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Environmental, Social & Governance (ESG)

TSMC is the only semiconductor company to be selected as a component of the Dow Jones Sustainability Indices for 23 consecutive years.

7.1 Overview

TSMC actively implements ESG management following three missions: Acting with Integrity, Strengthening Environmental Protection, and Caring for the Disadvantaged. In so doing, the Company seeks maximum achievements as the leading technology and capacity provider of the global logic IC industry and strives to establish mutually beneficial interaction with all stakeholders – employees, shareholders/investors, customers, suppliers/contractors, governments/associations and society as a whole – aiming to create sustainable value and to be a force for positive change.

Guidance for Implementing – ESG

With the vision of Uplifting Society, TSMC has formulated its ESG Policy as the overarching guiding principle for sustainable development, in which the ESG Matrix, established by the Company's founder Dr. Morris Chang, clearly defines the scope of its ESG responsibilities. TSMC strives to carry out its ESG commitment in seven areas: morality, business ethics, economy, rule of law, sustainability, work-life balance and happiness, and philanthropy. Actions that TSMC has taken to fulfill these commitments are integrity, law compliance, anti-corruption/anti-bribery/anti-cronyism, environmental protection/climate control/energy conservation, corporate governance, providing well-paying jobs, generating good shareholder return, employee work-life balance, encouraging innovation and a good work environment. TSMC also advances ESG through its Charity Foundation and Education and Culture Foundation to fulfill corporate citizenship responsibilities.

TSMC ESG Matrix

TSMC \ Society	Morality	Business Ethics	Economy	Rule of Law	Sustainability	Work/Life Balance Happiness	Philanthropy
Integrity	V	V					
Law Compliance				V			
Anti-Corruption Anti-Bribery Anti-Cronyism	V	V		V			
Environmental Protection Climate Control Energy Conservation				V	V		
Corporate Governance		V	V	V			
Provide Well-Paying Jobs			V			V	
Good Shareholder Return			V				
Employees' Work-Life Balance						V	
Encourage Innovation		V	V				
Good Work Environment						V	
TSMC Charity Foundation					V	V	V
TSMC Education and Culture Foundation					V	V	V

ESG Management

TSMC has established the ESG Steering Committee as the highest level of ESG decision-making, chaired by the Company's Chairman, while the Chairperson of the ESG Committee serves as executive secretary, and other members are senior executives from a wide variety of functions. All work together to examine material ESG issues in relation to the Company's operations, set the short-, medium- and long-term strategic directions that link to the UN's Sustainable Development Goals (SDGs).

The ESG Committee functions to coordinate and integrate resources, and facilitate communication among various divisions, implementing the resolutions of the Company's ESG Steering Committee. The ESG Department, on behalf of the ESG Committee, works together with cross-organizational representatives to identify key sustainability issues in relation to the Company's operations and stakeholders' concerns. Task forces are formed to address various issues and frame adaptive strategies, goals and action plans. The ESG Committee holds quarterly meetings to track progress and ensure the strategies are implemented effectively in daily operations. At the same time, every quarter the chairperson of the ESG Committee reports on the implementation of plans and results to the Board of Directors/Nominating, Corporate Governance and Sustainability Committee, under whose supervision the ESG Committee continues to improve TSMC's sustainability management policies, strategies, and goal setting and deepen sustainable development.

In 2023, TSMC focused primarily on green manufacturing and supply chain management (including net zero emissions, renewable energy access and use, biodiversity strategy, and low-carbon value chain management), diverse and inclusive workplace, and talent development (including a series of activities promoting diversity and inclusion, conducting human rights due diligence, deepening high school students' science, technology, engineering, and mathematics (STEM) programs), and public welfare investments such as the Public Welfare Green Energy Project. TSMC also planned and oversaw ESG budgets for 2023 and 2024. The Company uses sustainability reports as an ESG management tool and updates themed reports such as the Climate and Nature Report, the UN's SDG Action Report, and the Materiality Analysis Report. In June 2024, TSMC will release its first Sustainability Impact Valuation Report, which includes social impact and environmental profit and loss analysis, and Human Rights Report to further expand sustainability transparency and drive towards a better future.

Stakeholder Engagement

TSMC respects all stakeholders' rights and interests in sustainability issues and aims to foster interaction through diverse communication platforms. These channels include a dedicated ESG website, ESG mailbox, Investor mailbox, Employee Feedback Channels, Irregular Business Conduct Reporting System, and the Supply Chain Worker Grievance Channel. TSMC systematically manages and addresses stakeholders' concerns through identification, prioritization, and validation.

Stakeholders and Communication Channels in 2023

Stakeholders	Communication Channels
Employees	•Employee Opinion Survey on Company Core Values, Employee Engagement Survey •Employee trainings •Silicon Garden Meeting (labor-management meeting) •Communication meetings for various levels of managers and employees; e.g. the executives communication meeting, skip levels and communication meeting in individual functions or divisions •Human Resources Business Partner Team •Ombudsman system, whistleblower reporting system, irregular business conduct reporting system, and sexual harassment investigation committee •Corporate intranet (myTSMC), internal emails, and other announcement channels (such as promotion posters at facilities), TSMC eSilicon Garden Stories •Employee suggestion channels, such as the Fab Caring Circle, Employee Opinion Box, Wellness Center, wellness website, employee PIP & IT Security mailbox and hotline, etc.
Shareholders/Investors	•Annual general shareholders' meeting •Annual Reports, Sustainability Reports, Theme Reports (UN SDGs Action Reports, Materiality Analysis Reports, Sustainability Impact Valuation Report, Climate and Nature Report, Human Rights Report), and Form 20-F with the U.S. Securities and Exchange Commission •Quarterly earnings conference •Domestic and overseas broker conference •Face-to-face meetings, video conference calls and telephone conference calls •Major announcements on the Market Observation Post System, and corporate press releases on the Company's website
Customers	•Customer satisfaction survey •Business and technology assessment •Customer meetings •Customer visits/audits
Suppliers/Contractors	•Supplier Code of Conduct promotion •Supplier Sustainability Management Self-Assessment Questionnaire (SAQ) •Supply chain environment, safety and health training •Sustainable Supply Chain Environment, Safety and Health Forum •Carbon reduction follow-up meeting with major emission contributors •Supplier meetings •On-site support and audit •Supply Chain Employee Grievance Channel •Supply Online 360 Global Responsible Supply Chain Platform
Government/Industry Associations	•Industry association communication platform •Official correspondence and visits •Offer industry experience and advice, and keynote speech •Conferences (e.g., briefings, public hearings, symposia, seminars, meetups)
Society	•Volunteer activities and services, volunteer cadre meetings •Project collaboration and visit •Sponsorship of charity projects and educational projects •"Sending Love" charity platform •TSMC Education and Culture Foundation and TSMC Charity Foundation websites •ESG website, ESG Newsletter, ESG mailbox and social media (Facebook and LinkedIn)

Responsibilities of ESG Steering Committee and ESG Committee Members

Committee Members	Responsibilities	Stakeholders
Legal	Corporate governance, code of conduct, legal compliance (including fair competition, privacy and personal information, and protection for whistle-blowers), intellectual property, protection of confidential information	Employees Government/Industry Associations Society (Note)
Customer Service	Customers' service and satisfaction, customer trust, customer confidentiality, Responsible Business Alliance and its code of conduct	Customers Government/Industry Associations
Information Technology and Materials & Risk Management	Information security, materials and supply chain risk management, supplier management, conflict minerals, Responsible Business Alliance and its code of conduct; risk management, crisis management, emergency response and action plan	Employees Shareholders/Investors Customers Suppliers/Contractors Government/Industry Associations Society
Quality and Reliability	Product quality and reliability, product recall mechanism	Customers Suppliers/Contractors
Research and Development	Innovation management, green products	Employees Customers Suppliers/Contractors Government/Industry Associations
Business Development	Shaping an energy-efficient technology roadmap; building alliance with customers to foster smarter and greener product innovations; establishing and promoting TSMC as a responsible technology thought leader, and sharing its experiences and achievements	Employees Customers Society
Finance	Financial disclosure, dividend policy, tax strategy	Employees Shareholders/Investors Customers Suppliers/Contractors Government/Industry Associations
Investor Relations	Resolving issues of stakeholder concern, establishing trusting long-term relationships, effective two-way communication, annual report production	Shareholders/Investors
Operations	Operational eco-efficiency, pollution prevention, water resource risk management, green manufacturing	Customers Shareholders/Investors Suppliers/Contractors
Environment, Safety and Health	Environmental policy and management system, climate change mitigation and adaption, pollution prevention, energy consumption efficiency, carbon emissions and carbon rights management, product environmental responsibility, response mechanism for environmental issues, environmental spending, green supply chain, policy and management systems for occupational health and safety, workplace health and safety, occupational disease prevention and health promotion, communication of ESH regulations	Employees Shareholders/Investors Customers Suppliers/Contractors Government/Industry Associations Society
Human Resources	Diversity and inclusion, talent attraction and retention, talent development, human rights	Employees Government/Industry Associations Society
TSMC Education and Culture Foundation	Cultivating young generation, educational collaboration, promote arts and culture	Society
TSMC Charity Foundation	Philanthropy, community relations	Society
Public Relations	Stakeholder engagement, mechanism for reflecting issues of social concern, media relations	Society

Note: Society includes community, non-governmental organizations, non-profit organizations, and the public.

TSMC demonstrated its commitment to sustainable development by publishing a non-financial annual report for the 25th consecutive year and engaging diverse stakeholders in daily operations. Based on the five ESG directions of Drive Green Manufacturing, Build a Responsible Supply Chain, Create a Diverse and Inclusive Workplace, Develop Talent, and Care for the Disadvantaged, TSMC continued to develop more sustainable innovation models. The Company conducted a materiality analysis in line with GRI 3: Material Topics 2021 from the GRI Universal Standards 2021 released in October 2021 by the Global Sustainability Standards Board (GSSB), incorporated the spirit of its risk management policy, and identified ESG issues of significant impact on its operations and potential challenges that need to be addressed at its Taiwan facilities (headquarters, wafer fabs, backend packaging fabs, and testing fabs), TSMC China, TSMC Nanjing, TSMC Arizona, TSMC Washington, LLC, Japan Advanced Semiconductor Manufacturing, Inc., VisEra and other subsidiaries. This process has helped calibrate the Company's sustainable strategy, set goals, implement risk mitigation measures, enhance operational resilience, and deepen its sustainable development capacity. The TSMC sustainability report incorporates the following: the GRI Standards, Task Force on Climate-related Financial Disclosures (TCFD) Recommendations, Taskforce on Nature-related Financial Disclosures (TNFD) Recommendations, Sustainability Accounting Standards Board (SASB) Standards, AA1000 Accountability Principles. TSMC received assurance from the DNV Business Assurance Co. Ltd. that the Company is in compliance with DNV VeriSustain™ Protocol, the GRI standards, SASB Standards, and the TCFD framework.

As the only semiconductor company selected for the Dow Jones Sustainability World Indices for the past 23 consecutive years, TSMC actively fulfills its corporate citizenship responsibilities and responds to the UN SDGs by setting long-term goals for 2030 and implementing corresponding actions. Anchored in the concept of SDG 17 Partnerships for the Goals, TSMC collaborates with internal and external stakeholders to create sustainable value in ESG aspects. Through mutual dialogue, cooperation, and participation, TSMC strengthens resource linkage and overall value chain influence, driving substantial positive change and building a better future for all.

2023 ESG Awards and Ratings

Category	Organization	Awards and Ratings
Overall ESG	Dow Jones Sustainability Indices (DJSI)	•Dow Jones Sustainability World Index for the 23rd consecutive year
	MSCI ESG Indexes	•MSCI ACWI ESG Leaders Index component •MSCI ESG Research – AAA Ratings •MSCI ACWI SRI Index component •MSCI ACWI Islamic Index component •MSCI Emerging Markets ESG Leaders Index
	Sustainalytics	•Company ESG Risk Ratings: Low ESG Risk – Semiconductor Industry
	ISS ESG	•"Prime" Rated by ISS ESG Corporate Rating
	FTSE4Good Index	•FTSE4Good Emerging Index component •FTSE4Good All-World Index component •FTSE4Good TIP Taiwan ESG Index component
	World Benchmarking Alliance (WBA)	•SDG2000 – The 2,000 Most Influential Companies
	S&P Global	•The Sustainability Yearbook Award 2023 – Top 10% S&P Global ESG Score
	Taiwan Institute for Sustainable Energy	•Taiwan Top 10 Sustainability Exemplary Awards for the 8th consecutive year •Corporate Sustainability Report Awards •Circular Economy Leadership Awards •Information Security Leadership Awards •Supply Chain Leadership Awards •Sustainable Water Management Leadership Awards •Climate Leadership Awards
	Morningstar	•The Best Sustainable Companies to Own in 2023
	The Financial Times and Statista	•Asia-Pacific Climate Leaders 2023

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Category	Organization	Awards and Ratings
Economy and Governance	Institutional Investor Magazine	•Most Honored Company (Technology/Semiconductors) – All-Asia •Best Overall ESG (Technology/Semiconductors) – 1st Place (buy-side and sell-side) – All-Asia •Best CEO (Technology/Semiconductors) – 1st Place (buy-side and sell-side) – All-Asia •Best CFO (Technology/Semiconductors) – 1st Place (buy-side and sell-side) – All-Asia •Best Investor Relations Program (Technology/Semiconductors) – 1st Place (buy-side and sell-side) – All-Asia •Best Investor Relations Professional (Technology/Semiconductors) – 1st Place (buy-side and sell-side) – All-Asia •Best Investor Relations Team (Technology/Semiconductors) – 1st Place (buy-side and sell-side) – All-Asia •Best Company Board (Technology/Semiconductors) – 1st Place (buy-side and sell-side) – All-Asia
	IFI Claims Patent Services	•Ranked as 3rd in 2023 Top 50 US Patent Assignees
	Forbes	•The World's Top 10 Largest Technology Companies in 2023 •Global 2000
	FutureBrand Index	•FutureBrand Index component
	FORTUNE	•2023 World's Most Admired Companies •Fortune Global 500
	Brand Finance	•Brand Finance Global 500
	Asiamoney	•Overall Outstanding Companies by market •2023 Asia's Outstanding Companies – Semiconductors & Semiconductor Equipment Sector for the 6th consecutive year
	Business Today	•Top 1,000 Enterprises in Taiwan, Hong Kong and Mainland China
	Taiwan Stock Exchange	•Top 5% in Corporate Governance Evaluation of Listed Companies for the 9th consecutive year
	PricewaterhouseCoopers	•Global Top 100 Companies by Market Capitalization for the 11th consecutive year
	R.O.C. Ministry of Economic Affairs Intellectual Property Office	•Ranked No.1 in Taiwan Patent Applications for the 8th consecutive year •Ranked No.1 in Taiwan Patent Grants for the 4th consecutive year
	Germany Federal Office for Information Security	•Common Criteria, ISO/IEC 15408- EAL6 Site Certification – Fab 18A, Fab 18B, AP6, Fab 14A, Fab 14B
	Corporate Synergy Development Center	•Taiwan Continuous Improvement Award – Gold Tower Award – Fab 3 & EBO, Fab 8, Fab 14A, Fab 15B, Fab 18A, IMC •Taiwan Continuous Improvement Award – Silver Tower Award – Fab 2 & Fab 5, CPO, ACCT •Taiwan Continuous Improvement Award – Fab 3, EBO, IMC
	Clarivate	•2023 Top 100 Global Innovators
	LexisNexis	•Innovation Momentum 2023: The Global Top 100
Environment, Safety and Health	Corporate Knights & As You Sow	•2023 Carbon Clean 200™ List
	CDP	•Climate Change B Ratings •Water Security A- Ratings •Supplier Engagement B Rating
	Alliance for Water Stewardship, AWS	•"Platinum" Class Certification for the 4th consecutive year – Fab 5, Fab 6, Fab 12A, Fab 12B, Fab 14P5, Fab 14P6, Fab 14P7, Fab 15A, Fab 15B, AP3
	U.S. Green Building Council	•Leadership in Energy and Environmental Design (LEED) – "Gold" Class Certification – Fab 18P4 Office, Fab 18P6 & P7 Manufacturing Facility, Fab 12P8 Manufacturing Facility
	UL Solutions	•Platinum Rating for UL 2799 Waste Recycling Standard
	Ministry of Environment, R.O.C.	•National Enterprise Environmental Protection Award – Fab 8, Fab 14B, Fab 15B, VisEra •Green Chemistry Application and Innovation Award – Fab 14B, Fab 18P1, AP3
Society	Forbes	•2023 World's Best Employers
	Occupational Safety and Health Administration, Ministry of Labor, R.O.C.	•National Occupational Safety and Health Award – Enterprise Benchmarking Award for the 2nd consecutive year
	CommonWealth Magazine	•Talent Sustainability Award

7.2 Environmental, Safety and Health (ESH) Management

TSMC believes its environmental, safety and health practices must not only meet legal requirements but should also align with internationally recognized best practices. The Company's ESH policies aim to achieve "zero incidents" and "environmental sustainability" and to make TSMC a world-class organization in environmental, safety and health management. The Company's strategies for attaining these goals are to comply with regulations, promote safety and health, strengthen recycling and pollution prevention, manage ESH risks, instill an ESH culture, establish a green supply chain, and fulfill its related corporate social responsibilities.

All TSMC and its subsidiaries' manufacturing facilities have received ISO 14001: 2015 certification for environmental management systems and ISO 45001: 2018 certification for occupational safety and health management systems. TSMC and its subsidiary fabs in Taiwan have each been certified by the Taiwan Occupational Safety and Health Management System (TOSHMS). All the above certifications are maintained and valid. Per TSMC policy, all new facilities are required to attain the aforementioned certifications within 18 months after receiving their facility operating license.

To reduce overall environmental, safety and health risks, TSMC strives for continuous improvement and actively seeks to enhance climate-change management, pollution prevention and control, power and resource conservation, waste reduction and recycling, safety and health management, and fire and explosion prevention, as well as to minimize the impact of earthquake damage.

In order to meet regulatory and customer requirements for the management of hazardous materials, TSMC has adopted the IECQ QC 080000 hazardous substance process management (HSPM) system. All TSMC fabs have been QC 080000 certified and have maintained validity since 2007. Through the establishment of QC 080000, TSMC ensures that its products comply with customer requirements and international regulations including the European Union's Restriction of Hazardous Substances (RoHS) Directive, the EU's Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), the Montreal Protocol on Substances that Deplete the Ozone Layer, the "halogen-free in electronic products" initiative, perfluorooctane sulfonates (PFOS), perfluorooctanoic acid (PFOA) and related substances restriction standards. In addition, in 2016 TSMC started a project to minimize usage of the hazardous substance N-methylpyrrolidinone (NMP) and as a result by the end of 2022 NMP use in the Company's Taiwan fabs had been reduced by 97.2% compared to the use in 2016. In 2023, TSMC continued to further reduce NMP usage in its subsidiary fabs and expected to complete process replacement in 2024.

In 2011, TSMC began implementing the ISO 50001 energy management system for continuous improvement in energy conservation. In 2022, all TSMC and its subsidiaries' manufacturing facilities had received ISO 50001 Energy Management System certification and has maintained the certification validity until now except for TSMC Washington. TSMC Washington in the U.S. plans to receive this certification in 2024.

Aiming to establish the healthiest possible workplace, in 2017 TSMC formed a corporate-level health promotion committee led by executives at the vice president level to address on an ad-hoc basis occupational disease cases or other health issues. The committee members include site directors, managers of safety and health department, and representatives from wellness, HR and legal affairs divisions. External experts have also been invited to discuss the potential risks of occupational diseases in the semiconductor manufacturing process and prevention plans for such diseases. To mitigate health risks to employees, suppliers and contractors in the workplace, TSMC has adopted rigorous safety and health control measures focused on preventing occupational injuries and diseases and promoting employee safety, physical and mental health.

To minimize supply chain risk and fulfill corporate social responsibility, TSMC not only follows ESH best practices internally but also strives to improve the ESH performance of its suppliers and contractors through audits and counselling.

TSMC uses priority work management and self-management to govern services provided by contractors. The Company requires contractors performing level-one high-risk operations to complete certification for technicians and to establish their own ISO 45001 safety and health management system. The emphasis on self-management nurtures the sense of responsibility, with the goal of promoting safety awareness and technical improvement for all contractors in the industry. For onsite contractor personnel, TSMC has standardized courses on safety and health and increased the frequency of such courses to improve training effectiveness and safety awareness. To ensure that the Company's safety protocols are accurately delivered to contractors on a timely basis, TSMC has established a digital platform for mutual communication so that onsite operational risks can be mitigated.

TSMC collaborates with suppliers to manage the sustainability of the supply chain, including formulating supplier sustainability standards, drawing up audit plans, performing audits and tracking improvements, coaching and training, and additional instruction for suppliers with subpar performance. Strengthening the professional capabilities of suppliers in environmental protection, safety and health, fire response, and carbon inventory were key focuses in 2023. To achieve the goal, the Company held the environmental protection, safety and health workshops (57 participants from 52 suppliers), fire emergency response workshops (60 participants from 51 suppliers), supplier carbon inventory workshops (28 participants from 24 suppliers) and environmental protection, safety and health workshops for suppliers' senior managers (29 participants from 17 suppliers). In addition, for the past eight years suppliers have been invited to observe TSMC's annual emergency response drills (accumulated 195 participants from 190 suppliers) and the Company's environmental, safety and health sustainability forum focused on successful case sharing

(359 participants from 117 suppliers). TSMC also conducts environmental, safety and health audits at supplier manufacturing sites and actively assists suppliers in improving their ESH performance. Finally, the Company requests that suppliers conduct a carbon emissions inventory and encourages them to implement measures to save energy, reduce carbon emissions, conserve water and reduce waste.

7.2.1 Environmental Protection

Climate Change and Energy Management

• Task Force on Climate-related Financial Disclosures (TCFD)

In view of the potential financial risks of climate change on operations, in 2018 TSMC adopted TCFD recommendations released by the Financial Stability Board (FSB) to identify risks and opportunities and further establish metrics and management targets based on the results identified.

Management Structure of TSMC Climate-related Risks and Opportunities

Category	Management Strategy and Actions
Governance	Board of Directors periodically reviews climate change related risks and opportunities •ESG Steering Committee: TSMC's top organization in climate change management. Chaired by the Chairman of TSMC with the chairperson of the ESG Committee serving as executive secretary. The Committee reviews TSMC's climate change strategies and goals every quarter and reports to the Board of Directors. •Energy Saving and Carbon Reduction Committee: The Company's management organization for taking action on climate change risk and opportunity. It is chaired by the Vice President of Fab Operations. Every quarter, this Committee formulates management plans, reviews implementation status, and discusses future plans.
Strategy	Identify short-, medium- and long-term climate risks and opportunities through cross-departmental discussion
	Use scenario analysis to assess the potential operational and financial impact of significant climate risks and opportunities to the Company
	Promote low carbon manufacturing to approach net zero emissions and strengthen climate resilience
	Through communication and coaching, enhance suppliers' climate risk awareness and response capabilities, and cooperate with suppliers to actively develop and implement specific carbon reduction actions
Risk Management	Use the TCFD framework to establish TSMC's climate risk identification process
	Follow the risk identification and ranking on climate change to develop relevant responding projects
	Integrate climate risk identification and assessment into the enterprise risk management (ERM) process
Metrics and Targets	Set management metrics related to climate change
	Develop carbon emission reduction targets for TSMC and its suppliers and regularly review the progress on achieving said targets

Financial Impact Analysis and Response of Climate Risks and Opportunities

Climate Risks	Potential Financial Impact	Climate Opportunities	Potential Financial Impact	2023 Actions
Greenhouse Gas (GHG) Emissions Cap and Carbon Tax/Carbon Fee	Restrictions on capacity expansion, increases in operation costs	•Participation in renewable energy plans •Participation in carbon trading market	Early purchases of renewable energy, successfully increasing production capacity	•Entered into power purchasing agreements for renewable energy totaling 3.1GW •Used 2,590 GWh in renewable energy, and increased the proportion of renewable energy use to 11.2% •Achieved 100% renewable energy used in overseas subsidiaries and offices for the sixth consecutive year •Purchased 284 thousand tons of carbon credits to achieve net zero emissions of overseas plants
Trend to Net Zero Emission	•Increased cost of installation and operation of carbon reduction equipment •Increased cost of purchasing carbon offset products	Win public recognition and carbon emissions offset cooperation	Accumulate carbon credits in preparation for future carbon emissions offset	•Received carbon credit for fluorinated-GHG and nitrous oxide reduction offset project about 600 thousand tons •100% use of carbon neutral natural gas from Chinese Petroleum Corporation in TSMC Taiwan fabs •TSMC global offices used carbon credits to achieve net zero emissions
		Develop low-carbon product services to improve product energy efficiency	Satisfy customers' needs for energy-saving products and increase revenue	•Developed energy saving products for the 5nm, 3nm and more advanced manufacturing process
Commitment of Environmental Impact Assessment (EIA)	The development of advanced technologies potentially hampered by inability to obtain renewable energy and reclaimed water	Use reclaimed water	Smooth construction of advanced production lines	•Consumed reclaimed water 12.61 million cubic meter/year
Uncertainty of Development of New Energy Saving Technology	Rising electricity consumption in advanced technology production lines increases production costs	Construct green buildings	Reduce utility costs	•Received five green building certifications

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Climate Risks	Potential Financial Impact	Climate Opportunities	Potential Financial Impact	2023 Actions
Impact on the Company's reputation	Inability to satisfy the expectations of stakeholders, negatively impacting the Company's reputation	Improve the Company's reputation	Upgrade TSMC performance in stakeholders' sustainability ranking	•Led the industry as the only semiconductor company chosen for the Dow Jones Sustainability Indices (DJSI) for the 23rd consecutive year
Drought (TSMC Operation)	Production negatively affected, causing financial losses and a decrease in revenue	Increase resilience and ability to cope with natural disasters	Strengthen resilience in coping with climate change impact, lower risk of operations disruption, and reduce potential losses	•Raised the building base of Fab 18 Phase 8 and Fab 14 Phase 8 two meters higher •Fab 18 Phase 8 and Fab 14 Phase 8 committed to using and developing reclaimed water •Required suppliers to assess drought and flooding risk in operating facilities and implement related risk reduction actions •Implemented drills based on drought emergency procedures
Drought (Supply Chain)				
Flooding (TSMC Operation)				
Flooding (Supply Chain)				
Rising Temperatures	Increase in electricity consumption, cost, and carbon emissions	Strive for low-carbon, green manufacturing	Save energy and cut costs	Conserved 830 GWh of electricity through energy-saving projects

Greenhouse Gas (GHG) Emission Reduction and Energy Management

TSMC remains committed to becoming a global leader in green manufacturing. In response to threats presented by extreme weather, TSMC sets strategies and targets, ensures sound execution and strives to build a sustainable culture. In 2021, TSMC announced its long-term goal of net zero emissions by 2050, while setting the short-term goal of zero growth in emissions by 2025. By actively implementing emission reduction measures, the Company is working to return its carbon emissions to 2020 levels by 2030.

The Company actively participates in the initiatives of the World Semiconductor Council (WSC), and has leveraged its past experience to develop best practices, which have been fully adopted and implemented by the Company since 2012, to reduce perfluorinated compounds (PFC) emissions. In 2013, in accordance with the Ministry of Environment's regulation Early Actions for Carbon Credit of Greenhouse Gases Reduction, TSMC applied for recognition of GHG reduction from 2005 to 2011 and received 5.28 million tons of carbon dioxide credits in 2015. Those carbon credits can be used to offset GHG emissions of new manufacturing facilities regulated by Environmental Impact Assessment (EIA) Act, which can support the Company's sustainable operations and mitigate climate-change risk.

Since 2005, TSMC has completed the GHG inventory program and taken a complete inventory of its GHG emissions to gain ISO 14064 certification. The inventory shows that the major direct GHG emissions are PFCs, which are widely used in the semiconductor manufacturing process. The primary indirect GHG emission is electricity consumption. The analysis of the inventory data was performed not only to meet domestic regulatory reporting requirements but also to serve as a baseline reference for the Company's strategy to reduce GHG emissions. Since 2005, TSMC has also participated in the international disclosure and rating agency CDP to publicly disclose climate change information for 19 consecutive years and to continuously review and improve related management practices.

In response to the commitment of global climate summit Paris Agreement and the Republic of China's Greenhouse Gas Reduction and Management Act promulgated in 2015, TSMC initiated a cross-functional platform for carbon management in 2016. The three areas of focus of this platform are legal compliance, emission reduction, and carbon credit acquisition. In addition to participating in official regulatory consultation and communications meetings, the Company also sets short-, medium- and long-term reduction targets through the Energy Saving and Carbon Reduction Committee led by the fab operations vice president. The measures are carried out by energy and carbon reduction teams of individual fabs. Because more than 80% of TSMC's GHG emissions come from electricity consumption, the Company emphasizes energy conservation and carbon reduction initiatives. TSMC has not only implemented energy-conserving designs in its manufacturing fabs and offices but has also continuously improved the energy efficiency in operating its facilities. These efforts simultaneously reduce carbon dioxide gas emissions and costs. As a result, TSMC has conserved 3.9 billion kilowatt hours (kWh) of power since 2016. In February 2023, Taiwan renamed the "Greenhouse Gas Reduction and Management Act" to the "Climate Change Response Act" and amended the provisions. Relevant laws and regulations are being formulated. TSMC will continue to monitor and evaluate the potential impact on the Company, so as to respond early.

Since 2018, TSMC began to aggressively negotiate the purchase of renewable energy with suppliers in Taiwan. Targeting a long-term commitment of 100% renewable energy, TSMC has committed to achieving 60% renewable energy by 2030. Since 2018, the overseas manufacturing fabs and offices have purchased renewable energy, REC and carbon credits to offset all carbon emissions caused by power consumption. All TSMC overseas sites achieved net zero emissions in 2023 again. Although development of renewable energy in Taiwan is in an early stage, TSMC has established a renewable energy task force and continues to communicate closely with government. In the hope that the collaboration would speed up renewable energy development in Taiwan, the Company has made recommendations to the government. TSMC continues to find renewable energy. By the end of 2023, the total installation capacity of renewable energy contracted reached 3.1GW (gigawatts). The renewable energy will be provided to TSMC gradually after the related business process has been completed. This is a clear manifestation of the Company's active support of the UN Sustainable Development Goals (SDGs).

In 2020, TSMC became the first semiconductor company to join RE100, the global corporate renewable energy initiative, and pledged that power consumption of all the Company's manufacturing plants and offices would be 100% supplied from renewable energy by 2050. In 2023, TSMC further announced the acceleration of the RE100 sustainability process in response to climate change and mitigation of climate impacts by moving up the original goal from 2050 to 2040.

TSMC GHG Reduction Target and Achievement Status

Strategy	2030 Goal	2023 Target and Achievement	Achievement Status
Continue to use best available technology to reduce GHG emissions and become an industry leader in low-carbon manufacturing	Reduce GHG emissions per unit product (metric ton of carbon dioxide equivalent ($MTCO_2e$)/12-inch equivalent wafer mask layer) by 30% (Base year: 2020)	Reduced GHG emissions per unit product (metric ton of carbon dioxide equivalent ($MTCO_2e$)/12-inch equivalent wafer mask layer) increased by 31% (Target: -9%)	Unachieved (Note)

Note: Due to the impact of the global economic cycle, the overall production capacity of TSMC in 2023 did not meet expectations, resulting in an increase in unit product GHG emission and failure to achieve the annual target. Therefore, TSMC will continue to implement energy saving and carbon reduction related actions.

Air and Water Pollution Control

The Company has installed air and water pollution control equipment in each fab to meet regulatory emissions requirements. In addition, TSMC maintains backup pollution control systems, including emergency power supplies, to mitigate the risk of pollutant emissions in the event of equipment failure. The Company centrally monitors the operations of its air and water pollution control equipment 24 hours a day by rotating staff and treats system effectiveness as an important tracking item to ensure the quality of emitted air and discharged water.

To further enhance water resources management, TSMC has adopted and followed the Alliance for Water Stewardship (AWS) standard, the sustainable water management standard. In 2022, TSMC AWS certified fabs (Note) in Taiwan's three science parks including Hsinchu, Central Taiwan and Southern Taiwan obtained AWS Platinum certification – the highest level available and it has maintained it platinum-level certification in subsequent years.

Furthermore, the Company has upgraded the internal water platform (Water Map) to diverse water supply integration platform. In addition to improving use interface, the platform also includes diverse water use information like reclaimed water quality and quantity to fully grasp and manage the usage of water within the fab from all aspects, not only continuously tracks water reservoir capacity but also monitors in-house water quality and quantity. Based on the water balance diagram, it further integrates the water usage flow, flow rate, and recycling mechanisms to calculate the recovery rate, discharge rate, and water usage of each unit to improve water recycling rate. In 2023, TSMC continued to implement four major water saving measures: improving the water production rate of the system, reducing facility system water consumption, increasing the wastewater recycling of facilities, and decreasing water discharge loss from the system, and the overall system has increased recycled water use by 4.28 million cubic meters.

Note: TSMC AWS certified fabs include Advanced Backend Fab 3, Fab 5, Fab 12A/B, Fab 15A/B, Fab 6, Fab 14B and Fab 14 Phase 7, covering the watersheds of all the fab locations across the Hsinchu, Central Taiwan and Southern Taiwan Science Park.

The goal of water management at TSMC is to optimize utilization of every drop of water. In addition to positively implementing process water-saving measures, TSMC collaborates with industrial, governmental, and academic organizations to invest in the development of water reclamation technology. Through participation in the professional committee activities of the Taiwan Science Park Association, TSMC shares water-saving experiences and professional knowledge with semiconductor industry peers to achieve the common goal of the entire park and ensure long-term water resource supply-demand balance. In order to further circulate the use of water resources and support the government's promotion of reclaimed water policy, TSMC launched the Southern Taiwan Science Park Reclaimed Water Plant operation in September 2022, the first private water reclamation plant in Taiwan, and introduced reclaimed water into the semiconductor manufacturing process. In addition to reclaimed water supplied by TSMC's Southern Taiwan Science Park Reclaimed Water Plant, TSMC's fabs in Southern Taiwan Science Park started using reclaimed water supplied by the Yongkang reclaimed water plant and the Anping reclaimed water plant when they started up in later 2022 and early 2023 respectively. The supply of above reclaimed water exceeded 62.5 thousand cubic meters per day in 2023. By the end of 2023, 1.261 million cubic meters of reclaimed water had been used in the semiconductor manufacturing process in TSMC's Tainan fabs, helping the Tainan fabs reduce city water usage by 21% and TSMC reach the replacement rate of reclaimed water up to 12%. TSMC commits to continuing to increase the utilization of reclaimed water in newly constructed fabs in the future.

TSMC Water Usage in Recent Two Years

Year	Total Water Usage (m^3) (Note 1)	Unit Product Water Usage (L/12-inch wafer-e-layer)
2023	113,610,463	176.4
2022	104,681,272	137.3

TSMC Water Usage Reduction Target and Achievement Status

Strategy	2030 Goal	2023 Target and Achievement	Achievement Status
Enforce climate change mitigation policies, implement water conservation and water shortage adaptation measures	Reduce unit water consumption (liter/12-inch equivalent wafer mask layer) by 30% (Base year: 2010)	Increased unit water consumption by 25.24% (Target: -2.7%)	Unachieved (Note 2)

Note 1: Includes TSMC fabs in Taiwan and subsidiaries total use of city water and reclaimed water.
Note 2: Due to the impact of the global economic cycle, the overall production capacity of TSMC in 2023 did not meet expectations, resulting in an increase in unit product water consumption and failure to achieve the annual target. Therefore, TSMC will continue to implement process water saving and the use of reclaimed water.

Waste Management and Recycling

In recent years, as TSMC continued to develop advanced processes and expand capacity rapidly both at home and overseas, waste production has increased due to the complexity of new process development, demand for reliable yield rates, and increasing use of raw materials.

To achieve the goal of sustainable resource utilization, TSMC has a designated unit responsible for waste recycling and disposal. The priorities are process waste reduction onsite and offsite recycling and regeneration, with incineration and landfill as the least desirable final option. In 2017, TSMC amended its articles of incorporation to add four business items for chemical materials to enhance waste process flow and reduce risks of improper waste disposal by commissioned agencies. It also set up onsite resource activation facilities to convert waste resources produced during manufacturing process into products to be used onsite or to sell to other industries. TSMC recycled copper sulfate waste, cobalt-containing liquid waste, sulfuric acid waste and ammonium sulfate waste, all of which were regenerated into products. The Company also developed a system of cryolite synthesis whereby hydrogen fluoride (HF) waste is recycled and regenerated into raw material that can be used in other industries. As a result, the Company has become a leader in waste resources regeneration. At the same time, TSMC's fabs in Taiwan achieved a 95% waste recycling rate for the ninth consecutive year, with a landfill rate below 1% for the 14th consecutive year. Furthermore, TSMC's Taiwan fabs became the first semiconductor facilities in the world to jointly obtain the highest platinum rating for UL 2799 certification in 2023. This achievement builds on the success of TSMC's Fab 12 Phase 1 and Phase 2 in gaining the UL 2799 platinum certification in 2021. TSMC will continue to strive towards its goal of net-zero emission by 2050 reaffirming its commitment to the SDG 12.

TSMC Waste Quantity and Outsourced Unit Waste Disposal in Recent Two Years (Note 1)

Year	Outsourced General Waste (ton) (Note 2)	Outsourced Hazardous Waste (ton) (Note 2)	Outsourced Unit Waste Disposal (Note 3) (kg/12-inch equivalent wafer mask layer)
2023	285,605	371,236	1.17
2022	342,804	401,215	0.99

Note 1: The data in the table are preliminary results collected by TSMC and have not yet been verified by a third party
Note 2: Totals include Taiwan and subsidiary facilities
Note 3: Taiwan facilities

TSMC Waste Reduction Target and Achievement Status

Strategy	2030 Goal	2023 Target and Achievement	Achievement Status
Promote waste reduction by source separation and require vendors to provide low chemical consumption equipment	Outsourced unit waste disposal per wafer ≤0.50 (kg/12-inch equivalent wafer mask layer)	Outsourced unit waste disposal per wafer 1.17 (kg/12-inch equivalent wafer mask layer) (Target: ≤0.98%)	Unachieved (Note)

Note: The main reason was production decreased while waste generation did not decrease proportionally.

In order to ensure that all waste is treated and recycled properly, TSMC closely tracks the recycling and reuse practices of its cleanup and disposal vendors. The Company carefully selects waste disposal and recycling vendors that are certified and have required permits. TSMC regularly checks the onsite operational status, disposal declaration forms, operational records, etc., to compare with actual reuse and disposal, and takes proactive steps to strengthen vendor auditing. For example, all waste transportation contractors have agreed to join the GPS Satellite Fleet so that the cleanup transportation routes and abnormal stays for all trucks can be traced. All waste recycling and disposal vendors have installed closed-circuit TV systems at operating sites to monitor and audit waste handling. At the same time, to further guarantee proper waste handling, in 2022 TSMC built the system of waste intelligent fast track (S.W.I.F.T.) and completed five different types of waste treatment vendors for pilot testing. As of 2023, 29% of waste treatment vendors have instituted S.W.I.F.T. and TSMC intends to roll it out to all waste treatment vendors in 2030. Using AI technology in lieu of in-person on-site spot checks increases inspection efficiency 65-fold and reduces manual inspection by 13,000 hours each year. In addition, TSMC conducts ongoing surveys of recycled product tracking and requires all recycling contractors to report their recycled product sales monthly to track waste flow and ensure that actions are taken to adhere to lawful and proper waste recycling and treatment.

Environmental Accounting

The purpose of TSMC's environmental accounting system is to identify and quantify environmental costs for internal management. At the same time, the Company also calculates and evaluates the savings or economic benefits of environmental protection programs so as to continuously promote economically effective programs. While environmental expenses are expected to continue to rise, environmental accounting can help manage these costs more effectively. TSMC's environmental accounting measures various environmental costs, establishes independent environmental account codes, and provides the data to all units for use in annual budgeting. The Company's economic benefit evaluation calculates cost savings for energy conservation, water or waste reductions and recycling benefits in accordance with its environmental protection programs. The benefits disclosed in this report include real income from projects such as waste recycling as well as savings from major environmental projects. In 2023, the total benefits of environmental protection programs of TSMC fabs including waste recycling exceeded NT$3,160 million.

2023 Environmental Cost of TSMC Fabs in Taiwan

Unit: NT$ thousands

Classification	Description	Expense	Investment
1. Direct Costs for Reducing Environmental Impact			
(1) Pollution Control	Fees for air pollution control, water pollution control, and others	12,527,395	21,936,725
(2) Resource Conservation	Costs for resource (e.g. water) conservation	-	7,322,372
(3) Energy Conservation	Costs for electricity consumption saving	-	3,370,600
(4) GHG Reduction	Include: (1) Process GHG emissions abatement equipment; (2) Premium for purchasing renewable energy; (3) Costs for purchasing carbon credits; (4) Other costs for direct GHG emissions reduction	1,405,002	3,962,322
(5) Industrial Waste Disposal and Recycling	Costs for waste treatment (including recycling, incineration and landfill)	3,844,746	-
2. Indirect Costs for Reducing Environmental Impact (Environmental Managerial Costs)	(1) Cost of employee environmental training (2) Environmental management system and certification expenditures (3) Environmental impact measurement and monitoring fees (4) Environmental protection product costs (5) Environmental protection organization fees	751,872	1,137,685
3. Other Environmental Costs	(1) Costs for soil decontamination and natural environment remediation (2) Environmental damage insurance fees and environmental taxes and expenses (3) Costs related to environmental settlement, compensations, penalties and lawsuits	-	-
Total		18,529,015	37,729,703

2023 Environmental Efficiency of TSMC Fabs in Taiwan

Unit: NT$ thousands

Category	Description	Efficiency
1. Cost Savings of Environmental Protection Projects	Energy savings	1,326,241
	Water savings	53,419
	Waste reduction	1,127,000
2. Economic Efficiency for Industrial Waste Recycling	Recycling of used chemicals, wafers, sputter targets, batteries, lamps, packaging materials, paper cardboard, metals, plastics, and other waste	656,000
Total		3,162,660

Green Building and Green Factory

Since 2006, TSMC has adopted standards from both the Taiwan Green Building and the U.S. Green Building Council – Leadership in Energy and Environmental Design (LEED) for new fab and office building designs to achieve better energy and resource efficiency compared to conventional designs. The Company has also continued to upgrade existing office buildings to comply with the LEED standard each year. From 2008 to 2023, 44 of TSMC's fabs and office buildings achieved LEED certifications: three platinum and 41 gold. During this time, the Company also received six Taiwan Intelligent Building diamond-class certifications and 29 Taiwan ecology, energy saving, waste reduction and health (EEWH) certifications: 21 diamond, six gold and two silver. Since 2009, the Company has been a leading supporter of the Taiwan government's Green Factory Label standard, including the Clean Production and Factory Green Building evaluation systems. TSMC received Taiwan's first Green Factory Label and 14 labels in total as of the end of 2023 and is the most awarded company of this label in Taiwan.

Environmental Audit Results in Violation of Environmental Regulations

In 2023 and as of the date of this Annual Report, TSMC has had no environmental regulation violations.

7.2.2 Sustainable Products

TSMC collaborates with its upstream material and equipment suppliers, design ecosystem partners and downstream assembly and testing service providers to minimize environmental impact. Reducing the resources and energy consumed for each unit of production allows the Company to provide customers with more advanced, power efficient, and ecologically sound products. These include ultra-low power (ULP) and low operating voltage (low Vdd) chips for wearables and IoT devices, low-power chips for mobile devices, high-efficiency LED driver chips for flat panel display backlighting, indoor/outdoor solid state LED lighting, Energy Star certified low standby AC-DC adaptor chips, high-efficiency DC brushless motor chips, electric vehicle chips and low-power server chips. By leveraging TSMC's superior energy-efficient technologies, these chips support sustainable city infrastructure, greener vehicles, smarter grids, more energy efficient servers and data centers and other applications. In addition to helping customers design low power, high performance products to reduce resource consumption over the product's life cycle, TSMC's green manufacturing practices provide additional green value to customers and other stakeholders.

TSMC-manufactured ICs are used in a broad variety of applications in various segments of the computer, communications, consumer, industrial, electric vehicle, server and data center, and other electronics markets. Through TSMC's manufacturing technologies, customers' designs are realized and their products are incorporated into people's lives. These chips, therefore, make significant contributions to the progress of modern society. The Company endeavors to achieve profitable growth while providing products that add environmental and social value. Listed below are several examples of how TSMC-manufactured products make significant contributions to the environment and society.

Environmental Contributions by TSMC Foundry Services

1. Continuously Drive Technology to Reduce Power Consumption and Save Resources

- To play its part in achieving sustainability, TSMC continues to drive the development of advanced semiconductor process technologies to help customers create more advanced, energy-efficient and environmentally friendly products. In each new

technology generation, circuitry line widths shrink, making transistors smaller and reducing product power consumption for completing the same tasks or achieving the same level of performance. In addition, calculations using the Industry, Science, and Technology International Strategy Center's model reveal that in 2020 TSMC helped the world conserve 4kWh of energy for each 1kWh spent in production – a testimony to TSMC's commitment to green manufacturing both internally and externally. (Please refer to "Sustainable Products by TSMC Facilitates Global Energy Conservation" on page 11 of TSMC's 2020 Corporate Social Responsibility Report.)

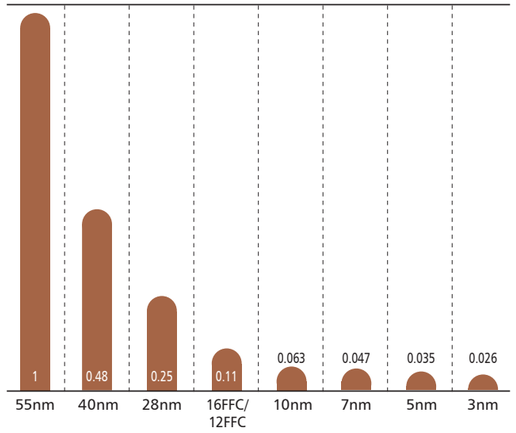
- As TSMC quickly ramped up its 7nm and newer generation technologies, combined wafer revenue contribution of 7nm and technologies beyond grew significantly from 9% in 2018 to 58% in 2023. TSMC's objective is to continue R&D investment and increase wafer revenue contribution in 7nm and technologies beyond, helping the Company achieve both profitable growth and sustainability.

TSMC Wafer Revenue Contribution from 7nm and Technologies Beyond

2018	2019	2020	2021	2022	2023
9%	27%	41%	50%	53%	58%

Chip Die Size Cross-Technology Comparison

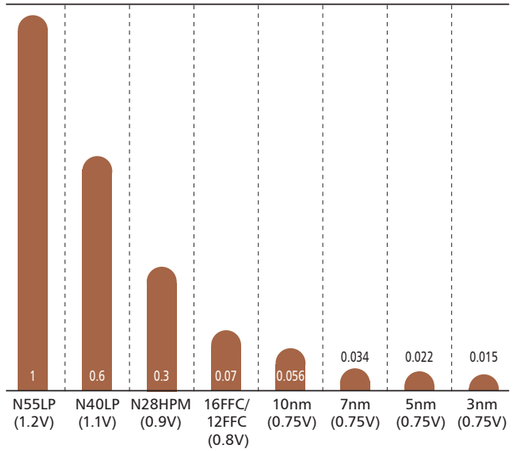
Die size reduces as line width shrinks



Note: The logic chip/SRAM/IO (input/output) ratio, which affects die size and power consumption, was re-aligned.

Chip Total Power Consumption Cross-Technology Comparison

More power is saved as line width shrinks



Note: The logic chip/SRAM/IO (input/output) ratio, which affects die size and power consumption, was re-aligned.

2. Provide Customers Leading Power Management IC Processes with the Highest Efficiency

- TSMC's leading manufacturing technology helps customers design and produce green products. Power management chips, the key components that supply and regulate power to all other IC components within electronic devices, are the most notable green IC products. TSMC helps customers produce industry-leading power management chips with more stable and efficient power supplies and lower energy consumption. Power management ICs manufactured by TSMC for its customers are widely used in computer, communication, consumer, electric vehicle, server and data center, and other systems around the globe.

3. Drive Industry-leading, Comprehensive ULP Technology Platform

- To meet low-power consumption requirements for IoT markets, such as smart wearable, smart home, health care and smart city for IoT products, TSMC continues to invest in expanding and enhancing its ultra-low power processes. The Company provides industry's leading and most comprehensive ULP technology platform to support various smart edge devices, including smart watches, hearing aids, pacemakers, continuous glucose monitoring (CGM) devices, environment monitoring, and smart grid infrastructure. TSMC's industry-leading ULP offerings include FinFET-based 12-nanometer technology, N12e™, featuring energy efficiency with high performance that results in more computing power and AI inferencing, 22nm Ultra-low leakage (ULL), 28nm ULP, 40nm ULP, and 55nm ULP, which have been widely adopted by various edge AI system-on-a-chip (SoC), battery-powered applications. TSMC has also extended its low Vdd offerings with simulation program with integrated circuit emphasis (SPICE) models with a wide-range of operating voltages for extreme low-power applications.

4. Develop Greener Manufacturing to Lower Energy Consumption

- TSMC continues to develop more advanced and efficient technologies to reduce energy/resource consumption and pollution per unit during the manufacturing process, as well as power consumption and pollution during product use. In each new technology generation, circuitry line widths shrink, making chips smaller for the same circuit designs and lowering the energy and raw materials consumed for per chip in manufacturing. In addition, the Company continuously provides process simplification and new design methodology based on its manufacturing excellence to help customers reduce design and process waste so as to produce more advanced, energy-saving and environmentally friendly products. For total energy savings and benefits realized in 2023 through TSMC's green manufacturing, see "Environmental Accounting" on page 162-163 in this annual report.

Social Contributions by TSMC Foundry Services

1. Unleash Customers' Mobile and Wireless Chip Innovations that Enhance Mobility and Convenience

- The rapid growth of smartphones and tablets in recent years reflects strong demand for mobile devices, which accelerates innovations for IC products such as baseband, RF transceivers, application processors (AP), wireless local area networks (WLAN), CMOS image sensors (CIS), near field communication (NFC), Bluetooth, and global positioning systems (GPS), ultra-wide band (UWB), organic light-emitting diode (OLED) display drivers and power management ICs (PMIC) among others. These mobile devices offer remarkable convenience in daily living, and TSMC contributes significant value to these devices in the following ways: (1) new TSMC process technologies help chips achieve faster computing speeds in smaller sizes, leading to smaller form factors for these electronic devices. In addition, TSMC SoC technology integrates more functions into one chip, reducing the total number of chips in electronic devices, again resulting in a smaller system form factor; (2) new TSMC process technologies also help chips reduce power consumption, allowing mobile devices to be used for a longer period of time between recharges; and (3) TSMC helps spread the growth of more convenient wireless connectivity such as 3G/4G/5G and WLAN/Bluetooth, meaning people can communicate more efficiently and "work anytime and anywhere," significantly increasing the productivity and mobility of modern society.

2. Unleash Customer Innovations in CMOS Image Sensors (CIS) and Micro-Electromechanical Systems (MEMS) that Enhance Human Health and Safety and Create Green Products

- To make machines smarter, safer and more user and environmentally friendly, sensors are a must. Optical, acoustic, motion, and environment sensors are mostly made using either CIS or MEMS technologies. TSMC continues to put substantial effort into developing more advanced CIS and MEMS technologies to enable customers to create new products for new applications. For CIS, TSMC and customers have extended applications from traditional RGB (red, green, blue) sensing to 3D depth sensing, optical fingerprint, and near infrared (NIR) machine vision, etc. For MEMS, TSMC and customers have extended applications from traditional motion sensing to microphone, bio-sensing, micro-speakers, medical ultrasound actuators and more. TSMC customers' sensing devices are used in consumer electronics, mobile communications, automotive electronics, industrial, and medical devices, and so on. They are increasingly smaller, faster, more accurate and more energy efficient, greatly enhancing human convenience, health and safety, and contributing to sustainability.

As an example, TSMC customers introduced the latest automotive CIS products for car safety systems in 2023, which makes the advanced driver assistance systems (ADAS) and autonomous driving systems smarter and safer. In addition, adopting TSMC's innovative MEMS technology, TSMC customers successfully introduced next-generation MEMS speakers, featuring smaller form factor and better high frequency response. These features further improve user experience by enabling more flexible industry design, bigger battery space and closer to natural sound quality for hearing aid and consumer grade hearing assistance devices.

7.2.3 Safety and Health

Safety and Health Management

TSMC's safety and health management complies with local and international standards and adheres to the management approach of Plan, Do, Check, Act to prevent accidents, promote employee safety and health, and protect Company assets. All TSMC fabs in Taiwan have received Taiwan Occupational Safety and Health Management System (TOSHMS) certification since 2009. In 2018, the International Organization for Standardization released ISO 45001: 2018, replacing OHSAS 18001, with major changes in the expansion of the scope, support and participation of the leadership, collection and planning of internal and external issues, the expectations and demands of stakeholders, the assessment of risk inspections, communication and consultation with non-managers, the application of performance indicators, and the evaluation of corrective and preventive actions. Meanwhile, ISO 45001 ensures the spirit of the system can be effectively implemented at the management level through management review, internal audit, automatic check, and security patrol to identify safety concerns and opportunities for improvement. All Company fabs in Taiwan received ISO 45001 certification for occupational health and safety in 2019 and all TSMC subsidiaries obtained the certification in 2020. All the above certifications have been maintained. New facilities, including TSMC Arizona, Japan Advanced Semiconductor Manufacturing, Inc. (JASM), are required to receive aforementioned certifications within 18 months upon receiving facility license per TSMC's internal policy.

In addition to accident prevention, TSMC has established emergency response procedures to protect employees and contractors if a disaster should occur, as well as to prevent and/or reduce the negative impact on the community and the environment. TSMC communicates regularly with suppliers to ensure that the potential risk in operating production equipment is minimized and that safety control procedures are followed rigorously during installation. The Company places stringent controls on high-risk operations and also evaluates the seismic tolerance of its facilities and equipment to reduce the risk of earthquake damage.

For epidemics, TSMC has established corporate-level prevention committees and procedures for emergency response to outbreaks of infectious diseases.

Working Environment and Employee Safety and Health Protection

The Company's ESH policy is focused on establishing a safe working environment, preventing occupational injury and illness, keeping employees healthy, enhancing every employee's awareness and sense of accountability to ESH, and building a strong ESH culture.

There were a total of 48 occupational injuries at TSMC in 2023, involving 48 people, representing approximately 0.07% of the total number of employees. The disabling injury frequency rate (FR) was 0.35, under the 0.4 target, and the disability injury severity rate (SR) was 4, not meeting the target of less than 4. TSMC is reviewing potential improvement measures, such as the promotion of safety culture-related posters or animations to strengthen employee safety awareness. By implementing interactive communication training courses on safety culture, TSMC can integrate safety into daily life and encourage employees to proactively discuss safety-related issues. To reduce sports injuries, it is mandatory for the welfare committee and departments to conduct risk identification and hazard reminders before organizing sports activities. The Company continuously observes operations and conducts compliance inspections to identify potential injury risks in the workplace and implement improvement measures to enhance workplace safety. In addition to regular reviews, the caring program for employees has been enhanced and managers have been directed to pay closer attention to the physical and mental state of employees to ensure their safety and health while at work.

TSMC safety and health management operations apply to the following:

- Equipment Safety and Health Management

In addition to meeting regulatory requirements and internal standards, as well as mitigating ESH-related risks when building or expanding facilities, TSMC also maintains procedures governing new equipment and raw materials, requires safety approvals for bringing new tools online, updates safety rules, and implements seismic protection and other safety measures.

TSMC requires that all new tools meet SEMI-S8 requirements and that appropriate supplementary control measures be taken to reduce ergonomic risk. Moreover, the Company endeavors to automate the transportation of 300mm front-opening unified pods (FOUPs) to prevent cumulative physical injury caused by repetitive manual handling of this equipment. TSMC 300mm fabs have all converted to automatic transportation control.

- Environmental, Safety and Health Evaluation of New Tools and New Chemical Substances

As a technology leader in the global semiconductor industry, TSMC operates increasingly diversified process tools and introduces new chemicals in the R&D stage. Before using new tools or new chemicals, they are reviewed carefully by the new tool and new chemical review committee. The purpose is to ensure that new tools are compliant with the semiconductor industry's safety standards (such as SEMI-S2) and that environmental, safety and health concerns about new chemicals are addressed and controlled including the use of engineering controls and personal protection equipment, as well as operational safety training during storage, transportation, use and disposal. A total of 417 cases of new tools and chemical substances were approved by the new tool and new chemical review committee in 2023 after they were evaluated and reviewed in accordance with the aforementioned standards and before entering TSMC.

- General Safety Management, Training and Audit

All TSMC manufacturing facilities hold environmental, safety and health committee meetings on a monthly basis. TSMC has adopted multiple preventive measures such as controls on high-risk work, contractor management, chemical safety management, personal protective equipment requirements, and safety audit management. In addition, the Company maintains detailed disaster response procedures and performs regular drills designed to minimize injuries to employees and damage to property, as well as the impact on society and the environment in the event of a disaster.

TSMC Safety-related Training and Promotion in Recent Two Years

Year	Total Number of Employees Who Have Completed Safety-related Training
2023	297,403
2022	271,702

- Working Environment Hazardous Factors Management

TSMC conducts workplace hazard assessments to provide a comfortable, safe workplace for employees. The Company also educates employees and requires them, when appropriate, to use personal protective equipment (PPE) to prevent hazardous exposures.

The Company performs semi-annual workplace environment assessments of physical and chemical hazards, including CO_2 concentration, illumination, noise, and hazardous chemical substances as regulated by local laws. In addition, TSMC performs exposure assessments and uses hierarchy management control for chemicals with potential health hazards. If abnormal measurements occur, events happen, or an exposure assessment indicates there is an adverse health effect on employees, ESH professionals immediately conduct onsite observation and intervention to reduce the risk of hazardous factors exposure to acceptable levels.

- Health Promotion Program

In order to establish the healthiest possible workplace and reduce the incidence of occupational disease, TSMC formed a corporate-level committee to carry out health promotion programs covering three key areas:

1. Exposure and health risk assessment: develop an exposure assessment system to identify high health risk employees.
2. Hazardous training and notification: use standardized training materials for employees and contractors in all TSMC fabs. Inform them of the health risks and prevention measures at the workplace before they begin working or providing any services there.
3. Strengthening management of chemicals with significant health risks: request suppliers that all materials they provide to TSMC comply with applicable laws including clear disclosure of any hazardous substances. Perform sampling of raw materials used in the manufacturing process to confirm that they do not contain any carcinogenic, mutagenic or toxic-reproductive materials as claimed on supplier's safety data sheet (SDS).

- Emergency Response

The planning and execution of an effective emergency response requires identifying potential high-risk events via risk assessment and being prepared for various scenarios. It should focus on continuous improvements and drills covering all potentially serious events. TSMC's emergency response plans include procedures for rapid-response crisis management and disaster recovery for potential incidents.

All TSMC fabs conduct major annual emergency response exercises and evacuation drills. TSMC's onsite service contractors are also required to participate in emergency response planning and exercises to ensure cooperation in handling accidents and to effectively minimize any damage caused by disasters. In 2023, the Company held 132 evacuation drills and 36 fire drills. At least every two years, each fab director invites fab management and support functions to participate in business continuity drills for potentially high-risk events such as earthquake, fire and flood (at the Tainan site). Since 2018, TSMC has conducted complex accident emergency response drills, which include simultaneous scenarios for earthquake, fire and chemical spills to ensure rapid response

to emergencies so that losses can be minimized in the event of a real disaster. In 2020, TSMC took the lead in the industry to introduce the all-hazard approach as recommended by the Federal Emergency Management Agency (FEMA) to conduct disaster prevention exercises.

In response to the COVID-19 pandemic, TSMC added tabletop exercises to disaster prevention training in an effort to minimize the risks of group infections that may arise as a result of full-scale exercises. The inclusion of tabletop exercises also aids in the verification of full-scale exercise procedures to make disaster response more comprehensive, thus effectively mitigating the impact of various types of disasters on business continuity in the future. As of 2023, in addition to 644 sessions of tabletop exercises, 91 full-scale exercises had also been completed.

In addition to the regular emergency response drills held by engineering and facilities departments each quarter, the Company's laboratory, canteen, dormitory, and shuttle bus personnel also hold emergency response drills to prepare for events such as earthquakes, chemical spills, ammonia release, fires and traffic accidents.

• Emerging Infectious Disease Response

TSMC has a dedicated corporate ESH organization to monitor emerging infectious diseases around the world, to assess any potential impact on the workplace, and to provide an appropriate strategic response plan. In previous outbreaks such as SARS in 2003, H1N1 influenza in 2009, and MERS in 2015, as well as with COVID-19 from 2019 to 2023, TSMC followed the Taiwan CDC's (Center for Disease Control) rules and convened the corporate influenza response committee to develop the Company's strategies. These strategies included educating employees in prevention and response, publishing guidelines for managers, establishing guidelines for employee sick leave, and installing alcohol-based hand sanitizers at appropriate locations. The Committee also monitors the status of employee leave due to illness and, at the same time, develops a continuity plan to address manpower shortages and minimize business impact. For example during the COVID-19 outbreak, in order to protect the health of TSMC employees, their families, and work partners, employees were encouraged to be fully vaccinated if in healthy condition. In addition, TSMC reviewed the situation from time to time and formulated appropriate preventive measures such as daily body temperature checks and updated vaccination information before entering Company facilities and continued to follow epidemic prevention recommendations such as mask wearing, frequent hand washing and social distancing.

• Employee Physical and Mental Health Enhancement

TSMC believes that employee physical and mental health is not only fundamental to maintaining sound business operations but is also an important part of a corporation's responsibility. To preserve and promote the physical and mental health of its employees, TSMC fosters collaboration among the onsite industrial safety and environmental protection department, the onsite medical personnel of the health center, and physicians of occupational medicine. TSMC strives to reduce cerebral and cardiovascular conditions or injuries that might be induced or aggravated by overwork, night work or shift work. The Company conducts programs for maternal health protection and for prevention of cumulative trauma disorders as well. TSMC devotes significant resources to mental health awareness, focused not only on hazards at work but also on employee health in general. In 2023, planned personal health management activities included: (1) 497 female employees participated in the maternal health program, and the completion rate was 100%. 496 of them were at first degree risk, where there was no potential harm to the mother or infant. One female employee was assessed as second degree risk, with potential harm to the mother or infant, but after proper adjustments to her work duties, her risk was downgraded to first degree. (2) Through analysis of historical cerebral and cardiovascular cases of its employees, TSMC sharpened the disease assessment criteria used by contracted doctors, and, in combination with internal annual health examination reports and work scheduling information, the Company was able to identify 2,830 employees with middle to high risk for cerebral and cardiovascular diseases. These employees were provided with health education and medical assistance. Also, they and their managers received recommended changes in working hours and shifts to reduce health risks. (3) 170 employees were identified as high risk for cumulative trauma disorders, including one who might also have job-related risks, and the Company adjusted working conditions accordingly to reduce potential risks. (4) As obesity has been considered as a precursor to hyperglycemia, dyslipidemia, and hypertension and insomnia, TSMC has held health promotion programs for several consecutive years. In 2023, in light of the COVID-19 pandemic and catering to the younger generation's preference for social and video media, apart from physical weight loss activities (5,782 participants; total weight loss reached 5,263 kg),TSMC conducted a series of online interactive activities including: (a) Fourteen sessions of "Health Lecture Online" with 7,142 attendees in total; (b) Nine health workshops with a total of 238 person-times; (c) Activities of World Mental Health Day with a total of 2,189 attendees. The above activities have all received positive feedback from employees. In the future, the Company will continue to implement relevant promotional activities to take care of the health of employees.

7.2.4 Supplier Management

Management Aspect

For better supply chain management, TSMC is committed to communicating with and encouraging its suppliers and contractors to increase their quality, cost effectiveness and delivery performance, and make continuous improvement in supply chain sustainability. Through regular communication with senior managers, site audits and experience sharing, the Company collaborates with major suppliers and contractors to enhance partnerships and ensure continued improvement of performance and increased joint contributions to society. As noted above, contractors performing high-risk activities must lay out clearly defined safety precautions and preventative measures. In addition, contractors working on high-risk engineering projects must establish ISO 45001 or OHSAS 18001 systems and the workers must successfully complete work-related skill training. All contractors performing high-risk activities obtained ISO 45001 certification before the end of 2021.

Supply Chain Sustainability

TSMC works with suppliers in several fields of sustainable development, such as greening the supply chain, carbon management for climate change, mitigation of fire risk, ESH management and business continuity plans in the event of a natural disaster.

Since becoming a full member of the Responsible Business Alliance (RBA) in 2015, TSMC has completed implementation of the RBA code of conduct throughout the Company by performing self-assessments at its facilities worldwide and reviewing policies and procedures in the areas of labor, health and safety, environment, ethics and management systems.

To enhance supply chain sustainability and streamline risk management, the Company is committed to collaborating with its suppliers to maintain full compliance with Taiwan's environmental, safety, health and fire protection regulations. TSMC developed a supplier's code of conduct, which affirmed basic labor rights and standards for health, safety, environment, ethics and management systems. TSMC works with suppliers to evaluate the risk and impact on the economy, the environment, and society and to make continuous improvement. The Company has helped boost suppliers' performance of sustainability through experience sharing and training and hopes to establish a world-class semiconductor supply chain that exceeds international standards and serves as a global benchmark.

TSMC is subject to the U.S. Securities & Exchange Commission (SEC) disclosure rule on conflict minerals released under Rule 13p-1 of the U.S. Securities Exchange Act of 1934. As a recognized global leader in the high-tech supply chain, the Company acknowledges its corporate social responsibility to ensure procurement of conflict-free minerals in an effort to recognize humanitarian and ethical social principles that protect the dignity of all people. To this end, TSMC has implemented a series of compliance safeguards in accordance with leading industry practices such as adopting the due diligence framework in the Organization for Economic Cooperation and Development (OECD)'s Model Supply Chain Policy for a Responsible Global Supply Chain of Minerals from Conflict-Affected and High Risk Areas, issued in 2011.

TSMC is a strong supporter of the RBA and the Global e-Sustainability Initiative (GeSI). As a member of RBA, TSMC requires suppliers source conflict-free minerals through their jointly developed Responsible Minerals Initiative (RMI). Since 2011, TSMC has asked its suppliers to disclose and make timely updates on smelters information. The Company encourages suppliers to source minerals from facilities or smelters that have received a "conformant" designation by a recognized industry group (such as the RMI) and also requires those who have not received such designation to become compliant with RMI or an equivalent third-party audit program. TSMC requires the use of conflict-free tantalum, tin, tungsten and gold in its products.

TSMC will continue to conduct the supplier survey annually and require suppliers to improve and expand their disclosure to fulfill regulatory and customer requirements. For further information, see the Company's Form SD filed with the U.S. SEC. (https://investor.tsmc.com/english/sec-filings)

7.3 TSMC Education and Culture Foundation

In 2023, the TSMC Education and Culture Foundation focused on three major areas: cultivation of the younger generation, educational collaboration, and promoting arts and culture. In order to meet these objectives, the Foundation committed NT$99 million to work towards achieving three of the United Nations 17 sustainable development goals (SDGs): SDG 4 Quality Education, SDG 5 Gender Equality, and SDG 11 Sustainable Cities and Communities. Foundation activities included organizing trips to science and arts museums for students from rural areas to broaden their horizon,

empowering teachers in rural areas to elevate students' literacy, and hosting popular science camps for young women from senior high school so as to spark their interest in STEM fields. In doing so, the Foundation contributed to sustainable development and created a positive impact on our society.

Create Diverse Platforms, Encourage the Young to Explore More Opportunities

The TSMC Education and Culture Foundation has long dedicated itself to young people's development. Hence the Foundation regularly organizes science and humanity learning platforms in the various forms of competitions, camps and lectures to spark young students' interest in the humanities and science. The Foundation joins forces with several educational institutes and media outlets to tap into great potential of the younger generation.

For the eighth TSMC Udreamer, themed "sowing a seed of dreams," the Foundation held a special exhibition that combined the dream-building journey of popular science writer Rui-Ming Wang (*Fat Fat Tree*) and organized events such as a guided ecological tour of the Botanical Garden, lectures and fairs as a way to inspire the younger generation to pursue their dreams. More than 5,000 person-times participated in this series of events reaching a historical high. In addition the Foundation launched the TSMC Udreamer mentorship program whereby 15 TSMC employees joined the mentorship effort to accompany competition teams along their nine-month journey of a dream-building project through professional training workshops and regular experience sharing to help the students be connected with the society and fully realize their potential through a multi-dimensional educational philosophy and design.

For artistic education to take root in children at an early age, the Foundation teamed up with the Sun Yun-Suan Foundation and the *Mandarin Daily News* to organize the first TSMC Penmanship Competition, thereby encouraging students to understand the beautiful lines embedded in Chinese characters by utilizing tools found in everyday life and to further enhance their own sense of beauty. The first competition was well-received and drew 4,824 entries. In addition to the Penmanship Competition, the Foundation continued to further develop the art of Chinese calligraphy and seal-carving. The 16th TSMC Youth Calligraphy and Seal-Carving Competition drew its inspiration from calligraphic characters seen in everyday life on billboards and signboards in the streets, urging the public to observe and appreciate Taiwan's unique signboards in Chinese characters. The Foundation invited two artists, Jun-Lin Ye and Liang-Zhi Ke, for a face-to-face conversation to share their knowledge of font design and calligraphy. The two artists also discussed the information embedded in and aesthetics conveyed through the Chinese characters on signboards. Their talks addressed the essence and beauty of the art of Chinese characters, increasing the public's knowledge of and interest in the arts of calligraphy and seal-carving.

The TSMC Youth Literature Award, co-organized by TSMC Education and Culture Foundation and the *United Daily*, celebrated its 20th anniversary in 2023 and received 13,752 entries. As part of the celebration, the Foundation also held three special literary events: Online Book Exhibitions of Past Award Winners, Risingsun Awards, and Documentary of Portraits of TSMC Youth Literary Writers. The Risingsun Awards grants its award to the most representative works of fiction, essays and contemporary poems as selected by a panel of judges of writers, Wen-Yin Zhong, Yu-Hui Liao and Wen-Wei Xu, from the published works of former TSMC Youth Literature Award winners and upcoming literary stars, which included 22 novels, 15 essays and 17 contemporary poems. The final Risingsun Awards were granted to the tenth award winner Zhen-Fu Xu, the first award winner Jie-An Chen, and the third award winner Zi-Xuan Zhuang. Judging from the list of the winners, it can be said that the literary seeds sown by the TSMC Youth Literature Award over the past 20 years are now growing into a flourishing garden of literature.

Apart from the humanities, TSMC Education and Culture Foundation has long promoted popular science education, sponsoring a wide range of science competitions and camps. The Foundation continued its partnership with Center for the Advancement of Science Education of National Taiwan University to hold the TSMC Cup: Competition of Scientific Short Talk, which included two events: competition for expressing scientific innovation and essay awards on reading popular science books, which aim to encourage young students to read popular science books and watch related videos. The events hope to enhance students' capacity to convey scientific knowledge through internalizing skills of analyzing and discussing science with dialectical logic. The competition for expressing scientific innovation, expanded its scope in 2023 and, as a result, not only did students in Taiwan enter the competition, but teams from as far as Malaysia also participated. More than 400 people took part in the two competitions. The Foundation has long funded the three major science camps for gifted students in Taiwan, Chien-Shiung Wu science camp, Ta-You Wu science camp and Marie Curie (formerly Madame Curie) science camp as a way to cultivate domestic talent in fundamental science. The TSMC Female Scientists Tour, on the other hand, focused on kindling female high school seniors' passion for science. Each year, young women from 12 senior high schools in Taiwan are invited to visit science museums, participate in science workshops and attend talks by female scientists, who can encourage female students to keep on exploring the STEM fields by relating their own education and work experience.

Work in Tandem with Educational Partners, Realize Quality Education

The TSMC Education and Culture Foundation works in tandem with public and private educational institutions – schools, NGOs and state-funded arts and educational institutes – to pool available resources and focus on the real needs of the society so as to reach those who need but have no accessible resources and allow quality education to be realized in every corner of Taiwan.

In 2021 the TSMC Education and Culture Foundation launched a five-year Teaching & Learning Project, in partnership with *CommonWealth Magazine* Education Foundation and Prof. Hwawei Ko Reading Research Center of National Tsing Hua University. The project aims to improve the measurement and evaluation of learning effectiveness through empowering teachers, to enhance teachers' literacy teaching capacity through technological integration, and to assist teachers in teaching reading comprehension. As the project reached its third year, the teaching plan was adjusted in accordance with actual practice so that the project would better fit the teachers' needs. In doing so, the Teaching & Learning Project gradually transformed from a one-way resource into a two-way communication activity and therefore provided more solid support for school teachers in rural areas. So far 127 teachers and 1,341 students have participated in the project. The Foundation also continued its collaboration with Junyi Academy to develop and promote online courses that cater to the real needs of teachers and students in rural areas and narrowing the gap of available sources between the urban and rural areas. The Foundation also funded scholarships and sponsored free laptops for 101 outstanding students from disadvantaged backgrounds at five national universities: National Central University, National Tsing Hua University, National Chung Cheng University, National Cheng Kung University, and National Sun Yat-sen University so that students from disadvantaged backgrounds can be free of financial worries and focus on their academic performance.

A three-way partnership with the Foundation, the National Symphony Orchestra (NSO), and Taipei National University of the Arts was launched and continued to promote the Music sans frontier Educational Project, which invited internationally-renown conductor Shao-Chia Lu and NSO's music director Jun Markl to university campuses to broaden music students' horizons. The initiative further arranged internships at the orchestra for the students enrolled in the class as a way to enrich their stage experience. The Foundation also carried on its collaboration with GuoGuang Opera Company to continue its three-year "on-campus project: Passing on Traditional Theatre Heritage," starting from 2021. This project offers a year-long course at both National Tsing Hua University and Tunghai University for three years consecutively. The course contents included the knowledge of the theater, Peking Opera analysis and appreciation, Peking Opera performance demonstration, showcasing and combining theoretical knowledge and hands-on performance practices, guiding 115 number of students to learn about and experience the beauty of theater. A public performance is scheduled at the end of this 3-year project that showcases the course's teaching and learning is scheduled to take place at the Main Theater of Taiwan Traditional Theatre Center in 2024. In 2023, TSMC Theater Lectures also broadened its scope. In addition to its partnership in passing on traditional theater with GuoGuang Opera Company, two other theater companies – Taiwan Kunju Opera Theatre and Hsing Legend Youth Theatre – came together to organize events specially designed for high school seniors in Hsinchu, Taichung and Tainan. 1,620 person-times participated in the events, which fostered the appreciation and understanding of traditional theater.

In 2023, the TSMC Education and Culture Foundation enhanced the contents of the TSMC Aesthetics Trip and the TSMC Science Trip from museum trips to in-depth educational courses. The trips still offer students guided tours to important permanent exhibitions at arts and science museums, but they now also offer lectures on art appreciation, hands-on workshops and science workshops with trained lecturers. The lectures guide primary students from rural areas to experience and learn in depth subjects on historical culture and artifacts, arts and aesthetics, architectural landscape and science. Finally, in order to assist junior high school students to appreciate the beauty of literature, the Foundation continued its partnership with Unitas literary magazine to organize the third TSMC Youth Literature Camp at the Emei Junior High School in Hsinchu. The Camp expanded to be an event lasting four days and three nights with the goal of improving literary education for junior high school students and guiding them to appreciate the

beauty of novels, essays, scripts and theater so that literature can take root in their lives.

Supporting Arts and Culture Teams, Promoting Cultural Canon

In addition to providing continuous quality education, the TSMC Education and Culture Foundation furthers dedicates itself to preserving traditional culture, funding long-term support for domestic and international performance teams, and promoting quality arts performances in local communities, thereby lifting the public's spirits, promoting good and beauty in society.

In 2023, the TSMC Hsinchu Arts Festival reached its twentieth anniversary and invited domestic and international artists to participate so they could give their talents full play to this year's theme, Ode to Youth. Among the performances, Youthful Whispering, a piece of a dance theater, was choreographed by a youth-run theater company from Hsinchu Plan B Theatre. Fifteen rising stars, selected from roughly 100 who auditioned, were trained intensively over the course of four months. The performers' youthful vivacity and physical rhythm exhibited explosive theatrical energy at their performance at the Moat Park in Hsinchu city and received loud applause and shouts of Bravo! from the 3,000 person-times strong audience from the local community. As part of the effort to promote exquisite performances, there were two other programs: the xiangsheng (traditional Chinese comic dialogues) Qu, Blooming into 30-Year Brilliance, performed by both second and third generation xiangsheng artists. The fact that the piece is taught hands-on to the third generation of young xiangsheng artists such as Ming-Han Song and Yin-Xie Wu by the second generation xiangsheng artists such as De-Gang Zhu, Guang-Yao Fan, and Yi-Jun Ye at the 30-year-old Taipei Qu Company is particularly meaningful as the process embodies the act of passing on tradition. The popular Berliner Barock Solisten, founded by leading members of the Berliner Philharmoniker, together with Yu-Chien Tseng, the prize-winning violinist of the international Tchaikovsky Competition, brought to the audience world-class performances of classical music. The 2023 TSMC Hsinchu Arts Festival organized 47 exquisite performances and exhibitions throughout, attended by over 52,000 person-times community members.

In addition to fine performances and exhibitions, the Foundation also funds radio programs, helping the public appreciate the beauty of theater and literature. The Stories of Peking Opera radio program on Sound of IC radio station, co-hosted by An-Qi Wang the artistic director of GuoGuang Opera Company and Prof. Shih-Lung Lo at the Department of Chinese Literature of National Tsing Hua University, introduced the public to fine and elegant theater through analyzing texts and the history of theater and interviewing theater maestros. This program was nominated for the Best Host of Arts and Culture at the 58th Golden Bell Awards. On another front, Yi-Yun Xin, a master in classic Chinese literature who has been presenting a radio lecture on Chinese classics on Sound of IC radio station since 2008, presented a new program in 2023, Yi-Yun Xin on Chinses Fu Verse, focusing on Chinese classical Fu verse and sharing the beauty of classic literature with the audience 1.62 million person-times tuned in to listen to the two programs: Stories of Peking Opera and Yi-Yun Xin on Chinese Classical Fu Verse.

As a way to enrich university campuses with arts and culture, the TSMC Education and Culture Foundation organizes the annual TSMC Lectures series at the end of each year. The lectures series invites renowned scholars in the humanities to introduce the public and college students to the richness of literature, history and philosophy. In 2023, the series specifically invited Yu-Shan Wu, academician at and founder of Institute of Political Science at Academia Sinica, to discuss Russia-Ukraine War. By analyzing the historical roots and the power dynamics between large and small countries, academician Wu offered a systematic analysis of this international war and what can be learned from it. Nearly a thousand community members attended the lectures.

7.4 TSMC Charity Foundation

Established in 2017 and led by its chairperson Sophie Chang, the TSMC Charity Foundation (the Foundation) focuses on empowering communities in rural and suburban areas in three ways: education empowerment, taking care of the elderly, and protecting the environment. Internally, the Foundation calls on TSMC volunteers' onsite/online services to address social inequalities and leverages its industrial network advantages to strengthen cooperation with local governments, enterprises and universities externally. Both the Foundation and the TSMC volunteers were committed to providing educational, medical and social welfare resources to children in rural schools or disadvantaged educational institutions, as well as to their families who were in urgent need of financial support, to help cultivate long-term career capabilities and improve their quality of life independently. The Foundation continued to operate the Sending Love platform to strengthen the cooperation among enterprises, local governments and universities so as to strengthen local services and jointly uplift society.

In 2023, the Foundation demonstrated its dedication to investing in public welfare and expanding projects to improve its scope of services:

- Education Empowerment

The Foundation continuously provides educational and living assistance to institutes in need and to children in rural areas, including volunteer services, economic support, food supplies and the purchase of digital learning equipment and materials. From 2022, the Foundation focused on rural students' employability. In 2023, the Foundation worked with six city governments to organize job fairs for senior high and vocational high school students, with career exploration and job placement designed as the main highlights. The aim was to focus resources on these two issues to help students identify certain targets early on and discover even more diverse career options, which eventually benefited more than 12,000 participants. In helping rural students obtain the skills to work locally, four enterprises, IKEA, LDC Hotels & Resorts Group, Howard Resort Xitou Hotel, and Panasonic Taiwan Co., Ltd., joined in 2023 to give training to seven senior vocational high schools and extended job offers to 68 students. The Foundation also spread the acknowledgement of vocational education by organizing a junior high school vocational expo and parent-child career workshops, as well as collaborating with 104 JOB BANK to promote the Road to Employment Program, inviting 104 professionals to appear on film and share their career stories. A dedicated website was also built to showcase these stories, encouraging students to use them as a reference in choosing their career paths.

The Foundation assisted 31,133 students from rural areas in 2023. TSMC volunteers used their professional knowledge to develop science popularization AI lesson plans with ideas generated by ChatGPT, which were later modularized and promoted to 35 science education activities by the Foundation, benefiting a total of 1,093 children.

The Foundation's Sending Love platform initiative visited and screened disadvantaged individuals in need of financial support and also provided financial assistance and daily necessities made possible by internal and external donations from TSMC to improve the living conditions of highly vulnerable and disadvantaged families. As of 2023, the Foundation had supported a total of 295 families.

- Taking Care of the Elderly

The Foundation collaborates with Network of Compassion partners to enhance the health and welfare of solitary elders by connecting them with social welfare groups and medical units. In 2022, the Foundation cooperated with National Yang Ming Chiao Tung University and Guandau Hospital to establish a smart exercise club for the elderly, and introduce the TSMC volunteer services to prevent disability and delay aging through exercise. In 2023, the Foundation launched the adaptability assessment system for TSMC volunteers. The system not only provides guidance for employees to join the volunteer team but also encourages retired colleagues to explore themselves. With the Foundation's volunteer training programs, the TSMC retired colleagues can contribute their experience and knowledge to society, thus better managing their next stage of life.

- Protecting the Environment

The Foundation helped disadvantaged social welfare institutes to increase the use of green energy and save power, while also continuing to implement the Cherish Food program to reduce resource waste. The Green Energy for the Disadvantaged project was launched in 2021, and by 2023 the Foundation had installed solar panels at seven social welfare institutes, which can supplement these institutes' operating expenses by selling green energy. The LED Lighting Replacement program helped 240 schools to reduce electricity costs by at least 30% with energy-saving lights. In the Cherish Food program, the Foundation continued to work with many food companies to donate out-of-spec foods to 150 disadvantaged social welfare institutes in order to provide children with after-school snacks, thereby reducing food waste. Current collaborators include Chi Mei Frozen Food Co., Ltd., Hunya Food Co., Ltd., Laurel Corporation, Lian-Hwa Foods Corp., Hsin Tung Yang Co., Ltd., and Lao Xie Zhen Co., Ltd.

7.5 TSMC i-Charity

The TSMC i-Charity platform, launched in 2014, is an interactive intranet site that employees use to propose charity projects, share project results, provide suggestions and responses, and conduct timely funding of activities to give back to society.

In 2023, a total of 62,351 people donated more than NT$71.68 million to support programs such as Lighting Up the Rural Learning Dream, Delivery of Fruit and Vegetables from Sheltered Farms, and four regular fundraising projects in helping baseball sports and academic education in rural areas and other fundraising projects.

The TSMC i-Charity platform has accumulated more than NT$343 million in donations since its inception in 2014. TSMC continues to carry out its social commitments and encourages its employees to care for and give back to society in various ways.

7.6 Sustainability Development Implementation Status as Required by Taiwan Financial Supervisory Commission

Assessment Item	Implementation Status			Non-implementation and Its Reason(s)
	Yes	No	Summary	
1. Does the Company have a governance structure for sustainability development and a dedicated (or ad-hoc) sustainable development organization with Board of Directors authorization for senior management, which is reviewed by the Board of Directors?	V		For the Company's governance structure for sustainability development, please refer to"7.1 Environmental, Social and Governance (ESG) – Overview" on page 152-156 of this Annual Report. For the structure, operations, implementation status and frequency of reporting to the Board of Directors of the Company's dedicated organization for sustainability development, please refer to "7.1 Environmental, Social and Governance (ESG) – Overview" on page 152-156 of this Annual Report. For progress of the Board of Directors' supervision of the Company's sustainability development, please refer to "7.1 Environmental, Social and Governance (ESG) – Overview" on page 152-156 of this Annual Report.	None
2. Does the Company follow materiality principle to conduct risk assessment for environmental, social and corporate governance topics related to company operation, and establish risk management related policy or strategy?	V		For the Company's scope of risk assessment, please refer to "7.1 Environmental, Social and Governance (ESG) – Overview" on page 152-156 of this Annual Report. For the principle, process and result of the Company's materiality analysis of ESG related topics and risk management related policy or strategy, please refer to "7.1 Environmental, Social and Governance (ESG) – Overview" on page 152-156 of this Annual Report.	None
3. Environmental Topic (1) Has the Company set an environmental management system designed to industry characteristics?	V		(1) For the Company's environmental management system and the regulations on which it is based, please refer to "7.2 Environmental, Safety and Health (ESH) Management" on page 156-169 and "6.3.3 Operational Risks – Risks Regarding Non-Compliance with Export Control, Environmental and Climate Change Related Laws, Regulations and Accords, and Failure to Timely Obtain Requisite Approvals Necessary for Conducting Business" on page 145-146 of this Annual Report. For the Company's international certifications and their scope, please refer to "7.2 Environmental, Safety and Health (ESH) Management" on page 156-169 of this Annual Report.	None
(2) Is the Company committed to improving resource efficiency and to the use of renewable materials with low environmental impact?	V		(2) For the Company's improvement of resource efficiency and the use of renewable materials, please refer to "7.2.1 Environmental Protection – Climate Change and Energy Management/Waste Management and Recycling" on page 158-159, 161-162 of this Annual Report.	
(3) Does the Company evaluate current and future climate change potential risks and opportunities and take measures related to climate related topics?	V		(3) For the Company's evaluation of potential risks and opportunities of current and future climate change and measures taken related to climate topics, please refer to "7.2.1 Environmental Protection – Climate Change and Energy Management" on page 158-159 of this Annual Report.	
(4) Does the Company collect data for greenhouse gas emissions, water usage and waste quantity in recent two years, and set greenhouse gas emissions reduction, water usage reduction and other waste management policies?	V		(4) For the Company's statistical data, intensity and data coverage for greenhouse gas emissions, water usage and waste quantity in recent two years, please refer to "7.2.1 Environmental Protection – Climate Change and Energy Management/Greenhouse Gas (GHG) Emission Reduction and Energy Management/Air and Water Pollution Control/Waste Management and Recycling" on page 158-159, 159-160, 160-161, 161-162, "7.7 Climate-related Information of Listed Companies – TSMC GHG Emissions in Recent Two Years" on page 176 of this Annual Report. For the Company's policies on the reduction of greenhouse gas emissions, water usage and waste management, please refer to "7.2.1 Environmental Protection" on page 158-163 of this Annual Report. For the Company's certification status of each data set and its scope, please refer to "7.2.1 Environmental Protection – Climate Change and Energy Management/Greenhouse Gas (GHG) Emission Reduction and Energy Management/Air and Water Pollution Control/Waste Management and Recycling" on page 158-159, 159-160, 160-161, 161-162 of this Annual Report.	

(Continued)

Assessment Item	Implementation Status			Non-implementation and Its Reason(s)
	Yes	No	Summary	
4. Social Topic (1) Does the Company set policies and procedures in compliance with regulations and internationally recognized human rights principles?	V		(1) For the Company's policies and specific programs in compliance with regulations and internationally recognized human rights principles, please refer to "5.6.1 Human Rights Policy and Specific Actions" on page 112-113 of this Annual Report.	None
(2) Has the Company established appropriately managed employee welfare measures (include salary and compensation, leave and others), and link operational performance or achievements with employee salary and compensation?	V		(2) For the Company's employee welfare measures, including salary and compensation, diverse and fair workplace, leave, allowance, bonuses, and subsidies, please refer to "5.6.6 Competitive Overall Compensation", "5.6.2 Diversity and Inclusion", "5.6.3 Workforce Structure", and "5.6.7 Employee Benefit System Superior to Statute" on page 115-116, 113, 114, 116-117 of this Annual Report. For the information on how the Company's operational performance or achievements are reflected in the policy and implementation of employee salary and compensation, please refer to "5.6.6 Competitive Overall Compensation" on page 115-116 of this Annual Report.	
(3) Does the Company provide employees with a safe and healthy working environment, with regular safety and health training?	V		(3) For the Company's status with respect to providing employees with a safe and healthy working environment, with regular safety and health training, please refer to "7.2.3 Safety and Health" on page166-169 of this Annual Report. For the Company's related certification status and its scope, please refer to "7.2.3 Safety and Health" on page166-169 of this Annual Report. For a presentation and analysis of the Company's occupational accidents in the current year and the number of employees involved, as well as related improvement measures taken, please refer to "7.2.3 Safety and Health" on page166-169 of this Annual Report. The number of fire incidents and the number of casualties in the given year, and the ratio of the number of casualties to the total number of employees, and improvement measures related to fire incidents: In 2023 and as of the date of this Annual Report, there were two fire incidents in the new construction site of TSMC and its subsidiary, which did not result in any injuries or deaths. The improvement measures at construction sites include (1) strengthening fire operation and personnel control measures, (2) adding mobile water mist fire extinguishing equipment, and (3) conducting annual fire emergency response and notification drills.	
(4) Has the Company established effective career development training plans?	V		(4) For the scope and implementation of the Company's employee training plans, please refer to "5.6.5 Talent Development" on page 114-115 of this Annual Report.	
(5) Does the Company's product and service comply with related regulations and international rules for customers' health and safety, privacy, sales, labelling and set policies to protect consumers' or customers' rights and consumer appeal procedures?	V		(5) Not applicable as TSMC is not an end product manufacturer. For the Company's policy to protect customers' rights, please refer to "5.4.1 Customers" on page 110 of this Annual Report.	
(6) Does the Company set supplier management policy and request suppliers to comply with related standards on the topics of environmental, occupational safety and health or labor right, and their implementation status?	V		(6) For the Company's supplier management policy and related compliance norms, and specific requirements for suppliers in environmental protection, occupational safety and health or labor rights, please refer to "7.2.4 Supplier Management" on page 169 and "5.6.1 Human Rights Policy and Specific Actions" on page 112-113 of this Annual Report. For a description of the implementation of the Company's supplier management policy and related compliance norms, please refer to "7.2.4 Supplier Management" on page 169 of this Annual Report.	
5. Does the Company refer to international reporting rules or guidelines to publish Sustainability Report to disclose non-financial information of the Company? Has the said Report acquire third party verification or statement of assurance?	V		For the reporting rules and guidelines that the Company follows in disclosing non-financial information in the Sustainability Report, please refer to "7.1 Environmental, Social and Governance (ESG) – Overview" on page 152-156 of this Annual Report. For third party verification of the Sustainability Report, please refer to "7.1 Environmental, Social and Governance (ESG) – Overview" on page 152-156 of this Annual Report.	None
6. If the Company has established its sustainable development code of practice according to "Listed Companies Sustainable Development Code of Practice," please describe the operational status and differences. TSMC follows the ESG Policy set by the Chairman, Dr. Mark Liu, to promote the Company's sustainable development through concrete practices. For sustainable development operational status, please refer to "7. Environmental, Social and Governance (ESG)" on page 150-176 of this Annual Report and environmental social governance related information on the Company's website: https://esg.tsmc.com/en-US				
7. Other important information to facilitate better understanding of the Company's implementation of sustainable development: Please refer to TSMC's website for its sustainable development implementation status: https://esg.tsmc.com/en-US				

7.7 Climate-related Information of Listed Companies

Items	Execution Status
1. Description on the Board and Management's oversight and governance on climate-related risks and opportunities	•ESG Steering Committee: TSMC's top organization in climate change management. Chaired by the Chairman of TSMC with the chairperson of the ESG Committee serving as executive secretary. The Committee reviews TSMC's climate change strategies and goals every quarter and reports to the Board of Directors •Energy Saving and Carbon Reduction Committee: The Company's management organization for taking action on climate change risk and opportunity. It is chaired by the Vice President of Fab Operations. Every quarter, this Committee formulates management plans, reviews implementation status, and discusses future plans
2. Description on how the identified climate risks and opportunities impact the company's business, strategies, and finance (short, mid, longterm)	TSMC holds the Climate Change Risk and Opportunity Workshop once every two years to identify and update climate risks and opportunities based on the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) framework. Please refer to the "Financial Impact Analysis and Response of Climate Risks and Opportunities" table for details on page 158-159 of this Annual Report.
3. Description on the impact extreme climate events and transitional actions have on finance	Please refer to the "Financial Impact Analysis and Response of Climate Risks and Opportunities" table for details on page 158-159 of this Annual Report.
4. Description on how the climate risk identification, assessment, and management process is integrated in the overall risk management system	Please refer to the Risk Management in "Management Structure of TSMC Climate-related Risks and Opportunities" table for details on page 158 of this Annual Report.
5. Should scenario analysis is used to assess the Company's resilience in face of climate change risks, explanations on the scenario, parameters, hypothesis, analysis factors and major financial impacts should be provided	TSMC selected high-emission scenarios (SSP5-8.5) from IPCC AR6 to analyze physical risks and assess the potential short, mid and long-term risks in TSMC facilities and supply chains. In addition to the existing flood, drought, and heat risks, the Company further evaluated risks such as wind disasters from typhoons, landslide disasters, and rising ocean levels. Meanwhile, TSMC increased its scope to cover all facilities around the world as well as five critical supply chains - direct raw materials, indirect raw materials, equipment, fab facilities, and parts and components. Analysis of physical risks shows that the risks of droughts are the most significant physical risks, which cause the impact to self-operation resulting financial loss and revenue decrease due to water shortage.
6. Should there be transitional programs in response to managing climate-related risks, please explain the program's content and metrics and targets used to identify and manage physical and transitional risks	TSMC actively implements greenhouse gas reduction measures in accordance with the 2050 Net Zero Transition Plan, in order to achieve the RE100 target by 2040 and net-zero emissions by 2050. Throughout the process, TSMC will continue to introduce the best energy-saving and carbon-reducing technologies to reduce emissions, and will continuously expand the use of renewable energy until reaching the RE100 goal. Ultimately, TSMC plans to achieve the net-zero transition target by partially offsetting emissions with carbon credits.
7. Should the internal carbon pricing is used as the planning tool, the pricing mechanism should be explained	Internal carbon prices include carbon tax (fee), regulatory fines, carbon reduction and renewable energy cost, carbon market price.
8. Should climate-related targets are in place, information such as their scope of action, GHG emissions, planned timeline, and yearly achieved progress should be stated; for targets achieved through carbon offset and RECs, the source of offset amount and number of RECs should be stated	1. Reduce unit GHG emissions by 30% compared to the base year (metric ton of carbon dioxide equivalent ($MTCO_2e$)/12-inch equivalent wafer mask layer), and restore GHG emissions to the 2020 level in 2030, net zero emissions in 2050. 2. 60% renewable energy company-wide in 2030, 100% renewable energy company-wide in 2040. 2023 achievements: unit GHG emissions (metric ton of carbon dioxide equivalent ($MTCO_2e$)/12-inch equivalent wafer mask layer) increased by 31%; used 2,590 GWh in renewable energy, and increased the proportion of renewable energy use to 11.2%.
9. GHG inventory and assurance status, and reduction goals, strategies and specific action plans	Please refer to "7.2.1 Environmental Protection – Climate Change and Energy Management" on page 158-159 of this Annual Report , "7.2.1 Environmental Protection – Greenhouse Gas (GHG) Emission Reduction and Energy Management" on page 159-160 of this Annual Report and the "TSMC GHG Emissions in Recent Two Years" table on page 176 of this Annual Report.

TSMC GHG Emissions in Recent Two Years

Year	Scope	Scope 1		Scope 2		Verification Party	Verification Guideline	Verification Statement
		Total Emissions (Metric Ton CO_2e)	Intensity (Metric Ton CO_2e / M NTD)	Total Emissions (Metric Ton CO_2e)	Intensity (Metric Ton CO_2e / M NTD)			
2023	Parent Company	1,307,966	0.61	10,150,252	4.71	DNV	ISO 14064-3	Reasonable Assurance
	VisEra Technologies Company Ltd.	4,399	0.61	37,135	5.13	DNV	ISO 14064-3	Reasonable Assurance
	TSMC China Company Limited	161,698	6.34	0	0	DNV	ISO 14064-3	Reasonable Assurance
	TSMC Nanjing Company Limited	45,118	0.74	0	0	DNV	ISO 14064-3	Reasonable Assurance
	TSMC Washington, LLC	76,851	9.28	0	0	AWN	ISO 14064-3	Limited Assurance
2022	Parent Company	1,669,738	0.75	9,540,171	4.24	DNV	ISO 14064-3	Reasonable Assurance
	VisEra Technologies Company Ltd.	5,845	0.64	29,683	3.27	DNV	ISO 14064-3	Reasonable Assurance
	TSMC China Company Limited	187,181	6.6	0	0	DNV	ISO 14064-3	Reasonable Assurance
	TSMC Nanjing Company Limited	46,209	1.09	0	0	DNV	ISO 14064-3	Reasonable Assurance
	TSMC Washington, LLC	109,784	10.65	0	0	AWN	SO 14064-3	Limited Assurance

Note 1: GHG includes CO_2, CH_4, N_2O, HCFCs, PFCs, SF_6, NF_3
Note 2: Scope 1: Direct emissions, i.e. sources owned or controlled by the Company; according to the 2019 Refinement to the Guidelines for National Greenhouse Gases Inventories of the United Nations; and use the Global Warming Potential (GWP) referring to the Intergovernmental Panel on Climate Change (IPCC) AR5 for calculation.
Scope 2: Indirect emissions, i.e. those arising from externally purchased electricity, heat or steam. The calculation is according to market-based method.