



2021
Sustainability Report

Governance	<ul style="list-style-type: none"> Macronix (the "Company") attaches importance to research and development, and the technical papers it published have been selected by many international academic conferences such as IEDM and ISSCC over the years. Macronix possesses a large number of high-quality international key technologies and intellectual property rights. The Company has obtained a total of 334 patents in 2021, and by the end of the year, it has had a total of 8,654 patents successfully registered worldwide. Automotive flash memory manufacturing has obtained the "ISO 26262" Road vehicles – Functional safety certification. 	<ul style="list-style-type: none"> All Macronix fabs, testing plants, and management centers have passed the IATF 16949:2016 standard certification of the International Automotive Task Force (IATF). Secure flash memory solution ArmorFlash™ has received the Cryptographic Algorithm Validation Program Certification from the National Institute of Standards and Technology (NIST CAVP) and earned PSA Certified, which indicates that its ability to protect network security and privacy is international-quality. Secure flash memory solution ArmorFlash™ has obtained AEC-Q100 Grade 1, 2, 3 qualifications of Automotive Electronics Council, which is a rigorous test 	<p>qualification in the automotive IC market.</p> <ul style="list-style-type: none"> In 2021, Macronix has led the way in the industry with mass production of high-speed, low-power 120MHz 1.2V Serial NOR Flash, which met the demand of network communication such as 5G and IoT and consumer demand. All facilities have obtained full score of 200 in the Validated Assessment Program (VAP) of the Responsible Business Alliance (RBA). All items of ESG information and data are disclosed in accordance with the SASB Standard of the semiconductor industry.
Environmental	<ul style="list-style-type: none"> Invested NT\$438 million in environmental safety and health in 2021 and proactively committed itself to and developed the strategy for sustainable operations. From 2017 to 2021, cumulative electricity savings was 41,520 MWh. Greenhouse gas emissions declined by 17% compared to the base year, and the average annual 	<p>reduction is 1.7%.</p> <ul style="list-style-type: none"> Produced 4.102 billion liters of reclaimed water, and the water recycling rate of all plants has reached 84.7%. 11,113 metric tons of waste were recycled/reused, and the waste recycling/reuse rate was 97.2% The average removal rate of volatile organic 	<p>compounds (VOCs) is 95.97%.</p> <ul style="list-style-type: none"> The Company has introduced the framework of the Task Force on Climate-related Financial Disclosures (TCFD) and selected five risks and five opportunities for management in response to the risks and opportunities brought about by climate change.
Social	<ul style="list-style-type: none"> Received the 2021 National Occupational Safety and Health Enterprise Benchmarking Award from the Occupational Safety and Health Administration of the Ministry of Labor. <p>Friendly Workplace/Employee Benefits:</p> <ul style="list-style-type: none"> Received the Excellent Business Unit in the Promotion of Work Equality in the Workplace – the High Distinction Award from the Hsinchu Science Park in 2021 The Welfare Committee has allocated NT\$43.979 million in total for employee welfare. Built a five-star employee recreation and fitness center and invested NT\$7.829 million in professional sports instructors and the maintenance of software and hardware equipment for the purpose of creating a friendly and safe leisure environment maintaining employees' physical and mental health; the Company has received the Taiwan i Sports Certification, which is valid for three years from 2020 to 2023, by the Sports Administration of the Ministry of Education. Purchased a NT\$9.036 million group insurance for employees, which covers accidents, diseases, and cancer, and the employees are allowed to add their 	<p>parents, spouses, and children as dependents for low-cost, self-pay insurance. As a result, our employees could have a more comprehensive protection for their families and be worry-free.</p> <ul style="list-style-type: none"> The Company offers free early-stage lung cancer CT scans and heart CT scans, which has benefited 395 employees in total, and the free CT scans are also available to the employees' family members at a discount, which has benefited 160 family members in total. In 2021, the Company offered to pay fees for PCR COVID-19 tests and COVID-19 rapid antigen tests, which have been done by 455 employees and 1,112 employees respectively. <p>Education and Training:</p> <ul style="list-style-type: none"> The Company provides consistent, progressive training programs for different specialties and tiers; on average, every employee has participated in 21 sessions and has had 62.8 hours of training. The Company provides a variety of learning approaches, including digital learning with no limitation of time and place; a total of 46,173 people have participated in training activities through the 	<p>digital learning platform, which accounts for 57% of all training activities.</p> <p>Charity Events:</p> <ul style="list-style-type: none"> The Macronix Education Foundation scholarships have exceeded NT\$170 million by the end of 2021. The Macronix Education Foundation has received the Social Education Contribution Award from the Ministry of Education. The Company has established a charitable organization, which has combined the strength of both the employees and the public, to help the needy in every corner of the society; a total of 4,748 employees have participated in public welfare activities, and donations of NT\$3.215 million have been made. The Company has adopted a 12km eco bike lane in Hsinchu City, providing local citizens with a comfortable and healthy environment to enjoy outdoor activities, and the Company has received a certificate of adoption from the Hsinchu City Government and the Clean Air Zone Adoption – Premium Award from the Environmental Protection Administration of the Executive Yuan.

2021 Awards and Recognition

★ **Internet security solution ArmorFlash™** was awarded

- EE Awards Asia - "Best Memory IC of the Year"
- EE Awards Asia - "Featured IoV Solution Provider"
- 2022 Taiwan Excellence Gold Award
- 2021 Hsinchu Science Park Innovative Product Award

★ Awarded the **2021 National Occupational Safety and Health Enterprise Benchmarking Award** by the Occupational Safety and Health Administration of the Ministry of Labor

★ The Macronix Education Foundation was Awarded the **Social Education Contribution Award** by the Ministry of Education

★ Ranked in the Top **6%~20%** in the Corporate Governance Evaluation





2021 MACRONIX Sustainability Report

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01

Messages from the Macronix Executives



1.1 Message from the Chairman and CEO

1.2 Message from the President

Chairman and CEO



1. Messages from the Macronix Executives

1.1. Message from the Chairman and CEO

Macronix International Co., Ltd. ("Macronix") was founded in Taiwan's Hsinchu Science Park in 1989, since then, Macronix has been dedicating itself to the research and development of advanced Non-Volatile Memory (NVM). We provide ROM, NOR Flash, NAND Flash solutions in a wide range of sizes and capacity. With the business philosophy "honesty," Macronix not only improves its ability to manufacture high-quality products, but also continuously paying attention to sustainable development and the corporate social responsibility it carries.

The impact of COVID-19 on the global economy has not subsided in 2021, but it has accelerated the progress of digitalization and created strong demand in fields of application, such as 5G, data centers, and automotive electronics, which has driven continued price hikes of high quality and high capacity products. Thanks to the collective efforts of all employees, Macronix has become the market leader with its advanced process technology and highest quality, and it has achieved excellent revenue, gross profit, and EPS growth in 2021. Our NOR and NAND Flash revenue increased over 50% compared with 2020, and it drove consolidated revenue to a record high in 2021. We successfully increased our profit margin through strategic adjustments of production capacity and optimization of product portfolio while operating at full capacity. Furthermore, the successful disposal of our 6-inch wafer fab and equipment increased non-operating income, and further improved our profit performance for the year.

The operating performance of 2021 is as follows: consolidated net operating revenue for the year was NT\$50.573 billion; annual consolidated gross profit was NT\$21.05 billion, while annual gross margin increased 7.9% compared with 2020 to 41.6%; net income after tax was NT\$11.963 billion; earnings per share jumped to NT\$6.48; cash generated from operating activities was NT\$16.116 billion; cash expenditures for investment activities was NT\$2.623 billion, with NT\$18.565 billion in cash at the end of the period; debt ratio was 39.1%; book value per share rose to NT\$25.2; return on equity increased to 29%. The steady growth of our cash flow and book value will continue to increase company value and strengthen our financial position.

Macronix has continuously made improvements through R&D and innovation since it was established, and has secured a crucial position in the world with its outstanding R&D capabilities and patents, while playing a key role in the non-volatile memory market. Our research results were once again recognized by the world and our paper was honored by the International Solid-State Circuits Conference (ISSCC) in 2021. As for patents, in 2021, we have obtained a total of 334 patents in various countries, and by the end of 2021, Macronix has accumulated a total of 8,654 patents worldwide, the amount of patents that Macronix obtained is growing steadily, which provides Macronix with a strong fortress of intellectual property rights and reinforce its leading position in the global non-

volatile memory market. Furthermore, we continue to collaborate with major international tech companies to develop advanced memory and analog artificial intelligence technologies and actively developing advanced non-volatile memory technologies and applications, in hopes of providing people with better digital lifestyles.

As for corporate governance, ethical corporate management stands as the cornerstone of our corporate culture. Macronix strictly complies with laws and regulations, and it attaches great importance to risk management with regard to trade secrets and information security, in order to create a sustainable business environment. As for sustainability, to promote organizational management and fulfill the responsibility as a global citizen, Macronix has already introduced various international management standards in relation to the Environment, Social, and Governance (ESG) aspects many years ago. As the world gradually shifted its attention to the United Nations' Sustainable Development Goals (SDGs) in the implementation of Corporate Social Responsibility (CSR), we have directed our attention to water resources, climate change, and biodiversity that are addressed in the environmental SDGs. We are actively implementing energy conservation, water conservation, and carbon reduction measures through the establishment of various management systems; we start from source management to comply with international standards and customer requirements, such as the EU's Restriction of Hazardous Substances (RoHS) Directive and Substances of Very High Concern (SVHC) requirements, as well as the End-of-life Vehicles (ELV) Directive, which has received the attention of the automotive industry – these are all strictly monitored by Macronix.

Macronix believes that talent cultivation is the foundation for strengthening the nation's technological capabilities, and therefore we spare no effort in the promotion of science

education. The Macronix Education Foundation was established in 2001 with an initial donation from Macronix, and it has held the Macronix Golden Silicon Awards and Macronix Science Awards for more than 20 consecutive years. Almost 40,000 teachers and students have participated in these awards. Because of the awards' extensive influence, Macronix was recognized with the Ministry of Education's Social Education Contribution Award; moreover, Macronix was awarded the Arts and Business Awards by the Ministry of Culture for its long-term support of local artists in Taiwan. Furthermore, it funded National Cheng Kung University to found the Miin Wu School of Computing in 2020, which helps the long-term domestic cultivation of interdisciplinary, artificial intelligence (AI) talents, and accumulates the human capital in innovative technology development.

Following in the wave of AI, demand for memory will continue to increase, and the market will continue to grow. Advanced semiconductor process technology has overcome the impossibility of miniaturization in 2D NAND and NOR and brought about 3D memory, continuously makes increase in capacity, and maintains growth momentum of NAND and NOR. In addition, the demands for memory and its specifications that big data and AI require have changed the role of memory. From its past behind-the-scenes supporting role in data storage, it has now moved to the front-of-stage role of combining logic chips for computing, finally realizing the development of memory as a protagonist. In the future, our management team will continue to leverage its forward-looking perspective and stable strategy to respond to new competition and challenges. We will continue to enhance our technical capabilities and cost advantages, create Memory-Centric Solutions for computer architecture, with the aim of jointly creating a mutually beneficial situation for employees, shareholders, customers, and suppliers.

1.2. Message from the President

COVID-19 has made a severe impact on the global economy, but Macronix has been tirelessly researching and developing new technologies and products. Thanks to the concerted efforts from all employees, Macronix has created better business results during the pandemic. ROM bit shipments grew quarterly in 2021 and accounted for 27% of our overall revenue that year. As for NOR Flash, our 55nm process continues to account for an increasing percentage and accounted for 58% of density shipment in the fourth quarter of 2021; we will develop the 45nm process and advanced NOR product applications. High-density products of 256Mb and above are accounting for an increasing percentage of NOR Flash revenue each year and has reached 42% as of 2021. Macronix has transitioned to applications that are less affected by cyclical fluctuations so as to reduce the impact of cyclical fluctuations in end demand on overall operations. Our revenue from industry grade, medical, and aerospace high quality applications doubled compared with 2020, showing that high quality and high-capacity applications will become the main source of Macronix's business growth. With regard to NAND Flash, 19nm process technology SLC NAND Flash products accounted for 59% of overall density shipment in the fourth quarter of 2021. New products and new applications are now entering the verification phase and will gradually make Macronix one of the main suppliers of SLC NAND Flash. As for 3D NAND Flash, our 48-layer 3D NAND Flash products have reached high-quality standards and obtained certification from our customers. Mass production of 48-layer 3D NAND Flash products began in the third quarter of 2021 and is expected to contribute to revenue in 2022. We will continue to develop 192-layer stacking technology to meet customers' need for high-capacity products.

Macronix attaches great importance to safety, environmental protection, and labor rights. Besides starting from the source, we have incorporated the concept of CSR into our product design. All of the chemicals and metals used on our products comply with internationally agreed regulations such as the EU's RoHS Directive, the REACH Regulation, and the Conflict Minerals Regulation. Ever since IECQ QC080000, the Hazardous Substance Process Management System, was started to be promoted in 2007, each year, we have attained third-party certification and gained recognition from our customers as well. As the world's leading manufacturer of non-volatile memory, Macronix not only focuses on its business operations, but also works towards sustainable development as the world focuses on ESG (environmental, social, and governance)

issues, sequentially establishing management procedures and gradually taking action. Macronix continued to maintain excellent performance domestically in the Corporate Governance Evaluation in 2021, it also won the National Occupational Safety and Health Enterprise Benchmarking Award from

the Ministry of Labor, which shows that Macronix has achieved excellent performance in safety and health management, friendly workplace, and corporate social responsibility.

Sustainability has become a crucial topic for corporations. The Macronix 2021 Sustainability Report faithfully discloses our persistence and determination to achieve sustainable development based on the GRI Standards published by the Global Reporting Initiative (GRI), and adds issues of stakeholders' concern such as SASB and TCFD. The report connects our business philosophy "honesty" with the UN SDGs. The SDGs have guided the establishment of an excellent governance system that will ensure that Macronix stably grows within Earth's capacity as we stride towards sustainable development.

We uphold the business philosophy "honesty" and insist on innovation and quality, which has allowed us to successfully develop the 3D generation, and once again fulfill our commitment to provide customers with the highest quality products and service support. Looking towards the future, 3D NAND and advanced NOR production capacity will provide important support for Macronix's business growth. Hence, the management team will adopt a stable strategy with a cautious attitude when implementing the 12-inch wafer fab capacity expansion project launched in 2021. We expect all employees to work together to accelerate the development of next generation key technologies for memory and products, and we will actively expand new customers and fields for high-end applications to reach new heights of operation, sharing the excellent results with employees, shareholders, and customers!



02

Macronix



2.1 Products and Services

2.2 Business Locations Worldwide

2.3 Macronix Sustainability Milestones

2.4 External Participation

2. Macronix

Macronix, a leading integrated device manufacturer in the global Non-Volatile Memory (NVM) market, provides a full range of ROM, NOR flash, NAND flash, and e.MMC solutions. With its world-class R&D and manufacturing capabilities, Macronix continues to deliver high-quality, innovative, and performance-driven products to its customers in the consumer, communication, computing, automotive electronics, and industrial markets, among others.

Macronix was founded in Taiwan's Hsinchu Science Park in 1989. Since its inception, the Company has continuously leveraged the competitive advantages of its products and constantly strived to enhance its production and manufacturing capabilities in order to deliver high-quality products and services. As a result, we have successfully established long-term, mutually beneficial strategic partnerships with large, world-class manufacturers. Macronix has adhered to high corporate governance standards, while actively maintaining investor relations and advocating CSR. Macronix was the first semiconductor company in the Hsinchu Science Park to receive the SA8000 Corporate Responsibility Management Systems certificate. The Company was also awarded the Corporate Governance Certification for publicly traded and over-the-counter companies. In 2020, Macronix passed the RBA VAP, where a report is valid up to two years, with excellent results, showing that we take CSR seriously and are committed to achieving sustainable development.

In recent years, Macronix has been allocating 10% or above of its revenue for R&D. The technical papers we published over the years were continued to be selected and

highlighted by multiple international academic conferences, such as the IEDM and the ISSCC. Macronix currently holds the intellectual property rights for over 8,000 key international technologies and patents. We have formed alliances with leading high-tech firms across the world to collectively conduct research, with the purpose of co-developing technologies for Phase Change memories. Macronix has also announced the world's first paper about the flash prospective technology — BE-SONOS™. All of these developments aim to provide solutions for the next generation of non-volatile memories.

Macronix currently owns one 12-inch wafer fab (Fab 5), and one 8-inch wafer fab (Fab 2). Macronix designs and fabricates its non-volatile memory products in Fab 5 and Fab 2. The original 6-inch fab (Fab 1) is mainly operates the foundry business of niche analog and logic products. Considering the policy of fully developing 12-inch wafers in the future, Macronix announced the sale of Fab 1 in 2021.

Macronix spun off its logic products unit to establish subsidiaries so that the Company's operations could better focus on delivering optimized performance. Since then, the subsidiaries and Macronix have cooperated in the R&D of mobile platform solutions; expanding the Group's overall integration capabilities.

Looking ahead, Macronix will continue to research and develop new technologies to stay ahead of the competition, while simultaneously pursuing new product development and enhancing its technologies, quality, and services in order to strengthen our competitive advantages and boost profits. We will do our utmost to deliver sustainable growth for Macronix while also enhancing Taiwan's international competitiveness.

Macronix's Mission and Statement

Be in today or in the future, Macronix strives to become a leading supplier in the semiconductor industry. The Company provides innovative customer/application-oriented solutions and NVM products thanks to its outstanding advanced technologies and reliable services.



2.1. Products and Services

As an integrated device manufacturer in the Non-Volatile Memory (NVM) market, Macronix provides a full range of NOR Flash, NAND Flash, and e.MMC™ solutions.

Thanks to its R&D and manufacturing capabilities, Macronix continues to deliver high-quality, innovative, and performance-driven products to its customers in various fields, such as the consumer, communication, computing, automotive electronics, industrial, and smart healthcare sectors. In 2021, Macronix owned three wafer fabs: the 6-inch wafer fab producing approximately 80,000 wafers, the 8-inch wafer fab producing approximately 550,000 wafers, and the 12-inch wafer fab producing approximately 250,000 wafers.

Macronix is capable of providing a comprehensive lineup of densities for serial NOR flash products, from 512 Kbit to 2 Gbit. We also provide miniature NOR flash products that can adequately fulfill the demands for lightweight and miniature portable electronic products. Moreover, our self-developed Single-Level Cell (SLC) NAND flash products provide superior quality and reliable applications that meet the needs of a high level, embedded market. Furthermore, we introduced the 19nm SLC and Multi-Level Cell (MLC) NAND in 2018. We also provide KGD (Known Good Die) products to meet the needs of SIP (System in Package). In our ROM business, 32nm XtraROM® has went into mass production.

Macronix has a wide variety of solutions that can help customers design the best products for different applications. In terms of IoT and other low power applications,

Macronix launched the Ultra Low Power Flash to gain a foothold in the wearable smart device market. It features low power consumption—60% less than conventional products—and wide range VCC. We further launched the Ultra Low VCC Flash (1.14V-1.3V) in 2017, in response to the trend for lower core voltage of logic ICs, as well as to support more efficiently IoT, Bluetooth, and health monitoring products that require low power consumption. As for the automotive market, Macronix provides octaflash, ArmorFlash, and LybraFlash that launched in 2020 to meet various clients' needs. Octaflash is the industry's fastest SPI NOR with a new-generation, low-pin count, high-performance OctaBus interface and Read-While-Write (RWW) functions, keeping with the requirements of in-vehicle infotainment, data communication, digital cameras, and IoT for a high-capacity, fast-transmission, and highly-reliable flash memory. As for the ArmorFlash solution, crucial security components were incorporated into memory chips to satisfy the pressing needs for information security in memory applications, as required by automotive electronics, IoT, and industrial control applications. ArmorFlash has been adopted in the autonomous driving platforms of international manufacturers. LybraFlash provides a high-quality, high-capacity flash memory solution for clients. LybraFlash smartly balances all the possible clients' needs, including cost effectiveness, high reliability, user friendliness, fast read and fast updates. So far LybraFlash samples have already been delivered for design-in validation.



Macronix Products and Applications

Product Type	Key Products	Applications and Functions
Non-Volatile Memory IC	Read-only Memory (Mask ROM/ XtraROM®)	Mainly applied in video game cartridges, electronic dictionaries, printers, personal entertainment devices,
	NOR Flash Memory	electronic toys, etc.
	NAND Flash Memory	Mobile phones, set-top boxes, personal computers, digital cameras, MP3 players, CD-ROM drives, printers, hard drives, network devices, tablet PCs, wireless communication devices (Bluetooth, WLAN), arcade games.
	e.MMCTM	Mobile phones, set-top boxes, TVs, digital cameras, MP3 players, printers, hard drives, network devices, tablet PCs, wireless communication devices (Bluetooth, WLAN), arcade games.
Wafer Foundry Service	Sub-micron Logic Process/Pressurized CMOS and BCD Process	Pressurized CMOS manufacturing power management and LED / LCD driver IC services.
	Embedded ROM/Flash/MTP/OTP Process	Provide integrated embedded ROM/Flash/MTP/OTP to strategic clients.

Scope of Application

Computing



Personal computers, notebooks, tablets, computer peripherals/accessories, printers, and data centers

Consumer



TV/MOD, wearable devices, drones, sports cameras, digital cameras, smart home appliances, video game systems, Pachinko, toys, audiovisual tools

Communication



Mobile networks, home networks, enterprise networks, telecommunication networks

Automotive Electronics



Advanced driving assistance systems, infotainment entertainment systems, information communication systems, dashboards

Industry



Automation system for plants, smart building, smart grid, smart medical application, transportation tool, POS device, M2M, smart healthcare

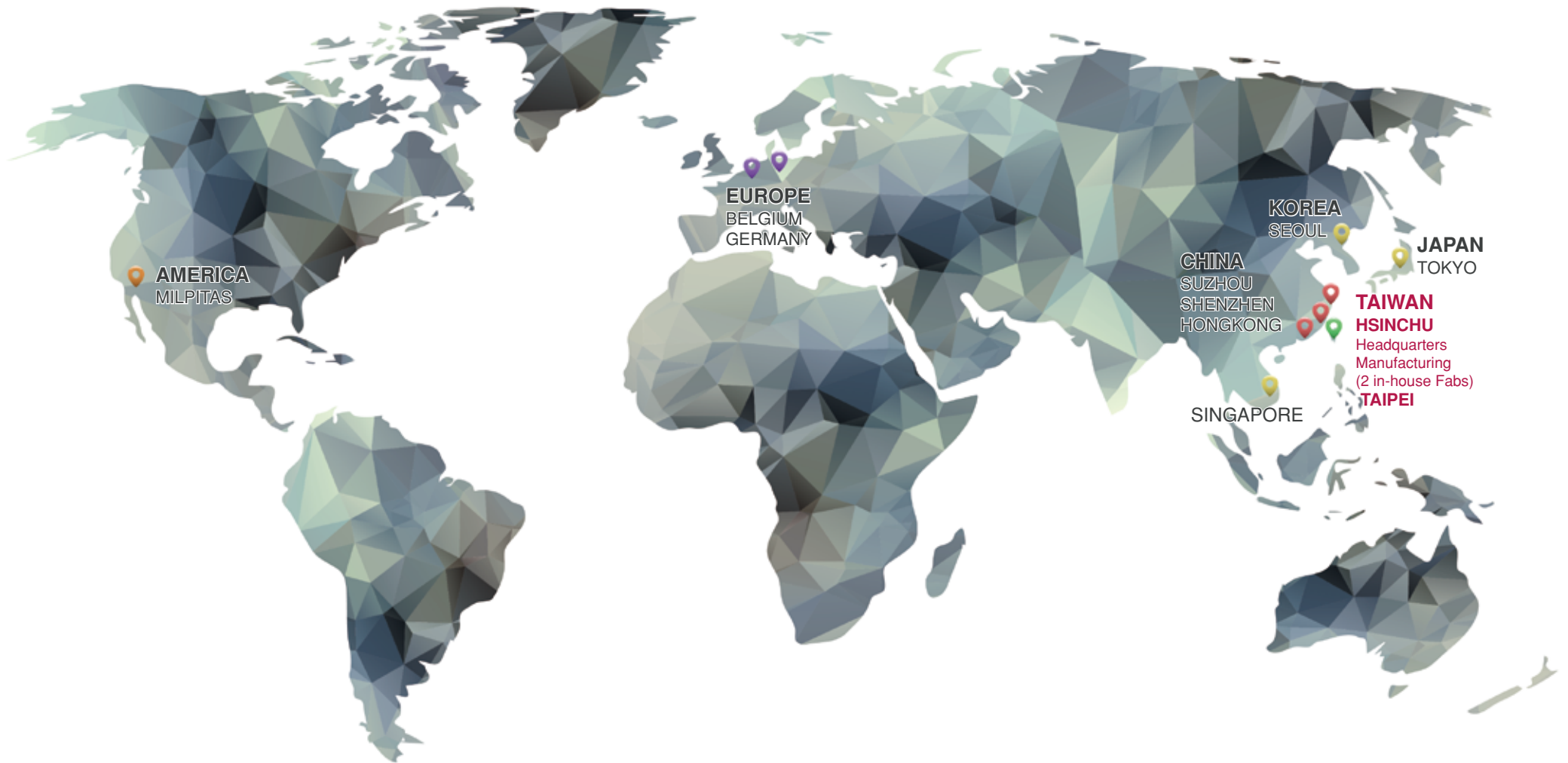
Key Markets

Macronix is an export-oriented company, and Japan is our main market. As a prolific manufacturer of gaming systems and consumer electronics worldwide, Japan has a strong and consistent demand for high-quality IC components. Other export destinations are based on the branch offices of Macronix in China, Europe, U.S., Korea, and Singapore. Macronix collaborates with international agents to provide our products to customers from all over the world.

Product Sales and Market Share


Product	2021(consolidated)	
	Sales Turnover(Thousand NTD)	Sales Ratio(%)
Flash	33,504,267	66.25
ROM	13,556,983	26.81
Foundry	3,501,876	6.92
Others	9,865	0.02
Total	50,572,991	100.00

2.2. Business Locations Worldwide



2.3. Macronix Sustainability Milestones

- **2000** · Held the first Macronix Golden Silicon Awards - Semiconductor Design and Application Competition
- **2001** · Established the Macronix Education Foundation
- **2002** · The Macronix Education Foundation held the first Macronix Science Awards.
- **2004** · Recognized as an Outstanding Enterprise by the Energy Saving Awards from the Bureau of Energy, Ministry of Economic Affairs
· First firm in the Hsinchu Science Park to complete the comprehensive inventory and verification on greenhouse gases
· Established the Macronix Science Awards Association
- **2005** · Received the ISO 14001:2004 Environmental Management System Certification from the British Standards Institute
· Macronix's Fab 2 won the 14th ROC Enterprise Environmental Protection Award for four consecutive years
- **2006** · Received a green product certification from international brands including SONY, CANON, and LG for compliance with RoHS Directive requirements
- **2007** · Received the IECQ QC080000 Hazardous Substance Process Management System Certification
· Recognized as an Outstanding Manufacturer for Voluntary Greenhouse Gases Emissions Reduction by the Bureau of Industrial Development, Ministry of Economic Affairs
· Received the ISO 14064-1 International Standard for GHG Emission Verification Certification from the British Standards Institute
· Credited with the CG6002 Corporate Governance Certification by the Taiwan Corporate Governance Association
- **2008** · Became the first semiconductor manufacturer to receive the SA8000 Corporate Responsibility Management Systems Certification
· Donated NT\$300 million to National Tsing Hua University to build the Macronix Building (Learning Resource Center)
· Donated CNY 5 million to help victims of the Sichuan earthquake
· Helped push upstream and downstream supply chain partners to implement the Electronic Industry Citizenship Coalition Code of Conduct (EICC)
· Granted the new OHSAS 18001: 2007 certification from SGS
· Granted the Taiwan Occupational Safety and Health Management System (TOSHMS) Certification
· Recognized as an Outstanding Enterprise in the Green Procurement Award from the Environmental Protection Administration
- **2009** · Awarded with the 3rd National Occupational Safety and Health Award
· Became the first semiconductor manufacturer to be recognized as an outstanding enterprise and to receive a safety certification
· Donated NT\$100 million to aid the victims of Typhoon Morakot in Taiwan
· Received the 5th annual Global Views Monthly Magazine CSR Award for its outstanding performance in Corporate Social Responsibility
- **2010** · Received the 6th annual Global Views Monthly Magazine CSR Award top honor (Five-star rating)
· Received the 2010 CommonWealth Magazine Excellence in Corporate Social Responsibility Award
· Donated an additional NT\$100 million for the Macronix Building at National Tsing Hua University
· Received the Employment Creation Contribution Award from the Executive Yuan
- **2011** · Donated NT\$30 million to the Japan Earthquake Relief Efforts
· Received the Employment Creation Contribution Award from the Executive Yuan
· Honored as one of the Top 100 Taiwan Brands by the Ministry of Economic Affairs
· Once again received the CommonWealth Magazine Excellence in Corporate Social Responsibility Award
· Honored with Contribution Award at the 2011 National Invention and Creation Award
· Received the CG6006 Corporate Governance Evaluation Certification
· Received the Employee Assistance Program Outstanding Business Award from the Council of Labor Affairs, Executive Yuan
- **2012** · Received the 8th annual Global Views Monthly Magazine CSR Award
· Once again received the CommonWealth Magazine Excellence in Corporate Social Responsibility Citizenship Award

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- 2013** · Official opening of the new Learning Resource Center at National Tsing Hua University — the Macronix Building
· The Macronix Education Foundation was awarded by the Ministry of Education as an Outstanding Educational Foundation
 - 2014** · Deputy Director Wang, Hung-Chih was named an Outstanding Internal Auditor by the Institute of Internal Auditors-Chinese Taiwan
· Received the first "Work-Life Balance Award" presented by the Ministry of Labor in recognition of the Company's performance in care and support for employee families and the health and safety of its employees
 - 2015** · Recognized as an Excellent Healthy Workplace by the Health Promotion Administration, Ministry of Health and Welfare
· The Taiwan Stock Exchange listed Macronix as one of the companies in the top 5% with outstanding performance in the first corporate governance evaluation.
 - 2016** · Recognized as an Outstanding Water-saving Manufacturer by the Water Resources Agency, Ministry of Economic Affairs
· Recognized as an Outstanding Energy-saving Manufacturer by the Ministry of economic Affairs
· Recognized as an Outstanding Energy-saving Manufacturer by the Hsinchu Science Park
· Awarded a badge for establishing and managing certified breastfeeding rooms
· Awarded the Top Honor for an Accredited Healthy Workplace
· Awarded for Excellence in Landscaping and Environmental Protection
· Recognized as one of the Top 100 Sustainable Enterprises in Asia by Channel NewsAsia
 - 2017** · Fab 1 received the Excellence in Safety and Health Award from Hsinchu Science Park
· Fab 2 received the Outstanding Energy-Saving Manufacturer Award from the Ministry of Economic Affairs
· Received the Excellence in Green Procurement Award for Private Enterprises and Organizations in Hsinchu City
· Received the Excellence in Occupational Safety and Health Promotion Award by the Hsinchu Science Park
· Received the Excellence in Workplace Equality Promotion Award by the Hsinchu Science Park
 - 2018** · Chairman Miin Wu was awarded Ernst & Young Entrepreneur of the Year and Business Paradigm Entrepreneur of the Year
· Fab 2, Fab 5, and the Testing Plant passed the Responsible Business Alliance Validated Assessment Program (RBA VAP) audit and obtained the Platinum Certification
· Fab 2 received the Outstanding Energy-Saving Manufacturer Award from the Ministry of Economic Affairs
· Awarded the Excellence in Green Procurement Award for Private Enterprises and Organizations in Hsinchu City
· The Head Office and Fab 1 won the Badge of Accredited Healthy Workplace
· Received the Creativity Gold Award for Healthy Workplace – Award of Excellence
 - 2019** · Received the Annual Sustainable Elite Award in the first SGS CSR Award
· Received the National Excellent Healthy Workplace – Paradigm in Health Award from the Health Promotion Administration, Ministry of Health and Welfare
 - 2020** · Received the Annual Sustainable Elite Award in the second SGS CSR Awards
· Received the Breastfeeding Room Certification - Award of Distinction from the Public Health Bureau, Hsinchu City in 2020
· Awarded Excellence in Landscaping and Environmental Protection in 2020
· Received the Excellence in Workplace Equality Promotion Award from the Hsinchu Science Park in 2020
· Fab 2, Fab 5, and the Testing Plant passed the Responsible Business Alliance Validated Assessment Program (RBA VAP) audit and obtained Platinum certification
 - 2021** · Won the 2021 National Occupational Safety and Health Enterprise Benchmarking Award from the Occupational Safety and Health Administration of the Ministry of Labor
· Awarded 2021 EE Awards Asia - "Best Memory IC of the Year"
· Recognized by the 2022 Taiwan Excellence Gold Award
· Secure flash memory ArmorFlash™ won the 2021 Hsinchu Science Park Innovative Product Awards
· The Macronix Education Foundation was recognized with the Social Education Contribution Award by the Ministry of Education

2.4 External Participation

Macronix upholds its business philosophy "honest" and actively participates in external associations, providing recommendations to companies, peers, and the industry through good interactions. The Company promotes exchanges and development of the business community, government offices, and academia. Macronix's important actions and contributions to different organizations are listed below:



Name	Title	Action/Contribution
Taiwan Electrical and Electronic Manufacturers' Association	Member	Macronix offers suggestions, promotes the collective interests of fellow members, functions as a bridge between the industry and the government, and promotes industrial development.
Allied Association for the Science Park	<ol style="list-style-type: none"> 1. Director 2. Convener of the Health and Safety Committee 3. Vice Convener of the Environmental Protection Committee 4. Convener of the Public Relations Committee 	<ol style="list-style-type: none"> 1. Macronix contributes to the discussion, decision, and execution of the association's operations. 2. Macronix leads the discussion, decision, and execution of work related to occupational safety and health and risk management in the science park. 3. Macronix communicates, coordinates, researches, participates, and provides services related to environmental protection. 4. Macronix promotes public relations for the science park and functions as a communication platform with the media.
Chinese National Association of Industry and Commerce, Taiwan	Director	Macronix offers suggestions, promotes collective interests of fellow members, functions as a bridge between the industry and the government, and promotes industry and commerce development.
Friends of the Second Special Police Corps, National Police Agency	Committee Member	Macronix cooperates with the police to enhance and promote crime control and prevention.
North consortium, Taiwan Occupational Safety & Health Management System (TOSHMS), Ministry of Labor	President of North Consortium	<ol style="list-style-type: none"> 1. Macronix shares its experience of winning the National Labor Safety Award. 2. Macronix promotes cross-industry education and awareness of labor safety issues and inspires creative solutions for promoting workplace safety.

Macronix's External Participation

Corporate Governance

- Computer Audit Association
- The Institute of Internal Auditors

Economy

- Chinese National Association of Industry and Commerce, Taiwan
- Taiwan Stock Affairs Association
- Chinese International Economic Cooperation Association

Society

- Friends of the Second Special Police Corps
- Taiwan Association of Occupational Health Nurses
- High-Tech Industry Salary Association
- Taiwan Union of Nurses Association

Technology and Industry

- GSA
- JEDEC Fee
- SEMI TAIWAN
- WSTS
- Chinese Institute of Engineers
- The Electronics Devices and Materials Association
- Taiwan CIO Association
- Monte Jade Science & Technology Association of Taiwan
- Taiwan Electrical and Electronic Manufacturers' Association
- Taiwan Society for Precision Engineering
- Chinese Society for Management of Technology
- The Allied Association for Science Park Industries



03

Sustainable Development Strategy



3.1 Sustainable Development System

3.2 Stakeholder Engagement

3.2.1. Stakeholder Identification and Interaction

3.2.2. Identifying and Prioritizing Material Issues

3. Sustainable Development Strategy

The key electronic components produced by Macronix have enriched human lives. As a member of the global market, we insist on sustainable management and are committed to our responsibilities as a corporate citizen of the world. We strive to create a better future by leveraging our advanced technological capabilities to assist our clients in creating excellent products.

To realize sustainable corporate management, Macronix continues to elevate shareholder rights and is committed to its duties as a global corporate citizen as it cares for the environment and conservatively uses natural resources. We have proactively pursued all aspects of the Responsible Business Alliance Code of Conduct (RBA CoC) and passed the RBA VAP with flying colors in 2020, contributing to society through scientific education and promotion. This shows that Macronix takes CSR seriously and is committed to sustainable development.

To fulfill our commitment to sustainability, we strive to:

- Go beyond compliance with regulatory requirements and enhance our environmental, safety and health performance, as well as risk management.
- Nurture a working environment with a well-planned and well-run human resources management system and related practices.
- Meticulously commit to sustainable supply chain management that is fully compliant with international standards, laws, and customer requirements.
- Increase our social care and respond to global trends. Macronix prohibits the use and purchase of conflict minerals. It tracks the source of gold (Au), tantalum (Ta), tin (Sn), tungsten (W), cobalt (Co) to ensure that these minerals come from eligible refineries; Macronix also requires its suppliers to meet this requirement in order to satisfy customer needs.
- Promote science education in order to cultivate innovation among the younger generation and expand our contribution to society.

3.1. Sustainable Development System

Corporate Social Responsibility Policy

Macronix's first issue of Corporate Social Responsibility (CSR) Policy was approved in 2008 by the president of the Company and published on the Company's electronic bulletin board. All of our new employees are required to undergo SA8000 and RBA CoC training.

The CSR Policy* implemented by Macronix comprises the following:

We determined to uphold labor rights, respect human rights, provide a safe, healthy, and amiable working environment, conservatively use the natural resources, promote science education, encourage innovative research and development, protect shareholders' rights, actively contribute to society, and persist in sustainable management.

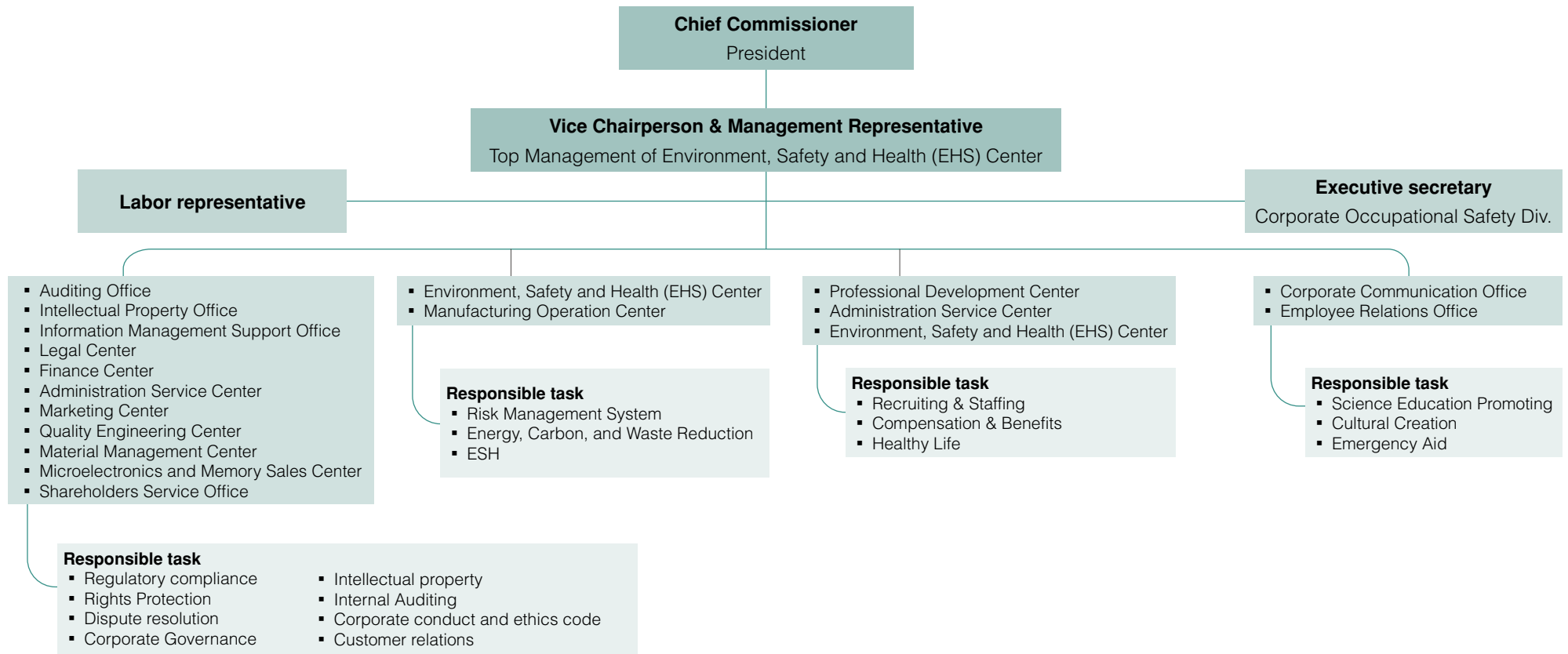
- (1) Fully comply with national laws or regulations, the agreed customer requirements, and the applicable social responsibility requirements that subscribes.
- (2) Prohibit child employment, nor engaging in involuntary labors.
- (3) Conduct the due diligence on our suppliers/subcontractors, including service provider.
- (4) Provide our employees a safe, healthy, and amiable working environment.
- (5) Respect the freedom of collective bargaining, association, and peaceful assembly, and do not allow any discrimination on racial difference, religious belief, and gender, etc.
- (6) Esteem our employees, and do not allow ruthless punishment measures.
- (7) Operate honestly, ethically and refuse any means of improper advantage violate business integrity.
- (8) Comply with the Responsible Business Alliance Code of Conduct (RBA CoC), and continue improving through the management system.

* : This version was revised on March 30, 2018

Corporate Social Responsibility Organization

Macronix's President currently serves as a member of the Board of Directors. The Company's EHS Center, Administration Service Center, and Professional Development Center jointly carry out CSR work. The President serves as the chairman, the highest executive of the Safety & Health Center serves as the management representative, and the committee members are representatives of the Company's cross-department center or business groups. They encourage the performance team to continuously increase its commitment to CSR-related tasks, ensure that Macronix complies with company and customers' relevant regulations, integrate cross-department resources for promoting and maintaining effective CSR operations, and provide employees with operational recommendations and consultation services to maintain and continuously improve the Company's operating systems.

Sustainability Report Execution Task Force Structure



3.2 Stakeholder Engagement

3.2.1. Stakeholder Identification and Interaction

Macronix recognizes that engaging in long-term conversations with stakeholders is necessary to improve its understanding of the community, and thus make proper decisions and reduce social conflicts. Macronix understands and responds to stakeholders' reasonable expectations, need, and topics of concern through a number of communication channels; such communications with stakeholders are reported to the Board of Directors annually. All stakeholders can access the Company's contact information and communication channels through the "Stakeholders Section" or "[Contact Us](http://www.macronix.com)" on the company website (<http://www.macronix.com>) to ask questions or express opinions.

Macronix continues to build a robust ESG value chain system, and work with our employees and corporate partners to understand and respond to stakeholders'

expectations toward Macronix's fulfillment of ESG, while also serving as a tool for the Company to learn more about trends, risks and development opportunities. The engagement of stakeholders will help us to turn our promises into actions that will bring about a positive contribution to society and the environment. Although this is a long-term challenge, Macronix is committed to continue making efforts in integrating our supply chain and cooperating with governance policies and guidelines to accomplish the goals for all kinds of issues.

Stakeholders in our sustainable reports are identified according to the requirements specified by the TWSE regarding stakeholders for listed companies, by interviewing personnel from the public relations office, shareholders service office, and related departments, and by referencing our peers to consider the level of concern, responsibilities, influence, diversity of perspectives, and tension identification pertaining to each stakeholder.



Interactions and Responses to Macronix's Stakeholders in 2021

Stakeholders	Communication channels	Topics of Concern	Highlights and results of communication in 2021	Subject to Influence (V) or Concern (*)	
Investors	Investor seminars (quarterly) Shareholders' meeting (at least once a year) Investor seminars/forums held by securities firms (irregular) Investor mailbox/website comments/phone calls (ad hoc)	Shareholder equity Corporate Governance Overview of Investments Innovative R&D Industry development Intellectual Property Rights Dividends distribution Corporate operations Product price Product use	<ul style="list-style-type: none"> Held 4 investor seminars Held 1 shareholder meeting, during which all motions were approved by a vote Participated in 19 investor seminars held by securities firms or foreign institutional investors The chairman or the designated person responded to shareholders during the annual shareholders' meeting Responded to topics of concern to investors by phone or mail 	Economy	V *
				Environment	
				Society	
Customers	Customer satisfaction survey (annual) Suppliers' conference (at the request of customers) Customer communication platform (available 24-7) Visits in person (as necessary) Supplier audits (at the request of customers)	Product lead time/price/technology/ quality Future direction of products Customer application services Green Products Corporate Social Responsibility Business Continuity Management	<ul style="list-style-type: none"> Completed the renewal of the IECQ QC080000 certificate of 2018 to maintain its effectiveness Passed the RBA VAP audit with the highest score Responded to a total of 2,526 customer CSR and GP questionnaires or self-evaluation forms Customer satisfaction survey response rate > 86% Continued to maintain the ISO 9001 certification Periodically provided customer purchase order and delivery information, and provided the quantity for supply and lead time within price validity period during quotation Periodically updated Macronix's product road map Abnormal event reporting and risk management procedures were completed according to plans and effectively carried out in compliance with customer requirements 	Economy	
				Environment	V *
				Society	*

Stakeholders	Communication channels	Topics of Concern	Highlights and results of communication in 2021	Subject to Influence (V) or Concern (*)	
Employees	Various open-discussion meetings (held periodically and ad hoc) "No Topic is Off Limits" suggestion box (available 24-7) Reporting hotline (available 24-7) Printed copies and electronic bulletin boards (to communicate information as necessary) Employee Relationship Management Portal (available 24-7) Learning map platform (available 24-7) Performance evaluation procedure (annually) Health consultation/promotion (held periodically and ad hoc) Employees seek advice in person or by phone (ad hoc)	Employee Communication Labor/Management Relations Compensation & Benefits Human rights policy Training System Performance evaluation results Occupational safety and health Key points of the amendment to the Labor Standards Act Pension calculation/qualifications of retirement pension COVID-19 prevention and management	<ul style="list-style-type: none"> Number of open-discussion meetings held: Orientation training for 435 new employees. Department discussions (held by each department as necessary). The head office and each fab convened 4 labor-management meetings. 4 Welfare Committee meetings. Received 62 cases from the "No Topic is Off Limits" suggestion box and reporting hotline with a 100% closing rate Received 0 sexual harassment complaints Periodically organized on-the-job occupational safety training; ESH offers consultation for employees at any time Planned the health promotion plan for the following year based on employees' health condition, opinions regarding the annual health exam, and current events Physicians provide consultation services for the entire company 10 times a month A total of 410 health promotion activities and seminars were attended by a total of 1,714 employees Following the changing trends of the pandemic situation at home and abroad, pandemic mitigation measures have been reviewed on a rolling basis, and hundreds of pandemic mitigation announcements have been issued. Through the digitization of the "body temperature registration and pandemic mitigation statement" and "visitors entry permit application", we monitor the pandemic mitigation status of the entire company on a daily basis, implement pandemic mitigation measures, and ensure the health and safety of employees and visiting manufacturers. 	Economy	V
				Environment	
				Society	V *
Suppliers	Suppliers' conference (annually) Supplier audits (performed annually based on risk levels) Supplier evaluation (quarterly and annually) Quality improvement meeting (ad hoc) Material supply/demand tracking (periodically and ad hoc) Contractor training courses (as necessary) Contractor coordination organization meetings (as necessary)	Occupational safety and health Supplier evaluation Green product requirements Corporate Social Responsibility Compliance with Business Ethics Quality improvement procedure Supply and demand of important materials	<ul style="list-style-type: none"> Contractor education and training, as well as coordination organization meetings are completed before operations in accordance with regulations We planned audits of 35 suppliers and HR outsourcing companies in 2021, and completed 33 supplier audits. Cooperation with 2 companies has ended, and thus the companies are not audited Held 1 suppliers' conference Have maintained the AEO certification for 12 years 100% of suppliers received a score of 80 points or above in the supplier rating Approximately 35% of raw materials are procured in Taiwan 	Economy	V *
				Environment	
				Society	*

Stakeholders	Communication channels	Topics of Concern	Highlights and results of communication in 2021	Subject to Influence (V) or Concern (*)	
Government/ Associations	Official document delivery (as necessary) Participation in presentations/ promotions/seminars/forums (ad hoc) Competent authority audits (as necessary) Phone call or e-mail (as necessary) Communication through the Allied Association for Science Park Industries and Chinese National Federation of Industries (as necessary) Visited competent authorities (as necessary) PUBCSR communication mailbox Charity organizations	Compliance with regulations Corporate Governance Labor/Management Relations Occupational safety and health Greenhouse gas emissions reduction Water resource management Waste Management Water Rationing and Drought Preparation Plan Effect of the new version IFRS (accounting principles) on the company Employee benefits and average salary Key points of the amendment to the Labor Standards Act Impact of the U.S.-China Trade War Employee overload management COVID-19 prevention and management Odor Noise Corporate sponsorship/funding Charity event participation	<ul style="list-style-type: none"> Increased disclosures on the Company website to increase information transparency Compliance with laws and regulations of competent authorities at each level, and cooperation with supervision and audits Participation in presentations, promotions, seminars, forums, or lectures organized by the competent authority Periodic compliance inspections and report compliance-related matters on a regular basis Complied with government regulations, proposed response measures, and revised related systems and specifications Total greenhouse gas emissions in 2021 decreased by 17% compared with 2011 Regularly track and manage the use of water resources and environmental, safety, and health management indicators – Process water recycling rate reached the goal for 2021 Conduct annual inspections of all waste management contractors, and strengthen auditing and management of waste disposal contractors' vehicles. The waste recycling rate has met the 2021 target The competent authority conducted 42 occupational safety and environmental protection audits; no major penalties were imposed A total of 569 nighttime employees received special medical check-ups Established the Epidemic Prevention Office and measures in accordance with the Central Epidemic Command Center's relevant regulations and conducts rolling reviews. In 2021, hundreds of meetings were held and 8,140 staff received concern, and maintained the record of zero confirmed cases. Donated over NT\$2.83 million 	Economy	V *
				Environment	V *
				Society	V *
Media	Press releases (periodically and ad hoc) Investor seminars (quarterly)	Operational performance General information about the Company	<ul style="list-style-type: none"> Published 16 press releases on revenue and investor conferences, 20 press releases on products, material information of the Company or supplemental data, and invited or organized press conferences 3 times. There were a total of 2,443 related news articles in 2021. 	Economy	*
				Environment	*
				Society	*
Macronix Education Foundation	Registration website Campus promotion Facebook fanpage Macronix Science Awards Association annual meeting	Macronix Golden Silicon Awards Macronix Science Awards	<ul style="list-style-type: none"> The 21th Macronix Golden Silicon Awards: A total of 255 teams registered and awards influenced 12,061 people The 20th Macronix Science Awards: A total of 655 works were submitted and awards influenced 251,347 people A total of 67 members participated in the welcome party of the Macronix Science Awards Association 	Economy	
				Environment	
				Society	*

3.2.2. Identifying and Prioritizing Material Issues

Relevant Issues

In order to fully understand the issues that concern both internal and external stakeholders, Macronix's Sustainability Report Execution Task Force interacted and communicated with stakeholders by gathering their questionnaire surveys responses, collecting meeting records, negotiating, and conducting interviews, etc. to collect the issues related to Macronix's CSR that concern the stakeholders. The impact of these issues on Macronix was then determined internally. After all the data was compiled, the key issues were then identified and ranked in this year's Sustainability report by using the Task Force's evaluation method.

Stakeholder Opinions Compiled for the 2021 Sustainability Report

Stakeholders	Relevant Issues -Compilation Method	Scoring method
Investors	Questionnaire survey, statement recording, negotiations	(1) Directly converted to scores for relevant issues (2) Questionnaire filled out by representatives of the Stock Affairs Office
Customers	Negotiation, questionnaire survey	(1) Questionnaire filled out by representatives of the district business offices (2) Customers' questionnaire responses
Employees	Questionnaire survey	Filled out by labor representatives of the labor/management conferences and Welfare Committee
Suppliers	Questionnaire survey	Distributed to and completed by suppliers on August 27, 2021
Media	Negotiation, questionnaire survey	Filled out by representatives of the Corporate Communication Office
Government	Questionnaire survey, negotiation	Government's summarized issues of concern during the year based on stakeholder communication policies and results
Schools	Negotiation	Not scored, please refer to the social welfare chapter



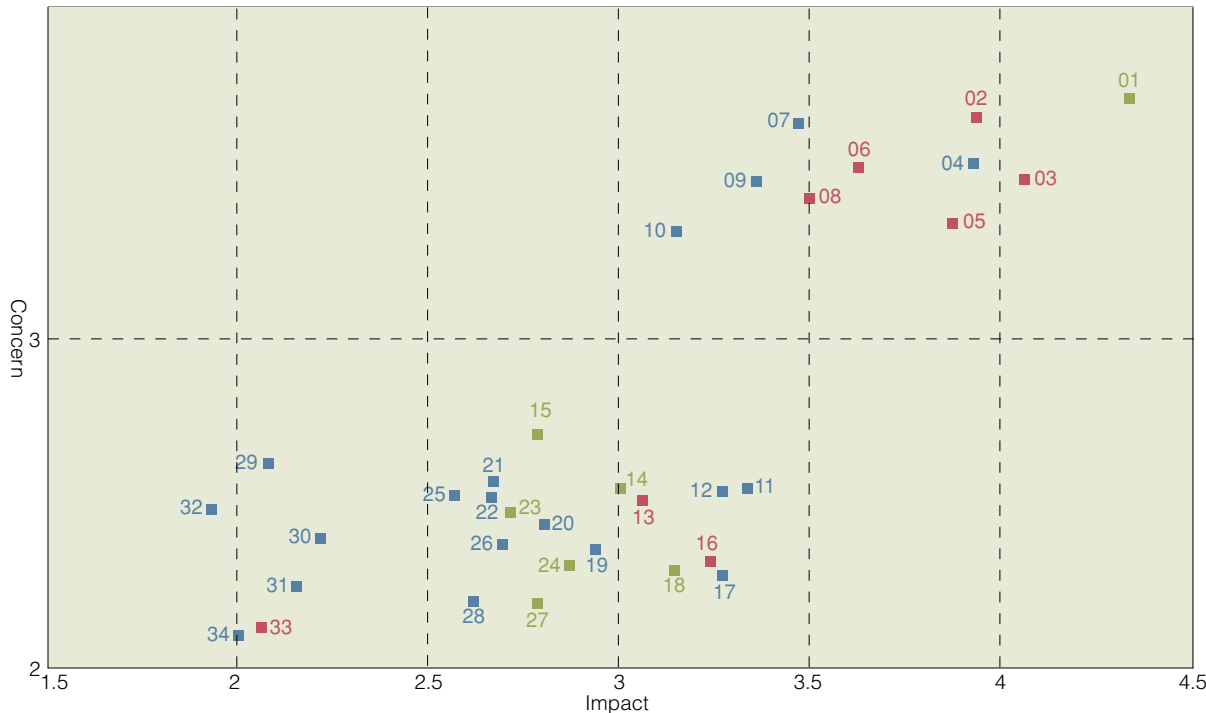
Ranking

For quantitative assessment of the degree of concern, e.g., a score of 0-5 points is given for each issue in the questionnaire survey to evaluate the effect on stakeholder assessment and decision making; a higher score represents a higher degree of concern. For qualitative assessments, e.g., engagement experience, opinions and interviews, and meeting/opinion records, stakeholders' issues of concern are given 5 points directly. For quantitative assessment of the degree of impact, e.g., a score of 0-5 points is given for each issue in the questionnaire survey to evaluate the economic, environmental, and social impact (positive or negative) on Macronix; a higher score represents a greater of impact. The scores for degree of concern and degree of impact are added together and then averaged for ranking.

Threshold Values, Elimination, and Degree of Coverage

Regarding the threshold value for material issues in this report, the top 10 issues are considered material issues. When the rating is higher than the threshold value but the degree of concern or impact has a score of 0, then discussions will determine if it is included as a major topic. This situation did not occur this year. Issues that are excluded by the threshold value are discussed one by one to decide if they are worth reporting. Issues ranked 11 and above are reported but the management policy is not disclosed. Lastly, the selected material issues are discussed by the report task force, and the report is presented to a management representative for approval after data collection is completed.

Issue Ranking



Economy

- 01 Economic performance
- 14 Anti-competitive Behavior
- 15 Anti-corruption
- 18 Tax
- 23 Market position
- 24 Indirect economic impacts
- 27 Procurement practices

Environment

- 02 Water and discharged water
- 03 Emissions
- 05 Wastes
- 06 Energy
- 08 Compliance with environmental protection laws
- 13 Supplier Environmental Assessment
- 16 Materials
- 33 Biodiversity

Society

- 04 Employment diversity and equal opportunities
- 07 Occupational safety and health
- 09 Labor/employer relations
- 10 Compliance with social and economic laws
- 11 Customer privacy
- 12 Customer health and safety
- 17 Marketing and labeling
- 19 Supplier social impact Assessment
- 20 Diversity and equal-opportunity
- 21 Non-discrimination
- 22 Training and education
- 25 Forced and compulsory labor
- 26 Human rights assessment
- 28 Security Practices
- 29 Child labor
- 30 Freedom of association and collective bargaining
- 31 Rights of indigenous peoples
- 32 Local communities
- 34 Public policies

Material Aspects and Boundary Setting

Category	Issue	Ranking	Previous Year Ranking	Difference	Material Issues	Impact Boundaries		
						Internal	Customers	Suppliers
Economy	Economic performance	1	1	≡	V	V		
	Market position	23	16	↓				
	Indirect economic impacts	24	15	↓				
	Procurement practices	27	20	↓	*			
	Anti-corruption	15	10	↓				
	Anti-competitive Behavior	14	14	≡				
	Tax	18	—	↑				
Environment	Materials	16	7	↓				
	Energy	6	6	≡	V	V		
	Water and discharged water	2	5	↑	V	V		
	Biodiversity	33	23	↓				
	Emissions	3	2	↓	V	V		
	Wastes	5	5	≡	V	V		
	Compliance with environmental protection laws	8	4	↓	V	V		
	Supplier Environmental	13	12	↓	*			

* Management guideline is not disclosed because it is not a material issue in 2021

Category	Issue	Ranking	Previous Year Ranking	Difference	Material Issues	Impact Boundaries		
						Internal	Customers	Suppliers
Society	Assessment	4	9	↑	V	V		
	Labor/employer relations	9	11	↑	V	V		
	Labor/management relations	7	8	↑	V	V		
	Occupational safety and health	22	27	↑	*			
	Training and education	20	24	↑	*			
	Diversity and equal opportunities	21	19	↓	*			
	Non-discrimination	30	29	↓				
	Freedom of association and collective bargaining	29	17	↓				
	Child labor	25	18	↓				
	Forced and compulsory labor	28	32	↑				
	Security Practices	31	31	≡				
	Rights of indigenous peoples	26	26	≡				
	Human rights assessment	32	21	↓				
	Local communities	19	30	↑	*			
	Supplier social impact Assessment	34	33	↓				
	Public policies	12	22	↑				
	Customer health and safety	17	28	↑				
	Marketing and labeling	11	25	↑				
	Customer privacy	10	13	↑	V	V		V

04

Corporate Governance

4.1. Corporate Governance

4.1.1. Governing Unit

4.1.2. Internal Audit

4.1.3. Ethical Corporate Management Rules

4.1.4. Confidential Information Protection

4.1.5. Compliance with Regulatory Requirements

4.2 Risk Management

4.2.1 Climate Change Risk Management

4.3 Innovation

4.3.1. Importance of Innovation

4.3.2. Intellectual Property Management

4.4 Supply Chain Management

4.4.1. Sharing Beneficial Outcomes with Customers

4.4.2. Growing Together with Our Suppliers



4. Corporate Governance

Macronix upholds high corporate governance standards and complies with corporate governance principles, and continues to establish a good corporate governance system in accordance with the Corporate Governance Best-Practice Principles for TWSE/TPEX Listed Companies and the Company's Corporate Governance Principles. In addition, ethical corporate management is Macronix's corporate culture. Macronix strictly complies with the law and attaches great importance to the protection of trade secrets and information security risk management. The Company established the Ethical Corporate Management Best Practice Principles and Code of Business Conduct and Ethics, in hopes of creating a business environment for sustainable development.

4.1. Corporate Governance

Besides complying with the law, Articles of Incorporation, and the guidelines and resolutions of shareholder meetings and board meetings, Macronix's corporate governance is in accordance with the following corporate governance principles:

- **Protect shareholder equity**
- **Strengthen the roles and powers of the Board of Directors**
- **Utilize the Audit Committee's functions**
- **Respect stakeholders' rights and interests**
- **Increase information transparency**

Since 2003, Macronix sequentially established independent director and functional committees such as the Audit, Compensation, and Nomination Committees, to strengthen the operations of the Board of Directors. In 2006, the Company modified the directors and supervisors election with candidate nominations.

The aforementioned shows our determination in establishing a good corporate governance system. In recognition of our efforts, we were ranked in the top 5% in the first Corporate Governance Evaluation for Listed and OTC Companies in 2015.

Macronix's Philosophy

Honesty

Macronix's Corporate Values

Innovation, Quality, Efficiency, Service, Team Work

4.1.1. Governing Unit

Board of Directors

Macronix's Board of Directors makes corporate governance decisions. Board meetings are convened by the chairman/CEO, and the Board is comprised of 14 members, including industry professionals, experts and scholars with practical and theoretical backgrounds in business, law, finance, accounting, electrical engineering, physics, and material engineering, etc. There are 4 independent directors who oversee the execution of Macronix's operation plans based on their expertise and objectivity to ensure the quality of the Board's decisions. Among the directors, 12 are men (86%) and 2 are women (14%). All directors are over 50 years old. Board meetings information is disclosed in the annual report, on Macronix's official website (<http://www.macronix.com>) and in the Market Observation Post System of [Taiwan Stock Exchange](#).

Furthermore, in 1997, Macronix began internally handling matters related to company stock with a dedicated unit to manage shareholder affairs, address shareholder concerns, and promote the relationships with institutional investors. Besides arranging visits to global institutional investors every year, we hold an investor's conference each quarter to maintain transparent communications.

Macronix Corporate Governance Highlights

Board of Directors

- Led Taiwan's industry in purchasing director liability insurance (in 1999)
- Established independent director seats (in 2003)
- Adopted the candidate nomination system for electing directors (in 2006)
- Replaced the supervisor system with the Audit Committee (in 2009)
- Established the Nomination Committee to plan and review director and senior executive candidates (in 2019)

Management Level

- Established the Compensation Committee to evaluate and approve the remuneration for high-level executives (in 2006)
- Prohibits the employment of people whom related to the high-level executives within the four degree of consanguinity
- Sets operation goals and implements PDP performance evaluation

Internal Control

- Systematized internal controls and self-evaluate operation procedures (in 2009)



Compensation Committee

The Compensation Committee was first established on August 8, 2005 and was renamed to comply with the law on August 23, 2011. The Compensation Committee is comprised of three independent directors, and Director Chiang Kao serves as the convener. The committee met four times in total in 2021. Meetings information is disclosed in the annual report, on Macronix's official website (<http://www.macronix.com>), and on the Market Observation Post System of [Taiwan Stock Exchange](http://www.tse.com.tw).

Audit Committee

Macronix's Audit Committee is comprised of the following four independent directors, one of whom is a certified public accountant of the R.O.C. Besides executing items specified in the law, the Audit Committee is responsible for the proper representation of the Company's financial statements, appointment (or dismissal), independence, and performance of certified public accountants, effective implementation of the Company's

internal control, the Company's regulatory compliance, and the control of existing or potential Company risks. The committee met seven times in 2021, and meetings information is disclosed in the annual report, on Macronix's official website (<http://www.macronix.com>), and the Market Observation Post System of [Taiwan Stock Exchange](http://www.tse.com.tw).



Name	Education	Previous Experience
Chiang Kao	Oregon State University Ph.D., Forest Management	Professor, Department of Computer Science, Southwest Texas State University President, National Cheng Kung University
Yan-Kuin Su	National Cheng Kung University Ph.D., Electrical Engineering	IEEE Academician SPIE Academician Professor and Dean of the Department of Electrical Engineering, Dean of Research and Development, and Dean of Academic Affairs at National Cheng Kung University Director, Engineering Department, National Science Council President, Kun Shan University
John C. F. Chen	National Cheng Kung University Bachelor of Accounting & Statistics	Certified Public Accountant Chairman, Diwan & Company
Tyzz-Jiun Duh	National Taiwan University Ph.D., Forestry	Director-General, Department of Commerce, MOEA Director-General, Department of Industrial Technology, MOEA Director-General, Industrial Development Bureau, MOEA Minister, Ministry of Economic Affairs Minister, National Development Council Vice Premier, Executive Yuan

Furthermore, according to the Code of Business Conduct and Ethics of Macronix, general manager, senior managers, and financial managers shall immediately report any conflict of interest or any concern of a potential conflict of interest to the Audit Committee.

Apart from the general manager, senior managers, and financial managers, Macronix employees shall disclose any occurring or potential conflict of interest to their supervisors or senior managers in writing.

Nomination Committee

Macronix established the Nomination Committee on January 22, 2019, which is comprised of the chairman and two independent directors. Chairman Miin Wu is the convener. The committee met five times in total in 2021. Meetings information is disclosed in the annual report, on Macronix's official website (<https://www.macronix.com>) and in the Market Observation Post System of [Taiwan Stock Exchange](#).

4.1.2. Internal Audit

In order to strengthen internal audit mechanisms, Macronix established a dedicated internal audit unit, which is an independent department with five full-time auditors directly reporting to the Board. The auditors are responsible for reporting audit operations to the Audit Committee and also attend board meetings for reporting.

Generally, internal audit operations are carried out according to the audit plan approved by the Board, and the unit periodically reviews the self-assessment operations as part of the internal control systems conducted by various divisions, including the quality of the internal control operations, and lastly report the compiled self-assessment results to the Board.

4.1.3. Ethical Corporate Management Rules

The Company has always complied with laws and regulations and has also devised risk management mechanisms. In 2021, Macronix did not violate any antitrust laws or engage in unfair competition practices and was not involved in any related litigation.

We have always upheld our business philosophy "honest" and thus have formulated and published the Ethical Corporate Management Best Practice Principles, Code of Business Conduct and Ethics, and Macronix CSR Policy, all of which serve as behavioral regulations for our directors, various levels of management personnel, and employees. We also expect the directors, managers, and employees of our affiliates to jointly adhere to the principle of honesty in running their businesses.

Besides establishing multifunctional committees under the Board of Directors, Macronix has also established the Committee for the Ethical Corporate Management Promotion

under management executives, in which the president serves as the chairman and level-1 supervisors of all departments are committee members. The committee aims to establish an ethical corporate management policy that will be submitted for discussion during Board meetings. The policy will be implemented in accordance with the law and its implementation status reported to the Board at least once a year.

Macronix upholds the philosophy "honest". The Company has established and implemented corporate governance and risk management mechanisms based on the values of innovation, quality, efficiency, service, and teamwork, thereby creating a business environment for sustainable development. Concrete measures are as follows:

1. Comply with laws and regulations.
2. Pragmatically implement company policies and the code of ethics.
3. Establish risk management mechanisms.
4. Establish a violation reporting system and protect reporters in accordance with the law.
5. Enhance on-the-job and ethics training.

Code of Business Conduct and Ethics

The Board of Directors approved the Code of Business Conduct and Ethics (the "Code") for directors, managers at all levels, and all employees.

The purpose of the Code is to deter wrongdoing and to promote:

- (1) honest and ethical conduct, including the ethical handling of actual or apparent conflicts of interest between personal and professional relationships;
- (2) full, fair, accurate, timely and understandable disclosure in reports and documents filed with, or submitted to, the Securities and Exchange Commission and in other public communications made by the Company;
- (3) compliance with applicable governmental laws, rules, and regulations;
- (4) the prompt internal reporting to an appropriate person or persons identified below of violations of this Code; and

(5) adherence to this Code.

To ensure that all Macronix employees understand the Ethical Corporate Management Best Practice Principles and this Code, all new employees must receive training and will be tested during their orientation. Furthermore, Macronix employees receive annual training of the Ethical Corporate Management Best Practice Principles and the Code, so that the principles and the Code are consistently implemented. Violation of the Ethical Corporate Management Best Practice Principles and the Code is included as an evaluation item in annual employee performance evaluations.

Macronix's anti-corruption policies state that "Company personnel should not abuse the opportunities that are discovered through the use of Company property, information or position for private gain, and not use Company property, information or position, or compete with the Company, for personal benefit. Company personnel owe a duty to the Company to advance its legitimate interests when the opportunity to do so arises." We have also developed ethical risk assessments for each department, which are carried out on a regular basis and cover all departments of the Company. To date, no cases of corruption have been reported.

To implement ethical corporate management and ethical behavior, Macronix annually arranges courses for directors and online courses for employees and the Company regularly organizes educational courses on trade secrets, domestic and international data privacy regulations, information security management, and prevention of insider trading for the purpose of raising awareness on corporate ethics and compliance. In 2021, the Company achieved 100% completion rate of the educational and training courses related to the Ethical Corporate Management Best Practice Principles, with approximately 18,575 participants and 5,940 training hours in total. Suppliers are also invited to the courses annually to ensure that they understand the regulations of Macronix's ethical corporate management. In 2021, a total of 134 suppliers participated and the number of training hours amounted to approximately 45 hours.

4.1.4. Confidential Information Protection

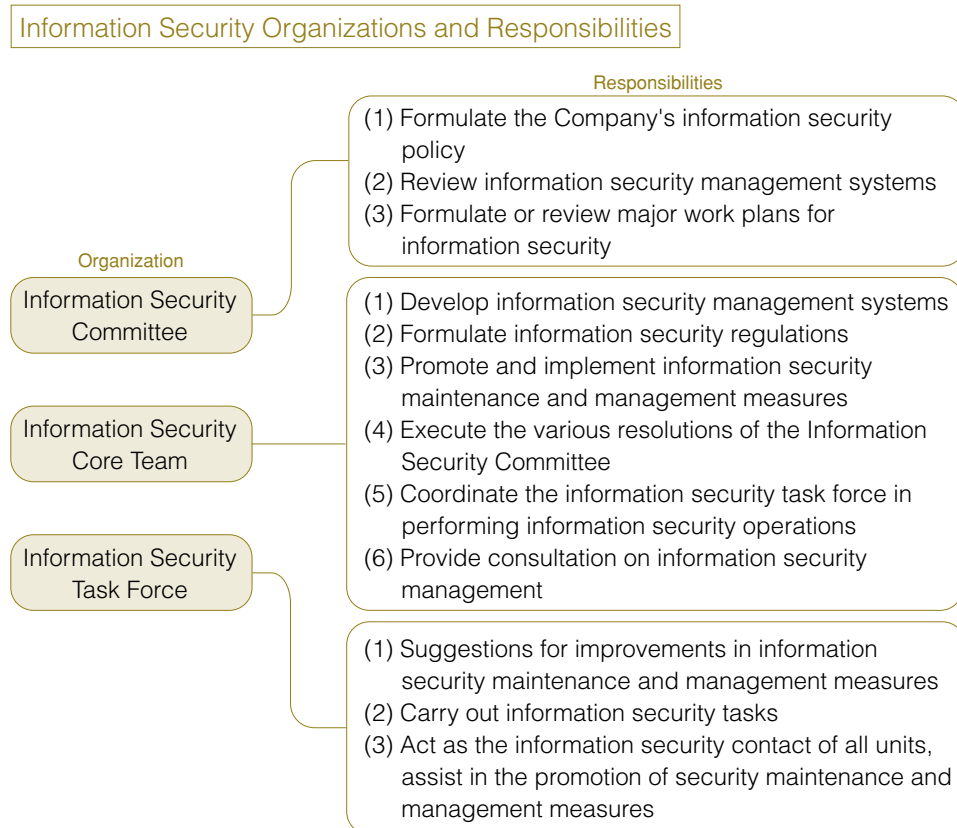
In recent years, Macronix has emphasized the importance of information security in protecting its intellectual property and customer confidentiality. Based on the idea of our president to "prevent information security incidents from happening before they occur," we

established an Information Security Committee led by the Company's vice president, and top supervisors from all divisions and business units serve as representatives. In addition, the information security core team and information security task force carry out related affairs to make sure that the goals of information security could be achieved. The Information Security Core Team holds regular monthly meetings to review information security issues and track progress of improvements; it also arranges inter-departmental meetings from time to time when deemed necessary to ensure that issues can be properly handled in a timely manner. The Information Security Task Force holds meetings depending on what the issue

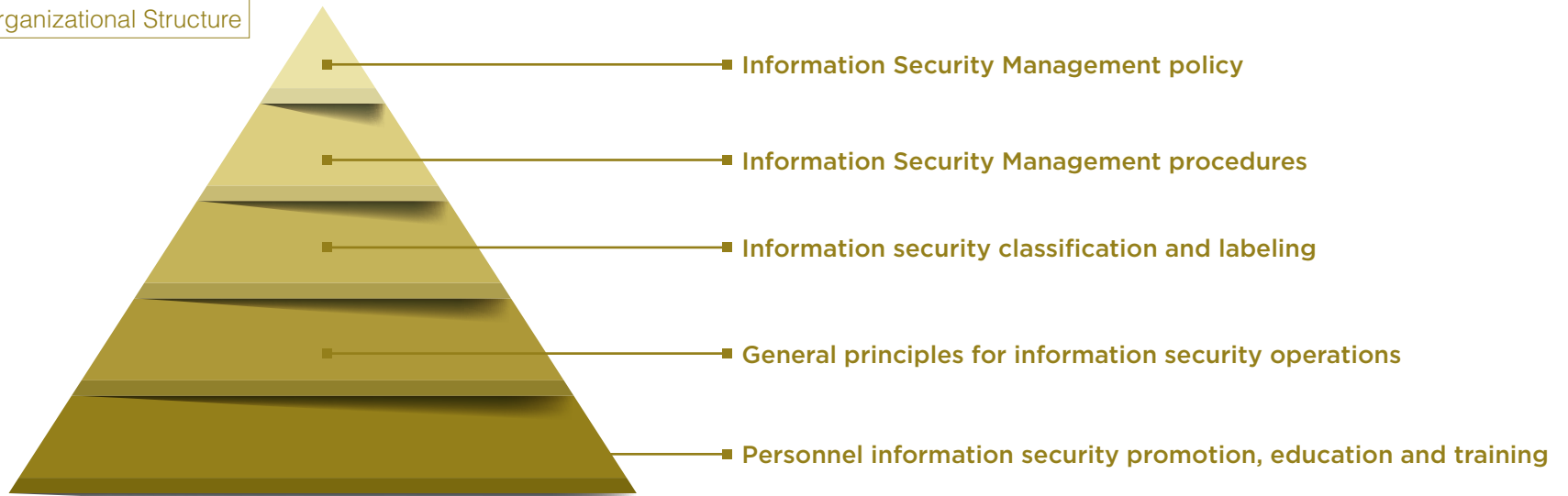
is, cooperates in the implementation of information security operations, and assists in the promotion of information security maintenance and management measures.

Trade secrets are the lifeline of technology companies. We revised confidential information protection related management procedures and regulations in our policy, and also classified and labeled information assets throughout the Company. We utilize a variety of information security mechanisms to properly protect our trade secrets and confidential information, thereby protecting the interests of the Company, shareholders, employees, customers, and suppliers.

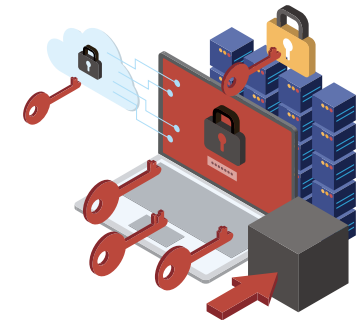
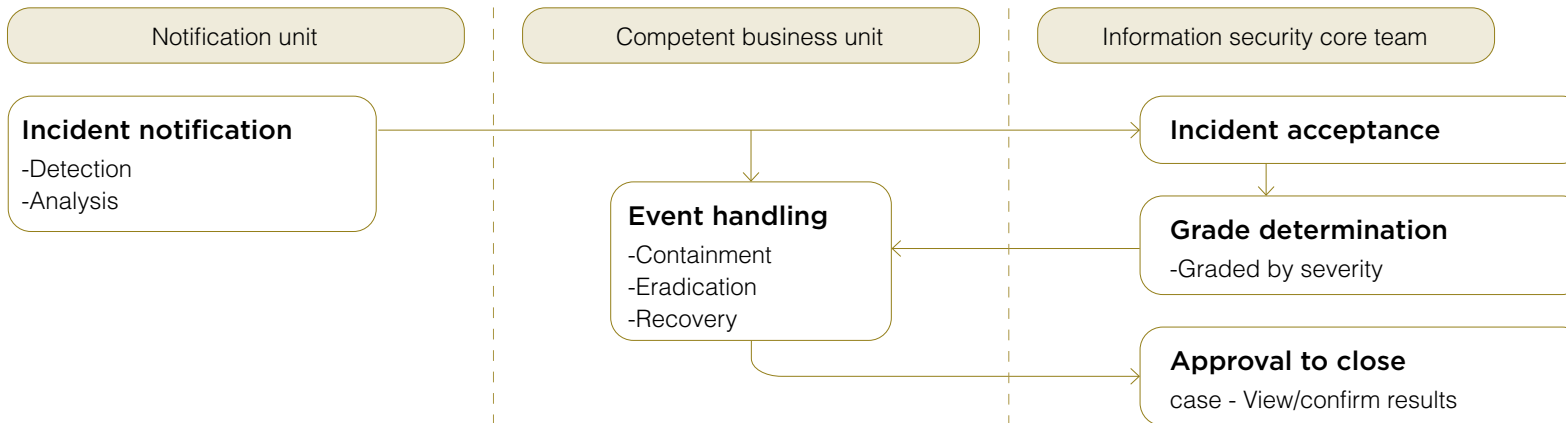
Macronix holds educational and training sessions, as well as promotional campaigns, to raise awareness of information security among employees. For example, Macronix offers training programs for new recruits, annual educational training for employees about information security, issuing monthly information security e-newsletters, and has established information security websites, to make "everyone is responsible for information security" not just an abstract slogan but an internalized policy for employees to protect the Company's confidential assets and clients' confidential information.. Furthermore, courses on trade secrets and other confidential information have been included in the annual employee education and training. The courses could strengthen employees' concepts of trade secrets and confidential information protection by experts explaining and sharing professional knowledge, related cases, and practices.



Information Security Organizational Structure



Information Security Event Reporting Procedure



- Hold a contingency meeting according to the impact of information security incidents on business, determine the grade and release information and other matters, and report to the corresponding supervisor.

4.1.5. Compliance with Regulatory Requirements

Macronix has always complied with laws and regulations. In 2021, Macronix was not involved in any litigation related to employee health or violation of safety regulations. We also did not receive any severe fines or punishment for violations pertaining to environmental laws and/or regulations, nor did we receive any severe fines or punishment for violations pertaining to social and economic laws and/or regulations. "Severe" means "cumulative fines for a single incident reaching NT\$1 million or above" according to Article 4, Paragraph 1, Subparagraph 26 of the Taiwan Stock Exchange Corporation Procedures for Verification and Disclosure of Material Information of Companies with Listed Securities.

Macronix has also set up a regulatory compliance unit that offers consultation services, supervises and implements regulatory compliance, and integrates the philosophy of honesty in its business management by obeying rules and applying knowledge into practice.

Again and again, we emphasize the importance of self-discipline and top-down compliance with laws and regulations (including the Securities and Exchange Act, Company Act, Labor Standards Act, Anti-Corruption Act, Fair Trade Act, Money Laundering Control Act, Act of Gender Equality in Employment, Personal Information Protection Act, regulations for import/export management, and environmental protection, etc.) We also frequently promotes relevant regulations and policies.

Macronix offers various channels to encourage learning and continuing education. For example:

- **Macronix Academy:** Has comprehensive facilities and professional equipment (including: an audiovisual room, training classrooms, computer classrooms, international lecture halls, and a library, etc.). Provides a comfortable reading environment where employees can borrow a variety of books.
- **Macronix e-Academy:** Offers online courses (including: Personal Information Protection Act, Trade Secrets Act, or sexual harassment prevention, etc.); employees can arrange their schedule without being subjected to space and time restrictions.
- **External training courses:** Encourage employees to leverage resources and engage in learning. For example, employees can use the libraries at National Tsing



Hua University for free, or they can be informed of governmental or private courses through Macronix e-Academy's external course announcements.

4.2. Risk Management

Macronix is the world's leading manufacturer of NVM. We manage risks through proactive, preventive management procedures that were established with regard to information security, intellectual property, standards of behavior, ethics, operations management, loss prevention, supplier management, environmental protection, safety and health, employee benefits, and health maintenance, etc. In order to protect the Company's assets, ensure employee health, and care for the rights and interests of stakeholders, we have integrated our business policy into our EHS policies, with hopes of achieving sustainable development. Furthermore, in response to internal and external technical data, the Company has adopted the following measures after conducting simulations and risk analysis:

Material Issues	Risk Assessment Item	Potential Risks	Risk Management Policy, Strategy, or Business Continuity Plan
Environment	Environmental protection and ecological conservation	Environmental protection management and pollution prevention	Introduced and passed the ISO 14001 Environmental Management System Certification. We ensure that our environmental management systems fully comply with the Plan-Do-Check-Act (PDCA) operations of the ISO system to maintain a healthy and safe environment, and continuously make improvements to reach our goal.
Environment	Environmental protection and ecological conservation	Energy and climate change management	<ol style="list-style-type: none"> 1. Macronix is dedicated to reducing energy use and consumption every year. We follow the instructions provided by the Bureau of Energy, Ministry of Economic Affairs each year to report our energy conservation audit system for energy users. 2. In response to the trend of greenhouse gas control and reduction in the supply chain due to global warming, we planned for greenhouse gas checks, control, and reduction, and described the process of compiling ISO14064-1 GHG inventory in the report. Please refer to the chapter on energy and climate change management for the impact identification, assessment, and climate-related risk management process.
Society	Occupational safety and health	The spread of COVID-19 influenced employee attendance and operations	<ol style="list-style-type: none"> 1. Convened the epidemic prevention meetings to formulate anti-epidemic policies and various management measures, and to establish a standard operating procedure, a reporting mechanism, and countermeasures. Please refer to chapter 7.3.2: Safety and Health Promotion Management. 2. Assigned dedicated staff to track and pay attention to the epidemic prevention and management measures. Daily pop-ups on computers remind employees of health and safety anti-epidemic measures, and rolling reviews are conducted for the results inspection.
Society	Occupational safety and health	Health and safety	<ol style="list-style-type: none"> 1. Physical 2. Chemical 3. Human factors engineering/Ergonomics 4. Traffic collision 5. Violent destruction 6. Force majeure 7. Stress at work
Society	Operational safety	Material supply	<ol style="list-style-type: none"> 1. Establish emergency procurement procedures 2. Prepare a safety stock 3. Audit suppliers' capability to plan regarding business continuity 4. Continue to develop alternative suppliers 5. Sign supply contracts with major suppliers



Material Issues	Risk Assessment Item	Potential Risks	Risk Management Policy, Strategy, or Business Continuity Plan
Society	Operational safety	Cyber attacks	1. Block malicious attacks with a firewall 2. Use a mail and website filtering system to intercept malware 3. Regularly update computer software and deploy endpoint protection software 4. Regularly back up important data 5. Cyber-attack simulation drills
Society	Operational safety	Contractor's supply chain cut off	1. Check the coordination and distribution of delivered materials 2. Estimate contractor's recovery time for capacity, and work-in-progress control 3. Ability to support outsourcing factories and audit capability to plan regarding business continuity
Society	Operational safety	Information system interruption	1. Install Uninterruptible Power Supply (UPS) 2. Remote backup 3. Backup data 4. Information system interruption simulation drill
Society	Operational safety	Water outage	1. Sign a service agreement with water wagon suppliers 2. Water conservation and drought preparation continuity plan for fabs 3. Water storage and mutual support between fabs 4. Water restrictions emergency response drill
Society	Operational safety	Power outage	1. The Park offers power supply design with double feeders 2. Emergency power generators and support machinery; clean room temperature and humidity; delivery resources 3. Diesel fuel resource distribution and procurement priority 4. Abnormal power supply emergency response drill
Society	Operational safety	Earthquake	1. Seismic resistant design of buildings and machines 2. Seismic resistance improvements: Stocker seismic reinforcement; purchase of new machines with active seismic resistance and fastening devices; steel cylinder seismic reinforcement; clean room automated handling system seismic improvement 3. Sign human resource service agreements with major suppliers 4. Earthquake emergency response drill



Material Issues	Risk Assessment Item	Potential Risks	Risk Management Policy, Strategy, or Business Continuity Plan
Society	Operational safety	Fire	1. Machine CO ₂ fire extinguisher system; Environmental sprinkler system 2. Very early warning smoke detectors 3. FM certified fireproof lockers 4. Fire prevention improvements: Replace plastic flammable pipelines each year; fireproof the supply end of flammable gases; replace CO ₂ fire extinguisher systems that are about to expire; upgrade explosion prevention equipment; improve environment fireproofing; gas cabinet automated fire extinguishing system 5. Fire accident emergency response drill
Society	Product safety	Green product management	1. Deliver products to ISO 17025 certified, credible domestic and foreign laboratories for testing 2. Green product instruments self-inspection 3. Suppliers provide documentary proof of non-use of environment-related substances 4. Identify new law amendments and periodically check regulatory compliance 5. Supplier communication and audit management 6. Qualified materials and supplier management system 7. Training courses relating to green products are organized each year
Society	Product safety	Conflict minerals	1. Non-use of Conflict Minerals Policy 2. Suppliers provide documentary proof of non-use of conflict minerals 3. Identify and amend management rules relating to conflict minerals and periodically check compliance 4. Supplier non-use of conflict minerals training and audit management 5. Supplier management system for non-use of conflict minerals
Corporate Governance	Society, economy, and regulatory compliance	Information Security	Established a dedicated information management unit and related management procedures to protect the safety of computer systems, prevent the risk of data leakage, and provide the basis for compliance by employees and responsible units. Please refer to chapter 4.1.4: Confidential Information Protection.
Corporate Governance	Society, economy, and regulatory compliance	Laws and Code of Ethics, etc.	All new employees receive training and evaluation during their orientation. Please refer to chapter 4.1.3: Ethical Corporate Management Rules.
Corporate Governance	Society, economy, and regulatory compliance.	Anti-corruption	1. Regularly conduct ethical and social responsibility risk assessments for each department 2. Regularly organizes courses on trade secrets, domestic and international data privacy regulations, information security management, and prevention of insider trading

4.2.1 Climate Change Risk Management

Due to the increase in global temperatures caused by climate change, climate abnormalities have occurred, resulting in many environmental problems, which in turn affect normal operations and production activities of enterprises. From the perspective of an enterprise, Macronix thinks about improvements and decisions that Macronix can make for climate change; at the same time, it considers the challenges to sustainability brought by climate change both to the Company and the supply chain. In 2021, with reference to the Task Force on Climate-related Financial Disclosures (TCFD) guidelines, Macronix assessed the impact to itself and introduced TCFD. Professional members from each center are assembled to form a TCFD task force. The task force uses the TCFD framework to identify climate risks and opportunities, devises management methods for impact items, and uses scenario analysis to quantify the financial impact of material risk opportunities, to take relevant countermeasures to reduce the impact on Macronix's operations.

Future Outlook: Set goals and low-carbon development strategies.

Items for TCFD disclosure

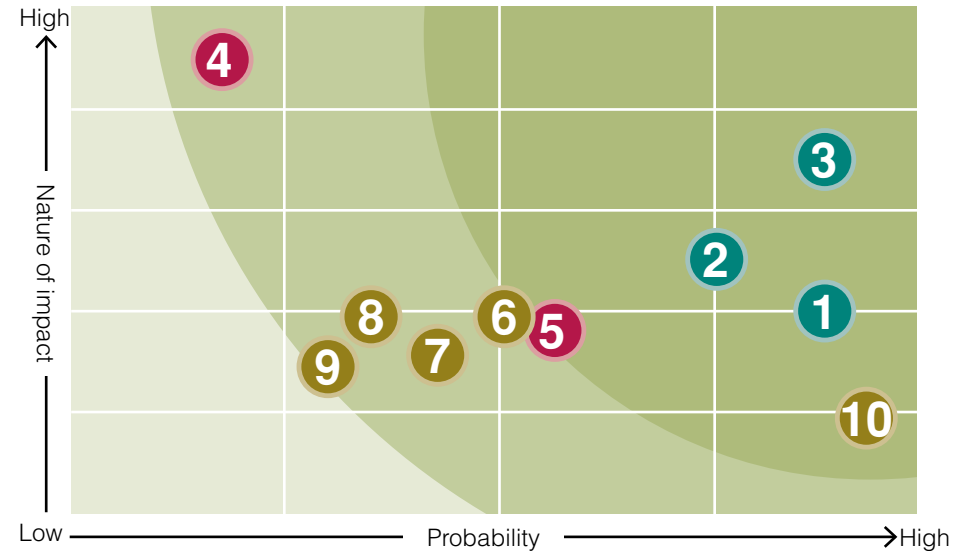
Four Cores	Disclosure Recommendations	Response
Governance	a. Describe the board's oversight of climate-related risks and opportunities.	a. It is planned that in Q1 of each year, the Corporate Occupational Safety Division will collate Macronix's performance, achievement status, and implementation results from the past year over all aspects of sustainability, including carbon inventory management, and report to the Board of Directors. Our measures include: Material issues such as performance in sustainability, results of communication with stakeholders, management of energy and climate change.
	b. Describe management's role in assessing and managing climate-related risks and opportunities.	b. The TCFD task force is composed of members appointed by the directors of each center; it jointly reviews internal and external risks and formulates risk response strategies for material risk issues.
Strategy	a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	a. Macronix introduced the TCFD framework for climate risk management in 2021. It has defined the short-term as the next 1 year, the medium-term as the next 1–8 years, and the long-term as the next 8 years and after. The main climate risks and opportunities at the Company level were identified by the TCFD task force based on job characteristics analysis. Sources include carbon taxes that may occur in the medium term and risks of transition to low-carbon technologies, as well as physical risks from average temperature changes; long-term risks are the risks of transition to cap & trade, and the physical risk of rising sea levels. As for opportunities, the production process belongs to the short-term, low-carbon products/services and adaptations/solutions belong to the medium-term, and the change of customer behavior and search for new business opportunities are long-term development opportunities for Macronix.
	b. Describe the impact of climate-related risks and opportunities on the organization's business, strategy, and financial planning.	b. Macronix will face transformation risk that will directly impact operating costs. Hence, we continually track international trends and regulatory developments, and ensure that we are 100% in compliance with government laws for climate management. In terms of green energy management, we cooperate with national policy by evaluating installation of solar panels and formulation of a green energy purchasing policy. For technology transformation, we are actively purchasing low-carbon (new process) machinery, lowering the carbon emission of production and operation of products, and producing low-carbon products that meet the expectations of our customers to enhance our competitiveness for sustainability. As for long-term risks, we established a weather forecast and refrigerating machine optimization mechanism, actively replaces machinery with more efficient one, and suppliers that are assessed as being at high-risk of climate change impact should have more than one supply source (2nd Source)

Four Cores	Disclosure Recommendations	Response
	c. Consider different climate-change-related scenarios	c. Positioning law-related pressures in transition risks as the main object for scenario analysis, and forecasting emissions growth based on historical data and future operational growth. Macronix assumes three types of external pressures from rising temperatures: 1.5°C, 2°C, and NDC; it estimates the future carbon-cost under these three scenarios, including carbon fees, carbon tax, renewable energy, etc., to remain alert to possible financial impact within the context of uncertain laws and regulations.
Risk Management	a. Describe the organization's processes for identifying and assessing climate-related risks	a. Based on the correlation between climate opportunity risks and the Macronix's various businesses, Macronix divides the TCFD task force into five dedicated task forces: product customers, finance, fab environmental protection, supply chain, and logistics support. Members of each task force include middle and senior management. Each task force, based on executive business and professional judgment, reaches a consensus on risks and opportunities that the Company may face, and formulates a list of such risks and opportunities.
	b. Describe the organization's management processes for climate-related risks.	b. After each task force completes identification, the Corporate Occupational Safety Division will consolidate the results and rank them by comprehensive consideration of the impact strength (5 levels) and possibility of occurrence (7 levels), and identify material risks by completing a risk matrix diagram. (See the figure for detailed process: TCFD assessment process)
	c. Describe how climate-related risks are integrated into the organization's overall risk management.	c. Each task force will formulate a material risk management approach based on feasibility, and assess the financial impact and impact on the Company's operations. (such as the material risk and opportunity analysis and management table)
Indicators and Targets	a. Disclose the indicators used by the organization to assess climate-related risks and opportunities under its strategy and risk management process	a. This is Macronix's first TCFD analysis and evaluation. After understanding the current situation based on the results of this TCFD identification, Macronix will deliberate on introducing mechanisms such as internal carbon pricing and product carbon footprint to manage related risks.
	b. Disclose Scope 1, Scope 2, and Scope 3 greenhouse gas (GHG) emissions	b. Please refer to chapter 6.2 Energy and Climate Change Management
	c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	c. At present, Macronix conducts an annual greenhouse gas inventory and reduces direct and indirect carbon emissions through energy conservation and various carbon reduction projects. This is Macronix's first TCFD identification, and goals related to risks and opportunities will be formulated based on the identification results.

Climate Risk and Opportunity Matrix Diagram

Climate risks and opportunities are plotted based on "likelihood of occurrence" and "impact" to determine their risk level. As for major risks with profounder impact, preventive measures and response plans will be formulated.

Figure: TCFD Evaluation Process



■ Transition risk

1. Carbon tax
2. Low-carbon technology transition
3. Cap & trade

■ Physical risk

4. Sea-level rise
5. Average temperature change

■ Opportunities

6. Low-carbon products or services
7. Adaptation and solutions
8. Changes in customer behavior
9. Find new business opportunities
10. Production process



Photos of the TCFD Task Force's Discussion and Project Completion



The following figure represents risks and opportunities arranged chronologically; the upcoming risks and opportunities could be identified by the timeline



Material risks and opportunities analysis and management table

Material risks analysis and management table

Material risk	Aspect	Impact on Macronix	Financial impact	Response management measures
Cap & trade	Transition risk/law-related aspect	Comply with international and domestic regulations of control over greenhouse gas emissions, set cap on emissions, established carbon emissions trading system and carbon pricing systems. Macronix currently has two factories that may be included as control targets for emissions trading.	The market transaction price or cash generated by excess emissions will increase the Company's direct operating costs	1. Greenhouse gas inventory and continuous tracking of carbon emissions 2. Implement energy conservation plans 3. Evaluate reduction plans and participate in offset projects 4. Assemble a renewable energy task force
Low-carbon technology transition	Transition risk/technical aspect	To meet market expectations for energy conservation and carbon reduction in manufacturing may lead to adjustments in process-related technologies.	Company R&D costs increase	Introduction of new machines and respective process adjustments.
Carbon tax	Transition risks/regulations	In accordance with the international and domestic climate change response laws, Macronix has listed two factories in mandatory inventory reporting, and it is expected that these two factories may be included as targets of carbon tax payment.	The Company's direct operating costs increase	1. Dedicated personnel continue to track regulations developments and analyze possible impacts. 2. Implement Energy Conservation Plan
Average temperature change	Physical risk/long term	The rise in average temperature will lead to an increases in air conditioning load, power consumption, and electricity bills.	The Company's direct operating costs increase	Establish a weather forecast and refrigerating machine optimization mechanism.
Sea-level rise	Physical risk/long term	Supply chain factory shutdowns lead to supply chain disruptions, resulting in failure to deliver raw materials on time.	The Company's direct operating costs increase	Suppliers assessed as being high risk are required to have more than one supply source (2nd Source).

▪ Material opportunities analysis and management table

Material opportunity	Aspect	Impact on Macronix	Financial impact	Response management measures
Low-carbon products or services	Products and services	Under the responsible consumption model guided by climate change, Macronix's existing and future product lines are all low-carbon products. If it continues to develop, it will provide customers with a wider variety of low-carbon products and create higher sales growth for the Company.	Low-carbon products help customer sales grow	Existing and future product lines are already low-carbon products, and they will continue to be developed with the existing management methods.
Changes in customer behavior	Products and services	Macronix has more than 30 years of industry experience and is one of the leading manufacturers of non-volatile memory IC; it is able to take the lead in cooperation in future low-carbon trends.	Low-carbon products generate higher gross margins	Continue to pay attention to the information and regulations related to low-carbon products, and frequently exchange opinions with customers.
Find new business opportunities	Market	Macronix is one of the leading manufacturers of non-volatile memory IC, especially in terms of quality and mastery of proprietary technology, which are conducive to the pursuit of emerging energy-saving and environmental protection applications and opportunities: Internet of Things (IoT), Bluetooth electronic applications, portable consumer electronics, assistive health care electronics, etc.	Revenue growth from new operating models	Continue to communicate with international customers and attempt to cooperate in new solutions.
Adaptation and solutions	Products and services	Macronix's proprietary technology, abundant experience, and its existing engineering development platform are sufficient to quickly respond to adaptation and solutions of low-carbon products.	Customer-generated sales growth reduces operating costs	1. Listen to customer requirements and ideas, respond with suitable products or adjustments 2. Plan for renewable energy and execute renewable energy allocation 3. Establish smart air conditioners with weather forecasting and refrigerating machine optimization mechanisms
Production process	Resource efficiency	In order to reduce the negative impact of the value chain on climate, Macronix actively adopts processes with higher efficiency in resource input, reduces waste generation, improves product yield, lowers the cost, and shortens delivery time.	Improving resource efficiency can reduce operating costs	1. PFC process optimization 2. Reduction of exhaust from factories 3. Adoption of PFC reduction equipment 4. Reduce chemical use at source 5. Process recipe engineering changes to speed up turnaround time (TAT) of production.

4.3. Innovation

4.3.1. Importance of Innovation

Currently, most of Macronix's flash memory products are NOR Flash. With excellent technology and quality, the product range covers various storage capacities, including 3V or 1.8V operating voltage, Serial or Parallel interfaces, and mainstream or niche specifications. Macronix has all products ready, and they are widely adopted by customers around the world.

In addition to NOR Flash, the independently-developed NAND Flash product line has stable quality and mass production, making Macronix one of the few suppliers of both NOR Flash and NAND Flash in the world.

Macronix has also passed the IATF 16949 certification of the quality management system in the fast-growing automotive electronics industry. The Company has equally managed to win the reliability standard AEC-Q100 certification for the two main product categories, namely NOR Flash and NAND Flash. Passing the two most important standards in the electronic IC supply chain makes Macronix an important partner of the first-class automotive electronics manufacturers.

Successful Developed Technologies or Products

In 2021, Macronix successfully implemented product and technology innovations to increase its superior product competitiveness.

(1) Technology innovation

- ◆ Innovation and verification of the second generation 3D NAND Flash IC and control technology.

(2) Product innovation

- ◆ Suitable for the applications of automotive electronic and IoT, the innovation and mass production of the new-generation, encrypted and protected NOR Flash.
- ◆ The innovation and mass production of the first generation 3D NAND Flash IC and control technology.
- ◆ Macronix's mature proprietary 0.11 μm embedded non-volatile memory and

0.18 μm BCD (Bipolar-CMOS-DMOS) technologies are integrated to provide foundry services in MCU and analog IC related markets.

Plans for New Products Development

(1) Non-volatile memory products

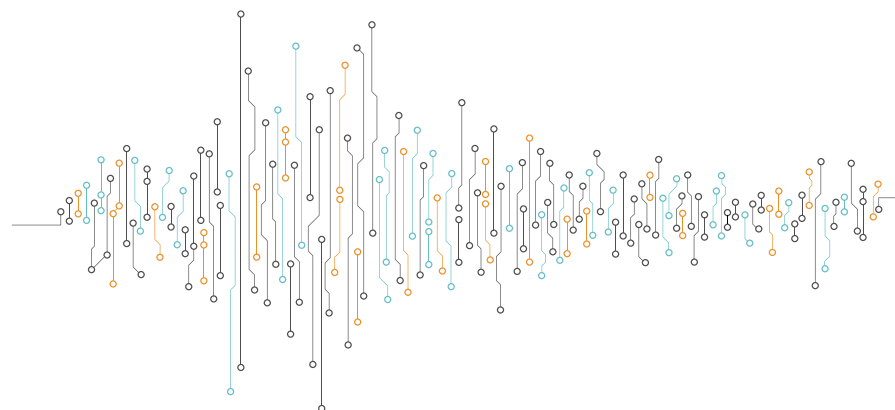
The Company makes good use of the advantages of the new equipment in the 12-inch wafer lab to create a higher-level R&D environment, and continues to develop the following two core technologies of the new generation. The Company will create the innovative memory product series and combinations based on this foundation.

- ◆ 3D NAND Flash: The second-generation plan.

- ◆ NOR Flash: 45nm plan.

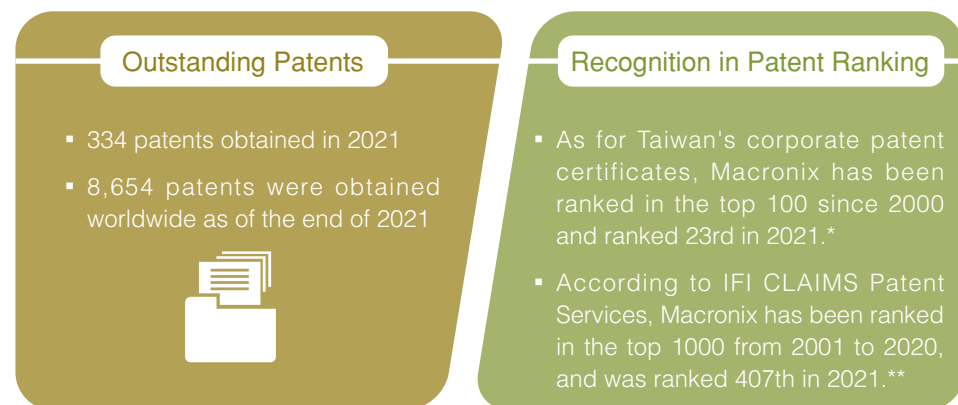
(2) Wafer foundry service

- ◆ Integrating Macronix's own embedded non-volatile memory logic platform technology into MCU and IoT markets
- ◆ Embedded ROM and OTP that are used in voice ICs.
- ◆ BCD (Bipolar-CMOS-DMOS) technology integrated with Macronix's own embedded non-volatile memory will greatly enhance the added value of analog and smart power management ICs.



4.3.2. Intellectual Property Management

Macronix has long been devoted to the innovation, research, and development (R&D) of non-volatile memory technologies and products, and has always attached a high level of importance to protecting its intellectual property (IP) rights. Macronix has filed patent applications in various countries to secure its key technologies and abundant R&D achievements.



*Source: Intellectual Property Office, Ministry of Economic Affairs.

**Source: IFI CLAIMS Patent Services

4.4. Supply Chain Management

As a leading semiconductor provider in the world, Macronix works with a variety of supply chain partners in the industry, including about 1,400 manufacturers, agents, and contractors from 7 aspects: materials, parts, photomasks, equipment, plant facilities, information and automated products, and semiconductor assembly and testing. To generate mutually beneficial outcomes, we select suppliers by placing equal importance on local suppliers and global supply chain partners to ensure our service quality, strengthen supplier cooperation, shorten the process of product development, enhance supply chain flexibility, and reduce unnecessary costs and carbon emissions during transportation. As of 2021, we had around 839 suppliers of raw materials and components, in which the amount of procurement in Taiwan accounted for 35% of our overall procurement amount (2020: 35%; 2019: 34%).

To manage the quality of material suppliers, Macronix aims to provide control and guidance in the following three aspects:

(1) Supplier management system certifications:

We require our suppliers to obtain international certifications such as ISO 9001, ISO 14001, and ISO45001 with respect to their quality, environmental, safety, and health management systems to ensure that they protect the environment and improve their safety and health practices.

(2) Supplier audit and counseling:

We formulate annual audit plans every year to conduct on-site audits. When any deficiencies are discovered, we immediately request that our suppliers submit improvement plans, wherein goals and deadlines are explicitly specified to meet our expectations.

(3) Supplier performance evaluation:

We conduct supplier performance evaluation on three dimensions: product quality, capability to comply with customers' requests and risk management, and product delivery date. For suppliers with good performance, order quantity will be increased, and the suppliers will be rewarded at the supplier meeting. For suppliers which do not meet the standards, the Raw Material Management Committee will carry out project improvements, counseling, auditing, as well as other measures. In 2021, all Macronix suppliers have undergone strict evaluation. In the final annual results, all suppliers have reached the standards of qualification, and there was as much as 98% raw material A-grade suppliers.

In implementing sustainability, we also take into account the participation of the overall supply chain, hoping to help our suppliers establish and raise their awareness and capabilities in Social and Environmental Responsibility (SER) by enhancing SER controls and training for our supply chain partners as well as performing audits.

We hold true to the principles of creating value together with our partners and adhering to high standards of business ethics to protect employees and partner rights and dignity. We set up strict and vigorous health and safety standards to minimize any negative influences on the environment, safety, health, and our partners. In order to fulfill these promises, we work closely with employees, suppliers, and suppliers' employees to ensure that all CSR values are put into practice throughout the entire organization, thereby making CSR a part of Macronix's corporate value.

4.4.1. Sharing Beneficial Outcomes with Customers

Macronix is committed to being an integrated solutions provider, which is not only a long-term promise that we have made to our corporate partners, but also our ultimate goal. In the IoT era, application-oriented devices will replace standardized products of the information era. As the leading memory supplier, Macronix is capable of delivering custom-made comprehensive solutions for countless electronic product applications. Macronix has transformed from an integrated service provider that offers comprehensive services ranging from R&D, design, manufacture, and production to assembly and testing, into an innovative solution partner for customers. We actively participate in the reference designs of major IC design companies, as well as the development projects of our system customers, providing not only innovative R&D concepts and advanced process technologies, but also creative ideas to help our customers develop marketable products.

After more than three decades of painstaking efforts, we have successfully established long-term, mutually beneficial strategic partnerships with large, world-class manufacturers in the U.S., Japan, Europe, and Asia. Our favorable long-term relationship with these powerful partners has enabled us to become a world-class manufacturer of NOR Flash memory and ROM products.

Macronix not only leverages its world-class R&D and manufacturing capabilities to offer customers high-quality, innovative, and performance-driven products, but also emphasizes the management of information security. The purpose of information security management is to protect the company's information assets from internal and external threats and damages, whether these may be intentional or accidental. The goal is to implement and maintain the company's information security management system, lower the occurrence of information security incidents, and manage risks caused by incidents so they only occur within an acceptable range, ensuring that the Company is able to continue normal operations. The information security policy must achieve the following:

- (1) Ensure the availability and integrity of information to protect the Company's and users' rights and interests.
- (2) Ensure the confidentiality of information to protect the Company's and users' data and privacy.

- (3) Ensure the accuracy of information to improve service quality.

- (4) Compliance with requirements of the competent authority and laws.

With regard to execution, Macronix has formulated Guidelines for Macronix Information Management that specifies procedures and regulations for managing confidential data. We regularly educate and train our employees regarding the protection of confidential data and require all employees to pass an information security test every year. All customer-related documents, data, and business-related information are strictly controlled by internal systems. In 2021, Macronix did not receive any complaints regarding the infringement of customer privacy, and no identified leaks, thefts, or losses of customer data occurred. In the future, Macronix will continue to accumulate its intellectual property, provide better products and services, and cooperate with its customers in order to face challenges pertaining to advanced technologies and collectively share its positive outcomes.

"Honest" is Macronix's business philosophy. Customer satisfaction surveys are conducted to determine if the Company's values of "innovation, quality, efficiency, and service" are implemented, and to achieve the goal which is mutually beneficial for the Company and customers. Annual customer satisfaction surveys are conducted by Macronix's headquarters in Taiwan. Questionnaire survey results are summarized and analyzed for the management team to truly understand the degree of customer satisfaction. To further understand customers' needs and their degree of satisfaction, we have instituted satisfaction evaluation mechanisms for the 7 areas of greater concern: sales services, order shipments, product quality, product technology, customer application services, green product regulation, and overall performance. Surveys are conducted through questionnaires or telephone interviews; the results serve as an important basis for Macronix to review our service quality and improve our operation flow, which will subsequently allow us to optimize our services and thus enhance our relationships with customers. The 2021 customer satisfaction survey has a response rate of 86%, which is higher than the 77% rate in the previous survey. According to the results, customers gave positive and satisfied ratings on all of our 7 indicators (the maximum score is 5; 4 or above means "Satisfied").

4.4.2. Growing Together with Our Suppliers

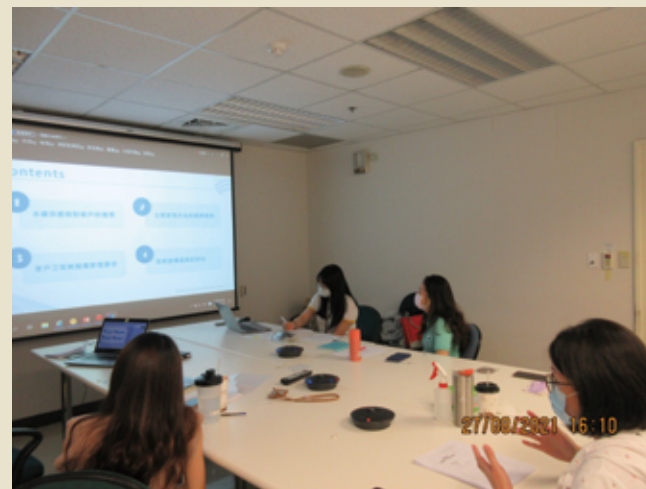
Macronix uses CSR as an indicator for evaluating and selecting suppliers. We have further intensified CSR programs in our supply chain to confirm that supply chain partners are in compliance with CSR and are willing to accept ethical standards through signing [Code of Conducts Compliance Certificate](#). We also attach great importance to labor occupational safety and health. We look forward to implementing CSR-related work and growing together.

Macronix was one of the first companies in the Hsinchu Science Park to complete greenhouse gas emissions verification, and among the first semiconductor providers to receive AEO certification from the Directorate General of Customs Administration under the Ministry of Finance. We also actively pushed upstream and downstream supply

chain partners to comply with the "Responsible Business Alliance® Code of Conduct" and instituted "Supplier Green Product and SER Audit" mechanisms. By conducting annual audits on our supply chain partners, we have expanded our CSR to the safety supply chain system level, taking action to implement supplier environmental and social assessments.

We extended the requirements of our CSR policy (e.g. no child labor, the granting of freedom of assembly and association, and no forced labor) to our supplier selection policies (including human outsourcing regarding security guards, cleaners, etc.) and incorporated these principles in our employee training courses and promotional materials. In 2021, 33 suppliers passed our RAS audit. For those suppliers who failed the audits, we offered assistance so that 100% of our suppliers ultimately complied with our requirements.

■ Propagating Macronix's CSR policy and supplier agenda during the 2021 suppliers' meeting (Meetings were changed into an online format due to the pandemic)



05

Economic Dimension

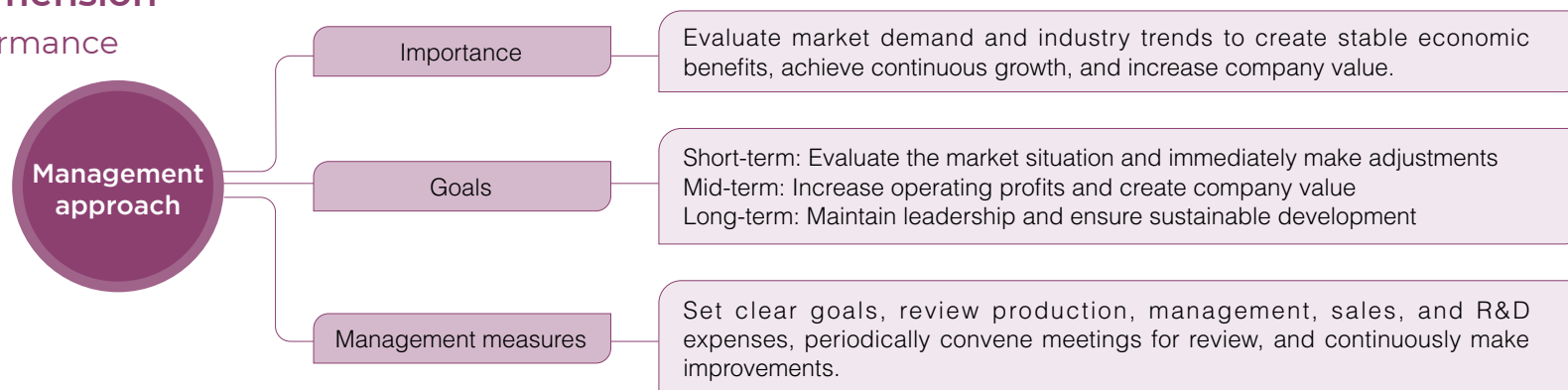


5.1 Financial Performance

5.2 Tax Policyz

5. Economic Dimension

5.1. Financial Performance



2021 Implementation Results: Please see our business performance

Macronix established its headquarters in the Hsinchu Science Park on December 9, 1989, and commenced operations in December of that year. The main business activities of Macronix include the design, manufacturing, and marketing of integrated circuits and memory wafers, the commissioned design of related products, development, and consultation, as well as engagement in business-related import/export trading. Macronix was listed on the Taiwan Stock Exchange on March 15, 1995. As of December 31, 2021, our paid-in capital is approximately NT\$18.6 billion.

For details on our subsidiaries, shareholding ratio, and business items, please refer to Appendix 6 or subsidiaries that were included in the 2021 Q4 consolidated financial report. As of December 31, 2021, subsidiaries that are directly or indirectly owned by the Company include Run Hong Investment, Ltd. ("Run Hong"), Hui Ying Investment, Ltd. ("Hui Ying"), Mxtran Inc. ("Mxtran"), Macronix America Inc. ("MXA"), Macronix (BVI) Co., Ltd. ("MXBVI"), Mxtran Holding (Samoa) Co., Ltd. ("Mxtran Samoa"), Mxtran (H.K.) Holding Co., Limited ("Mxtran HK"), New Trend Technology Inc. ("NTTI"), Macronix (Asia) Limited ("MX Asia"), Macronix Pte. Ltd. ("MPL"), Macronix Europe NV. ("MXE"), Macronix (Hong Kong) Co., Ltd. ("MXHK"), and Macronix Microelectronics (Suzhou) Co., Ltd. ("MXm"). Except for being disclosed with the financial information, the aforementioned subsidiaries are not included within the scope of this report.

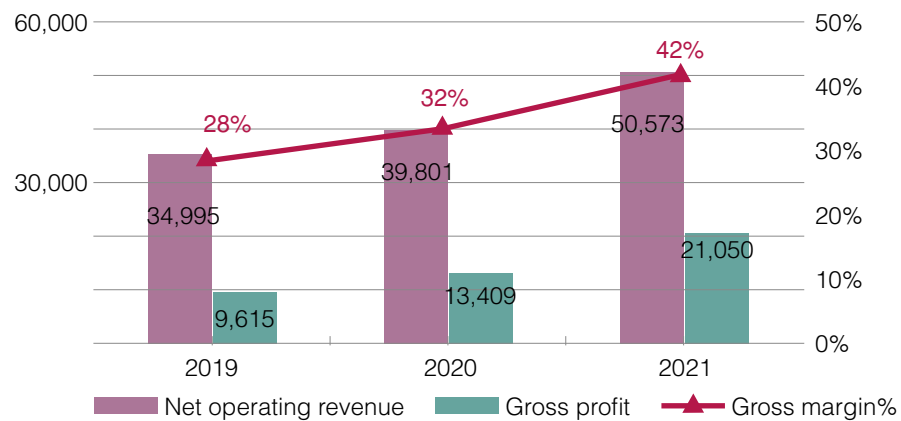
2019~2021 Business Performance (Consolidated financial statement figures)

Unit: NT\$ Million

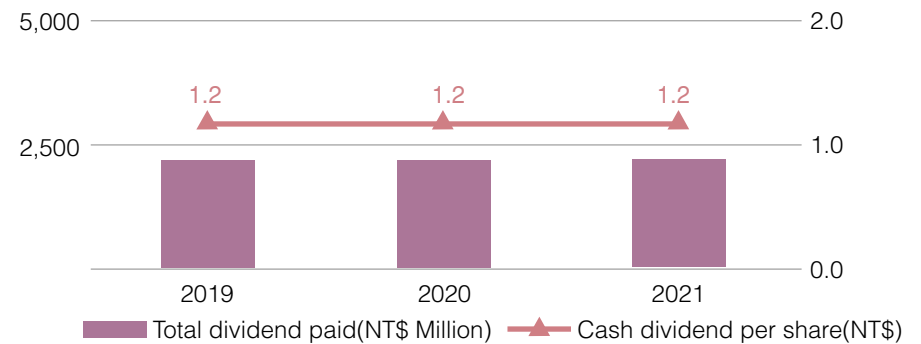
Item	2019	2020	2021	Comments
Net operating revenue	34,995	39,801	50,573	Direct economic value
Operating costs	25,380	26,392	29,523	Distribution of economic value
Gross profit	9,615	13,409	21,050	
Operating expenses	6,517	7,543	9,986	Distribution of economic value
Income from operations	3,099	5,866	11,064	
Total non-operating income and expenses	(73)	(25)	2,264	Distribution of economic value
Income before income tax from continuing operations	3,026	5,841	13,328	
Income tax expense	13	515	1,365	Distribution of economic value
Net income for the year	3,013	5,326	11,963	Economic value retained

Net operating revenue & Gross profit

Unit: NT\$ Million

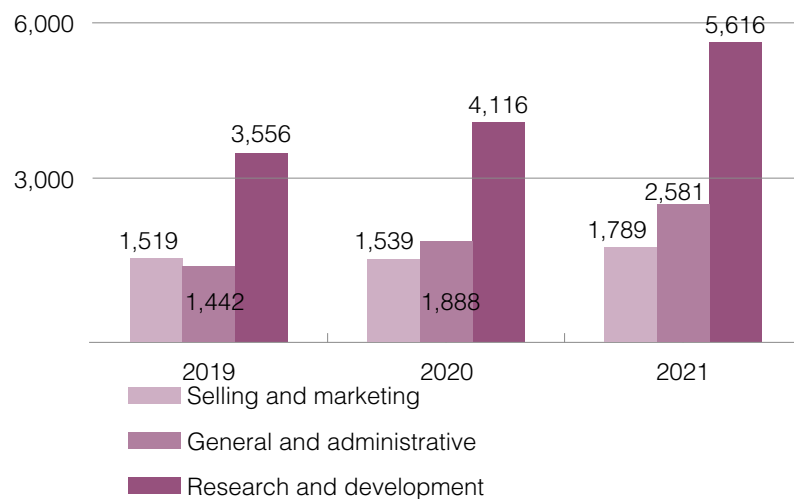


Cash dividends policy



Operating expenses

Unit: NT\$ Million



R&D Investments

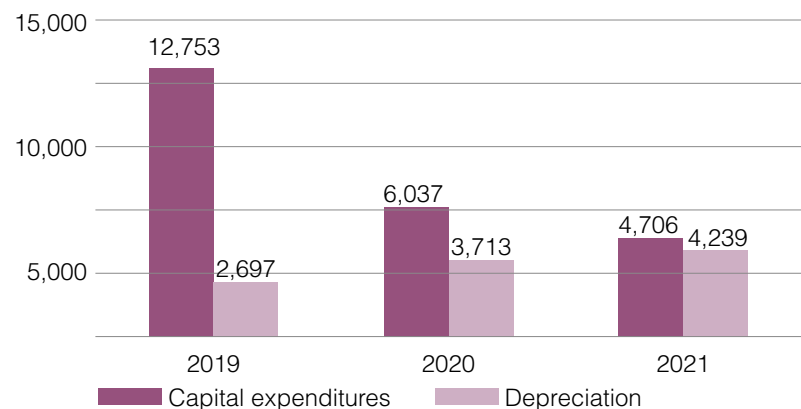
Unit: NT\$ Million

Item	2019	2020	2021
Fixed R&D investment	3,556	4,116	5,616
Total revenue	34,995	39,801	50,573
Percentage	10%	10%	11%



Capital expenditures & Depreciation

Unit:NT\$ Million



Employee benefit expenses in 2021 include salaries, labor and health insurance premiums, director's remuneration, pensions, and other employee benefit information. Please refer to [page 80 of the 2021 Q4 IFRSs stand-alone financial statements](#) (summary of employee benefits, depreciation, and amortization expenses)

Financial Assistance Received from the Government

In 2021, Macronix obtained a NT\$2.83 billion government preferential loan from the "Action Plan for Welcoming Overseas Taiwanese Businesses to Return to Invest in Taiwan". The loan will be repaid in equal monthly installments when the grace period ends. The fair value of the loan was estimated based on the market interest rate, which is the rate at the time when the loan was obtained. The difference between the obtained amount and the fair value of the loan is NT\$56.583 million, which is regarded as a government low-interest loan and recognized as deferred income. In 2021, the Company recognized other income of NT\$1.357 million and the interest expense of the loan of NT\$3.532 million, respectively.



5.2. Tax Policy

Macronix seeks to improve tax risks management, and is committed to ensuring information transparency and regulatory compliance. We also support government tax policies to drive economic development and sustainability.

Macronix's six guidelines for tax management

1. All operations comply with tax laws and regulations of Taiwan.
2. Transactions between affiliated enterprises comply with the internationally recognized pricing principles announced by the OECD, and BEPS related regulations, so that the pricing policy of related parties complies with the arm's length principle.
3. In response to the global trend of anti-tax evasion, avoid involving countries with low tax rates in tax planning with the purpose of tax evasion.
4. Transparent reporting about tax information, submitting the Country-by-Country Report, Master File, and Local File to the tax authority, so that tax disclosure complies with laws, regulations, and guidelines.
5. The Company's tax planning and decisions all take the effect of tax risks into consideration.
6. Establish a good interaction with the tax authority based on the principles of mutual trust and information transparency.

Macronix effective tax rate

Macronix's effective tax rate was 9.79% in 2021, lower than the statutory tax rate, 20%, of the R.O.C. Profit-Seeking Enterprise Income Tax. This is because the deduction of operating loss carryforwards in the previous year is applicable to Macronix and tax credit for research and development expenditure.

06

Sustainable Environmental Dimension

6.1 Environmental Protection Management and Pollution Prevention

6.1.1. Water Resource Management

6.1.2. Air Pollution Prevention

6.1.3. Waste Management

6.2 Energy and Climate Change Management

6.2.1. Energy Management

6.2.2. Climate Change Management

6.3 Ecological Environment and Conservation

6.4 Green Enterprises

6.4.1. Green Products

6.4.2. Green Procurement and Environment, Safety, and Health Costs Accounting Management System



6. Sustainable Environmental Dimension

Macronix's ESH Policy

- **Rights and Obligations:** Commits and guarantees all employees can work in a comfortable, safe and healthy environment, and provides employees and their representatives ample ESH consultation and participation, so as to make the best efforts fulfilling their duties and obligations regarding **ESH**.
- **Regulation Compliance:** Abide by ESH regulations and thoroughly do real ESH practices.
- **Hazard Prevention:** Prevent pollution and potential damages by hazard identification, risk assessment, environmental impact analysis and hazardous sources control. Also, implement energy conservation, carbon reduction, greenhouse gas reduction, water conservation and waste reduction, etc.
- **Education and Training:** Provide employees with competitive and comprehensive ESH training programs for assuring them being able to implement the ESH works appropriately.
- **Sustainable Development:** Meet international Green Product requirements and implement environmental related substances management system.
- Ensure the sustainable development of Macronix's business operation and ESH works by effectively utilizing corporate resources to establish and continuously enhance the ESH management system to meet interested parties.



6.1. Environmental Protection Management and Pollution Prevention

Macronix has always upheld the principle of sustainable development. We see a sustainable environment as the foundation of our corporate culture, and we seek to protect the planet through concrete actions. Each year, we continue to reduce our energy consumption and carbon emissions, purchase "Green Mark" products, increase resource efficiency, and design green products. We actively promote energy and water conservation, waste reduction, process improvement, pollution control, green offices, resource recycling and reuse, ecological conservation, and educational training. We have adopted a proactive attitude toward complying with regulations and international standards to set up pollution prevention facilities such as wastewater treatment facilities, scrubbers, waste storage areas, toxic gas detectors, and soundproof walls, to prevent various types of pollution, including wastewater, air pollution, industrial waste, toxic chemical substances, and noise. Nevertheless, we go to great lengths each year to minimize the impact of our operations on the environment and enhance our corporate competitiveness by raising our quality control criteria. Macronix did not receive any severe penalties in 2021 under our strict environmental quality monitoring.

Major awards received by Macronix during 2021 in recognition of our achievements in the environmental category include:

- ★ Hsinchu City private manufacturer and group that performed exceptionally well in green procurement / Hsinchu City Government
- ★ Adopters of Air Quality Purification Zone / The Environmental Protection Administration: An Outstanding Adopter



We introduced and passed the ISO 14001 Environmental Management System Certification in 1997. We ensure that our environmental management systems fully comply with the Plan-Do-Check-Act (PDCA) operations of the ISO system to maintain a healthy and safe environment and continuously make improvements to reach our goal. Currently, 100% of Macronix's facilities have passed the Environmental Management System (ISO 14001:2015) Certification.

To ensure that a smooth communication channel is provided for environmental or other issues to both Macronix's stakeholders and internal employees, we have contact persons to handle and respond to the precious feedback that is provided externally or internally from the government, general public, customers, investors, employees, the media, and suppliers. In 2021, Macronix did not receive any environment-related complaints according to statistics on environmental complaints.

Every month, Macronix monitors the use of materials based on the permits issued by governmental agencies to ensure that the use of materials is within the maximum approved amount. Our engineering department often checks whether an opportunity is available to reduce the use of materials based on process requirements. As a semiconductor manufacturer, Macronix uses wafers the most. Due to the high purity of silicon wafers used in the semiconductor industry, there is currently no proper way to recycle and reuse wafers. Therefore, we do not use recycled materials. The consumption of wafers and packaging materials is as follows:

Materials	Amount Consumed in 2020 (Ton)	Amount Consumed in 2021 (Ton)
Renewable Materials (Packaging Materials)	373.69	303.44
Non-renewable Materials (Wafer)	66.83	64.07
Total Amount of Materials Consumed	440.52	367.51

6.1.1. Water Resource Management

Management approach	
Importance	Reduce environmental load and impact via water quality control and reuse
Medium and long-term development direction	Actively develop wastewater recycling technology to increase the efficiency of water resource use
Management method	External: Hsinchu Science Park Bureau water use plan review, wastewater (sewage) testing report Internal: ISO14001 Manual/Procedure/Specifications/Records
Measures	1. Water volume statistics are compiled and the water balance chart is reported on a monthly basis 2. Periodically monitor effluent water quality and outsource effluent testing once every six months
2021 implementation results	Average process water recycling rate of all fabs in the Company was 84.7%
Targets in 2022	Maintain the process water recycling rate of all fabs in the Company \geq 84%

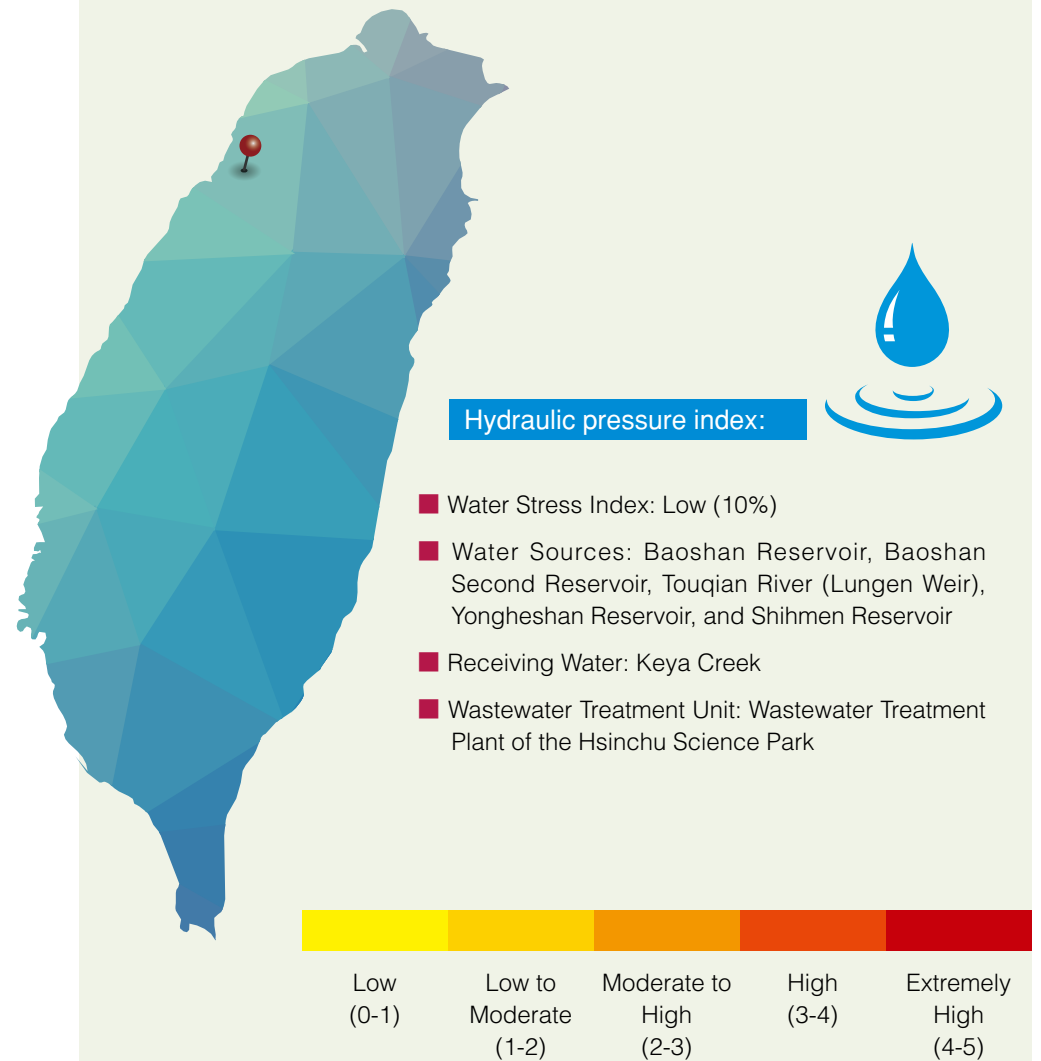
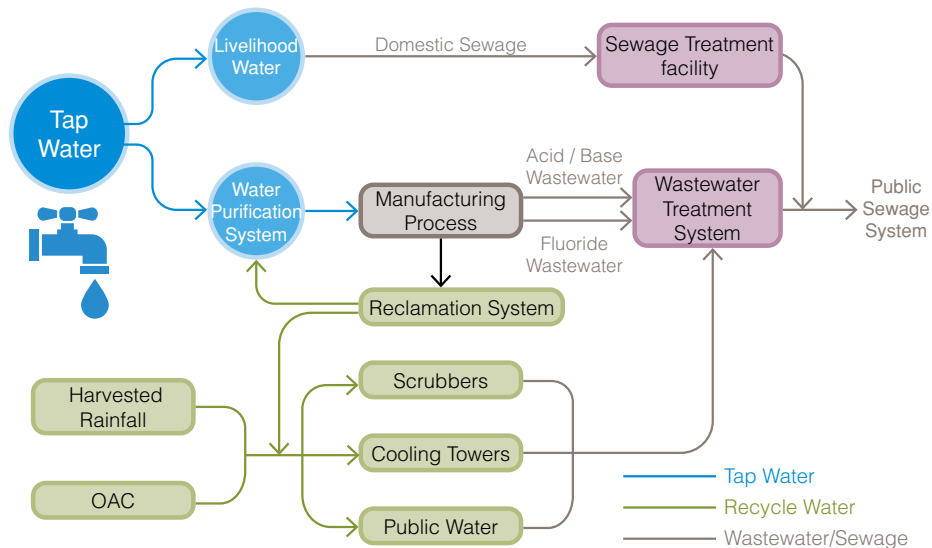
*Note: Process water recycling rate is calculated using the formula specified by Hsinchu Science Park Bureau.

The main source of water for Macronix's plants is running water supplied by Taiwan Water Corporation from Baoshan Reservoir and Yongheshan Reservoir. Hence, water intake does not have any material effect on the water source. All of our plants have water storage facilities in coordination with the regulations of the Water Resources Agency, Ministry of Economic Affairs, which are for public and firefighting urgency use. The water storage facilities that were planned have all reached safe storage capacity. Since manufacturing semiconductors requires a large amount of ultrapure water, Macronix sets up an annual target for water consumption and reviews the water pressure condition to avoid wasting water resources. Moreover, water consumption is reviewed every quarter to ensure that risks remain under control. Macronix's total running water usage in 2021 amounted to 2,887 million liters, with 735 million liters in total water consumption and 2,152 million liters in total water discharge. Recycling discharged water has always been an issue of concern for Macronix. In addition to submitting water consumption data and water balance charts to the Hsinchu Science Park Bureau on a monthly basis, our internal units also monitor the process water recycling rate on a daily basis through wastewater recycling technology and the SCADA system in order to meet our water-saving target and improve the usage efficiency of water resources. In 2021, the total volume of process water recycled was 4,102 million liters and recycling rate was 84.7%.

Macronix Annual Water Consumption Statistical Table

Item	2019	2020	2021
Running Water Usage(Unit: million liters)	2,737	2,915	2,887
Total Water Consumption(Unit: million liters)	639	713	735
Total Water Discharge(Unit: million liters)	2,098	2,202	2,152
Recycled Process Water(Unit: million liters)	3,712	4,049	4,102
Recycling Rate (Unit: %)	85.0%	84.0%	84.7%
Total Revenue (Unit: million NT\$)	34,995	39,801	50,573
Water usage intensity(Unit: million liters/million NT\$)	0.0782	0.0732	0.057

Illustration of Macronix's Water Recycling



Note:

- Source: Water Resources Agency, MOEA.
- [Aqueduct tools](#) are used to calculate hydraulic pressure.

Wastewater generated from the manufacturing of semiconductors can be roughly divided into acid and alkaline wastewater and fluoride-containing wastewater, based on its characteristics. Our wastewater is properly treated in a wastewater treatment facility, and pH, BOD, COD, SS, and NH3-N are regularly tested based on the water quality standards of Hsinchu Science Park to bring it into the allowable limit before being discharged into the sewage system. The sewage system is connected to the park's wastewater treatment facility, where the wastewater is treated to higher water quality standards than the national effluent standard, and then discharged into Keya River through a special pipe. Therefore, there is no significant impact on the ecological environment. Other water resource management measures include:

- Regularly tracking and managing the usage data of water resources
- Conducting risk assessment and management
- Determining if our manufacturing facility is located in an area with water shortages
- Promoting water resource utilization programs
- Entrusting certified organizations with sampling and analyzing the quality of discharged water twice a year
- Carrying out real-time monitoring of pH/fluoride concentrations of effluents and the pH of rainwater
- Confirming water quality by testing and sampling water in cooperation with Hsinchu Science Park Bureau
- Having environmental inspectors routinely examine the conditions of wastewater treatment and report the results in a timely manner to confirm that discharged wastewater meets regulatory standards
- Setting up a rainwater harvesting tank at headquarters to harvest rainwater, storing in the water tower and using it to water plants and flush toilets

In response to the ammonia reduction plan set up by the Hsinchu Science Park Bureau, Macronix has taken proactive measures to reduce the concentration of ammonia in effluents. For example, in 2015, our Fab 2 and Fab 5 plants began implementing measures, including reduction of materials, wastewater diversion, and improvements in the treatment system, such as setting up A/O-MBR.

Quality of Macronix's discharged water in 2021

Plant	pH	BOD (mg/L)	COD (mg/L)	SS (mg/L)	NH3-N (mg/L)
FAB1	6.9	4.05	15.95	3.25	4.83
FAB2	6.7	21.7	66.7	32.2	24.1
FAB5	6.6	22.5	90.4	69.3	22.9
BE	8.5	48.1	122	39.8	-
Allowable limit	5-9	300	500	300	30

Notes: Water quality data obtained from the data reported in the "Application Form for Channeling Business Wastewater (Sewage) into Dedicated Sewage Systems"



Reduction at the source starts from a small place. Waste water treatment can also reduce carbon

In recent years, energy conservation, carbon reduction, and sustainable development have been attracting more and more attention. Macronix, as a leading manufacturer of non-volatile memory, is committed to promoting energy conservation and carbon reduction internally and externally. In order to respond to and implement the policy of energy conservation and carbon reduction, Macronix's employees have invested in projects to analyze reduction of carbon emissions caused by the process of wastewater treatment, to not only meet effluent water standards, but also consume less energy and resources in the entire process.

Macronix has approached the wastewater treatment process from the perspective of source reduction, waste avoidance, and optimization of operations. Through continuous improvement activities and cross-departmental cooperation, Macronix has successfully achieved "increasing of sulfuric acid recycling," "reducing the amount of resin backwash chemicals," and "optimization of chemical dosing mode" in the second wafer fab, thereby reducing the carbon emissions from wastewater treatment by 89 tons (6.7% reduction) per month in total, which is equivalent to the annual carbon absorption of 2 Daan Forest Parks. In addition, the project was also awarded with the Silver Tower Prize of the 2021 Taiwan Continuous Improvement Award.



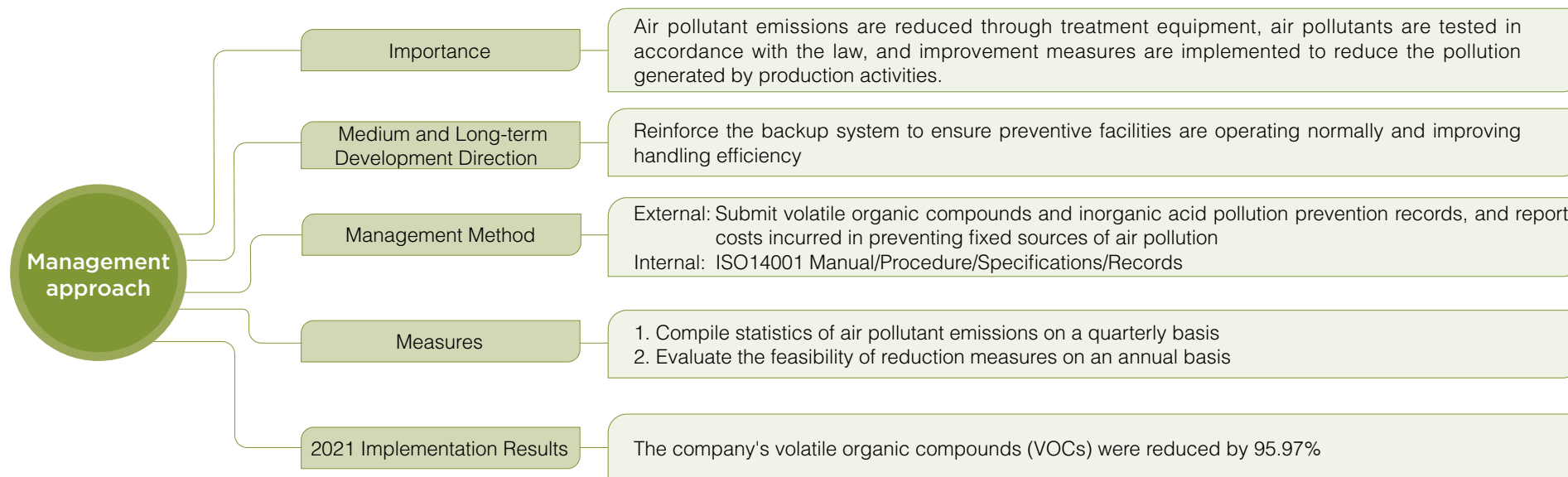
This event used innovative methods to improve various systems; but what is more exciting is that the proposal has received support for deeper cross-departmental collaboration, which fully demonstrates the refined skills of each unit, not only breaking through existing stereotypes, but also fully demonstrating the fact that teamwork can produce more spectacular results.

Looking forward to more carbon reduction achievements.

Yu Cheng-Xun Macronix/Facility



6.1.2. Air Pollution Prevention



All waste gases generated from manufacturing process at Macronix are collected and classified via the gas collector and subsequently treated before being discharged; this process conforms to the government's regulations for environmental protection. The central gas emission treatment system at Macronix consists of three main systems, one each for general emissions, acid/alkaline gas emissions, and volatile organic compounds (VOCs). Waste gases are treated in professionally designed facilities, and emissions are released in accordance with statutory regulations. We entrust certified organizations to test our waste gas emissions every year. Macronix facilities have had continuous monitoring devices installed to measure VOCs; the emissions removal rate is as high as 90%, and the emissions are less than 0.6 kg/hour from each fab; average VOCs removal rate reached 95.97% in 2021.

Note: Fab 1 planned to reduce production in 2021. Due to the lack of VOC processing equipment, the monitoring data is distorted, so the average VOC monitoring this year is not included in Fab 1 values.

2021 Waste Gases Emission Data

Plant	VOCs (kg/year)	NOx (kg/year)	SOx (kg/year)
FAB1	929.48	679.78	60.19
FAB2	7190.81	1890.63	248.88
FAB5	4441.36	7553.71	157.06

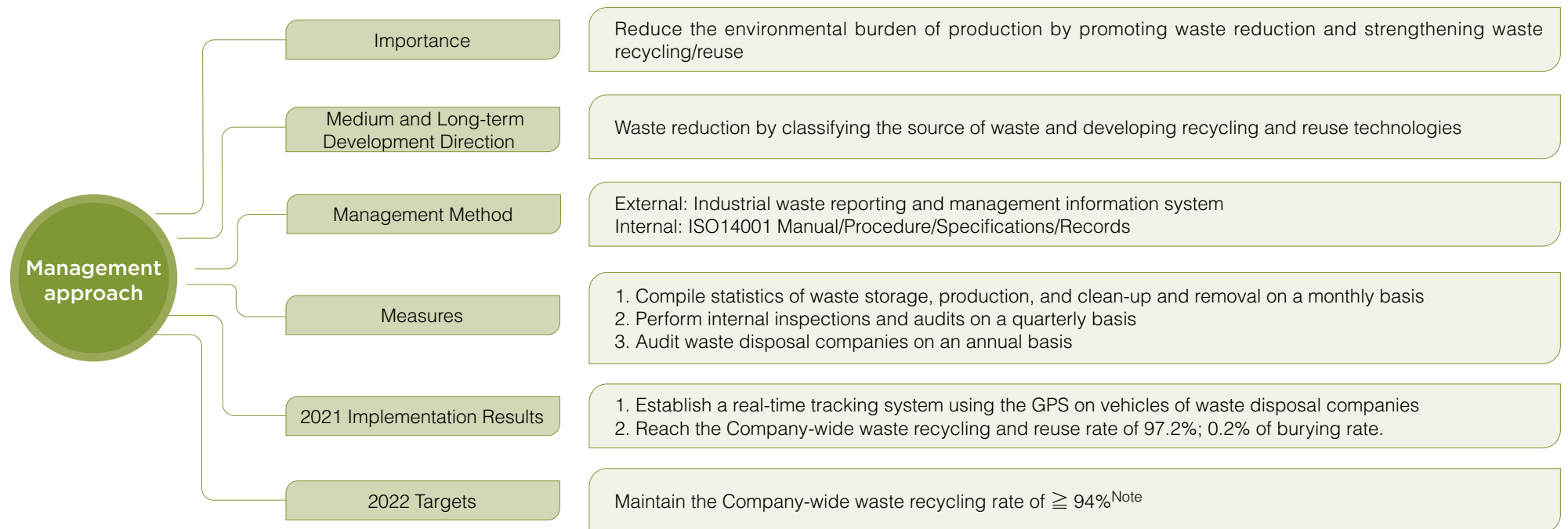
Notes: Emission data obtained from reports concerning the costs of preventing fixed sources of air pollution.

Macronix manages the emission of waste gases generated from various types of transportation, such as shuttle buses for employees, public vehicles, and wafer transport vehicles:

- Employee shuttle bus to/from work: Vehicle providers include car rentals, which execute the management by requesting the party to sign a self-management agreement form (including maintenance plans, type of gasoline used, emission tests, etc.), and keep all signed documents.
- Corporate vehicle/wafer transport vehicle: The car rental companies are responsible for the related to rental car's maintenance and regular exhaust inspections.

Our factories are located within the Hsinchu Science Park; we are willing to fully cooperate in all matters required by the Science Park. Macronix's headquarters and Fab 5 are surrounded by factories, and nearby neighborhoods are concerned about unpleasant odors. The exhaust gas of each Fab of the Company is properly treated before being discharged, so there should be no unpleasant smell.

6.1.3. Waste Management



Note: Recycling/reuse and composting waste are recycling technologies with environmental protection and economic benefits. Hence, these two indicators are used to evaluate and present the complete picture of our recycling/reuse results.

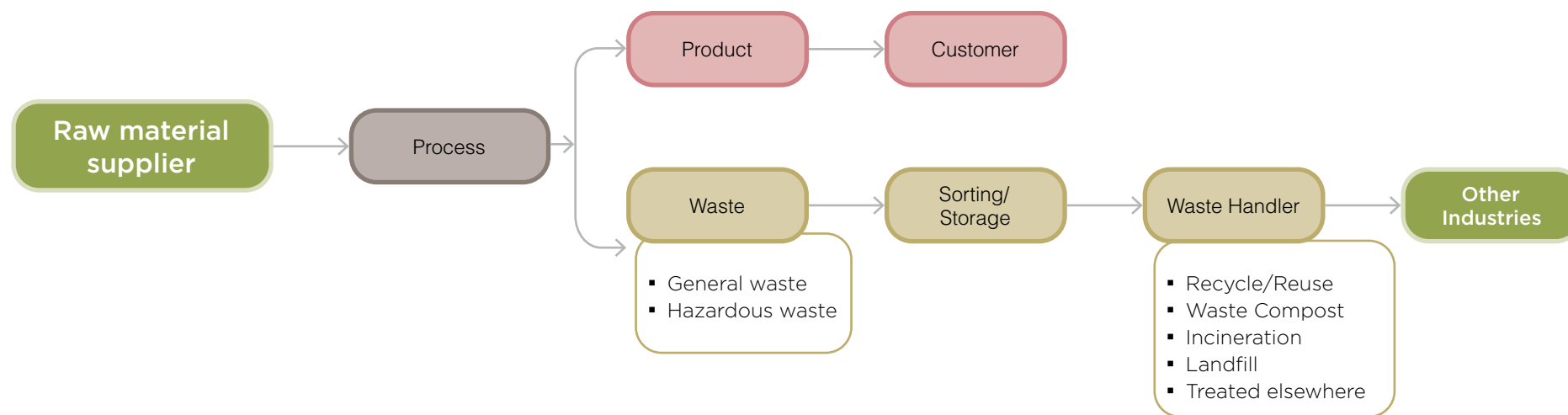
Macronix has completed the adoption of alternative materials and the improvement of the manufacturing processes regarding hazardous substances used in electronics that are of concern to the international community and specified in the EU RoHS (Restriction of Hazardous Substances) Directive. We received the IECQ QC 080000 Hazardous Substances Process Management System Certification in November 2007, which confirmed that our products comply with RoHS and customer requirements. Thanks to our thorough hazardous substance management system, we have been awarded green product certifications from many internationally renowned customers.

Our main consideration regarding waste management strategies is to recycle and reuse. Our waste production is categorized into general waste and hazardous waste, both of which are entrusted to qualified waste-treatment companies for subsequent waste treatment. Before entrusting the waste for the treatment, it is necessary to confirm whether the treatment method adopted by the entrusted company is appropriate, and the company must pass the relevant review procedures before being entrusted with the waste treatment. In view of the increasing emphasis of current government agencies on waste disposal, Macronix will continue to supervise and manage waste-treatment companies, and conduct their on-site audits. In 2021, Macronix initiated a total of 44 audits at selected new waste-

treatment companies and already available ones. During the audits, not only the licenses of the companies were confirmed, but also their product and sales flow were recorded as the basis for evaluation. Furthermore, no incidents of severe leakage, related to the waste disposal, were reported in 2021.

The total waste disposal output in 2021 was approximately 11,428 tons, of which the majority of 62.7% was hazardous waste. Recycling/reuse rates reached 94% (general waste) and 99% (hazardous waste), and the total recycling/reuse rate reached 97.2%. Landfill treatment, which has a heavy burden on the environment, was 29 metric tons of waste, and the landfill rate was only 0.2%, which shows that the Company takes environmentally friendly methods of waste disposal as a priority. In the disposal process there was no waste was exported overseas.

To effectively control waste generated by the Company and the recycling rate, Macronix has set up annual targets and reviews them every quarter to ensure that the operations comply with the given targets. The Company reduces waste by cutting down the consumption of materials through the joint efforts of engineering departments based on a feasible reduction plan.

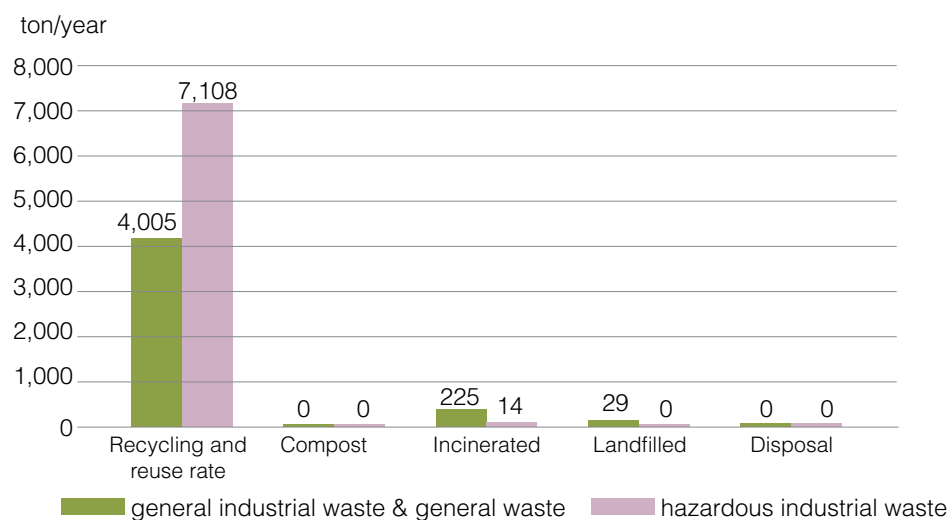
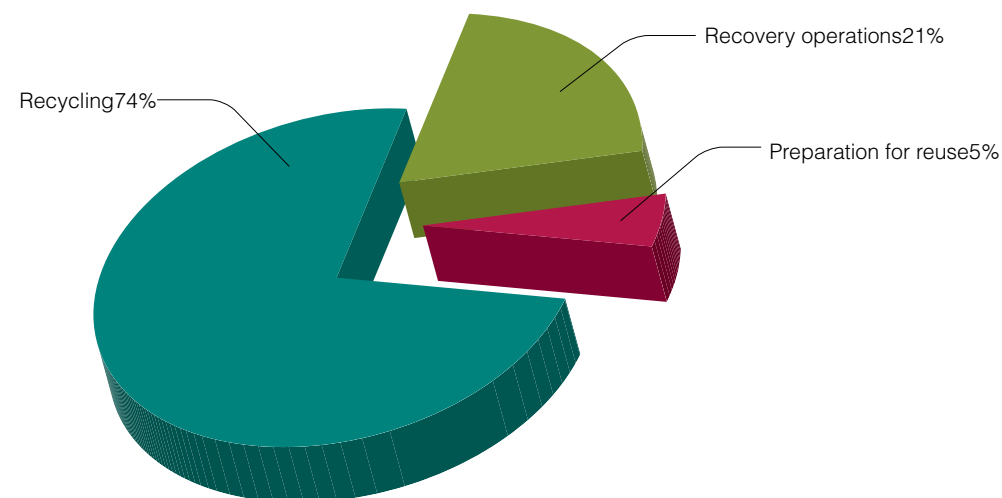


Item	2019	2020	2021
Total Recycled/Reused Amount (metric tons)	8,601	10,891	11,113
Non-Recyclable Amount (metric tons)	800	388	315
Hazardous Industrial Waste (metric tons)	5,718	7,159	7,169
Total Amount of Waste (metric tons)	9,401	11,279	11,428
Recycling/Reuse Rate (%)	91.5	96.6	97.2
Total Revenue (million NT\$)	34,995	39,801	50,573
Waste output intensity (million tons/million NT\$)	0.269	0.283	0.226

Waste Produced by Macronix in 2021

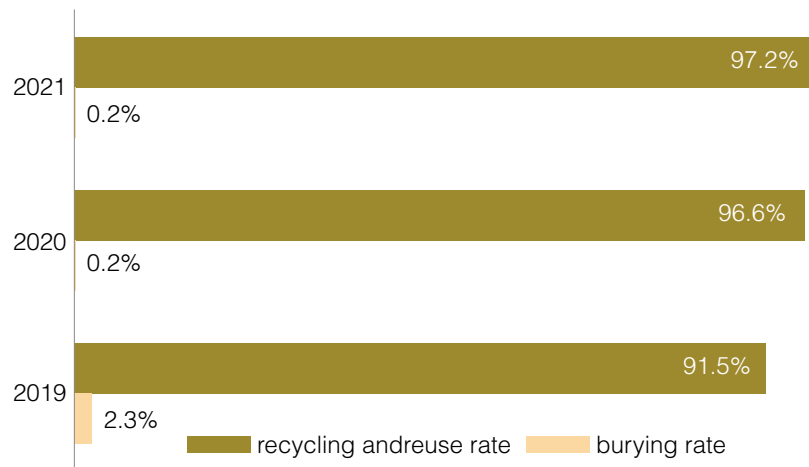
Item	General industrial waste and general waste	Hazardous Industrial Waste
Recycling/reuse	4,005	7,108
Waste compost	0	0
Incineration	225	14
Landfill	29	0
Treated elsewhere	0	0
Other	0	47
Total	4,259	7,169
Percentage	37.3%	62.7%
Recycling Rate	94%	99%

Recycling waste classification



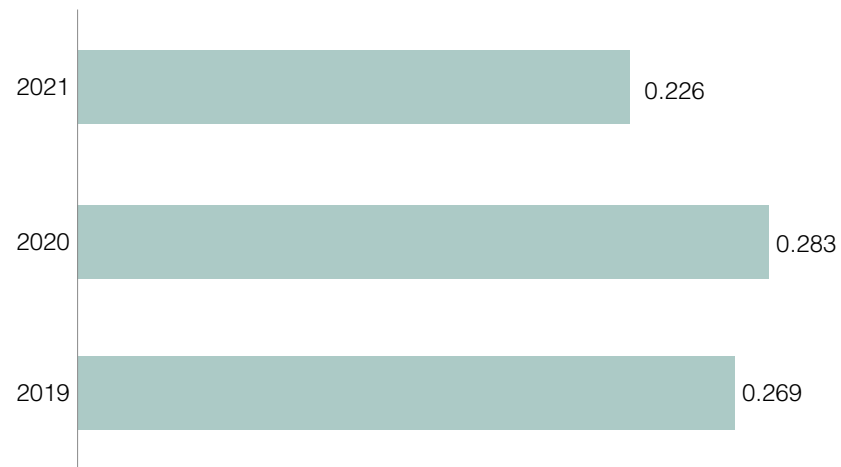
Percentage of Industrial Waste Recycled/Buried

unit : %



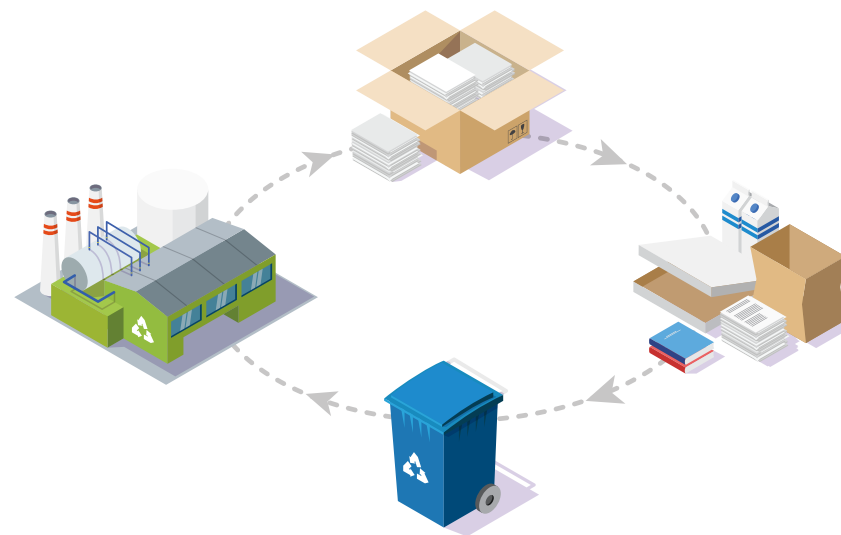
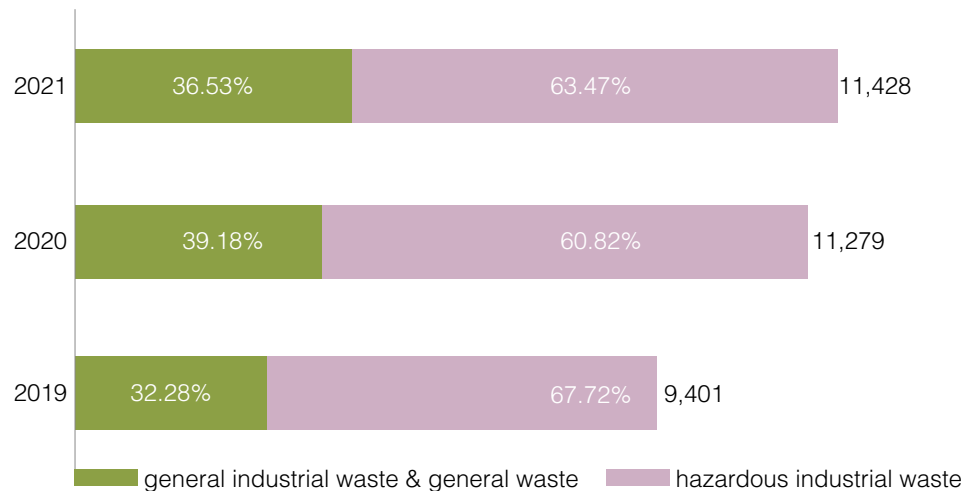
Waste Intensity

Unit : ton/million NT\$



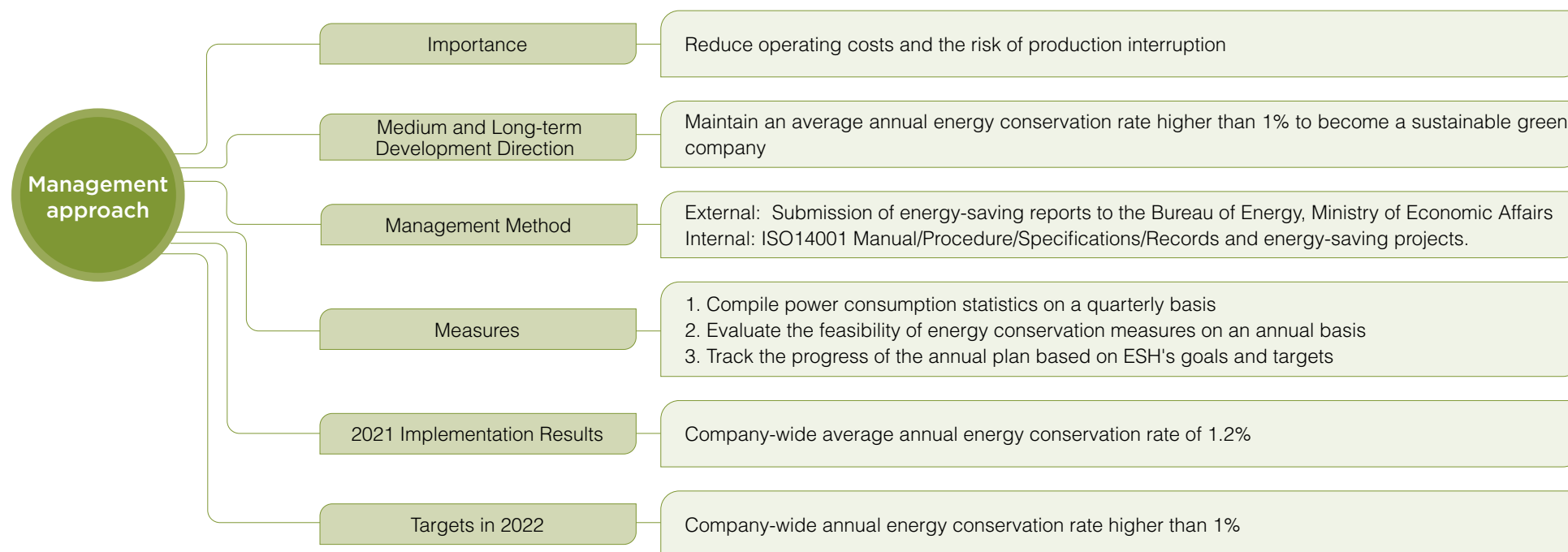
Total Waste Generated

unit : Ton/year



6.2. Energy and Climate Change Management

6.2.1. Energy Management



Macronix is dedicated to reducing energy use and consumption every year. We follow the instructions provided by the Bureau of Energy, Ministry of Economic Affairs each year to report our energy conservation audit system for energy users, as well as our energy use status from the previous year. Furthermore, we officially formed the Macronix "Energy Conservation Service Group" in 2008 to carry out various energy conservation activities, implementing energy management in various aspects. Over the years, work activities in this domain have been as follows:

Key Tasks of Macronix Energy Conservation Service Group

- Improve factory and office equipment
 - Adopt green procurement strategies
 - Introduce and install new management tools
- Hold regular internal energy control meetings to implement projects and track progress.
- Routinely maintain records of various energy supplies and check energy equipment at our facilities.
- Constantly promote the importance of energy conservation and carbon reduction to employees through training, post education, and electronic bulletin announcements.
- Perform unscheduled audits on module energy consumption and energy equipment checks.
- Introduce external energy audits and invited experts to provide guidance, include ITRI energy conservation service group, and promoted an energy conservation guidance program for firms in the Science Park.



In 2021, the total energy consumption reached 1,922,589 GJ, in which the power consumption from the grid hit 1,842,964 GJ, accounting for 100% of the total power consumption; renewable energy had not been utilized yet.

In response to newly added obligations for "Power Users Above a Certain Contract Capacity" under the Renewable Energy Development Act, Macronix soon established a renewable energy task force in 2019. The task force evaluated each project in terms of its renewable energy obligations and feasibility based on the conditions of the Company's power consumption, and in 2020 reported suggested projects to senior management level. In 2021, Macronix completed the installation of rooftop solar photovoltaic equipment in the factory area, outsourcing of renewable energy and related certificate planning, in order to comply with the national policies and regulations.

Energy consumption within Macronix's Organization

Item	Consumption in 2019	Consumption in 2020	Consumption in 2021
Diesel fuel	1,491	434	534
Natural gas	75,010	81,986	78,574
Electricity	1,787,738	1,896,325	1,842,964
Liquefied petroleum gas (LPG) used in kitchens and dormitories	265	253	260
Amount of petroleum used	286	248	257
Total energy consumption (GJ)	1,864,811	1,979,244	1,922,589
Total revenue(million NT\$)	34,995	39,801	50,573
Energy intensity(GJ/million NT\$)	53	50	38

Notes: (1) Energy consumption unit: GJ, (2) Data obtained from GHG inventory data, including the power consumption of subsidiaries' offices in the company headquarters. (3) The heating values used for calculations are based on the GHG emission factor management form. (4) Feb 1 data as of September 1, 2021

Macronix has implemented various energy-saving projects over the past few years, including projects focusing on the chiller system, power system, and illumination equipment, all of which achieved significant results. The energy-saving strategy in 2021 mainly focuses on energy saving of air conditioners, chiller systems, and motors. A total of 25 energy-saving plans were implemented. The total energy savings recognized in 2021 reached 6,145,697 kWh (22,125 gigajoules (GJ)), which is equivalent to a reduction of 3,085 metric tons of carbon dioxide emissions.

Macronix's Energy Conservation Measures in 2021

Energy Conservation Items	Energy conservation amount (kWh/year)	Carbon reduction (tonCO ₂ e)	Energy conservation contribution ratio (%)
Air conditioner energy conservation (7 items)	1,281,000	643	20.84
Equipment operating optimization (4 items)	519,709	2,610	8.46
Chiller energy conservation (5 items)	2,180,341	1,095	35.48
Cooling tower energy conservation (2 items)	390,503	196	6.35
Motor energy conservation (2 items)	1,359,990	683	22.13
Lighting energy conservation (4 items)	120,694	61	1.96
Other (1 item)	293,460	147	4.78
Total	6,145,697	3,086	100

Notes:

1. Data is obtained from the energy reports; the type of energy conserved in each item is electricity.
2. The amount of energy conserved is compared against the amount of energy consumed before improvements were made
3. Energy conservation contribution ratio = Number of kWh conserved for each item / Total number of kWh conserved

Sparing no effort to promote energy conservation

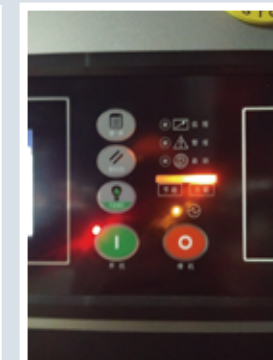
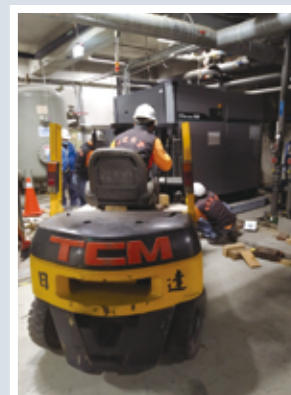
Electricity usage (Scope 2) is one of Macronix's largest sources of carbon emissions. In view of this, Macronix conducts in-plant inspections every year to actively look for energy-conservation solutions. Macronix proposed an updated energy-conservation improvement plan for Compress Dry Air (CDA) equipment in 2021, thus greatly reducing the energy consumption of back-end operations at fabs. The energy consumption of the original CDA compressor per m³ of air pressure flow is 8.2 kilowatts (kW), and the air volume processed per minute is 11 m³. The energy consumption of the new high-efficiency CDA compressor per m³ of air pressure flow is 6.5 kilowatts (kW), and the air volume processed per minute increased to 24.5 m³.

This replacement saves about 367,920 kWh of electricity each year, and reduces carbon emissions by about 185 tons of CO₂ emissions, thereby contributing to the mitigation of climate change.

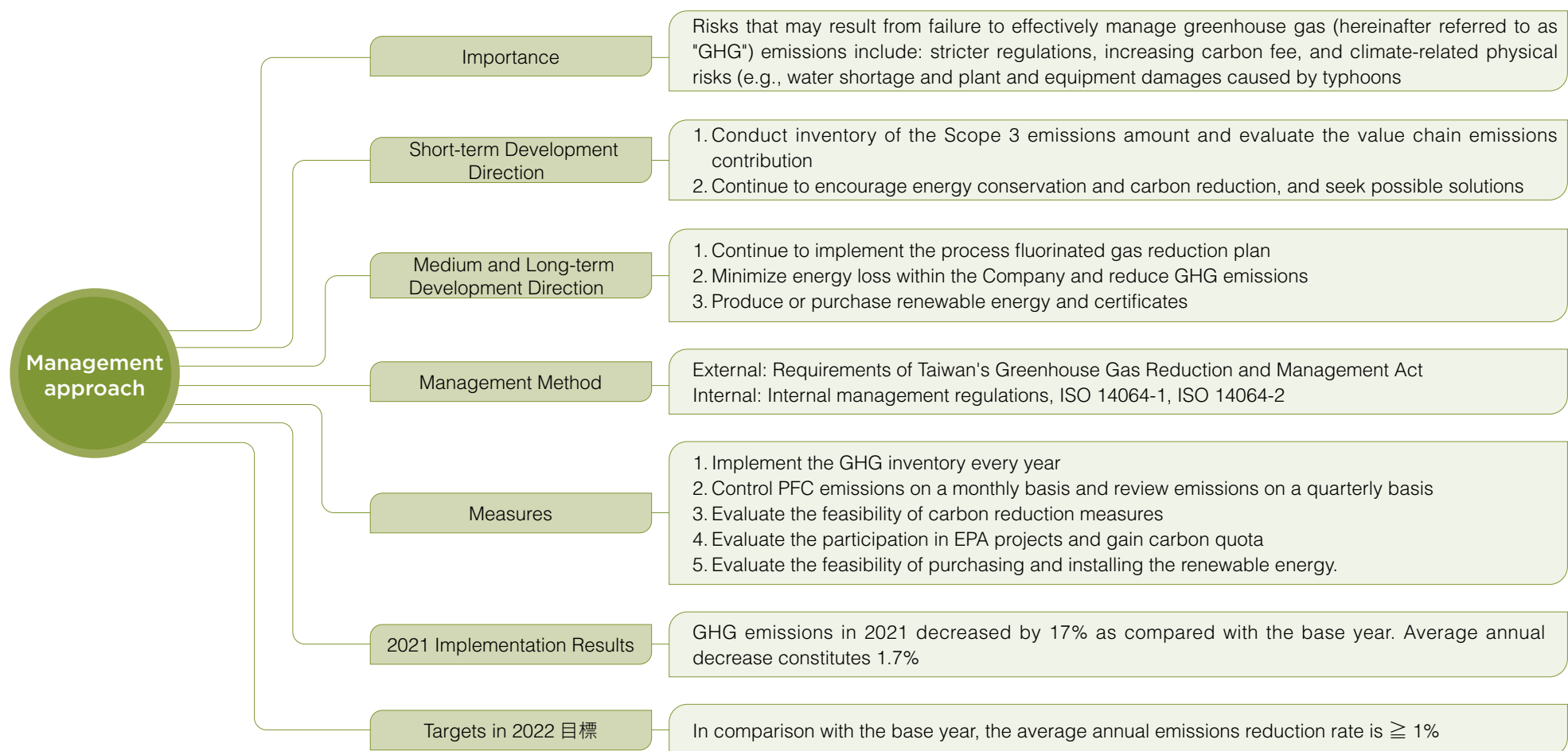
It is wonderful to have the opportunity to participate in the Company's installation of a new air compressor for the smooth power transmission.

Listening to the fascinating sound of the air compressor as it runs and watching its excellent energy efficiency, I am honored to be able to contribute to the sustainability of the earth.

Lin Kang-Xiang Macronix/Facility



6.2.2. Climate Change Management



Note: The emissions of Fab 1 in this year's report are calculated according to the operation control method as of September 1, 2021.

In response to the trend of GHG reductions control and reduction in the supply chain due to global warming, Macronix began planning for GHG emissions inventory, control, and reduction in 2000 and obtained the 2005 ISO14064-1 GHG emissions verification statement in 2007.

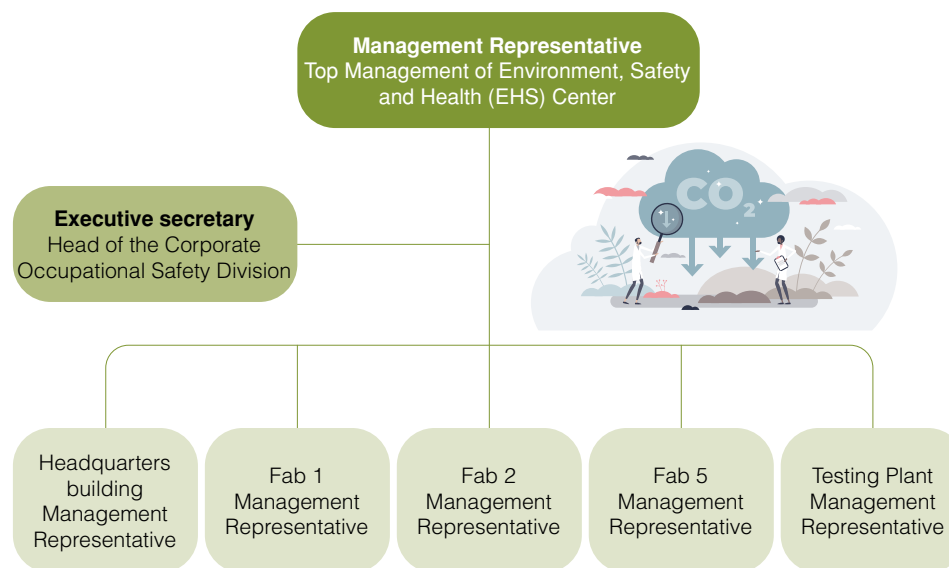
We established the units to manage GHG according to ISO 14064-1 verification standards, as illustrated below. Through the complete management system, we performed thorough checks on the energy use conditions in our facilities and offices, and thereby established inventory records and internal procedures for GHG inventories. Therefore, we are able to use the information as a basis for selecting alternative production technologies with reduced energy consumption and GHG emissions in order to achieve our goal in this respect. Ozone-depleting substances (ODS) controlled by the Montreal Protocol are identified during the GHG inventory, but are not included in emissions according to regulations of the EPA.

In response to global climate change and carbon reduction trends and in the hope of contributing to the mitigation of global warming, beside directing our efforts to energy conservation and carbon reduction in manufacturing processes and equipment, we are also actively participating in government-guided projects.

In 2018, we participated in the Industrial Development Bureau's Low Carbon Technology Industrial Application Subsidy Project, and completed the Fab 5's project plan for the newly installed point of use (POU) abatement equipments for the manufacturing machines. We applied to the Environmental Protection Administration for the registration of our GHG offset project in 2019 to gain an offset quota. The project passed review of the Environmental Protection Administration at the end of 2020, and the monitoring plan for the expected 50% of the machines was completed in 2021. It is expected that the remaining machine testing, monitoring reports, and verification of reduction will be completed in 2022. It is estimated that there will be a reduction of more than 10,000 tons each year.

All of the Company's plants completed ISO 14604-1 Scope 1, 2, and 3 inventory and third-party verification in 2021. The data covers all plants and sites (excluding subsidiaries). According to regulations of the EPA, the GWP value of the GHG inventory was changed in 2016 to the Fourth Assessment Report released in 2007 by IPCC. As a result, the Company adjusted the base year to 2011 and has made relevant changes to the table and chart of GHG emissions in this report. In accordance with the operation control method, Macronix calculated the 7 kinds of GHGs including CO₂, CH₄, N₂O,

Macronix Greenhouse Gases Management Organization Chart



HFCs, PFCs, SF₆, and NF₃. Macronix's total emissions in 2021 were 405,629.737 tonCO₂e. The proportions of emissions are as follows: Macronix's Scope 1 emissions accounted for 36.6% and Scope 2 emissions accounted for 63.4% of the Company's total emissions. In addition, we began to compile the data of indirect GHG emissions in addition to imported energy at the end of 2019 to provide a more complete GHG inventory and monitor GHG emissions of our value chains. The first verification in accordance with ISO 14064-1:2018 was conducted in 2021. The total indirect GHG emissions excluding imported energy reached 204,561.3601 tons CO₂e in 2021 (as the base year of Scope 3). Most indirect GHG emissions were generated from the products (including purchased goods and services) used by the organization. Since the value chain projects covered by Scope 3 will be included in the inventory year by year according to the accuracy and availability of data, the base year will vary with the addition of new projects.

Macronix GHG Emissions

Unit: 1,000 tonCO₂e/year

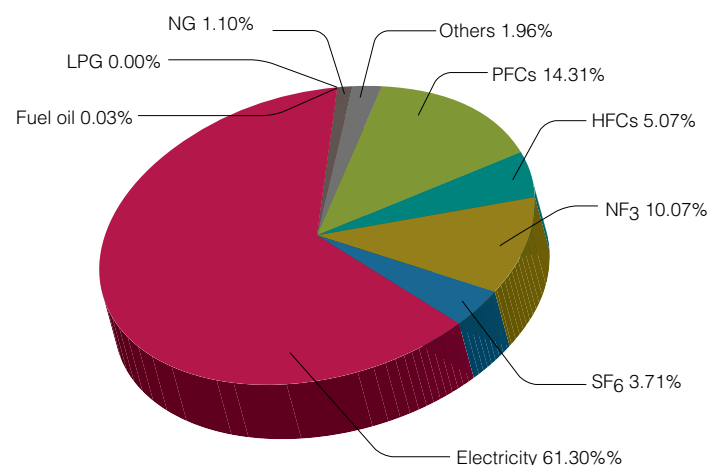
Scope	2019		2020		2021	
	Carbon emissions	Percentage	Carbon emissions	Percentage	Carbon emissions	Percentage
Scope 1 Direct emissions	157	37.2%	175	39.5%	149	36.6%
Scope 2 Indirect emissions	265	62.8%	268	60.5%	257	63.4%
Total	422	100%	443	100%	401	100%

PFC Emission Amount Over the Years

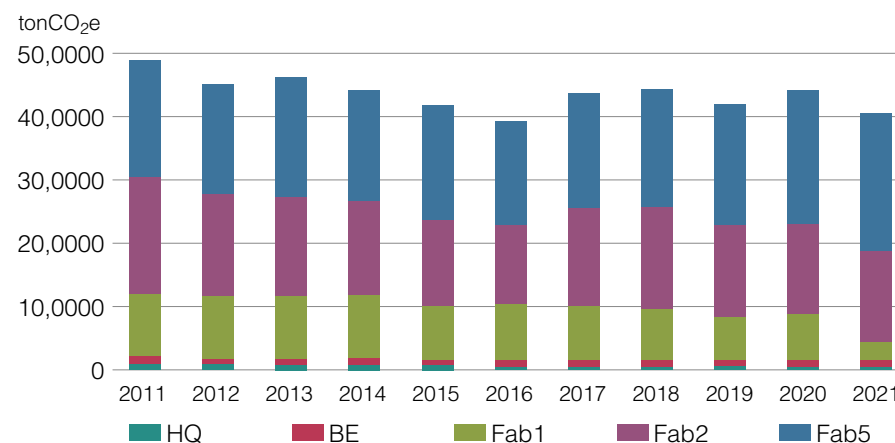
Unit: tonCO₂e/year

Year	2019	2020	2021
Total	70,944	76,343	58,084

Ratios of GHG Emissions by Source of Emission, 2021



Carbon Emission Trend



Carbon Emission Intensity

Item	Calculation Unit	2019	2020	2021
Carbon Emission Intensity	tonCO ₂ e /million NT\$ of revenue	12.1	11.1	8.0
Carbon Emissions(Scope 1 & 2)	1000 tonCO ₂ e	422	443	406
Total Revenue	million NT\$	34,995	39,801	50,573



6.3. Ecological Environment and Conservation

In order to implement ecosystem conservation concepts, Macronix has adopted six hectares of land from the Science Park Administration Bureau. There are more than 1000 trees and up to 90 types of plants within the Macronix's plant and park area. They include banyan trees, camphor trees, red cedar trees, Madagascar almonds, bamboos, Chinese fringe trees, cherry blossoms, deciduous trees, and Taiwan golden-rain trees. The pond in the Macronix Park also contains rare aquatic and terrestrial plants such as common wax-plants, Britton's Wild Petunias, Job's tears, water lilies, yellow water lilies, narrow leaf water-plantains, which display a completely different landscape each season.

The landscapes of plant area and Macronix Park are watered with recycled rain water, which not only facilitates water conservation, but also serves as the best example for environmental protection. Ecological urban designs for the Macronix Park, such as 3D green designs, roof greens, multilayer planting, and ecological ponds, also demonstrate our utmost efforts to protect the ecosystem.

Macronix Park is open to the public to enjoy during regular hours. It also became an ideal place for schools and environmental groups to hold ecological education events. Since 2004, Macronix Park has won the Award of Distinction for Green Beautification from the Hsinchu Science Park Bureau for many consecutive years.

In addition, all Macronix facilities are located inside the Science and Industrial Park. All environmental protection work complies with local government regulations, internal corporate environmental policies and specifications to effectively conserve the ecological environment. Environmental awareness is raised to encourage everyone to fulfill their duties as global citizens.



6.4. Green Enterprises

6.4.1. Green Products

Following the rising awareness of green consumption and more and more strict environmental protection laws worldwide, we are not only reducing environmental pollution caused by our production processes, but also focusing on managing chemicals in product ingredients. Currently, our green efforts include:

- Products are in compliance with EU Restriction of Hazardous Substances (RoHS) in Electrical and Electronic Equipment
- Products are in compliance with the European Union's requirements on Substances of Very High Concern (SVHC) and the End-of-Life Vehicles (ELVs)
- Green product certifications are obtained from internationally acclaimed customers such as Sony

Macronix has been passing the [IECQ QC 080000 Hazardous Substance Process Management System](#) Certification annually since 2007 to ensure the effectiveness of its green product management. According to Principle 15 in the Rio Declaration on Environment and Development, "In order to protect the environment, the precautionary approach shall be widely applied by each country according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." Macronix has complied with regulatory requirements while managing green materials, and no environmental degradation has occurred due to material usage.

Macronix has developed a risk assessment of suppliers (RAS) system that integrates the quality management system and green product control system for supply chain management, to ensure that upstream and downstream suppliers comply with RoHS directives, the EU regulations on SVHC and ELVs, international laws, and customer requirements. Additionally, there's no substance in our products that need to be disclosed in this report based on the reporting threshold of certain reportable applications and reporting level of International Electrotechnical Commission (IEC) 62474 Material Declaration for Products of and for the Electrotechnical Industry accordingly. As a key member of the electronic supply chain, Macronix has responded to the demand for global human rights protection by purchasing metals such as gold, tin, tungsten, tantalum, and other minerals required by customers to be used in products only with good due diligence, and we insist on not using metals that come from conflict mineral areas. In the internal management process we regularly review the changes in the list of approved smelters and refineries in the CMRT (Conflict Minerals Reporting Template), CRT (Cobalt Reporting Template), and EMRT (Extend Minerals Reporting Template), which are updated at least every six months or when necessary. If supply chain members have any questions about Macronix responsible minerals template, they can contact pubcsr@mxic.com.tw.



6.4.2. Green Procurement and Environment, Safety, and Health Costs Accounting Management System

To keep up with international trend, to fulfill our environmental and social responsibilities, and also to raise the effectiveness of our investments in the environment, worker safety, and health management, Macronix has implemented an environmental, safety, and health costs accounting (ECA) management system under the commitment and support of high-level executives since 2005.

Macronix's environmental, safety, and health costs accounting (ECA) management system incorporates the investment costs and benefits of environmental safety and health as a whole. Through the system operation management, it provides supervisors, employees, and personnel from the industrial safety/environmental protection departments the understanding of both past and current operating conditions of environmental safety and health and can provide planning for future tasks and goals.

Our environmental, safety, and health expenditures and total investment amounted to NT\$400 million in 2021, and there were no losses resulting from EHS violations. Details are shown in the table below:

Item	Description	2021 Expenses (NT\$)
Outsourcing (services)	Outsourcing expenses for environmental protection, safety, and health management, such as environment maintenance fees, sterilization, waste cleaning, and wastewater treatment	72,860,138
Personnel	Personnel expenses for environmental protection, safety, and health management	56,972,134
Energy	Water, electricity, and fuel expenses for environmental protection, safety, and health management facilities	120,532,906
Commission and Research	Projects or research expenses for improving environmental protection, safety, and health management performance	1,027,250
Education and Training	Transportation, accommodations, and registration expenses for participating in or organizing environmental protection, safety, and health education and training	781,361
Administrative Management	Administrative management expenses for environmental protection, safety, and health management	7,431,926
Equipment and Engineering Investment	Investments in purchasing environmental protection, safety, and health equipment or expenses for improvements	36,792,655
Maintenance and Consumables	Expenses for the maintenance of environmental protection, safety, and health facilities, replacement of consumable parts, and waste storage containers	70,836,666
Equipment Depreciation	Depreciation expense of all the pollution prevention equipment	65,165,445
Testing	Outsourced testing and instrument calibration expenses	6,074,135
Other	Other environmental protection, safety, and health management expenses that are not categorized	0
Loss compensation	Compensation for losses sustained during environmental protection, safety, and health accidents, fines for violation of the law, and losses from returned goods that do not comply with international environmental protection regulations	0

Total : 438,474,616

07

Social Dimension

7.1 Staff Respect

7.1.1. Recruitment

7.1.2. Upholding Employee Rights

7.1.3. Salary and Welfare Systems

7.2 Learning and Development

7.2.1. Nurturing Talents

7.2.2. Macronix Academy

7.3 Work-life Balance

7.3.1. Macronix H2O

7.3.2. Safety and Health Promotion Management

7.4 Social Welfare

7.4.1. Planting the Seed of Science Education

7.4.2. Fostering Local Culture and Creativity

7.4.3. Environmental Protection and Charity

7.4.4. Employees Participation in Charity



7. Social Dimension

Warmth, happiness, and growth is the vision of Macronix human resource management.

An enterprise is like a big family, and at Macronix we provide our staff with the care and attention that any other family would. With empathy, we respect, understand, and care for the work and life of our staff and extend this caring to their families. This makes employees treat each other with mutual trust and cooperation. Following the philosophy of humane leadership, we provide staff with high flexibility and autonomy at work and continuously encourage staff to actively make valuable innovative solutions to our nonvolatile memory solutions. Therefore, the firm has been able to present top technical papers at the International Electron Devices Meeting (IEDM), VLSI Symposia, and International Solid-State Circuits Conference (ISSCC), receiving worldwide attention to its progressive R&D outcomes. Macronix believes in respecting individual diversity and adopting an open-door policy to create an atmosphere of open and transparent communication. We routinely hold management communication meetings, conduct labor/management conferences, and set up staff suggestion boxes in order to provide a platform to encourage our staff to communicate, express their ideas, and share their voices. Macronix established the Macronix CSR Policy based on requirements on human rights protection set forth in the Universal Declaration of Human Rights, ILO International Labor Standards, SA8000, and RBA CoC. We devote our utmost efforts to create a superior human resource management system and labor system with perfect planning and execution abilities, to comply fully not only with local labor laws and regulations, but also CSR specifications to protect human rights.

A happy staff usually consists of those employees with the highest efficiency. Macronix provides competitive compensation packages, a people-oriented management system, top recreation and leisure infrastructure, and diverse and meaningful extracurricular activities to motivate staff and make them to enjoy working. These measures also help staff nurture active and positive work values, broaden the horizons, spark their passions and showcase the strengths. The Company hopes staff can find happiness, morals, self-confidence, satisfaction and pride in the work they do.

Talent is the foundation and the most valuable asset of the corporation. Hence the Company established a comprehensive training system and provides well-structured and constant training plans. This system accommodates different learning paths, competencies, and career ladder structure to provide staffs with individual development plan. To achieve continuous growth for the Company and its staff, Macronix has various types of training programs that are in line with corporate strategies and organizational development. The programs adopt innovative and diverse teaching methods to enhance staff's knowledge, skills, and capabilities that will strengthen the Company's competitiveness.

We believe that a comfortable working and learning environment will bring out additional growth potential and renewed energy for our staff, which is the prime motivation of success. For this reason, Macronix works hard to build a work environment that allows staff to enjoy physical, psychological, and spiritual health. The Company values caring for its staff through its management system, and ensures that measures are properly implemented through internal and external audits. We also have improved the workplace environment and increased harmony between the staff and the management team in order to build a warm, happy, and growing family.



7.1. Staff Respect

7.1.1. Recruitment

Equal Opportunity

Macronix provides equal employment opportunities, and is against discrimination, child labor and non-compulsory labor and agrees with the requirements of international customers to not employ modern slavery. This is the core value of our happy enterprise philosophy. We aim to provide fair promotion, equal employment, and forbid discrimination and harassment in the workplace. This principle of equal opportunity is the root of Macronix's corporate value. At Macronix, employment, work assignment, and promotion are based on individual abilities and job requirements, and are not affected by age, birthplace, race, skin color, gender, sexual preference, language, religion, disability, political ideology, nationality, social status, financial status, family background, or any other status.



Prohibition of Child Labor

Macronix prohibits child labor and stipulates in its internal regulations that workers under the age of 16 may not be hired. The ID documents of new employees are inspected when they report for work; the Regulations on Child Labor Remedies (OI1080-0103) were established to investigate, handle, and remedy situations when child labor is hired by accident.

Its R&D alternative service management assessment was rated first place in the private industry group for outstanding R&D alternative service employers in 2021 by the National Conscription Agency (Ministry of the Interior).



Workforce Structure

As of the end of 2021, the total number of employees at Macronix was 3,809, including 3,790 regular employees and 19 temporary employees, all of whom work in Taiwan and are full-time employees; 11 of whom were sent to work overseas. Employees between the ages of 30-50 who have a wealth of specialized knowledge and experience are the Company's backbone, and account for 62.8% of all regular employees. The workforce structure is detailed in the two tables below:

Workforce Structure of * Regular Employees

Category	Sub-category	Male		Female		Subtotal and percentage of sub-categories	
		Head count (A)	Percentage of sub-category(A/C)	Head count (B)	Percentage of sub-category(B/C)	Subtotal (C)	Percentage of regular employees (C/Total number of employees)
Position	Executives*	499	72%	194	28%	693	18%
	Non-executives*	1,736	56%	1,361	44%	3,097	82%
Age	Under 30	606	67%	293	33%	899	23.7%
	30-50	1,319	55%	1,062	45%	2,381	62.8%
	Above 50	310	61%	200	39%	510	13.5%
Nationality	Taiwanese Citizen	2,091	61%	1,344	39%	3,435	91%
	Foreigner	144	41%	211	59%	355	9%
Type of staff	Direct Employee	379	27%	1,023	73%	1,402	37%
	Indirect Employee	1,856	78%	532	22%	2,388	63%
Work Location	Local	2,226	59%	1,553	41%	3,779	99.7%
	Offshore	9	82%	2	18%	11	0.3%
Subtotal by Gender		2,235	59%	1,555	41%	3,790	100%
Total Number of Employees						3,790	100%

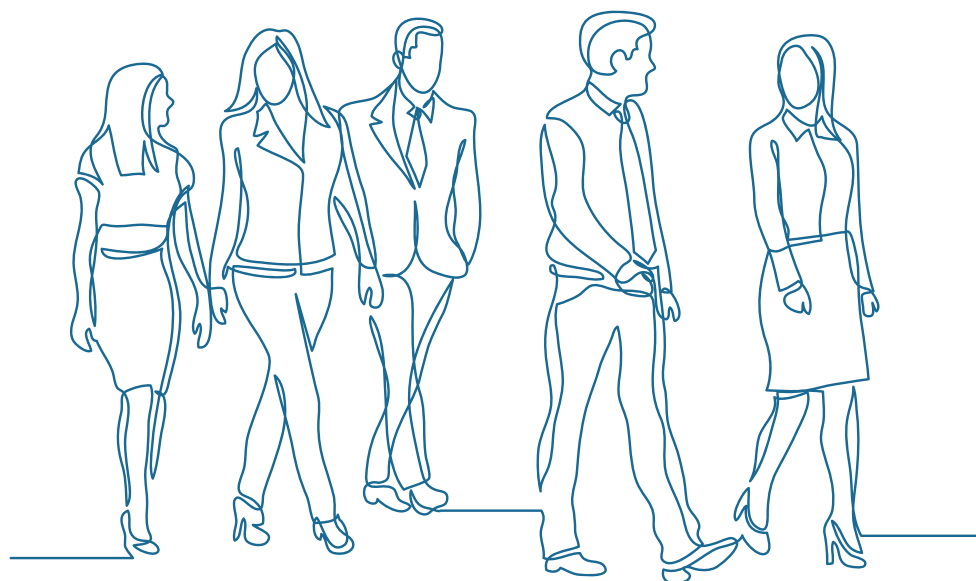
* Regular employees: Non-fixed term contractor or specific fixed-term contractor with a term of one year or longer

* Executives: Managerial officers

Workforce Structure of * Temporary Employees

Category	Sub-category	Male		Female		Subtotal and percentage of sub-categories	
		Head count (A)	Percentage of sub-category(A/C)	Head count (B)	Percentage of sub-category(B/C)	Subtotal (C)	Percentage of regular employees (C/Total number of employees)
Age	Under 30	1	50%	1	50%	2	11%
	30-50	6	46%	7	54%	13	68%
	Above 50	1	25%	3	75%	4	21%
Subtotal by Gender		8	42%	11	58%	19	100%
Total Number of Employees						19	100%

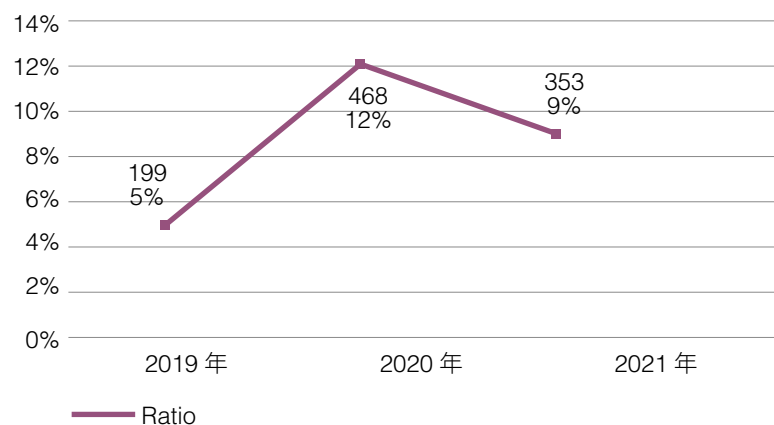
* Temporary employees: Fixed-term contractor (does not include specific fixed-term contractor with a term of one year or longer)



New Employees

To attract outstanding talent and increase our competitiveness, we implement a multi-channel recruitment project, including visits, recommendations from internal employees, campus job fairs, alternative civilian service (research and development substitute services), and industry-academia collaboration. As of the end of 2021, we had hired 353 new employees (262 male and 91 female), accounting for 9% of all employees. The majority of new employees were under the age of 30 (210 male and 73 female), accounting for 80% of new employees.

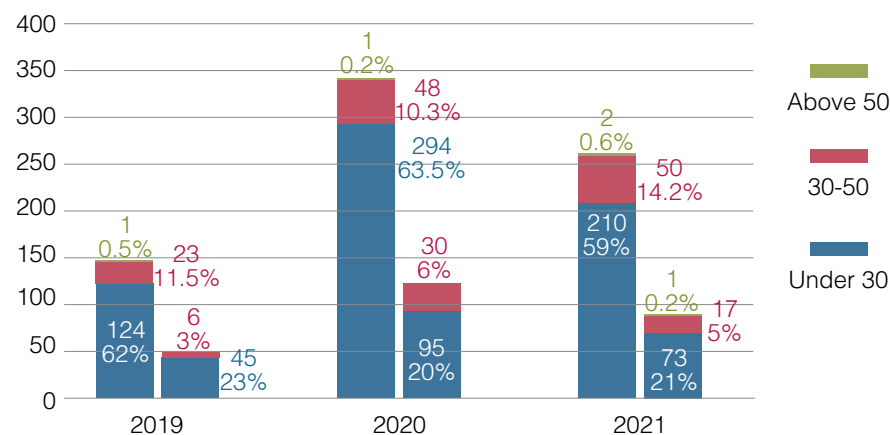
The Number and Ratio of New Employees



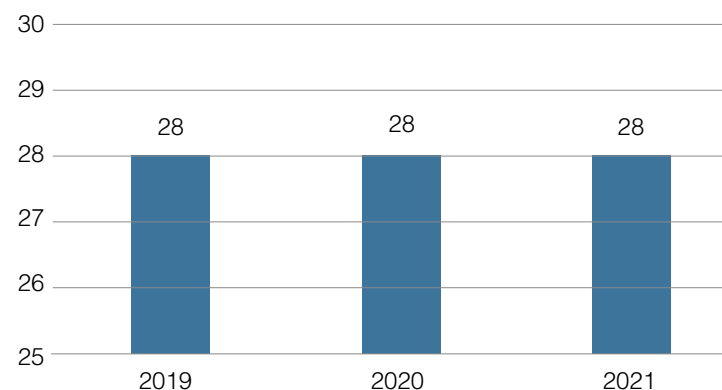
Hiring Employees with Physical and Mental Disabilities

We respect the working rights of people with disabilities and firmly adhere to the related regulations. Macronix has employed 38 individuals with disabilities in accordance with Article 38 of the People with Disabilities Rights Protection Act (PDRPA), including instances where a person with severe or extremely severe disabilities has been hired, which counts as two individuals with disabilities. As of the end of 2021, we have hired 28 employees with physical and mental disabilities (17 of which are severely disabled), thus reaching the quota of individuals with disabilities that should be hired as stipulated by the PDRPA.

Distribution of New Employees by Gender/Age



Number of Disabled Workers



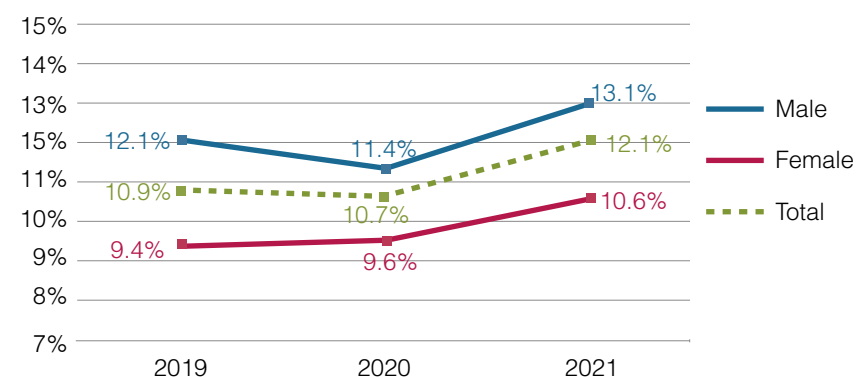
Turnover Rate

In 2021, 457 regular employees (292 male and 165 female) resigned from their positions at the Company; turnover rates over the years are shown in the following table.

Distribution of Employees Who Resigned Over the Years (by Gender)

Year \ Gender	Male		Female		Total number of employees and rate	
	Head count	Percentage	Head count	Percentage	Head count	Percentage
2019	263	12.1%	156	9.4%	419	10.9%
2020	259	11.4%	157	9.6%	416	10.7%
2021	292	13.1%	165	10.6%	457	12.1%

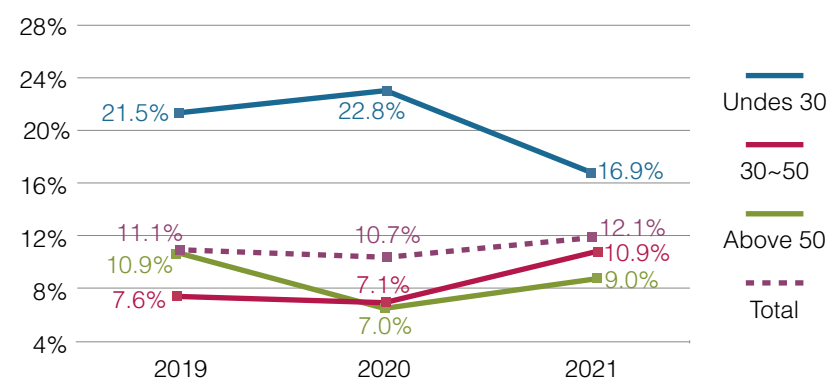
* Turnover rate = Number of employees of each gender who resigned on the said year / Total number of employees of the said gender



Distribution of Employees Who Resigned Over the Years (by Age)

Year \ Gender	Under 30		30-50		Above 50		Total number of employees and rate	
	Head count	Percentage	Head count	Percentage	Head count	Percentage	Head count	Percentage
2019	179	21.5%	199	7.6%	41	11.1%	419	10.9%
2020	202	22.8%	183	7.1%	31	7.0%	416	10.7%
2021	152	16.9%	259	10.9%	46	9.0%	457	12.1%

* Turnover rate = Number of employees in each age group who resigned on the said year / Total number of employees in the said age group



Caring for visually impaired colleagues; creating a friendly workplace

Macronix has been hiring visually impaired masseurs for more than 11 years. In addition to increasing employment opportunities for the visually impaired, it also provides free massage services for colleagues and their dependents, helping to alleviate fatigue and improve work efficiency while releasing job-related pressure in a short period of time. The service was suspended in 2020 due to the pandemic, and although the visually impaired masseurs could not come to the factory to provide services, they still received monthly salaries and enjoyed employee benefits.

Visually impaired colleagues share their work experience with Macronix

"Friendly working hours, simple environment, stable salary..., etc." is the experience of visually impaired masseurs Yi-Fan and Jin Shu at Macronix. Masseur Yifan is a good student who is serious and diligent in his studies. He is currently studying in the Department of Acupressure Technology at Chung Hwa University of Medical Technology. Yifan often shares a lot of health care tips with colleagues. A rather shy individual, he said that he was very embarrassed to have to trouble the guides, but his vision was poor at night, and thanks to the help of the guides, he did not miss the shuttle bus or miss the bus back to Taoyuan.

"Thank you Macronix for your most substantial help during the pandemic!" The masseuse Jin Shu recalled that she had just left the massage station of Tzu Chi Hospital 2 years ago and set up her own massage studio in Changhua, but unfortunately it was closed due to the pandemic. Fortunately, there was still a salary provided by Macronix that allowed her to cover her living expenses. In addition, Jin Shu shared that she had applied to be a massage therapist at other companies before. The working hours were until 8:30 pm, and after work she could not catch the last bus back to Changhua, where she lived. In comparison, Macronix arranges for her to leave work at 7 pm, and the working hours were much friendlier!

Providing an employment environment suitable for visually impaired colleagues and constant on-the-job care is Macronix's most substantial aid to visually impaired colleagues. We hope that through concrete actions, we can form a force to continuously promote a friendly workplace.



7.1.2. Upholding Employee Rights

At Macronix, our hiring and employment, job assignments, and promotion practices are based on an individual's abilities and potential, and we do not discriminate against any worker based on age, birthplace, race, skin color, gender, sexual orientation, language, religion, disability, political ideology, nationality, social status, financial status, family background, or any other status. We continue to make revisions to support employment for people with disabilities and endeavor to prevent prejudice, discrimination, and harassment. Since Macronix was founded in 1989, the Company has maintained good relationships between labor and employees from the outset management, and has never experienced loss of business due to labor/management disputes. Based on this relationship, Macronix has received recognition from competent authorities. Macronix did not receive any complaints or experienced any incidents where the rights of local staff or aboriginals were infringed in 2021. There were no material operation changes that affect labor rights. If there are any material operation changes that require employees be notified in advance, we will provide a notice in accordance with the law.

Employment Transfers

Macronix respects individual work rights and complies with related laws and regulations, including job transfer requirements specified in Article 10-1 of the Labor Standards Act:

1. The employee shall be transferred based on the needs of business operations and without improper motives or purposes.
2. The wages and other working conditions shall not be changed to be unfavorable to the employee concerned.
3. The employee shall still be able to satisfactorily perform the duties required in terms of physical ability and skills after the transfer.
4. The employer shall provide necessary assistance if the relocated workplace is too far away for the employee concerned.
5. The livelihood interests of the employee and his or her family shall be considered.

Prohibition of Forced Labor

Macronix does not force or threaten any unwilling persons to provide labor services, and ensures that all work is performed voluntarily. We do not force workers or engage in the

hiring slaves, forced or imprisoned workers, or bonded labor.

All employees have freedom of movement and dormitories do not have a curfew. We do not seize employees' ID documents, passbooks, seals, passports, or work permits, and we enforce the policy of zero charges on foreign workers. Employees have the freedom to terminate their labor contract as long as they comply with laws and regulations.

Pension Plan

Macronix has set up its retirement policies according to the related regulations in the Labor Standards Act. We have established the Pension Supervisory Commission to supervise and manage pension reserve funds, appropriation calculation, and management and operations of other pension-related issues. The Company appropriates the pension reserve funds according to the regulations of the Labor Pension Act. We invite professional accountants and consultants to conduct the actuarial valuation of the Company's pension funds each year, in order to ensure sufficient funding for future employee pension payments.

■ Pension Contribution Under the Labor Standard Act:

Macronix appropriates 2% of the total monthly wages of our employees, and deposits it to a designated account for pension reserve funds in the Bank of Taiwan every month. As of the end of 2021, the fair value of assets was NT\$1,021,636,000. Expenses recognized in 2021 were NT\$13,516,000, and net defined benefit liability is listed at NT\$1,406,011,000 as of the end of 2021.

■ Pension Contribution Under the Labor Pension Act:

For those applicable to the new pension system, the Company appropriates 6% of employees' monthly salaries and moves it into their individual labor pension accounts. Employees may also choose to contribute up to 6% of their salaries into their individual labor pension accounts. The amount of expenses recognized in 2021 was NT\$208,895,000.

Notes: This annual report references the reporting recommendations in GRI 201-3, and uses the same consolidation method for preparing financial statements.

Open Communication Environment

We respect individual diversity and have adopted an open-door policy to create an atmosphere of open and transparent communication. We regularly hold meetings based on open communication, including: new employee orientation, departmental staff meetings, staff conference, and labor/management meetings (the opinions of all employees can be expressed by labor representatives) in order to provide a clear channel of communication that ensures that everyone's voice is heard. The "No Topic is Off Limits" suggestion box is provided for employee to communicate and express their opinions. Employees can make inquiries, suggestions, and complaints through the suggestion box. All letters are kept confidential, and the progress and improvement results tracking ensures harmonious communication between employees and the Company. We also provide communication and sharing platforms, including a bulletin board and the "Our Family" Employee Relations Website, which allows us to timely understand the needs and issues that employees are facing in real life, so as to positively guide and encourage staff and maintain a strong labor/management relationship.



7.1.3. Salary and Welfare Systems

Competitive Compensation Package

Employees are the most important assets of Macronix. To attract, motivate, and retain the best talent, we provide attractive and highly competitive compensation packages according to the importance and complexity of the job, without prejudice in terms of political ideology, gender, marital status, or any such differences. Bonuses are distributed according to individual performance. Based on the idea of sharing profit, when yearly final accounts indicate a surplus, we also distribute annual bonuses based on regulations from the Company's Articles of Incorporation and each employee's individual performance.

Non-Managerial Full-Time Employee Salary Information in 2021

Item/Year	2020	2021	與前一年度相比
Number of full-time employees	3,666 Person(s)	3,590 Person(s)	-2.07%
Total salary of full-time employees	5,220,151 Thousand NT\$	6,582,561 Thousand NT\$	26.10%
Average salary of full-time employees	1,424 Thousand NT\$	1,834 Thousand NT\$	28.79%
Median salary of full-time employees	1,093 Thousand NT\$	1,388 Thousand NT\$	26.99%

Welfare Benefits

In addition to providing leaves for full-time employees as well as labor insurance and national health insurance coverage, Macronix also offers relevant welfare measures which are described in the following table. We were awarded "Excellent Business Unit in Workplace Equality Promotion Award" from the Hsinchu Science Park Bureau in 2021 for our leave program and flexible working hours, maternal health protection measures, daycare measures, unpaid parental leave, and reinstatement assistance, all of which are superior to regulatory requirements.

Welfare Benefits	Description	Proactive Measures
Leave Programs	Various types of leave are granted according to laws and regulations such as: Parental leave, parental employee time adjustment, family-care leave, paternity leave, and menstrual leave.	<ul style="list-style-type: none"> ✓ Flexible Leave ✓ Accompanying Miscarriage Leave
Insurance Plans	As required by law, we provide labor insurance, national health insurance, and group insurance (life /accident/cancer/ medical treatment) coverage for our employees, as well as travel insurance for business-related travel abroad. We not only provide basic protection, but also allow employees to raise their insurance premiums and include dependents in the insurance policy at their own expense, depending on their needs; this is aimed to provide employees' families with an extra protection and care.	<ul style="list-style-type: none"> ✓ Dependent Enrollment at Own Expense
Welfare Subsidies	We provide subsidies for child birth, marriages, funerals, emergencies, injuries, hospitalization, and extracurricular cultural activities.	<ul style="list-style-type: none"> ✓ Encouraging Extracurricular Activities
Welfare Facilities	Employee dormitory, parking lot, restaurants, recreation and fitness center, green park, convenience stores, coffee shops, breastfeeding room, and healthcare room.	<ul style="list-style-type: none"> ✓ Recreation and Fitness Center Exclusive for employees
Pension Plans	Our pension fund payment and contributions fully comply with related regulations. In recognition of an employee's contribution and hard work, we also bestow medals to retired employees.	<ul style="list-style-type: none"> ✓ Assistance with Reemployment After Retirement
Staff Welfare Committee	We established the Staff Welfare Committee in accordance with laws and regulations, and systematically promote various employee welfare measures.	<ul style="list-style-type: none"> ✓ Designated Unit
Employees Counseling and Services	We provide free psychological consultation and guidance services, regular health examinations, and post-health examination consultation services.	<ul style="list-style-type: none"> ✓ 24-hour 0800 Service Hotline ✓ Free Psychological Consultation

Unpaid Parental Leave

In 2021, the number of employees qualified for taking unpaid parental leave was 253 (184 male and 69 female), of which 21 actually applied for taking unpaid parental leave (6 male and 15 female).

As of the end of 2021, the number of employees reinstated after taking unpaid parental leave was 7 (1 male at a 20% reinstatement rate; and 6 female at a 67% reinstatement rate).

Among 18 employees that were reinstated in 2020 (5 male; 13 female), 15 (3 male, 60% retention rate; 12 female, 92% retention rate) had stayed on for 12 months or more after their reinstatement as of the end of 2021.

Number of Applicants for Unpaid Parental Leave and Reinstatement and Retention Rates

Application rate

Category	Male	Female	Total
Number of employees eligible to apply for unpaid parental leave in 2021 (A)	184	69	253
Number of employees that applied for unpaid parental leave in 2021 (B)	6	15	21
Application rate (B/A)	3%	22%	8%

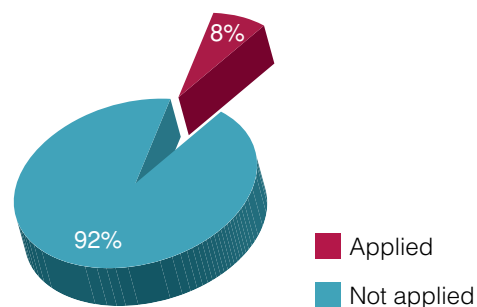
Reinstatement rate

Category	Male	Female	Total
Number of employees expected to be reinstated after unpaid parental leave in 2021 (C)	5	9	14
Number of employees reinstated after unpaid parental leave in 2021 (D)	1	6	7
Reinstatement rate (D/C)	20%	67%	50%

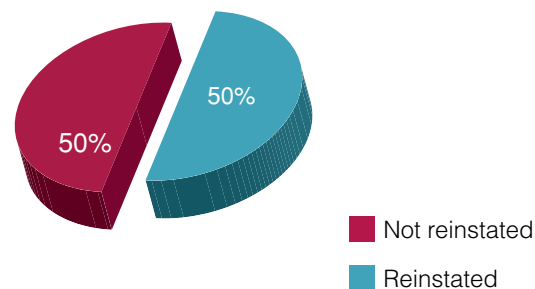
Retention rate

Category	Male	Female	Total
Number of employees reinstated after unpaid parental leave in the previous year (2020) and still active at the end of 2021 (E)	3	12	15
Number of employees reinstated after unpaid parental leave in the previous year (2020) (F)	5	13	18
Retention rate (E/F)	60%	92%	83%

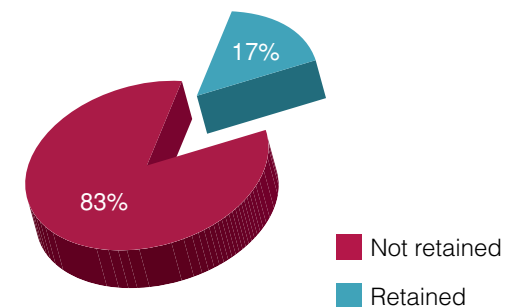
Application rate



Reinstatement rate



Retention rate



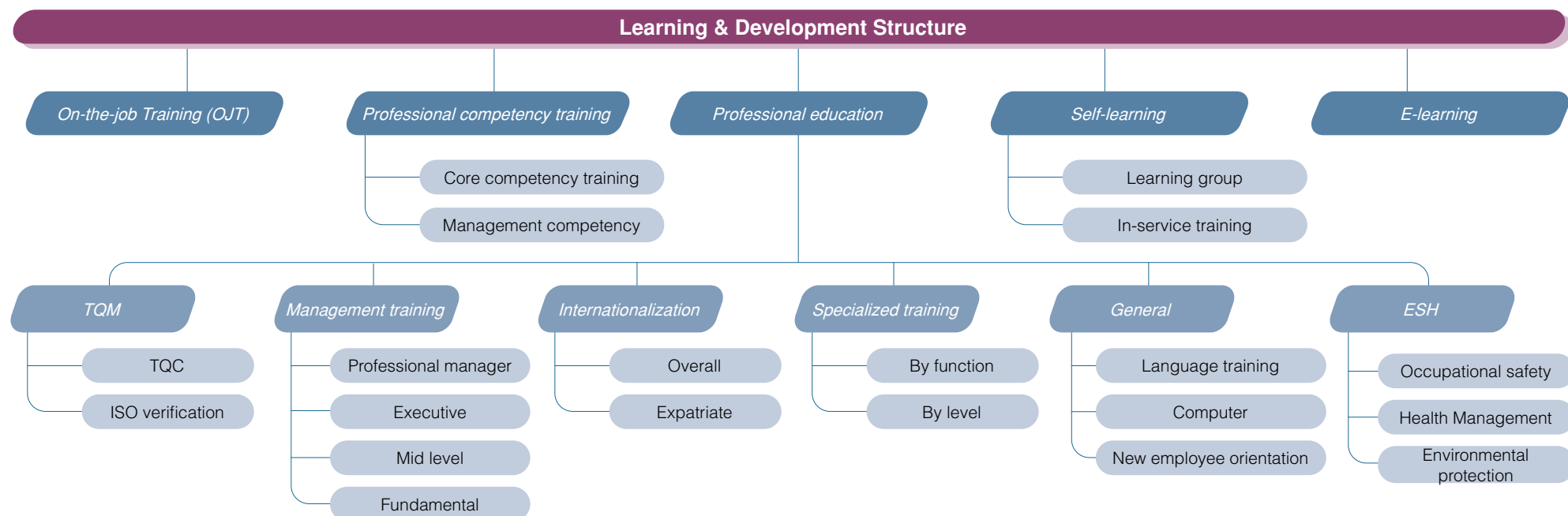
7.2. Learning and Development

Macronix believes talent is the foundation and the most valuable asset to the corporation. Hence, the Company has established a comprehensive training system and provided well-structured and constant training plans and learning roadmaps. This system accommodates different learning paths, competencies, and career ladder structure to provide staff with opportunities for self-growth and allow them to create their own individual development plans.

Our performance management system and individual development plans are closely connected. Interviews for performance reviews are held twice a year in order to confirm whether the employee is on track to achieve his/her individual performance goals and the organization's goals. Based on individual performance, face-to-face meetings between employees and their supervisors can be arranged in order to discuss what is needed to achieve the employee's individual goals and tailor an individual development plan, so as to broaden and deepen employees' professional knowledge and skills. In 2021, the performance appraisal implementation rate for each employee category was 100%.

7.2.1. Nurturing Talents

Macronix has developed a variety of training courses according to corporate strategies, job requirements, and individual development. With clear goals and strategic directions, we provide detailed learning roadmaps to employees to optimize their personal learning paths. These learning roadmaps include a series of activities that help employees achieve their goals and develop an extended skill set. These learning roadmaps also provide a list of learning programs that can help to increase their learning efficiency.



Our learning roadmaps include four categories:

- (1) New employee roadmap: For new employees to become familiar with the corporate culture through experience and learning. This allows new employees to adjust to their new work environment and quickly become immersed in our corporate culture.
- (2) Competency roadmap derived from company values: Courses that are designed to implement corporate values and impart related skills, so that employees can demonstrate the conduct expected by the Company.
- (3) Managerial roadmap for different levels of management: Provides ladder structures in management training and features various courses designed for different levels of management, enabling them to maintain steady progress and strengthen their management skills.
- (4) Professional roadmap based on various fields: Guest speakers from within and outside the Company are invited to deliver professional training, on topics including R&D, production, quality, risk management, human resources, administration, sales, and information management, in order to strengthen and deepen employees' professional skills.

Macronix also provides various learning channels to satisfy a number of learning needs of each employee. Our measures include:

- (1) Internal training: Guest speakers from within and outside the Company are invited to host various types of training courses.
- (2) External training: Allows employees to participate in external and work-related training courses and conferences.
- (3) On-the-job training (OJT): Allows employees to develop on-the-job professional knowledge, through job assignments, hands-on practice, and project participations; employees can acquire the necessary knowledge and skills by performing these tasks.
- (4) Online training: Macronix's e-academy learning platform was established to provide employees with easy access to online courses. Individuals so that individuals can study at their own pace and with their own schedule.



7.2.2. Macronix Academy

The Macronix Academy is the platform for employees to continue their learning and development; it has a comprehensive learning system to provide employees with complete and abundant resources for planning their career. Through knowledge gathering and sharing, employees can enjoy enriched learning resources to achieve their career goals.

Moreover, this helps employees to advance in their careers and equips them with skill sets needed to successfully overcome various challenges.

Macronix Academy features the facilities and professional equipment required for employees to learn in a positive environment, including:

- (1) Audio-visual room: Contains multimedia computers, books, DVD/CDs, video tapes, and audio tapes. This rich learning platform allows students to learn without boundaries.
- (2) Training classrooms: Macronix provides numerous lecture halls and classrooms of various sizes that can accommodate different types of course designs.
- (3) Computer classrooms: Personal computer access is available for all students so that they can significantly increase their learning efficiency.
- (4) International lecture halls: Accommodates seats for 250 people, making it the best location for large-scale training courses, conferences, and lectures.
- (5) Library: Features rich and diverse books, periodicals, and audio/video resources for employees to satisfy their learning needs.

Employee Training Costs and Hours

Indicator	Unit	2019	2020	2021
Total Training Costs	Million NT\$ million	10.61	8.06	9.49
Total Training Hours	Hour	173,461	189,047	239,205
Total Employees	Person	3,853	3,992	3,809
Total Revenue	Million NT\$ million	34,995	39,801	50,572
Total Training Costs/Total Revenue	%	0.03	0.02	0.02
Total Training Costs/Total Employees	NT\$1/person	2,755	2,018	2,491
Total Training Hours/Total Employees	Hour/person	45.02	47.36	62.80



7.3. Work-life Balance

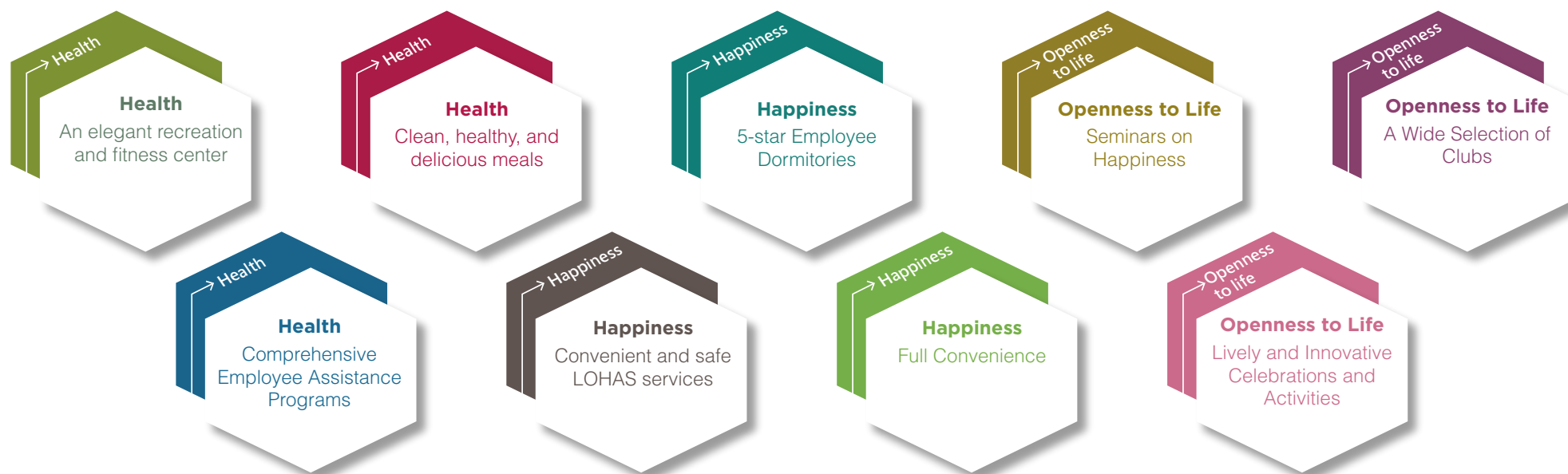
7.3.1. Macronix H2O

Macronix believes that personnel who enjoys physical and psychological health are the essence of a successful enterprise. For this reason, Macronix strives to provide an excellent work environment for staff, and promotes various approaches to take care of employees' health. In terms of infrastructure, we established a recreation and fitness center and a land for a park, suitable for all sorts of activities, and provide benefits such as health examinations. Our employees benefit from an energetic work environment and are encouraged to enjoy an active life!

To help employees form the habit of exercising, which can help them improve their sleeping quality, relieve stress, think more clearly, and perform tasks more efficiently, we actively encourage employees to participate in sports related activities/clubs/courses. Their participation helped Macronix obtain the "Taiwan i Sports" certification issued by the Sports Administration, Ministry of Education (valid for 3 years from 2020 to 2023).

We hope that all employees work in a healthy and happy way, with a work-life balance based on the values of "health, happiness, and openness to life" (H2O). We continuously promote the H2O Corporate Wellness Program to provide employees with comprehensive care. Macronix uses H2O to advocate and encourage employees to maintain a work-life balance and help create a bright future together with the Company.

H₂O=Health • Happiness • Openness to life



Health

An elegant recreation and fitness center

To provide an excellent recreational environment for our employees and their families, Macronix has taken a leading position in the industry by establishing the most comprehensive and comfortable employee recreation and fitness center. The center includes a 50-meter heated swimming pool, hydrotherapy spa, children's swimming pool, video game room, a fitness room, racquetball courts, aerobics classrooms, a karaoke room, and multi-purpose indoor courts. It provides employees with the most comfortable and healthy facilities for enjoying recreational activities.

Clean, healthy, and delicious meals

Macronix works with professional caterers to provide food with no MSG and low in sodium and oil. Partner companies also have professional nutritionists to ensure the healthiness and nutritional balance of the daily meals while the managing units routinely publish food safety inspection results. Furthermore, Macronix routinely inspects kitchen safety and food cleanliness, as well as fire safety management, in order to ensure that employees can eat healthily and with peace of mind.

Comprehensive Employee Assistance Programs (EAPs)

Macronix has integrated external professional resources and gathered teams from the Employee Relations Department, Health-promoting Office, and the Performance and Learning Development Department to establish employee-support services and implement the Employee Assistance Program (EAP); in combination with a professional consulting agency, we provide 24-hour psychological, legal, and financial counseling services free of charge for our employees. We hope that these efforts will be able to help employees deal with a variety of issues, such as health, marriage, family, finance, law, emotions, stress, and work, thereby assisting employees in solving difficulties in their everyday lives and at work.



Happiness

Convenient and safe LOHAS services

Macronix provides complete life management services with optimal comfort and support in the work environment. The company has set up on-site convenience stores and various vendors/stores to satisfy the nutrition, clothing, living, traveling, recreation, and leisure needs of employees. We hope employees enjoy working in such a balanced environment!

5-star employee dormitories

The Macronix employee dormitory totals 16,000 square meters and is situated in a beautiful community. The dormitory can accommodate 1,000 employees, and has a living room, restaurant, training classrooms, game room, elevators with views, garden, parking lot for cars and scooters, and a 24-hour central surveillance security system to provide a safe and comfortable living environment for employees.

Full convenience

Macronix provides employees with various on-site convenience services such as convenience stores, coffee shops, and travel agencies, so employees can complete daily activities while at work. In addition, Macronix has agreements with various vendors to provide employees with a variety of choices for the needs of daily life, including food, clothing, housing and transportation.



Openness to Life

Seminars on happiness

Macronix aims to constantly improve its employees' quality of life. For this reason, the Company organizes a variety of events and courses on daily living, leisure, and health topics to provide more energy and growth to employees. We hope that employees can achieve a perfect balance between family, health, friends, and spirituality in order to have satisfying, healthy, and happy lives!

A wide selection of clubs

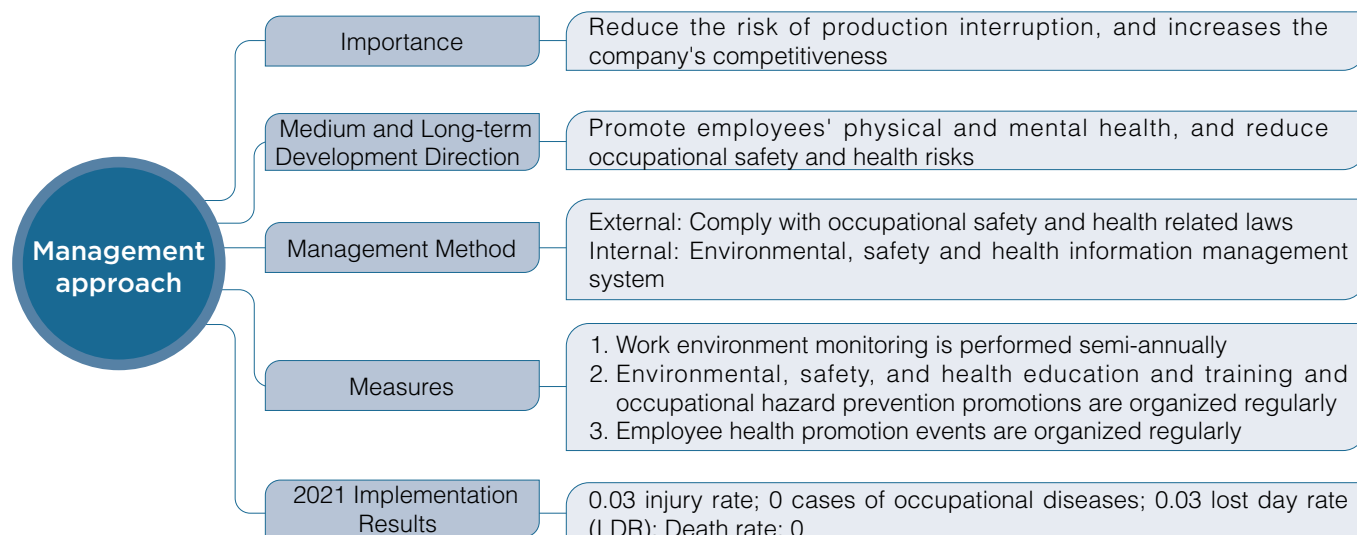
In order for employees to achieve a work-life balance, Macronix offers more than 40 clubs, such as creative balloon design, Chinese calligraphy, longboard, water activities, Chinese traditional music, and Chinese cultural studies, as well as charity clubs such as the Humane Society and Big Love Society, so that they can make friends and form new hobbies.

Lively and innovative celebrations and activities

In response to the pandemic, family days and sports games were put on halt to protect employees' health and the quality of those activities. The budget of these was turned into vouchers, included with the Company's bonuses for the Quintuple Stimulus Voucher, in order to encourage and thank colleagues for their hard work and active fight against the pandemic over the past year. Macronix continues to seek agreements with vendors and organize reference book collective buying to provide discounts and a convenient life for employees.



7.3.2. Safety and Health Promotion Management



Year	Workers	Head count	Ratio
2019	Macronix employed workers	4,006	97%
	Non-Macronix employed workers	140	3%
2020	Macronix employed workers	3949	97%
	Non-Macronix employed workers	103	3%
2021	Macronix employed workers	3,922	100%
	Non-Macronix employed workers	0	0%

Notes:

1. Source: Ministry of Labor Occupational Safety and Health Administration – Occupational Injury Online Report System
2. Macronix employed workers: Macronix employees;
3. Non-Macronix employed workers: Contractor personnel stationed in plants that follow instructions and are subject to supervision (there are no "noncontract employees" after October 2020.)
4. The number of workers is the sum of the monthly average number of workers at each plant

Occupational Safety and Health Management

Macronix is fully aware of the impact of employee safety and health on our corporate competitiveness, therefore Chairman Wu has always played the role of the Company's advocate ever since Macronix's inception in 1989. He urges employees to take environment, safety, and health management seriously, and establish safety and health work rules. Besides requiring executives of various levels to participate in safety and health management tasks, he shows respect and care for employees by replacing penalties with incentives. If there are any emergencies, occupational injuries, or false alarms in the workplace, employees can propose occupational safety and health issues or improvement suggestions through the suggestion box or labor representatives, and employees who make the best proposals are rewarded. Moreover, Chairman Wu actively introduced various international certification standards during the planning stages of Macronix's environment, safety, and health management systems, so that we could build a comprehensive platform and provide workers with a healthy work environment. We have strict and complete environment monitoring procedures that allow

us to examine the number of bacteria in drinking fountains each quarter and regularly check food safety to ensure employee health and safety. We periodically evaluate and review our management measures according to government regulations and customers' requirements. Macronix constantly promotes occupational safety and health concepts through training and promotion measures. We work together with employees and vendors to jointly create a healthy, safe, and comfortable working environment, and thus received the highest honor from the Occupational Safety and Health Administration of the Ministry of Labor – National Occupational Safety and Health Enterprise Benchmark Award in 2021.

Thanks to the efforts of its employees, Macronix obtained the ISO 45001 Occupational Health and Safety Management Systems Certification in 2019. We continue to gain the recognition of the competent authority each year, and our "excellent culture of safety" is transforming into the values of corporate sustainable development. In the future, Macronix will continue to promote employees' and visitors' safety and health, and build a work environment with a high-safety level.

Macronix Occupational Safety and Health Concepts and Performance

Macronix's core philosophy is to be "people-oriented". We fully understand the effect of employees' safety and health on our competitiveness. Combining occupational safety and health with environment, production, and quality control, we implement and promote this concept, and face strong international competitiveness. Using the five values of innovation, quality, efficiency, service, and teamwork, we will create a healthy, safe, and comfortable working environment, enhance the competitiveness of the enterprise, and achieve sustainable management and benchmark enterprise goals.

With the commitment and support from senior managers, all staff exercise to strengthen health. Senior managers lead exercises during working hours. Advancing deployment for COVID-19 pandemic mitigation, we actively implement defensive rapid screening. Occupational safety and health budgets are not getting lower, and the funds have been growing year by year. Less salt and oil, and no MSG, balanced nutrition, coupled with food safety testing ensures employee food safety. Adoption of the 8-hectare Macronix Park and NTS200-million investment into building an activity center, provide employees with a good place for healthy parent-child sports and leisure activities, physical and mental relaxation, ecological conservation, and diversified community activities. It creates a comfortable and healthy working environment.

We also implemented monitoring of high-risk contractor operations, developed a high-efficiency occupational safety license management system, introduced advanced gas detection systems and AI occupational safety systems, etc., all of which greatly improve occupational safety management performance. We hire employees with disabilities for positions, which are superior to regulatory requirements. The Company also adopted the beautiful Nanliao bicycle path in northern Taiwan. We assist the Hsinchu City Government and Hsinchu Science Park Administration in setting up "Macronix Safe and Healthy Family" system to coach SMEs, and adopt the model of leading the smaller factories by passing the experience of large factories to them to help improve management performance. The Company has been cultivating scientific talent for the nation and society for a long time. It has held the Golden Silicon Awards and Science Awards, and was awarded the highest honor of the Ministry of Education—"Outstanding Educational Foundation". Macronix also served as a president of the Taiwan Occupational Safety and Health Management System (TOSHMS) north district promotion association under the Occupational Safety and Health Administration and the general convener of the Health and Safety Committee of the park association to promote occupational safety management activities, showing Macronix's outstanding performance in CSR occupational safety public welfare activities.

Macronix has introduced an AI occupational safety system, and engineering personnel can automatically conduct different verifications when entering the factory, including engineering insurance and engineering operation permits. The AI face recognition system is able to understand the correctness of the project and provide construction security, omitting complicated manual verification procedures, effectively improving administrative efficiency, and providing data on the number of people entering and leaving the factory, as well as personal safety.

It is a great blessing for construction and safety in contractor management.

Xu Neng-Yuan, Nomura Micro Science Engineering/Deputy General Manager

Once again won the highest honors
for occupational safety and health
management
the 2021 "National Occupational Safety
and Health Award"



Hazard Identification, Risk Assessment and Accident Investigation

In accordance with the Occupational Safety and Health Act and the requirements of the occupational safety and health management system (ISO 45001), risk assessments are conducted by personnel certified upon training to identify the hazards and risks during routine and non-routine operations of employees (including visitors and vendors), to perform risk rating, and to establish an improvement process and prevention and control management measures. In addition to regular identification and evaluation, when the operation activities are changed or abnormal conditions occur, hazards are immediately identified and risks are assessed to reduce the Company's operational risks.

In accordance with the Occupational Safety and Health Act, employees have the right to stop the work and evacuate to a safe location if there is any potential imminent danger at a workplace. Therefore, the Company has formulated relevant rules governing the rights to hazard identification, stopping the work, evacuating, and reporting. Moreover, exercising such rights will not be punished by the Company.

The risk assessment is categorized into six levels. Levels 1 and 2 (such as fires and explosions causing employees' deaths and interruption of operations) are high risk levels, the top priority risks that should be reviewed and improved. With accordance to PDCA Macronix will improve the atmosphere and continue to follow up on and improve matters related to each risk level to ensure a normal operation of the occupational safety and health management system.

The Company has formulated the occupational injury and accident investigation procedure, which classifies incidents into four levels, i.e., "Near-miss" (Level 0), "Mild" (Level 1), "Normal" (Level 2), and "Severe" (Level 3); investigations are undertaken in accordance with this rating. The personnel of the unit, where the accident occurred,

enter the incident information into the incident investigation system, analyze causes, and review corrective measures for improvement. All plants simultaneously implement hazard identification and risk assessment/improvement, adopting a PDCA approach to prevent accidents from happening again.

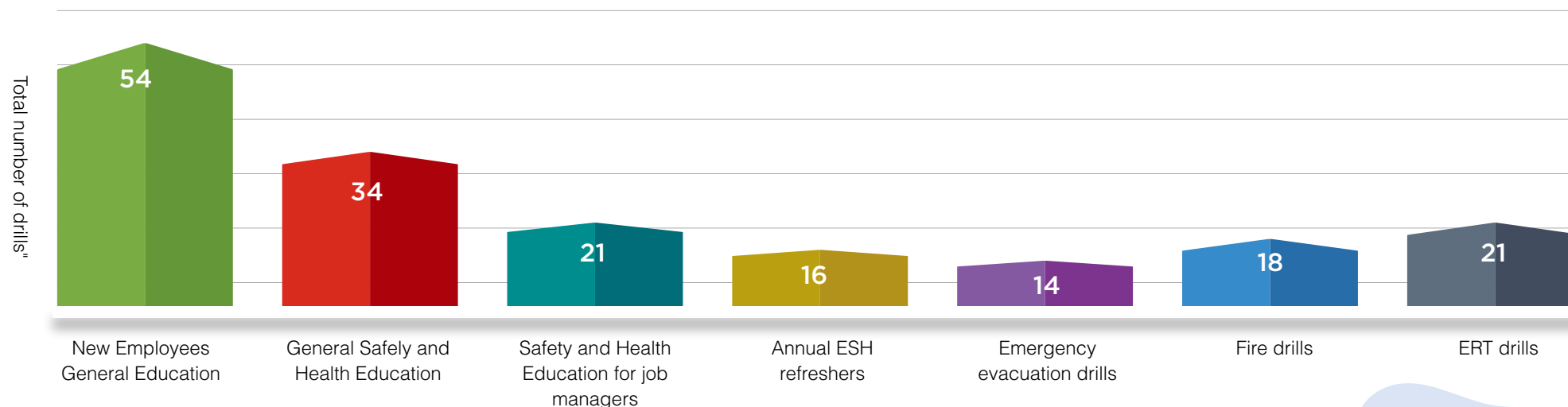
In respect of the operations management, Macronix has also established the Occupational Safety Health and Environment Committee (OSHEC), which was led by the president of Macronix to oversee the promotion and execution of environmental protection, safety, and health measures. As of 2021, Macronix OSHEC consisted of 5 managers, 4 directing supervisors, 20 labor representatives, 6 technical engineering representatives, and 11 environmental, safety, and health representatives; labor representatives account for 43% of the committee. The committee convenes meetings at least once every quarter, mainly to discuss the Company's environmental, safety, and health management operations, organization, and supervision issues, as well as to track the progress of various projects. Each manufacturing facility holds monthly or quarterly meetings to review the implementation of various initiatives.

We offer our employees adequate personal protective equipment (PPE), complete safety and health education and training, and a 24-hour emergency response team (ERT) that works four shifts in rotation. The business continuity program (BCP) has also been created to ensure employee and corporate safety. We also organize education and training on occupational safety and health, emergency evacuation drills, fire drills, and emergency response team (ERT) drills (including earthquake, fires, gases, and chemicals) on a regular basis to enhance employees' response to emergencies. The workplace is also regularly inspected for comfort. A total of 178 drills were organized for a total of 14,861 participants in 2021.

Hazard Identification and Risk Assessment Process



2021 Macronix Environment, Safety, and Health Education and Training Statistics



In addition to establishing standard operating procedures, the following measures have been taken to prevent any occupational hazard or disease from impacting employees and corporate operations:

- Professional audits and 24-hour monitoring are provided.
- All accidents are investigated and followed up with related safety improvements in order to prevent any reoccurrence or further incidence.
- Training for new and current employees and PPE management are provided.
- Occupational safety meetings are conducted at each level.
- The workplace is monitored, and occupational safety is continuously improved according to regulatory requirements.
- A 24-hour health service center is available for conducting professional health check management, health promotion activities, health lectures, psychological counseling, and an employee sports and fitness center.
- An employee assistance program (EAP) has been implemented and doctors specializing in occupational diseases have been invited on-site to guide and instruct employees concerning work safety and health.
- Regular doctor visits are scheduled at our facilities to provide medical advice to employees, help conduct health risk evaluations, and assist with health management at different levels.
- The unit responsible for protecting against epidemics collects the latest epidemic prevention information and then integrates any related epidemic control measures in order to safeguard employee health.
- Pregnant employees are taken care of by implementing the “Three No’s”, no night shifts, no heavy lifting, and no radiation work, and by creating a friendly workplace.



Macronix Employee Disabling Injury-Related Indicator in 2021

Year	Gender	Head count	Number of Deaths Caused by Occupational Injury	Total Work Hours (hr)	Injury Rate (IIR)	Occupational Disease Rate (ODR)	Lost Day Rate (LDR)	Absence Rate (AR)	Rate of Death Caused by Occupational Injury
2019	Male	2268	0	4,536,000	0.00	0	0.00	0.003	0
	Female	1738	0	3,476,000	0.12	0	0.12	0.004	0
	Total	4006	0	8,012,000	0.05	0	0.05	0.004	0
2020	Male	2278	0	4,556,000	0.09	0	1.27	0.004	0
	Female	1671	0	3,342,000	0.12	0	5.33	0.007	0
	Total	3949	0	7,898,000	0.10	0	2.99	0.005	0
2021	Male	2304	0	4,589,568	0.04	0	0.04	0.003	0
	Female	1618	0	3,223,056	0.00	0	0.00	0.008	0
	Total	3922	0	7,812,624	0.03	0	0.03	0.005	0

Notes:

1. Types of work injuries calculated by work-related injury statistics
2. Total work hours = Total number of employees × 8 hours × Number of work days in the year
3. Leaves of absence includes ordinary sick leave, menstrual leave, occupational injury leave, special sick leave, and quarantine leave.
4. $IR = (\text{Number of disabling injuries} \times 200,000) / \text{Total work hours}$
5. $LDR = (\text{Total work days lost} \times 200,000) / \text{Total work hours}$
6. $ODR = (\text{Number of occupational diseases} \times 200,000) / \text{Total work hours}$
7. $AR = (\text{Number of hours absent}) / \text{Total work hours}$
8. $\text{Death rate} = (\text{Number of deaths caused by occupational accidents} \times 200,000) / \text{Total work hours}$
9. All of Macronix's fabs are located in Taiwan.
10. As the Company has no unified channel for recording occupational injuries, occupational diseases, or the number of hours absent related to contractors, such information is not disclosed. The relevant information collection system is expected to be launched in 2022.
11. The transportation equipment arranged by Macronix didn't cause any traffic accident.



Health Promotion Management

People working in today's world often experience high levels of work-related stress. Since employees are our most important asset, Macronix actively examines employees' physical and mental health problems. Only with healthy and happy work partners can the Company be filled with the vital force and sustain its operations; this is the management concept of Macronix.

■ Continued to promote the Macronix Sports Day Program (since 2011):

- (1) With the support and leadership of the chairman and supervisors at all levels of management, the Company's activity center was used by about 6,000 people in 2021 (due to the pandemic, the activity center was closed from January to March and May to August, and the number of visitors was limited).
- (2) Established diverse and active clubs, with a total of 24 different sports clubs.

■ Weight loss course:

- (1) Obesity continues to be the top ten abnormality in the Company's health examination. In 2021, the Company cooperated with contract vendors to conduct weight-loss classes for colleagues with BMI>24 and above. The participants, 79 people, joined core muscle group exercise courses (live + live broadcast). In total 17 sessions were organized. The total weight loss was 102.5 kg.
- (2) Health education messages are regularly displayed and promoted as slideshows on TV, online courses, and posters.

■ Increase the number of participants in health promotion activities:

- (1) Conduct annual surveys on the needs of employees and plan appropriate health promotion activities.
- (2) Lung cancer has been the top cause of death in Taiwan in recent years. In 2021 Macronix collaborated with Min Sheng General Hospital (hospital qualified to perform laborer physical examinations and medical check-ups) to provide free low-dose CT lung screenings to assist employees with disease prevention and provide subsequent health care. A total of 193 employees took advantage of this and 108 family members took advantage of the discounted price.
- (3) Free "heart CT scans" and early detection of cardiac arrest prevention help

are provided to the employees. A total of 202 employees benefited from such assistance. Employees' family members are provided with the discounts, and a total of 52 family members participated.

- (4) Osteoporosis is the second most important disease in the world, only behind cardiovascular disease. Hence, we continued to work together with Hsinchu Science Park Clinic (qualified hospital for laborer physical examinations and medical check-ups) in 2021. A total of 139 employees participated in the free dual energy bone mineral density x-ray inspection (DXA).
- (5) Autumn and winter are the flu season every year. Flu prevention ways include not only emphasis on personal hygiene and hand washing, but also receiving the flu vaccine. We worked together with Hsinchu Science Park Clinic (qualified hospital for laborer physical examinations and medical check-ups) in 2021 to provide flu vaccination at employees' own expense for 276 employees.
- (6) Hepatitis B is prevalent in Taiwan, and its most severe complications are cirrhosis and liver cancer. These two diseases have remained major causes of death in Taiwan to this day. Patients diagnosed with cirrhosis or liver tumors are the main targets for performing an abdominal ultrasound. The inspection can also achieve early discovery of issues with the liver, gallbladder, bile duct, pancreas, spleen, and kidneys. Hence, we continued to work together with Min Sheng General Hospital (qualified hospital for laborer physical examinations and medical check-ups) in 2021 to provide total of 211 people with the self-paid abdominal ultrasound examinations; however, the examination was interrupted due to the pandemic.
- (7) We started planning to include CPR+AED training in our regular employee training in 2020 to protect the lives of our employees and their families! Physical courses were reduced and online courses were filmed in response to the pandemic, with 2,875 employees completing online training; CPR+AED physical lectures originally scheduled for 2021 were cancelled due to the pandemic. Training has been included in the compulsory course for new recruits from July 2021.

■ Maternal worker health management:

- (1) Care programs for female employees have been introduced to implement maternal health care measures that allow employees to work at ease while also caring for their families. Mothering classes are held every month, and cancer screening

activities take place occasionally to provide health-related information for women. Macronix advocates breastfeeding, and each of its plants has set up a breastfeeding room that offers comfortable equipment exclusively for employees who need to breastfeed. We also offer small gifts to employees who have been breastfeeding for more than 6 months.

(2) We have won awards in the breastfeeding room contest held by the Hsinchu City Government for eight consecutive years (2013-2020), and won the Outstanding Award in 2020 (effective for three years).

■ Since working in the high-tech industry is often competitive and stressful, the Company has planned a long-term EAP to arrange a series of stress-relieving seminars, invite psychologists to provide consultation services at the plants (consultations can also be provided outside of the Company by calling a toll-free number), and employ visually impaired masseurs/masseuses to provide massages. (In 2021, physical contact activities were discontinued due to the pandemic)

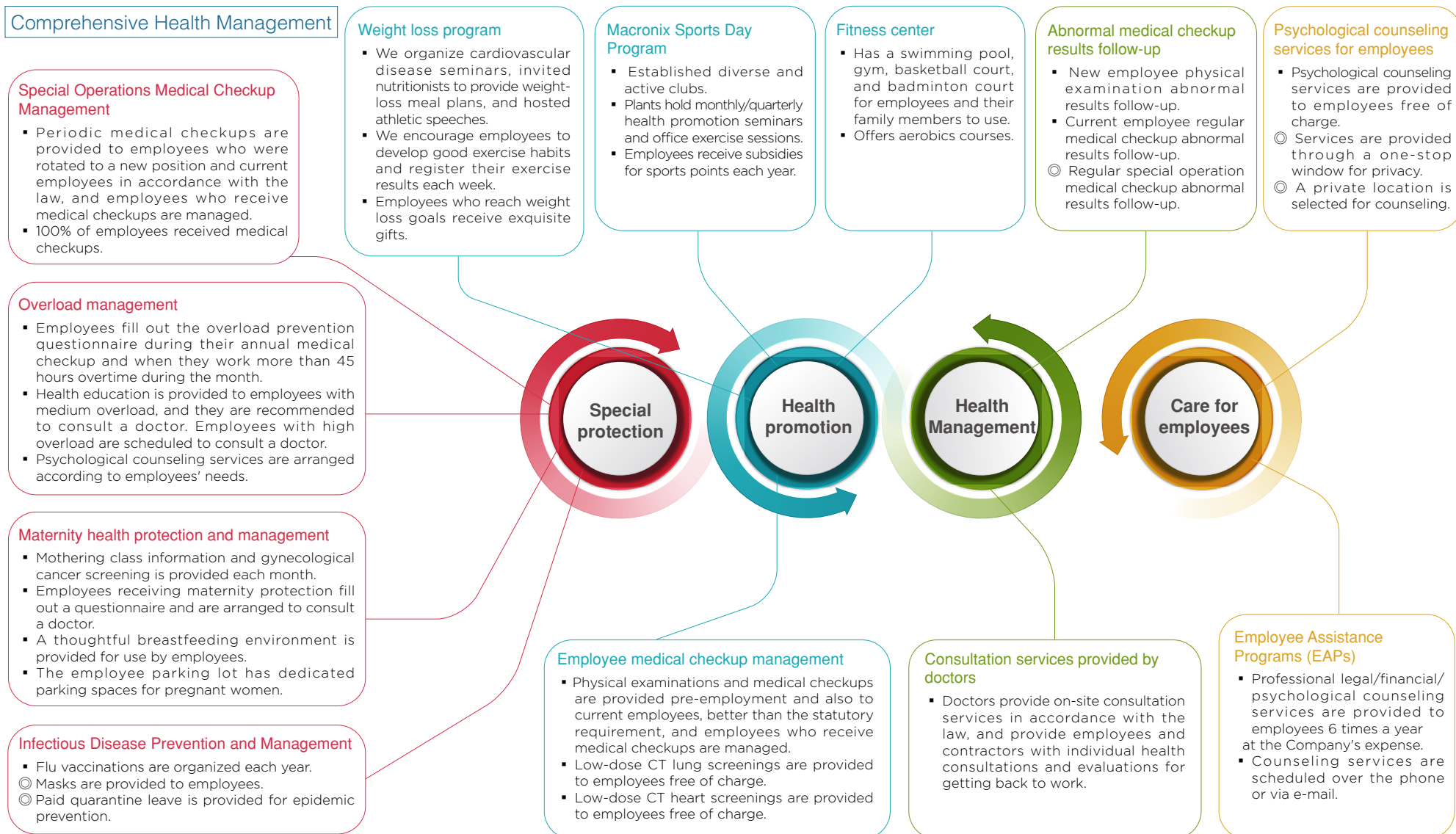
■ COVID-19 prevention and management:

- (1) Macronix immediately established the COVID-19 Epidemic Prevention Office when the COVID-19 pandemic broke out in early 2020. The Task Force frequently convenes anti-epidemic meetings to formulate anti-epidemic policies and various management measures, and to establish a standard operating procedure, a reporting mechanism, and countermeasures.
- (2) Appointed dedicated staff to track and pay attention to pandemic mitigation and management measures, e.g., E-system (body temperature & pandemic prevention statement, filled in daily through computer or mobile phone, registration management of vaccine administration, implementation of the contact tracking system in public areas, and application for visitor manufacturers to enter the factory), pandemic mitigation statement, environmental cleaning and disinfection, food safety and hygiene, social distancing, anti-pandemic consulting services, anti-pandemic supplies management, an anti-pandemic board for awareness, the anti-pandemic e-management system, and visitors entry permit application.
- (3) Rolling review of the most appropriate pandemic prevention measures in response to changes in the pandemic: employees' work status adjustments, work from home, restrictions of the red/blue work teams, adoption of online meetings/training sessions, meals self-health management, limited number of people for elevators/pantry/toilet, etc. It also includes strengthening or upgrading pandemic mitigation measures, in order to implement the pandemic mitigation management of employees, visitors, and contractors, to maximize the effectiveness of pandemic prevention and protection of the health of personnel.

■ Awards & achievements in 2021

- ★ Awarded by Health Promotion Administration, Ministry of Health and Welfare: Health Promotion Badge - Accredited Healthy Workplace in (2019-2021) in 2019
- ★ Received the Breastfeeding Room Certification (2020-2023) from the Public Health Bureau, Hsinchu City in 2020
- ★ Received the Breastfeeding Room - Award of Distinction from the Public Health Bureau, Hsinchu City in 2020





7.4. Social Welfare

Since the inception of Macronix in 1989 till now, we keep maintaining sustainable operations and continue to enhance shareholders' rights and interest and care for the environment. Macronix never forgets to repay this environment and society that nourishes it.

We have devoted longtime efforts to community involvement through the Macronix Education Foundation, particularly in the three main areas, such as science education, cultural creation assistance, and care for the disadvantaged.

7.4.1. Planting the Seed of Science Education

Background

We believe that only by constantly fostering technology talent can Taiwan keep its competitive and superior position in the international arena. Accordingly, Macronix made donations to create the Macronix Education Foundation in 2001, chaired by the Chairman of Macronix, Miin Wu. Macronix donated to the Foundation approximately NT\$20 million to hold its primary events. Macronix employees also participate in the Foundation's events. It is anticipated that through the strength of the Macronix Education Foundation, resources can be maximized systematically, enabling more people to participate, therefore increasing the innovative competency of the younger generations, and expanding the knowledge and perspectives of our domestic scholars.

Tenets

The foundation's work focuses on enhancing the value of knowledge economy, cultivating science and technology talent, caring for children's and adolescents' physical and mental development, and elevating social harmony and quality of life. In accordance with relevant laws and regulations, it has endeavored to:

- I. Sponsor technological development.
- II. Reward outstanding science and technology talent.
- III. Cultivate children and adolescents to develop an interest in learning knowledge related to science, humanities, and nature.
- IV. Plan activities such as nature observation, cultural events, historic site visits, and folk art events.

- V. Handle public welfare and education related matters that conform to the tenets of the foundation.

Outcomes

By focusing on cultivating basic scientific knowledge and nurturing talented engineers, the Foundation continues to implement the Future-Knowledge Engineering Program because we know that education is the basis for the future that must be constantly planned and promoted. Furthermore, the foundation holds various activities for different groups, including the Macronix Golden Silicon Awards, Macronix Science Awards, Macronix Chair Professor Project. The Foundation also supports national science education in order to foster scientific talents in Taiwan.

For more than 20 consecutive years, nearly 40,000 teachers and students have participated in the Macronix Golden Silicon Awards and Macronix Science Awards with extreme enthusiasm. Scholarships worth over NT\$170 million have been awarded. In 2013, the Macronix Education Foundation participated in a rating evaluation conducted by the Ministry of Education for the first time and received the highest "outstanding" rating. In recognition of the Macronix Education Foundation's important contributions to Taiwan's science education, Chairman Miin Wu, leader of the Foundation, received the Social Education Contribution Award from the Ministry of Education in 2017, and won Country Winner and Business Paradigm Entrepreneur of EY Entrepreneur Of The Year 2018. In 2021, Macronix Education Foundation was once again recognized by the Ministry of Education with the honor of "Social Education Contribution Award in Group category".





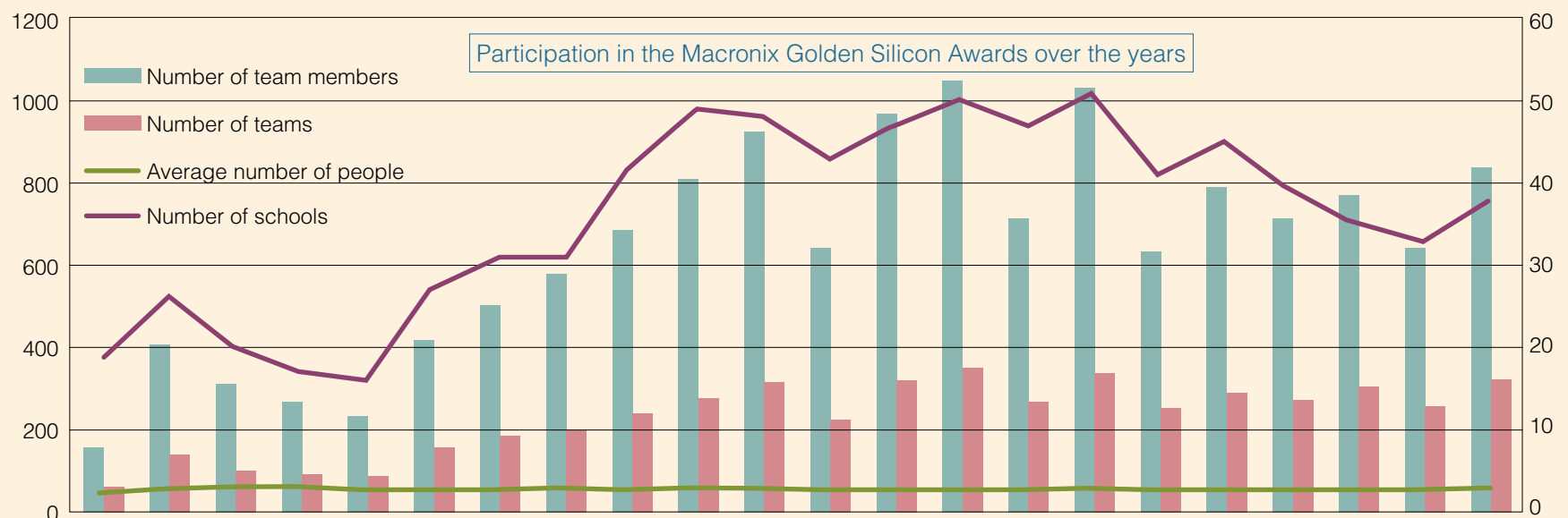
Macronix Golden Silicon Awards

To inspire Taiwanese college students' creative spirit and hands-on experience in the field of semiconductor research, as well as to promote positive exchange and interactions between industry and academia, the Macronix Education Foundation held the first Macronix Golden Silicon Awards - Semiconductor Design and Application Competition in 2000. Now, over 17,000 students and teachers nationwide have participated in these competitions. It is regarded as the most important competition among electronic and electrical engineering students for evaluating their performance before graduation. In 2021, when the world encountered the COVID-19 pandemic, the Macronix Golden Silicon Awards were held online to continue the work of cultivating scientific and technological talents during the pandemic. Envisioning the industry's development trends, Macronix continues to incorporate a wide variety of applications, such as biomedicine, robotics, smart homes, automotive electronics, IoT, and AI into the Golden Silicon Awards. The goal of adding new categories to the competition is to attract and encourage students to propose innovative ideas and exciting creations in relevant domains, thus further stimulating domestic research trends.

The Green category of the awards was established within the Application Group to promote sustainable development of the environment, encouraging students to engage in energy conservation and environmental protection-related research. Over the years, 162 works have been submitted under this category, including a winner of the Judging Panel's Gold Award.



■ Wu Tsung-tsong, Minister of the Ministry of Science and Technology (MOST), served as the VIP awardee of the Golden Silicon Awards and was very attentive to the creative works displayed by the award-winning students.



	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd
Number of team members	157	408	311	271	234	417	504	579	686	810	924	642	968	1046	713	1033	635	792	713	771	644	833
Number of teams	61	140	100	91	86	159	186	199	238	278	315	223	319	352	269	336	253	289	272	303	255	275
Average number of people	2.5	2.9	3.1	3	2.7	2.6	2.7	2.9	2.8	2.9	2.9	2.8	3	2.9	2.6	3	2.5	2.9	2.8	2.5	2.7	3
Number of schools	19	26	20	17	16	27	31	31	42	49	48	43	47	50	47	51	41	45	39	35	33	38

To inspire senior high school students' interests in natural and applied sciences as well as encourage them to explore science, develop their potential for innovation, outside-the-box thinking, and diversified learning enhancement, the Macronix Education Foundation held the first Macronix Science Awards in 2002 with Chia-Tung Lee, Emeritus Professor, National Chi Nan University, serving as the convener.

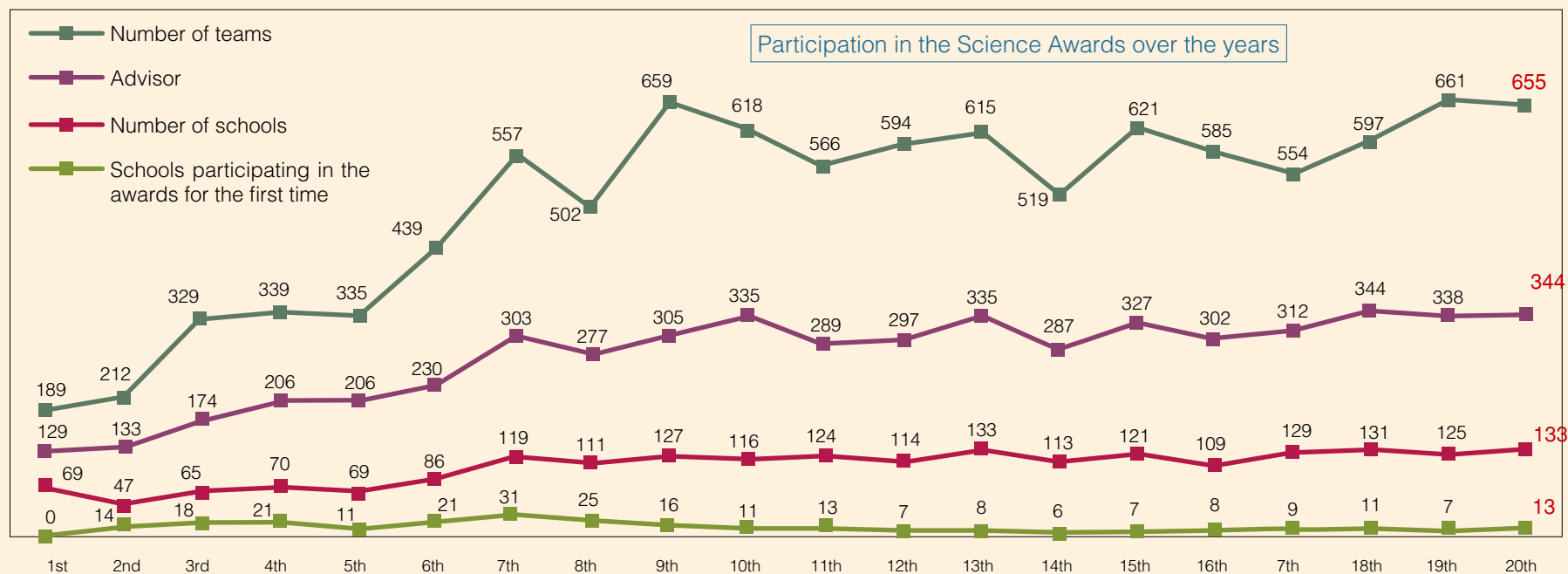
The number of students and schools participating in the Macronix Science Awards has grown from 189 teams in the first year to a total of 655 teams, comprising 20,000 participants, by the twentieth year. Cumulative awards from previous competitions have exceeded NT\$90 million, and an average annual award close to NT\$5 million is bestowed to the award-winning teachers and students of the year, making it the science competition with the highest monetary amounts in Taiwan. More than half of the high schools across Taiwan have participated in these competitions, which has been acclaimed in Taiwan as the "Nobel Prize" of senior high school students due to its vast influence. 2021 is the 20th anniversary of the Macronix Science Awards, for which occasion the scholarship amount was increased by 20%. The award-winning students receive a maximum of NT\$576,000 in four-year university scholarships encouraging more students who love science to join competition. In addition, we invited a total of 29 award-winning schools, teachers, and students to share their experience on the 20th Anniversary Website- Influence over 20 years.

Macronix Science Awards





■ Administrative Deputy Minister of Education Lin Teng-chiao and Deputy Minister of Science and Technology Tzong-Chyuan Chen attended the awards ceremony to encourage the award-winning teachers and students.



Macronix Science Awards Association

To extend the creative spirit of the Macronix Science Awards, the foundation established the Macronix Science Awards Association in September 2004, which is composed of all prize winners. Through the association, new attendees can network with the senior members to expand their scientific horizons from diverse fields' perspectives, thereby helping each other grow and form lifetime bonds.



The foundation has a project team that guides the association officers in planning and execution of the association's annual meetings. Various seminars are held from time to time inviting Macronix Science Awards committee members and leaders in technological, social, and cultural fields to inspire members to explore life and knowledge in a relaxed, dynamic, and enjoyable manner.

Macronix Chair Professor Project

Macronix has also setup the Macronix Chair Professor Project, which helps academic institutions in Taiwan offer positions for senior faculty and famous researchers in the areas of VLSI and SoC. Macronix hopes that doing so will give students the opportunity to learn about state-of-the-art technologies and keep up with the latest industry developments. The Company also encourages the participation and collaboration of industry, academia, and research institutions.

Donations to NCKU to Construct the Cheng Kung Innovation Center-MACRONIX Hall to Cultivate Interdisciplinary Talent

Macronix attaches great importance to the promotion and development of knowledge engineering. After donating NT\$400 million to National Tsing Hua University to construct the Macronix Learning Resource Center (Macronix Building), we donated NT\$420 million to National Cheng Kung University in 2019 to construct the Cheng Kung Innovation Center-

MACRONIX Hall to foster technology talent. National Cheng Kung University founded the Miin Wu School of Computing in 2020, to provide teachers and students with an excellent research environment, cultivating interdisciplinary talent for Taiwan with an expertise in computational science, artificial intelligence, and data science. This will allow Taiwan to take an important place on the international stage in the field of technology, which will be crucial to changing the society and solving humanity's problems.

Sponsoring Important Science Education Organizations

Since its establishment in 2001, the Macronix Education Foundation has continuously promoted science and technology education by upholding the values of the knowledge economy, caring for the development of children and adolescents, and elevating social harmony and quality of life. By supporting major organizations devoted to promoting fundamental science education, including the Wu Chien Shiung Scholarship Foundation, Yuan T. Lee Foundation Science Education for All, and Boyo Social Welfare Foundation, the Macronix Education Foundation aims at inspiring students to learn about science from everyday life, find an interest in science, and ultimately contribute new findings to society.

Furthermore, Macronix sporadically sponsors colleges to organize EE camps or invites students and charity groups to visit Macronix for popular science education activities.

The Macronix Education Foundation has also made donations every year since 2012 to the International Organization of Chinese Physicists and Astronomers (OCPA) for the Outstanding Young Researcher Award (Macronix Prize) to encourage young overseas Chinese researchers in the fields of physics and astronomy in order to jointly promote high-tech developments. Research grants have been awarded to 13 recipients.



- Chairman Miin Wu was invited to give a speech during the Wu Chien-shiung Science Camp, sharing his academic and entrepreneurship experience with nearly 200 high school students from around Taiwan.

7.4.2. Fostering Local Culture and Creative Industries

Inviting Cutting-Edge Taiwanese Artists to Design Award Trophies has been recognized by the Ministry of Culture Arts and Business Awards

The Macronix Golden Silicon Awards and Macronix Science Awards have become a major battleground for scientific competition in Taiwan. To cultivate local artists, the Macronix Education Foundation has set an example by inviting different local artists to design the trophies every year. The Macronix Education Foundation has supported local sculptors with donations of over NT\$1 million per year, with the total exceeding NT\$18 million over the years and with almost 30 artists benefiting from this. These creations are the spiritual accomplishments created by more than 20 artists, and have allowed over 40,000 participants a chance to appreciate the beauty of art as they cheer the winners of the awards. For 21 consecutive years, the Macronix Education Foundation has supported local Taiwanese artists in creating works. In 2021, the foundation was awarded with the "15th Arts and Business Awards - Permanent Award - Bronze Award" by the Ministry of Culture.



Technology for Charity - Care for Underprivileged Groups

The Macronix Education Foundation not only cares for the development of science and technology talent, but also places importance on disadvantaged groups. Since 2009, the Macronix Education Foundation has sponsored the St. Joseph Social Welfare Foundation to assist mentally and physically challenged children and adults in adapting to society and workplaces, and gaining independence through rehabilitation and various medical resources.



- Macronix Education Foundation was awarded with the 15th Arts and Business Awards - Permanent Award - Bronze Award, CEO I-Ju Chang (right) receiving the award on behalf of the Foundation.



7.4.3. Environmental Protection and Charity Events

Adopting a Bicycle Eco-path in Hsinchu City and Co-organizing ESH & Charity Events

Based on its corporate social responsibility, Macronix adopted a 12-km long bicycle eco-path in Hsinchu City, located south to the Hsinchu Fish Harbor, north to the Jincheng Lake. Alongside the path, people can enjoy the scenery changing from the Hsinchu Fish Harbor, Hsinchu Environmental Protection Park, Sea Viewing Park, the seawall and sandy coast near the Hsinchu City EPB Incinerator Plant, Hsinchu City Coastal Low Carbon Center for Environmental Education, Hai-Tian-Yi-Xian Sea-watching Wooden Trail, Konan Coastal Scenic Area, Konan Canal, and finally reach Jincheng Lake, the center of Hsinchu City's bird-watching zone. In particular, the Hai-Tian-Yi-Xian scenic spot's splendid scenery attracts many people during weekdays and weekends that come to enjoy the gentle breeze blowing along the wooden trail. Macronix has assigned dedicated employees to clean the path every week to provide a clean and tidy environment for the public, so that people can spend time with their kids in pleasant surroundings. Thanks to the bicycle path's beautiful landscape, families can create unforgettable memories and enhance their health.

In 2021, Macronix was recognized with a "Certificate of Gratitude for Adopting the Hsinchu Environmental Bikeway"; and won the Clean Air Zone Adoption "Premium Award" issued by Environmental Protection Administration Executive Yuan.



7.4.4. Employees Participation in Charity Event

Macronix, to fulfill its corporate social responsibility in response to the UN SDGs, has taken active steps to fulfill social responsibility, and has demonstrated compassion for those in need during the occurrence of major disasters, helping people in all corners of society. By actively establishing charity clubs, raising funds for those clubs, and helping with allotting club meeting sites and human resources, we show our enthusiasm and support for social charities to all Macronix employees, and deeply endow the DNA of social responsibility in the hearts of our employees.

Humane Society

Macronix set up an internal employee charity club, called the Humane Society, in March 2001 with the purpose of helping those in need and increasing social harmony. Comprised by a group of caring Macronix employees—the Humane Society—works with other charitable organizations, such as the Hsinchu Taiwan Fund for Children and Families, to help the underprivileged in Hsinchu. The Humane Society was approved by the Hsinchu City Government in 2008 to change its name to the "Humane Society Service Organization".



The Macronix Family Sponsorship Drive

The Macronix Family Sponsorship Drive has entered its 19th year, unwaveringly calling upon employees to donate to and support social welfare organizations, with total donations in 2021 amounting to NT\$2.31 million. The drive sponsors 137 children from six charity organizations including the Taiwan Fund for Children and Families (aboriginal children), Sacred Heart Home, Miracle Home (teenagers), World Vision, Humane Society Service Organization, and Eden Social Welfare Foundation.

Emergency Aid

Upholding the purpose of helping people in distress, the Humane Society organizes fundraising activities to help colleagues and their family members who encounter major crises or need urgent assistance.



Big Love Society

Macronix's Big Love Society is the first charitable organization in the Hsinchu Science Park that focuses on healthcare. It promoted the "10,000 Organ Donor Signups with National Health Insurance Card" initiative as its first phase goal. The year 2017 marked the 10th year of its promotion, when the society completed its 10-year mission to help promote organ donation. In the future, the promotion of organ donation will be carried on by medical professionals, and Big Love Society will withdraw from related campaigns. However, the spirit of big love will not end, and Big Love Society will continue to gather together company employees and the public to help all corners of society that are in need of assistance.



Promotion of After School Classes for Disadvantaged Students

In 2013, Big Love Society initiated a charity event to collect monthly donations for Boyo Social Welfare Foundation to help disadvantaged children attend after school classes. Over eight years have passed and over 72 students participated in after school classes in 2021, thanks to the donations that totaled NT\$524,000.

Promotion of Charity Group Activities

Big Love Society actively promotes events of charity organizations, and assisted over 2 charity organizations through charity sales, donations, collection of supplies, and volunteer service in 2021, donating and raising over NT\$30,000.

Vulnerable groups have not been able to raise funds through activities due to the impact of the pandemic in 2021. This year, Big Love Society will use community funds to assist the Hsinchu Branch of the Syin-Lu Social Welfare Foundation and the St. Joseph Social Welfare Foundation to handle activities related to mentally handicapped children.



Animal Club

The Animal Club was established to help take care of stray animals with dedication, love, and compassion, by embracing the principles of respecting life, caring for life, and advocating the concept of respecting animal life, as well as protecting the environment. It is the only corporate club in Taiwan that aims to protect animals.

The Animal Club works with local governments and is dedicated to trap-neuter-return (TNR) of stray dogs/cats in Hsinchu and Miaoli. Besides rescuing injured animals, even bigger efforts are put into capturing the stray dogs/cats, and sending the stray animals for spaying/neutering at an animal hospital. This stops the breeding of stray animals at the source, reducing the number of stray animals that are born each year by 3,000-4,000, and helps the government resolve a social issue.

It organizes free adoption activities at holiday flower markets during all holidays (including Chinese New Year), conducts follow-ups and bears the vaccination and spaying of female dogs expenses. This prevents the constant increase of stray dogs and rabies, which will cause even more environmental and safety issues.

The club also raised NT\$7 million to build an animal shelter for dogs that it could not find an owner for; the shelter has maintained about 300 stray dogs over the last 17 years.

The Animal Club has not ceased its efforts in animal protection for a single day in the 17 years since it was established. The annual support of about NT\$4 million is also self-financed. It has been extremely difficult, but the club hopes to help the most disadvantaged lives that are of least concern to the public based on the belief that each life is equal, allowing the public to emphasize the importance of animal lives and jointly contribute to protecting stray animals in Taiwan.



Adoption of stray dogs

Every weekend and national holiday, volunteers together with young students of charity organizations of Hsinchu's local high schools and colleges host an event at the Hsinchu flower market to allow people to adopt animals. The event raises awareness about adopting instead of buying, not abandoning their pets, and common knowledge for interacting with animals, allowing more people to learn to respect life and mitigate social issues caused by stray animals. Each year, the club finds new homes for approximately 250-300 dogs, conducting follow-up, and pays for vaccines and spaying of female dogs.

Spaying/neutering in place of killing

Spaying/neutering rather than killing not only effectively resolves the problem of too many stray dogs, but also manifests the act of having respect for life. Animal Club sterilizes more than 500 stray dogs and cats on average every year, reducing the reproduction of thousands of stray animals each year.

Animal rescue in action

The Animal Club receives public call-ins from Hsinchu County/City and nearby counties, assists with rescuing injured animals, and captures stray female dogs to have them spayed in veterinary hospitals.

Cleaning Animal Shelters and Feeding Stray Animals

Stray dogs in animal shelters are fed by volunteers every day at a specific time, and cages in the animal shelter are cleaned once a day.

Rabies vaccination for stray dogs

The Animal Club helps Hsinchu City Government provide rabies vaccinations for stray animals and home grown pets; on average, a total of 600 animals receive vaccine injections every year to help prevent the spread of rabies in Taiwan.



8. Appendix

8.1. About this Report

▪ Editorial Principles

Thank you for reading the Macronix International Co., Ltd. (hereinafter “Macronix”) Sustainability Report. Both Chinese and English versions of the Report can be found on the [Macronix website](https://www.macronix.com/) (<https://www.macronix.com/>). The purpose of the Report is to provide the general public and all Macronix stakeholders a better understanding of our concerns and actions in 2021 with regard to sustainability topic. The Report also shows our other commitments to various CSR matters and our performance in these areas.

▪ Reporting Period

The report discloses Macronix’s 2021 management guidelines, the core topics on CSR, our corporate commitment, and the results of our various CSR initiatives during the period from January 1, 2021 to December 31, 2021. This report is issued on an annual basis (the previous version was issued in June 2021, and the next version will be issued on June, 2023). During the reporting period, sale of Macronix Fab 1 was announced. No other major changes occurred in organization, structure, ownership, or supply chain. Except for employee relations and compliance with social and economic regulations, there were no changes regarding material issues compared to 2020.

▪ Aspect Boundaries and Scope of the Report

- Headquarters (Address: No.16, Li-Hsin Road, Science Park, Hsin-chu, Taiwan, R.O.C.)
- Fab 1 (Address: No. 3, Creation Road III, Science Park, Hsin-chu, Taiwan, R.O.C.)
- Fab 2 (Address: No.16, Li-Hsin Road, Science Park, Hsin-chu, Taiwan, R.O.C.)
- Fab 5 (Address: No. 19, Li-Hsin Road, Science Park, Hsin-chu, Taiwan, R.O.C.)
- Testing Plant (No. 8, Creation Road IV, Science Park, Hsin-chu, Taiwan, R.O.C.)
- Among these facilities, Fab 1 stopped production in May 2021. The sale of the Fab 1 and equipment to Hon Hai Precision Industry Co., Ltd. Was announced on August 5, 2021. Other than information disclosed in the consolidated financial report, the subsidiaries are not included within the scope of this report.

▪ Reporting and Third-Party Verification

The Macronix Sustainability Report Execution Task Force is built on the basis of the CSR Report Execution Task Force, and holds a "Sustainability Report Writing Commencement Meeting" in the second half of each year to discuss the direction of the annual plan and compilation of the Sustainability Report. Macronix has been compiling a Corporate Social Responsibility Report since 2012, and the Corporate Social Responsibility Report was renamed the Sustainability Report in 2021.

The report was written based on the GRI Standards of the Global Reporting Initiative (GRI) and AA 1000AP(2018), and was checked by a third party verification unit. Bureau Veritas Certification (Taiwan) Co., Ltd. was entrusted with the evaluation of the report. The report was verified to comply with the requirements of the GRI Standard (Core) and AA1000AS(2018) standards. The assurance level to be applied is Moderate Level Assurance (Type I). This report meets the requirements of the Financial Supervisory Commission to import Task Force on Climate-related Financial Disclosures (TCFD) and the US Sustainability Accounting Standards Board (SASB) to disclose the information of stakeholder concern.

▪ Contact information

We sincerely welcome any comments and suggestions about the 2021 Macronix Sustainability Report.

Contact Person: Environment, Safety and Health (EHS) Center Pei-Ti Tai

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Tel:886-3-5786688

Company Website:www.macronix.com

E-mail:pubcsr@mxic.com.tw

8.2. GRI/SASB Content Index

8.2.1 GRI Content Index

GRI Standards	Information Disclosed	Page	Omitted
GRI 101: Foundation 2016	-	-	-
General Disclosures			
GRI 102:General Disclosures 2016	102-1 Name of the organization	Cover	
	102-2 Activities, brands, products, and services	10-13	
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	102-4 Location of operations	13	
	102-5 Ownership and legal form	51	
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	102-11 Precautionary Principle or approach	36-39,73	
	102-12 External initiatives	9	
	102-13 Membership of associations	16-17	
	102-14 Statement from senior decision-maker	5-7	
	102-16 Values, principles, standards, and norms of behavior	19,32-33	
	102-18 Governance structure	19,30-32	
	102-40 List of stakeholder groups	25	
	102-41 Collective bargaining agreements	NA	The Company has no collective bargaining agreements.
	102-42 Identifying and selecting stakeholders	25	
	102-43 Approach to stakeholder engagement	21-24	
	102-44 Key topics and concerns raised	23-28	
	102-45 Entities included in the consolidated financial statements	51	
GRI Standards	Information Disclosed	Page	Omitted
GRI 102:General Disclosures 2016	102-46 Defining report content and topic boundaries	25-28	
	102-47 List of material topics	27-28	
	102-48 Restatements of information	According to the description	
	102-49 Changes in reporting	115	
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Anti-corruption			
	103-1 Explanation of the material topic and its boundary	51	

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GRI 103: Management approach 2016	103-2 The management approach and its components	51	
	103-3 Evaluation of the management approach	51	
GRI 205: Anti-corruption	205-3 Confirmed corruption and adopted measures	32-33	
Materials			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	55-56	
	103-2 The management approach and its components	55-56	
	103-3 Evaluation of the management approach	55-56	
GRI 301: Materials	301-1 Applied material's weight and volume	56	
Energy			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	65	
	103-2 The management approach and its components	65	
	103-3 Evaluation of the management approach	65	
GRI 302: Energy 2016	302-1 Energy consumption within the organization	67	
	302-2 Energy consumption outside of the organization	—	
	302-3 Energy intensity	67	
	302-4 Reduction of energy consumption	67	
Water			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	56	
	103-2 The management approach and its components	56	
	103-3 Evaluation of the management approach	56	
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	56-57	
	303-2 Management of water discharge-related impacts	56-57	
GRI 303: Water and Effluents 2018	303-3 Water withdrawal	56-57	
	303-4 Water discharge	56-57	

GRI Standards	Information Disclosed	Page	Omitted
	303-5 Water consumption	56-57	
Emissions			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	60,69	
	103-2 The management approach and its components	60,69	
	103-3 Evaluation of the management approach	60,69	
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	71	
	305-2 Energy indirect (Scope 2) GHG emissions	71	
	305-3 Indirect (Scope 3) GHG emissions	70	
	305-4 GHG emissions intensity	71	
	305-5 Reduction of GHG emissions	70	
	305-7 Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	60	
Waste			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	61	
	103-2 The management approach and its components	61	
	103-3 Evaluation of the management approach	61	
GRI 306: Waste 2020 (Management Policy)	306-1 Waste generation and significant waste-related impacts	61-62	
	306-2 Management of significant waste related impacts	61-62	
GRI 306: Waste 2020	306-3 Waste generated	62-64	
	306-4 Waste diverted from disposal	62-64	
	306-5 Waste directed to disposal	62-64	
Environmental Compliance			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	55	
	103-2 The management approach and its components	36,55	
	103-3 Evaluation of the management approach	36,55	
GRI 307: Environmental Compliance 2016	307-1 Non-compliance with environmental laws and regulations	36,55	

GRI Standards	Information Disclosed	Page	Omitted
Employment			
GRI 103:Management Approach 2016	103-1 Explanation of the material topic and its boundary	76	
	103-2 The management approach and its components	76,83	
	103-3 Evaluation of the management approach	76,83	
GRI 401:Employment 2016	401-1 New employee hires and employee turnover	80-81	
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	85-86	
	401-3 Parental leave	87	
Labor/Management Relations			
GRI 103:Management Approach 2016	103-1 Explanation of the material topic and its Boundary	76	
	103-2 The management approach and its components	76	
	103-3 Evaluation of the management approach	76	
GRI 402:Labor/Management Relations 2016	402-1 Minimum notice periods regarding operational changes	83	
Occupational Health and Safety			
GRI 103:Management Approach 2016	103-1 Explanation of the material topic and its boundary	95	
	103-2 The management approach and its components	95	
	103-3 Evaluation of the management approach	95	
	403-1 Occupational health and safety management system	95	
	403-2 Hazard identification, risk assessment, and incident investigation	97	

GRI Standards	Information Disclosed	Page	Omitted
GRI 403:Occupational Health and Safety Management Approach 2018	403-3 Occupational health services	98,100-102	
	403-4 Worker participation, consultation, and communication on occupational health and safety	102	
	403-5 Worker training on occupational health and safety	98	
	403-6 Promotion of worker health	100-102	
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	97-99	
	403-9 Work-related injuries	99	
Customer Privacy			
GRI 103:Management Approach 2016	103-1 Explanation of the material topic and its boundary	48	
	103-2 The management approach and its components	48	
	103-3 Evaluation of the management approach	48	
GRI 418:Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	48	
Socioeconomic Compliance			
GRI 103:Management Approach 2016	103-1 Explanation of the material topic and its boundary	36	
	103-2 The management approach and its components	36	
GRI 419:Socioeconomic Compliance 2016	103-3 Evaluation of the management approach	36	
	419-1 Non-compliance with laws and regulations in the social and economic area	36	

8.2.2 SASB Content Index







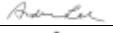

Sustainability Accounting Standards Board ,SASB

Topic	Code	Accounting Metric	Page
Greenhouse Gas Emissions	TC-SC-110a.1.	Gross global Scope 1 emissions and amount of total emissions from perfluorinated compounds	71
	TC-SC-110a.2.	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	69
Energy Management in Manufacturing	TC-SC-130a.1.	(1) Total energy consumed, (2) Percentage grid electricity, (3) Percentage renewable	67
Water Management	TC-SC-140a.1.	(1) Total water withdrawn, (2) Total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	57
Waste Management	TC-SC-150a.1.	Amount of hazardous waste from manufacturing, percentage recycled	63-64
Employee Health & Safety	TC-SC-320a.1.	Description of efforts to assess, monitor, and reduce exposure of employees to human health hazards	97
	TC-SC-320a.2.	Total amount of monetary losses as a result of legal proceedings associated with employee health and safety violations	36
Recruiting & Managing a Global & Skilled Workforce	TC-SC-330a.1.	Percentage of employees that are (1) Foreign nationals (2) Located offshore	78
Product Lifecycle Management	TC-SC-410a.1.	Percentage of products by revenue that contain IEC 62474 declarable substances	Not Applicable
	TC-SC-410a.2.	Processor energy efficiency at a system-level for: (1) Servers (2) Desktops (3) Laptops	Not Applicable
Materials Sourcing	TC-SC-440a.1.	Description of the management of risks associated with the use of critical materials	37
Intellectual Property Protection & Competitive Behavior	TC-SC-520a.1.	Total amount of monetary losses as a result of legal proceedings associated with anticompetitive behavior regulations.	32-33

8.3. Comparison of UN Sustainable Development Goals (SDGs)

Goals	Description	Related Chapter
1	End poverty in all its forms everywhere	7.4.4. Employees Participation in Charity Events
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	7.4.4. Employees Participation in Charity Events
3	Ensure healthy lives and promote well-being for people of all ages	7.3.2. Safety and Health Promotion Management
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	7.2. Learning and Development 7.4.1. Planting the Seed of Science Education
5	Achieve gender equality and empower all women and girls	7.1. Staff Respect
6	Ensure availability and sustainable management of water and sanitation for all	6.1.1. Water Resource Management 7.3.2 Safety and Health Promotion Management
7	Ensure access to affordable, reliable, sustainable, and modern energy for all	6.2.1. Energy Management
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	4.3. Innovation 7.1.1. Recruitment
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	4.2. Risk Management 4.3.1 Importance of Innovation
10	Reduce inequality within and among countries	7.1. Staff Respect
11	Make cities and human settlements inclusive, safe, resilient and sustainable	7.3.1. Macronix H2O
12	Ensure sustainable consumption and production patterns	6.4. Green Enterprises
13	Take urgent action to combat climate change and its impacts	4.2. Risk Management 6.2. Energy and Climate Change Management
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	6.1.1 Water Resource Management
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	6.3 Ecological Environment and Conservation
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive	4.1 Corporate Governance
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	4.4. Supply Chain Management

8.4. Independent third-party assurance statement

 <p>INDEPENDENT ASSURANCE STATEMENT</p> <p>To: The Stakeholders of Macronix International Co., Ltd.</p> <p>Introduction and objectives of work</p> <p>Bureau Veritas Certification Taiwan has been engaged by Macronix International Co., Ltd. to conduct an independent assurance of its 2021 Macronix International Co., Ltd. Sustainability Report. This Assurance Statement applies to the related information included within the scope of work described below.</p> <p>This information and its presentation in the 2021 Macronix International Co., Ltd. Sustainability Report are the sole responsibility of the management of Macronix International Co., Ltd.. Bureau Veritas was not involved in the drafting of the Report. Our sole responsibility was to provide independent assurance on its content.</p> <p>Scope of work</p> <p>The assurance process was conducted in line with the requirements of the AA1000 Assurance Standard (AA1000AS, 2008) with 2018 addendum, Type 1 - AccountAbility Principles and Performance Information engaged. The scope of work included:</p> <ul style="list-style-type: none"> Data and information included in 2021 Macronix International Co., Ltd. Sustainability Report for the 1st January, 2021 to 31st December, 2021; Appropriateness and robustness of underlying reporting systems and processes, used to collect, analyse and review the information reported; Evaluation of the Report against the main principles of the AA1000 Accountability Principle (2018)¹ <ul style="list-style-type: none"> Inclusivity Materiality Responsiveness Impact Evaluation of the Report against the principles of Stakeholder Inclusiveness, Sustainability Context, Materiality, Completeness, Balance, Comparability, Accuracy, Timeliness, Clarity, and Reliability, as defined in the GRI Sustainability Reporting Standards. <p>The levels of assurance have been applied as moderate level assurance.</p> <p>Methodology</p> <p>As part of its independent assurance, Bureau Veritas undertook the following activities:</p> <ol style="list-style-type: none"> Interviews with relevant personnel of Macronix International Co., Ltd.; Review of documentary evidence produced by Macronix International Co., Ltd.; Review performance data listed in report with sampling basis; <p><small>¹ Published by AccountAbility: The Institute of Social and Ethical Accountability http://www.accountability.org</small></p> <p>BUREAU VERITAS Page 1 of 4</p>	 <ol style="list-style-type: none"> Visits to 1 site located in Taiwan (Hsinchu City); Review of Macronix International Co., Ltd. data and information systems for collection, aggregation, analysis and review. <p>Our work was conducted against Bureau Veritas' standard procedures and guidelines for external Assurance of Sustainability Reports, based on current best practice in independent assurance.</p> <p>The work was planned and carried out to provide reasonable, rather than absolute assurance and we believe it provides a reasonable basis for our conclusions.</p> <p>Our findings</p> <p>On the basis of our methodology and the activities described above, it is our opinion that:</p> <ul style="list-style-type: none"> The information and data included in 2021 Macronix International Co., Ltd. Sustainability Report are accurate, reliable and free from material mistake or misstatement; The Report provides a fair representation of Macronix International Co., Ltd.'s activities over the reporting period; The information is presented in a clear, understandable and accessible manner, and allows readers to form a balanced opinion over Macronix International Co., Ltd.'s performance and status during the 1st January, 2021 to 31st December, 2021; The Report properly reflects the organisation's alignment to and implementation of the AA1000 Assurance Standard (AA1000AS, 2008) with 2018 addendum's principles of Inclusivity, Materiality, Responsiveness and Impact in its operations. Further detail is provided below; Macronix International Co., Ltd. has established appropriate systems for the collection, aggregation and analysis of relevant information; <p>Alignment with the principles of AA1000 Accountability Principle (2018)</p> <p>Inclusivity</p> <p>Macronix International Co., Ltd. has processes in place for engaging with key stakeholders including socially responsible investors, clients, employees, supply chain and local community, and has undertaken a number of formal stakeholder engagement activities in 2020 covering a range of material topics such as Economic, Social and Environment.</p> <p>Materiality</p> <p>The Report addresses the range of environmental, social and economic issues of concern that Macronix International Co., Ltd. has identified as being of highest material importance. The identification of material topics has considered both internal assessments of risks and opportunities to the business, as well as stakeholders' views and concerns.</p> <p>BUREAU VERITAS Page 2 of 4</p>	 <p>Responsiveness</p> <p>Macronix International Co., Ltd. is responding to those issues it has identified as material and demonstrates this in its policies, objectives, indicators and performance targets. The reported information can be used by the organisation and its stakeholders as a reasonable basis for their opinions and decision-making.</p> <p>Impact</p> <p>Macronix International Co., Ltd.'s management system can monitor, measure and be accountable for how their actions affect their broader ecosystems.</p> <p>GRI report Structure</p> <p>Macronix International Co., Ltd. does fully provide the information to achieve the GRI Standards 'core' in accordance, and the performance indices do correspond and can be cross referenced to the content of relevant GRI Standards.</p> <p>Key areas for ongoing development</p> <p>Based on the work conducted, we recommend Macronix International Co., Ltd. to consider the following:</p> <ul style="list-style-type: none"> Encourage organization to assess the impact of material topics that are potentially occurring outside the organization, report its disclosures and management approach for the topic, (INCLUSIVITY) <p>Limitations and Exclusions</p> <p>Excluded from the scope of our work is any assurance of information relating to:</p> <ul style="list-style-type: none"> Activities outside the defined assurance period; Positional statements (expressions of opinion, belief, aim or future intention by Macronix International Co., Ltd.) and statements of future commitment. <p>This independent statement should not be relied upon to detect all errors, omissions or misstatements that may exist within the Report.</p> <p>Statement of independence, impartiality and competence</p> <p>Bureau Veritas is an independent professional services company that specialises in Quality, Health, Safety, Social and Environmental management with more than 194 years history in providing independent assurance services. Bureau Veritas 2021 full year revenues reached 4.98 billion euros. The Group's adjusted net profit for 2021 reached 480 million euros.</p> <p>Bureau Veritas has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day to day business activities. We are particularly vigilant in the prevention of conflicts of interest.</p> <p>No member of the assurance team has a business relationship with Macronix International Co., Ltd., its Directors or Managers beyond that required of this assignment. We have conducted this verification independently, and there has been no conflict of interest.</p> <p>BUREAU VERITAS Page 3 of 4</p>	 <p>The assurance team has extensive experience in conducting assurance over environmental, social, ethical and health and safety information, systems and processes, has over years combined experience in this field and an excellent understanding of Bureau Veritas standard methodology for the Assurance of Sustainability Reports.</p> <p>Bureau Veritas Certification Taiwan</p> <p>3F-B, No. 16, Nanjing E. Rd., Sec. 4, Songshan District, Taipei 10553, Taiwan R.O.C. 26th April, 2022</p> <div style="display: flex; justify-content: space-around; align-items: center;">   <div style="text-align: center;"> <p>AA1000 Licensed Report 000-76/V3-T8X31</p> </div> </div> <div style="display: flex; justify-content: space-between;"> <div> <p>Technical Reviewer: </p> <p>Assurer: </p> </div> <div> <p>Date: 26/Apr/2022</p> <p>Date: 26/Apr/2022</p> </div> </div> <p>BUREAU VERITAS Page 4 of 4</p>
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INTERNATIONAL Co., LTD.