Activity Costs	expenses incurred in improving the environment such as nature protection, afforestation, and landscaping the environment	366	0
Environmental Taxation and Fees	(1) expenses incurred by air pollution (2) examination and certificate expenses for pollution prevention and control	542	0
	Total	644,055	475,265
	Sum Total	1,119,320	

► 2014 to 2018 economic benefits generated by promoting and implementing ISO 14001 management solution (NT\$ thousand)

	2014	2015	2016	2017	2018
Energy (electricity) saving program	510	3,176	4,427	16,677	8,744
Waste reduction program	37	7	720	778	0
Program of reducing consumption of process raw materials	53,804	8,951	8,168	14,960	12,179
Actual benefits of industrial waste recycling	18,610	20,445	14,021	778	11,502
Electricity saving from low power and advanced process	-	-	-	305,111,000	736,071,000
In total	72,963,014	32,581,015	27,338,016	354,334,017	736,103,425
Records of violating environmental protection regulations	0	0	0	0	0

► Benefits generated by auditing internal management systems in 2018

	ISO 14001	OHSAS 18001
Number of abnormality	17	10
Type of abnormality	Mainly violating 4.4.6 Operational Control and 8.1 operational planning and control	Job safety analysis (JSA) had not been conducted according to the SOP; contractors' safety notices were not complete; tracking abnormal checkpoints was not thorough; emergency preparation for clean room environment and emergency assessment for finding abnormalities in hazard identification were not complete
Case closing rate	100%	100%





07

Harmonious Workplace

An Attractive Employer for Professional Talents

Nanya Technology Corporation continues to create momentum for growth amid change. Even during material changes in the environment, we use talent retention and cultivation to preserve competitive advantages and accept employee opinions to create a safe, human rights-based, and harmonious workplace and fulfill our business targets.

73,074 hours

We organized a total of 1,786 courses in 2018 and accumulated 73,074 hours in total training participation

100%

100% retention rate after unpaid parental leave

0%

0% disabling injuries frequency rate and disabling injuries severity rate



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Strategy and Achievement

○ Unachieved ✓ Achieved ★ Surpassed

Material issues	Strategies	2019 Goals	2018 Targets	2018 Achievements	Target achievement status
Talent retention and employee care	• Excellent compensation: Provide competitive compensation • Manpower stabilization: Implement talent retention plans to stabilize outstanding employees	95% retention rate of outstanding employees		New KPI in 2019	
		Voluntary turnover rate <8.4%	8.53%	8.53%	✓
Talent development		Employee engagement survey Loyalty rate *1	70%	68%	○
	• Goal connection: Connect to management goals and improve returns on human resources • Improvement of professional skills: establish training development plans based on the Company's strategy • Diverse learning: Provide diverse education courses and channels and improve employees' average annual participation • Individual development: Personal development for improving substitution rates for job openings	Human capital ROI ≥15%	15%	21%	★
Occupational safety and health		Annual plan completion rate ≥ 96%	92%	98%	★
		Employees' average annual participation: 12 times	7 times	11.8 times	★
		Internal candidates substitution rate for open positions ≥50%	50%	47.4%	○
Occupational safety and health	• Early diagnosis and early improvement: Continuous PDCA improvements for the occupational health and safety system • Safety culture: Build employees' safety awareness and establish a high-quality safety culture • Cross-inspection: Cross-inspection by internal and external institutions to strengthen independent inspections	Disabling injuries frequency rate *2 <0.25	0.34	0	★
		Disabling injuries severity rate *3 <8	11	0	★
		Internal and external independent inspection rate *4 >92%	90%	98.1%	★

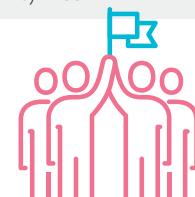
Note:

*1: 1. This survey uses a 10-degree scale 2. Loyalty refers to a score of 7 and above

*2: Disabling injuries frequency rate (FR) = (total employees with disabling injuries × 106)/total work hours

*3: Disabling injuries severity rate (SR) = (total days lost to disabling injuries × 106)/total work hours

*4: Independent inspection rate: (Number of cases reported by departments/number of discrepancies reported by safety and health units) *100%



Employee Diversity

Employees are the most important asset of the company and the key to sustainable operations and innovative R&D. We strive to create a humane and comfortable office environment where new employees are able subjected to systematic training and have access to diverse learning resources to help them quickly accumulate professional knowledge and skills for the semiconductor industry, and receive reasonable compensations in return. The Company also has an Employee Welfare Committee that organizes exciting and interesting recreation activities on a yearly basis to improve employees' work-life balance. By engaging employees in fun activities, we aim to provide stress relief on both the physical and mental level.

We believe a competitive and stable workforce to be essential for improving the productivity and competitive advantage of Nanya Technology Corporation. We strive to become the best employer by designing and providing an environment where talents may thrive.

Stable Workforce

Nanya Technology Corporation has a stable and productive workforce. In 2018, the Company hired a total of 3,219 permanent employees in Taiwan and in overseas

subsidiaries (3,120 in Taiwan and 99 in overseas subsidiaries), and 43 non-permanent employees*1. Male employees totaled 2,294 whereas female employees totaled 925, representing a gender ratio of 2.48 (male):1 (female). Average age of the Company's employees was calculated at 35.4. The 30-49 age group was the most dominant of all, representing 69.03% of total employee size. 100% of permanent and non-permanent employees are hired directly by the Company without engaging any third-party agency. The Company hired no part-time staff in 2018 and 100% of its employees worked on a full-time basis.

In 2018, Nanya Technology Corporation had 23 female junior-level managers, which accounted for 14.38% of total junior-level managers; there were also 3 female mid-level managers, which accounted for 6.82% of total mid-level managers; the Company currently has no female in the top management. There were a total of 18 female managers of section and above in revenue-generating departments, which accounted for 15.00% of total managers. Based on characteristics of the semiconductor industry and social culture in Taiwan, there are more male managers and professionals in NTC. As for production line management roles such as team leader and shift leader, females accounted for as high as 93.68% and had significant influence on the productivity of Nanya Technology Corporation.

*1: Includes contracted consultants, contract staff and interns.

► Number and percentage of female managers in the last 3 years

Count/Percentage	2016		2017		2018	
	Number of females	Percentage of females	Number of females	Percentage of females	Number of females	Percentage of females
Total employees	841	31.39%	879	29.46%	925	28.74%
Junior management (section/department head)	17	12.06%	21	14.89%	23	14.38%
Middle management (plant/division head)	3	6.38%	3	6.00%	3	6.82%
Top management (Assistant Vice President and above)*2	0	0.00%	0	0.00%	0	0
Head of revenue-generating department (section head and above)	13	8.67%	17	11.33%	18	15.00%
Head of production line operations	66	94.29%	87	94.57%	89	93.68%

* Percentage of females refers to females as a percentage of total employees in the respective category.

* 2: Revenue-generating department refers to any department other than planning, administration, operational support, quality assurance, legal affairs and safety & health.



The semiconductor industry is both capital and technology intensive. The multi-billion dollar plants and manufacturing equipment require support from a substantial number of technical and R&D personnel, which is why Nanya Technology Corporation actively recruits college talents of engineering background to join our production team on a yearly basis. As of December 31, 2018, the Company had 3,219 permanent employees on its payroll, and 81.24% of whom were professionals³. Overall, the Company has a competitive, healthy and growing talent base to support development of innovative production procedures, technologies and products. Age distribution and education background are as shown in the following chart.

► Age/education of permanent employees

Division	Classification	Taiwan				Overseas subsidiaries				Total			
		♀	As a percentage of total females in Taiwan operations	♂	As a percentage of total males in Taiwan operations	♀	As a percentage of total females in overseas operations	♂	As a percentage of total males in overseas operations	♀	As a percentage of total female employees	♂	As a percentage of total male employees
Age group	29 and below	137	15.09%	635	28.71%	2	11.76%	15	18.29%	139	15.03%	650	28.33%
	30-39	419	46.15%	897	40.55%	8	47.06%	17	20.73%	427	46.16%	914	39.84%
	40-49	316	34.80%	544	24.59%	2	11.76%	19	23.17%	318	34.38%	563	24.54%
	50-59	34	3.74%	127	5.74%	5	29.41%	25	30.49%	39	4.22%	152	6.63%
	60 and above	2	0.22%	9	0.41%	0	0.00%	6	7.32%	2	0.22%	15	0.65%
Education	Doctoral Degree	0	0.00%	26	1.18%	0	0.00%	1	1.22%	0	0.00%	27	1.18%
	Masters Degree	187	20.59%	872	39.42%	2	11.76%	24	29.27%	189	20.43%	896	39.06%
	Bachelor Degree	357	39.32%	1146	51.81%	15	88.24%	49	59.76%	372	40.22%	1195	52.09%
	College	161	17.73%	109	4.93%	0	0.00%	7	8.54%	161	17.41%	116	5.06%
	Senior high school	203	22.36%	58	2.62%	0	0.00%	1	1.22%	203	21.95%	59	2.57%
	Junior high school	0	0.00%	1	0.05%	0	0.00%	0	0.00%	0	0.00%	1	0.04%

*3: "Professional" refers to non-line production operators

Top Talents Attraction

The Company adopts recruitment policies that comply with labor regulations in Taiwan as well as its own ethical employment principles. The Company strives to provide equal employment opportunities and environment, and recruit talents solely based on individual professional capabilities and experience without discrimination whether in terms of age, ethnicity, gender, sexual preference, religion, political association, place of birth, marital status, appearance or disability. Employees' promotion, performance evaluation, training, reward and discipline after hiring have been explicitly stated in policies. From recruitment, selection to job assignment, the Company ensures the fairness, openness and transparency of its process so that everyone may have equal chances to job assignment and training.

In 2018, 304 engineers were added to the team to support organizational transformation and transition into 20nm production. The Company recruits entry-level engineering talents through factory sites and campus recruitment programs. The Company approaches renowned local colleges each year to recruit engineers graduates of bachelor, masters and doctoral degree and matches them to open positions on-site. In 2018, the company held 16 campus recruitment events at renowned colleges nationwide, and engaged young students in a series of interaction, communication and discussion based on the theme - "Infinite Future." It is our hope to encourage all willing students to pursue a dream in the high-tech industry and contribute to semiconductor development in Taiwan. Recruitment of entry-level production line operators is carried out with the help of local employment service stations near the Company's plants. On-site interviews are held from time to time, and local residents are hired as a priority to promote local employment. Managers of Taiwan operations consist entirely of Taiwanese nationals for 100% localized hiring.

► Campus recruitment



► 2018 campus recruitment events

Category	Session
Campus recruitment exhibition	8
Campus seminars	8

The Company invites honest, motivated, passionate and innovative individuals to join the organization and contribute to the prosperity of the semiconductor industry. New recruits accounted for approximately 12.58% of the Company's total employees in 2018. Gender distribution of new recruits was approximately 4.70 (male):1 (female).

► New recruits of Taiwan and overseas operations, by age and education

Division	♀		♂		Total		
	Head count	Percentage * ¹	Head count	Percentage * ²	Head count	Percentage * ³	
Age group	29 and below	40	56.34%	267	79.94%	307	75.80%
	30-39	22	30.99%	48	14.37%	70	17.28%
	40-49	8	11.27%	14	4.19%	22	5.43%
	50-59	1	1.41%	4	1.20%	5	1.23%
	60 and above	0	0.00%	1	0.30%	1	0.25%
Education	Doctoral Degree	0	0.00%	2	0.60%	2	0.49%
	Masters Degree	27	38.03%	136	40.72%	163	40.25%
	Bachelor Degree	23	32.39%	177	52.99%	200	49.38%
	College	19	26.76%	13	3.89%	32	7.90%
	Senior high school	2	2.82%	6	1.80%	8	1.98%
	Junior high school	0	0.00%	0	0.00%	0	0.00%
	Total new recruits	71		334		405	
	As a percentage of total employees	2.21%		10.38%		12.58%	

Note: New recruits refer to personnel hired and remained employed in 2018 (excluding those who resigned during the year)

*1: As a percentage of total new female recruits.

*2: As a percentage of total new male recruits

*3: As a percentage of total new recruits.



Diversified Recruitment Policy

We have many service locations deployed locally and abroad to accommodate the Company's global expansion. As a result, in addition to Taiwanese, we have hired employees of diverse nationalities including Chinese, French, German, Italian, Japanese, Korean, British, American and Turkish (total 9 nationalities) within the last 3 years.

Nanya Technology Corporation also supports the government's policies of hiring people with disability as part of its workplace diversity initiative. As of December 2018, Nanya Technology Corporation hired a total of 27 employees with disability, which represented 0.87% of total employees. Due to the work nature involved and inconvenient traffic access, hiring of persons with disability has been rather difficult. The Company had hired persons with disability to the full quota before November 2018, but a change of contract in December left some quota unfilled. The Company will continue to hire the required number of persons with disability and evaluate suitable job openings for them to work, and strive to fulfill the government's regulation of the hiring of persons with disability.

	2016	2017	2018
Nationality count	8	9	10
Nationalities	Taiwanese, Chinese, German, Italian, Japanese, Korean, British, USA	Taiwanese, Chinese, German, Italian, Japanese, Korean, British, USA, French	Taiwanese, Chinese, German, Italian, Japanese, Korean, British, USA, French, Turkish
Number of employees with disability	27	25	27



Internship Program

Nanya Technology Corporation values talent development and takes initiative in promoting industry-academia collaboration. A total of 125 interns (48 indirect interns and 77 direct interns) from 7 institutions were offered internship in 2018. These students were assigned to suitable departments based on their studies, specialties and career plans, where they were able to learn how businesses function and apply theory into practice. During the internship, the Company engaged the schools, the students and department heads in meetings to establish students' work and learning progress. These communication sessions enable timely response and handling of relevant issues and ensure favorable outcome of the internship program. The Company has been surveying indirect department heads for satisfaction of the internship program since 2016. The 2018 survey averaged a satisfaction score of 4 (out of 5), which indicated that the internship program has been soundly executed. The internship program not only gives students the opportunity to develop independence and interpersonal skills, but also enables the Company to evaluate students' work performance and explore potential talents suitable for opening positions. Over the long term, the internship program has the potential to improve image and train talents to the benefit of the Company and the high-tech industry. An internship reward system is being implemented to commend top-performing students and attract young talents into providing service after graduation.

► Number of interns in the latest 3 years - Taiwan

	2016	2017	2018
Number of interns (persons)	12	39	125
Number of partnered institutions	2	1	7

► Internship satisfaction survey for department heads

	2016	2017	2018
Average satisfaction (5-point scale)	3.9	3.8	4
Professional capabilities	3.4	3.4	3.7
Problem-solving	3.5	3.5	3.9
Work attitude	4.1	4.1	4.2
Compliance with discipline	4.2	4.3	4.1

Talent Retention and Employee Care

The Company not only offers competitive salary packages, but also introduces a full range of welfare measures and training systems that address employees' needs on all aspects from work, life to health. It is the goal of the Company to create a work environment where employees may realize their full potentials with a peace of mind, and for which we have implemented an employee assistance program as part of our corporate social responsibilities.

Job Security

Nanya Technology Corporation continues to make rational adjustments to its operations and processes in response to industry changes and challenges of the environment. The Company makes it a priority to secure employees' work rights, and chooses to support its employees even under the most difficult situation. Under the human resource coordination system of the Formosa Plastics Group, employees are transferred first before they are made redundant. Transfer and redundancy of employees are announced and notified in advance in accordance with the Labor Standards Act and relevant laws, whereas department managers would also communicate fully with the employees in question and execution decisions in accordance with law. The Company uses quarterly bonus as a retention incentive, a profit-sharing measure, and as an encouragement for employees to accomplish organizational goals and higher business targets.

Nanya Technology Corporation inherits the "pragmatic" spirits of Formosa Plastics Group and wins the trust and recognition of its employees and management by offering a favorable work environment and life security. These are the reasons why the Company has relatively stable employee turnover compared to peers. The up rise of China's semiconductor industry in 2017 provoked intensive competition for talents and resulted in a significant increase in turnover rate. Compared to the 2017 voluntary turnover rate of 10.86%, the turnover rate was reduced to 8.53% in 2018 (gender distribution was approximately 3.8 (male):1 (female)). This reduction was mainly the result of various retention and incentive measures introduced in 2018, including the issuance of "employee stock option certificates" and implementation of "adjustable salary package for new recruits."

2,559 people

- The number of employees is offered the right to exercise Employee Stock Options
- First wave of eligible employees: employees onboard before 2016/3/31; head count: 2,394 people
- Second wave of eligible employees: employees onboard before 2016/7/31; head count: 165 people

163 people

New recruits subject to salary adjustment

The Company uses remuneration and incentive bonus to control employee turnover risks and retain talents

► Turnover rate analysis for the last 3 years - Taiwan

Employee turnover rate	2016	2017	2018
Voluntary turnover rate	6.59%	10.86%	8.53%
Total turnover rate	7.47%	11.68%	9.04%

*Calculation of turnover rate = (number of resignations in January / total number of people at the end of January) x 100% + (number of resignations in February / total number of people at the end of February) x 100% + ... + (number of resignations in December / total number of people at the end of December) x 100%

* Voluntary turnover refers to resignation initiated by the employee. The Company calculates turnover rate mainly based on voluntary turnover. Total turnover rate includes voluntary (included retirees) and involuntary turnover (included dismissal, redundancy, death etc.)

► Resigned and retired personnel by age and education - Taiwan

Division	♀		♂		Total	
	Head count	As a percentage of entire division	Head count	As a percentage of entire division	Head count	As a percentage of entire division
29 and below	20	36.36%	141	60.52%	161	55.90%
30-39	28	50.91%	51	21.89%	79	27.43%
40-49	10	18.18%	15	6.44%	25	8.68%
50-59	1	1.82%	1	0.43%	2	0.69%
60 and above	0	0.00%	1	0.43%	1	0.35%
Doctoral Degree	0	0.00%	2	0.86%	2	0.69%
Masters Degree	11	20.00%	66	28.33%	77	26.74%
Bachelor Degree	20	36.36%	115	49.36%	135	46.88%
College	8	14.55%	5	2.15%	13	4.51%
Senior high school	20	36.36%	21	9.01%	41	14.24%
Junior high school	0	0.00%	0	0.00%	0	0.00%
Total resigned/retired employees	59	209	268			
As a percentage of total employees	1.89%	6.70%	8.59%			

* As a percentage of total employees: Refers to the number of resigned/retired females, males and employees as a percentage of total employees in Taiwan as of 2018/12.

Employee Engagement Survey

In 2018, the Company conducted an organization-wide Employee Engagement Survey to evaluate employees' loyalty to the Company. This survey used 23 questions to collect employees' opinions on 6 aspects, and received a response rate of 85%. The result showed average loyalty of 68% among employees, which was slightly lower than the 70% last year. However, the response rate is significantly higher than the 44% last year which would be reliable to address the reference. The company will be using the survey to provide the basis for subsequent improvements to the management system, increased compensations and bonuses introduced and explore ways to raise employees' loyalty for long-term talent retention.

Aspects	2017		2018	
	♀	♂	♀	♂
Individual work performance	65%	69%	60%	66%
Engagement with line manager	68%	73%	66%	73%
Understanding of corporate vision/culture	66%	70%	64%	72%
Performance of the managed team	67%	70%	63%	74%
Relationship with peers	77%	79%	75%	81%
Satisfaction with promotion/compensation	64%	65%	58%	65%
Average loyalty	70%		68%	
Response rate	44%		85%	

Note: 1. This survey uses a 10-degree scale

2. The above loyalty refers to a score of 7 and above

Union of Nanya Technology Corporation was voluntarily assembled by employees in April 2012. Although the Company has not signed a collective bargaining agreement with the union, it holds monthly meetings in accordance with the spirits of "Regulations for Implementing Labor-Management Meeting" to engage worker representatives in the discussion of a wide range of employment issues. These meetings have been significantly helpful in promoting labor-management relations and employee welfare, for they enable the union to openly discuss employment terms and legally express opinions.

The Company organizes events such as CSR Monthly to convey its commitment to corporate social responsibilities and related practices. Through these efforts, we hope to educate employees on the topic of corporate social responsibility and involve them in actual activities.



Regular convention of employee meetings



Interactive opinion section

Competitive Compensation Program

Nanya Technology Corporation's salary packages for new recruits are based on individual background, peer level, local economics and supply/demand of the local labor market, and outlined in employment contracts. Employees of similar job role, education and career experience are remunerated with equivalent salaries and benefits without gender difference of any kind. Adjustments to employees' salaries and benefits are evaluated primarily based on work performance.

The Company's compensation and welfare systems have been developed through local salary surveys and discussions with regional salary associations, after taking into account factors such as industry competitiveness, macroeconomics, corporate culture and business sustainability. This process ensures the competitiveness of our overall salary package. The salary package includes basic salary, meal/travel/location allowance and efficiency bonus. We also offer additional bonuses and variable compensations based on employees' individual performance and accomplishment of organizational goals (or profitability), and in doing so, we reward employees for their excellent performance and share with them the profits we make as a group, regardless of their gender. We protect employees' basic work rights and offer reasonable salaries to help them sustain a worry-free lifestyle and keep them motivated at work. Through the use of a bonus system, we aim to motivate employees in ways that would improve performance for the department and the organization as a whole. After taking into account quarterly incentive bonuses and year-end remuneration, employees received more than 4 months' worth of salary in bonus on average in 2018. In addition, non-managerial full-time employees averaged NT\$1,793,000 in annual salary which was 6.35% higher than 2017, weighted average number of non-managerial full-time employees was 2,769 which was 10.41% higher than 2017.

Employees' compensation and bonus mainly comprise the following components:

- Competitive compensation: Nanya Technology Corporation is a composition of Taiwan High Compensation 100 Index
- Year-end bonus, festive bonus, Dragon Boat Festival/Mid-autumn diligence bonus, grade bonus
- Long-term incentives: Include employee remuneration, employee stock option certificates, incentive bonus and annual salary adjustments

Item	Details	Subject
Employee remuneration	Amount allocated to employees from previous year's earnings, subject to resolution of the board of directors and shareholders	All permanent employees
Employee stock option certificates	Employees' rights to subscribe a certain quantity of the Company's shares at the specified price within the effective duration in the future	Employees conferred with warrants
Incentive bonus	Bonus is allocated based on quarterly target accomplishment, individual performance and percentage of days on the job	All permanent employees
Annual salary adjustment	Salary is adjusted in line with increased price level, peer standards, and competitive margin over peers	All permanent employees

Starting salary and terms of compensation are indifferent between male and female employees in Taiwan. Female managers received slightly lower compensation on average than males in 2018. In terms of total salary package, females received 88.64% that of males on average; in terms of remuneration, females received 92.07% that of males on average. This difference was mainly attributed to the higher average years of service among males, which entitled them higher compensation and remuneration compared to females. In 2018, female employees of non-managerial role received total salary package at 109.11% that of male counterparts on average, and remuneration at 115.31% that of male counterparts on average. Females received higher compensation and remuneration than males in this respect mainly because of their higher average years of service. Overall, the Company offers competitive compensation along with full benefits and facilities that enable employees to enjoy job security and quality lifestyle. To accommodate work hour restrictions of the Labor Standards Act and employees' work-life quality, the Company adopts a computerized system that manages employees' attendance and issues exception reminders, and has so far yielded favorable results.

6.9%

Increment of starting salary for entry-level production line operators over the minimum wage

From NT\$23,520

Starting salary for entry-level production line operators

73.27%

Increment of starting salary for employees with bachelor degree in engineering over the minimum wage

From NT\$38,120

Starting salary for employees with bachelor degree in engineering

► Comparison of average gender compensation - Taiwan

Average compensation ratio	2016	2017	2018
Female-to-male average salary ratio - senior management	-	-	-
Female-to-male average salary ratio - management level	83.92%	86.77%	88.64%
Female-to-male average remuneration ratio - management level	86.65%	89.43%	92.07%
Female-to-male average salary ratio - non-management level	107.54%	110.35%	109.11%
Female-to-male average remuneration ratio - non-management level	110.81%	116.37%	115.31%

Note:

- "Average salary" refers to the annual average of regular salary (including monthly/basic salary, efficiency bonus, meal/location/travel allowance, operational/professional bonus and other payable items) + grade bonus.
- "Average remuneration" refers to the annual average of regular salary + grade bonus + incentive bonus + employee remuneration + festive bonus + Mid-autumn and Dragon Boat Festival Diligence bonus + year-end bonus.
- "Senior management" refers to assistant vice president grade and above, and the Company had 0 female senior manager in the last 3 years.
- "Management level" refers to section + department + division level head

Employees of Taiwan operations are free to take unpaid parental leave of absence to balance their lives between family and work. By addressing employees' dilemma between child care and work, we contribute to the stability of the society. In 2018, a total of 305 employees (86 females and 219 male) were entitled to take unpaid parental leave, and a total of 32 people (28 females and 4 male) had actually applied.

► Application of unpaid parental leave and reinstatement rate - Taiwan

Item	2016			2017			2018		
	♀	♂	Total	♀	♂	Total	♀	♂	Total
No. of employees applied for unpaid parental leave	39	2	41	39	2	41	28	4	32
No. of people due for reinstatement in the current year (A)	13	1	14	17	0	17	11	1	12
No. of people applied for reinstatement in the current year (B)	12	0	12	12	1	13	7	0	7
Reinstatement rate % (B/A)	92.31%	0.00%	85.71%	70.59%	-	76.47%	63.64%	0.00%	58.33%
Retention rate %	100.00%	-	100.00%	83.33%	-	83.33%	100.00%	100.00%	100.00%

Note:

- "No. of people due for reinstatement in the current year": does not include employees who applied to extend their unpaid leave during the year.
- "No. of people applied for reinstatement in the current year": includes employees who applied for reinstatement in the current year before the end of their leave.
- "Retention rate" refers to the percentage of employees reinstated from unpaid parental leave who continued to work for one year and above.

- Leave:** The Company offers special leave, wedding leave, funeral leave, business leave, occupational illness/injury leave, paternity leave, maternity leave, medical leave, menstrual leave, family care leave, epidemic prevention leave, and home visit leave for expatriates in accordance with law. In addition, payment of salary in the event of employees' absence during medical leave and Typhoon leave is more favorable than what the labor laws require.
- Insurance:** In addition to Labor Insurance and National Health Insurance, the Company's Employee Welfare Committee also purchases group insurance for employees.
- Wedding/funeral/child care:** The Company offers congratulatory or condolence money for occasions such as wedding or funeral involving the employee or employee's spouse, parent or child, and subsidizes line managers for giving congratulatory/condolence money in their personal capacity. The Company also offers child care leave that eligible employees may take and adjust work hours accordingly for child care.
- Retirement benefits:** The Company's retirement policies have been established in accordance with the Labor Standards Act and Labor Pension Act of Taiwan. For employees who opt for the old scheme, the Company makes monthly contributions at 2% of monthly salary into employees' dedicated accounts held with Bank of Taiwan. These funds are deposited and utilized under the supervision of the Company's Labor Pension Supervisory Committee. The size of pension fund under the old scheme accumulated to NT\$487,329,405 in 2018, and had been fully contributed. For employees who opt for the new scheme, the Company makes monthly contributions at 6% of monthly salary into employees' individual pension accounts, as stipulated in "Employee Monthly Pension Contribution Chart." Voluntary contributions are also deposited into the same account, and the pension system is considered to have been properly implemented.

Benefit Program

The Company offers a wide range of benefits from dining, accommodation, shuttle bus to parking to improve the friendliness and convenience of the work environment for employees. Detailed descriptions are as follows:

- A. Canteens have been established at all plant sites to serve healthy and hygienic meals to employees, whereas convenience stores, coffee/fruit shops etc are also available to satisfy employees' needs for diversity. Special meals are prepared during festive occasions and Chinese New Year periods as recognition for the sacrifice of those on shift.
- B. Employees are entitled to apply for single dormitory at discount rates.
- C. Car/motorcycle parking lots and shuttle bus services have been made available as more convenient commuting options for employees.

The Company also has an Employee Welfare Committee available to arrange diverse benefits and activities for employees. The Employee Welfare Committee comprises 9 members, 1 of whom is appointed by the Company whereas the other 8 are elected by employees from different departments. One committee chairman, one vice chairman and one committee member in charge of financial affairs are elected among members of the Employee Welfare Committee. The Employee Welfare Committee is funded by revenue contributions, salary contributions and other income sources. The Employee Welfare Committee received approximately NT\$52 million in funding in 2018; the majority of which was spent on incentive trips, festive gifts, birthday vouchers, children's scholarship, group insurance, entertainment, and childbirth and hospitalization subsidies.



2018 year-end party



Film carnival



Baseball day



BBQ DAY and singing contest



Family Day - We Are the World



Coffee/fruit bar



Convenience store



Clean single dormitory

Sports-Friendly Workplace

The Company organizes sport and entertainment activities from time to time to advocate work-life balance. By encouraging the creation of sport clubs and exercise space, we aim to promote sport habit and employees' physical as well as mental health. Some of the actions taken are as follows:

● Full-fledged sports/Recreation center:

The Company has a multi-purpose sports and recreation center with facilities including air track, basketball court, badminton court, KTV, pool table, aerobics room, massage chair and fitness equipment that employees may use to maintain health amidst their busy schedules.

8,921

Number of people using the sports and recreation center in 2018

41,524

Number of visits to the sports and recreation center in 2018

● Encouragement of sport activities:

Departments are encouraged to organize entertainment activities as ways to enhance interaction among employees and between line managers and subordinates, and promote department unity as a result. Meanwhile, fitness courses of various types are being introduced to teach employees the correct and professional way of weight training. The Company participates in the biennial sports event of Formosa Plastics Group by organizing various sport competitions such as basketball, badminton, swimming, table tennis, volleyball, tug of war, dodge ball and track and field (high jump, long jump, shot put, sprint and long-distance run etc). These events help train potential talents that may someday win honor for themselves and the Company.

► Sport courses and participation count in 2018

Course category	Sessions	No. of participants
TRX	3	25
Muscle strength	6	75
Boxing	11	132
Yoga	12	123
Massage roller	2	25
Total	34	380

► Use of recreation center by department and club - 2018

	Basketball	Volleyball	Table tennis	Others	Total
Department count	12	1	29	42	
Total participant count	255	100	687	1,042	
Club count	1		1	2	
Total participant count	110	40	150		

● Diverse club activities:

The Company has clubs of diverse themes including parenting, jogging, basketball, table tennis, badminton, slow pitch and hiking. More than 1280 employees had participated in the above club activities in 2018. Clubs are encouraged to recruit participants on a yearly basis for increased exposure.



The 35th Sports Day



Women's basketball tournament



Women's tug of war



Employee trip



Basketball club - 3 on 3 tournament



Newly opened recreation center

Healthy and Caring Environment

For the convenience of female employees, the Company offers priority parking lots for pregnant employees and has nursery rooms in place to support gender equality. The health center also conducts maternal hazard assessments for women who are pregnant and breastfeeding.

The Company complies with the Occupational Safety and Health Act, and as an employer, it undertakes hazard evaluation, control and classification measures for work activities that are hazardous to maternal health. For female workers who are pregnant or have given birth less than a year ago, the Company adopts health protection measures and adjusts work details as recommended by physicians, and keeps relevant details on record. The Company disseminates health-related information and organizes women's health seminars on a regular basis. There are professional nurses stationed at plant sites to offer counsel on infant care for pregnant women. Nursery rooms fully equipped with lockers, refrigerators and water heaters have been deployed at all plant sites for the peace and comfort of all breastfeeding employees.

Human Rights

Human Rights Policy

Nanya Technology Corporation places great emphasis on employees' rights. The Company has employment and ethics policies in place, and complies with behavioral guidelines of Responsible Business Alliance (RBA), 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. By implementing human rights risk assessment and management, the Company hopes to create an inclusive and friendly workplace.

The Company did not encounter any incident of human rights violation or discrimination involving its employee in 2018. The Company never hired child labor and commits not to hire child labor less than 16 years of age in the future. For the protection of employer's and employees' rights, all employees are given an employment notice prior to the work commencement date. The Company signs employment commitment in writing with all new recruits on the work commencement date, and 100% of employees have signed the commitment, meaning that all employees of the Company are fully protected by the terms of the employment contract. All employees have been hired with employment terms established under the free will, consent and consensus of both parties; no employee was forced or coerced to perform work activities unwillingly.

Human Rights Risk Assessment

Nanya Technology Corporation assesses human rights risks according to RBA and workplace health principles. The Company has an internal audit system in place to regularly assess employees' risk exposure and devise mitigation measures accordingly. We constantly identify personnel issues, susceptible parties and departments, and perform human rights risk assessments on a regular basis. Risk values are calculated to reflect the percentage of people at risk relative to total employees; based on the assessment results, the Company is able to devise annual improvements and set mitigation targets for human rights risks in the future.

In 2018, we incorporated the four main tasks of occupational safety laws and GDPR into our human rights risk assessment framework, and found the organization to be susceptible to risks such as work hour, employment dispute, sexual harassment, personal data protection and protection of occupational health, with risk value calculated at 13.3%. Compared to 2017, the Company exhibited an increase in risk value mainly due to adjustment of the risk assessment framework. Meanwhile, we also offer mitigation and compensation measures for human risk factors of medium-level risk.

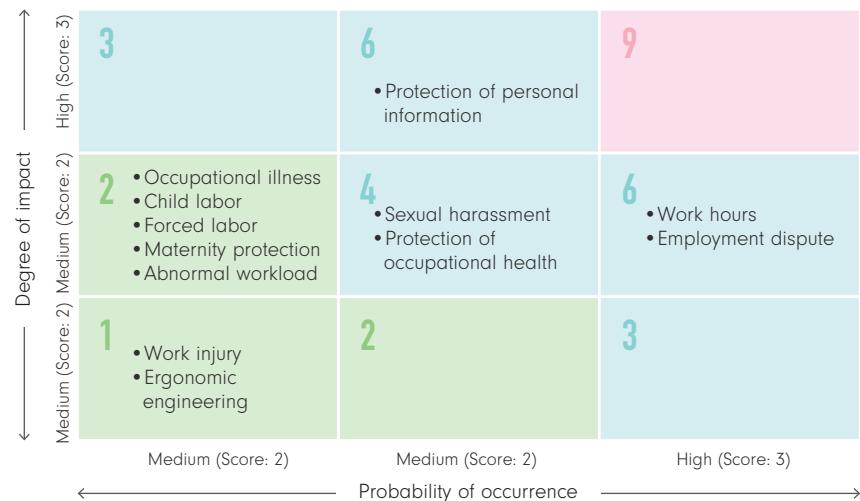
► Human rights risks of Nanya Technology Corporation

Human rights issues	Parties susceptible to influence	Assessment tools	2017 risk	2017 risk value	2018 risk	2018 risk value
Work hours	Production engineer/technician/R&D personnel	Attendance system	Medium		Medium	
Work injury	Production/new recruit	Occupational injury report	Medium		Low	
Employment dispute	All employees	Government correspondence on employment disputes	Medium		Medium	
Occupational illness	All employees	Special health checkup	Low		Low	
Sexual harassment	Female	Grievance investigation	Low		Medium	
Child labor	Employees aged 18 and below	Identity proof	Low		Low	
Forced labor	All employees	RBA internal audit	Low		Low	
Protection of personal information	All employees (European employees)	Violation of GDPR	-		Medium	
Maternity protection	Females in pregnancy or within 1 year of labor	Females in pregnancy or within 1 year of labor are subjected to regular tracking	-		Low	
Protection of occupational health	People with blood pressure > 140/90mmHg or metabolic syndrome	People with blood pressure >140/90mmHg or metabolic syndrome are subjected to regular tracking	-		Medium	
Abnormal workload	Overtime working exceeding 37 hours a month for 6 consecutive months	People who work overtime more than 37 hours a month for 6 consecutive months are subjected to regular tracking	-		Low	
Ergonomic engineering	People with ergonomic engineering risk grade >2	People with ergonomic engineering risk grade >2 are subjected to regular tracking	-		Low	

10.9%

13.3%

► Human rights risk matrix



Description:
High risk (score: 9),
medium risk (score: 3~6),
low risk (score: 1~2)



► The following mitigation measures and compensations were proposed for issues identified as medium risk in 2018:

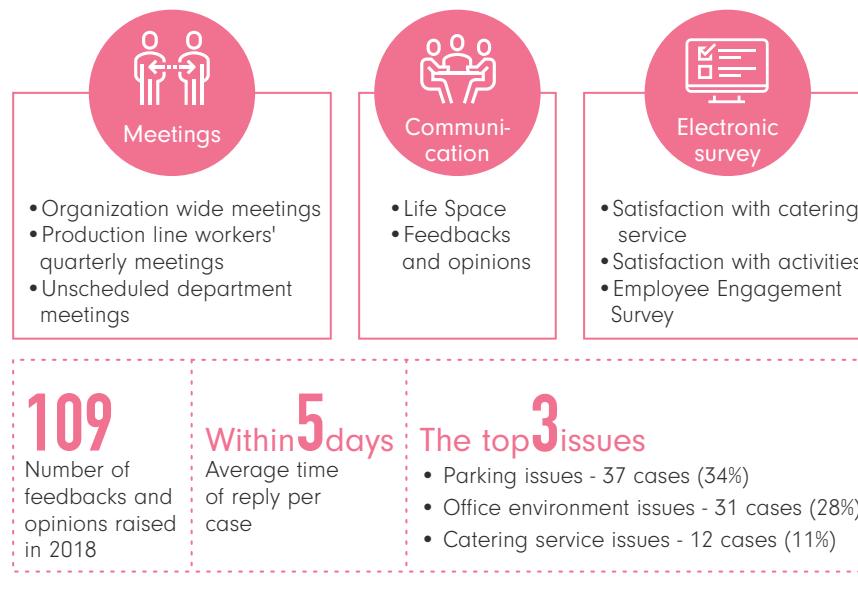
Human rights issues	2018 risk	Mitigation measures	Compensations
Work hours	Medium	1. Units that exhibit excessive overtime work hours are instructed to analyze the underlying cause and propose improvements 2. Employees' overtime working is monitored on a monthly basis, and line managers are notified to make improvements	Internal policies have been adjusted to prohibit employees from working overtime in excess of statutory limits
Employment dispute	Medium	1. The Company has always responded to employment disputes through open and rational communication, as we strive to resolve difference in opinions and develop consensus among the workforce. 2. In light of the series of adjustments made to employment regulations in recent years, the Company has made corresponding changes to its management system as a means to reduce chances of employment dispute.	Employees are compensated for their losses based on the employment dispute record
Protection of personal information	Medium	1. The Personal Information Management Procedures have been updated and disseminated to all employees for compliance with GDPR. 2. "Cross-border Transmission Agreements" have been signed with European subsidiaries. 3. The personal information task force has been made aware of GDPR terms and protection mechanisms available within the organization	1. The Company takes initiative in reporting to the local authority. 2. Employees are compensated for their losses based on the outcome of the investigation.
Protection of occupational health	Medium	1. The Company conducts investigations on areas including maternal health, high health checkup risk, ergonomic engineering, and abnormal workload. 2. Employees who have been subjected to regular tracking are offered health-related counsel and recommendation	1. Provide health-related counsel and recommendation 2. Employees may discuss with line managers to have overtime reduced if they are physically or mentally unable to cope. 3. Regular follow-up diagnosis and treatment.
Sexual harassment	Medium	1. Sexual harassment prevention courses are held for department heads of various factory sites 2. Establishment of workplace sexual harassment prevention, grievance and disciplinary policies	Take disciplinary actions on a case-by-case basis, segregate victim from the accused, and arrange other appropriate work positions.

Grievance channels

The following grievance channels have been implemented according to "Nanya Technology Corporation Employee Complaint Guidelines," "Workplace Sexual Harassment Prevention, Grievance and Disciplinary Policy," and "Nanya Technology Corporation Whistleblower Policy": The Human Resource Department is responsible for handling inappropriate or unfair work requests, workplace harassment and other work-related issues. Illegal, non-compliant and inappropriate conducts involving the Company can be reported to the President's Office through mail or phone.

Internal Communication

The Company has diverse, open and transparent communication channels in place to maintain harmonic employment relation, facilitate labor-management collaboration and improve workers' benefits. These communication channels not only enable employees to express opinions on various issues concerning health, safety, benefits and basic work conditions, but also allow the Company to take initiative in learning employees' thoughts and address problems in a timely manner. The Company also has complaint mailbox, whistleblower hotline and sexual harassment prevention hotline available for reporting illegal matters, and any opinions concerning corporate policies may be raised using "Management System Improvement Opinion Form." Employees are entitled to communicate openly and thoroughly with the management about work-related or personal affairs, terms of employment, salary, benefits and personal opinions through the following channels:



Talent Development

Talent Development System

► Training and talent development guidelines

Ideology

NTC is people-oriented and sustainability, and advocates lifelong learning while assisting employees with their career development. It is the Company's goal to create a competitive training system that is suitable for the semiconductor industry.

Policy

To improve talent quality and support employees' ongoing education and career development. To optimize the training system and offer diverse, systematic training solutions needed for employees to develop proper skills, knowledge and attitude, and thereby accomplish the Company's annual strategic objectives.

Objective

2019 goals: Annual plan completion rate $\geq 96\%$; Internal employee substitution rate for job openings $\geq 50\%$.
 2021 goals: Annual plan completion rate $\geq 98\%$; Internal employee substitution rate for job openings $\geq 60\%$.

System

Training procedures, education/training implementation rules, structured on-the-job training policy, on-job training management policy, internal instructors training policy, and training materials management policy.

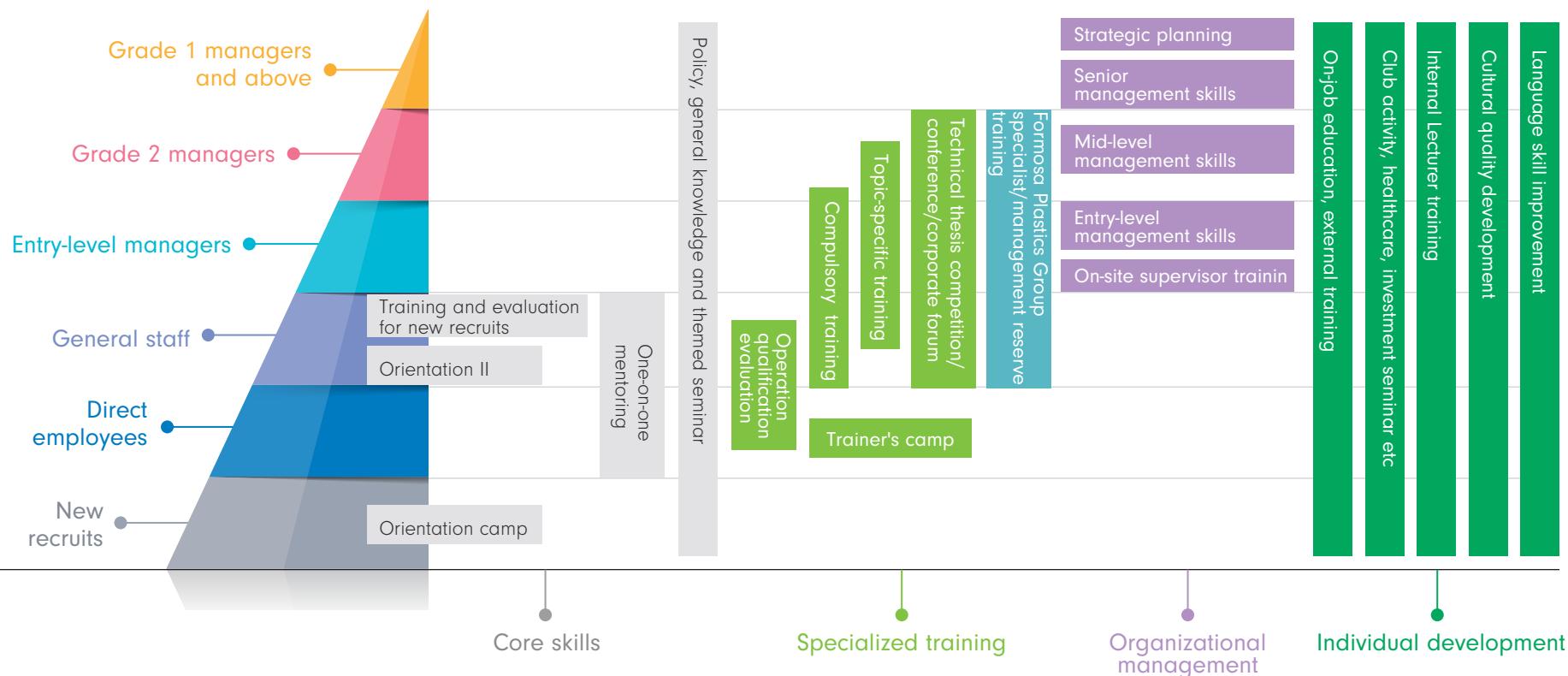
Implementation

Annual training plans are devised and executed according to corporate strategies. The Company monitors training indicators on a monthly basis, whereas the Training & Development Committee conducts quarterly reviews on plan execution and training outcome.

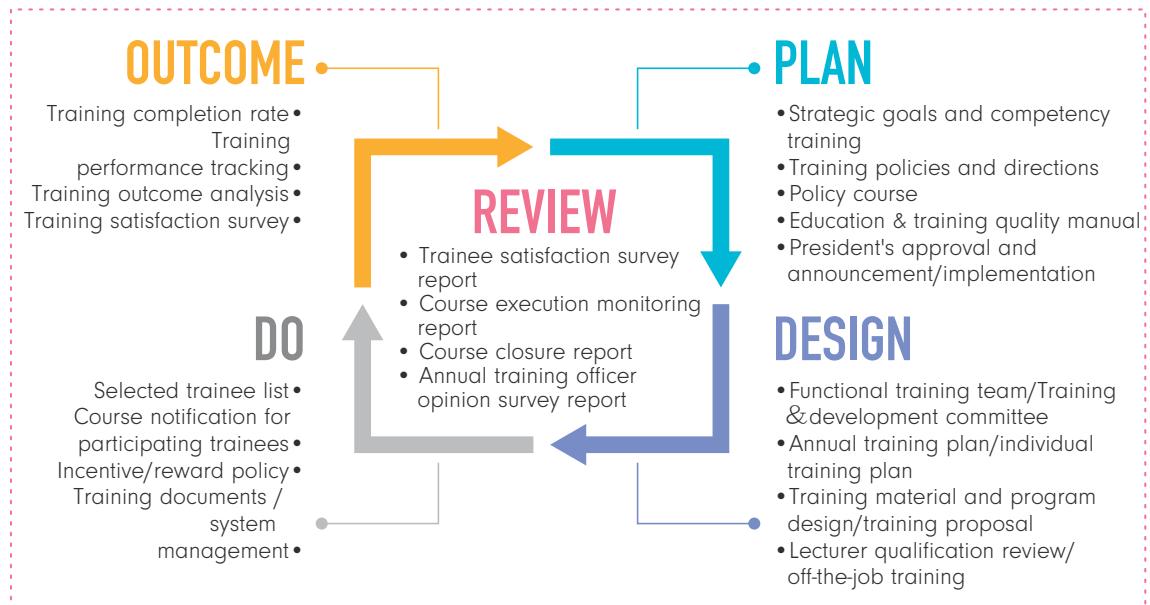
Training System and Management

Nanya Technology Corporation continually enhances and improves its training system to ensure better quality and more efficient talent development. Using the training management system as a guide, the Company executes classroom and e-learning courses of various themes including: orientation, general knowledge, specialist training, managerial skills, key talents, internal instructors, direct employees, and personal career development. Through establishment of a "training system" and a "knowledge management system," the Company is able to enhance the effectiveness of its skill development efforts while inspire creativity within the organization. The Company not only enables employees to absorb, share and learn knowledge, courses and information through internal systems and platforms, but also arranges external training, seminars, technical forums and other resources for the purpose of creating a learning organization and improving the overall training result.

Training & development system



► Training management system



Nanya Technology Corporation continues to adjust its course structures in line with corporate strategies and goals, and takes step to improve the effectiveness, yield and output of its training efforts. In addition to regular internal audit, analysis and tracking of training quality, the Company also participated in the Talent Quality-management System (TTQS) developed by Workforce Development Agency, Ministry of Labor, in 2018. The TTQS review the planning, design, execution, outcome of a training program, and the Company was able to stand out among the many participants to claim the Gold Award in the Large Enterprise category. Motivated by the recognition for the Company's talent training and development efforts, Nanya Technology Corporation will be participating in the 2019 National Talent Development Award (NTDA) competition to test its talent training practices. Below are descriptions of the Company's award-winning experiences and training programs by category:



TTQS - Enterprise - Gold Medal Certification



Experience Sharing

Nanya Technology Corporation appreciates the organizing and reviewing committee for awarding Gold, the most prestigious certification of the TTQS. Our streamlined training system is the ultimate representation of the Company's attention, initiative and capability in talent development. Nanya Technology Corporation values talent training and development, and takes initiative to fulfill employees' training requirements. Below is a summary of key points for this award.

1. Problem analysis and key points

- Understanding the procedures of TTQS (applicant eligibility, mechanism, timing, documents etc)
- Self-examination of TTQS adoption and ongoing improvements
- Referencing and understanding the practices and experiences of gold-certified enterprises
- Adopt and execute project for the goal of winning gold



2. Issues, knowledge and tips

- Establishing control over the 19 review indicators of TTQS
- Prepare self-assessment sheet of the 19 review indicators and present to the review committee
- Provide details on TTQS adoption, ongoing training and completion progress
- Prepare complete file on training programs, policies, documents and records for review
- Engage the President to enhance senior managers' attention toward training
- Present professional teamwork; rehearse early, middle and late stages of the review process.

3. Solutions and recommendations

- The TTQS framework
- TTQS review indicators
- Training quality management cycle
- Training system and management
- Adopt and apply TTQS recommendations

4. Preparation for the review

- Control the 19 review indicators
Gather documents and proofs relating to the indicators; prepare self-assessment sheet of the review indicators and present to the review committee
- Prepare proof of training completed in previous years
The review includes an authenticity check, and therefore requires preparation of training plan, policies, documents and records on file
- Professional involvement from the senior management
Engage the President to present professional teamwork



Global Senior Management Strategy Camp

Training Categories



Core skills

Orientation

The orientation is intended to provide new employees with a quick understanding of the corporate environment and the semiconductor industry, and help them adapt to the Company's organization and culture in shorter time. The orientation offers a comprehensive range of basic training and on-the-job training courses to shorten employees' learning curve and help them develop skills in line with the Company's strategies. The Company hired additional staff in 2018, and a total of 528 new recruits completed their orientation during the year.

General knowledge training

This training mainly comprises courses that have been structured in line with the government's legal requirements on worker safety, environment and health, or customers' product quality requirements, or the Company's business development strategies.



Specialized training

Function-based specialized training

Specialized training is a systematic way for employees to develop professional knowledge and the required skills, and incorporates one-to-one mentorship, operations certification, and external training assignment. This year, department counselors called "Buddies" were offered instructor training to help improve professional capabilities of individual employees.

Direct employee training

Direct employees are offered pre-job training on the professional knowledge and machine operation skills to help them obtain the required certifications. By adopting the trainer system and offering rewards, direct employees are given the incentive to adapt quickly to the clean room environment and join the production line at an earlier time. A total of 183 direct employees had completed their training during the year.



Organizational management

Management training

The Company not only offers managerial skill training for managers of different grades, grade 1 and grade 2 management reserves are also required to participate in advanced management workshops depending on their roles. These training courses are intended to improve leadership, decision-making and adaptation of management philosophy among management reserves. In addition, the annual senior management strategy meetings further unite strategic consensus within the Company, and contribute effectively to the accomplishment of corporate objectives.



Individual development

Individual development

Administrative resources and incentives are being offered in accordance with the Company's on-job training policy to encourage lifelong learning and support career development among employees. Internal employee substitution rate for job openings was calculated at 47.4% for 2018. Employee training subsidies in previous years are shown in the following chart.

Internal lecturers training

The Company has an internal training program in place to develop quality lecturers for the purpose of transferring corporate knowledge. A total of 16 internal lecturers were newly certified in 2018. As a show of gratitude and encouragement for lecturers' contribution to the enhancement of internal training, the Company organizes commendation events every year during Teacher's Day in September with the support and participation of senior management. A total of 15 top-performing lecturers were commended in 2018.



Award ceremony for outstanding lecturers





Training and Development Outcome

The Company organized 1,786 training sessions and delivered 5,689 hours of training in 2018. These courses received 38,218 enrollments and completed 73,074 man-hours of training in total, which averaged 22.7 hours per employee and incurred total training expense of NT\$5,142,302. The significant increase in training sessions and man-hours in 2018 was mainly attributed to the voluntary learning incentives offered to various departments and the course feedback system established during the year. The reduction in training expenses in 2018 was due to the absence of training expenses spent on transferring advanced production procedures from abroad. Training performance data and indicators for the last 3 years are presented below.

► Employee training and average training hours

Item	♀			♂			Total		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
Total man-hours of training (hours)	7,570	14,870	21,128	21,489	41,446	51,946	29,059	56,316	73,074
Total employee count (persons)	830	879	925	1,764	2,105	2,294	2594	2,984	3,219
Average training hours per person (hours)	9.1	16.9	22.8	12.2	19.7	22.6	11.2	18.9	22.7

► Average training hours by category

Unit: hours

Category	♀			♂			Total hours		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
Managerial role	6.4	12.2	13.2	6.9	13.2	13.7	3,162	3,908	4,446
Professional technology	14.7	21.0	23.5	16.0	22.5	24.3	17,330	34,981	40,821
Administrative support	11.0	21.8	26.5	8.7	16.7	25.7	5,218	10,891	16,021
Direct employees	6.7	12.4	20.2	6.7	12.4	19.9	3,349	6,536	11,786

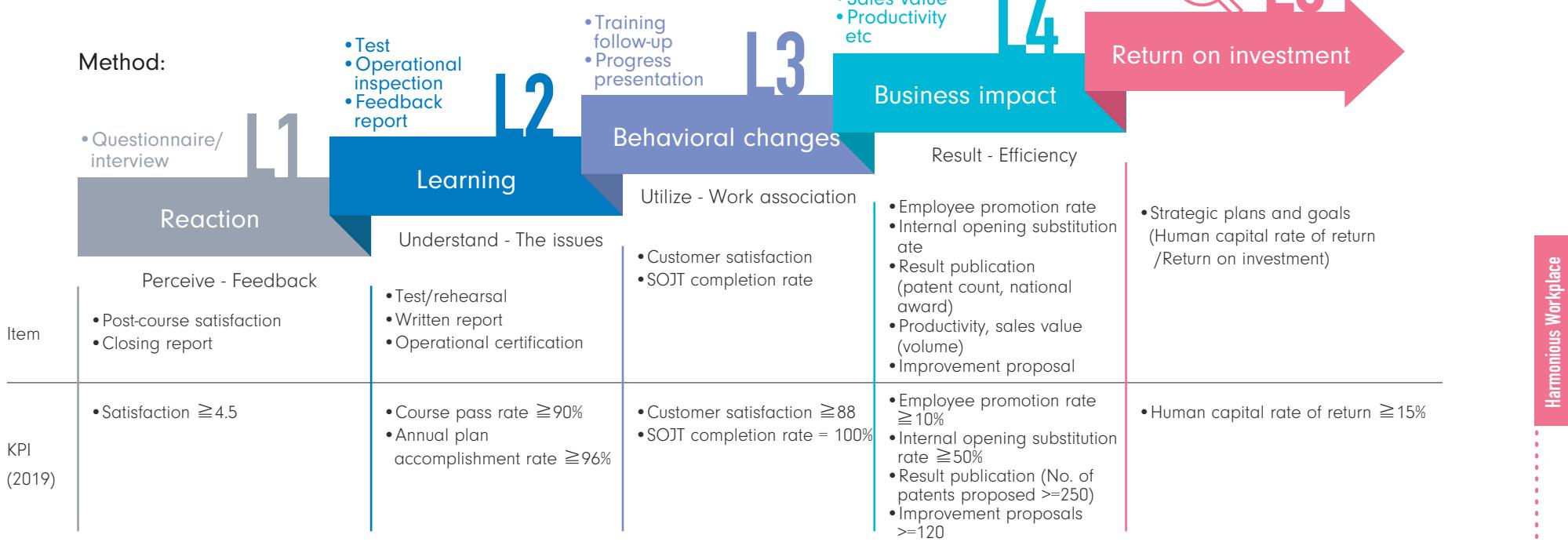
Note1: Employee training hours do not include training under mentorship

Note2: Managerial role refers to assistant vice president grade and above, plant/division head, department/section head, and production line chiefs

Training management indicator	2016	2017	2018
Total course session count	640	981	1,786
Total training hours (hours)	1,398	2,524	5,689
Total course enrollments	13,726	22,018	38,218
Total man-hours of training	34,722	56,316	73,074
Average training hours per person	13	18.9	22.7
Training expense (NT\$)	8,738,943	7,537,561	5,142,302
Average training expense per person (NT\$)	3,262	2,526	1,597
Substitution rate of employees (%)	23.7%	43.0%	47.4%

In an attempt to keep track of operational yields and effectiveness of various training projects, Nanya Technology Corporation has adopted the Kirkpatrick model and evaluated its courses on several levels (L1~L5). Findings of this evaluation have helped improve training quality and raised employees' willingness to participate in the training system. Under the approval and supervision of the President, the annual training plan has been executed properly with various training programs and courses carried out according to schedule, and employees' post-learning outcomes assessed afterwards.

► Diversity and completeness of training evaluated by the Kirkpatrick model :



Grade	Item	2016			2017			2018		
Return on investment (ROI) Level 5	Human capital rate of return (%)	13			15.3			20.8		
	Productivity per employee (NT\$ K)	15,402			18,404			26,319		
	Profit contribution rate of human cost (%)	131			201			263		
	Return on personnel training investments (%)	91			485			799		
		All employees	♀	♂	All employees	♀	♂	All employees	♀	♂
Result Level 4	Employee promotion rate (%)	12.90	3.01	9.89	16.08	3.50	12.58	16.12	3.16	12.96
	Promotion rate of employees with <3 years service (%)	1.93	0.36	1.57	2.07	0.22	1.84	3.67	0.57	3.10
	Promotion rate of employees with ≥3 years service (%)	10.97	2.65	8.32	14.02	3.28	10.73	12.45	2.59	9.86
	Turnover rate of total employees (%)	7.74	2.29	5.45	11.68	2.94	8.74	9.04	1.99	7.05
	Turnover rate of top employees (%)	1.78	0.27	1.51	4.46	1.18	3.28	1.41	0.12	1.29
Behavior Level 3	Internal opening substitution rate (%)	23.7			43.0			47.4		
	Patent count (cases)	478			471			502		
	Improvement proposals (cases)	44			47			51		
	Customer satisfaction (score)	88.5			88.7			90.6		
	SOJT completion rate (%)	100			100			100		
Learning Level 2	Course pass rate (%)	90.4			90.6			94.1		
	Annual plan accomplishment rate (%)	88.6			90.8			98		
	Annual plan (unplanned) accomplishment rate (%)	119.1			124.2			126.9		
Reaction Level 1	Satisfaction (5-point scale)	4.53			4.51			4.72		

Note 1: Return on personnel training investments (ROI) was lower in 2016 mainly because the Company had placed its focus on low-power consumption products, which accounted for a lower percentage of overall operations.

Note 2: Top employee refers to those who achieved a performance rating of "Excellent" or "Good" during the year



Key Training & Development Projects

Nanya Technology Corporation envisions itself as one of the Best DRAM Provider for Smart World, and has therefore invested extensively into developing DRAM as its core competitive advantage. Research, development and manufacturing of this particular product has been enhanced over time to satisfy the market's diverse requirements, and it carries significance in all of the Company's technology projects and plans. The following is a list of key training programs executed in 2018

Year	Project	Training topic	Importance of the project to corporate operations	Assessment of training outcome and operational yields (NT\$)	Kirkpatrick (L1 - L5)	Employee participation rate (% as a percentage of all employees)
2018	Training program for advanced procedure/niche DRAM development	1. Training on advanced procedures/new procedures/niche products 2. Conference skill training for project managers 3. Managerial skill training for managers 4. Training for the improvement of training program	As the Company progresses into the next-generation production procedure (20nm), new marketing and product strategies are required to support development of this advanced procedure as well as demand for niche DRAM products. This training program has the potential to improve the Company's product competitiveness and stabilize product margins.	Employees: SOJT completion rate = 100%	L3: Structured on-the-job training (SOJT)	
				Improved efficiency: A total of 239 product R&D/validation enhancement/advanced procedure adoption/productivity improvement tasks were completed, and 51 improvement proposals were raised	L4: Productivity	85%
				Production volume: >950M	L4: Productivity	
2018	Talent development system enhancement program	1. Market planning and sales competitiveness enhancement course 2. TTQS evaluation 3. Professional skill enhancement on all management levels	Given the Company's talent and technology-intensive nature, it is important to implement an effective and technology-focused training program that not only aligns with the Company's strategic goals, but also improves employees' professional skills, know-how and increases sale of next-generation products.	Result publication: 1. Patent count: 502 2. Won Ministry of Labor's TTQS evaluation - Gold	L4: Result publication	82%
				Profit creation: NT\$ 649,451,446 (ROI: 855%)	L5: Return on investment	
2017	Advanced DRAM procedures and product development training program	1. Training for new procedures and product conversion 2. Project management and execution training 3. Training for the improvement of training program	This program has enabled the company to successfully adopt next-generation production procedures (20nm) and develop proprietary R&D capabilities for a number of benefits including reduced product cost, increased production capacity, enhanced product competitiveness, and sustainable business.	Employees: SOJT completion rate = 100%	L3: Structured on-the-job training (SOJT)	
				Improved efficiency: A total of 717 new procedure/product adoption and production enhancement tasks were completed, and 47 improvement proposals were raised	L4: Productivity	86%
				Result publication: Patent count: 471	L4: Result publication	
2016	Training program for development of new low-power consumption DRAM	1. Specialized training for production procedures and low-power consumption products 2. Project management and execution training 3. Patent talent training course	This program supports the Company's transformation efforts and helps develop the proprietary technologies needed to design kits, which bring a number of benefits including broader product diversity, higher market share in mobile memories, increased product value, wider customer reach, balanced product portfolio, reduced market and customer concentration, and more sustainable business.	Employees: SOJT completion rate = 100%	L5: Return on investment	
				Improved efficiency: A total of 320 low-power consumption product adoption and production enhancement tasks were completed, and 44 improvement proposals were raised	L4: Productivity	85%
				Result publication: Patent count: 478	L4: Result publication	
				Profit creation: NT\$ 804,042,459 (ROI: 98%)	L5: Return on investment	

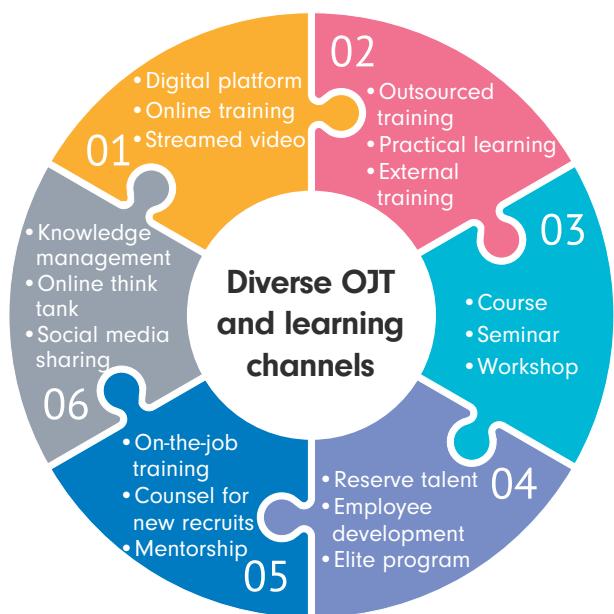
► Human Capital ROI

NT\$ (thousands)	2015	2016	2017	2018
(a.) Total revenues	43,875,905	41,632,505	54,918,224	84,721,804
(b.) Operating expense	3,820,610	4,298,858	5,852,847	7,260,533
(c.) Personnel expense	2,966,302	3,119,440	3,419,910	3,902,719
Resulting HC ROI (a-(b-c)) / c	14.5	13.0	15.3	20.8

Diverse Development and Learning Paths

The Company offers complete and diverse range of on-job training and learning channels to support talent development, lifelong learning and assist employees with career development. Together, they satisfy employees' needs for diversified learning.

Online learning video center <p>The Company's internal training & development system incorporates a video center as a more flexible method and environment for learning. This digital environment provides employees with more freedom on how they wish to proceed with their learning. The Company released 72 digital courses onto the digital learning environment in 2018, and employees as a whole completed 10,172 hours of training and reading online.</p>	Language learning subsidy <p>The Company's "language learning subsidy program" subsidizes and rewards employees for taking language courses. In addition to internal English courses, the Company collaborates with external training institutions to offer training opportunities for the improvement of employees' language skills. The Company also has a "TOEIC Exam Simulation System" set up for employees to practice, and organizes simulation exams to prepare employees for the real event. TOEIC results have been associated with personnel assignment and promotion. In 2018, an additional 331 employees (66% increase) had achieved the target TOEIC score needed for job transfer and promotion.</p>	On-job diploma <p>In addition to industry-academia collaboration and technology development projects, the Company also offers subsidies and incentives through its on-job training policy to encourage employees' participation in tertiary education outside work hours. These subsidies/incentives have helped a total of 699 employees attain new tertiary degrees to date, including 201 diplomas, 382 bachelor degrees, and 116 postgraduate degrees.</p>	Participation in external courses <p>Nanya Technology Corporation encourages employees to expand their professional capacity and obtain certifications relevant to their works through participation in external training courses, as the knowledge is likely to benefit the Company in the form of new product development and added product value. External training courses received a total of 171 enrollments in 2018.</p>
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In addition to the diverse learning platform and classroom courses, the Company also uses professional certification and offers job rotation and project involvement opportunities as means for employees to expand their areas of expertise. Interdepartmental knowledge sharing conferences such as: i-Share, TED TALK, i-Change and Wall Breaker are held regularly to facilitate interactions. To ensure effective control of materials used internally by various departments for Structured on-the-Job Training (S-OJT), the Company has established a set of training material management guidelines and integrated it with the approval process of the knowledge management system so that the training materials are managed, updated, accessed and shared more efficiently through a unified portal. The system currently holds 2014 internal training materials contributed by various departments.



i-Share, TED TALK



i-Change & Wall Breaker conference

Maximizing Employee Performance

The purpose of Nanya Technology Corporation's performance management system is to maximize employees' potentials. In addition to providing good learning environment and implementing sound performance management systems, the Company also emphasizes productive interaction between line managers and their subordinates. Apart from annual performance evaluation, line managers are also required to engage subordinates in quarterly performance reviews. Through interaction and communication, employees are given the care and assistance they need to improve and accomplish individual as well as organizational goals.

The review process begins with the line manager breaking down organizational goals and setting individual work objectives for subordinates face-to-face, and is followed by feedbacks on the execution of work objectives and performance review at the end of the period. Between 2015 and 2018, 100% of employees were subjected to objective management and performance ranking. Performance management tools used by the Company in 2018 included: annual performance evaluation for all employees, and 180- & 360-degree performance evaluation for managers. Using different talent development tools, the Company offers suitable work performance improvement opinions to employees of all grades. 180-degree performance evaluation is intended for section managers and above, and involves review from 4~6 colleagues or managers that the subject has business dealing with, as chosen by the line manager. 360-degree performance evaluation is intended for plant and division managers and above, and involves feedbacks from subordinates on the subject's managerial skills. Details of the 180-degree performance evaluation (involving colleagues) and the 360-degree performance evaluation (involving subor-

dinates) are shown in the table below. In 2018, 10% of the Company's employees were subjected to multi-dimensional performance evaluation. Employees who exhibit good performance are rewarded; for those who exhibit poor performance, the system actively reminds their line managers to direct attention and provide assistance until there is significant improvement in performance. This treatment is not differentiated by gender in any way.

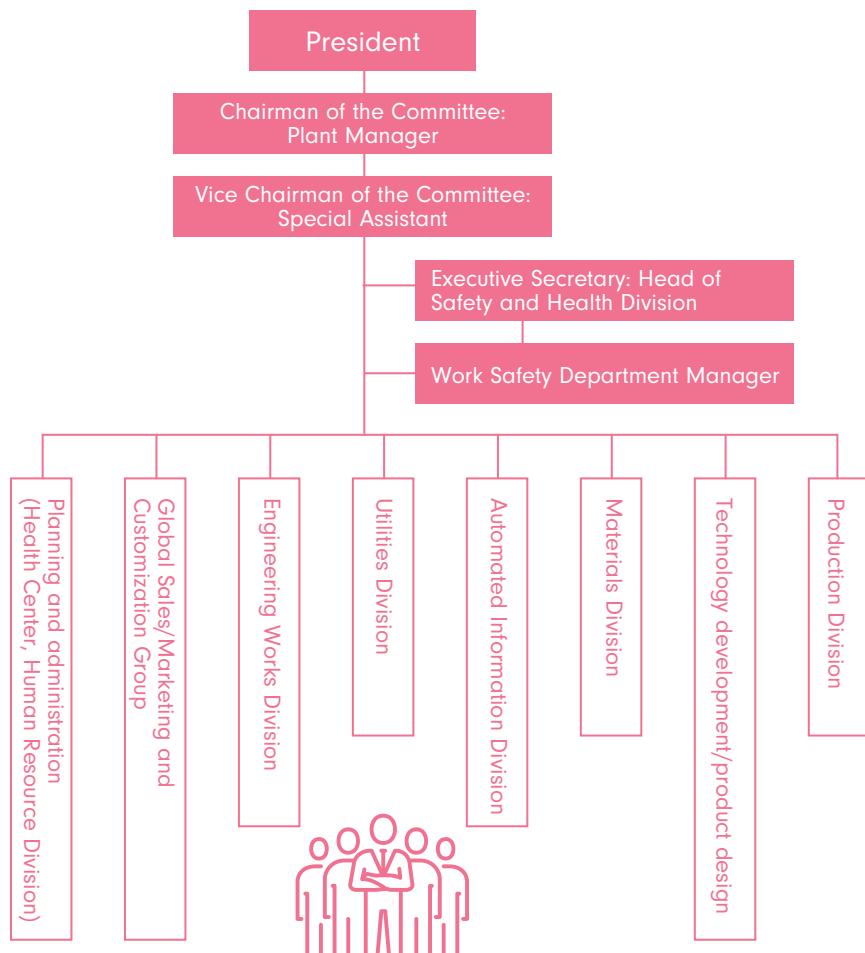
► Assessment criteria of the 180- and 360-degree performance evaluation

Category	180-degree performance evaluation (peers)	360-degree feedback (subordinates)
Assess criteria	Work attitude	Excellence
	Teamwork	Decision skills
	Communication skills	Innovativeness
	Execution	Leadership
		Communication

Occupational Safety and Health

Occupational Safety and Health

► Nanya Technology Corporation Organizational chart of the Occupational Safety and Health Committee



Occupational Safety and Health Committee meetings are hosted by plant managers and involve participation from senior managers, department heads, and committee members. The Company convenes Occupational Safety and Health Committee meetings at higher frequency than the requirements. Accomplishment of safety/health/environment management goals and resolution of safety and health issues are monitored on a monthly basis. The committee welcomes participation from all employees in the meeting, and the meetings are also used to discuss issues including compliance with the latest regulations, contractor management, health promotion and management. The committee has been assembled in accordance with law, with 34% of members comprising workers' representatives for proper reflection of employees' opinions on occupational safety and health issues. Issues reviewed during monthly committee meetings:

- 1 Occupational safety and health project and performance evaluation
- 2 Annual occupational safety and health training plan
- 3 Operating environment monitoring and outcome analysis
- 4 Accidents and improvement measures
- 5 Regulatory changes and response measures
- 6 Safety walk and talk and emergency response
- 7 Health management and health promotion
- 8 Propaganda by Administrative Division of Formosa Plastics
- 9 Contractor-related affairs

Prevention and Management of Occupational Hazards

Frequency of disabling injuries (No. of disabling injuries/million work hours) and severity of disabling injuries (No. of work days lost/million work hours) were both 0 in 2018, meaning that the Company had achieved zero disabling injury.

Occupational injury prevention goals of Nanya Technology Corporation

Zero disabling injuries



Zero occupational illness



Nanya Technology Corporation remains vigilant about hazard prevention even if it has achieved zero disabling injury across all plants, and continues to promote safety awareness among new recruits and contractors. The following measures have been taken to prevent occupational hazards:

1. Occupational safety and health training
2. Job safety analysis for identification of potential operational risks
3. Safety walk and talk (SWAT)
4. Process safety management (PSM) in coordination with Formosa Plastics Group
5. HazOp analysis for potential equipment risks

For the protection of employees, Nanya Technology Corporation has adopted the following measures to prevent occupational illness and hazard involving special health risks:

1. Health check for special hazards (noise, ionizing radiation, arsenic, indium, mercury and inorganic compound etc.) and health risk grading
2. Health management plan (prevention of excessive work hours and repetitive musculoskeletal hazard)
3. Maternal hazard assessment for pregnant women
4. At least 5 health seminars and blood donation events are held each year
5. Operating environment monitoring is performed twice a year
6. Chemical classification and management system

The following chart and figure contain statistics on the Company's occupational hazards and illnesses in the most recent year. The Company achieved zero disabling injury in 2018, and will strive to maintain this record in the future:

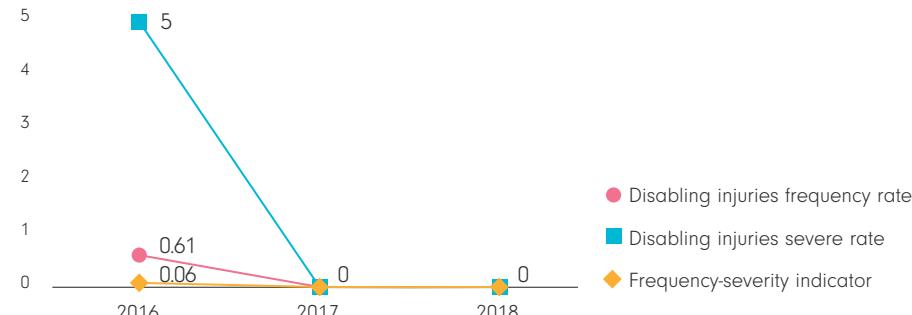
	2016		2017		2018	
Disabling injuries frequency rate (male/female)	0.61		0		0	
	0.40	0.20	0	0	0	0
Disabling injuries severe rate (male/female)	5		0		0	
	5	0	0	0	0	0
No. of major occupational hazards	1.Incidents resulting in death		0		0	
	2.Incidents resulting in 3 or more victims		0		0	
	3.Incidents resulting in the hospitalization of 1 or more victims		2		0	
Item	Work hours/days lost (male/female)		27.75		0	
	25.75	2	0	0	0	0
No. of disabling injuries in contractors		0		0		0
Absence rate (AR) (male/female)		0.23%		0.34%		
		0.11%	0.13%	0.24%	0.10%	0.26% 0.19%
No. of occupational illnesses certified by physician (male/female)	0		0		0	
	0	0	0	0	0	0
No. of resignations caused by occupational hazard (male/female)	0		0		0	
	0	0	0	0	0	0

Note:

1: Disabling injuries frequency rate (FR) and disabling injuries severe rate(SR) are based on occupational hazard data reported by the Company, and do not include contractors, traffic accidents outside production facilities, or minor injuries (that can be treated via first-aid on site).

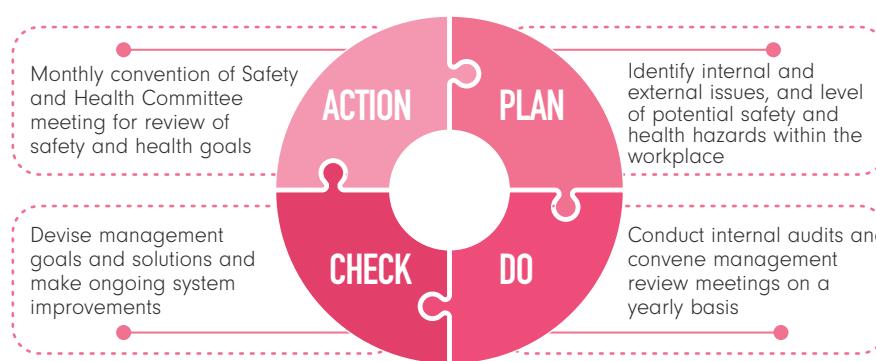
2: Absence rate (AR) = total hours absent (including inpatient leave + outpatient leave + occupational injury leave + menstrual leave)/total work hours*100%.

3: Female employees exhibited higher absence rate in 2018 due to increased inpatient leave compared to 2017. The Company will continue organizing health promotion activities for employees in the coming year.



Occupational Safety and Health Management System

Nanya Technology Corporation actively obtains certification for OHSAS18001:2007 and TOSHMS, and plans to convert system certification according to the latest ISO45001:2018 standards in 2019. Meanwhile, the Company continues to arrange special health checkups for high-risk employees, including those exposed to noise, chemical substance (arsenic/mercury/indium) and ionizing radiation, and adopts the following P-D-C-A process to set goals, execute solutions, and address internal/external issues and potential operational risks:



P (Plan): The Occupational Safety and Health Committee convenes monthly meetings to discuss accomplishment of safety/health/environment management goals as well as occupational safety and health issues.

D (Do): The Environment, Safety and Health Risk Committee convenes quarterly meetings to identify internal/external issues, hazards and potential workplace safety and health hazards, and to assess and grade the identified risks.

C (Check): The Company conducts internal audits and convenes management review meetings on a yearly basis to assess the review outcomes.

A (Action): In terms of hazard control, the Company performs feasibility analysis on all identified areas of high risk in order to devise management goals, solutions and make ongoing system improvements.

The following chart shows the number and details of improvement measures undertaken by the Company in the most recent year:

	2016	2017	2018
No. of improvement proposals	24	25	27
Improvement of moderate-high risk issues (case count/details)	16	16	17
	Ergonomic design for operational platforms and installation of emergency equipment, motor protection covers, and pipeline protection covers for reducing operational risks	Installation of ventilation equipment for laboratory, work isle improvement, emergency response drill, installation of forklift sensor, and installation of supply truck safety harness for reducing operational risks	Installation of water absorption device, ladders and maintenance platforms for elevated operations, and improved ventilation for reduced operational risks
Corrective measures (case count/details)	8	5	3
	Traffic safety improvement, valve fluid leakage prevention	Office air conditioning improvement, pipeline support enhancement and repiping	Photo resistor replacement, repiping for reduced fluid leakage
Project improvements (case count/details)	0	4	7
	-	Job safety analysis (JSA) project	Traffic safety project



Selection of Quality Contractors

In order to further strengthen and optimize safety measures, we have implemented a grading system for all contractors that undertake construction works outsourced from the Company. The system exists not only to control contractors' quality and safety standards, but also to protect their employees from occupational injury.

By investigating contractors' professional background, factory location, equipment, work site safety management capabilities and track records, the Company rates its contractors by competency and assigns one of three grades: A, B or C. Contractors that meet grade requirements are eligible to issue quotations for construction projects of appropriate specialization and size, whereas those that do not meet the grade requirements may apply for upgrade review with the Outsourcing Center, Administrative Division of Formosa Plastics Group. The Outsourcing Center convenes regular supplier conferences and assists suppliers with upgrades by reviewing improvements in areas such as specialization, work safety personnel, professional technicians, key technical personnel, business partners, work equipment, and track records.

Contractor Work Safety Review System

Contractors' safety has always been a key safety and health management concern for any business. At Nanya Technology Corporation, we value contractors' employees as our own, and respect them for contributing professional equipment and technology and assisting us with construction and maintenance works. To facilitate construction projects, the Company devotes attention not only to work quality and progress, but to safety and environmental management as well. In addition to existing systems on outsourcing management, contractor work safety review and work safety training, the Company introduced pre-work health check and training courses this year to ensure workers' compliance with safety requirements and safety conducts. Through these measures, we hope to accomplish our goals toward zero hazard and zero accident.

Nanya Technology Corporation follows the contractor management policies and systems of Formosa Plastics Group, and imposes the same safety and health standards for contractors' employees as do its own. The Company ensures construction quality at the source, and uses computerized control from design, budgeting, outsourcing to the work stage. Only the top-performing contractors are selected for plant expansion or maintenance. A certification-based training system has been adopted as a means to improve contractors' work skills and safety awareness, and reduce chances of occupational hazard.

Production outsourcing

- Issuance of outsourcing order
- Work safety notice: Establishes potential hazards and safety measures for the work environment

Design and budgeting

- Safety issues are taken into account and budgeted during work design
- Work safety notice is sent to contractor for quotation

Safety notice to contractors

- Once work has been assigned, the contractor is briefed on safe issues

Application of entry permit

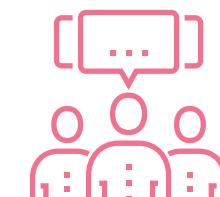
- Contractors registered for e-service may apply for entry permit online
- Contractors not yet registered for e-service are required to submit an entry application form and have the Work Supervision Department input into the system

Issue entry permit

- Work safety notice confirmation (contract No.)
- Contractor pre-entry safety training (employee ID)

Work application and permit

- Work safety permit OA circulation
- Assignment of work supervisor and safety supervisor
- Cross-site/cross-division permit application and training



Nanya Technology Corporation follows the construction management policy of Formosa Plastics Group and includes safety and health management expenses as a necessary personnel expense during budgeting. The required safety and health facilities are also listed in details in relevant contracts. When evaluating contractors' quotations, the Company makes sure that the quoted safety and health management expenses do not fall below the budget. This is to prevent contractors from undercutting the competition at the expense of safety and health management.

Contractors' safety and health management budget is calculated using the following standards:

► Construction Safety and Health Expense Standards

Item No	Wage amount (\$)	Percentage of work site safety and health expense (%)	Description
1	Less than NT\$30,000	5%	-
2	NT\$30,000~NT\$1,000,000 (inclusive)	4.5%	Amount must not be less than NT\$1,500
3	NT\$1,000,000~NT\$5,000,000 (inclusive)	4%	Amount must not be less than NT\$45,000
4	NT\$5,000,000~NT\$10,000,000 (inclusive)	3.5%	Amount must not be less than NT\$200,000
5	Above NT\$10,000,000	3%	Amount must not be less than NT\$350,000

► Work safety and health expenses in the last 3 years

Year	Amount of work safety and health expense (\$)
2016	122,813,177
2017	129,907,185
2018	109,053,787*



* : Higher amounts of work safety and health expense were incurred in 2016 and 2017 due to ongoing expansion. As the expansion project came to an end in 2018, the sums paid to contractors reduced and so did the work safety and health expense.

Work Safety Practical Training

Nanya Technology Corporation has robust internal policies in place to regulate its contractors, including: work permit policy, safety and health code of conduct, application form for restricted work activities, application form for open flame operations, application form for use of power system, high-risk worker checklist, and emergency response policy. Every contractor that the Company partners with is required to sign a work contract and a work safety notice that outline the work environment, hazards, and relevant safety and health rules. Meanwhile, Nanya Technology Corporation's existing safety and health practices such as self-inspection, inspection by Work Safety Department personnel, examination of employees' work and interviews, accident reporting and investigation, etc. also apply to contractors. Employees are encouraged to monitor contractors for unsafe conducts, and may report abnormal findings to team leaders, Central Control or work safety personnel for immediate tracking and improvement. All contractors' employees are required to undergo "Contractor In-plant Safety and Health Training" before carrying out work activities on factory premise (the training course covers: legal basis and compensation for occupational hazard/introduction to plant environment and evacuation/introduction to the consultative organization/safety of restricted works/use of common personal protection gear; and lasts 1 hour per session). The purpose of this training is to notify contractors of existing hazards in the work environment, rules that they are bound to comply, and safety awareness. Meanwhile, employees who have been assigned to supervise work on-site are required to complete the safety supervisor course before commencing duty; the purpose of this course is to provide safety supervisors with a clear understanding of their duties and to prevent occupational hazard.

Contractor training course	Year	Total hours	Trainee count	Coverage rate
Work safety and health	2016	54	5,929	100%
	2017	45	3,509	100%
	2018	51	4,451	100%

Note: All contractors entering factory premises are required to pass the in-plant safety and health training. 100% of contractors have passed the training to date.

Daily Toolbox Meetings

To ensure that the contractors do take safety measures to prevent accidents and eliminate occupational hazards during work activities, the Company explicitly informs contractors of the work environment they are presented with as well as the safety and health measures they are expected to take during the tender stage. Once the work has been assigned, the winning contractor will be strictly required to follow applicable rules, including the convention of daily toolbox meetings to announce work site rules and confirmation of work site safety before commencing work each day. All uses of temporary facility, safety/health facility and pollution control measure and disposal of waste and soil by contractors during the work period are bound to comply with relevant laws and corporate policies. Any occurrence of work safety incident due to non-compliance will result in work suspension or termination of further business dealings.

Occupational Safety and Health Training



Through continuous education, training, certification and regular retraining, Nanya Technology Corporation keeps new recruits and senior employees/managers updated on mandatory certifications, hazardous operations and emergency responses. Apart from courses, the Company also organizes emergency response drills on high risk areas and puts up posters throughout the factory premise to share safety and health knowledge. In an attempt to promote employees' traffic safety and defensive driving awareness during their commute, the Company invited Xinzhuan Traffic Police Branch of New Taipei City to conduct road safety seminar at factory premise twice during the year. These seminars helped reduce traffic accident during employees' commute, minimize chances of accident caused by unsafe behaviors, and develop safety awareness among employees, and constitute a part of the Company's occupational safety and health drill.

Item No.	Classification	Training	Total hours (hours)	Total participant count
1	Training and education	Occupational safety and hand training plan	340	3,860
2	Contingency drill	Plant evacuation drill	2	1,655
3	Road safety seminar	Motorcycle safety and defensive driving training	4	239
4	Statutory certification	OJT for organic solvent operations officer	18	121
5	Statutory certification	OJT for special chemical operations	18	76
6	Statutory certification	OJT for forklift operators	3	26
7	Training and education	Explanation to ISO 45001 and internal audit personnel training	42	39



ERT personnel drill
(use of chemical protection gear)

Sharing of safety and health knowledge
(use of promotional posters)



Motorcycle safety training (Road safety seminar by Xinzhuan Traffic Police Branch of New Taipei City at factory premise)

Workers' OJT
(Statutory certification - organic solvent operations officer)Emergency response drill
(assembly in response to clean room hazard)Regular fire drill
(validation and rehearsal of the fire safety team)Plant-wide evacuation drill
(emergency assembly area)

Employee Healthcare

The Company collaborates with professional medical team from Chang Gung Hospital to provide annual health check service for employees. A total of 1,021 employees had completed their health checks in 2018, for which the Company incurred total expenses of NT\$1,166,310 in expenses.

Employees who exhibit abnormal health check results are tracked on an ongoing basis and subjected to health management. All factory sites are equipped with infirmary facilities and have physicians stationed on-site to provide medical and consultation services for employees. The Company also organizes quarterly seminars and courses to care for employees' mental and physical health while satisfy their needs for health-related knowledge.

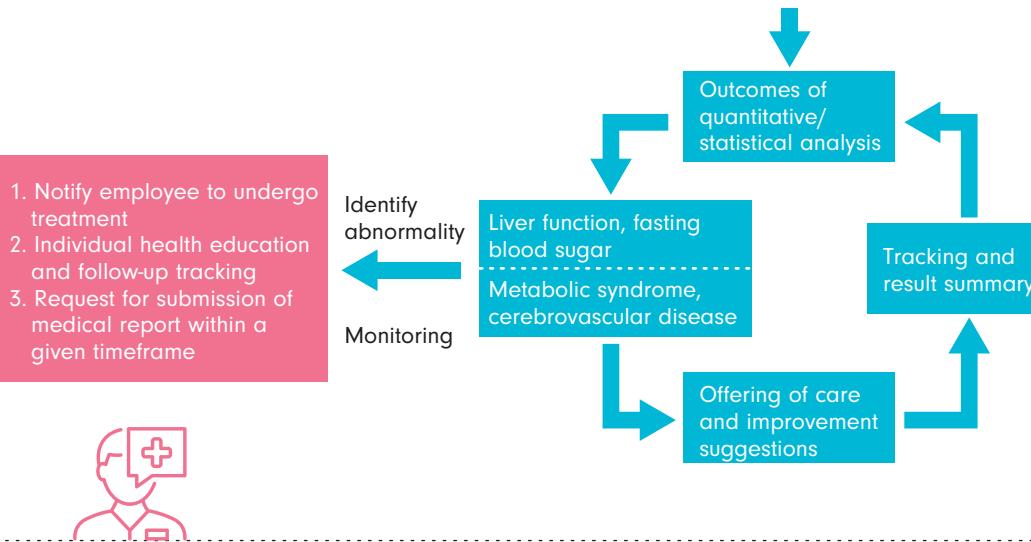
● Enforcement of health promotion

The Company offers regular employee health check services that are more favorable than what the laws require, and the health checkup also includes cancer screenings for α -Fetoprotein, carcinoembryonic antigen and oral cancer

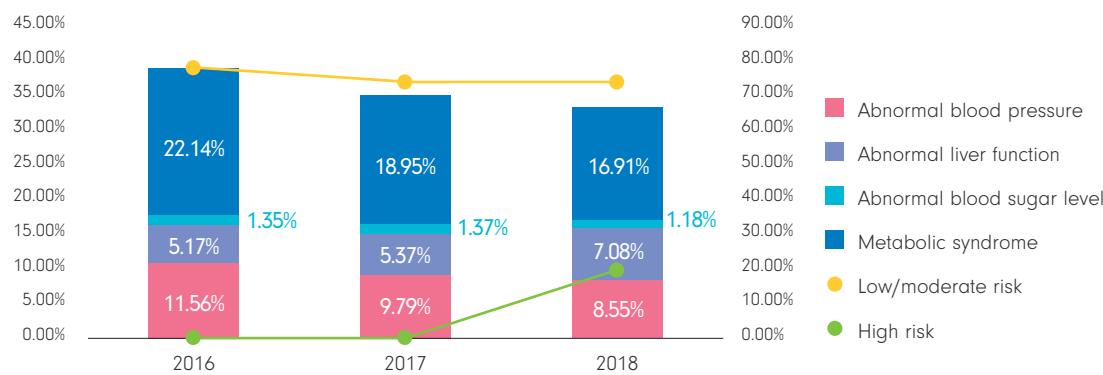
and waistline monitoring.

Based on the health check results, the Company identifies employees who exhibit abnormal health conditions (such as liver function, blood sugar, metabolic syndrome, cerebrovascular disease etc) and provides them with healthcare information, suggestions and follow-up tracking.

	Abnormal blood pressure	Abnormal liver function	Abnormal blood sugar level	Metabolic syndrome	Low/moderate risk	High risk	Total employees checked for the year
2016	11.56%	5.17%	1.35%	22.14%	79.83%	0	813
2017	9.79%	5.37%	1.37%	18.95%	75.47%	0	950
2018	8.55%	7.08%	1.18%	16.91%	74.53%	0.2	1,017
Total							2,780



► Health promotion



In addition to arranging health check for employees, the Company also has a Health Center available to provide services such as preliminary treatment of injuries, preventive healthcare, weight management, and smoking cessation consultation. Furthermore, the Health Center organizes health seminars, blood donations, stress relief workshops and technology-based fitness programs to promote preventive healthcare and reduce chances of illness. These events receive at least 300 enrollments on a yearly basis.

As a member of Formosa Plastics Group, the Company has the support of Chang Gung Memorial Hospitals as well as access to medical center-grade treatment and healthcare services. Employees of Nanya Technology Corporation and dependents are subsidized when seeking treatment at Chang Gung Memorial Hospitals, and are entitled to discounts on health checkups and various deductibles not covered by National Health Insurance Scheme.

● Response to epidemic disease

The Company has assembled an Epidemic Response Team based on recommended practices for SARS and avian influenza to facilitate quick response in the outbreak of epidemic disease, such as influenza virus. Response measures are being devised and conveyed to employees on an ongoing basis. The Company has taken the following actions relating to epidemic prevention:

- Epidemic prevention propaganda**
 - Influenza virus response measures are announced internally.
 - Large posters are placed throughout plant premise to convey the importance of epidemic prevention.
 - Distribution of health self-management notice

- Epidemic prevention measures**
 - Reporting, containment and epidemic prevention leave.
 - Epidemic prevention for contractors and visitors





Seminar on cheek health



Rejuvenation workshop



2018 health checkup

Blood donation



Technology-based fitness program



Placement of epidemic prevention posters

Well- equipped Recreation center

08

Common Good

An Active Participant in Community and Social welfare

Nanya Technology Corporation is committed to social engagement and participates in public affairs and local care to become an active participant that gives back to the society. We promote social influence and community development to lead the society to a better and sustainable future.

92.21%

NTC actively invested in social engagement, among them, the amount of commercial initiatives accounted for 92.21%

783 participants

Organized industrial expert seminars in which 9 supervisors served as instructors to promote connections between the industry and the academia for a total of 783 participants

500 kg of bananas / **144** kg of fair-trade coffee

To support Taiwan's local agricultural produce, NTC purchased 500kg of bananas from local banana farmers at reasonable prices; NTC sponsored 144kg of fair-trade coffee for charity organizations



135 Social Influence

138 Social Engagement

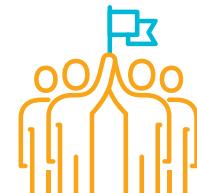
Strategy and Achievement

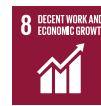
Unachieved
Achieved
Surpassed

Material issues	Strategies	2019 Goals	2018 Targets	2018 Achievements	Target achievement status
Social Engagement	<ul style="list-style-type: none"> Establish NTC's talent recruitment foundations through cooperation with the education system and industry associations Connect different types of NPOs to promote environmental protection ideals Improve social welfare by working with local art and charity groups Participate in the neighborhood communities, building a harmonious and mutually beneficial living sphere 	Increase the total investment amount by 15%	NT\$ 20,000,000	NT\$ 20,230,510	
		Commercial initiatives account for 85% of the total investment amount	NT\$ 18,000,000	NT\$ 18,654,240	
		130 Interns	30 Interns	125 Interns	
		Organize 15 sessions of campus seminars	3 sessions	10 sessions	

Social Influence

As a leading innovative company of global DRAM product, NTC thinks that it should play a role as a participant who actively contributes to the society to help resolve environmental challenges and social issues, making efforts to create positive influence. The United Nations' Sustainable Development Goals (SDGs) have revealed the sustainable challenges that human beings are facing, and companies are expected to be the key roles in jointly resolving the problems. We have been thinking how to respond to the SDGs on the basis of our core professional innovative capabilities. Relating to the strategic social welfare, SDG 8 (decent work and economic growth) drives us into talent cultivation and industry-academia cooperation. We have actively promoted technology upgrades and innovations for economic value enhancement in order to cultivate professional skills of youngsters and students, building the main theme of talent cultivation. SDG 13 (climate action) allows us to deeply experience the impacts that the extreme climates have on the community environment and the ecology. Therefore, NTC has set up a main theme of environmental conservation to safeguard environmental biodiversity and move toward the low carbon society. SDG 1 (no poverty) is the base for the NTC's public welfare implementation, so we have built two main themes of humanistic care and community harmony so that we are able to make long-term contributions to the communities and neighborhoods where we have been operating.



Main theme	Purpose	Vision	Audience	Social Influence
 Talent cultivation	 8 DECENT WORK AND ECONOMIC GROWTH Cooperate with the education system and cultivate potential students to reserve technology talent	<ul style="list-style-type: none"> Fresh graduates will be immediately hired by companies to satisfy their needs Improve the quality of employees and build a positive company culture 	Students in colleges and universities	<ul style="list-style-type: none"> Focus on education and talent cultivation
 Environmental protection	 13 CLIMATE ACTION Connect up non-profit organizations with different attributes and introduce various activities to promote environmental protection concept	<ul style="list-style-type: none"> Build a green and sustainable ecological environment 	Community organizations and environmental protection groups	<ul style="list-style-type: none"> Mitigate ecological impacts Build an inclusive society
 Humanistic care	 1 NO POVERTY Combine local art and culture with charity units and promote humanistic public welfare activities to enhance social welfare	<ul style="list-style-type: none"> Create an equal and friendly society 	Local art and culture organizations and charities	<ul style="list-style-type: none"> Enhance social welfare Deepen public welfare participation
 Community harmony	 1 NO POVERTY Participate in the neighborhood communities and public affairs, building a harmonious and mutually beneficial living sphere	<ul style="list-style-type: none"> Build an inclusive and harmonious living sphere 	Local township offices and community organizations	<ul style="list-style-type: none"> Inclusive and harmonious communities

Influence starts from changes. NTC has adopted the London Benchmarking Model (LBG) to evaluate the benefits and influence of each public welfare activities, adjusting public welfare programs and invested resources step by step. Moreover, NTC reviews effects and result, tightly linking core operation with social issues. To deepen and expand corporate long-term influence on the society, NTC focuses on connecting its core operational capabilities with social demands, setting up four public welfare themes: talent cultivation, environmental protection, humanistic care, and community harmony. We hope that through our professional innovative capabilities, which are our most competitive advantage, we are able to resolve social issues, creating a mutually beneficial and beautiful hometown. Shared value is the core concept of NTC's participation in social public welfare. Our short-term goal is to maximize the benefits of the invested resources. In the long run, we hope that the behaviors, awareness, and well-being of the entities we have helped would generate positive influence.

In recent years, cash and commodities have been the main resources NTC invested in public welfare activities, accounting for 90%, while employee volunteering accounts a partial of NTC's participation. The main types of public welfare activities are commercial activities aiming for technology talent cultivation, following by long-term investment in the communities. Only a small part of the activities are pure for charity. In the future, we will continue to review the effects of public welfare activities through the LBG, focusing on the ratio between commercial activities and long-term investment in the communities while considering the percentage of employee volunteering. In the meantime, we have also formulated long-term goals for public welfare activities, hoping that in 2021, the resources invested in public welfare can increase by 25%.

Main theme	Content	Commercial benefits	Social benefits
 Talent cultivation	<ul style="list-style-type: none"> Sponsor campus activities Handle lectures of professionals from industries Hold corporate visits Promote industry-academia cooperation Setting scholarships and financial aid 	<ul style="list-style-type: none"> Innovative technology R&D (3 industry-academia cooperation cases) NTC's supervisors served as professionals from industries (9 supervisors) Talent recruitment (485 participants for the corporate visits) 	<ul style="list-style-type: none"> Enhance technology capabilities (the amount of industry-academia cooperation is NT\$ 3.1 million and the cooperation period is 2018/11 - 2021/10) Industry-academia connections (783 participants for the lectures of professionals from industries) Assist employment opportunities (scholarships of NT\$ 520,000)
 Environmental protection	<ul style="list-style-type: none"> Environmental topic initiatives Safeguard ecological environment Community assistance 	<ul style="list-style-type: none"> Cohesion of employees (255 employees as participants) Media favorability (online media exposure: 1,680 hours) Enhance corporate image (participated in 1 environmental protection initiative activity) 	<ul style="list-style-type: none"> Environmental biodiversity (garbage clearance of 105kg) Reduction of plastics, paper, and carbon (100,000 kWh saved in electricity consumption through turning off the lights for one hour in all of Taiwan/-carbon reduction of 52,700kg in all of Taiwan)
 Humanistic care	<ul style="list-style-type: none"> Cooperate with public welfare groups Community care Charity bazaars 	<ul style="list-style-type: none"> Cohesion of employees (7,161 employees as participants) Media favorability (online media exposure: 480 hours) Enhance corporate image (2 certificates of appreciation) 	<ul style="list-style-type: none"> Sponsor local talent (sponsored 1 emerging artist) Prosper community environment (purchased 144kg of fair trade coffee) Reduce the gap between the have and have-nots (provided financial aid to 2 entities)
 Community harmony	<ul style="list-style-type: none"> Community assistance Community care 	<ul style="list-style-type: none"> Cohesion of employees (7 employees as participants) Media favorability Enhance corporate image 	<ul style="list-style-type: none"> Deepen community communication (communication entities of 450 participants)

In the past three years, the resources NTC invested in social public welfare has increased over 10 times, from over NT\$ 2 million to more than NT\$ 20 million. The forms of invested resources are money contributions, accounting for more than 90% of the resources. The commercial innovative public welfare activities using our core capabilities to resolve social issues have always been our priority items in implementing our public welfare themes. NTC has actively promoted technology upgrades and innovations for economic value enhancement in order to cultivate professional skills of youngsters and students, allowing us to be in line with the decent work and economic growth of SDGs8 on the aspects of talent cultivation and industry-academia cooperation.

► Public welfare categories invested by NTC

	Charities	Long-term community investment	Commercial initiatives
2016	10.18%	0.00%	89.82%
2017	3.02%	30.30%	66.68%
2018	7.15%	0.64%	92.21%

► Resources invested in social public welfare

	Cash contributions		Commodity donation		Employee volunteering		Management costs	
	Appropriation (NT\$)	Ratio (%)	Appropriation (NT\$)	Ratio (%)	Appropriation (NT\$)	Ratio (%)	Appropriation (NT\$)	Ratio (%)
2016	1,999,048	99.75%	0	0.00	5000	0.25	0	0.00
2017	4,946,200	69.70%	2,142,000	30.18%	8500	0.12	0	0.00
2018	19,732,840	97.54%	43,000	0.21%	30,400	0.15	424,270	2.10%

Social Engagement

NTC hopes to make efforts to resolve social and environmental issue as well as promoting local community development in terms of public welfare implementation. When investing in each public welfare theme, we always consider the connection between social issues and the NTC's roles and methods, displaying annual effects through method promotion so as to convey the NTC's public welfare footprints to the public. Meanwhile, through the feedback for these issues, we also review the public welfare themes and promotion methods, pursuing a co-prosperity society.



Talent
cultivation

Social issues we would like to resolve

Our roles and methods

Major results in 2018

Narrow the gap between the knowledge students learn at school and the practical applications at workplace to reduce the employment run-in period so that students are able to rapidly adapt to the workplace when employed.

- Sponsor campus activities: In response to the corporate spiritual concept of contributing the society, we sponsor campus activities to encourage students to study hard and hold various activities, promoting diverse development.
- Handle lectures of professionals from industries: To connect what students learn at school with the actual situations of workplace, we have planned that starting from 2018, middle and high level supervisors have served as the speakers from the industries and entered campuses to interact and share with students face-to-face.
- Hold corporate visits: To improve students' awareness and understanding toward our industry development, we invite various school students to our company for visits.
- Promote industry-academia cooperation: To promote industry-academia exchanges and utilize the resources of the academia, we reinforce teacher-student contact and recruit quality talent for our company.
- Setting scholarships and financial aid: To encourage students to contribute themselves to academic research, and praise excellent students for their constantly striving for perfection, we have formulated methods for scholarships and financial aid.

- Sponsored 4 campus activities: Total sponsorship amount is NT\$ 480,000 with about 700 participants.
- Lectures of professional from industries were held for experiences sharing at key schools in Northern Taiwan. In 2018, total 10 talks were held with about 783 participants.
- Total 12 corporate visits were held with about 485 teachers and students.
- A total of 3 industry-academia cooperation research cases were promoted.
- A total of 3 scholarship items were provided and the total amount was about NT\$ 520,000.



Talent cultivation

Our footprints

• In 2018, we participated in campus activities, including the MakeNTU experience activity titled "Integration of Software and Hardware" held by the Department of Electrical Engineering of National Taiwan University (NTUEE), the friendship sports games of the Graduate Institute of Electronics Engineering of NTU (NTUGIEE), the electronics night of National Chiao Tung University (NCTU), and the microelectronics camp of NCTU. Through various experience and friendship activities, we improved the exchanges between the industry and the academia, conveying our active, young, and energetic corporate image. Moreover, we connect excellent students of



Friendship sports games of NTUGIEE



Electronics night of NCTU



MakeNTU experience activity of NTUEE



Microelectronics camp of NCTU

electronic engineering around Taiwan and allowed communications among different fields, setting off a new wave of technology. NTC will make every effort to build a bridge between the industry and students, cultivating students' interests and passions for science engineering and advanced technology.



Keynote speech at NTU

Keynote speech at NTHU

Lecture of professional from industries at NCTU

Talk at Lunghwa University of Science and Technology

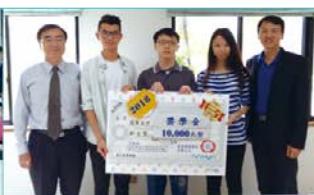
• We have invited teachers and students of the colleges and universities in Northern Taiwan to attend the corporate visits, introducing them the working environment and working processes of our company's production engineering division and the development and applications of each product. Moreover, we also arranged field observation at the clean rooms, so students were able to understand the operation and characteristics of our company and know the future trends so as to plan individual study directions. Some of the visits were cooperated with the internship programs. Before the internship, students could understand further about the job contents through visits in person. Moreover, students could figure out if they were suitable for certain positions through interviews and communications with supervisors, which was beneficial for their internships or full-time jobs in the future, helping them rapidly adapt to the workplace.



Visit of NTU



Visit of National Taipei University of Technology (Taipei Tech)



Visit of St. John's University

Scholarship award at the Institute of Electrical and Computer Engineering of NCTU

• We cooperated with NTU on 3 industry-academia research plans, and conducted cooperative plans on semiconductor application technology and product design and R&D with the NTU's professors and students.

• In 2018, we provided scholarships to students from the Institute of Electrical and Computer Engineering of NCTU, NTUEE, and Ming Chi University of Technology, hoping that the awards would reduce the financial burdens in students and encourage their hard-working attitudes toward study.



Environmental protection

Social issues we would like to resolve

The burdens on our earth resulting from climate change and environment pollution are getting serious and gradually become the global focus. It is imperative to fulfill the earth citizens' responsibilities through enhancing environmental protection awareness.

Our roles and methods

NTC connects up non-profit organizations with different attributes and actively participates in various activities to promote environmental protection concept, for example: 1. Support the Earth Hour activity, saving electricity consumption from small steps to safeguard the energy of earth. 2. Hold swallow watching and wetland talks, promoting ecological conservation and reconstruction.

Major results in 2018

About 300 employees participated in the initiative activities Invested in nearly NT\$ 250,000

Our footprints

Earth Hour Activities

This year, the Earth Hour activities were held on March 24, participated by 187 countries and regions around the world and over 12,000 landmarks. The Taipei event was held jointly by the Society of Wilderness and the Department of Environmental Protection of Taipei City Government. NTC was also on the site to support the activity. On the event day, Taipei City mayor Ko Wen-je was invited to the activity and conducted the countdown for turning off the light, lasting for one hour from 20:30 to 21:30 on March 24 across Taiwan.



According to statistics from the Taiwan Power Company, the day of the event around 100,000 kWh of electricity were saved in all of Taiwan by turning off the lights for one hour; this is equivalent to a 52,700kg decrease in carbon emissions or planting 4,791 trees! We hope that the Earth Hour is not merely an annual activity but is also a chance to remind the public that we should save electricity starting from small steps to safeguard the energy of earth!

Talk on finding the beauty of wetland

In cooperation with the summer swallow watching activities, our employees who registered in the swallow watching activities could join the pre-activity talk on environmental protection promotion. The topic of the pre-activity talk was finding the beauty of wetland, which introduced the importance of wetland to the earth and the environment, and how the profound ecological system of wetland worked. After the talk, our employees gave us huge feedback and suggested that talks on related topics could be held more often internally so our employees would attach more importance to environmental conservation.



Summer swallow watching

The Wugu wetland, a wetland at national level, has been damaged by human beings, resulting in environmental degradation with serious water pollution without living creatures. Recently, the New Taipei City government and the Society of Wilderness have worked together to conserve and reconstruct the wetland as well as educate the public, so the profound and diverse ecological areas of the wetland have gradually appeared again. The profound and diverse ecological environment of the Wugu wetland is exactly the kind of place providing food for flocks of swallows, so it becomes a popular place for swallow watching.

To treat the environment friendly and protect the homeland, NTC cooperates with the Society of Wilderness to handle the swallow watching activities at the Wugu wetland so as to promote environmental education to our employees and express NTC's support for Taiwan's wetland ecological protection.



Humanistic care

Social issues we would like to resolve

Enhance humanistic literacy of the public and broaden their horizons on the human-oriented base in order to build a love and caring social atmosphere.

Our roles and methods

Work with local academic units and public welfare groups on promoting art and culture activities to sponsor local soft power of culture and creativity as well as assist vulnerable groups in need of help.

Major results in 2018

- Worked with three public welfare groups (Fu Jen Creative Design Center, Okogreen Co. Ltd., and Children Are Us Foundation)
- Sponsored the consumption of 144kg of fair trade coffee
- Over 5,700 people understood the fair trade ideals

Our footprints

Sponsored local culture and creativity, cooperating with emerging artists to hold digital solo exhibition of illustrations

NTC, located in a mountain area of Taishan district, worked with Fu Jen Creative Design Center of Xinzhuan on supporting local emerging designers, who stationed at our company and handled solo exhibitions of creation. Hoped to sponsor local soft power of culture and creativity through cooperation with local academic units on promoting art and culture activities.

Ruby Wang, an emerging artist currently serving as a concept artist at the Flight School Studio, loves telling stories, fascinated by the messages conveyed through the design and colors of light and shadows. She is good at using light and shadows along with colors to tell stories. We hoped that these stories would give our colleagues different feelings to enhance the NTC's humanistic atmosphere.



Fair trade pantry room

This June, the NTC's pantry rooms have been transformed into places where public welfare ideals are able to be implemented. NTC has joined the project of fair trade pantry room promoted by Okogreen Co. Ltd., (the first Taiwanese trading company received the verification from the Fairtrade International (FLO)), installing fair trade coffee machines in the pantry rooms of the company. Our employees can drink a cup of fair trade coffee at NT\$ 10, taking concrete action to implement the help with poor farmers in the Third World and social responsibility of environmental protection.

Moreover, on June 27, we held a talk titled "One cup of fair trade coffee wakes up a forest, sweetening two families" to promote fair trade ideals and enhance our employees' awareness of fair trade, continuing to support and improve the poverty in the Third World through trade fair.



"Christmas pop-up afternoon tea-fair trade + Children Are Us Foundation+ NTC"

To promote fair trade ideals and support public welfare, NTC used the income of half a year from the fair trade coffee machines to fund the plan for Christmas pop-up afternoon tea, sharing with all employees.

In addition, to implement public welfare, we specifically entrusted Children Are Us Foundation for hand-made Christmas cookies, so the income would turn into public welfare again.





Community harmony

Social issues we would like to resolve

Local prosperity and local value preservation should not be contradictory but complement each other. As cultivating local connections, how to incorporate themselves into community reconstruction is a crucial subject when enterprises think about social responsibility.

Our roles and methods

Listen to local needs, through concrete action displaying enterprises' sincerity to prosper and share with local residents.

Major results in 2018

- Total 500 employees of participation and purchase of 500kg bananas
- To improve the company's sports activities, providing NT\$ 300,000 to sponsor 60 little baseball players

Our footprints

Community harmony mountain cleaning activity at Chiung-tzu lake in Taishan district

To have a friendly environment and harmonious community, NTC worked with volunteers from Nan Ya Plastics Corporation to conduct a mountain cleaning activity at the Chiung-tzu lake trail in Taishan district on May 19. Through the instruction and activity of mountain cleaning, we deeply felt the difficulty of environmental conservation. Garbage not only created dirty environment, but also endangered the ecological balance of the forest. With volunteers' hard work, roads, parks, ditches, and wells near the plant area were smoothly removed out plastic garbage, iron and aluminum cans, butts, and mud. We hope that through participating in environmental protection activities, we will be the catalyst for change. Not only will we change our habits of using plastic products, but also will recycle every item. Moreover, we will be able to spread the concept of environmental protection to the people and objects around us, so positive strength will expand to everyone. After the activity, we received appreciation from the Solidarity Association of Taishan district, residents of Taishan, and mountain friends for making the surrounding environment clean. We were praised as a good neighbor of Taishan residents, which made us all feel satisfied.



Click the Like Button for NTC and Cheer for Taiwan's sports

In response to biannual Formosa Plastics Group sports games, encourage the NTC's employees to win medals, and support public welfare in order to support Taiwan's sports activities, we specifically set up a cheer zone within NTC. Once a cheering sentence was written, the company would donate NT\$ 10 as the funds of public welfare.

Moreover, once players representing NTC to participate in the corporate sports games scored and received rankings, the company would donate corresponding funds of public welfare so as to encourage players to strive for medals.

The total amount of donation accumulated to NT\$ 300,000, and in December 2018, it was used to sponsor the baseball team of Gueishan Junior High School in Taoyuan City, a local school, through the "database matchmaking platform for sports sponsorship" of the Sports Administration under the Ministry of Education.



Take action to support local banana farmers

In recent years, banana farmers have faced price fluctuations, excessive production, and low prices. In order to support Taiwan's local agricultural products, NTC purchased bananas directly from the farmers from the place of origin at a reasonable price. On that day, President and Vice President of NTC jointly sold bananas and the quantities of sales reached 500kg. NTC continues to promote community harmony and local care, taking action to enhance positive influence so as to enjoy mutually beneficial and beautiful homeland with the Taiwan society.

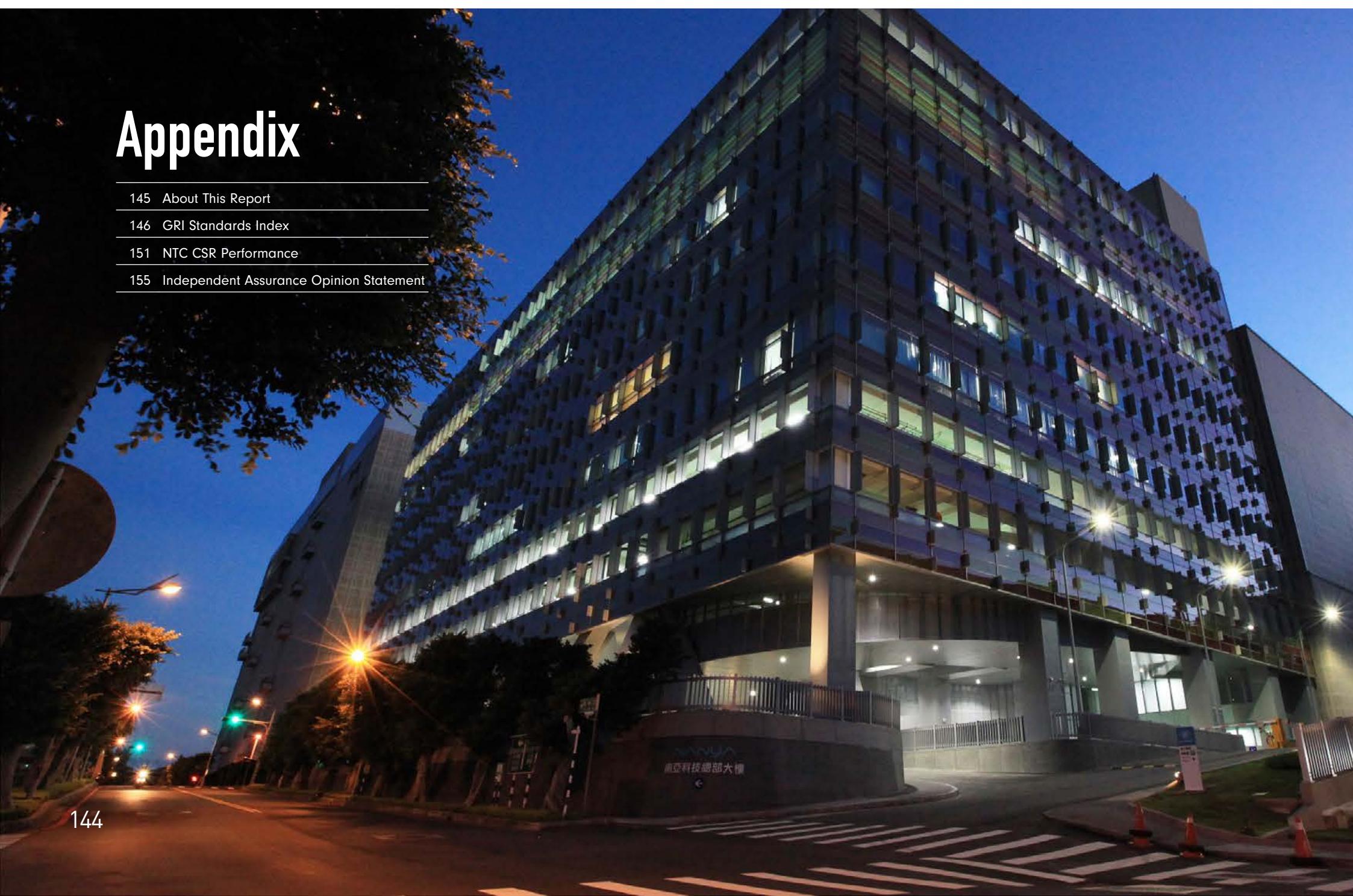






Appendix

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About this Report

Report Overview

This report is the ninth Corporate Social Responsibility Report issued by Nanya Technology Corporation (NTC), and contains information regarding the Company's corporate governance, environmental sustainability development, employee care and social welfare practices from January 1, 2018 to December 31, 2018. The scope of this report mainly covers NTC and its subsidiaries. Inconsistencies, if any, are explained separately in notes. The statistics provided in this report have been obtained from NTC's audited financial statements.

Information disclosure timeframe January 1, 2018 to December 31, 2018

Scope of data	Nanya Technology Corporation's operations system include Nanya Technology Corporation and its subsidiaries.
Data quality management	<ul style="list-style-type: none"> • Financial data: KPMG Taiwan • Quality management ISO9001, IATF16949: LRQA • Environmental management ISO14001: LRQA, ISO14064: SGS • Safety and health OHSAS18001/TOSHMS: LRQA • Electronic Industry Citizenship Coalition Code of Conduct RBA VAP (V5.1): TUV • Sustainability Information AA1000AS 2008 with 2018 Addendum: BSI
Guidelines and Standards for Drafting	GRI Standards Core option
Level of Guarantee	AA 1000 Type II High assurance level
Contact Window	Nanya Technology Corporation President Office Special Assistant Chien Telephone: +886-2-2904-5858 ext. 1027 Fax: +886-2-2908-0327 Email: NTCCSR@ntc.com.tw

Date of Publication

Nanya Technology Corporation's CSR report is published annually.

- Current edition: June 2019
- Last edition: June 2018
- Next edition: June 2020

Report Management

- 1 Annual results review
- 2 Confirm drafting methods
- 3 Collect information
- 4 Report preparation
- 5 Third-party attestation
- 6 Sustainable Development Committee Confirmation
- 7 Reports to the Board of Directors
- 8 Publish the Report on the CSR page of the Company's website

GRI Standards Index

GRI Standards (Version 2016)	Disclosure indicator	Indicator description	Chapter	Page
	102-1	Name of the organization	Company Overview	11
	102-2	Activities, brands, products, and services	Company Overview Major Products and Operation Performance	11 13-14
	102-3	Location of headquarters	Company Overview	11
	102-4	Location of operations	Company Overview	11
	102-5	Ownership and legal form	Company Overview	11
	102-6	Markets served	Company Overview	11
	102-7	Scale of the organization	Company Overview Major Products and Operating Performance	11 13
	102-8	Information on employees and other workers	Employee Diversity	98
	102-9	Supply chain	Supplier Sustainability Management	63
GRI 102: General Disclosures 2016	102-10	Significant changes to the organization and its supply chain	No significant change had taken place in 2018	-
	102-11	Precautionary principle or approach	Risk Management	39-47
	102-12	External initiatives	The Company participates in CDP by responding to CDP questionnaires	-
	102-13	Membership of associations	Company Overview	13
	102-14	Statement from senior decision-maker	Message from the President	5
	102-16	Values, principles, standards, and norms of behavior	Business Integrity	48
	102-18	Governance structure	Governance and Organization Corporate Governance	19 35
	102-40	List of stakeholder groups	Materiality Analysis	22
	102-41	Collective bargaining agreements	Talent Retention and Employee Care	105
	102-42	Identifying and selecting stakeholders	Materiality Analysis	22
	102-43	Approach to stakeholder engagement	Materiality Analysis	22
	102-44	Key topics and concerns raised	Materiality Analysis	22
	102-45	Entities included in the consolidated financial statements	Major Products and Operation Performance	15

GRI Standards (Version 2016)	Disclosure indicator	Indicator description	Chapter	Page
GRI 102: General Disclosures 2016	102-46	Defining report content and topic Boundaries	Appendix - About the report	145
	102-47	List of material topics	Materiality Analysis	22
	102-48	Restatements of information	None had occurred in 2018	-
	102-49	Changes in reporting	Materiality Analysis	22
	102-50	Reporting period	Appendix - About the report	145
	102-51	Date of most recent report	Appendix - About the report	145
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	102-53	Contact point for questions regarding the report	Appendix - About the report	145
	102-54	Claims of reporting in accordance with the GRI Standards	Appendix - About the report	145
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	102-56	External assurance	Appendix - Assurance Statements	151
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its Boundary	Materiality Analysis	22
GRI 200: Economic Series				
Series	Indicator	Description	Corresponding chapter	Page
GRI 103: Management Approach 2016	103-2	The management approach and its components	Materiality Analysis Talent Retention and Employee Care; Employee Diversity; Supplier Sustainability Management; Business Integrity	22 ▶ 48 ▶ 61 98-109
	103-3	Evaluation of the management approach	Materiality Analysis Talent Retention and Employee Care; Employee Diversity; Supplier Sustainability Management; Business Integrity	22 ▶ 48 ▶ 61 98-109
GRI 201: Economic Performance 2016	201-1	Direct economic value generated and distributed	Major Product and operation Performance	16
	201-3	Defined benefit plan obligations and other retirement plans	Talent Retention and Employee Care	108
GRI 202: Market Presence 2016 (Material issue)	202-1	Ratios of standard entry level wage by gender compared to local minimum wage	Talent Retention and Employee Care	106
	202-2	Proportion of senior management hired from the local community	Employee Diversity	100
GRI 203: Indirect Economic Impacts 2016	203-1	Infrastructure investments and services supported	Social influence	135
	203-2	Significant indirect economic impacts	Social engagement	138

GRI 200: Economic Series				
Series	Indicator	Description	Corresponding chapter	Page
GRI 204: Procurement Practices 2016 (Material issue)	204-1	Proportion of spending on local suppliers	Supplier Sustainability Management	61
	205-1	Operations assessed for risks related to corruption	Business Integrity	48
GRI 205: Anti-corruption 2016 (Material issue)	205-2	Communication and training about anti-corruption policies and procedures	Business Integrity	49
	205-3	Confirmed incidents of corruption and actions taken	Business Integrity	49
	206-1	Legal actions for anti-competitive behavior	No violation had occurred in 2018	-
GRI 300: Environmental Series				
Series	Indicator	Description	Corresponding chapter	Page
GRI 103: Management Approach 2016	103-2	The management approach and its components	Materiality Analysis Energy Management; Water Management; Greenhouse Gas Management; Emissions, Waste and Recycling; Supplier Sustainability Management"	22 61 80-95
	103-3	Evaluation of the management approach	Materiality Analysis Energy Management; Water Management; Greenhouse Gas Management; Emission, Waste and Recycling; Supplier Sustainability Management	22 61 80-95
GRI 301: Materials 2016	301-1	Materials used by weight or volume	Eco-friendly products	78
	301-2	Recycled input materials used	Eco-friendly products	78
	301-3	Reclaimed products and their packaging materials	Eco-friendly products	78
GRI 302: Energy 2016 (Material issue)	302-1	Energy consumption within the organization	Energy Management	86-87
	302-3	Energy intensity	Energy Management	86-87
	302-4	Reduction of energy consumption	Energy Management	86-87
	302-5	Reductions in energy requirements of products and services	Energy Management	86-87
GRI 303: Water 2016 (Material issue)	303-1	Interactions with water as a shared resource	Water Management	88-89
	303-2	Management of water discharge-related impacts	Water Management	88-89
	303-3	Water withdrawal	Water Management	88-89

GRI 300: Environmental Series				
Series	Indicator	Description	Corresponding chapter	Page
GRI 305: emissionss 2016 (Material issue)	305-1	Direct (Scope 1) GHG emissions	Greenhouse Gas Management	82-85
	305-2	Energy indirect (Scope 2) GHG emissions	Greenhouse Gas Management	82-85
	305-4	GHG emissions intensity	Greenhouse Gas Management	82-85
	305-5	Reduction of GHG emissions	Greenhouse Gas Management	82-85
	305-6	Emissions of ozone-depleting substances (ODS)	The Company does not use ODS	-
	305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	Emissions, Waste and Recycling	90-91
	306-1	Water discharge by quality and destination	Water Management	88-89
GRI 306: Effluents and Waste 2016 (Material issue)	306-2	Waste by type and disposal method	Emissions, Waste and Recycling	90-91
	306-3	Significant spills	No spillage of oil, fuel, waste or chemical had occurred in 2018	-
	306-4	Transport of hazardous waste	Emissions, Waste and Recycling	90-91
	306-5	Water bodies affected by water discharges and/or runoff	Water Management	88-89
GRI 307: Environmental Compliance 2016	307-1	Non-compliance with environmental laws and regulations	There had been no violation of environmental protection law in 2018.	-
GRI 308: Supplier Environmental Assessment 2016 (Material issue)	308-1	New suppliers that were screened using environmental criteria	Supplier Sustainability Management	64
	308-2	Negative environmental impacts in the supply chain and actions taken	Supplier Sustainability Management	64
GRI 400: Social Series				
Series	Indicator	Description	Corresponding chapter	Page
GRI 103: Management Approach 2016	103-2	The management approach and its components	Materiality Analysis Employee Diversity; Talent Retention and Employee Care; Occupational Safety and Health; Talent Development; Social Engagement; Supplier Sustainability Management; Customer Service	22 ▶ 57 61 ▶ 98-133 138
	103-3	Evaluation of the management approach	Materiality Analysis Employee Diversity; Talent Retention and Employee Care; Occupational Safety and Health; Talent Development; Social Engagement; Supplier Sustainability Management; Customer Service	22 ▶ 57 61 ▶ 98-133 138

GRI 400: Social Series					
Series	Indicator	Description	Corresponding chapter	Page	
GRI 401: Employment 2016 (Material issue)	401.1	New employee hires and employee turnover	Employee Diversity		101
	401.2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	Talent Retention and Employee Care		105-106
	401.3	Parental leave	Talent Retention and Employee Care		107
GRI 402: Labor/Management Relations 2016	402.1	Minimum notice periods regarding operational changes	Employee Diversity		103
GRI 403: Occupational Health and Safety 2016 (Material issue)	403.1	Workers representation in formal joint management-worker health and safety committees	Occupational Safety and Health		124
	403.2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	Occupational Safety and Health		126
	403.3	Workers with high incidence or high risk of diseases related to their occupation	Occupational Safety and Health		126
GRI 404: Training and Education 2016 (Material issue)	404.1	Average hours of training per year per employee	Talent development		119
	404.2	Programs for upgrading employee skills and transition assistance programs	Talent development		121
	404.3	Percentage of employees receiving regular performance and career development reviews	Talent development		123
GRI 405: Diversity and Equal Opportunity 2016	405.1	Diversity of governance bodies and employees	Corporate Governance Employee Diversity		36 99
	405.2	Ratio of basic salary and remuneration of women to men	Talent Retention and Employee Care		107
GRI 406: Non-discrimination 2016	406.1	Incidents of discrimination and corrective actions taken	Employee Diversity		111
GRI 413: Local Communities 2016 (Material issue)	413.1	Operations with local community engagement, impact assessments, and development programs	Social engagement		138-139
GRI 414: Supplier Social Assessment 2016 (Material issue)	414.1	New suppliers that were screened using social criteria	Supplier Sustainability Management		64
GRI 417: Marketing and Labeling 2016	417.2	Incidents of non-compliance concerning product and service information and labeling	None had occurred in 2018		-
	417.3	Incidents of non-compliance concerning marketing communications	None had occurred in 2018		-
GRI 418: Customer Privacy 2016 (Material issue)	418.1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	Customer Service		58
GRI 419: Socioeconomic Compliance	419.1	Non-compliance with laws and regulations in the social and economic area	In 2018, there were 4 labor inspections and fines totaling NTD 110,000.		-

NTC CSR Performance

NTC's Sustainable Roles	Sustainability Indicators	Unit	2016	2017	2018
A Trustworthy Company	Operating Revenue	NT\$ Million	41,633	54,918	84,722
	EPS	NT\$	8.67	14.36	12.80
	Ratio of Outside Directors	%	25	25	25
	Board Members Participation Rate	%	89	96	92
	"RBA Labor and Ethical Code of Conduct Course" completion rate	%	100	100	100
	"Business and Ethical Code of Conduct Course" completion rate	%	-	100	100
	"Anti-corruption Course" completion rate	%	-	99	100
	Internal audit Anomaly improvement rate	%	100	100	100
The Best Memory Partner for Our Customers	Grievance and complaint case	-	4	4	4
	Appropriation for Innovative R&D/ Revenue	%	6.0%	6.7%	5.7%
	Number of innovative R&D personnel/ Total Number of employees	%	11.6%	14.4%	15.5%
	Number of patents granted	-	478	471	502
	Number of NTC trade secrets	-	3,274	4,172	5,056
	TAT meet rate of RMA cases	%	90	94	91
	Score of satisfaction	-	88.5	88.7	90.5
A Promoter of Shared Value	Coverage rate of customer	%	63.2	100	100
	Number of major suppliers (Tier 1)	-	-	350	270
	Number of key suppliers	-	-	89	80
	Proportion of key suppliers	%	-	25.4	29.6
	Proportion of procurement from key suppliers	%	-	79	77
	Percentage of Signature Supplier/ Contract COC	Major supplier (including key suppliers) New suppliers Key suppliers	%	-	60.29% 23.68% 80.89%
					75.56% 75% 77.5%

NTC's Sustainable Roles	Sustainability Indicators	Unit	2016	2017	2018
A Promoter of Shared Value	Percentage of high-risk suppliers by sustainability risk assessment	Tier 1 suppliers (Major suppliers)	%	-	1%
		Tier 1 key suppliers (Major suppliers)	%	-	4.5%
		Tier 2 key suppliers (Major suppliers)	%	-	2.3%
	Sustainability audit	Numbers of audited suppliers	-	12	8
		Average audit score	-	-	89.37
		Non-compliant audit item	-	3	20
		Improvement rate	%	100	100
	Local procurement (Taiwan)	%	30	37	37
	Improved performance of raw material consumption	Extensions to use cycle	-	0	0
		Formula development of new processes	-	0	3
		Reductions of process consumption	-	9	9
A Producer of Green Technology	Greenhouse gas emissions(scope 1+2)	ton-CO ₂ e	290,021.428	376,193.581	448,215.687
	Emission intensity-GHG emissions per unit area of product	kg-CO ₂ e/cm ²	0.54	0.75	0.77
	GHG emissions/chip kpcs	ton/kpcs	507	606	470
	GHG emissions/revenue	kg/million NTD	6,966	6,848	5,290
	PFC Performance	ton-CO ₂ e	307,431	373,941	519,296
	Perfluorocarbons emissions per unit wafer output	kg/ton	325	282	383
	Perfluorocarbons emissions per unit revenue	kg/million NTD	733	483	463
	Electricity consumption	MWh/million NTD	10.3	105	7.6
	Electricity consumption per unit capacity	MWh/k-pcs	0.75	0.93	0.68
	Natural gas consumed per unit capacity	M ³ /k-pcs	4.0	5.9	4.5
	Natural gas consumed per unit revenue	M ³ /million NTD	55.0	66.7	50.1
	Energy costs per unit capacity	10kNTD/k-pcs	0.17	0.21	0.16
	Energy costs per unit revenue	10kNTD/million NTD	2.37	2.36	1.76
	Water consumption per unit capacity	ton/k-pcs	3.9	5.0	3.2

NTC's Sustainable Roles		Sustainability Indicators	Unit	2016	2017	2018
A Producer of Green Technology	Water consumption per unit revenue	ton/million NTD	53.9	56.3	35.7	
	Ultra-pure water consumption per unit capacity	ton/k-pcs	4.0	4.2	3.2	
	Ultra-pure water consumption per unit revenue	ton/million NTD	54.9	47.9	35.7	
	VOCs emissions per unit capacity	g/kpcs	27.5	26.0	21.0	
	VOCs emissions per unit revenue	g/million NTD	377.5	293.7	236.2	
	Waste water discharge volume per unit capacity	ton/k-pcs	3.3	4.1	2.6	
	Waste water discharge volume per unit revenue	ton/million NTD	44.8	46.9	29.5	
	Hazardous waste/chip kpcs	kg/kpcs	8.2	14.6	14.6	
	Hazardous waste/revenue	kg/million NTD	113.3	165.3	164.5	
	Recycling rate of industrial waste	%	94.4	92.9	93.4	
An Attractive Employer for Professional Talents	Amount of environmental accounting expenses	NTD thousand	436,100	1,373,833	1,119,320	
	Total employees	%	31.39	29.46	28.74	
	Junior management (section/department head)	%	12.06	14.89	14.38	
	Middle management (plant/division head)	%	6.38	6.00	6.82	
	Top management (Assistant Vice President and above)	%	0	0	0	
	Head of revenue-generating department (section head and above)	%	8.67	11.33	15.00	
	Head of production line operations	%	94.29	94.57	93.68	
	Nationality count	-	8	9	10	
	Number of employees with disability	-	27	25	27	
	Number of interns	-	12	39	125	

NTC's Sustainable Roles	Sustainability Indicators	Unit	2016	2017	2018
An Attractive employer for professional talents	Female-to-male total salary ratio - management level	%	83.92	86.77	88.64
	Female-to-male remuneration ratio - management level	%	86.65	89.43	92.07
	Female-to-male total salary ratio - non-management level	%	107.54	110.35	109.11
	Female-to-male remuneration ratio - non-management level	%	110.81	116.37	115.31
	Reinstatement rate of unpaid parental leave	%	85.71	76.47	58.33
	Retention rate of unpaid parental leave	%	100	83.33	100
	Average training hours per person	hours	22.6	22.8	22.7
	Average training hours per person-management	hours	13	18.9	22.7
	Substitution rate of management	%	23.7%	43.0%	47.4
	Human capital rate of return	%	13	15.3	20.8
	Productivity per employee	NT\$ K	15,402	18,404	26,319
	Profit contribution rate of human cost	%	131	201	263
	Return on personnel training investments	%	91	485	799
	Disabling injuries frequency rate	Number of Injuries / Million Man-hours	0.61	0	0
An Active Participant in Community and Social welfare	Disabling injuries severe rate	Lost hours of Injuries / Million Man-hours	5	0	0
	Frequency-severity indicator	-	0.06	0	0
	Work safety and health expenses	NTD	122,813,177	129,907,185	109,053,787
	Coverage rate of Contractor training	%	100	100	100
	Category	Ratio of Charities	%	10.18	3.02
		Ratio of Community Investment	%	0	30.30
		Ratio of Commercial initiatives	%	89.82	66.68
	Type of Contribution	Ratio of Cash Donation	%	99.75	69.70
		Ratio of Goods Donation	%	0	30.18
		Ratio of Volunteering	%	0.25	0.12
		Ratio of Management Cost	%	0	0.15
					2.10



Independent Assurance Opinion Statement

INDEPENDENT ASSURANCE OPINION STATEMENT

Nanya Technology 2018 Corporate Social Responsibility Report

The British Standards Institution is independent to Nanya Technology Corporation (hereafter referred to as Nanya Technology in this statement) and has no financial interest in the operation of Nanya Technology other than for the assessment and verification of the sustainability statements contained in this report.

This independent assurance opinion statement has been prepared for the stakeholders of Nanya Technology only for the purposes of assuring its statements relating to its corporate social responsibility (CSR), more particularly described in the Scope below. It was not prepared for any other purpose. The British Standards Institution will not, in providing this independent assurance opinion statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used, or to any person by whom the independent assurance opinion statement may be read.

This independent assurance opinion statement is prepared on the basis of review by the British Standards Institution of information presented to it by Nanya Technology. The review does not extend beyond such information and is solely based on it. In performing such review, the British Standards Institution has assumed that all such information is complete and accurate.

Any queries that may arise by virtue of this independent assurance opinion statement or matters relating to it should be addressed to Nanya Technology only.

Scope

The scope of engagement agreed upon with Nanya Technology includes the following:

1. The assurance scope is consistent with the description of Nanya Technology 2018 Corporate Corporate Social Responsibility Report.
2. The evaluation of the nature and extent of the Nanya Technology's adherence to AA1000 AccountAbility Principles (2018) and the reliability of specified sustainability performance information in this report as conducted in accordance with type 2 of AA1000 Assurance Standard (2008) with 2018 Addendum sustainability assurance engagement.

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

Opinion Statement

We conclude that the Nanya Technology 2018 Corporate Social Responsibility Report provides a fair view of the Nanya Technology CSR programmes and performances during 2018. The CSR report subject to assurance is materially correct without voluntary omissions based upon testing within the limitations of the scope of the assurance, the information and data provided by the Nanya Technology and the sample taken. We believe that the 2018 economic, social and environmental performance information are correctly represented. The CSR performance information disclosed in the report demonstrate Nanya Technology's efforts recognized by its stakeholders.

Our work was carried out by a team of (CSR) report assurers in accordance with the AA1000AS (2008) with 2018 Addendum. We planned and performed this part of our work to obtain the necessary information and explanations we considered to provide sufficient evidence that Nanya Technology's description of their approach to AA1000AS (2008) with 2018 Addendum and their self-declaration in accordance with GRI Standards: Core option were fairly stated.

Methodology

Our work was designed to gather evidence on which to base our conclusion. We undertook the following activities:

- a top level review of issues raised by external parties that could be relevant to Nanya Technology's policies to provide a check on the appropriateness of statements made in the report
- discussion with managers on Nanya Technology's approach to stakeholder engagement. Moreover, we had sampled two external stakeholders to conduct interview
- interview with 26 staffs involved in sustainability management, report preparation and provision of report information were carried out
- review of key organizational developments
- review of the extent and maturity of the relevant accounting systems for financial and non-financial reports
- review of the findings of internal audit
- the verification of performance data and claims made in the report through meeting with managers responsible for gathering data
- review of the processes for gathering and ensuring the accuracy of data, followed data trails to initial aggregated source and checked sample data to greater depth during site visits
- the consolidated financial data are based on audited financial data, we checked that this data was consistently reproduced
- review of supporting evidence for claims made in the reports
- an assessment of the organization's reporting and management processes concerning this reporting against the principles of Inclusivity, Materiality, Responsiveness and Impact as described in the AA1000AP (2018)

Conclusions

A detailed review against the Inclusivity, Materiality, Responsiveness and Impact of AA1000AP (2018) and sustainability performance information as well as GRI Standards is set out below:

Inclusivity

In this report, it reflects that Nanya Technology has continually sought the engagement of its stakeholders and established material sustainability topics, as the participation of stakeholders has been conducted in developing and achieving an accountable and strategic response to sustainability. There are fair reporting and disclosures for economic, social and environmental information in this report, so that appropriate planning and target-setting can be supported. In our professional opinion the report covers the Nanya Technology's inclusivity issues and has demonstrated social responsible conduct supported by top management and implemented in all levels among organization.

Materiality

The Nanya Technology publishes material topics that will substantively influence and impact the assessments, decisions, actions and performance of Nanya Technology and its stakeholders. The sustainability information disclosed enables its stakeholders to make informed judgements about the Nanya Technology's management and performance. In our professional opinion the report covers the Nanya Technology's material issues.

Responsiveness

Nanya Technology has implemented the practice to respond to the expectations and perceptions of its stakeholders. An Ethical Policy for the Nanya Technology is developed and continually provides the opportunity to further enhance Nanya Technology's responsiveness to stakeholder concerns. Topics that stakeholder concern about have been responded timely. In our professional opinion the report covers the Nanya Technology's responsiveness issues.

Impact

Nanya Technology has identified and fairly represented impacts that were measured and disclosed in probably balanced and effective way. Nanya Technology has established processes to monitor, measure, evaluate and manage impacts that lead to more effective decision-making and results-based management within an organization. In our professional opinion the report covers the Nanya Technology's impact issues.

Performance Information

Based on our work described in this statement, specified sustainability performance information such as GRI Standards disclosures disclosed in this report, Nanya Technology and BSI have agreed upon to include in the scope. In our view, the data and information contained within 2018 Nanya Technology CSR Report are reliable based on procedures undertaken by means of vouching, re-tracking, re-computing and confirmation.

GRI Sustainability Reporting Standards (GRI Standards)

Nanya Technology provided us with their self-declaration of in accordance with GRI Standards: Core option (For each material topic covered by a topic-specific GRI Standard, comply with all reporting requirements for at least one topic-specific disclosure). Based on our review, we confirm that social responsibility and sustainable development disclosures with reference to GRI Standards disclosures are reported, partially reported or omitted. In our professional opinion the self-declaration covers the Nanya Technology's social responsibility and sustainability topics.

Assurance Level

The high level assurance provided is in accordance with AA1000AS (2008) with 2018 Addendum in our review, as defined by the scope and methodology described in this statement.

Responsibility

This report is the responsibility of the Nanya Technology's chairman as declared in his responsibility letter. Our responsibility is to provide an independent assurance opinion statement to stakeholders giving our professional opinion based on the scope and methodology described.

Competency and Independence

The assurance team was composed of Lead auditors experienced in relevant sectors, and trained in a range of sustainability, environmental and social standards including AA1000AS, ISO 14001, ISO 45001, ISO 14064 and ISO 9001. BSI is a leading global standards and assessment body founded in 1901. The assurance is carried out in line with the BSI Fair Trading Code of Practice.

For and on behalf of BSI:

Peter Pu
Managing Director BSI Taiwan
2019-05-15

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