



**MACRONIX
INTERNATIONAL Co., LTD.**

2022 Sustainability Report



Issued in June 2023

Sustainability Performance and Highlights

Governance

- 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 240 patents in 2022, and by the end of the year, it has had a total of 8,894 patents successfully registered worldwide.
- Automotive flash memory manufacturing has obtained the "ISO 26262" Road vehicles – Functional safety certification.
- Awarded the "Outstanding Business Entities for Using Electronic Uniform Invoices" by the Hsinchu Branch, National Taxation Bureau of the Northern Area, Ministry of Finance.
- Chairman of Macronix, Miin Wu, was awarded with the 2022 EEAwards Asia “Executive of the Year”; Macronix received the EEAwards Asia “Featured Vehicle Electronics Solution Supplier”; Macronix’s Ultra-Low-Power 1.2V Serial NOR Flash Memory was named the EEAwards Asia “Best Memory of the Year”.
- All Macronix fabs, test building, and management centers have passed the IATF 16949:2016 standard certification of the International Automotive Task Force (IATF).
- Passed the “ISO 27001” information security management system certification in 2022.
- All plants have obtained full score of 200 in the Validated Assessment Program (VAP) of the Responsible Business Alliance (RBA) in 2022.
- All items of ESG information and data are disclosed in accordance with the SASB Standard of the semiconductor industry.

Environmental

- Invested NT\$422 million in environmental safety and health in 2022 and proactively committed itself to and developed the strategy for sustainable operations.
- From 2018 to 2022, cumulative electricity savings was 33,913 MWh.
- Greenhouse gas emissions declined by 0.6% compared to the base year, and the average annual reduction is 0.06%.
- Awarded “First Class Award” among the excellent water saving units in the “Selection of Excellent Water Saving Units and Water Conservation Experts” organized by the Water Resources Agency, MORA in 2022.
- Produced 4.123 billion liters of reclaimed water, and the water recycling rate of all plants has reached 85.7%.

- “Award of Excellence” among the outstanding enterprises in waste reduction and circular economy in Hsinchu Science Park in 2022.
- 11,044 metric tons of waste were recycled/reused, and the waste recycling/reuse rate was 97.7%.
- The average removal rate of volatile organic compounds (VOCs) is 95.94%.
- Won the “Award of Excellence” in the 2022 Clean Air Zone Adoption presented by the Environmental Protection Administration, Executive Yuan.
- 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.
- Awarded the Excellence in Green Procurement Award for Private Enterprises and Organizations in Hsinchu City in 2021.

Social

- Received the National Excellent Healthy Workplace – “Paradigm in Health Award” in 2022.

Friendly Workplace/Employee Benefits:

- The Welfare Committee has allocated NT\$55.003 million in total for employee welfare.
- Built a five-star employee recreation and fitness center and invested NT\$8.785 million in professional sports instructors and the maintenance of software and hardware equipment to create 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\$10.619 thousand group insurance for employees, which covers accidents, diseases, and cancer, and the employees are allowed to add their 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.
- The Company offers free early-stage lung cancer CT scans and heart CT scans, which has benefited 369 employees in total, and the free CT scans are also available to the employees’ family members at a discount, which has benefited 217 family members in total.
- In 2022, the Company offered to pay fees for PCR COVID-19 tests and COVID-19 rapid antigen tests, which have been done by 763 employees and 38,158 employees respectively.

Education and Training:

- The Company provides consistent, progressive training programs for different specialties and tiers; on average, every employee has participated in 20 sessions and has had 65.7 hours of training.

- The Company provides a variety of learning approaches, including digital learning with no limitation of time and place; a total of 45,453 people have participated in training activities through the digital learning platform, which accounts for 58% of all training activities.

Charity Events:

- The Macronix Education Foundation scholarships have exceeded NT\$180 million by the end of 2022.
- The Company has established a charitable organization, which has combined the strength of both the employees and the public, to help those in need in the society; a total of 4,692 employees have participated in public welfare activities, and donations of NT\$3.316 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 – Excellence Award from the Environmental Protection Administration, Executive Yuan.

2022 Awards and Recognition

- Chairman Miin Wu won the 5th “Presidential Innovation Award”
- Chairman Miin Wu was awarded with the 2022 EE Awards Asia “Executive of the Year”



- Macronix’s Ultra-Low-Power 1.2V Serial NOR Flash Memory was recognized as the 2022 EE Awards Asia “Best Memory of the Year”
- Macronix was presented with the 2022 EE Awards Asia “Featured Vehicle Electronics Solution Supplier”



- Ranked in the Top 6%~20% in the 8th Corporate Governance Evaluation – Top 10% in the electronics category of listed companies with a market value of more than NT\$10 billion
- 2022 "Excellent Healthy Workplace - Paradigm in Health Award"



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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. We provide a wide range of ROM, NOR Flash, and NAND Flash solutions. With the business philosophy of "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.

In 2022, the global economy was affected by multiple factors such as the epidemic, war, inflation, interest rate increases and geopolitics. This suppressed market demand, leading to excess inventory. However, due to the success of the high-quality product long-term development strategy, Macronix has reduced the impact of fluctuations in end-market demand, and performed relatively stable in the midst of adversity. It maintained stable prices with excellent services and quality products, and revenue remained high. The annual gross profit margin increased by 2.6 percentage points compared with the previous year. Facing the downward economy and the pressure of industry and customer inventory adjustment, Macronix also timely implemented production reduction measures to effectively control inventory levels and transfer resources to accelerate technology development to seize the opportunity of process technology advancement and further strengthen the Company's long-term competitiveness.

In 2022, Macronix's consolidated net operating revenue for the year was NT\$43.487 billion, and the annual consolidated gross profit was NT\$19.238 billion. The annual average gross profit margin increased to 44.2%. The net income after tax was NT\$8.97 billion, and the earnings per share was NT\$4.85. The cash generated from operating activities was NT\$11.656 billion, and the expenditures for investment activities was NT\$10.339 billion. The cash equivalent at the end of the period was NT\$19.764 billion. The debt ratio decreased to 37.3%. The book value per share increased to NT\$28.38, and the return on equity was 18%.

Macronix has long invested in innovation and R&D, which has greatly strengthened Macronix's intellectual property rights and competitive strength. Taking patents as an example, a total of 240 patents were applied for in various countries in 2022. By the end of 2022, Macronix has been granted for 8,894 patents worldwide. In addition to the number of patents ranked among the best in semiconductors, Macronix's large number of high-quality international key technologies and trade secrets have maintained the Company's excellent competitiveness and consolidated its leading position in the international non-volatile memory market. Macronix was awarded not only the "Featured Vehicle Electronics Solution Supplier" of the 2022 EE Awards Asia, but also the "Best Memory of the Year" for two consecutive years. Furthermore, Macronix was also selected into the Global Top 100 Innovators of LexisNexis in 2023. All these recognitions show that Macronix bravely engages in innovation, persists in product improvement, and has the ability to create value-added applications for customers.

Facing increasingly complex market environments and risks, corporate sustainability is confronted with more challenges. Macronix follows the UN Sustainable Development Goals (SDGs) and the Corporate Governance 3.0 – Sustainable Development Roadmap of the Financial Supervisory Commission, and has gradually established and implemented corporate governance and risk management mechanisms. The Board of Directors established the sustainable development policy and risk management policy in 2022. The policies serve as the highest guiding principles for the Company's sustainable development and risk management. The disclosure framework of the Task Force on Climate-Related Financial Disclosures (TCFD) and principles of Sustainability Accounting

Standards Board (SASB) is incorporated in the Macronix's Sustainability Report, and further increases the transparency of Macronix's Environmental, Social, and Governance (ESG) information. In addition, as the world gradually shifted its attention to 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), 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. Over 40,000 teachers and students have participated in these awards and made extensive influence. In 2020, Macronix donated NT\$100 million each year to National Cheng Kung University for the tenth consecutive year to establish Taiwan's first cross-disciplinary course "Miin Wu School of Computing", setting a precedent for Taiwan's innovative AI applications and cross-domain talent cultivation.

Macronix began to enter the automotive electronics market in 2009, and its memory is used in the self-driving car computing platform of Nvidia. Currently, the global shipment volume of Macronix's automotive grade products has exceeded 560 million units. It is expected that starting from 2023, Macronix will leap to become the largest supplier of automotive flash memory.

Following in the wave of AI, demand for memory increases, and the market will continue to grow. Advanced semiconductor process technology has overcome the barriers 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.

Chairman and CEO Miin Wu



1.2.Message from the President

Although COVID-19 continues to make a severe impact on the global economy, Macronix has been tirelessly researching and developing new technologies and products. Thanks to the concerted efforts from all employees, with regard to the development of processes and products, ROM accounted for 25% of annual revenue in 2022. NOR Flash accounted for 55% of annual revenue and is currently expanding to the high-value-added market. For example, 256Mb and above high-density products are accounting for an increasing percentage of NOR Flash revenue each year, and has reached 50% as of 2022. We are accelerating the development of the world's first ultra high-density 3D NOR Flash, which will help expand the high capacity NOR market. Moreover, our flash products revenue from high quality applications, such as automotive, industrial, healthcare, and aerospace, reached 41% and became one of the greatest driving forces of Macronix's business growth. Revenue from automotive applications field significantly increased 43% compared with the previous year (2021). Bit shipments also reached a record high, and compound annual growth rate in the past five years reached 30%, with cumulative shipments surpassing 560 million. In terms of NAND Flash, the annual revenue accounted for 11%, and 96-layer 3D NAND Flash products began mass production at the end of last year (2022) and will gradually contribute to revenue. We expect to complete the development of 192-layer 3D NAND Flash products by this year (2023), and will continue to develop higher layer stacking technologies to meet customers' demand for products with higher capacity.

Following the rapid development of data centers, artificial intelligence, automotive markets, and 5G, applications of memory chips have become even more extensive. Macronix upholds the spirit of innovation, quality control, and strict supervision to fulfill its commitments. Macronix continues to provide customers with high performance and highly reliable memory solutions, and has obtained excellent certifications and recognition accordingly. For example, OctaFlash™ obtained the highest level ASIL D certification of ISO 26262 Automotive Electronics Functional Safety, and was deployed by major automotive chip manufacturers around the world. ArmorFlash™ products certified by numerous international safety standards, showing that the excellent quality of Macronix products already meets strict international standards, and thus has won the trust of high-end customers. Moreover, Macronix launched a new generation ultra-low voltage 1.2V SPI NOR Flash following the trend of low-carbon economy, which was recognized as the Best Memory Product of the Year in the 2022 EE Awards Asia. This is another excellent example representing Macronix as a leader of the technological innovation. Furthermore, the trend of artificial intelligence led to the development of memory-centric system architectures. The new FortiX™ series 3D NAND/NOR Flash Memory, released by Macronix, also provides an in-memory computing solution, which in the future will develop more towards memory A.I. systems in response to next generation high-performance memory becoming the mainstream in the field of A.I..

As for the ESG (Environmental, Social, and Governance) requirements, beside starting from the source, we also attach importance to the concept of product life cycle. From product design, all of the chemicals and minerals used in 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, we have attained third-party certification each year 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. For net zero emissions by 2050, we have also formulated a complete carbon reduction strategy and way according to the scientific carbon reduction methodology, and gradually carried out specific actions. Taking one step at a time, Macronix has become an excellent company ranked in the top 10% of electronics companies with a market cap of NT\$10 billion and above in the Corporate Governance Evaluation, and was recognized for the excellence in workplace sustainability, health, and safety by the Occupational Safety and Health Administration, Ministry of Labor; excellence in water conservation

by the Water Resources Agency, MOEA as well as in waste reduction and circular economy by the Hsinchu Science Park Administration. These awards are recognitions of Macronix's ESG and sustainable development performance.

We uphold the business philosophy of "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 momentum for Macronix's business growth. Hence, the management team will adopt a stable strategy and a cautious attitude when implementing the capacity expansion project of 12-inch wafer fab 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.

President Chih-Yuan Lu



A handwritten signature in black ink, appearing to read "Chih-Yuan Lu".

2. Macronix

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.

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 2022, 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.

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.



2.1. Products and Services



As an integrated device manufacturer in the Non-Volatile Memory (NVM) market, Macronix provides a full range of ROM, 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 2022, Macronix owned two wafer fabs: the 8-inch wafer fab producing approximately 516,000 wafers, and the 12-inch wafer fab producing approximately 215,000 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-1.6V) 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, 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.

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, electronic toys, etc.
	NOR Flash Memory	Applied in 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.
	NAND Flash Memory	Applied in mobile phones, set-top boxes, TVs, digital cameras, MP3 players, printers, hard drives, network devices, tablet PCs, wireless communication devices (Bluetooth, WLAN), arcade games.
	e.MMC™	Mainly applied in industrial and networking products.
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

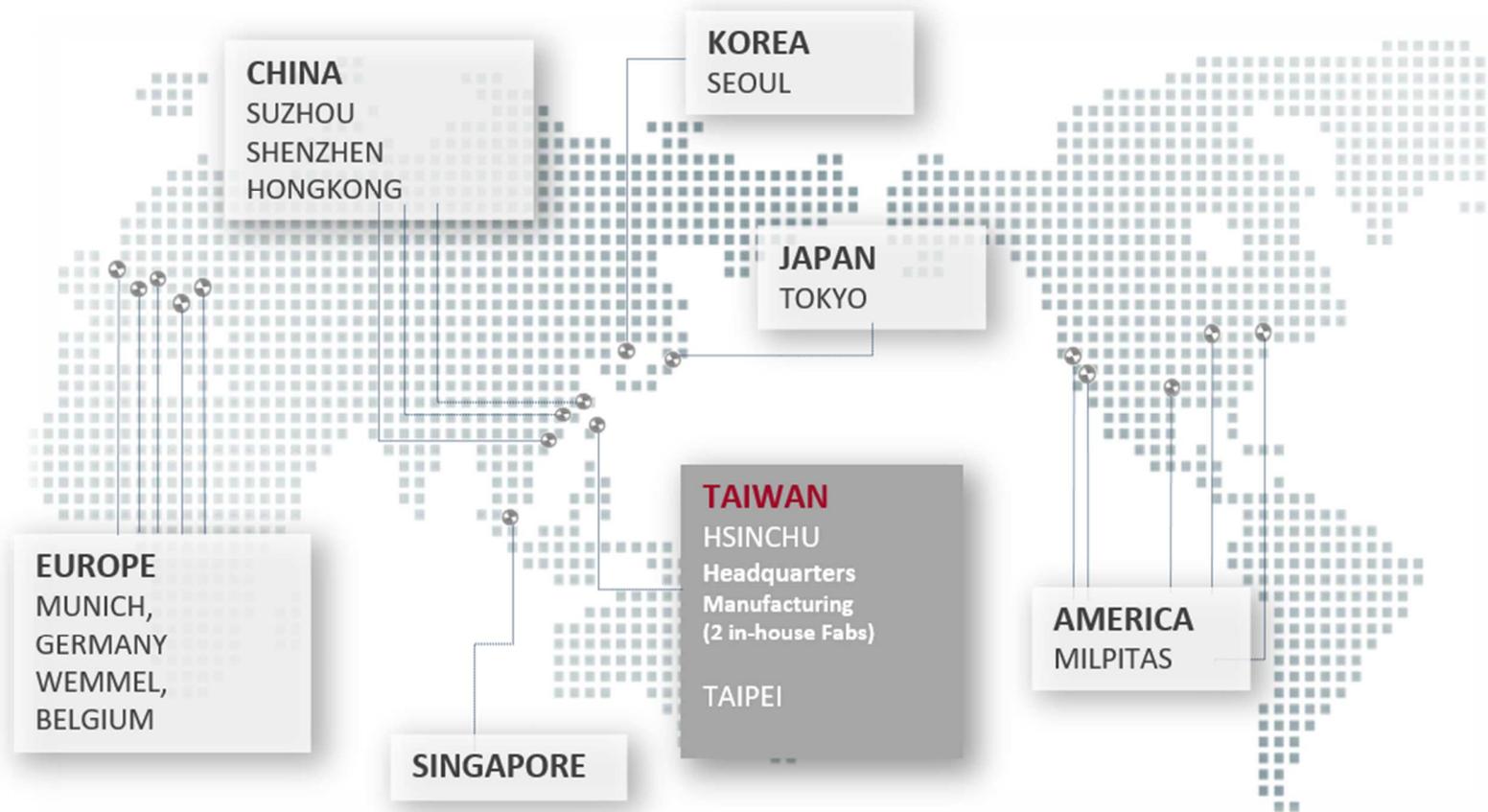
Macronix is an export-oriented company, and Japan is our main market. As a prolific manufacturer of gaming systems and consumer electronics worldwide, Japan has a strong and consistent demand for high-quality IC components. Other export destinations are based on the branch offices of Macronix in China, 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	2022 (consolidated)	
	Sales Turnover (Thousand NTD)	Sales Ratio (%)
Flash	29,001,475	66.69
ROM	10,670,968	24.54
Foundry	3,796,517	8.73
Others	18,494	0.04
Total	43,487,454	100.00

Macronix's main products, NOR Flash Memory and MaskROM/XtraROM[®], have long held a leading position in the global market share. According to the analysis of Macronix's Marketing Division, in 2022, the market share of Macronix's ROM was No. 1 in the world, exceeding 50%; while the global market share of NOR Flash was about 25%.

2.2. Business Locations Worldwide



2.3. Macronix Sustainability Milestones

Time	Milestones
2000	<ul style="list-style-type: none"> •Held the first Macronix Golden Silicon Awards - Semiconductor Design and Application Competition
2001	<ul style="list-style-type: none"> •Established the Macronix Education Foundation
2002	<ul style="list-style-type: none"> •The Macronix Education Foundation held the first Macronix Science Awards.
2004	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •Received a green product certification from international brands including SONY, CANON, and LG for compliance with RoHS Directive requirements
2007	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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

Time	Milestones
	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •Received the 8th annual Global Views Monthly Magazine CSR Award •Once again received the CommonWealth Magazine Excellence in Corporate Social Responsibility Citizenship Award
2013	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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

Time	Milestones
2018	<ul style="list-style-type: none"> •Chairman Miin Wu was awarded Ernst & Young Entrepreneur of the Year and Business Paradigm Entrepreneur of the Year •Fab 2, Fab 5, and the Test Building 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	<ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •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 Test Building passed the Responsible Business Alliance Validated Assessment Program (RBA VAP) audit and obtained Platinum certification
2021	<ul style="list-style-type: none"> •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
2022	<ul style="list-style-type: none"> •Chairman Miin Wu won the 5th “Presidential Innovation Award” •Chairman Miin Wu was awarded with the 2022 EE Awards Asia “Executive of the Year” •Presented with the 2022 EE Awards Asia “Featured Vehicle Electronics Solution Supplier” •Ultra-Low-Power 1.2V Serial NOR Flash Memory was recognized as the 2022 EE Awards Asia “Best Memory of the Year” •Recognized as an Excellent Healthy Workplace – Paradigm in Health Award by the Health Promotion Administration, Ministry of Health and Welfare •Fab 2, Fab 5, and the Test Building passed the Responsible Business Alliance Validated Assessment Program (RBA VAP) audit and obtained 200-point Platinum certification. •Awarded “First Class Award” among the excellent water saving units in the “Selection of Excellent Water Saving Units and Water Conservation Experts” organized by the Water Resources Agency, MOEA •“Award of Excellence” among the outstanding enterprises in waste reduction and circular economy in Hsinchu Science Park •Awarded the “Outstanding Business Entities for Using Electronic Uniform Invoices” by the Hsinchu Branch, National Taxation Bureau of the Northern Area, Ministry of Finance. •Awarded the Excellence in Green Procurement Award for Private Enterprises and Organizations in Hsinchu City in 2021.

2.4. External Participation

Macronix upholds its business philosophy of "honesty" 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	1. Director 2. Convener of the Health and Safety Committee 3. Vice Convener of the Environmental Protection Committee	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.
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	1. Macronix shares its experience of winning the National Occupational Safety & Health Award – Enterprise Benchmarking 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	Economy	Society
<ul style="list-style-type: none"> ⊙ Computer Audit Association ⊙ The Institute of Internal Auditors 	<ul style="list-style-type: none"> ⊙ Chinese National Association of Industry and Commerce, Taiwan ⊙ Taiwan Stock Affairs Association 	<ul style="list-style-type: none"> ⊙ Friends of the Second Special Police Corps ⊙ Taiwan Association of Occupational Health Nurses ⊙ High-Tech Industry Salary Association

	© Chinese International Economic Cooperation Association	© Taiwan Union of Nurses Association
Technology and Industry		
GSA	The Allied Association for Science Park Industries	
JEDEC Fee	Monte Jade Science & Technology Association of Taiwan	
SEMI TAIWAN	Taiwan Electrical and Electronic Manufacturers' Association	
WSTS	Taiwan Society for Precision Engineering	
Chinese Institute of Engineers	Chinese Society for Management of Technology	
The Electronics Devices and Materials Association	International Microelectronics Assembly and Packaging Society Taiwan Chapter (iMAP)	
Taiwan Institute of Chemical Engineers	Advanced Microsystems & Package Technology Alliance (AMPA)	
NVM Express	PCI-SIG annual membership	

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.

In 2022, after expanding the scope of the existing social responsibility management system organization, Macronix established the “Sustainable Development Committee” to promote ESG matters through the operation of the committee, fulfill CSR and protect our living environment, cherish and make good use of our limited natural resources as the main strategy to achieve sustainable development of the enterprise. The sustainable development goals are proposed after taking into account the opinions of stakeholders, which include the compliance with the requirements of Responsible Business Alliance Code of Conduct (RBA CoC). In 2022, we passed RBA VAP (Validated Assessment Program) audit with excellent results. We also complied with various requirements of the Corporate Social Responsibility Best Practice Principles of the Financial Supervisory Commission. In terms of social responsibility, apart from dedicating ourselves to scientific research and education, Macronix actively encourages cultural development as a way to give back to society. All these efforts highlight Macronix's commitment to corporate social responsibility and sustainable development.

Macronix’s sustainable development also involves a rolling review of external environmental factors, such as the strategy for achieving net-zero carbon emissions by 2050 and geopolitical risks, and reports the implementation process to the Board of Directors regularly.



To fulfill our commitment to sustainability, Macronix strives 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 adheres to and requires its suppliers to refrain from using or purchasing conflict minerals. Additionally, we track the source of gold (Au), tantalum (Ta), tin (Sn), tungsten (W), cobalt (Co) and other various minerals to ensure such minerals come from qualified refineries.
- ◆ Promote science education in order to cultivate innovation among the younger generation and expand our contribution to society.

3.1. Sustainable Development Policy and Organization

Sustainable Development Policy

Macronix's "Corporate ESG Policy" incorporates the existing environmental safety and health policy, social responsibility policy, and ethical corporate management policy, and is formulated with reference to the "Taiwan Sustainable Development Goals" proposed by the National Council for Sustainable Development of the Executive Yuan. In 2022, the Board of Directors approved the policy and plan. To ensure the implementation of the policy, all Macronix employees must receive training on sustainable development.

The main concept of the "Corporate ESG Policy"

Macronix International Co., Ltd. abides by the philosophy of building an "honest" business. We establish and implement corporate governance and risk control mechanisms through the values of innovations, quality control, operation efficiency, customer service, and teamwork to create a sustainable business environment. Macronix respects employees' right and interests, and is committed to providing a safe and healthy workplace for employees. We are also dedicated to building an environmentally friendly business, properly using natural resources, implementing green energy, energy conservation and carbon reduction. We are delighted to give back to society through promotion of science and innovations, and encouragement of research and development. We are committed to protecting the shareholders' interests in the goal of growing a sustainable business.

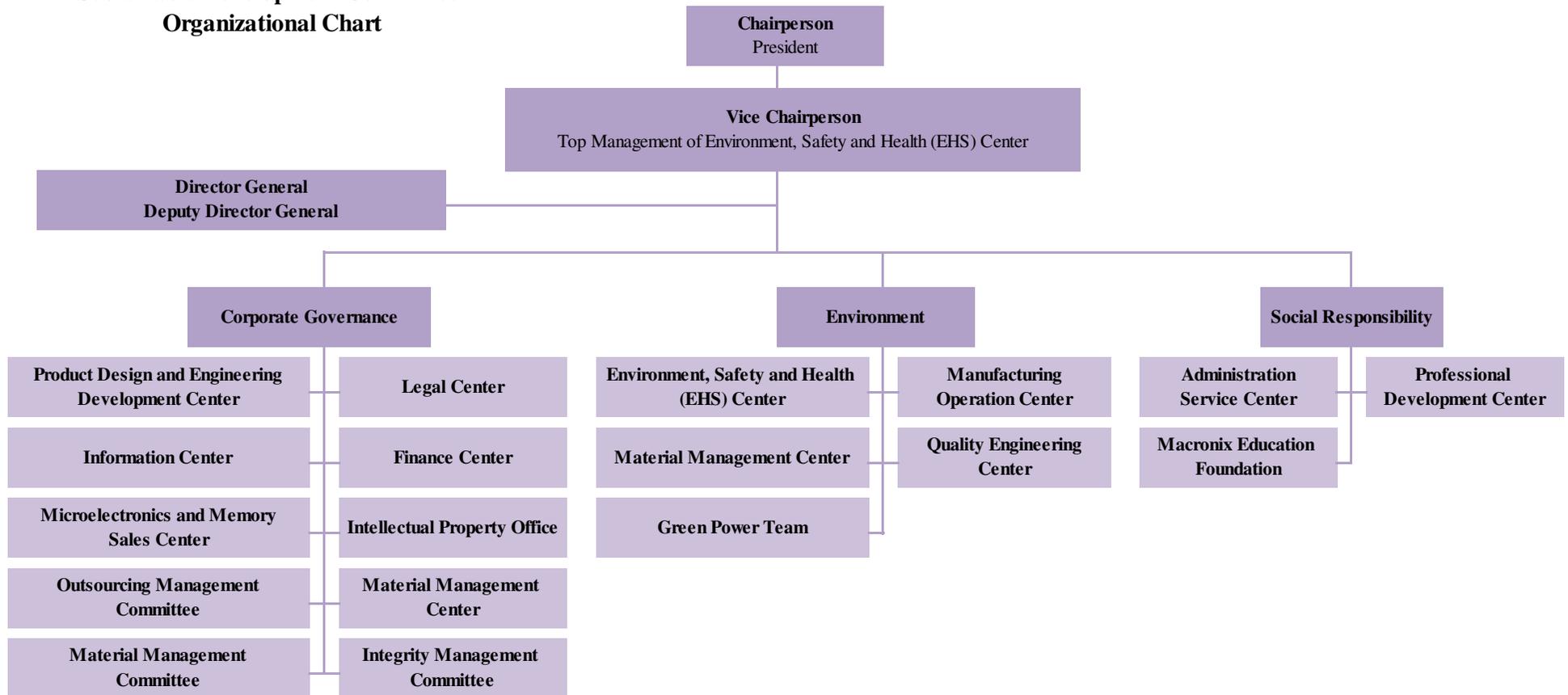
1. To comply with the national regulations related to the sustainable development, customer requirements and relevant Macronix regulations.
2. To conduct the due diligence on suppliers and contractors to facilitate the sustainable development in the performance of the supply chain.
3. To reduce environmental load, mitigate climate change and maintain ecological balance.
4. To consider the United Nations Sustainable Development Goals (SDGs) as well as the Corporate Governance 3.0 - Sustainable Development Road Map of the Financial Supervisory Commission (FSC) to be our vision, perform the continuous improvement through the management system to achieve international standards.

Organization of the Sustainable Development Committee

The Sustainable Development Committee is responsible for developing and supervising the implementation of sustainable development policies, management systems, and annual promotion plans. The President serves as the Chairperson, the Top Management of Environment, Safety and Health (EHS) Center serves as the Vice Chairperson, and the committee members are representatives of the Company's cross-department center or business groups. The execution team adheres to the mission of sustainable corporate development, integrates cross-departmental resources to promote and maintain the effective operation of various sustainable development goals and programs, and enhances the awareness of sustainable development among employees, so that the system can be maintained and continuously improved. The team regularly reports to the Board of Directors and carries out the various requirements set by the directors for sustainable development.

The Chairperson or Vice Chairperson of the Sustainable Development Committee reports to the Board of Directors of the Company on the operation of the Sustainable Development Committee and implements the requirements of the directors for sustainable development.

**Sustainable Development Committee
Organizational Chart**



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 Macronix's contact information and communication channels through the "Stakeholders Section" or "Contact Us" 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 various goals.

Stakeholders in our sustainable reports are identified according to the requirements specified by the TWSE regarding stakeholders for listed companies, the AA1000 Stakeholder Engagement Standard, by interviewing personnel from the Sustainability Report Execution Task Force, 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.

Stakeholder



Employees

Talents are the fundamental and most valuable asset of an enterprise. Macronix stands on the same front with its employees, cares about their work and life, and builds a sustainable Macronix home.



Customers

Provide customers with trusted green products and services and increase the value for their products through continuous innovation.



Investors/Banks

The long-term support of investors and banks is the driving force for Macronix's continuous growth and innovation.



Macronix Education Foundation

The Foundation has been promoting science education and cultivating technology talents.



Media

Media serves as an important channel for Macronix to provide, collect, and communicate with stakeholders.



Suppliers

Maintain good partnership and build consensus through audit and counseling.



Government/Associations

Comply with laws and regulations, and actively cooperate with the policies of the competent authorities to move towards a sustainable enterprise.

Interactions and Responses to Macronix's Stakeholders in 2022

Stakeholders	Communication channels	Topics of Concern	Highlights and results of communication in 2022	Subject to Influence (V) or Concern (*)	
Investors/Banks	<u>Corporate Social Responsibility Website</u> and <u>Sustainability Report</u> (annually) Corporate website, financial statements (annually) Shareholders' meeting (annually) Self-organized investor seminars (quarterly) Participate in forums/visits by investors/visits to investors (irregularly) Investor service mailbox/phone calls (irregularly)	Shareholder equity Corporate Governance Overview of Investments Innovative R&D Industry development Intellectual Property Rights Dividends distribution Corporate operations Product price Product use	* Participated in investors-related ESG activities to understand the awareness and expectations of investors and shareholders on ESG * Provided investors with open and transparent operational information and assist investors to understand Macronix's long-term strategic goals and prospects (held 1 shareholders' meeting, 4 self-organized investor seminars, and participated in more than 80 external meetings) * Continued to invest in the R&D of various semiconductor processes. In 2022, a total of 240 domestic and foreign patents were obtained, and the cumulative total number of patents granted to Macronix is 8,894. * Disclosure of financial and operational reports on investor relations on the Company's website: https://www.mxix.com.tw/zh-tw/about/investor-relations/Pages/quarterly-results.aspx	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 (irregularly) 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	* Passed the RBA VAP audit with the highest score in 2022 * Customer satisfaction survey response rate > 81% * 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	*

Employees	<p>Various open-discussion meetings (held periodically and ad hoc)</p> <p>"No Topic is Off Limits" suggestion box (available 24-7)</p> <p>Reporting hotline (available 24-7)</p> <p>Printed copies and electronic bulletin boards (to communicate information as necessary)</p> <p>Employee Relationship Management Portal (available 24-7)</p> <p>Learning map platform (available 24-7)</p> <p>Performance evaluation procedure (annual)</p> <p>Health consultation/promotion (held periodically and ad hoc)</p> <p>Employees seek advice in person or by phone (irregularly)</p>	<p>Employee Communication</p> <p>Labor/Management Relations</p> <p>Compensation & Benefits</p> <p>Human rights policy</p> <p>Training System</p> <p>Performance evaluation results</p> <p>Occupational safety and health</p> <p>Key points of the amendment to the Labor Standards Act</p> <p>Pension</p> <p>Calculation/qualifications of retirement pension</p> <p>COVID-19 prevention and management</p>	<p>* Number of open-discussion meetings held: Orientation training for 684 new employees. Department discussions (held by each department as necessary). The head office and each fab convened 4 labor-management meetings. 2 Welfare Committee meetings.</p> <p>* Received 120 cases from the "No Topic is Off Limits" suggestion box and reporting hotline with a 100% closing rate</p> <p>* Periodically organized on-the-job occupational safety training; ESH offers consultation for employees at any time</p> <p>* Planned the health promotion plan for the following year based on employees' health condition, opinions regarding the annual health exam, and current events</p> <p>* Physicians provide consultation services for the entire company 10 times a month</p> <p>* A total of 2 health promotion activities and seminars were attended by a total of 1,041 employees</p> <p>* 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 principles have been issued. Through the digitization of the "body temperature registration and pandemic mitigation statement", "COVID-19 rapid test login" 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.</p>	Economy	V
				Environment	
				Society	V*
Suppliers	<p>Suppliers' conference (annual)</p> <p>Supplier audits (performed annually based on risk levels)</p> <p>Supplier evaluation (quarterly and annually)</p> <p>Quality improvement meeting (irregularly)</p> <p>Material supply/demand tracking (periodically and ad hoc)</p>	<p>Occupational safety and health</p> <p>Supplier evaluation</p> <p>Green product requirements</p> <p>Corporate Social Responsibility</p> <p>Compliance with Business Ethics</p> <p>Quality improvement procedure</p> <p>Supply and demand of important materials</p>	<p>* Contractor education and training, as well as coordination organization meetings are completed before operations in accordance with regulations</p> <p>* Completed 31 supplier audits in 2022</p> <p>* Held 1 suppliers' conference</p> <p>* Have maintained the AEO certification for 13 years</p> <p>* 100% of suppliers received a score of 80 points or above in the supplier rating</p> <p>* Approximately 38% of raw materials are procured in Taiwan</p>	Economy	V*
				Environment	
				Society	*

	Contractor training courses (as necessary) Contractor coordination organization meetings (as necessary)				
Government/Associations	Official document delivery (as necessary) Participation in presentations/promotions/seminars/forums (irregularly) 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 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	* 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 * Participated in the Safety and Health Committee/Environment Committee and visit the competent authorities in response to the operational appropriateness of the consultation law and the requirements of the competent authorities * Total greenhouse gas emissions in 2022 decreased by 0.6% 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 2022 * 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 2022 target	Economy	V*
				Environment	V*

		Noise Corporate sponsorship/funding Charity event participation	* The competent authority conducted 55 occupational safety and environmental protection audits; no major penalties were imposed * Annual disease prevention plan based on abnormal workload, regular tracking and evaluation management * Established the Epidemic Prevention Office and measures in accordance with the Central Epidemic Command Center's relevant regulations and conducts rolling reviews. In 2022, hundreds of meetings were held and 13,698 employees received concern, and maintained the normal operation of the Company. * Donated over NT\$3.31 million	Society	V*
Media	Press releases (periodically and ad hoc) Investor seminars (quarterly)	Operational performance General information about the Company	* Published 16 press releases on revenue and investor conferences, 36 press releases on products, material information of the Company or supplemental data, and invited or organized press conferences 2 times. * There were a total of 1,708 related news articles in 2022.	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	* The 22nd Macronix Golden Silicon Awards: A total of 275 teams registered and awards influenced 29,499 people * The 21st Macronix Science Awards: A total of 589 works were submitted and awards influenced 473,542 people * A total of 48 members participated in the welcome party of the Macronix Science Awards Association	Economy	
				Environment	
				Society	*

3.2.2. Determining Material Topics

Material topics are evaluated in this report in accordance with the following determination steps, and the management policies are disclosed in each chapter of the report. The disclosure of management policies is not mandatory for non-material topics.

Process for determining material issues

	I. Understanding the Organizational Context		II Identifying Actual and Potential Impacts			III Determining Material Topics
Process	1. Stakeholder Identification	2. Sustainability Issue	3. Investigating the Level of Stakeholder Concern	4. Internal Impact Assessment.	5. Evaluation of Issues	6. Determining Material Topics
Method	<ul style="list-style-type: none"> According to the requirements specified by the TWSE regarding stakeholders for listed companies. Interview the Sustainability Report Execution Task Force and other relevant departments, require them to follow the AA1000 Stakeholder Engagement Standard: level of concern, responsibilities, influence, diversity of perspectives, and tension identification. Referencing our peers. 	The working group enumerates sustainability issues with reference to the GRI Standards, SASB, SDGs and TCFD.	Surveyed 7 categories of stakeholders on their concerns about Macronix's sustainability issues through "Macronix 2022 CSD Issue Survey".	Investigated the impact of various issues in the organization's operation process through "Macronix 2022 CSD Issue Survey".	Steps 3 and 4 are used as the basis for ranking, combining external expert advice with internal organizational adjustments.	Assessed the significance of actual and potential impacts of the 13 material issues on the Macronix's economy, environment, and society (people) through interview with Sustainability Report Execution Task Force.
Result	Identify 7 major stakeholders: investors/banks, customers, employees, suppliers, government/associations, Macronix Education Foundation, and media.	Listed out 35 sustainability issues.	Received 95 valid questionnaires.	Received 19 valid questionnaires.	20 sustainability issues were selected.	Confirmed that these 13 material issues had a significant impact, drafted a materiality matrix and reported to the Sustainable Development Committee.

Understand the organizational context

The initial 35 sustainability issues were proposed based on stakeholder requests and a combination of international and domestic standards and Macronix's previous ESG data.

Investigating the level of stakeholder concern and internal impact assessment

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. 20 potential issues were pre-screened after consolidation with external experts' suggestions.

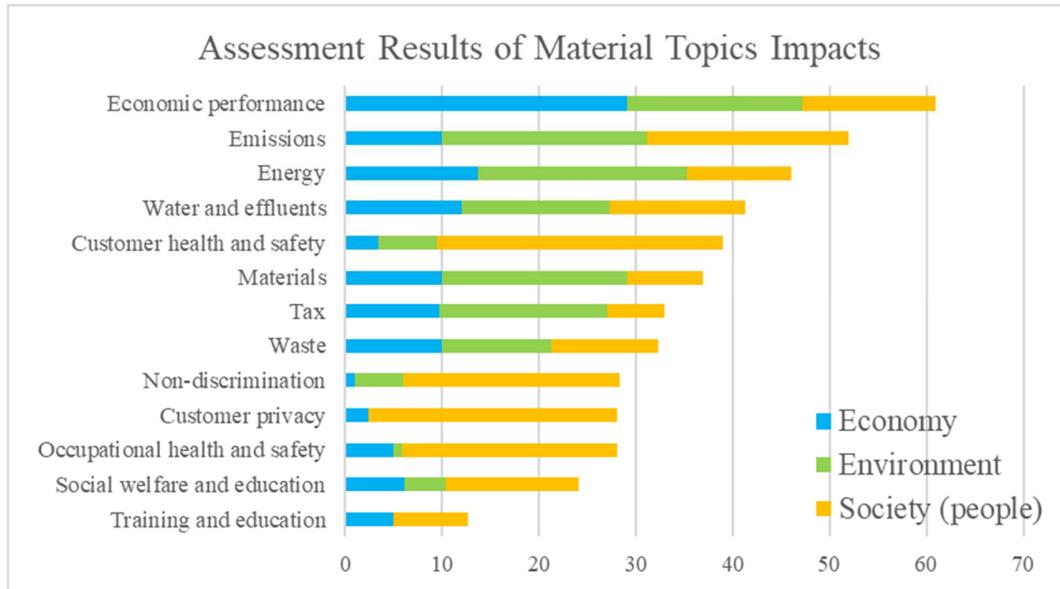
Stakeholder Opinions Compiled for the 2022 Sustainability Report

Stakeholders	Relevant Issues- Compilation Method	Scoring method
Investors/Banks	Questionnaire survey, statement recording, negotiation	(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 Suppliers' conference held on August 26, 2022
Media	Negotiation, questionnaire survey	Filled out by representatives of the Corporate Communication Office
Government/Associations	Questionnaire survey, negotiation	Government's summarized issues of concern during the year based on stakeholder communication policies and results
Macronix Education Foundation	Negotiation, questionnaire survey	Filled out by representatives of the foundation

Determining material topics

Based on the actual and potential positive and negative impacts of the 20 preliminary issues, a quantitative assessment of four factors, including impact scale, impact range, frequency of occurrence, and possibility of occurrence was conducted through departmental group interviews to determine the threshold values of material topics for the year. In 2022, 13 material topics were evaluated, and relevant issues are responded to in this report.

The results of the economic, environmental, and social (people) impacts of the material topics are shown in the following graph:



Material Aspects and Boundary Setting

Category	Issue	Material Topica		Impact Boundaries (V – Direct; O – Indirect)			Corresponding Chapters
		2021	2022	Internal	Customers	Suppliers	
Economy	Economic performance	V	V	V	O	O	5 Economic Dimension
	Anti-corruption	V					
	Tax		V	V			5.2 Tax Policy
Environment	Materials	V	V	V	O		6 Sustainable Environmental Dimension
	Energy	V	V	V	O	O	6.2.2 Energy Management
	Water and effluents	V	V	V	O		6.1.1 Water Resource Management
	Emissions	V	V	V	O	O	6.1.2 Air Pollution Prevention, 6.2.3 Climate Change Management
	Waste	V	V	V	O	O	6.1.3 Waste Management
	Environmental compliance	V					
Society	Labor management relations	V					
	Occupational health safety	V	V	V		V	7.3.2 Safety and Health Promotion Management
	Training and education		V	V	O	O	7.2 Learning and Development
	Non-discrimination		V	V	O		7.1.2. Upholding Employee Rights
	Customer health and safety		V	O	O	V	6.4.1 Green Products
	Customer privacy		V	V	V	O	4.4.1 Sharing Beneficial Outcomes with Customers
	Social welfare and education		V	V			7.4 Social Welfare

4. Corporate Governance

Macronix upholds high corporate governance standards, 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 Macronix’s Corporate Governance Guidelines. 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 “Corporate Ethical Management Guidelines” and “Code of Business Conduct and Ethics”, in hopes of creating a business environment for sustainable development.

Macronix’s Philosophy

Honesty

Macronix’s Corporate Values

Innovation, Quality, Efficiency, Service, Team Work

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 shareholders’ rights and interests
- ◆ 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. In the first Corporate Governance Evaluation for Listed and OTC Companies in 2015, we ranked among the top 5% excellent companies. In the eighth evaluation in 2022, the Company was ranked among the top 10% in the electronic companies with a market value of more than NT\$10 billion, demonstrating Macronix’s outstanding results in promoting and its spirit of actively improving corporate governance.

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. The directors were fully re-elected on May 27, 2022, with the term of office from May 27, 2022 to May 26, 2025. The Board is comprised of 15 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. Furthermore, among the directors, 13 are men (87%) and 2 are women (13%). All directors are over 50 years old. The members

of the Board of Directors, their concurrent positions and convening status are 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.

In addition, since 1997, Macronix has been managing its own stock affairs and has established relevant dedicated units to handle shareholder affairs, address shareholder concerns, and enhance relationships with corporate entities. In addition, the "Investor Relations Office" has been set up to 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.

Board composition and diversity

The Board of Directors is the highest governance body of Macronix. The composition of the Board of Directors is diverse and independent. Regarding director candidates, Macronix adopts a "candidate nomination system". All director candidates are reviewed by the Nomination Committee and approved by the Board of Directors, and submitted to the shareholders' meeting for election. The Chairman of the Company is elected by the directors in accordance with the law and serves as the external representative of the company.

The 12th Board of Directors consists of 15 members, including 2 female directors. Macronix recruited industry experts and scholars with professional backgrounds in industrial technology, law, financial accounting, education, marketing and public relations. More than 90% of the directors have industrial technology background. The overall capabilities of the Board of Directors are in line with Macronix's future development needs and the Board diversity policy. The directors supervise the implementation of Macronix's business plans in terms of their professionalism and objectivity. The implementation of the Board diversity policy is disclosed in the annual report and on Macronix's official website (<http://www.macronix.com>).

Conflict of interest regulation and management

Regarding the governance, operation, and management of the Board of Directors, as well as the Audit, Compensation, and Nomination Committees, regulations are followed based on laws, articles of incorporation, and relevant organizational regulations. Those who have an interest in any agenda item of the Board meeting shall specify the important aspects of their interest. If such interest is potentially detrimental to the interests of the Company, they shall not participate in the discussion and voting, and shall recuse themselves during discussion and voting, and shall not exercise their voting rights on behalf of other members.

Please refer to the Company's annual report and website for the concurrent positions of Macronix's directors and the list of top ten shareholders. For related party transactions and securities holdings, please refer to the financial statements.

Independence of the Board of Directors

When a director or a juristic person the director represents has an interest in any agenda item of the Board meeting, the director shall follow Article 17 of the Company's "Procedure Rules of the Board of Directors Meetings" and specify the important aspects of their interest at the respective meeting. When it is detrimental to the interests of the Company, the director shall not participate in discussion or voting, and shall recuse themselves during discussion and voting, and shall not exercise their voting rights on behalf of other members. If the spouse of a director, a relative within the second

degree of consanguinity, or a company with which the director has a controlling relationship of subordination, has an interest in an agenda item of the Board meeting as mentioned above, such director is deemed to have an interest in that agenda item.

In addition, in order to continuously implement corporate governance and strengthen the eligibility of independent directors, the Corporate Governance Officer regularly reviews the qualifications and independence of independent directors during their terms of office and reports to the Board of Directors.

Continuing education of directors

In accordance with the “Directions for the Implementation of Continuing Education for Directors and Supervisors of TWSE Listed and TPEX Listed Companies”, the Company arranges continuing education for members of the Board of Directors every year to enhance the professionalism required for the business execution by the directors and to effectively perform the functions of the Board of Directors. In 2022, we arranged 6 hours of courses on “Risks and Opportunities under Climate Action-Carbon Neutrality Promotion” and “The Latest Trends of Must-know Corporate Governance Evaluation-Intellectual Property Management” to enhance the directors’ understanding of sustainable development and corporate governance trends. The directors of the Company actively participate in internal and external training courses, covering topics such as climate risk, corporate sustainable management, intellectual property management, information security, risk management, corporate governance, etc. The average training hours of each director in 2022 was 10.73.

Board of Directors Performance Evaluation

In order to implement corporate governance and continuously improve the effectiveness of the Board of Directors, Macronix has formulated the “Rules for Board of Directors Performance Assessment”, which stipulates that the Board of Directors should perform an “internal performance evaluation” every year. In 2022, the internal performance evaluation of the entire Board of Directors, individual directors and functional committees (including the Audit Committee, the Compensation Committee and the Nomination Committee) has been implemented. The performance evaluation results have been reported to the Nomination Committee and the Board of Directors held on March 3, 2023, and disclosed in Macronix’s annual report and on the official website (<http://www.macronix.com>).

In addition, in order to strengthen the independence and effectiveness of the performance evaluation of the Board of Directors, on top of internal performance evaluation, an external professional institution or expert is entrusted to perform the “External Performance Evaluation” at least once every three years. Macronix has entrusted the “Taiwan Corporate Governance Association” to perform the 2020 “External Performance Evaluation of the Board of Directors”, and the results of the external performance evaluation are reported to the Nomination Committee and the Board of Directors held on February 26, 2021.

Macronix will continue to improve the operational efficiency of the Board of Directors and functional committees based on the results and recommendations of the performance evaluation.

Macronix Corporate Governance Highlights

Scope	Highlights
Board of Directors	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ Established the Compensation Committee to evaluate and approve the remuneration for senior executives (in 2006) ◆ Prohibits the employment of people who are related to the senior executives within the four degree of consanguinity ◆ Sets operation goals and implements PDP performance evaluation
Internal Control	<ul style="list-style-type: none"> ◆ Systematized internal controls and self-evaluate operation procedures (in 2009)

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. The current term of office is from May 27, 2022 to May 26, 2025. The director of Tyzz-Jiun Duh serves as the convener. 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 2022, the members of the Audit Committee, their concurrent positions and convening status are disclosed in the annual report, on Macronix's official website (<http://www.macronix.com>), and the "Market Observation Post System" of Taiwan Stock Exchange.

Name	Education	Previous Experience
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
Chiang Kao	Oregon State University Ph.D., Forest Management	Professor, Department of Computer Science, Southwest Texas State University President, National Cheng Kung University

Cheng-Wen Wu	University of California, Santa Barbara Campus Ph.D., Electrical and Computer Engineering	Dean, College of Electrical Engineering and Computer Science, National Tsing Hua University Vice President, National Tsing Hua University Vice President, National Cheng Kung University
Chien-Kuo Yang	Tamkang University B.S., International Trade	Certified Public Accountant, Ernst & Young Independent Director, Spirox Corporation Independent Director, M31 Technology Corporation Supervisor, YoungTek Electronics Corp.

Furthermore, according to the “Code of Business Conduct and Ethics” of Macronix, the president, vice president, and financial managers shall immediately report any conflict of interest or any concern of a potential conflict of interest to the Audit Committee. As for other employees, if they become aware of any conflicts of interest, they may also report them in writing to their supervisors or members of the management team at any time.

Nomination Committee

Macronix established the Nomination Committee on January 22, 2019, which is comprised of the chairman and two independent directors. The Chairman is the convener. The committee met five times in total in 2022. The composition, functions and operations of the relevant Nomination Committee are 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.

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. The current term of office is from May 27, 2022 to May 26, 2025, and Director Chiang Kao serves as the convener. The committee met 5 times in total in 2022. The composition, functions, and operations of the relevant Compensation Committees are disclosed on pages 42-43 of the annual report, on Macronix’s official website (<http://www.macronix.com>), and on the “Market Observation Post System” of Taiwan Stock Exchange.

The Company’s highest individual annual compensation in 2022 was 22.1 times the median compensation of employee (Note). The highest individual annual compensation change rate was 3.3 times the median compensation change rate of employee (Note).

Note: Calculated based on employee compensation in service for a full year

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 2022, 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 of “honesty” 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 of “honesty”. 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 prevent the misconduct 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 required to pass the test 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 2022, the Company achieved 100% completion rate of the educational and training courses related to the Ethical Corporate Management Best Practice Principles, with approximately 18,963 participants and 6,578 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 2022, a total of 162 supplier participated and the number of training hours amounted to approximately 27 hours.

In order to strengthen internal and external communication channels, Macronix has set up a special telephone line to directly report to the Audit Office: 03-5786688 ext. 78119, and has established the notification and handling of violations of the Ethical Corporate Management. All cases are numbered, documented, investigated and handled one by one, and kept in accordance with the law. After the reported case is accepted, a project team will be formed depending on the nature and type of the case, or transferred to the relevant unit for investigation, and reported to the Board of Directors. In order to effectively carry out the investigation of reported cases, a real-name reporting system is implemented. Whistleblowers are required to provide their name, contact information, as well as the name of the person being reported and specific evidence of the alleged illegal activities. This information is essential for conducting proper verification and investigation.

4.1.4. Confidential Information Protection

(1) Information security management strategy, structure and results:

1. Information Security Policy

Information security is an important issue for the Company’s operations. In order to protect the Company’s information assets from internal or external, intentional or accidental threats and damage, and reduce the probability of information security accidents and the risk caused by management accidents to an acceptable level, the Company has formulated information security policies and established relevant management systems, which are announced on the Company’s website. Macronix requires all employees and business partners to follow such policies and systems.

Through active actions to protect the confidentiality, integrity and availability of the Company’s information, we ensure the normal operation of the Company’s business and comply with the requirements of the competent authorities and national laws.

2. Information security management organization and responsibilities

In order to implement the information security policy, the Company has established the Chief Information Security Officer in accordance with the provisions of the Regulations Governing Establishment of Internal Control Systems of Public Companies to comprehensively strengthen information security governance and information protection, and set up the “Information Security Committee”, with the Chief Information Security Officer as the chairman, and the top executives of each center and business unit as representatives. In addition, the “Information Security Core Team” and the “Information Security Task Force” perform related matters to ensure that the purpose of information security management can be achieved.

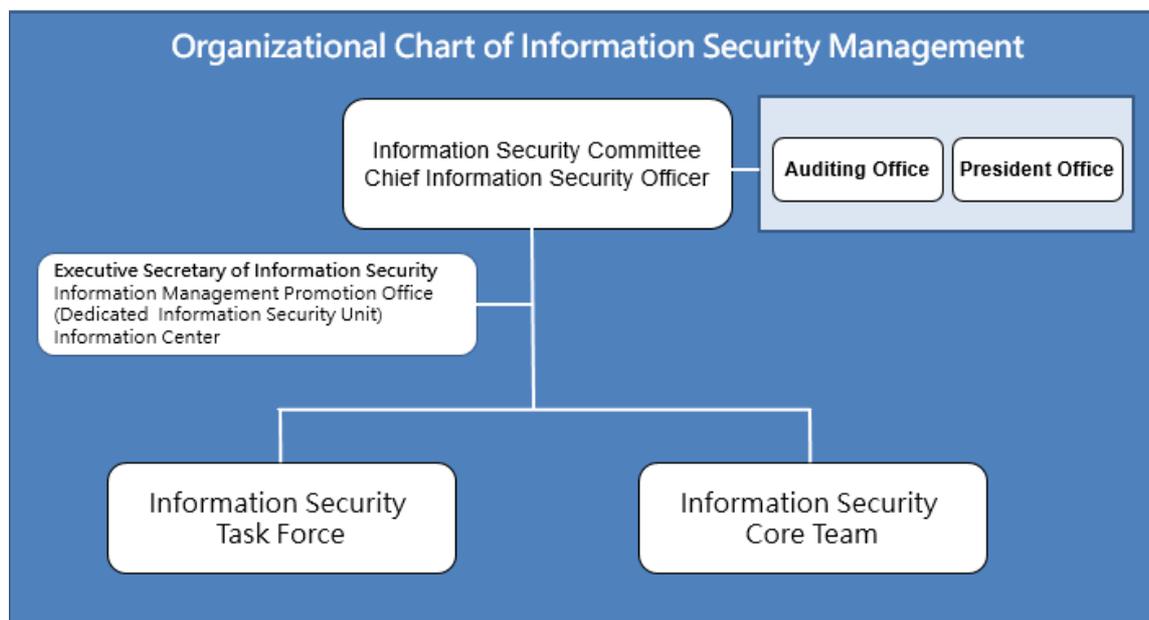


Figure: Organizational Chart of Information Security Management

Organization	Responsibilities
Information Security Committee	Formulate the Company’s information security policy Review information security management systems Formulate or review major work plans for information security

Information Security Core Team	Develop information security management systems Formulate information security regulations Promote and implement information security maintenance and management measures Execute the various resolutions of the Information Security Committee Coordinate the information security task force in performing information security operations Provide consultation on information security management
Information Security Task Force	Suggestions for improvements in information security maintenance and management measures Carry out information security tasks Act as the information security contact of all units, and assist in the promotion of security maintenance and management measures

Table: Information Security Organizations and Responsibilities

3. Information Security Organizational Structure

In addition to formulating relevant management procedures and regulations for confidential information protection in policy terms, Macronix also classifies, categorizes and labels the Company's information assets. Through the design of various information security mechanisms and system architectures, such as DLP (Data Loss Prevention) systems, data encryption, document management, network security control, endpoint protection and other tools, confidential information is properly managed and protected to ensure the best interests of the Company, shareholders, employees, customers and suppliers.

Macronix strengthens the information security awareness of all employees through relevant education and training and information security awareness activities, including trade secrets and confidential data protection, anti-virus, anti-hacking, and anti-fraud. Through the annual education and training, information security e-newsletters, information security websites, and social engineering drills, we provide explanations and sharing of professional knowledge, relevant cases, and practices to deepen the employee's concept of information security protection, so that "everyone is responsible for information security" is not only an information security management slogan, but also an in-depth internalization of Macronix employee's action policy to protect the Company's intellectual properties and customers' confidential information.

In addition to requiring employees' awareness of information security, Macronix also includes its contractor/supplier in the scope of information security protection. Manufacturers must understand Macronix's supplier information security instructions before they cooperate with Macronix, and external personnel must complete information security courses and tests before they enter Macronix.

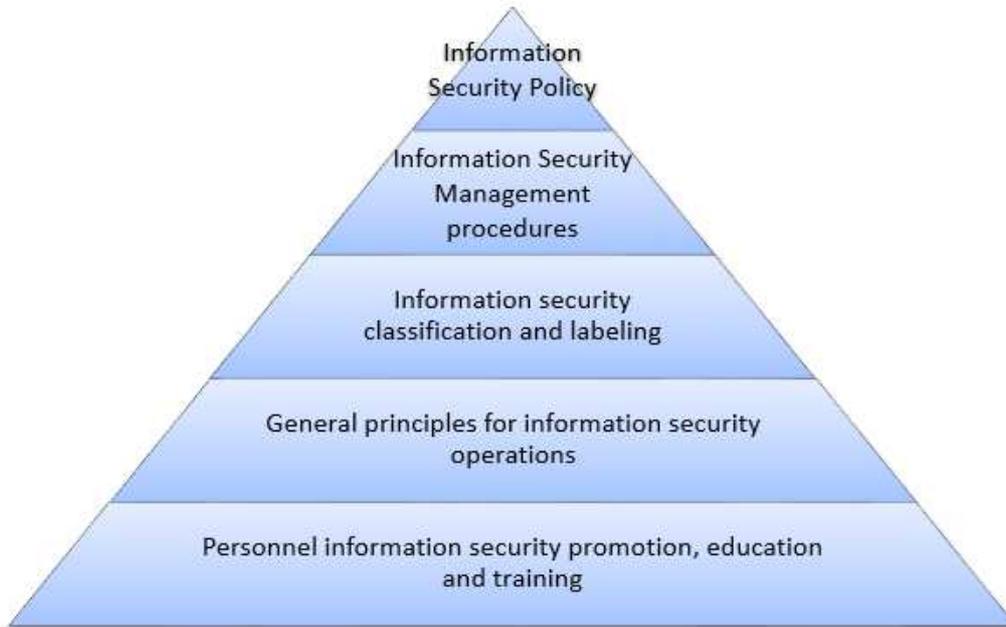


Figure: Information Security Organizational Structure

4. Specific management plan for information security

Macronix uses the design of various information security mechanisms and system architectures to block the ever-changing information security threats. The precautions include establishing appropriate security control mechanisms for the use of computers, regulatory information equipment, and network resources. In order to prevent and reduce the damage caused by malware attacks, the Company has established relevant strengthening mechanisms and systems, such as mandatory requirement for equipment to be scanned for virus to prevent malware from entering the Company's network, strengthening firewalls and network control to prevent the spread of computer viruses across regions, building endpoint anti-virus and anti-hacking measures, introducing advanced solutions to detect and handle malware, establishing an integrated network security monitoring center, and regularly entrusting external experts to perform information security assessments. In order to ensure the effective operation of the above management measures, we have established an information security digital management system to implement the spirit of zero trust.

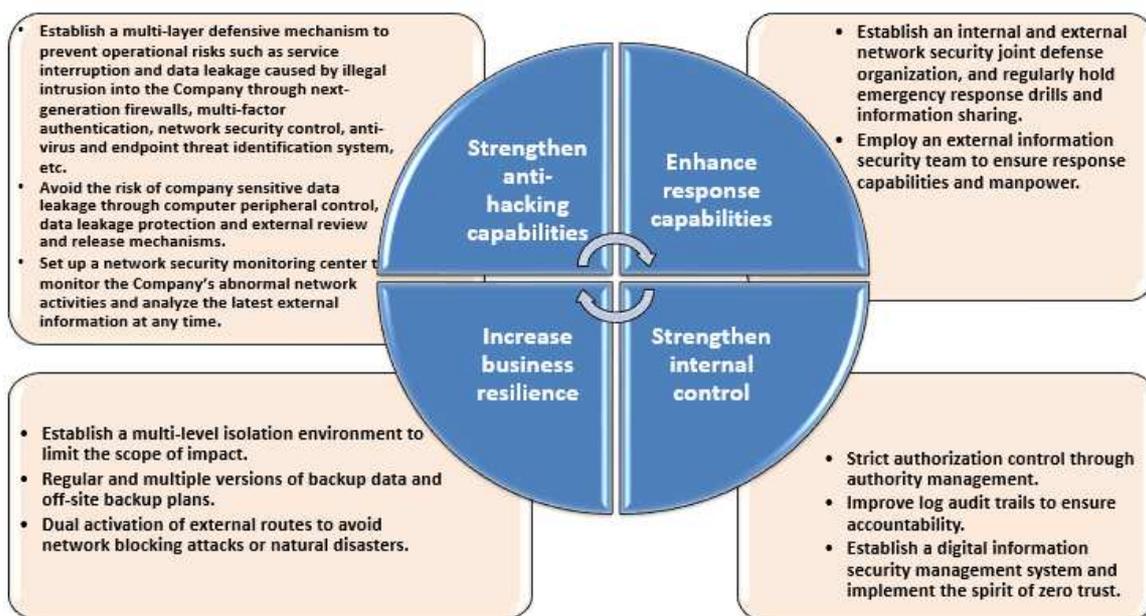


Figure: Specific management plan for information security

5. Achievements of information security measures promotion and implementation

In order to implement the P-D-C-A of information security management, the Company promoted a number of information security enhancement measures in 2022, and passed the ISO27001 international information security management system certification in December 2022. The important implementation results are summarized as follows.



Regulations	Training and promotion	Verification	Monitoring	Continuous improvement
<ul style="list-style-type: none"> Optimize information security control measures to balance information security and efficiency Strengthen supplier information security control operations to ensure supply chain information security 21 new/ revised regulations to be in line with information security regulations and international standards 	<ul style="list-style-type: none"> Complete information security awareness training for global employees Complete trade secret promotion courses Complete social engineering promotion and drills Complete contractor/supplier information security promotion courses Publish Chinese and English e-newsletter on information security on a quarterly basis 	<ul style="list-style-type: none"> Perform information and communication operation record check to ensure that abnormal events are promptly reported Implement supplier information security questionnaires to establish a scoring basis for information security maturity of important suppliers Implement internal and external audits of information security control operations and pass ISO27001 information security management system certification 	<ul style="list-style-type: none"> Effective monitoring through in-depth information security defense mechanism Entrust an external information security professional team to regularly perform intrusion threat hunting and in-depth network security identification and analysis for the Company with no successful hacking incidents found 0 major information security incident 	<ul style="list-style-type: none"> Carry out risk assessment, assess the information security risks that the Company may encounter, and strengthen the information security structure and operations Implement improvement measures based on internal audit findings Establish information security digital management capabilities to improve information security management

Figure: Achievements of information security measures promotion and implementation

6. Resources invested in information security management

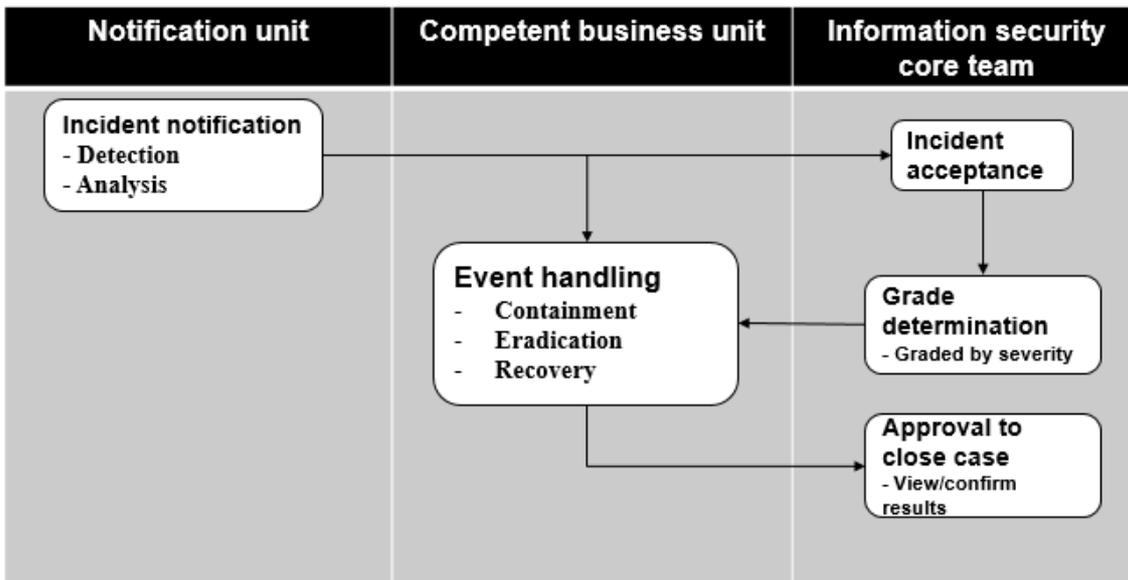
In order to meet the needs of information security management, Macronix has invested relevant resources in the establishment and maintenance of defensive measures and hedging mechanisms, including more than 100 information security-related personnel, and the amount of information security accounts for about 7.5% of the information-related budget. The key projects are as follows:

Category	Contents
Defensive Measures	<ul style="list-style-type: none"> ✓ Establish document labelling and printing watermark functions to strengthen the identification of sensitive documents ✓ Establish the Company-wide anti-virus and anti-hacking architecture, including IT and OT regions ✓ Install firewalls and intrusion detection and prevention systems in the network section of sensitive data ✓ Build a DLP system at the data transmission node to protect the transmission of sensitive data ✓ Cooperate with information security units, professional manufacturers and consultant experts to ensure the agility in responding to information security incidents
Hedging Mechanism	<ul style="list-style-type: none"> ✓ Sign a Non-Disclosure Agreement (“NDA”) with external customers and suppliers ✓ Insure against the impact of damage caused by information security incidents, so that the Company can make up for part of the losses in the event of information security incidents

Table: Resources invested in information security management

(2) Major information security incidents:

In order to strengthen information security risk management, Macronix has established information security incident notification and handling procedures to ensure immediate reporting and handling of information security incidents when they occur. In the last three years and up to the date of publication of this report, there have been no major information security incidents.



- 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.

Figure: Information security incident notification and handling process

4.1.5. Compliance with Regulatory Requirements

Macronix has always complied with laws and regulations. In 2022, 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

1. Risk management policies and procedures

Macronix formulated the “Risk Management Policy” in 2022, which was approved by the Board of Directors as the highest guiding principles of the Company’s risk management;

The Company has formulated risk management policies for various risks, covering management objectives, organizational structure, ownership of powers and responsibilities, and risk management procedures.

2. Scope of risk management

Includes the management of “strategic risks”, “operational risks”, “financial risks”, “legal compliance risks”, “information security risks” and “climate risks”.

3. Organizational structure

In accordance with the Company’s risk management policy, a risk management promotion working group is established to plan, implement, review and improve the risk management system. The President serves as the chairman of the risk management promotion committee, and each business unit regularly conducts risk factor identification and risk control, and reports the risk assessment and risk management operation for the previous year to the Board of Directors once a year.

4. Operational status

(1) Strengthening the functions of the Board of Directors in accordance with the Corporate Governance 3.0-Sustainable Development Roadmap of the Financial Supervisory Commission, and specifically promote the Company's to introduction of the enterprise risk management mechanism.

(2) A risk management implementation group meeting was held on September 27, 2022, and educational training was held to enhance risk management awareness.

(3) Reporting to the Board of Directors on October 25, 2022, proposing the risk management policy, establishing a "Risk Management Implementation Committee" and implementing a risk management plan.

Please refer to the "Risk Management Section" on the Company's website (<http://www.macronix.com>) for Macronix's risk management policies and management information.

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, damage 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 hope to achieve 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
Society	Operational safety	Cyber attacks	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Install Uninterruptible Power Supply (UPS) 2. Remote backup 3. Backup data 4. Information system interruption simulation drill
Material Issues	Risk Assessment Item	Potential Risks	Risk Management Policy or Strategy

Society	Operational safety	Water outage	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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
Society	Operational safety	Fire	<ol style="list-style-type: none"> 1. Machine CO2 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 CO2 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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
Material Issues	Risk Assessment Item	Potential Risks	Risk Management Policy or Strategy
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	<ol style="list-style-type: none"> 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



4.3 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 to be one of the few suppliers of both NOR Flash and NAND Flash in the world.

Macronix has 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 certifications in the electronic IC supply chain makes Macronix a key partner of the Tier One automotive electronics manufacturers.

Successful Developed Technologies or Products

In 2022, Macronix successfully implemented product and technology innovations to increase its superior product competitiveness.

(1) Technology innovation

- ◆ Innovation and verification of the third 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 preparation of the second 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

Macronix makes good use of the advantages of the new equipment in the 12-inch wafer lab to create more advanced 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 third-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.

Outstanding Patents	
◆	240 patents obtained in 2022
◆	8,894 patents were obtained worldwide as of the end of 2022
Recognition in Patent Ranking	
◆	As for Taiwan's corporate patent certificates, Macronix has been ranked in the top 100 since 2000 and ranked 21st in 2022.*
◆	According to IFI CLAIMS Patent Services, Macronix has been ranked in the top 1000 from 2001 to 2022, and was ranked 488th in 2022.**

*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 1,470 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 2022, we have around 809 suppliers of raw materials and components, in which the amount of procurement in Taiwan accounted for 38% of our overall procurement amount (2021: 35%; 2020: 35%).

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 ISO 45001 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 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 2022, all Macronix suppliers have undergone strict evaluation. In the annual final results, all suppliers have reached the standards of qualification, and there was as much as 95% 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 becoming a leading supplier in the semiconductor industry, providing innovative customer/application-oriented solutions and non-volatile memory products with exquisite technology, highest quality and reliable services. As a leading supplier of non-volatile memory in the world, Macronix provides NOR, NAND Flash memory, eMMC and ROM for a wide range of applications for computing, communication, consumer electronics, automotive and industrial uses. In the past year, sales of NOR Flash has accounted for more than half of the revenue, and communication, computing and consumer applications are the main sources of revenue, while the proportion of automotive and industrial applications is growing rapidly.

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.

Management Policy	Importance	Continue to optimize the information security management system to protect the Company's information assets from internal or external, intentional or accidental threats and damage.
	Mid-and long-term development direction	Implement and maintain the Company's information security management system to reduce the probability of information security incidents and manage the risks caused by incidents to an acceptable level to ensure the normal operation of the Company's business.
	Management method	<ol style="list-style-type: none"> 1. Clearly define the procedures and specifications of confidential information management. 2. Regularly implement the promotion and training of confidential information protection.
	Measures	<ol style="list-style-type: none"> 1. All employees are required to pass the information security awareness ability and personal information awareness course tests every year. 2. All employees and suppliers are required to sign a confidentiality agreement and be responsible for data protection.
	2022 Implementation results	<ol style="list-style-type: none"> 1. There have been no complaints from external parties or regulatory authorities that the customer privacy has been violated, and there have been no internal incidents of information leakage, theft or loss of customer data. 2. Passed the ISO 27001:2013 Information Security Certification
	Goals (next year's goals, short-, medium-and long-term goals)	Zero customer privacy leakage and complaints

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. All customer-related documents, data, and business-related information are strictly controlled by internal systems. In the future, Macronix will continue to accumulate its intellectual property, have the courage to innovate and provide better products and services, create value-added applications and a sense of security for customers, and cooperate with its customers in order to face challenges pertaining to advanced technologies and collectively share its positive outcomes.

“Honesty” 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 2022 customer satisfaction survey has a response rate of 81%. 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.

Macronix extended the requirements of our sustainable development policy and 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 2022, 31 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 sustainable development policy, CSR policy and supplier agenda during the 2022 suppliers’ meeting

Matters that should be cooperate with suppliers (changed to online meetings in response to the

5. Economic Dimension

5.1. Financial Performance

Management Approach	Importance	Evaluate market demand and industry trends to create stable economic benefits, achieve continuous growth, and increase company value.
	Goals	Short-term: Evaluate the market situation and immediately make adjustments Mid-term: Increase operating profits and create company value Long-term: Maintain leadership and ensure sustainable development
	Management measures	Set clear goals, review production, management, sales, and R&D expenses, periodically convene meetings for review, and continuously make improvements.
	2022 implementation results	Please see our business performance below.

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 has been listed on the Taiwan Stock Exchange from March 15, 1995. As of December 31, 2022, our paid-in capital is approximately NT\$18.6 billion.

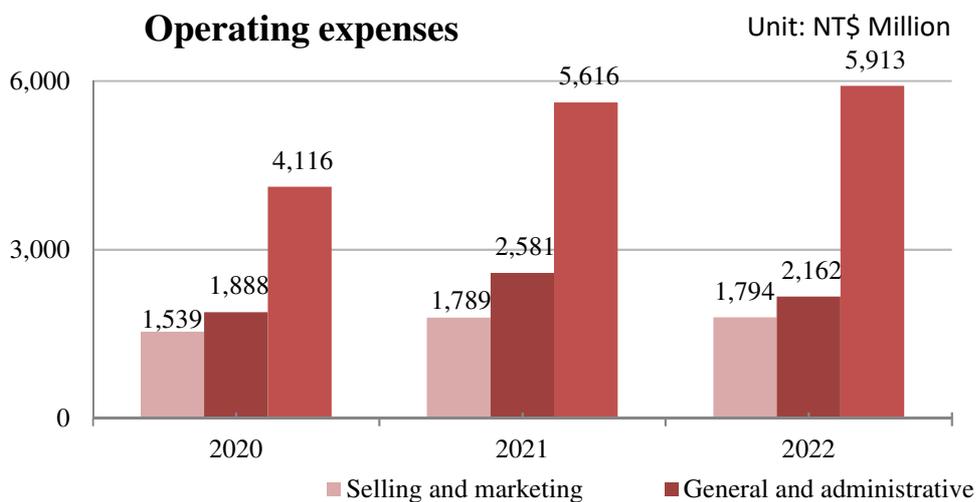
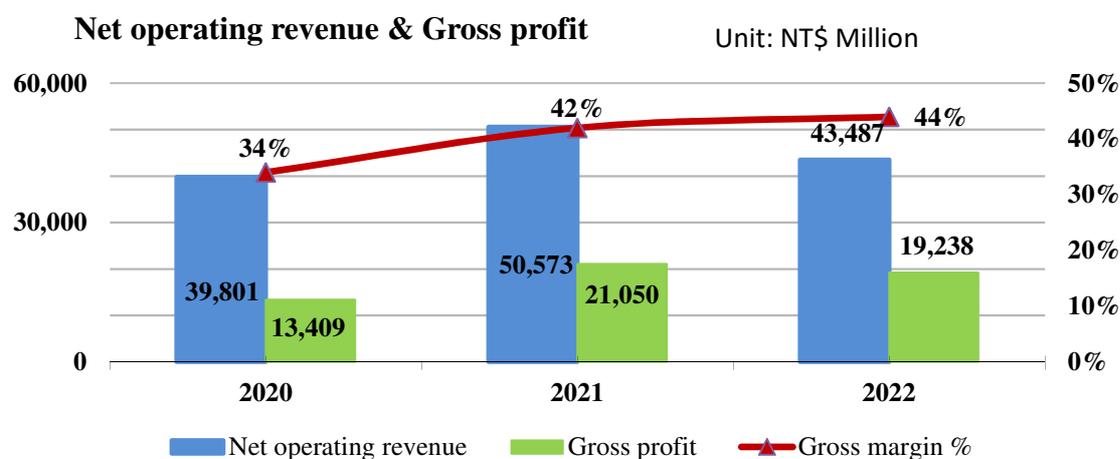
For details on our subsidiaries, shareholding ratio, and business items, please refer to Appendix 5 or subsidiaries that were included in the 2022 Q4 consolidated financial report. As of December 31, 2022, subsidiaries that are directly or indirectly owned by the Company include Run Hong Investment, 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.

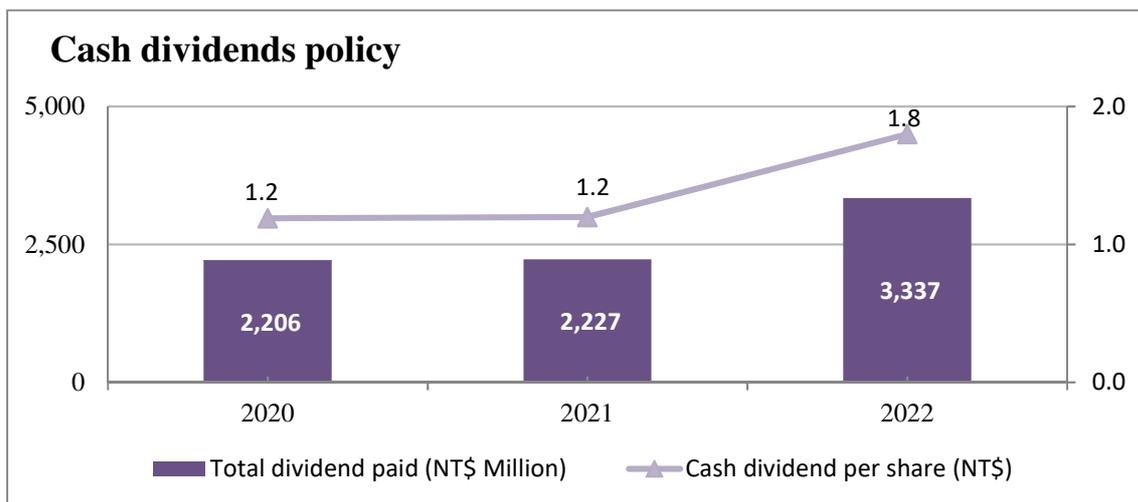
2020~2022 Business Performance (Consolidated financial statement figures)

Unit: NT\$ Million

Item	2020	2021	2022	Notes
Net operating revenue	39,801	50,573	43,487	Direct economic value
Operating costs	26,392	29,523	24,250	Economic value distributed

Gross profit	13,409	21,050	19,238	
Operating expenses	7,543	9,986	9,869	Economic value distributed
Income from operations	5,866	11,064	9,369	
Total non-operating income and expenses	(25)	2,264	923	Economic value distributed
Income before income tax from continuing operations	5,841	13,328	10,292	
Income tax expense	515	1,365	1,323	Economic value distributed
Net income for the year	5,326	11,963	8,970	Economic value retained

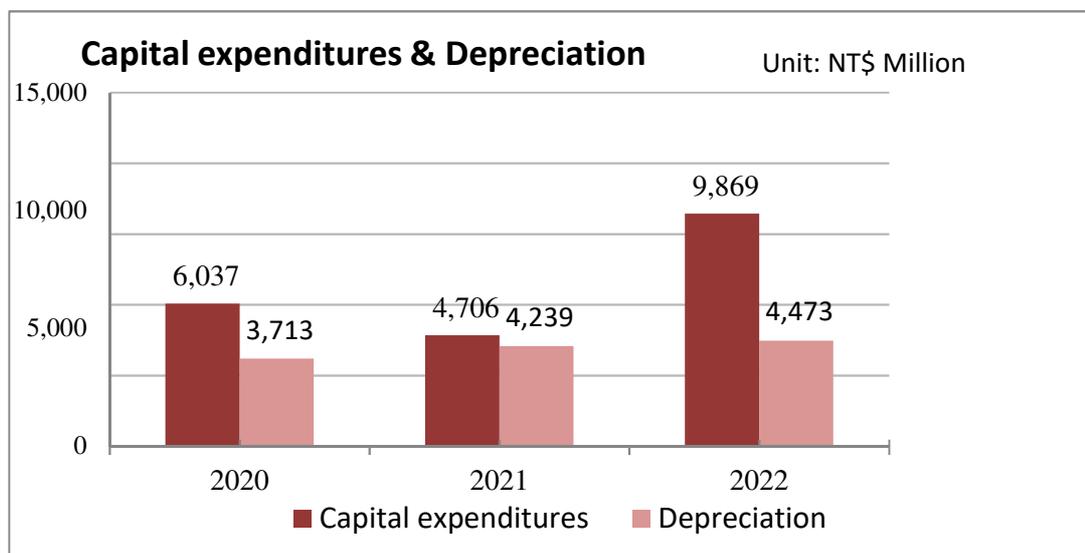




R&D Investments

Unit: NT\$ Million

Item	2020	2021	2022
R&D investment	4,116	5,616	5,913
Total revenue	39,801	50,573	43,487
Percentage	10%	11%	13%



Employee compensation expenses in 2022 include salaries, labor and health insurance premiums, director's remuneration, pensions, and other employee benefit information. Please refer to page 84 of the 2022 Q4 IFRSs stand-alone financial statements (summary of employee benefits, depreciation, and amortization expenses).

Financial Aid Received from the Government Grants

As of 2022, Macronix obtained a government preferential interest rate loan of NT\$7,787,000 thousand from the "Action Plan for Welcoming Overseas Taiwanese Businesses to Return to Invest

in Taiwan”. The loan will be repaid on an average monthly basis after the date of expiry. At the time of the borrowing, the fair value of the borrowing was estimated based on the market interest rate. The difference between the amount obtained and the fair value of the loan is NT\$115,898 thousand, which is regarded as a government low interest loan and recognized as deferred income. In 2022, the Company recognized other income of NT\$12,420 thousand and the interest expense of the loan was NT\$18,797 thousand 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 12.6% in 2022 which was lower than the statutory tax rate, 20%, of the R.O.C. Profit-Seeking Enterprise Income Tax. The main reason was the tax credit for research and development expenditure.

Macronix's performance in promoting e-invoices

Macronix was awarded the "Outstanding Business Entities for Using Electronic Uniform Invoices" by the Hsinchu Branch, National Taxation Bureau of the Northern Area, Ministry of Finance. The award once again affirmed Macronix's efforts in improving corporate governance, strengthening the Company's operational structure with honest and transparent financial disclosure and tax policies, and continuing to fulfill its ESG sustainable development commitments.

Macronix adheres to the principles of ethical corporate management, legal compliance, and giving back to the society. It began to introduce the e-invoice system in 2017 and officially launched it in 2018. The promotion of e-invoices greatly saves the Company's costs. In addition to reducing the paper cost by 40,000 to 50,000 pieces per year, it also reduces the staff cost of sending, receiving, registering and verifying invoices. It does not need to worry about the risk of invoice loss and data registration error. In addition to the actual operational improvement, the electronic information exchange and processing is a major driving force for corporate progress.

In addition, according to the Ministry of Finance, e-invoices can reduce carbon emissions by 990,368 tons per year to maximize the benefits of the digital economy. In the future, the Company will continue to fulfill its commitment to sustainable development and enhance its competitiveness through ESG.

[2022 Outstanding Business Entities for Using Electronic Uniform Invoices Award]



From the introduction of e-invoice promotion to the process of going online, a necessary breakthrough is to change the paper-based operation habits that have been maintained for many years, and on the other hand, in the process of opening and receiving e-invoices, it is necessary to prepare a postcard to continuously persuade customers, employees and suppliers in the Company to join the e-invoicing process one by one. Through the electronic use of external certificates and the Company's internal promotion of online verification, it not only saves the original labor time, but also helps in energy saving and carbon reduction.

Promoting e-invoices is the best way for our accounting personnel to contribute to energy saving and carbon reduction. At present, e-invoices have not yet been fully popularized. In line with government policies, the Company continues to share the benefits of using e-invoices with suppliers through experience and information sharing, in order to create a win-win situation with suppliers and promote the full use of e-invoices.

Tim Ku Accounting Director, Macronix

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 with ample ESH consultation and participation, so as to make the best efforts fulfilling their duties and obligations regarding ESH.
- ◆ **Regulation Compliance:** Comply with ESH regulations, and implement 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 to ensure they are able to implement the ESH works properly.
- ◆ **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 the expectations of all colleagues, customers, shareholders and stakeholders.

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 2022 under our strict environmental quality monitoring.

Major awards received by Macronix during 2022 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 environmental bikeway in the air quality purification zone / The Environmental Protection Administration
- ◆ Excellent water saving units / Ministry of Economic Affairs: First Class Award (Fab 5)

- ◆ Outstanding enterprises in waste reduction and circular economy in Hsinchu Science Park / Hsinchu Science Park Bureau : Award of Excellence (Fab 2)

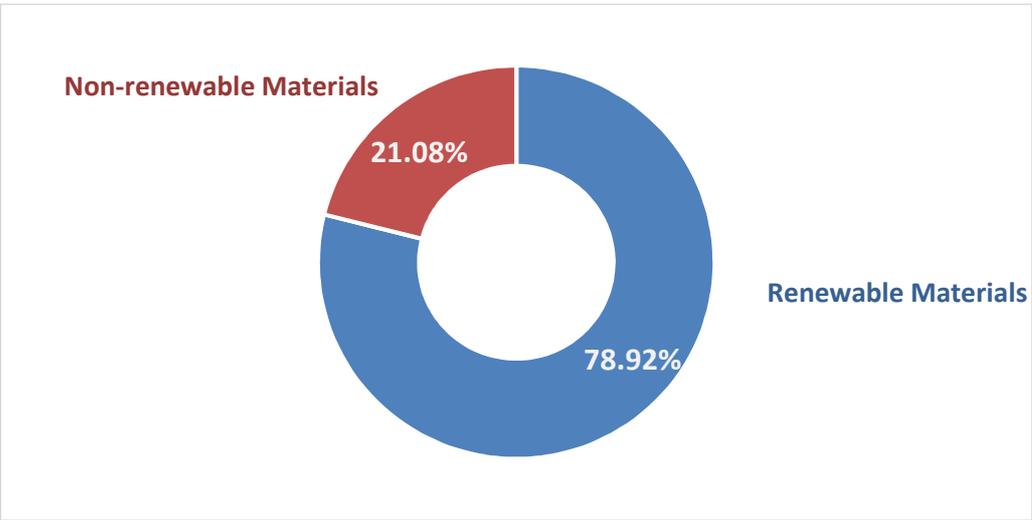
Macronix introduced and passed the ISO 14001 Environmental Management System Certification in 1997. We ensure that our environmental management systems fully comply with the Plan-Do-Check-Act (PDCA) operations of the ISO system to maintain a healthy and safe environment and continuously make improvements to reach our goal. Currently, the Macronix Headquarters, Fab 2, Fab 5 and the Test building have all 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 valuable feedback that is provided externally or internally from the government, general public, customers, investors, employees, media, and suppliers. In 2022, 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)	Amount Consumed in 2022 (Ton)
Renewable Materials (Packaging Materials)	373.69	303.44	197.73
Non-renewable Materials (Wafer)	59.10	63.23	52.82
Total Amount of Materials Consumed	432.79	366.67	250.55



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
	2022 implementation results	Average process water recycling rate of all fabs in the Company was 85.7%
	Targets in 2023	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.

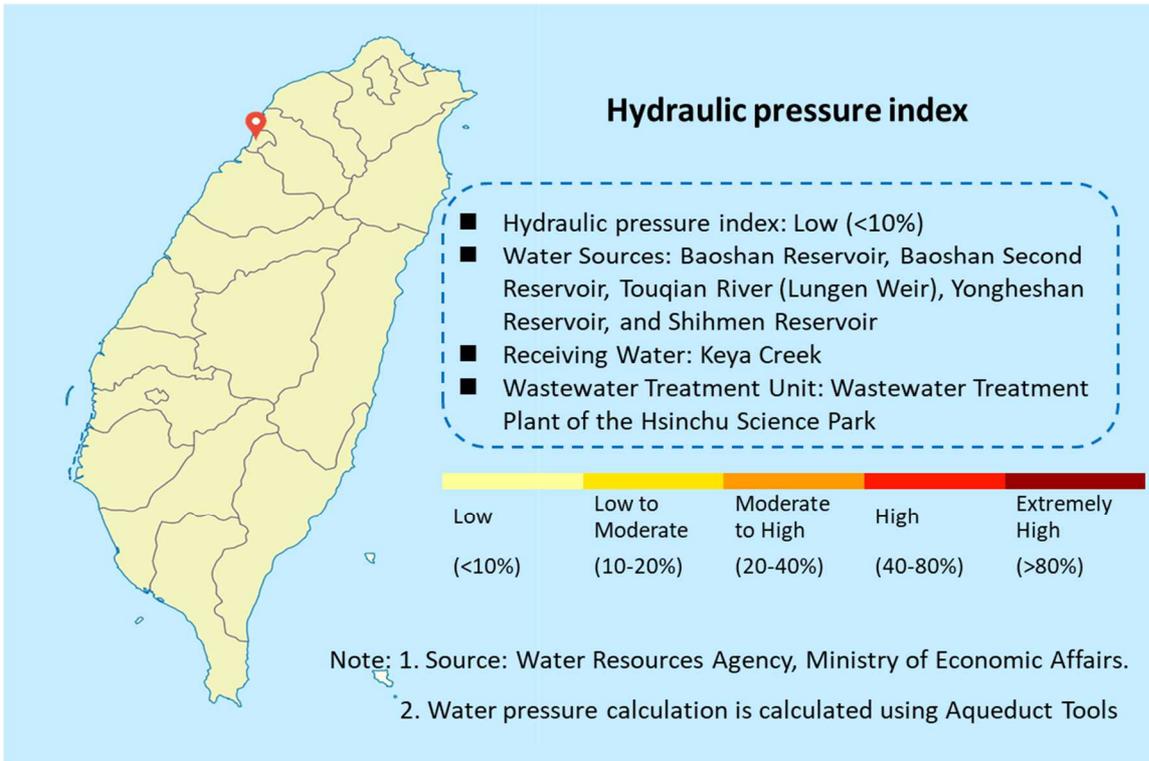
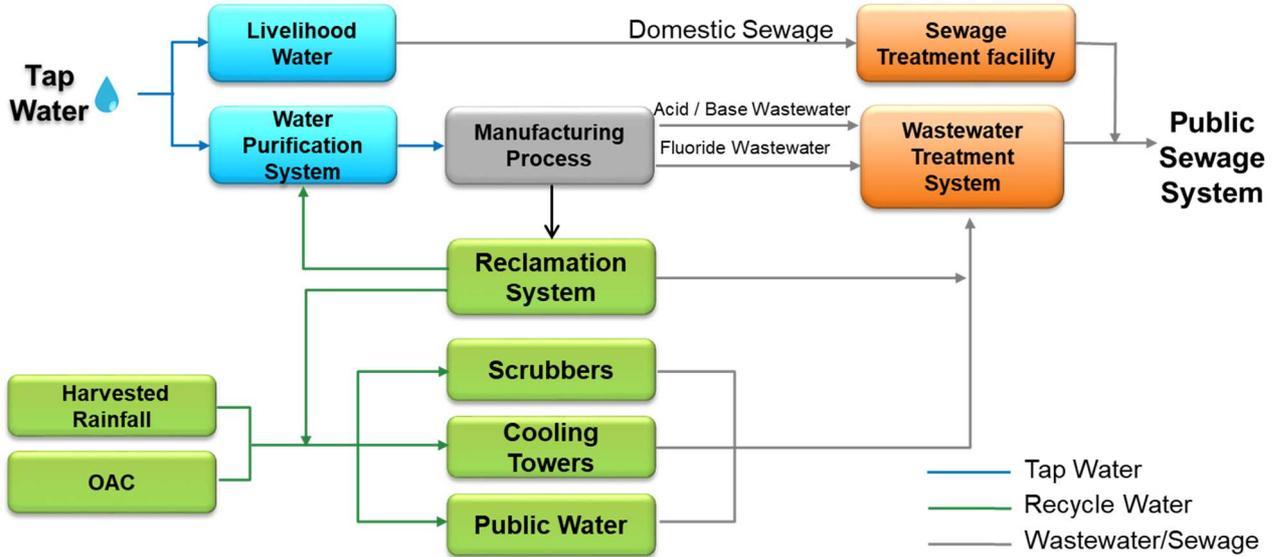
The main source of water for Macronix's plants is running water supplied by Taiwan Water Corporation from Baoshan Reservoir and Yongheshan Reservoir. Hence, water intake does not have any material effect on the water source. All of our plants have water storage facilities in coordination with the regulations 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 2022 amounted to 2,836 million liters, with 738 million liters in total water consumption and 2,098 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 2022, the total volume of process water recycled was 4,123 million liters and recycling rate was 85.7%.

Macronix Annual Water Consumption Statistical Table

Item	2020	2021	2022
Running Water Usage (Unit: million liters)	2,491	2,600	2,836
Total Water Consumption (Unit: million liters)	641	657	738
Total Water Discharge (Unit: million liters)	1,850	1,943	2,098
Recycled Process Water (Unit: million liters)	3,575	3,832	4,123

Recycling Rate (Unit: %)	85.1%	85.8%	85.7%
Total Revenue (Unit: million NT\$)	39,801	50,573	43,487
Water usage intensity (Unit: million liters/million NT\$)	0.063	0.051	0.065

Note: In 2021, there was an abnormality with the sewage flow meter at the activity center; the flow meter was updated in the said year and the abnormal data have been corrected.



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 2022

Plant	pH	BOD (mg/L)	COD (mg/L)	SS (mg/L)	NH3-N (mg/L)
FAB2	6.9	1.7	67.9	56.8	33.8
FAB5	6.7	6.3	54.0	37.9	10.7
BE	8.4	41.2	64.1	8.5	-
Allowable limit	5-9	300	500	300	30

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

Improvement at the source and optimized operations, water conservation and carbon reduction for the environment

In recent years, water conservation, carbon reduction and sustainable development have been attracting more and more attention, and Macronix has adhered to the business philosophy of “honesty”. To implement the concept of sustainable development, Macronix employees have invested in projects to analyze how to remediate with different methods and equipment and recycle every drop of water more times, so that the water quality can comply with the discharge water standards, while less water can be consumed during the entire process.



Macronix has approached the water 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 “650 gas extraction system”, “optimisation of chemical dosing system”, “reducing the amount of resin backwash chemicals” and “reusing recycled water in the manufacturing process” in the fifth water fab, thereby saving 604,430 tons of water and reducing 91 tons of carbon emissions per year in total. In addition, the project also won the “First Class Award” among the excellent water saving units in 2022.



The improvement focuses on installing a new system and enhancing its operation, but what is more exciting is that the proposal has received support for departmental top-to-bottom team collaboration, fully demonstrating the unity of various departments and the fact that teamwork can produce more spectacular results.

Mason Huang facility staff, Macronix

6.1.2. Air Pollution Prevention



Management approach	Importance	Air pollutant emissions are reduced through treatment equipment, air pollutants are tested in accordance with the law, and improvement measures are implemented to reduce the pollution generated by production activities.
	Medium and Long-term Development Direction	Reinforce the backup system to ensure preventive facilities are operating normally and improving handling efficiency
	Management Method	External: Submit volatile organic compounds and inorganic acid pollution prevention records, and report costs incurred in preventing fixed sources of air pollution Internal: ISO14001 Manual/Procedure/Specifications/Records
	Measures	1. Compile statistics of air pollutant emissions on a quarterly basis 2. Evaluate the feasibility of reduction measures on an annual basis
	2022 Implementation Results	The company's volatile organic compounds (VOCs) were reduced by 95.94% ^{Note}

Macronix does not use or discharge any ozone-depleting substances. All waste gases generated from manufacturing process 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; average VOCs removal rate reached 95.94% in 2022, which confirmed that it meets the air pollution control and emission standards of the semiconductor manufacturing industry; the emissions removal rate is as high as 90%, and the emissions are less than 0.6 kg/hour from each fab.

Macronix's air pollutant emissions in 2022

Item/Plant	FAB 2	FAB 5
PM	182.67	123.51
HAP	0.082	0.032
PDP	0	0

SO _x	416.93	278.3
NO _x	2,794.44	2,778.13
VOCs	6,664.66	3,802.39

Unit: kg/year

Note: 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



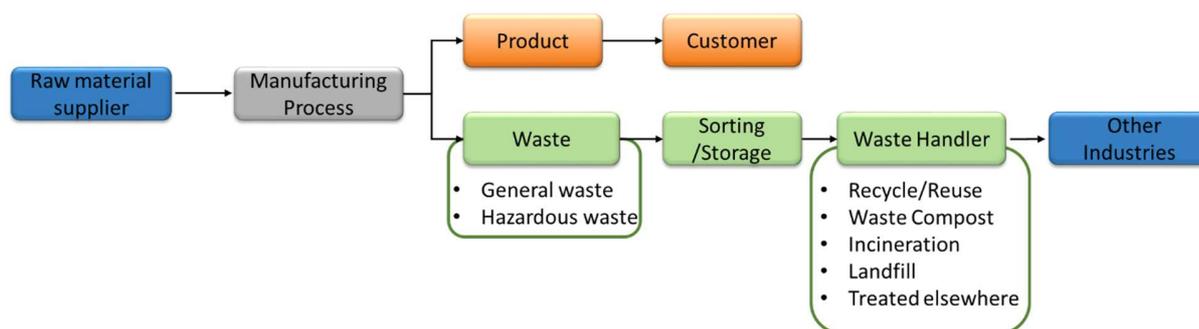
Management approach	Importance	Reduce the environmental burden of production by promoting waste reduction and strengthening waste recycling/reuse
	Medium and Long-term Development Direction	Waste reduction by classifying the source of waste and developing recycling and reuse technologies
	Management Method	External: Industrial waste reporting and management information system Internal: ISO14001 Manual/Procedure/Specifications/Records
	Measures	1. Compile statistics of waste storage, production, and clean-up and removal on a monthly basis 2. Perform internal inspections and audits on a quarterly basis 3. Audit waste disposal companies on an annual basis
	2022 Implementation Results	1. Every month, waste specialists in each plant area conduct spot checks on the real-time tracking system using the GPS on vehicles of waste disposal companies 2. Reach the Company-wide waste recycling and reuse rate of 97.7%; 0.5% of burying rate
	2023 Targets	Maintain the Company-wide waste recycling rate of $\geq 94\%$ ^{Note}

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.

Product category	Scrapped products (metric tons)	Recycling rate (%)
IC	7.895	100
Wafer	22.387	100

Note: IC and Wafer are all recycled.



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 2022, Macronix initiated a total of 38 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 2022.

The total waste disposal output in 2022 was approximately 11,303 tons, of which the majority of 61.52% was hazardous waste. Recycling/reuse rates reached 94.4% (general waste) and 99.8% (hazardous waste), and the total recycling/reuse rate reached 97.7%. Landfill treatment, which has a heavy burden on the environment, was 56 metric tons of waste, and the landfill rate was only 0.5%, 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.

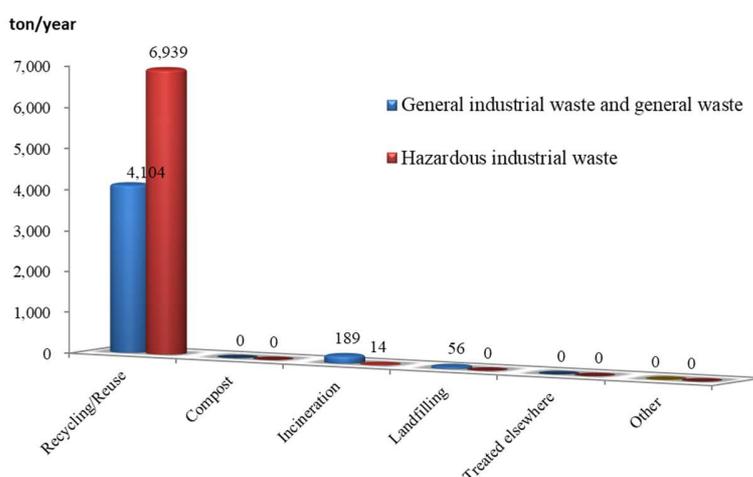
To effectively control waste generated by the Company and the recycling rate, Macronix has set up annual

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.

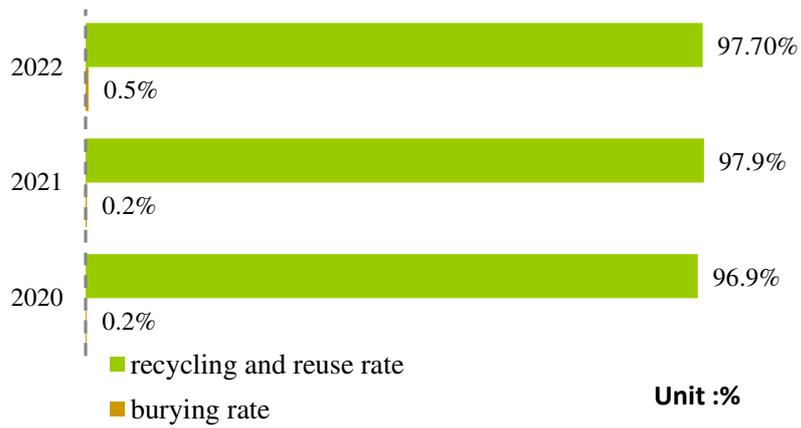
Item	2020	2021	2022
Recycled/Reused Amount (metric tons)	10,597	11,064	11,044
Non-Recyclable Amount (metric tons)	336	241	259
Total Amount of Waste (metric tons)	10,933	11,306	11,303
Recycling/Reuse Rate (%)	96.9	97.9	97.7
Total Revenue (million NT\$)	39,801	50,573	43,487
Waste output intensity (million tons/million NT\$)	0.275	0.224	0.260

Waste Produced by Macronix in 2022

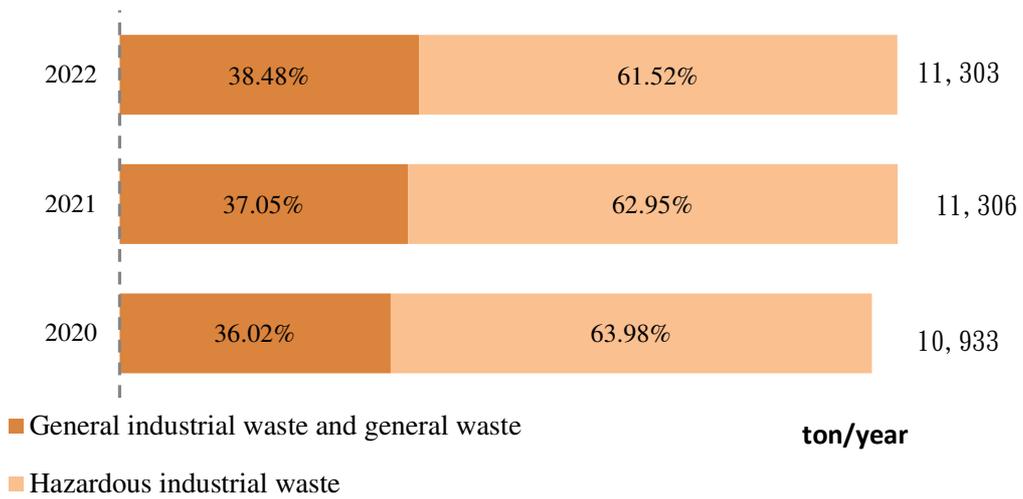
Item	General industrial waste and general waste	Hazardous industrial waste
Recycling/Reuse (metric tons)	4,104	6,939
Compost (metric tons)	0	0
Incineration (including energy recycling) (metric tons)	189	14
Landfilling (metric tons)	56	0
Treated elsewhere (metric tons)	0	0
Other (metric tons)	0	0
Total (metric tons)	4,349	6,954
Percentage (%)	38.48	61.52
Recycling rate (%)	94.4	99.8



Percentage of Industrial Waste Recycled/Buried

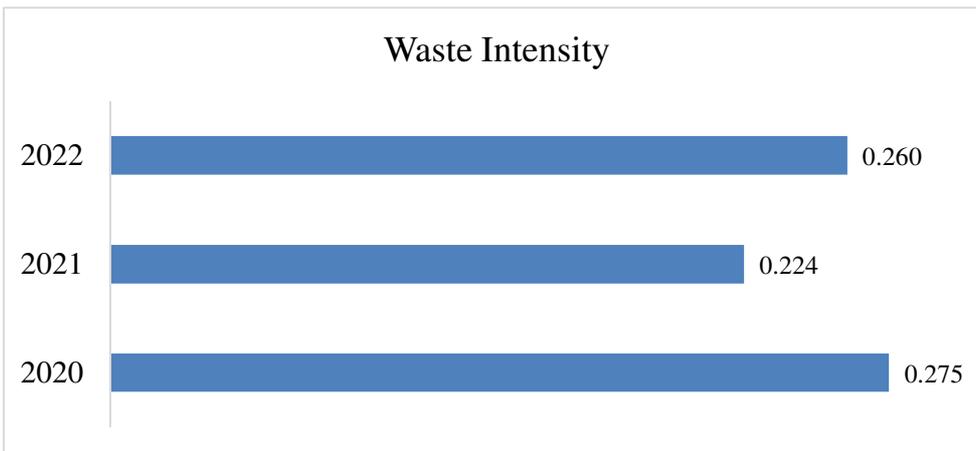
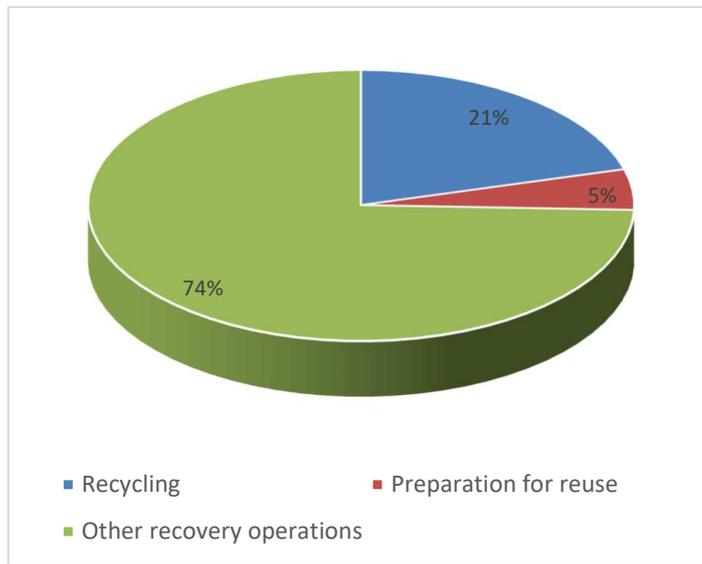


Total Waste Generated



2022 Macronix recycling waste classification

Item	General industrial waste and general waste	Hazardous industrial waste
Recycling	2,132	157
Preparation for reuse	20	515
Other recovery operations	1,952	6,267
Total	4,104	6,939



Optimizing the lifecycle of waste resources

Recently, the issue of net-zero transformation has become increasingly hot, and the issue of resource recycling and zero waste has become one of the key issues. Taking into account the environmental impact of the lifecycle of each product is a necessary direction; As a leading integrated device manufacturer in the global Non-Volatile Memory (NVM) market, Macronix actively implements waste minimization and resource recycling optimization adjustments, and spares no efforts in promoting the execution of internal and external policies from top to bottom. In order to respond to and implement the Company's policies, Macronix employees have invested in related projects to promote the manufacturing process improvement and output reduction process on the engineering side, enhance the resource value of waste to increase the back-end reuse efficiency and increase the value of waste used in the fabs. It not only conforms to the spirit of reducing environmental impact, but also makes sustainable recycling of resources the beginning of moving towards net zero emissions.



This activity is based on the concept of proper cleaning of industrial waste, implementation of source reduction, and active promotion of resource recycling and reuse, with cross-departmental support and cooperation by way of proposal. In addition to the effectiveness of source reduction, we have successfully achieved resource recycling in the second wafer fab with the results of “increasing sulfuric acid recycling and reuse” and “diverting isopropanol from fabs”, which were recognized by the Hsinchu Science Park with the “Award of Excellence” among the outstanding enterprises in waste reduction and circular economy. It is hoped that horizontal cross-departmental communication and execution can bring even more spectacular results in the future.

Miss Chen environmental staff, Macronix

6.2 Energy and Climate Change Management



6.2.1 Climate Change Risks and Opportunities

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.

1. Items for TCFD disclosure

Four Cores	Disclosure Recommendations	Response
Governance	<p>a. Describe the board’s oversight of climate-related risks and opportunities</p> <p>b. Describe management’s role in assessing and managing climate-related risks and opportunities</p>	<p>a. In Q1 of each year, the Environmental Safety and Health Center 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.</p> <p>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.</p>
Strategy	<p>a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term</p>	<p>a. In the climate risk and opportunity analysis model of Macronix, 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 transition risk of carbon taxes and low-carbon technologies that may occur in the medium term, 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-</p>

	<p>b. Describe the impact of climate-related risks and opportunities on the organization's business, strategy, and financial planning</p> <p>c. Consider different climate-change-related scenarios</p>	<p>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.</p> <p>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 strategy. 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).</p> <p>c. Positing 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.</p>
Risk Management	<p>a. Describe the organization's processes for identifying and assessing climate-related risks</p>	<p>a. Based on the correlation between climate-related risks and opportunities and the Macronix's various businesses, Macronix divides the TCFD task force into five dedicated task forces: product and customers, finance, facility and environmental protection, supply chain, and logistics support. Members of each task force include middle or 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. (See the figure for detailed process: TCFD evaluation process)</p>

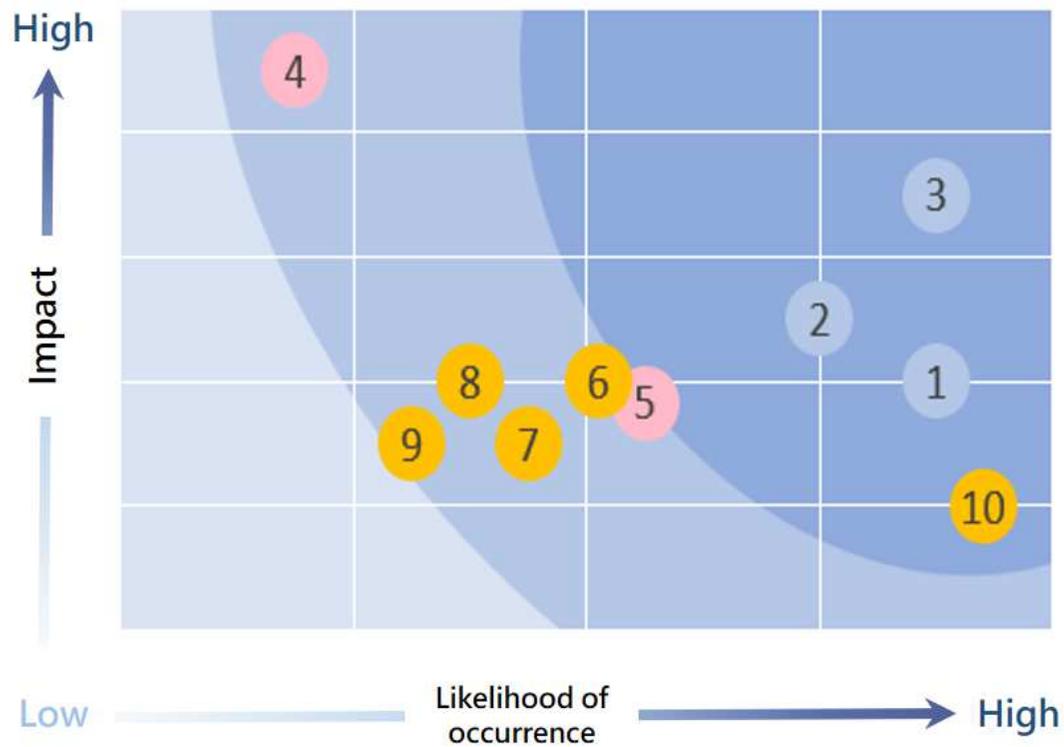
	<p>b. Describe the organization’s management processes for climate-related risks</p> <p>c. Describe how climate-related risks are integrated into the organization’s overall risk management</p>	<p>b. According to the current status of the TCFD identification results, the Sustainable Development Promotion Committee will promote project management based on the results of risk and opportunity assessment.</p> <p>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)</p>
Indicators and Targets	<p>a. Disclose the indicators used by the organization to assess climate-related risks and opportunities under its strategy and risk management process</p> <p>b. Disclose Scope 1, Scope 2, and Scope 3 greenhouse gas (GHG) emissions</p> <p>c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets</p>	<p>a. After each task force completes identification, the Environmental Safety and Health Center will consolidate the results and rank them by comprehensive consideration of the impact strength (5 levels) and likelihood of occurrence (7 levels) and identify material risks by completing a risk matrix diagram. (See the figure for detailed process: TCFD evaluation process)</p> <p>b. Please refer to chapter 6.2.2 Energy Management and chapter 6.2.3 Climate Change Management.</p> <p>c. Macronix has set a long-term target of net zero emissions by 2050 and planned the reduction path as a regular performance inspection indicator. Each plant will formulate carbon reduction projects based on the reduction path and execute them according to the budget review, perform an organizational greenhouse gas inventory and verification every year, and track the progress of carbon reduction on an annual basis, with 2025 as the first target inspection point.</p>

Climate Risk and Opportunity Matrix Diagram

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

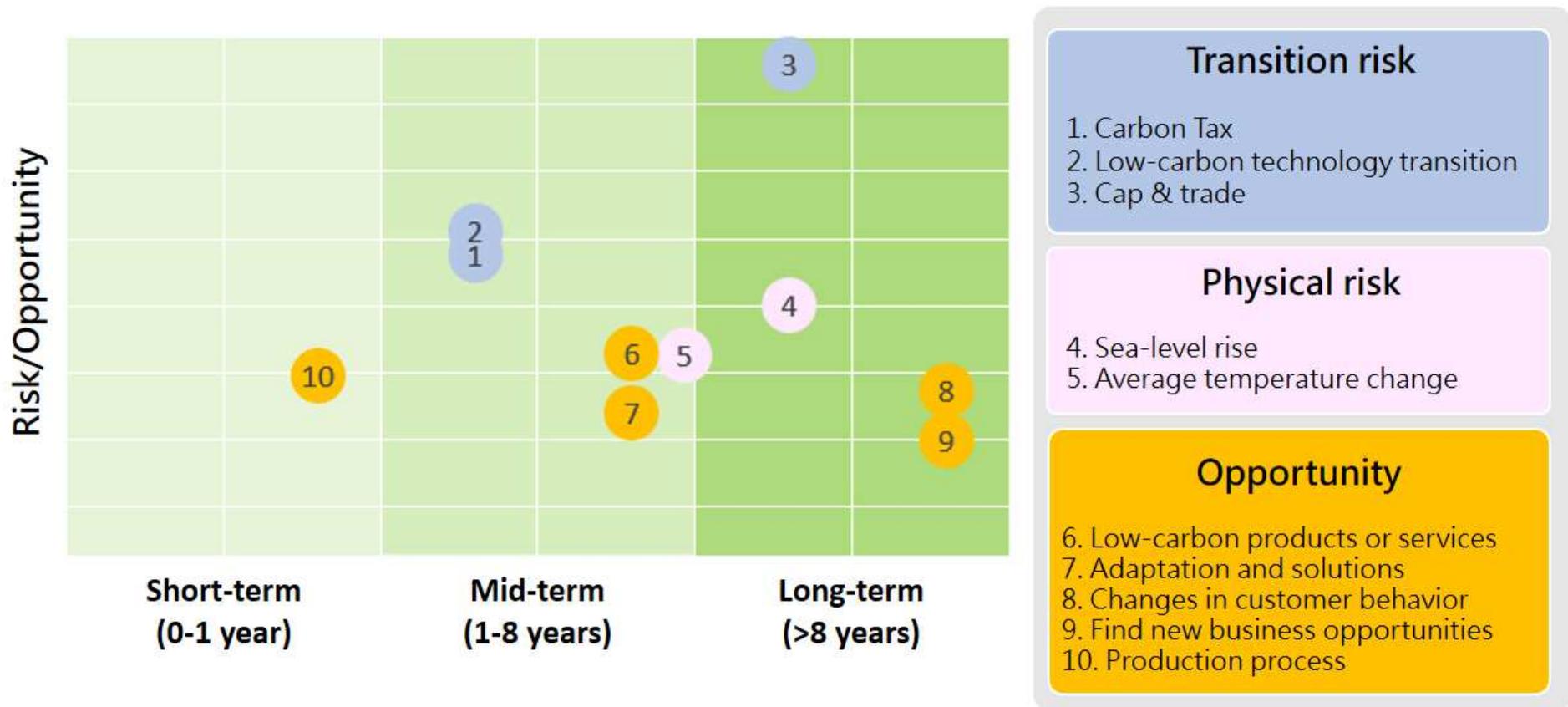
Figure: TCFD Evaluation Process





<p>Transition risk</p> <ul style="list-style-type: none"> 1. Carbon Tax 2. Low-carbon technology transition 3. Cap & trade 	<p>Physical risk</p> <ul style="list-style-type: none"> 4. Sea-level rise 5. Average temperature change
<p>Opportunity</p> <ul style="list-style-type: none"> 6. Low-carbon products or services 7. Adaptation and solutions 8. Changes in customer behavior 9. Find new business opportunities 10. Production process 	

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



3. Material risks and opportunities analysis and management table

Material risks analysis and management table

Aspect	Material risk	Upstream suppliers impact analysis	Macronix impact analysis	Downstream customers impact analysis	Financial impact	Response management measures
Transition risk/law-related aspect	Cap & trade	<ol style="list-style-type: none"> 1. Product shipment performance and cost increase are affected by carbon emission limits. 2. Increase in management and production costs. 	<ol style="list-style-type: none"> 1. Macronix currently has two fabs that may be included as control targets for total volume control/emissions trading. 2. In order to comply with total volume control and regulatory requirements, Macronix needs to control emissions, which may affect production capacity and orders. 3. The introduction of carbon reduction measures to reduce carbon emissions results in higher production costs. 	<ol style="list-style-type: none"> 1. Customers may turn to other alternative suppliers due to Macronix's reduced supply. 2. Customers request Macronix to actively reduce carbon emissions. 	The market transaction price or cash generated by excess emissions will increase the Company's direct operating costs	<ol style="list-style-type: none"> 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
	Carbon fees (tax)	<ol style="list-style-type: none"> 1. The upstream suppliers pay carbon fees and fines, and transfer the relevant fees to increase the purchase cost. 2. The production volume of the suppliers may be capped, resulting in the limited supply or the extension of supply period. 	<ol style="list-style-type: none"> 1. The two current fabs of Macronix are emission sources that should be accounted and registered, and are estimated to be the first batch of carbon fee collection targets. 2. In order to reduce the carbon fees impact, the carbon fees and the cost of carbon reduction measures will be weighed to implement the carbon reduction plan. 	<ol style="list-style-type: none"> 1. The increase in product costs has reduced competitiveness. 2. Control of production capacity and delivery schedule due to emission reduction. Failure to meet customer expectations will affect customer reputation and orders. 3. Customers request Macronix to actively reduce carbon emissions. 	The Company's direct operating costs increase	As above

			3. Controlling emissions, which may affect production capacity and order delivery.			
Transition risk/technical aspect	Low-carbon technology transition	1. Suppliers develop low-carbon products or technologies to help Macronix reduce indirect emissions. 2. The cost of supplier R&D and materials will increase.	1. To meet market expectations for energy conservation and carbon reduction in manufacturing may lead to adjustments in process-related technologies. 2. The introduction of new technologies or machines may increase production costs.	1. Customers may request Macronix to provide products that help with lower carbon emissions. 2. Customers request Macronix to reduce carbon emissions at the organization and product levels.	Company R&D costs increase	Introduction of new low-carbon or gas-reducing machines and respective process adjustment
Physical risk/long term	Average temperature change	1. Affected by the increase in energy consumption, the production cost increases. 2. Increasing investment and production costs.	The rise in average temperature will lead to an increase in air conditioning load, power consumption, and electricity expenses.	1. As a result of cost increase, the selling price has increased, resulting in decrease in product competitiveness. 2. Customers request Macronix to actively reduce carbon emissions.	The Company's direct operating costs increase	Establish a weather forecast and chillers optimization mechanism
	Sea-level rise	1. The affected suppliers cannot produce normally or the transportation is interrupted. 2. Suppliers establish measures to avoid operational interruptions, such as off-site backup and inventory increase, which will increase operating costs.	If the supply chain factory is shut down and causes production interruption, Macronix will continue to strengthen its continuous operation mechanism, such as maintaining appropriate inventory and increasing the number of suppliers to diversify risks.	Material or transportation disruptions may affect product delivery schedules, which may in turn affect customer reputation and orders.	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

Aspect	Material opportunity	Upstream suppliers	Macronix	Downstream customers	Financial impact	Response management measures
Products and services	Low-carbon products or services	<p>1. Require suppliers to provide low-carbon (mining) products and raw materials, thereby reducing Macronix’s supply chain carbon emissions.</p> <p>2. Low-carbon raw materials can meet the expectations of Macronix and stakeholders.</p>	<p>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.</p>	<p>1. Early access into the customer market with low carbon emission requirements will help increase the sales volume of products.</p> <p>2. Providing diversified products and assisting existing customers to move into the low-carbon emission market to consolidate customers’ demand.</p> <p>3. Satisfying customers’ needs and enhancing partnership.</p>	<p>Low-carbon products help customer sales grow</p>	<p>Existing and future product lines are already low-carbon products, and they will continue to be developed with the existing management methods.</p>
	Changes in customer behavior	<p>Low-carbon raw materials can meet the expectations of Macronix and stakeholders.</p>	<p>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.</p>	<p>Meet Macronix’s needs and enhance partnership.</p>	<p>Low-carbon products generate higher gross margins</p>	<p>Continue to pay attention to the information and regulations related to low-carbon products, and frequently exchange opinions with customers.</p>
	Adaptation and solutions	<p>1. Require suppliers to provide low-carbon (mining) products and raw materials, thereby reducing Macronix’s supply chain carbon emissions.</p> <p>2. Strengthen supply chain climate resilience.</p>	<p>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.</p>	<p>1. Early access into the customer market with low carbon emission requirements.</p> <p>2. Strengthen the competitiveness of the customer consumption market.</p>	<p>Customer-generated sales growth reduces operating costs</p>	<p>1. Listen to customer requirements and ideas, respond with suitable products or adjustments</p> <p>2. Plan for renewable energy and execute renewable energy allocation</p> <p>3. Establish smart air conditioners with weather</p>

						forecasting and chillers optimization mechanisms
Market	Find new business opportunities	<ol style="list-style-type: none"> 1. Increase potential new applications. 2. Find new business opportunities from suppliers to reduce the total carbon emissions of Macronix's supply chain. 	<p>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.</p>	<ol style="list-style-type: none"> 1. Increasing potential new customers. 2. The customer's brand image is improved, and supply chain is in line with the goal of energy conservation and carbon reduction, which in turn enhances Macronix's competitiveness. 	Revenue growth from new operating models	Continue to communicate with international customers and attempt to cooperate in new solutions.
Resource efficiency	Production process	<ol style="list-style-type: none"> 1. In line with the low-carbon trend of supply chain. 2. Provide recyclable raw materials or develop new technologies. 	<p>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.</p>	<ol style="list-style-type: none"> 1. Reduce supply chain carbon emissions for customers. 2. Meet customers' expectations for high-efficiency, high-quality, and low-carbon products. 	Improving resource efficiency can reduce operating costs	<ol style="list-style-type: none"> 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

6.2.2 Energy Management

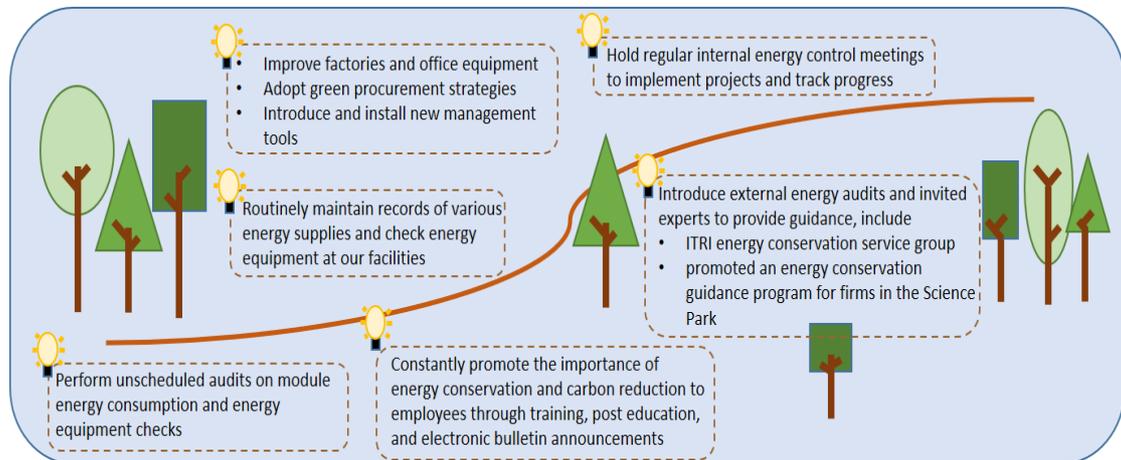


Management approach	Importance	<ol style="list-style-type: none"> Actual impact: Carefully use energy to reduce operating costs, increase the use ratio of renewable energy source to reduce the impact of traditional grey power to the environment, and comply with regulatory requirements Potential impact: Manage energy use to reduce the risk of production interruption, and increase the use ratio of renewable energy source to comply with the international green supply chain trend
	Medium and Long-term Development Direction	Maintain an average annual energy conservation rate higher than 1%, increase the use ratio of renewable energy source to become a sustainable green company
	Management Method	<p>External: Submission of energy-saving reports to the Bureau of Energy, Ministry of Economic Affairs</p> <p>Internal: ISO 14001 Manual/Procedure/Specifications/Records and energy-saving projects</p>
	Measures	<ol style="list-style-type: none"> Compile power consumption statistics on a quarterly basis Evaluate the feasibility of energy conservation measures on an annual basis Track the progress of the annual plan based on ESH's goals and targets Establish roof solar power generation equipment for self-use Procure renewable energy source to improve the utilization rate of green power
	2022 Implementation Results	The company achieved an average annual energy savings rate of 1.1%
	Targets in 2023	The company's average annual energy savings rate exceeds 1%
	Medium and Long-term Targets	Achieve net zero emissions by 2050 in line with the Company's GHG reduction targets

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



In 2022, the total energy consumption reached 1,867,660 GJ, in which the power consumption from the grid hit 1,797,377 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 2022, the Company started the installation of rooftop solar photovoltaic equipment of about 400 kW, which is expected to be completed in the first half of 2023, and the purchase of renewable energy and certificates is expected to begin in 2023 with the transfer of 5 million kWh of solar power, completing the renewable energy obligations ahead of schedule, in order to comply with the national policies and regulatory requirements.

Solar power module under installation (located on the rooftop of the parking building of Fab 5)



Energy Consumption within Macronix's Organization

Item	2020		2021		2022	
	Consumption (GJ)	Percentage (%)	Consumption (GJ)	Percentage (%)	Consumption (GJ)	Percentage (%)
Purchased electricity (Taipower)	1,664,283	96.05	1,722,313	95.95	1,797,377	96.24
Natural gas	67,623	3.90	71,647	3.99	68,871	3.69
Diesel fuel	275	0.02	489	0.03	824	0.04
Liquefied petroleum gas (LPG) used in kitchens and dormitories	253	0.01	260	0.01	337	0.02
Amount of petroleum used	248	0.01	257	0.01	250	0.01
Renewable source	0	0	0	0	0	0
Total energy consumption (GJ)	1,732,681	100	1,794,967	100	1,867,660	100
Total revenue (million NT\$)	39,801		50,573		43,487	
Energy intensity (GJ/million NT\$)	44		35		43	

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

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 2022 mainly focuses on energy saving of air conditioners, chiller systems, and motors. A total of 23 energy-saving plans were implemented. The total energy savings recognized in 2022 reached 5,521,180 kWh (19,876 GJ), which is equivalent to a reduction of 2,810 metric tons of carbon dioxide equivalent emissions.

Macronix’s Energy Conservation Measures in 2022

Energy Conservation Items	Energy conservation amount (kWh/year)	Carbon reduction (tonCO ₂ e)	Energy conservation contribution ratio (%)
Air conditioner energy conservation (8 items)	2,230,142	1,135	40.39
Chiller energy conservation (3 items)	1,193,179	607	21.61
Cooling tower energy conservation (5 items)	827,486	421	14.99
Motor energy conservation (3 items)	671,340	342	12.16
Other (1 item)	293,460	149	5.32
Equipment operating optimization (1 item)	184,883	94	3.35
Lighting energy conservation (2 items)	120,691	61	2.19
Total	5,521,180	2,810	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

6.2.3 Climate Change Management

Management approach	Importance	<p>1. Actual impact: Green supply chain requires companies to plan and implement greenhouse gas reduction targets and measures, and the related response costs have begun to increase</p> <p>2. Potential impact: Climate Change Response Act came into effect, the country's 2050 net zero emissions target will be incorporated, and mechanisms such as carbon fee collection and voluntary reduction plans will be added, the future response costs may also rise</p>
	Short-term Development Direction	<p>1. Conduct inventory of the Scope 3 emissions amount and evaluate the value chain emissions contribution</p> <p>2. Continue to encourage energy conservation and carbon reduction, and seek possible solutions</p> <p>3. Establish roof solar power generation equipment for self-use and purchase renewable energy source to increase the use ratio of renewable energy source</p>
	Medium and Long-term Development Direction	<p>1. Continue to implement the process fluorinated gas reduction plan</p> <p>2. Minimize energy loss within the Company and reduce GHG emissions</p> <p>3. Produce or purchase renewable energy and certificates</p>
	Management Method	<p>External: Domestic Climate Change Response Act requirements</p> <p>Internal: Internal project management, internal regulations, ISO 14064-1, ISO 14064-2</p>
	Measures	<p>1. Implement the GHG inventory every year</p> <p>2. Control PFC emissions on a monthly basis and review emissions on a quarterly basis</p> <p>3. Evaluate the feasibility of carbon reduction measures and provide a budget for the implementation of measures</p> <p>4. Evaluate the participation in government-guided projects and gain carbon reduction quota or participate in a counseling case in response to international trends</p> <p>5. Evaluate the feasibility of purchasing and installing the renewable energy</p>
	2022 Implementation Results	<p>In 2022, the greenhouse gas emissions decreased by 0.6% compared with the base year, representing an average annual decrease of 0.06%. The failure to meet the target was due to an increase in emissions from the expansion of process production lines in 2022. However, the Company has set a target of 5 years to review the goal of net zero emissions, and has arranged reduction plans year by year, such as adding fluorinated exhaust gas treatment equipment and increasing the use of renewable energy source to achieve the goal of emission reduction.</p>
	Targets in 2023	In comparison with the base year, the average annual emissions reduction rate is $\geq 1\%$
	Medium and Long-term Targets	<p>1. 20% reduction in 2025 compared to estimated emissions</p> <p>2. Achieve net zero emissions in Taiwan by 2050</p>

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 ISO 14064-1 GHG emissions verification statement in 2007.

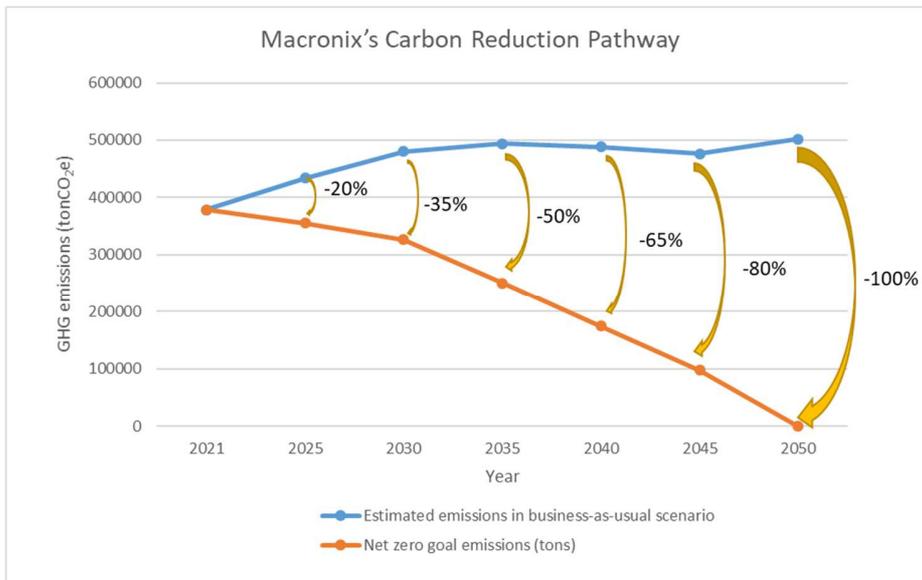
We established the management organization to manage GHG according to ISO 14064-1 verification standards, as illustrated below. Through the complete management system, we performed thorough checks on the energy use conditions in our facilities and offices, and thereby established inventory records and 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.

Macronix Greenhouse Gases Management Organization Chart



In response to global climate change and carbon reduction trends and in line with the national goal of net zero emissions by 2050, Macronix also planned a carbon reduction pathway in 2022, reviewed and approved the long-term carbon reduction goal of net zero emissions by 2050, focusing on manufacturing process improvement, energy efficiency enhancement, increasing the use ratio of renewable energy source, and planning for carbon credit acquisition. In addition, we also actively evaluate the participation 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) GHG abatement equipment for the manufacturing machines. We applied to EPA for the registration of our GHG offset

project in 2019. The project passed review of EPA at the end of 2020, and completed the first monitoring report and verification of the reduction quota in 2022. In 2023, we expect to apply for emission reduction credits from EPA. It is estimated that there will be a reduction of more than 8,000 tons CO₂e each year.



All of Macronix's plants completed ISO 14604-1 Scope 1, 2, and 3 inventory and third-party verification in 2022. The data covers all plants and sites (excluding subsidiaries in the consolidated financial report). 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 for Scope 1 and Scope 2 to 2011. Information on the base year (excluding Fab 1): Total emissions were 392,366.585 metric tons CO₂e, with Scope 1 accounting for 34.9%, and Scope 2 accounting for 65.1%. The Company 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, HFCs, PFCs, SF₆, and NF₃. Macronix's total emissions in 2022 were 389,948.020 metric tons CO₂e. The proportions of emissions are as follows: Macronix's Scope 1 emissions accounted for 34.8% and Scope 2 emissions accounted for 65.2% of the Company's total emissions. In addition, we began to compile the data of indirect GHG emissions in addition to purchased 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 264,671.7807 metric tons CO₂e in 2022 (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.

The inventory and assurance of GHG emissions of the parent company

(unit: ton CO₂e/year)

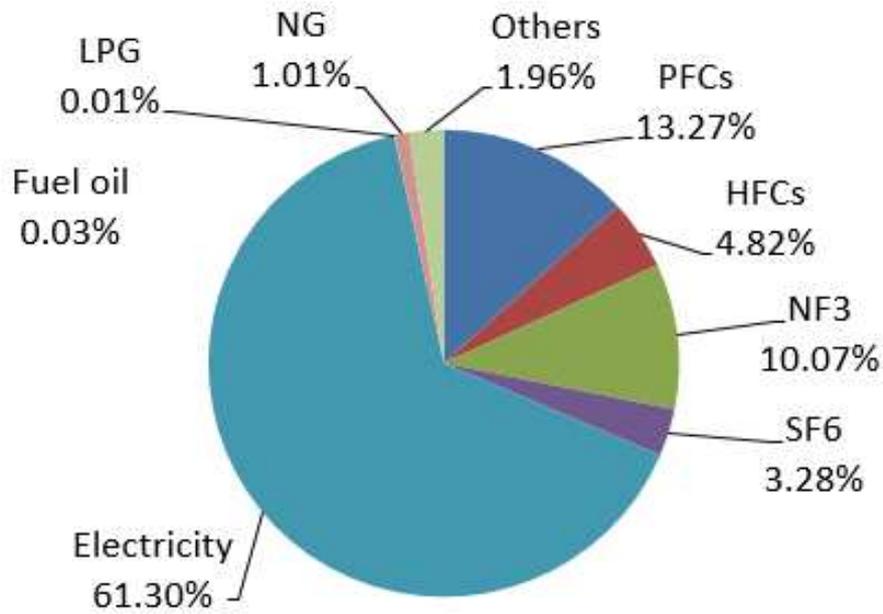
Scope	2022			Intensity (metric tons CO ₂ e /NT\$1,000)
	Carbon emissions (metric tons CO ₂ e/year)	Percentage		
		Scope 1 + 2	Scope 1 + 2 + 3	
Scope 1 – Direct emissions	135,818.8572	34.8	20.7	0.0031
Scope 2- Energy indirect emissions	254,129.1632	65.2	38.8	0.0058
Total	389,948.020	100	-	0.0090
Scope 3- Other indirect emissions	264,671.7807	-	40.4	0.0061
Total of Scope 1, 2, and 3	654,619.801	-	100	0.0151

Assurance body: Bureau Veritas Certification (Taiwan) Co., Ltd.

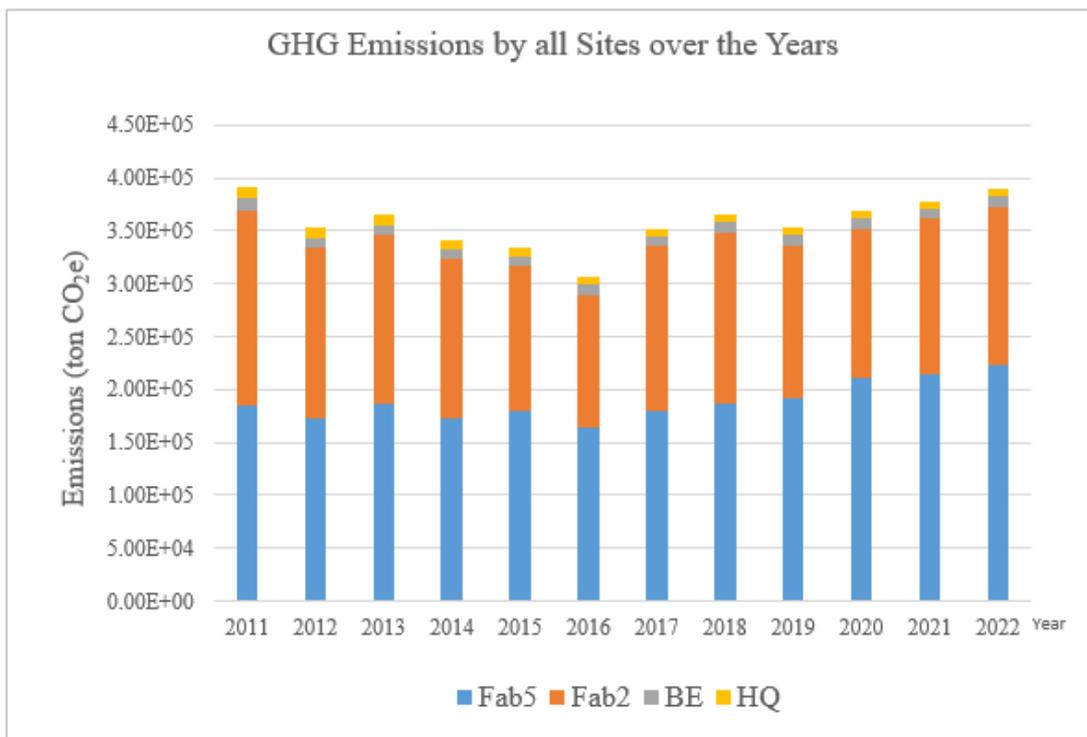
Assurance description: Based on the process and procedures conducted, we conclude that the GHG statement for Category 1, 2, and 4 is materially correct and is a fair representation of the GHG data and information, and is prepared in accordance with the ISO 14064-1: 2018. It is our opinion that MACRONIX INTERNATIONAL CO., LTD. has established appropriate systems for the collection, aggregation and analysis of quantitative data for determination of these GHG emissions for the stated period and boundaries.

PFC Emission Amount Over the Years (Unit: ton CO₂e/year)

Year	2020	2021	2022
Total	76,343	58,031	51,741



Ratios of GHG Emissions by Source of Emission, 2022



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 plants 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 becomes 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 plants are located inside the Science 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

Management approach	Importance	Comply with international green product regulations, aiming to protect the earth, environment and ecology, and reduce the impact of products on the environment.
	Medium and Long-term Development Direction	Comply with international green product trends, implement environmental-related substance management, uphold the concept of “continuous improvement”, effectively apply overall resources, and meet the expectations of all employees, customers, shareholders and stakeholders, so as to achieve sustainable development of business operations.
	Management Method	Through the “IECQ QC 080000 Hazardous Substance Process Management System” to achieve the goal of green products, establish a systematic and clear management process, and implement the management of hazardous substances.
	Measures	<ol style="list-style-type: none"> 1. Macronix has developed a risk assessment of suppliers (RAS) system that integrates the quality management system and green product system for supply chain management, to ensure that upstream and downstream suppliers comply with RoHS directives, the EU regulations on SVHC and ELVs. 2. Regularly send the products to ISO 17025-certified laboratories for testing to ensure that the products comply with regulations and customer requirements.
	2022 Implementation Results	<ol style="list-style-type: none"> 1. All products are 100% compliant with the limit required by EU RoHS Directive (2011/65/EU, 2015/863/EU), and there is no return of goods due to violation of RoHS. 2. Passed the certification of IECQ QC 080000 Hazardous Substance Process Management System. 3. Obtained Sony Green Product Certificate
	Targets (next year’s targets, short-, medium-and long-term targets)	Pass the certification of “IECQ QC 080000 Hazardous Substance Process Management System” to implement the concept of green products and continuous improvement, satisfy customers and comply with international regulatory requirements for green products, so as to reduce the negative impact of products on the environment, and fulfill social responsibilities.

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 D25.00 Material Declaration for Products of and for the Electrotechnical Industry accordingly.

Conflict Minerals Management

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), EMRT (Extend Minerals Reporting Template), and PRT (Pilot Report 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



In line with the international environmental protection trend, Macronix purchases products with domestic and foreign “green mark”, “energy-saving”, “water-saving” labels, and carbon-reduction labels to fulfill its corporate social responsibility and receives recognition and commendation from the authorities.

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.

The environmental, safety, health and management expenditures and total investment of Macronix amounted to approximately NT\$400 million in 2022, and there were no losses resulting from EHS violations. Details are shown in the table below:

Item	Description	2022 Expenses (NT\$)
Outsourcing (services)	Outsourcing expenses for environmental protection, safety, and health management, such as environment maintenance fees, sterilization, waste cleaning, and wastewater treatment	76,664,917
Personnel	Personnel expenses for environmental protection, safety, and health management	59,840,760
Energy	Water, electricity, and fuel expenses for environmental protection, safety, and health management facilities	124,845,421
Commission and Research	Projects or research expenses for improving environmental protection, safety, and health management performance	1,586,036
Education and Training	Transportation, accommodations, and registration expenses for participating in or organizing environmental protection, safety, and health education and training	968,093
Administrative Management	Administrative management expenses for environmental protection, safety, and health management	8,903,577
Equipment and Engineering Investment	Investments in purchasing environmental protection, safety, and health equipment or expenses for improvements	13,771,708
Maintenance and Consumables	Expenses for the maintenance of environmental protection, safety, and health facilities, replacement of consumable parts, and waste storage containers	64,010,241
Equipment Depreciation	Depreciation expense of all the pollution prevention equipment	66,798,962
Testing	Outsourced testing and instrument calibration expenses	5,061,647
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		422,451,362

7. Social Dimension

Warmth, happiness, and growth are 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, International Microwave Workshop (IMW), 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” and “Macronix Human Rights 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 with CSR specifications to protect human rights.

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. Besides, Macronix's Human Rights Policy and measures are announced on the website. 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

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 enjoy working. These measures also help staff nurture active and positive work values, broaden their horizons, spark their passions, and showcase their 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 staff 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.

Macronix 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 for 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.

Workforce Structure

As of the end of 2022, the total number of employees at Macronix was 3,948, including 3,926 regular employees and 22 temporary employees, all of whom work in Taiwan and are full-time employees; 14 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 59% of all regular employees. The workforce structure is detailed in the table on the left and the table below:

Workforce Structure of * Regular Employees

Category	Sub-category	Male		Female		Subtotal and percentage of sub-categories	
		Headcount (A)	Percentage of sub-category (A/C)	Headcount (B)	Percentage of sub-category (B/C)	Subtotal (C)	Percentage of regular employees (C/Total number of employees)
Position	Executives*	488	72%	191	28%	679	17%
	Non-executives	1,866	57%	1,381	43%	3,247	83%
Age	Under 30	682	69%	301	31%	983	25%
	30-50	1,298	56%	1,027	44%	2,325	59%
	Above 50	374	61%	244	39%	618	16%
Nationality	Taiwanese Citizen	2,210	63%	1,317	37%	3,527	90%
	Foreigner	144	36%	255	64%	399	10%
Type of staff	Direct Employee	426	29%	1,031	71%	1,457	37%
	Indirect Employee	1,928	78%	541	22%	2,469	63%
	Local	2,342	60%	1,570	40%	3,912	99.6%

Work Location	Offshore	12	86%	2	14%	14	0.4%
Subtotal by Gender		2,354	60%	1,572	40%	3,926	100%
Total Number of Employees						3,926	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	
		Headcount (A)	Percentage of sub-category (A/C)	Headcount (B)	Percentage of sub-category (B/C)	Subtotal (C)	Percentage of temporary employees (C/Total number of employees)
Age	Under 30	4	67%	2	33%	6	27%
	30-50	5	38%	8	62%	13	59%
	Above 50	0	0%	3	100%	3	14%
Subtotal by Gender		9	41%	13	59%	22	100%
Total Number of Employees						22	100%

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

Headcount of On-site Contractors

The average headcount of on-site contractors of Macronix in 2022 was 235, including cleaning, security, food, transportation and other services. For details of the workforce structure, please refer to the following table:

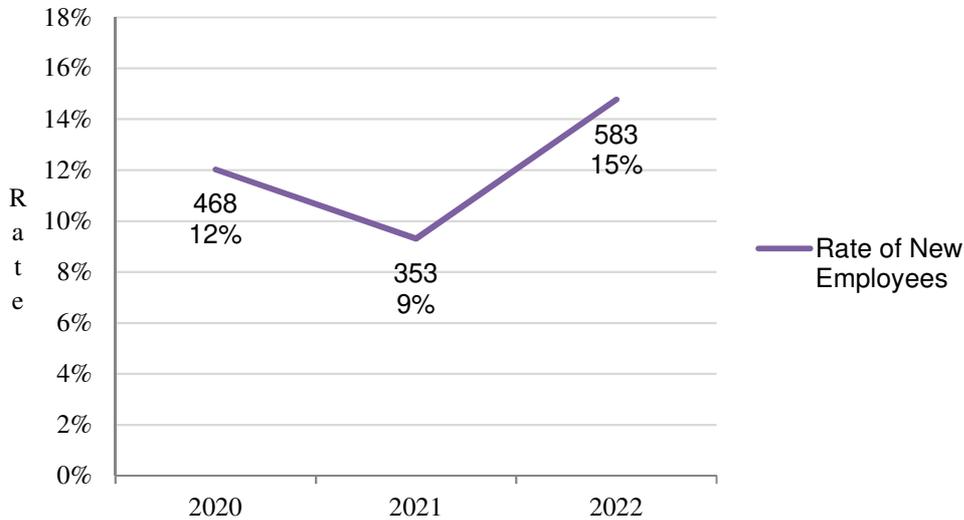
Male		Female		Subtotal and percentage	
Head count (A)	Percentage of sub-category (A/C)	Head count (B)	Percentage of sub-category (B/C)	Subtotal (C)	Percentage ((A + B)/C)
111	47.4%	124	52.6%	235	100%

New Employees

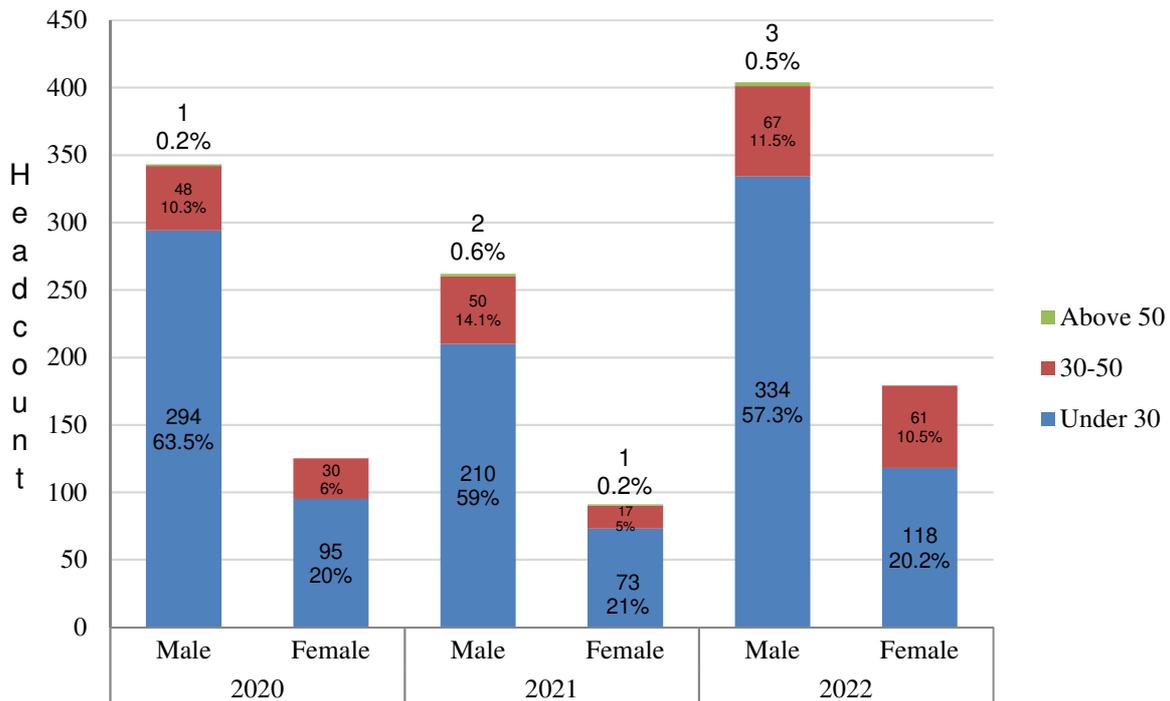
To attract outstanding talent and increase our competitiveness, we implement a multi-channel recruitment project, including visits, recommendations from internal employees, campus job fairs,

alternative civilian service (research and development substitute services), and industry-academia collaboration. As of the end of 2022, we had hired 583 new employees (404 male and 179 female), accounting for 15% of all employees. The majority of new employees were under the age of 30 (334 male and 118 female), accounting for 77.5% of new employees.

The Number and Rate of New Employees



Distribution of New Hires by Gender/Age

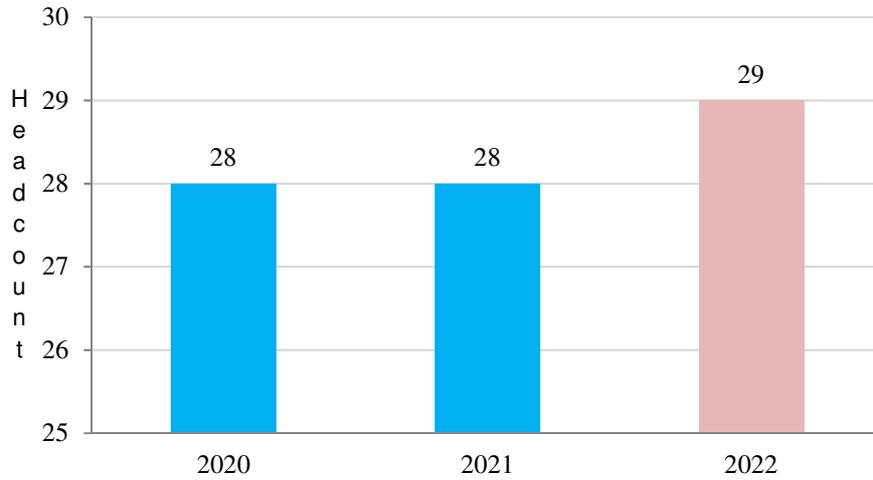


Hiring Employees with Physical and Mental Disabilities

We respect the working rights of people with disabilities and firmly adhere to the related regulations. Macronix has employed 39 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 2022, we have hired 29 employees with physical and mental disabilities (28 of which are severely disabled), thus reaching the quota of individuals with disabilities that should be hired as

stipulated by the PDRPA.

Number of Disabled Workers



Turnover Rate

In 2022, 458 regular employees (295 male and 163 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)

Gender Year	Male		Female		Total number of employees and rate	
	Headcount	Percentage	Headcount	Percentage	Headcount	Percentage
2020	259	11.4%	157	9.6%	416	10.7%
2021	292	13.1%	165	10.6%	457	12.1%
2022	295	12.5%	163	10.4%	458	11.7%

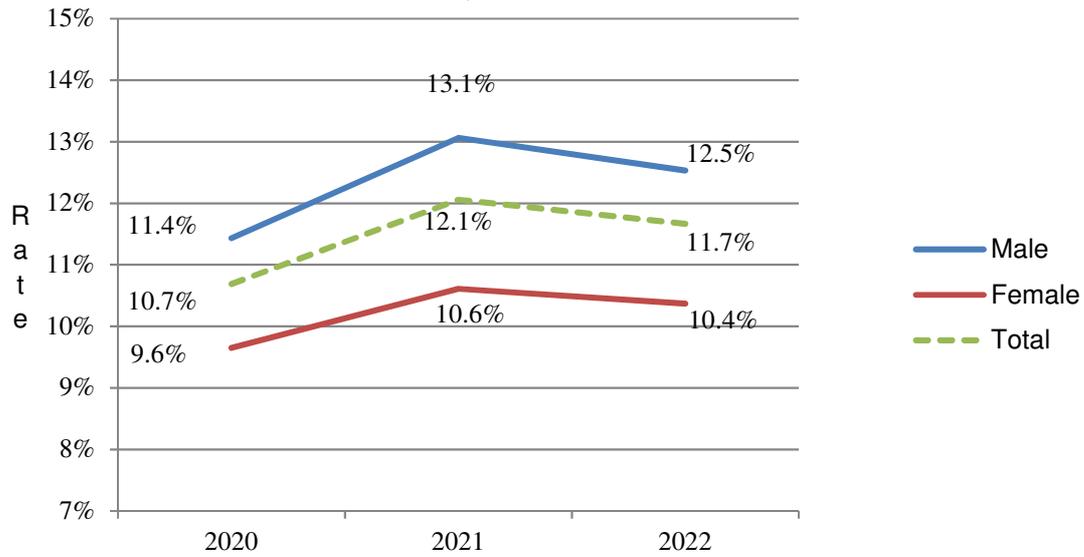
* Turnover rate = Number of employees of each gender who resigned on the said year / Total number of employees of the said gender

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

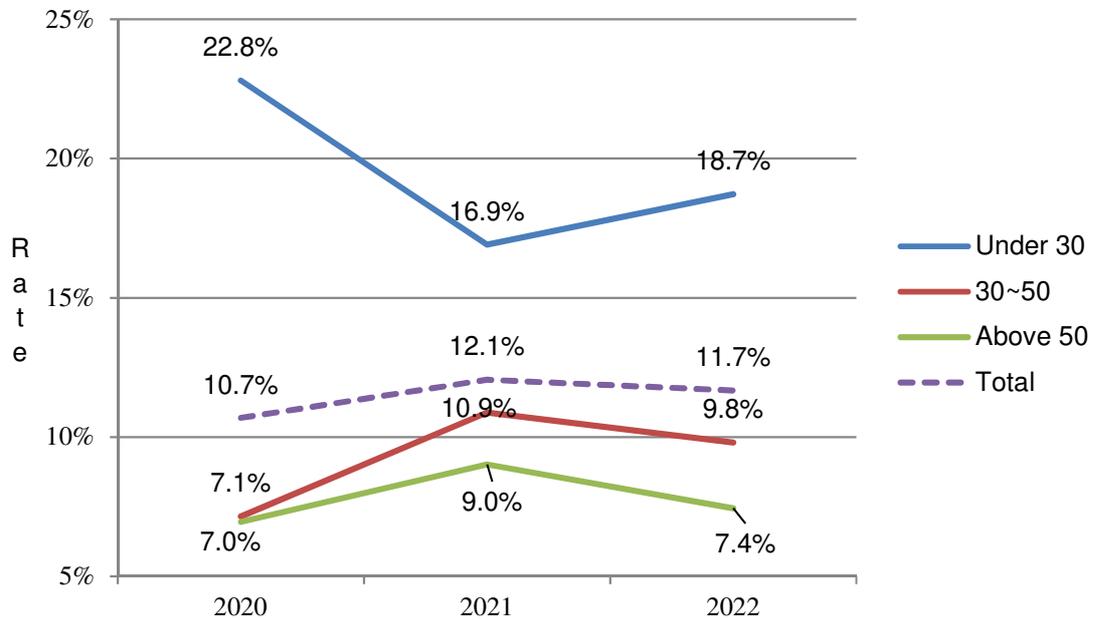
Age Year	Under 30		30-50		Above 50		Total number of employees and rate	
	Headcount	Percentage	Headcount	Percentage	Headcount	Percentage	Headcount	Percentage
2020	202	22.8%	183	7.1%	31	7.0%	416	10.7%
2021	152	16.9%	259	10.9%	46	9.0%	457	12.1%
2022	184	18.7%	228	9.8%	46	7.4%	458	11.7%

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

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



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



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 2022. There were no material operation changes that affect labor rights. If there are any material operation changes that require employees to be notified in advance, we will provide a notice in accordance with the law.

Management approach	Importance	Safeguarding employees’ rights and interests and ensuring the protection of human rights
	Medium and long-term development direction	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 with CSR specifications to protect human rights.
	Management method	<ol style="list-style-type: none"> 1. Annual compulsory courses 2. Macronix’s CSR Policy expressly states that we shall esteem our employees, and do not allow ruthless punishment measures, and do not allow any discrimination on racial difference, religious belief, and gender, etc. 3. Website announcement of Macronix’s principle of equal human resources opportunities 4. Regularly announce and reiterate the “Sexual Harassment Management Regulations” and complaint channels 5. High-risk departments undergo workplace violence risk assessment operations
	Measures	<ol style="list-style-type: none"> 1. Investigation and handling procedures according to the “No Topic is Off Limits” suggestion box and reporting hotline management regulations 2. Investigation and handling procedures according to “Macronix Workplace Violence Risk Assessment and Prevention Plan” 3. Investigation and handling procedures according to the “Sexual Harassment Management Regulations”
	2022 implementation results	Macronix did not receive any complaints or experienced any incidents where the rights of local staff or aboriginals were infringed in 2022. There were no material operation changes that affect labor rights.
	Short, Medium, and Long-term Targets	<ol style="list-style-type: none"> 1. It is forbidden for all departments to engage in forced, threatening, humiliating or exploitative act, including posture, verbal and physical contact. 2. In matters such as hiring, compensation, training opportunities, promotion, termination, or retirement, there shall be no discrimination or support for discriminatory acts based on race, ethnicity, ancestry, social class, nationality, birthplace, religion, disability, gender, sexual orientation, family responsibilities, marital status, union membership, political affiliation, pregnancy, protected genetic information, or any other discriminatory factors.

If there is any change in the relevant provisions of the working rules of Macronix, it will be discussed in the labor/management conferences and announced after amendment, which is applicable to all employees of the company.

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 of 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 2022, the fair value of assets was NT\$1,274,760 thousand. Expenses recognized in 2022 were NT\$12,680 thousand and net defined benefit liability is listed at NT\$1,073,502 thousand as of the end of 2022.

◆ Pension Contribution Under the Labor Pension Act:

For those who are eligible for the new pension system, Macronix will contribute 6% of their labor pension level to the individual pension account of employees every month, and employees may also choose to contribute 6% of their pension to the individual pension account at his or her own will. The amount of expenses recognized in 2022 was NT \$213,554 thousand.

Notes: This 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 orientations, departmental staff meetings, staff conferences, 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 employees 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 ensure 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 2022

Item/Year	2021	2022	Compared with the previous year
Number of full-time employees	3,590 Person(s)	3,608 Person(s)	0.50%
Total salary of full-time employees	NT\$ 6,582,561 thousand	NT\$ 6,237,248 thousand	-5.25%
Average salary of full-time employees	NT\$ 1,834 thousand	NT\$ 1,729 thousand	-5.73%
Median salary of full-time employees	NT\$ 1,388 thousand	NT\$ 1,281 thousand	-7.71%

Overall Gender Pay Ratio in 2022

Type of staff	Position	Male	Female
Direct Employee	Executives	1	1.14
	Non-executives	1	1.24
Indirect Employee	Executives	1	0.95
	Non-executives	1	0.78

Note 1: The number of employees is based on those in service throughout 2022 (excluding managers).

Note 2: The overall pay includes regular salary, three-festival bonus, and employee remuneration received in 2022.

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.

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 childbirth, 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

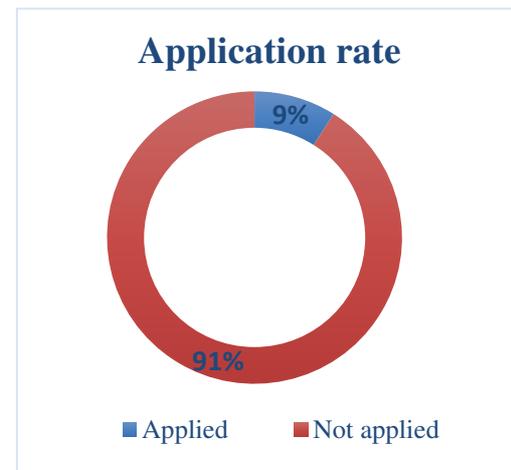
In 2022, the number of employees qualified for taking unpaid parental leave was 224 (164 male and 60 female), of which 20 actually applied for taking unpaid parental leave (5 male and 15 female).

As of the end of 2022, the number of employees returned to work after taking unpaid parental leave was 19 (5 males at a 100% return to work rate; and 14 females at a 78% return to work rate).

Among 7 employees that returned to work in 2021 (1 male; 6 female), 7 (1 male, 100% retention rate; 6 female, 100% retention rate) had stayed on for 12 months or more after their reinstatement as of the end of 2022.

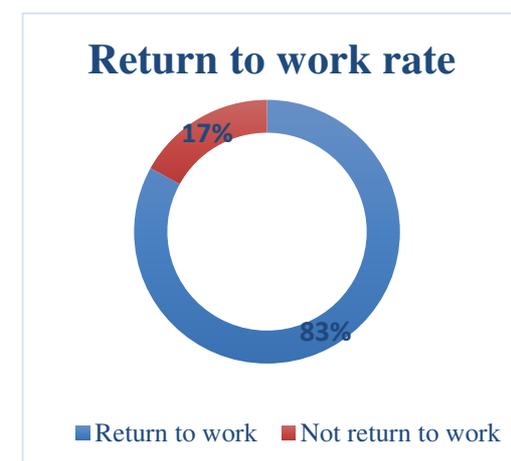
Number of Applicants for Unpaid Parental Leave. Return to work and Retention Rates

Category	Male	Female	Total
Number of employees eligible to apply for unpaid parental leave in 2022 (A)	164	60	224
Number of employees that applied for unpaid parental leave in 2022 (B)	5	15	20
Application rate (B/A)	3%	25%	9%



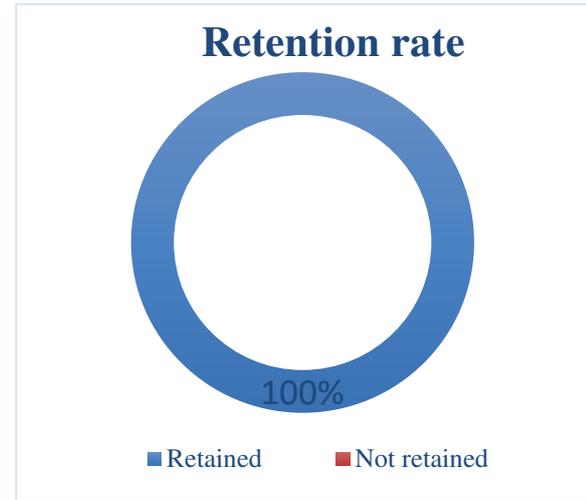
Return to work rate

Category	Male	Female	Total
Number of employees expected to return to work after unpaid parental leave in 2022 (C)	5	18	23
Number of employees returned to work after unpaid parental leave in 2022 (D)	5	14	19
Return to work rate (D/C)	100%	78%	83%



Retention rate

Category	Male	Female	Total
Number of employees reinstated after unpaid parental leave in the previous year (2021) and still active at the end of 2022 (E)	1	6	7
Number of employees reinstated after unpaid parental leave in the previous year (2021) (F)	1	6	7
Retention rate (E/F)	100%	100%	100%





7.2 Learning and Development

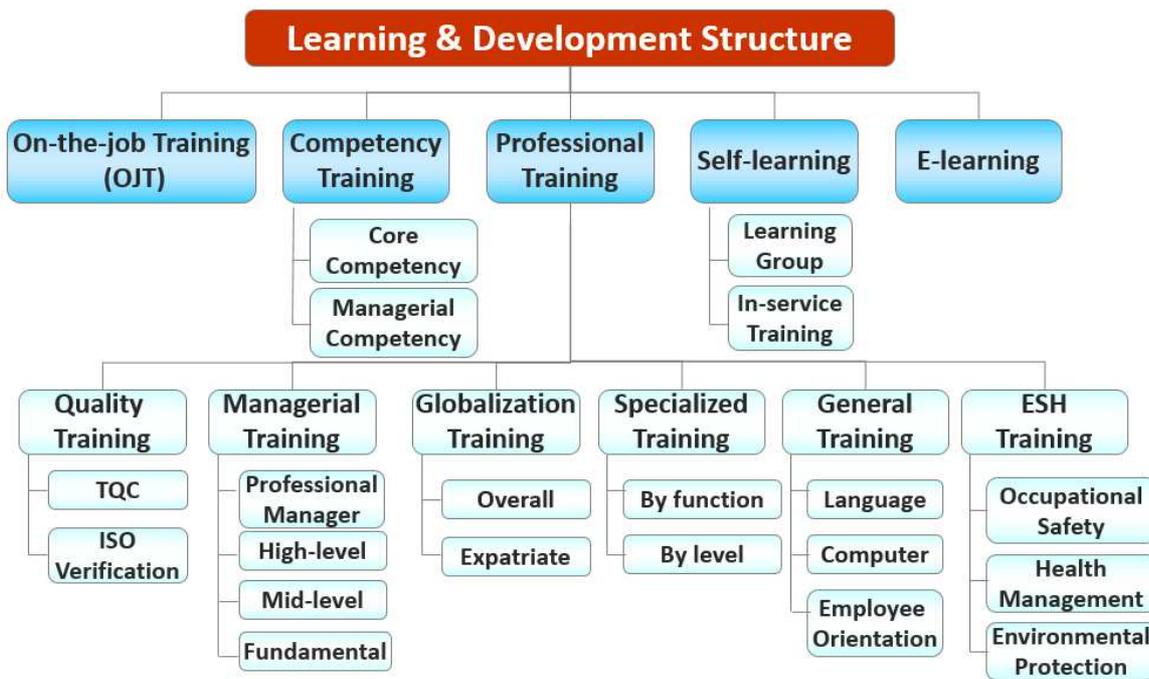
Macronix believes talent is the foundation and the most valuable asset to the corporation. Hence, the Company has established a comprehensive training system and provided well-structured and constant training plans and learning roadmaps. This system accommodates different learning paths, competencies, 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 2022, the performance appraisal implementation rate for each employee category was 100%.

7.2.1 Nurturing Talents

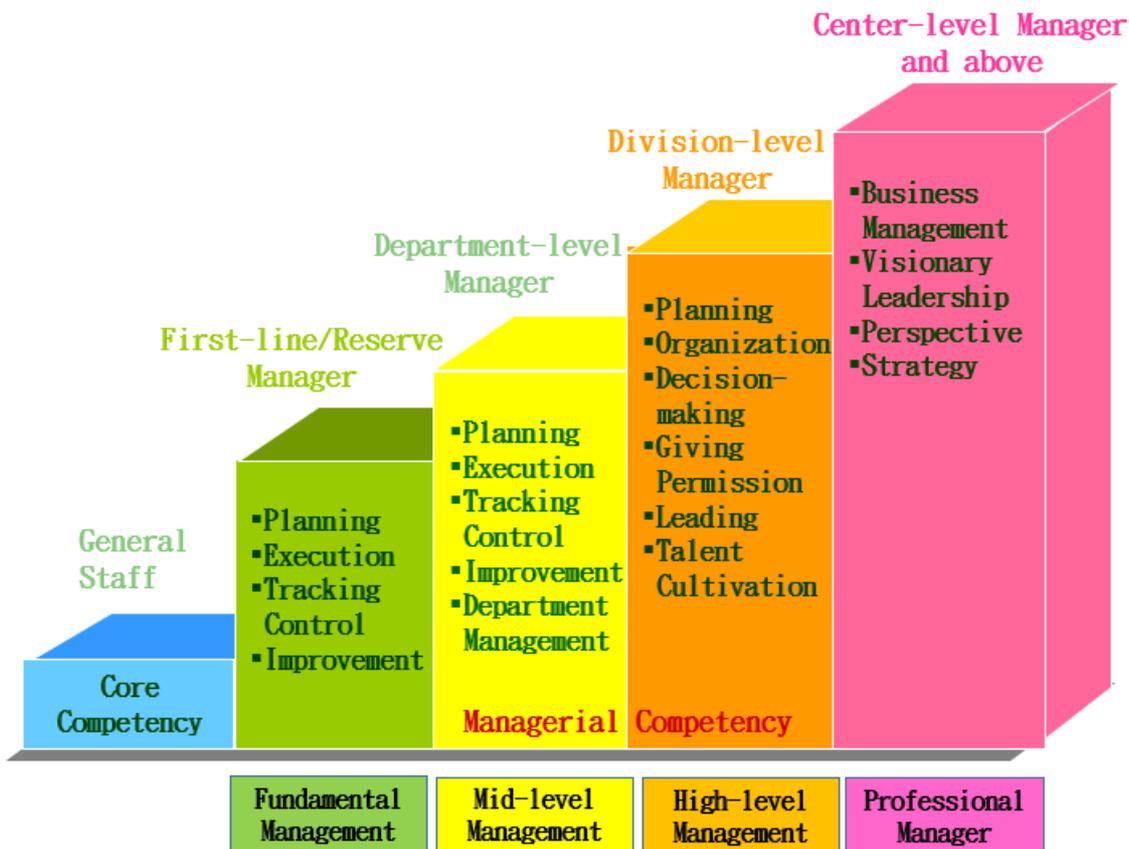
Importance	Talent is the foundation and the most valuable asset of the corporation, and the Company nurtures high-quality human resources.
Medium and Long-term Development Direction	Continue to improve the knowledge, skills, and capabilities of employees, so that employees can continue to grow in response to the environment and organizational needs, and enhance the company's overall competitiveness, so that employees can grow together with the company.
Management Method	Externally: Establish a complete and systematic training system through the PDDRO (Plan, Design, Do, Review, Outcome) process. Internal: Internal management regulations, personnel rules and regulations.
Measures	<ol style="list-style-type: none"> 1. Plan and organize various training courses in response to the Company's operating strategies and organizational development. 2. Implement on-the-job training and one-on-one instruction system to ensure that employees can meet the knowledge and skills requirements for the position and quickly shorten the learning curve of employees. 3. Provide a variety of online courses to encourage employees to learn independently and share and pass on the company knowledge effectively.
2022 Implementation Results	<ol style="list-style-type: none"> 1. Average training hours per person: 65.7. 2. Hours of new online courses produced: 46.1.
Targets in 2023	<ol style="list-style-type: none"> 1. Average training hours per person: more than 66. 2. Hours of new online courses produced: more than 50.

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 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: Provide ladder structures in management training and feature 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: Allowing employees to participate in external and work-related training courses and conferences.
- (3) On-the-job training (OJT): Allowing employees to develop on-the-job professional knowledge, through job assignments, hands-on practice, and project participation; employees can acquire the necessary knowledge and skills by performing these tasks.
- (4) E-learning: Macronix's e-academy learning platform was established to provide employees with easy access to online courses 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 careers. Through knowledge gathering and sharing, employees can enjoy enriched learning resources to achieve their career goals and to embrace workplace challenges at any time.

Moreover, this helps employees to advance in their careers and equips them with the 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: Containing multimedia computers, books, DVDs/CDs, video tapes, and audio tapes. This rich learning platform allows employees 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 employees so that they can significantly increase their learning efficiency.

(4) International lecture halls: Accommodating seats for 250 people, making it the best location for large-scale training courses, conferences, and lectures.

(5) Library: Featuring rich and diverse books, periodicals, and audio/video resources for employees to satisfy their learning needs.



Indicator	Unit	2020	2021	2022
Total Training Costs	Million NT\$ million	8.06	9.49	14.80
Total Training Hours	Hour	189,047	239,205	257,794
Total Employees	Person	3,992	3,809	3,926
Total Revenue	Million NT\$ million	39,801	50,572	43,487
Total Training Costs/Total Revenue	%	0.02	0.02	0.03
Total Training Costs/Total Employees	NT\$/person	2,018	2,491	3,770
Total Training Hours/Total Employees	Hour/person	47.36	62.80	65.66
Total Training Hours for Male Employees/Total Male Employees	Hour/person	-	-	74.55
Total Training Hours for Female Employees/Total Female Employees	Hour/person	-	-	52.36
Total Training Hours for Direct Employees/Total Direct Employees	Hour/person	-	-	76.89
Total Training Hours for Indirect Employees/Total Indirect Employees	Hour/person	-	-	46.63

Note: The average training hours of gender (male/female) and employee categories (direct/indirect) have been added since 2022.

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 employees, 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, which encourage our employees to enjoy an energetic work environment and 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 and art-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=健康Health • 快樂Happiness • 品味生活Openness to life



健康 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, 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.

快樂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 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.

品味生活 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 a halt to protect employees' health and the quality of those activities. The budget of these was turned into vouchers, included with an additional bonus of NT\$10,000 per employee, in order to encourage and thank our employees and family members for their support. Macronix continues to seek agreements with vendors and organize reference book collective buying to provide discounts and convenient life for employees.



旺宏家庭日感謝回饋
感謝好禮 每人 1.2萬

參考書團購優惠
國小國中65折起、高中77折起

收單		到貨
日期	地點/時間	日期/地點/時間
即日起 -08/26	1.【群組訂購】 請搜尋Line 社群： 「旺宏電子」加入後可 至聊天室-檔案內下載訂 購單，填妥後請回傳至 聊天室即完成訂購。 (詳細步驟請參閱附件1)。 2.【傳真訂購】 03-5268449	1.到貨日期： 依廠商通知(約訂購後5日內) 2.取貨地址： 新竹市東區食品路134巷23號 3.取貨時間： 週一~週五 08:00~20:00 週六 09:00~18:00

Promotion of cultural and artistic activities

In 2022, considering the epidemic factors, Macronix took care of the health of employees while promoting cultural exhibitions, and held several exhibitions and small-scale on-site guided tours in the Sunlight Corridor of Li-Hsin Factory, together with a series of online lectures and related quiz draws, to encourage colleagues to get in touch with cultural and artistic activities and understand the meaning therein in their spare time.

Exhibition works	Name of the exhibition	Exhibition-related information and event purposes
Joint exhibition of the “Qing Court Version” and “Qiu Ying’s Version in the Ming Dynasty” of “Along the River During the Qingming Festival”	Joint Exhibition Lecture Series (Online) 1. Artistic Achievements of Annotated Illustrations of “Along the River During the Qingming Festival” 2. Examining the Urban Economy and Prosperity of the Song Dynasty through “Along the River During the Qingming Festival”	1. Promoting artistic appreciation, understanding the artistic achievements and historical implications of “Along the River During the Qingming Festival” 2. Understanding the life and culture of the Song people through appreciation 3. Understanding the mood and technique of Chinese painting and its origin
I say autumn days surpass the spring, for here I have a painting that enchants my eyes – Joint exhibition of “Tang Yin’s Fishing in Reclusion Among Mountains and Streams and Zhao Mengfu’s Autumn Colors on the Chiao and Hua Mountains”	Joint Exhibition Lecture Series (Online) 1. Examining the artistic achievements of Zhao Mengfu from Autumn Colors on the Chiao and Hua Mountains/Calligraphy and Poems on the Baotu Spring 2. Examining the artistic achievements of Tang Yin from “Fishing in Reclusion Among Mountains and Streams”	1. Promoting artistic appreciation, understanding the artistic achievements and historical implications of Yuan and Ming literati 2. Understanding the life and culture of Yuan and Ming literati through appreciation 3. Examining the artistic achievements of Zhao Mengfu from Autumn Colors on the Chiao and Hua Mountains/Calligraphy and Poems on the Baotu Spring 4 Examining the artistic achievements of Tang Yin from “Fishing in Reclusion Among Mountains and Streams”

《唐寅-溪山漁隱》 vs. 《趙孟頫-鵲華秋色、書趵突泉詩》 聯展

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2022 · 11/21~2023 · 12/2 中午12點~13點 地點：力行廠日光走廊

Source: Copyright © National Palace Museum



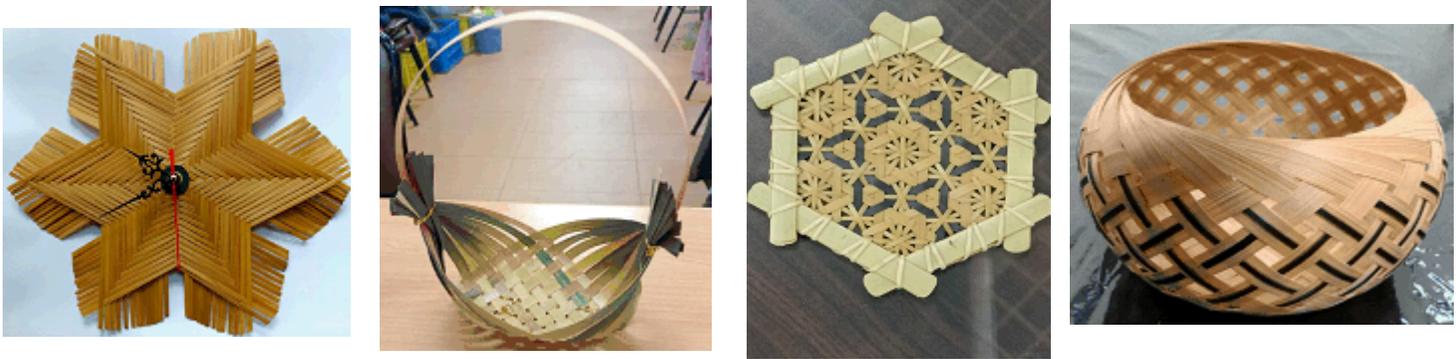
Source: Copyright © National Palace Museum



Source: Copyright © National Palace Museum



In addition, in order to inherit Taiwanese folk art, the “Bamboo Weaving Experience Course” was held to teach different bamboo weaving skills in four stages, and the exhibition of work achievements was held in the Sunlight Corridor of Li-Hsin Factory, making the new life of epidemic prevention full of joy and aesthetics.

<p>Exhibition works</p>	
<p>Name of the exhibition</p>	<p>“Bamboo Weaving Experience Course” teacher and student achievement exhibition</p>
<p>Exhibition-related information and event purposes</p>	<p>Bamboo Weaving Experience Course</p> <ul style="list-style-type: none"> (1) Inherit Taiwanese folk art. (2) Beautify life with art skills to make the new life of epidemic prevention full of joy and aesthetics. (3) Increase artistic self-cultivation and achieve stress relief to improve work efficiency. <p>4 batches of courses were held on 11/22, 11/29, 12/6, and 12/13 to learn different types of bamboo weaving skills</p>

7.3.2 Safety and Health Promotion Management



Management approach	Importance	Reduce the risk of production interruption, and increases the company's competitiveness
	Medium and Long-term Development Direction	Promote employees' physical and mental health, and reduce occupational safety and health risks
	Management Method	Externally: Comply with occupational safety and health-related laws Internal: Environmental, safety, and health information management system
	Measures	1. Work environment monitoring is performed semi-annually 2. Environmental, safety, and health education and training and occupational hazard prevention promotions are organized regularly 3. Employee health promotion events are organized regularly
	2022 Implementation results	0.05 injury rate; 0 cases of occupational diseases; 0.32 lost day rate (LDR); Death rate: 0
	Future Targets (Short, Medium and Long-term Targets)	Promote the Occupational Safety and Health Administration's [GRI 403 Occupational Health and Safety] advanced indicators, and plan to complete the 2023~2025 three-year program year by year to implement safety and health management performance, ensure a safe and healthy working environment, and achieve the "zero disaster" target.

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, false alarms and workplace violence in the workplace, employees can propose occupational safety and health issues or improvement suggestions through the suggestion box, the "proposal improvement system" or labor representatives at the Environmental Safety and Health-related meetings, 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. In order to strengthen the consultation and participation with employees on safety and health issues, labor representatives participated in the Occupational Safety, Health and Environment Committee, together with the revision of safety and health work rules, incident investigation and working environment monitoring, etc. Non-employees communicate with each other through protocol organization meetings and pre-operational safety notices. 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 communication measures. We work together with employees and vendors to jointly create a healthy, safe, and comfortable working environment.

Thanks to the efforts of its employees, Macronix Headquarters, Fab 2, Fab 5 and Test Building have obtained the ISO 45001 Occupational Health and Safety Management Systems Certification every year since 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.



In respect of operation managements, 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 2022, Macronix OSHEC consisted of 4 managers, 3 directing supervisors, 21 labor representatives, 7 technical engineering representatives, and 10 environmental, safety, and health representatives; labor representatives account for 47% 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.

Year	Workers	Headcount	Ratio
2020	Employed workers	3949	97%
	Non- employed workers	103	3%
2021	Employed workers	3,922	100%
	Non- employed workers	0	0%
2022	Employed workers	3,888	94%
	Non- employed workers	0	0%
	On-site contractors	235	6%

Note:

4. Source: Ministry of Labor, Occupational Safety and Health Administration – Occupational Injury Online Report System
5. Employed workers: Macronix employees;
6. Non-employed workers: Contractor personnel stationed in plants and under supervising (there are no “noncontract employees” after October 2020.)
7. On-site contractors: Contractors engaged in daily routine operations in the site area (Macronix began to collect data on occupational injuries of contractors in 2022)
8. The number of workers is the sum of the monthly average number of workers at each plant

Hazard Identification, Risk Assessment and Accident Investigation

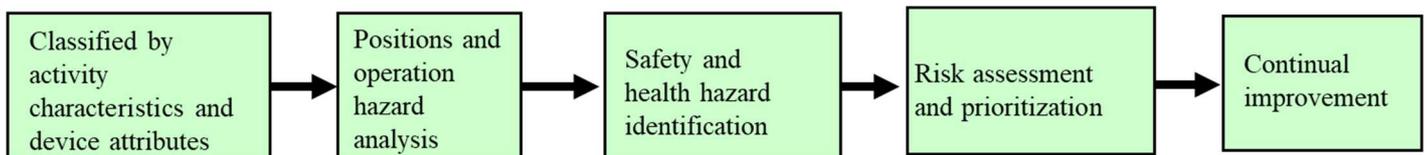
In accordance with the Occupational Safety and Health Act and the requirements of the occupational safety and health management system (ISO 45001), risk assessments are conducted by personnel certified upon training to identify the hazards and risks during routine and non-routine operations of employees (including visitors and vendors), to perform risk rating, and to establish an improvement process and prevention and control management measures. The aim is to eliminate hazards and reduce risks. 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, Macronix has formulated relevant rules governing the rights to hazard identification, stopping the work, evacuating, and reporting.

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.

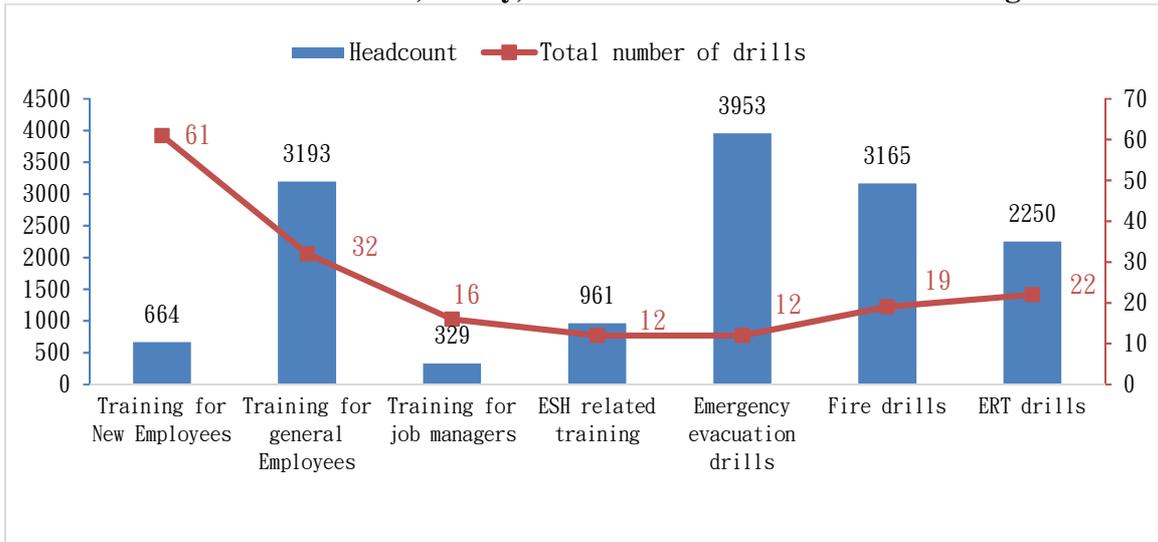
Macronix has formulated the occupational injury and accident investigation procedure, which classifies incidents into four levels, i.e., "Near-miss" (Level 0), "Mild" (Level 1), "Normal" (Level 2), and "Severe" (Level 3); investigations are undertaken in accordance with this rating. The personnel of 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 the hazard identification and risk assessment/improvement, adopting a PDCA approach to ensure that similar accidents no longer occur.

Hazard Identification and Risk Assessment Process



We offer our employees adequate personal protective equipment (PPE), complete safety and health educations and trainings, 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 educations and trainings on occupational safety and health, emergency evacuation drills, fire drills, and emergency response team (ERT) drills (including earthquakes, 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 174 drills were organized for a total of 14,515 participants in 2022.

2022 Macronix Environment, Safety, and Health Education and Training Statistics



In 2022, Macronix did not have any occupational accidents resulting in serious injuries, and the number of occupational injuries that could be recorded was 2. The main types of occupational injuries were cuts, slashes, abrasions, and falls, etc. The investigation of accidents and analysis of causes were carried out, and corrective measures were proposed to improve personnel awareness of hazards and the working environment through the parallel development of each plant.

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 2022

Year	Workers	Gender	Head count	The number of fatalities as a result of work-related injury	Total work hours (hr)	Injury Rate (IR)	Occupational Disease Rate (ODR)	Lost Day Rate (LDR)	Rate of fatalities as a result of work-related injury
2020	Employed workers	Male	2278	0	4,556,000	0.09	0	1.27	0
		Female	1671	0	3,342,000	0.12	0	5.33	0
		Total	3949	0	7,898,000	0.10	0	2.99	0
2021	Employed workers	Male	2304	0	4,589,568	0.04	0	0.04	0
		Female	1618	0	3,223,056	0.00	0	0.00	0
		Total	3922	0	7,812,624	0.03	0	0.03	0
2022	Employed workers	Male	2319	0	4,618,452	0.04	0	0.17	0
		Female	1570	0	3,126,444	0.06	0	0.58	0
	On-site contractors	Male	111	0	221,610	0.00	0	0.00	0
		Female	124	0	246,178	0.00	0	0.00	0
	Total			4123	0	8,212,684	0.05	0	0.32

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. IR = (Number of disabling injuries×200,000)/Total work hours
4. LDR = (Total work days lost×200,000)/Total work hours
5. ODR = (Number of work-related ill health×200,000)/Total work hours
6. Death rate = (Number of fatalities as a result of work-related injury * 200,000)/Total work hours
7. All of Macronix’s fabs are located in Taiwan.
8. Macronix collected data on work-related injuries of contractors in 2022.
9. 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 7,000 people in 2022 (due to the pandemic, the activity center was closed from January to March and April to October, and the number of visitors was limited).

(2) Established diverse and active clubs, with a total of 23 different sports clubs.

◆ Weight loss course and health promotion:

(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 (suspended due to the severe pandemic situation in 2022, and subsequent arrangements will depend on the development of the pandemic).

(2) Health education messages are regularly displayed and promoted as slideshows on TV and posters.

(3) In the monthly/quarterly meetings on work safety in each plant, health promotion will be given on one theme every month (online meeting).

◆ 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 2022, 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 257 employees took advantage of this and 130 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 112 employees benefited from such assistance. Employees’ family members are provided with the discounts, and a total of 46 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 2022. A total of 155 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 2022 to provide flu vaccination at employees’ own expense for 370 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 checkups) in 2021 to provide total of 211 people with self-paid abdominal ultrasound examinations; however, the examination was interrupted due to the pandemic (suspended due to the severe pandemic situation in 2022, and subsequent arrangements will depend on the development of 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 2022 were cancelled due to the pandemic. Training has been included in the compulsory course for new recruits from July 2020.

◆ 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 2022, physical contact activities were discontinued due to the pandemic).
 - ◆ COVID-19 prevention and management:
 - (1) Macronix immediately established the COVID-19 Epidemic Prevention Office, which 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, when the COVID-19 pandemic broke out in early 2020.
 - (2) Appointed dedicated staff to track and pay attention to pandemic mitigation and management measures, e.g., E-system (fill in daily body temperature & pandemic prevention statement, 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), environmental cleaning and disinfection, food safety and hygiene, social distancing, anti-pandemic consulting services, anti-pandemic supplies management, set up an anti-pandemic bulletin 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 of self-health

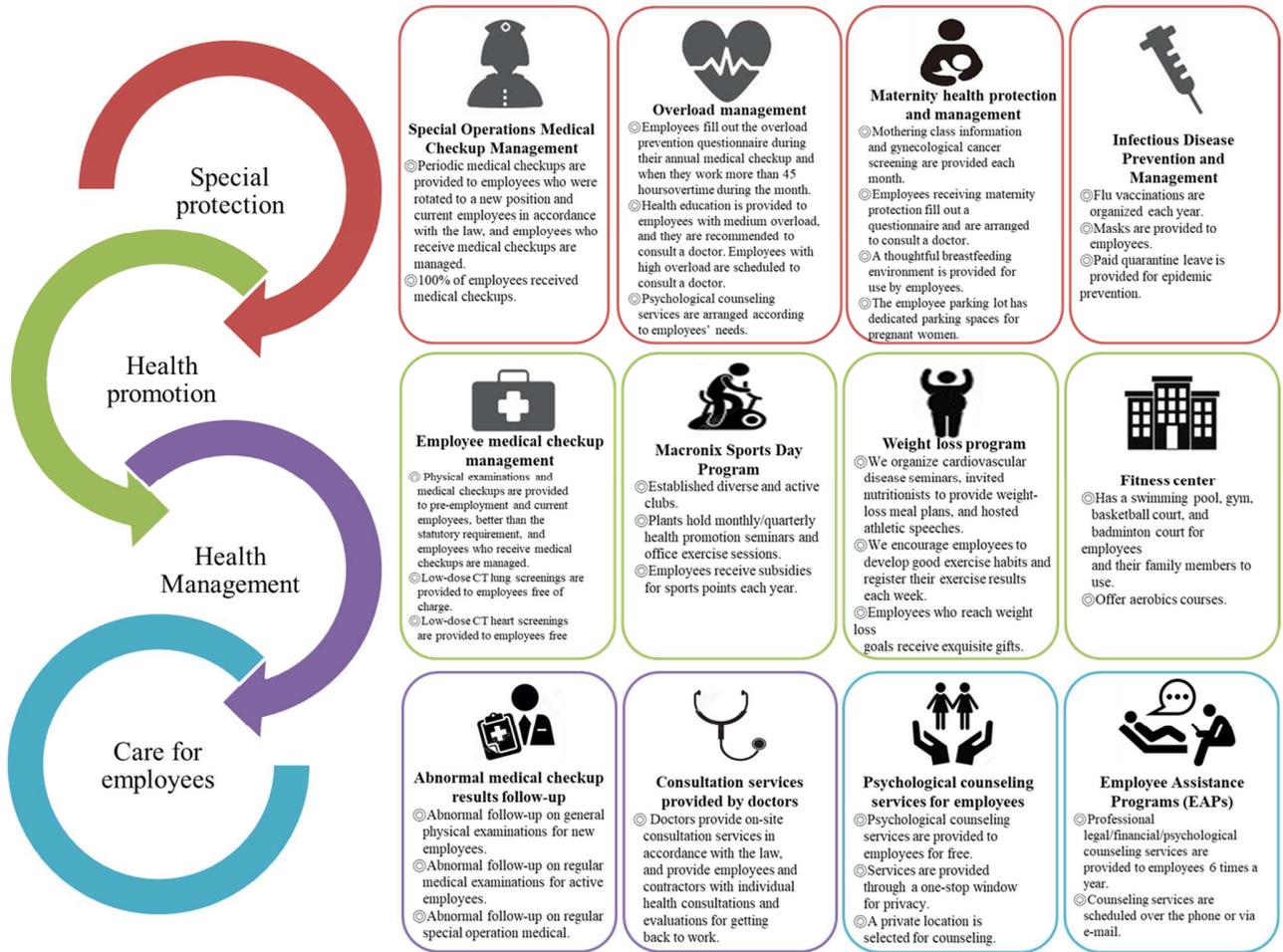
management, a limited number of people for elevators/pantry/toilet, etc. It also includes strengthening or upgrading pandemic mitigation measures, in order to implement the pandemic mitigation management of employees, visitors, and contractors, to maximize the effectiveness of pandemic prevention and protection of the health of personnel.

◆ Awards & Achievements in 2022

- 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
- Awarded by Health Promotion Administration, Ministry of Health and Welfare: Health Promotion Badge – Accredited Healthy Workplace in (2022-2024) in 2021
- Awarded by Health Promotion Administration, Ministry of Health and Welfare: Paradigm in Health Award - Excellent Healthy Workplace in 2022



Comprehensive Health Management



Work-related ill health

Every year, occupational health examinations for the prevention of work-related ill health are carried out in compliance with the law on workers' occupational accident insurance. A total of 343 people received the health checkups in 2022 under the comprehensive judgement of physicians. 144 were first-level management and 199 were second-level management. None of them suffered from work-related ill health.

7.4 Social Welfare

Management approach	Importance	Persist in sustainable operation and continue to give back to society
	Medium and Long-term Development Direction	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.
	Management Method	<ol style="list-style-type: none"> 1. Sponsor technological development 2. Reward outstanding science and technology talent 3. Cultivate children and adolescents to develop an interest in learning knowledge related to science, humanities, and nature 4. Plan activities such as nature observation, cultural events, historic site visits, and folk-art events 5. Support and organize public welfare and education-related matters
	Measures	<ol style="list-style-type: none"> 1. Organize the Macronix Golden Silicon Awards 2. Organize the Macronix Science Awards 3. Sponsor important science education organizations 4. Foster cultural and creative industries
	2022 Implementation Results	<ol style="list-style-type: none"> 1. The Macronix Golden Silicon Awards attracted 1,009 teachers and students to participate, and the number of participating teams reached 275. The amount of scholarship awarded was NT\$3.46 million. 2. The Macronix Science Awards attracted 914 teachers and students to participate, and the number of participating teams reached 589. The amount of scholarship awarded was NT\$4.8 million. 3. Nearly NT\$4.6 million in support of public welfare and education as well as local cultural and creative industries
	Target in 2023	<ol style="list-style-type: none"> 1. The Macronix Golden Silicon Awards aims to increase the number of participants by 3% each year, and the number of participating teams is expected to be about 285. 2. The Macronix Science Awards aims to increase the number of participants by 3% each year, and the number of participating teams is expected to be about 610. 3. More than NT\$5.15 million in support of public welfare and education as well as local cultural and creative industries

Since the inception of Macronix in 1989, 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 Miin Wu. Macronix donated to the Foundation approximately NT\$20 million to hold its primary events each year. Since the establishment of the Foundation, Macronix has donated more than NT\$500 million in the Foundation for the cultivation of talent and the promotion of related businesses. 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 students.

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, and Macronix Chair Professor Project. The Foundation also supports domestic science education in order to foster scientific talents in Taiwan.

For more than 20 consecutive years, over 40,000 teachers and students have participated in the Macronix Golden Silicon Awards and Macronix Science Awards with extreme enthusiasm. Scholarships worth over NT\$180 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

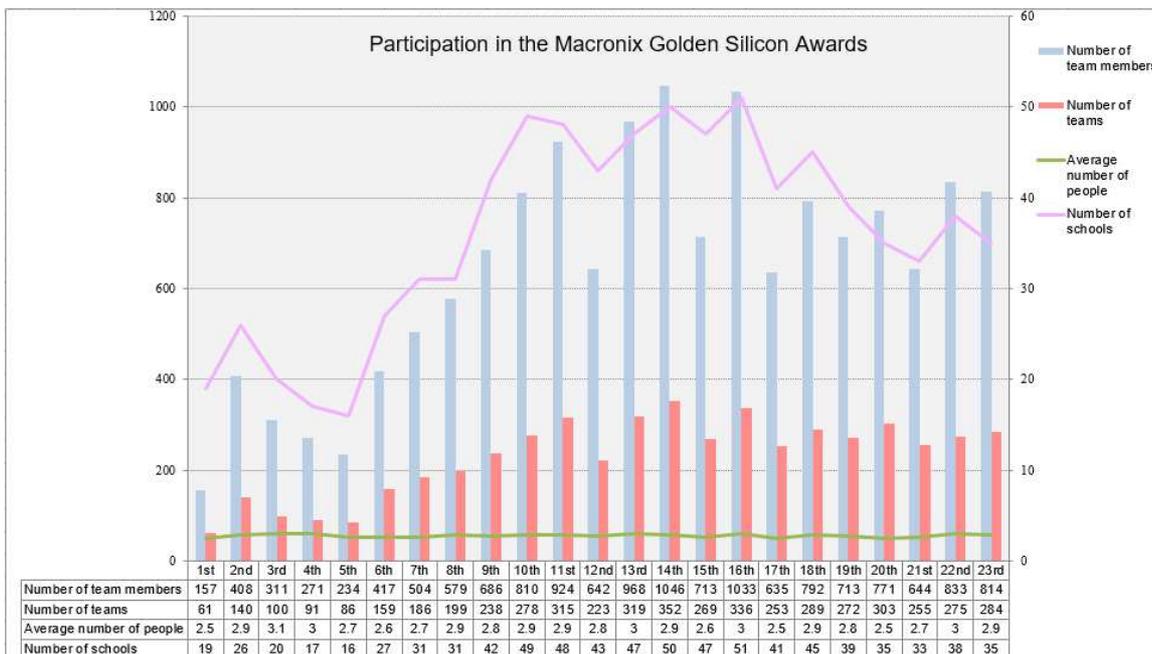


To inspire Taiwanese college students' creative spirit and hands-on experience in the field of semiconductor research, as well as to promote positive interactions between industry and academia, the Macronix Education Foundation held the first Macronix Golden Silicon Awards - Semiconductor Design and Application Competition in 2000. Over 18,000 students and teachers nationwide had participated in these competitions. It is regarded as the most important competition among electronic and electrical engineering students for evaluating their performance before graduation. Envisioning the industry's development trends, Macronix continues to incorporate a wide variety of applications, such as power management, security, biomedical, robotics, digital home, automotive/EV, 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.

To promote sustainable development of the environment, the Green category of the awards was established within the Application Group, encouraging students to engage in energy conservation and environmental protection-related research. Over the years, 182 works have been submitted under this category, including a winner of the Judging Panel's Gold Award.



Chen Tzong-chyuan, Vice Minister of NSTC, and Li Yu-chuan, Secretary of Department of Lifelong Education of MOE, invited as the awarder of the Golden Silicon Awards and was very attentive to the creative works displayed by the award-winning students.

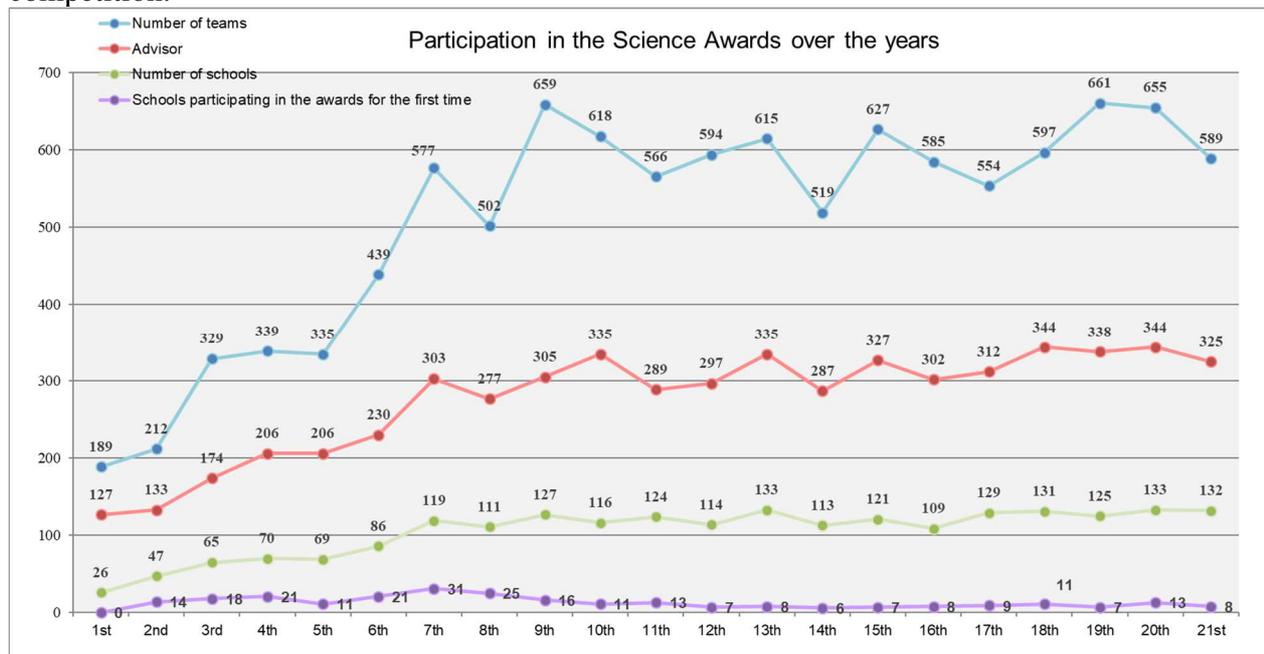


Macronix Science Awards



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 of 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 589 teams, comprising nearly 22,000 participants, by the twenty-first year. Cumulative awards from previous competitions have exceeded NT\$100 million, and an average annual award of approximately 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. In general, the award-winning students receive a maximum of NT\$480,000 in four-year university scholarships encouraging more students who love science to join the competition.



James C. Liao, President of Academia Sinica, Lin Teng-chiao, Administrative Deputy Minister of Education, and Lin Minn-tsong, Deputy Minister of NSTC, 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 to 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.

Sponsoring Important Science Education Organizations

Since 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.



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.

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

From 2012 to 2022, the Macronix Education Foundation has also made donations every year 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 16 recipients.

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.

7.4.2 Fostering Local Cultural and Creative Industries

Holding art exhibitions to support local cultural and creative industries

Since 2019, we have invited an emerging Taiwanese artist to exhibit artworks of different characteristics in the exclusive space of Macronix's show room every year, so as to provide employees with the opportunity to get close to and appreciate the beauty of art, and to help visitors at home and abroad understand Taiwan's art and culture. For the art works that are newly displayed every year, we will invite artists to share their creative ideas and conduct guided tours of their works, so that employees can cultivate their artistic literacy and their temperament to achieve work-life balance and diversity.



We invite different artists to exhibit their art works of different characteristics in Macronix's show room every year

Inviting 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 and NT\$116.4 million was donated in 2022, with the total approaching NT\$20 million over the years and with almost 30 artists benefiting from this. These creations are the spiritual accomplishments created by nearly 30 artists. They also provide an opportunity for more than 40,000 participants to not only experience the joy of winning but also share in the beauty of artistic creation. For 22 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.



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

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.

7.4.3 Environmental Protection and Charity Events

Adopting a Bicycle Eco-path in Hsinchu City



Based on its corporate social responsibility and commitment to giving back to the community, Macronix adopted a 12-km long bicycle eco-path in Nanliao, 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 families 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 2022, Macronix was recognized with a “Certificate of Gratitude for Adopting the Hsinchu Environmental Bikeway” issued by the Hsinchu City Government; and won the “Award of Excellence” in the 2022 Clean Air Zone Adoption presented by the Environmental Protection Administration Executive Yuan.



Refurbished Computer and Digital Training Program

Since 2020, Macronix has started donating obsolete computers and peripheral equipment to the ASUS Foundation as part of the "Refurbished Computer and Digital Training Program", which combines environmental protection with social welfare. In 2022, a total of 832 computers and monitors were donated, along with over 850 other computer peripherals. The goal is to contribute to resource recycling and the creation of a "circular society", while also hoping to make a greater social impact and shorten the digital divide.



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 20th year, unwaveringly calling upon employees to donate and support social welfare 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. In 2022, the monthly number of adoptive sponsors was 134 people, and the total annual donation amount was approximately NT\$2.29 million.

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. In 2022, a total of 1 emergency aid was held, with 469 employees participated and approximately NT\$730,000 donated.

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 primary goal. This goal has been promoted for a decade since 2017. 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 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 the Boyo Social Welfare Foundation to help disadvantaged children attend after school classes. Over nine years have passed and over 75 students participated in after school classes in 2022, with the donations that totaled NT\$590,000.

Promotion of Charity Group Activities

- Big Love Society actively promotes events of charity organizations by providing sponsorship funds, collecting donations, and volunteering. In 2022, they assisted more than three charity organizations and sponsored and raised over NT\$30,000.
- Vulnerable groups have not been able to raise funds through activities due to the impact of the pandemic in 2022. This year, Big Love Society will use community funds to assist the Hsinchu Branch of the Syn-Lu Social Welfare Foundation and the St. Joseph Social Welfare Foundation to handle activities related to mentally handicapped children. It will also make donation to Youth at Risk Ministry in Catholic Hsinchu Diocese.

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 costs of vaccination and spaying of female dogs. 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 18 years.

The Animal Club has not ceased its efforts in animal protection for a single day in the 18 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.



<p>Adoption of stray dogs</p>	<ul style="list-style-type: none"> • 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.
<p>Spaying/neutering in place of killing</p>	<ul style="list-style-type: none"> • 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.
<p>Animal rescue in action</p>	<ul style="list-style-type: none"> • 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.
<p>Cleaning Animal Shelters and Feeding Stray Animals</p>	<ul style="list-style-type: none"> • 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.
<p>Rabies vaccination for stray dogs</p>	<ul style="list-style-type: none"> • 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 available on the Macronix website (<https://www.macronix.com/>). The purpose of the Report is to provide the general public and all stakeholders of Macronix a better understanding of our concerns and actions in 2022 with regard to sustainability topic. The Report also highlights our commitments and achievements in various sustainability areas.

Reporting Period

The Report discloses Macronix 's performance information in terms of sustainability management policies, key issues, corporate commitments, and actual actions throughout the year 2022 (from January 1, 2022, to December 31, 2022). This Report is issued on an annual basis (the previous version was issued in June 2022, and the next version will be issued in June, 2024). Material topics, including tax, training and education, non-discrimination, and climate change have been added compared to 2021.

Aspect Boundaries and Scope of the Report

The aspect boundaries and scope of the Report include: Headquarters (Address: No.16, Li-Hsin Road, 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.), and Test Building (No. 8, Creation Road IV, Science Park, Hsin-chu, Taiwan, R.O.C.) The aspect boundaries have been adjusted to exclude Fab 1 (Address: No. 3, Creation Road III, Science Park, Hsin-chu, Taiwan, R.O.C.). The historical data on the environment in 2020 and 2021 have been adjusted to exclude Fab 1, so the emissions data are lower than previously reported. The financial, personnel, and occupational safety disaster data are based on historical data because it is not easy to distinguish individual information of the plants. 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 regularly holds a “Sustainability Report Writing Commencement Meeting” 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 and AA1000AS(2018) standards. The assurance level to be applied is Moderate Level Assurance (Type I). The Report also 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 2022 Macronix Sustainability Report.

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

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8.2 Content Index

8.2.1. GRI Content Index

GRI STANDARD	DISCLOSURE	Page	OMISSION
GRI 1: Foundation 2021	-	-	
General disclosure			
GRI 2: General Disclosure 2021	2-1 Organizationa Details	a. Cover, 55 b. 55 c. 12 d. 12	
	2-2 Entities included in the organization's sustainability reporting	a. 55 b. 55-58 c. 55-58	
	2-3 Reporting period, frequency and contact point	a. 149-150 b. NA c. 149-150 d. 150	
	2-4 Restatements of information	a. 63, 67, 69, 85, 89	The historical data of environment in 2020 and 2021 have been adjusted to exclude Fab 1, so the emissions data are lower than previously reported. The financial, personnel, and occupational safety disaster data are based on historical data because it is not easy to distinguish individual information of the plants.
	2-5 External assurance	a. 26, 149-150 b. 149-150	
	2-6 Activities, value chain and other business relationships	a. 9 b. 9-11, 51-54	

		c. 55 d. NA	
	2-7 Employees	a. 99-100 b. 99-100 c. 99-100 d. 99-100 e. There is no significant fluctuation	
	2-8 Workers who are not employees	a. 100 b. 100 c. First-time disclosure	On-site contractors: Macronix began to collect data on work-related injuries of contractors in 2022, and there is no other annual information available.
	2-9 Governance structure and composition	a. 31-35 b. 31-35 c. 31-35	
	2-10 Nomination and selection of the highest governance body	a. 31-35 b. 31-35	
	2-11 Chair of the highest governance body	a. 33-34 b. 32	
	2-12 Role of the highest governance body in overseeing the management of impacts	a. 19-20 b. 23-26 c. 27	
	2-13 Delegation of responsibility for managing impacts	a. 21-26 b. 26-27	
	2-14 Role of the highest governance body in sustainability reporting	a. 26-27 b. NA	
	2-15 Conflicts of interest	a. 32 b. 32	
	2-16 Communication of critical concerns	a. 36-37 b. 36-37	
	2-17 Collective knowledge of the highest governance body	a. 31-34	

	2-18 Evaluation of the performance of the highest governance body	a. 31-34 b. 31-34 c. 31-34	
	2-19 Remuneration policies	a. 34-35 b. NA	
	2-20 Process to determine remuneration	a. 34-35	
	2-21 Annual total compensation ratio	a. 35 b. 35 c. 35	
	2-22 Statement on sustainable development strategy	a. 19	
	2-23 Policy commitments	a. 97-98 b. 19,97-98 c. 19 d. 19 e. 19, 97-98 f. 19, 23-26	
	2-24 Embedding policy commitments	a. 19, 51-54, 149	
	2-25 Processes to remediate negative impacts	a. 8, 19, 36-37 b. 108 c. 21-26, 52, 55, 62, 66, 68, 84, 88, 95, 112, 134 d. 21-26 e. 21-26, 149	
	2-26 Mechanisms for seeking advice and raising concerns	a. 21-22	
	2-27 Compliance with laws and regulations	a. 43 b. 43 c. 43 d. 43	
	2-28 Membership associations	a. 16-17	

	2-29 Approach to stakeholder engagement	a. 21-26	
	2-30 Collective bargaining agreements	a. 36-37 b. All of colleagues are included	
GRI 3 Material Topic			
Economic Performance			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	55	
	3-2 List of material topics	55	
	3-3 Management of material topics	55	
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	55-57	
	201-2 Financial implications and other risks and opportunities due to climate change	74-83	
	201-3 Defined benefit plan obligations and other retirement plans	58, 106	
	201-4 Financial assistance received from government	58	
GRI 205: Anti-corruption 2016	205-3 Confirmed incidents of corruption and actions taken	36-37	
Tax			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	58	
	3-2 List of material topics	58	
	3-3 Management of material topics	58	

GRI 207: Tax 2019	207-1 Approach to tax	58	
	207-2 Tax governance, control, and risk management	58	
	207-3 Stakeholder engagement and management of concerns related to tax	58	
Material			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	60-61	
	3-2 List of material topics	60-61	
	3-3 Management of material topics	60-61	
GRI 301: Materials 2016	301-1 Materials used by weight or volume	60-61	
	301-2 Recycled input materials used	60-61	
	301-3 Reclaimed products and their packaging materials	60-61	
Energy			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	84	
	3-2 List of material topics	84	
	3-3 Management of material topics	84	
GRI 302: Energy 2016	302-1 Energy consumption within the organization	86	
	302-3 Energy intensity	86	
	302-4 Reduction of energy consumption	87	
Water and Effluents			

GRI 3: Material Topic 2021	3-1 Process to determine material topics	62	
	3-2 List of material topics	62	
	3-3 Management of material topics	62	
GRI 303: Water 2018 (management)	303-1 Interactions with water as a shared resource	62	
	303-2 Management of water discharge-related impacts	62-63	
GRI 303: Water 2018	303-3 Water withdrawal	62-63	
	303-4 Water discharge	62-63	
	303-5 Water consumption	62-63	
Emissions			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	66, 88	
	3-2 List of material topics	66, 88	
	3-3 Management of material topics	66, 88	
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	91	
	305-2 Energy indirect (Scope 2) GHG emissions	91	
	305-3 Other indirect (Scope 3) GHG emissions	91	
	305-4 GHG emissions intensity	91	
	305-5 Reduction of GHG emissions	88-89	
	305-6 Emissions of ozone-depleting substances (ODS)	66, 89	

	305-7 Nitrogen oxides (NO _x), sulfur oxides (SO _x), and other significant air emissions	66-67	
Waste			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	68	
	3-2 List of material topics	68	
	3-3 Management of material topics	68	
GRI 306: Waste 2020 (management)	306-1 Waste generation and significant waste-related impacts	68	
	306-2 Management of significant waste-related impacts	68	
GRI 306: Waste 2020	306-3 Waste generated	68-72	
	306-4 Waste diverted from disposal	68-72	
	306-5 Waste directed to disposal	68-72	
Employment			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	97-98	
	3-2 List of material topics	97-98	
	3-3 Management of material topics	97-98	
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	99-101	
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	108-109	
	401-3 Parental leave	110-111	

Occupational Health and Safety			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	124	
	3-2 List of material topics	124	
	3-3 Management of material topics	124	
GRI 403: Occupational Health and Safety 2018 (management)	403-1 Occupational health and safety management system	124-125	
	403-2 Hazard identification, risk assessment, and incident investigation	126	
	403-3 Occupational health services	129-133	
	403-4 Worker participation, consultation, and communication on occupational health and safety	129-133	
	403-5 Worker training on occupational health and safety	127	
	403-6 Promotion of worker health	133	
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	127	
	403-8 Workers covered by an occupational health and safety management system	99-101	
GRI 403: Occupational Health and Safety 2018	403-9 Work-related injuries	127	
	403-10 Work-related ill health	133	b. The supplier's personal information is confidential and thus not available

Training and Education			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	112	
	3-2 List of material topics	112	
	3-3 Management of material topics	112	
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	112	
	404-2 Programs for upgrading employee skills and transition assistance programs	112, 114	
	404-3 Percentage of employees receiving regular performance and career development reviews	112	
Non-discrimination			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	104	
	3-2 List of material topics	104	
	3-3 Management of material topics	104	
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	104	
Customer Health and Safety			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	52	
	3-2 List of material topics	52	
	3-3 Management of material topics	52	
GRI 416: Customer Health and Safety 2016	416-1 Assessment of the health and safety impacts of product and service categories	52	

	416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	43, 112	
Customer Privacy			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	52	
	3-2 List of material topics	52	
	3-3 Management of material topics	52	
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	52	
Social Welfare and Education			
GRI 3: Material Topic 2021	3-1 Process to determine material topics	134	
	3-2 List of material topics	134	
	3-3 Management of material topics	134	

8.2.2 SASB 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	91
	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	88
Energy Management in Manufacturing	TC-SC-130a.1.	(1) Total energy consumed, (2) Percentage grid electricity, (3) Percentage renewable	84-87
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	62-63
Waste Management	TC-SC-150a.1.	Amount of hazardous waste from manufacturing, percentage recycled	68-69
Employee Health & Safety	TC-SC-320a.1.	Description of efforts to assess, monitor, and reduce exposure of employees to human health hazards	126
	TC-SC-320a.2.	Total amount of monetary losses as a result of legal proceedings associated with employee health and safety violations	43
Recruiting & Managing a Global & Skilled Workforce	TC-SC-330a.1.	Percentage of employees that are (1) Foreign nationals (2) Located offshore	99-100
Product Lifecycle Management	TC-SC-410a.1.	Percentage of products by revenue that contain IEC 62474 declarable substances	94-95
	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	43-47
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	36

8.2.3 Sustainable Disclosure Indicator — Semiconductor Industry

No.	Indicator	Response	Page
I	Total energy consumption	1,867,660 billion joules (GJ)	85
	Percentage of purchased electricity	96.24%	85-86
	Utilization rate of renewable energy source	0%	85-86
II	Total water withdrawal	2,836 thousand cubic meters (m ³)	62-63
	Total water consumption	738 thousand cubic meters (m ³)	62-63
III	Weight of hazardous waste produced	6,954 metric tons (tons)	68-69
	Percentage of hazardous waste recycled	99.8%	68-69
IV	Disclosure of work-related injuries categories	The main types of work-related injuries were cuts, slashes, abrasions, and falls	127
	Disclosure of the number of work-related injuries victims	2 people	127
	Disclosure of the rate of work-related injuries	0.05%	127-128
V	Disclosure of product life cycle management: including the weight of scrapped products and electronic wastes	IC: 7.895 tons Wafer: 22.387 tons	61

	Disclosure of product life cycle management: including the recycling percentage of scrapped products and electronic wastes (Note 1)	IC: 100% Wafer: 100%	61
VI	Description of risk management relating to the use of key materials	Pay attention to and understand the risks of fire, earthquake, flood, typhoon, infectious disease, water shortage, power outage, etc., in order to take corresponding risk management and control strategies in a timely manner according to the priority and ranking of risks to minimize the impact of damage.	43-47
VII	Total monetary losses arising from legal proceedings relating to anti-competitive behavior regulations	None.	36
VIII	Output of main products by product category	Refer to the annual report for the production value table for the last two years	9

8.2.4 Comparison of Task Force on Climate-related Financial Disclosures (TCFD)

Risks and opportunities of climate change to the Company and the corresponding measures taken by the Company		
Item	Implementation status	
	Corresponding chapter	Corresponding page
1. Describe the Board of Directors' and management's supervision and governance of climate-related risks and opportunities.	Ch6.2	74
2. Describe how the identified climate risks and opportunities affect the corporate business, strategy, and finance (short, medium, and long term).	Ch6.2	74-75
3. Describe the financial impact of extreme climate events and transformation actions.	Ch6.2	80-81
4. Describe how the identification, assessment, and management processes of climate risks are integrated into the overall risk management system.	Ch4.2	43-47
5. If scenario analysis is used to assess the resilience to climate change risks, the scenarios, parameters, assumptions, analysis factors and major financial impacts used should be stated.	Ch6.2	75
6. If there is a transformation plan to manage climate-related risks, the content of the plan, and the indicators and targets used to identify and manage physical and transformation risks should be stated.	Ch6.2	74-79
7. If internal carbon pricing is used as a planning tool, the basis for price setting should be stated.	Internal carbon pricing mechanism has	

		not been established	
8	If a climate-related target is set, the activities covered, scope of GHG emissions, planning schedule, annual progress and other information should be stated; If carbon offset or Renewable Energy Certificates (RECs) are used to achieve the relevant targets, the source and quantity of the carbon reduction quota offset or the quantity of Renewable Energy Certificates (RECs) should be stated.	Ch6.2	84-86
9	GHG inventory and assurance	Ch6.2.3	91

8.3 Comparison of UN Sustainable Development Goals(SDGs)

Goals	Description	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	6.2.2 Energy Management
8 	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	4.3. Innovation 6.1.1 Water Resource Management 6.2.2 Energy Management 7.1.1. Recruitment
10 	Reduce inequality within and among countries	7.1. Staff Respect
11 	Make cities and human settlements inclusive, safe, resilient and sustainable	6.1.1 Water Resource Management 6.1.2 Air Pollution Prevention 6.1.3 Waste Management 6.3 Ecological Environment and Conservation 7.3.1. Macronix H2O
12 	Ensure sustainable consumption and production patterns	6. 1. Environmental Protection Management and Pollution Prevention

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	7.4.3 Environmental Protection and Charity Events
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	6.4.2 Green Procurement and Environment, Safety, and Health Costs Accounting Management System 4.4. Supply Chain Management

8.4 Independent third-party assurance statement



INDEPENDENT ASSURANCE STATEMENT

To: The Stakeholders of MACRONIX INTERNATIONAL CO., LTD.

Introduction and objectives of work

Bureau Veritas Certification Taiwan has been engaged by MACRONIX INTERNATIONAL CO., LTD. to conduct an independent assurance of its **2022 Sustainability Report**. This Assurance Statement applies to the related information included within the scope of work described below.

This information and its presentation in the **2022 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.

Scope of work

The assurance process was conducted in line with the requirements of the AA1000 Assurance Standard (AA1000AS v3), Type 1 – Account Ability Principles engaged. The scope of work included:

- Data and information included in **2022 Sustainability Report** for the **1st January, 2022 to 31st December, 2022**;
- 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
 - 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.

The levels of assurance have been applied as moderate level assurance.

¹ Published by AccountAbility: The Institute of Social and Ethical Accountability
<https://www.accountability.org/>



Methodology

As part of its independent assurance, Bureau Veritas undertook the following activities:

1. Interviews with relevant personnel of **MACRONIX INTERNATIONAL CO., LTD.**;
2. Review of documentary evidence produced by **MACRONIX INTERNATIONAL CO., LTD.**;
3. Review performance data listed in report with sampling basis;
4. Visits to 1 sites located in Taiwan (Hsinchu City);
5. Review of **MACRONIX INTERNATIONAL CO., LTD.** data and information systems for collection, aggregation, analysis and review.

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.

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.

Our findings

On the basis of our methodology and the activities described above, it is our opinion that:

- The information and data included in **2022 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, 2022 to 31st December, 2022**;
- The Report properly reflects the organisation's alignment to and implementation of the AA1000 Assurance Standard (AA1000AS v3) 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;

Alignment with the principles of AA1000 Accountability Principle (2018)

Inclusivity

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 2022 covering a range of material topics such as Economic, Social and Environment.

Materiality

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.



Responsiveness

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.

Impact

MACRONIX INTERNATIONAL CO., LTD. 's management system can monitor, measure and be accountable for how their actions affect their broader ecosystems.

GRI report Structure

MACRONIX INTERNATIONAL CO., LTD. does fully provide the information to achieve the GRI Standards, and the performance indices do correspond and can be cross referenced to the content of relevant GRI Standards.

Key areas for ongoing development

Based on the work conducted, we recommend **MACRONIX INTERNATIONAL CO., LTD.** to consider the following:

- Encourage organization to include all entities in consolidated financial statement within reporting boundaries to present a more complete corporate sustainability performance. (INCLUSIVITY)

Limitations and Exclusions

Excluded from the scope of our work is any assurance of information relating to:

- 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.

This independent statement should not be relied upon to detect all errors, omissions or misstatements that may exist within the Report.





Statement of independence, impartiality and competence

Bureau Veritas is an independent professional services company that specialises in Quality, Health, Safety, Social and Environmental management with more than 195 years history in providing independent assurance services. Bureau Veritas 2022 full year revenues reached 5.7 billion euros. The Group's adjusted net profit for 2022 reached 533.9 million euros.

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.

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.

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.

Bureau Veritas Certification Taiwan

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XXth May, 2023



AA1000
Licensed Report
000-76/V3-HWYIA

技術審查: *li*

日期: 18/May/2023

查證人員: *Lily Chuang*

日期: 18/May/2023

