# TSMC 2024 Sustainability Report

# Contents



## Sustainability Roles



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# Wafers Shine on Visions Wide

Ideas stream like colors glide.

In wafers mirrored and aligned, for the vibrant future you envision.

We unleash your innovation, weaving humanity with nature’s flow.

With stakeholders together, we make it so — Unleashing tech in endless glow.

Each drop becomes a widening ripple, at each encounter, let brilliance sparkle.

# Letter from the ESG Steering Committee Chairperson

At TSMC, we solve the world's most complex technological challenges. As one of the global leaders in semiconductor technology and production, we are driven by the belief that the solutions deliver power progress – not just for our customers, but for global society as a whole. From smartphones to AI and supercomputers, when we talk about addressing challenges, it's beyond circuits and wafers — it's about shaping the future.

Creating a responsible and sustainable future, sustainability is not an afterthought in TSMC – it's embedded in every decision we make. Each year, we advance our commitment to operating with minimal environmental impact. To us, ESG is not merely a responsibility; It is fundamental to our operational resilience, competitiveness, and long-term value.

We lead pioneering carbon reduction technologies and low-carbon operations, ambitiously pursuing net zero emissions and carbon neutrality. We invest in next-generation carbon reduction, water-saving and circular economy practices; we support renewable energy; and we cultivate an inclusive, empowering, and innovative workplace.

Our sustainability ethos extends far beyond our walls. To build a responsible value chain, TSMC encourages suppliers to develop environmentally friendly products and technologies, ensuring responsible mineral sourcing and human rights protection. Additionally, TSMC actively engages with communities where our global production sites are located, supporting local environmental initiatives, education, healthcare, and caring for the elderly and underprivileged. TSMC ensures that employees take pride in their work, knowing it contributes to a company that prioritizes responsible operations and global positive impact.

TSMC's cross-generational sustainable products lead the world in density and energy efficiency. According to the latest studies from ITRI, the carbon reduction achieved in TSMC's manufacturing process, combined with the energy-saving effects of information and communication products using TSMC chips, saved 141 billion kWh of electricity globally, equivalent to reducing 59 million tons of carbon emissions in 2024. By 2030, every kWh consumed in semiconductor production at TSMC is projected to save 6.39 kWh globally.

2024 marked the first year in which global temperatures exceeded the critical 1.5 ° C threshold established by the Paris Agreement. At TSMC, urgent climate actions have long-been underway. We firmly believe that every initiative we undertake in pursuit of sustainability is an opportunity to generate shared value and drive transformative change for both the environment and society.

In this sustainability report, you will see TSMC's significant advancements in its five sustainability roles: as an innovation pioneer, a responsible purchaser, a practitioner of green power, an admired employer, and power to change society. I extend my profound gratitude to all TSMC employees who exemplify excellence in their roles, harnessing technology, expertise, and passion to elevate human welfare and safeguard our ecological environment, alongside our steadfast stakeholders.

**C.C. Wei**
Chairman and Chief Executive Officer/
ESG Steering Committee Chairperson

# Letter from the ESG Committee Chairperson

In today's era of interconnected global risks, the United Nations reaffirmed the importance of multilateralism and international cooperation during the 2024 Summit of the Future, advocating for collective action to advance sustainability and drive transformative change worldwide. Reflecting these global priorities, TSMC actively collaborates with internal and external stakeholders across five ESG directions — Drive Green Manufacturing, Build a Responsible Supply Chain, Create a Healthy and Inclusive Workplace, Develop Talent, and Care for the Underprivileged. Through these efforts, TSMC strives to contribute to a resilient, inclusive, and shared future for all.

Maintaining its industry-leading position, the Company successfully began risk production of 2nm technology in 2024, with exploratory research advancing into technologies beyond 14 angstrom (A14). By leveraging 288 process technologies enabling 11,878 customer product innovations, TSMC continues to pioneer technological and societal progress. Through global expansion and cross-border, cross-disciplinary collaborations, the Company is working with partners worldwide to drive semiconductor industry innovation and promote shared growth.

According to the World Economic Forum's (WEF) latest "Global Risks Report ," extreme weather events are the top ranking long-term (10-year) global risk for the second consecutive year, indicating critical needs for accelerating climate action. In 2024, TSMC deployed 1,177 electricity-saving measures, expanded a diverse portfolio of renewable energy solutions , and set 2025 as the baseline year for achieving Scope 1 to 3 absolute emission reduction targets under the SBTi Corporate Net Zero Standards by 2035. "Water Positive " was incorporated into TSMC's long-term Water Stewardship goals and established as a key strategy for addressing climate change and strengthening climate resilience. Additionally, TSMC introduced its first carbon reduction subsidy program, specifically targeting tier 1 raw material suppliers operating in Taiwan, as part of its efforts to develop a low-carbon supply chain. Beginning in 2025, the Company will incorporate carbon reduction performance into its supplier selection criteria . It will also require key contributors to emissions — suppliers responsible for 90% of total raw material carbon emissions — to sign the TSMC Greenhouse Gas Reduction, Emissions Elimination & Neutrality (GREEN) Agreement . This initiative aims to strengthen efforts in reducing Scope 3 emissions.

TSMC is dedicated to fostering a people-focused culture. In 2024, the Company continued to host a series of Global Inclusive Workplace Campaigns , focusing on three key themes: Action, Equity, and Allyship. These initiatives strive to empower employees to become advocates for a more inclusive workplace. In alignment with TSMC's Human Rights Policy , the Company conducted its first global "Workplace Human Rights Climate Survey," engaging employees across all operational sites, to better understand their perspectives on work-related human rights issues. The insights gained will serve as a valuable reference to shaping future human rights management actions. Additionally, human rights due diligence has been expanded to the supply chain, with long-term goals now incorporating human rights performance metrics to ensure accountability. In fostering a workplace prioritizing both mental and physical well-being as well as intrinsic safety, TSMC began expanding its World Mental Health Month campaign in 2024, introducing protective gear in diverse sizes for employees and on-site contractors, and enhancing construction project safety by deploying 24/7 on-site ambulances and emergency medical technicians to safeguard workers' health and safety.

As the Company approaches the midterm milestone of achieving the United Nations SDGs by 2030, the TSMC Education and Culture Foundation and the TSMC Charity Foundation are actively driving a wide range of social initiatives aimed at supporting the realization of these goals. TSMC continues to expand its industry-academia collaboration to enhance performance in SDG 17 – Partnerships for the Goals performance. To ensure effective use of resources, the Company conducts thorough social impact analysis and assessments using the IMP and the IRIS+ frameworks.

Transparency and disclosure of information remain the foundation of trust between companies and stakeholders. In response to global sustainability regulations and trends, TSMC adopted the Double Materiality principle set out by the ESRS and established an implementation plan for the "IFRS Sustainability Disclosure Standards " in 2024. These efforts were aimed at reinforcing ESG governance structures and internal control mechanisms for realizing more efficient, data-driven sustainability management models to make positive impacts across the entire value chain.

**Lora Ho**
Senior Vice President and ESG Committee Chairperson

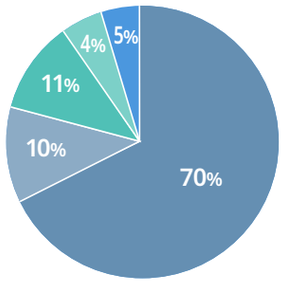
# About TSMC

To address the rapid growth of artificial intelligence applications, TSMC continues to scale up its R&D capabilities, offering industry-leading 3-nanometer, 2-nanometer, and 16-angstrom process technologies to meet customer needs and deliver advanced technology. The Company is driven by its three key competitive strengths: Technology Leadership, Manufacturing Excellence, and Customer Trust. It aims to achieve success in its core business while actively upholding its responsibilities as a corporate citizen. TSMC strives for excellence, by working closely with all of its stakeholders including employees, shareholders/investors, customers, suppliers/contractors, government/industry associations, and communities, to shape a sustainable and inclusive future.

TSMC operates four 12-inch wafer Gigafab® facilities, four 8-inch wafer fabs, and one 6-inch wafer fab in Taiwan, as well as overseas facilities including TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, and JASM (Japan). The Company has also established subsidiaries or offices in the United States, Europe, Canada, Japan, and South Korea. In 2024, ESMC in Dresden, Germany, began construction on a wafer fabrication facility for specialty processes. The Company also unveiled plans for a third fab at TSMC Arizona to deliver technical and business support to customers.

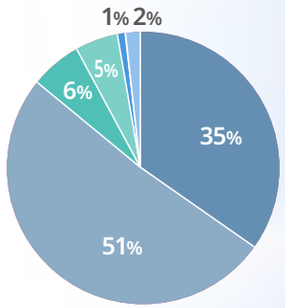
| Headquarters | Founded in | Number of Employees |
|---|---|---|
| **Hsinchu Science Park** | **1987** | **84,512** |

## Revenue Share by Customer Headquarters Location




- North American Market
- Asia-Pacific Market Excluding Japan and China
- Chinese Market
- European, Middle Eastern, and African Market
- Japanese Market

## Revenue Share by Product Platform




- Smartphones
- Highperformance Computing
- Internet of Things (IoT)
- Automotive Electronics
- Consumer Electronics
- Other Products

**12.9 Million Wafers**

Shipments reached an equivalent of 12.9 million 12-inch wafers

**522 Customers**

Provided with 288 process technologies for their product needs

**$1.17327 Trillion**

Net income (NT$)

**69%**

69% of revenue generated from advanced processes of 7nm and below, up 11 percentage points from 2023

**$6.361 Billion**

R&D expenses (US$)

# Innovation Value

Semiconductors are the foundation of technological progress, revolutionizing daily lives and work environments. They are integral to pioneering advancements in AI-empowered communications, data analytics, environmental sustainability, healthcare, smart living, autonomous transportation, and entertainment. Through five major technology platforms including High Performance Computing (HPC), Smartphones, Internet of Things (IoT), Automotive, and Digital Consumer Electronics (DCE), TSMC provides comprehensive and competitive logic process technologies, specialty technologies, intellectual properties (IPs), and packaging and testing technologies. These offerings help customers accelerate their product innovation, foster economic growth, protect the environment, and drive sustainable social progress.

## Technology Development Focuses

- Driving semiconductor scaling for both logic and specialty technologies
- Expanding specialty technology offerings
- Advancing and expanding TSMC 3DFabric® technology offerings

## Innovations for Sustainability

TSMC continues to advance semiconductor technologies and services, enabling customers to unleash 11,878 chip innovations in 2024. These innovations make products more advanced, capable, intelligent, energy-efficient, and safer, significantly increasing the quality of life and contributing to a sustainable society for the common good.

## Benefits to Customer Product Innovation

- Boosting product computing power
- Increasing product energy efficiency
- Enabling smaller form factors
- Providing greater chip design flexibility

HPC enhances AI-driven technology by enabling fast, precise, and energy-efficient training and inference of complex predictive models on data center CPUs, GPUs, and ASICs. Beyond empowering early warning systems to mitigate extreme climate disasters and advancing medical breakthroughs, HPC also enables smart factories to improve energy efficiency through real-time data analysis, optimized energy use, and reduced consumption.


Equipped with increasingly powerful neural processing units (NPUs) and sensors, smartphones can perform complex on-device AI tasks, such as multi-modal features like chatbots, translation, image recognition, and analytics. In the future, smartphones will feature agentic AI capable of executing entire workflows from start to finish, resulting in faster response times and creating user experiences that are more secure, seamless, and personalized.

Intelligent IoT has the potential to transform industries, improve productivity, reduce waste and loss, and enhance quality of life by advancing digital healthcare. For example, wireless technology chips enable continuous glucose monitoring (CGM) for people living with diabetes worldwide, thereby improving health management efficiency. (Chip photo courtesy of EM Microelectronic)

The automotive industry is evolving through greener electric vehicles (EVs), safer AI-powered advanced driver-assistance systems (ADAS), and autonomous driving (AD). AI-assisted digital cockpits are becoming more interactive and power-efficient, enhancing human-machine interaction and delivering smarter, more eco-friendly driving experiences, all while making roads safer.

AI-enabled digital consumer electronics have significantly transformed lives by enhancing the human-machine interface for improved user experiences. For example, many smart digital TVs (DTVs) now feature voice recognition technology, AI-driven picture quality (PQ), and high frame rates (HFR) of 120Hz or even higher. Additionally, advanced process technology in set-top boxes (STBs) reduces power consumption, helping them achieve higher ENERGY STAR® standards.

## Five Technology Platforms

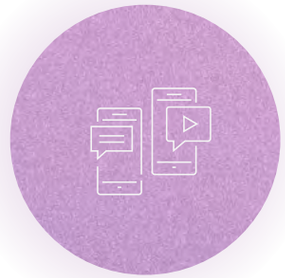
### High Performance Computing (HPC)

**Enables 5G, artificial intelligence (AI), cloud, and data centers to deliver faster, smarter, and more efficient services across various sectors**

- Central Processing Unit (CPU)
- Graphics Processor Unit (GPU)
- Field Programmable Gate Array (FPGA)
- Server CPU
- Artificial Intelligence/Machine Learning (AI/ML) Accelerator
- Network Processing Unit (NPU)
- High-speed Networking Chip, etc.

### Smartphones

**Enhances productivity and streamlines daily tasks to improve communication effectiveness**



- Application Processor (AP)
- Baseband
- RF Transceiver
- Wireless Local Area Network (WLAN)
- CMOS Image Sensor (CIS)
- Near Field Communication (NFC)
- Bluetooth
- Global Positioning System (GPS)
- Ultra-wideband (UWB), etc.

### Internet of Things (IoT)

**Enables pervasive connectivity through Artificial Intelligence of Things (AIoT) innovations for a smarter, greener future**

- Application Processor (AP)
- Microcontroller Unit (MCU)
- Baseband
- RF Transceiver
- Wireless Local Area Network (WLAN)
- CMOS Image Sensor (CIS)
- Near Field Communication (NFC)
- Bluetooth
- Embedded Non-volatile Memory (eNVM)
- Radio Frequency Identification (RFID)
- Ultra-wideband (UWB), etc.

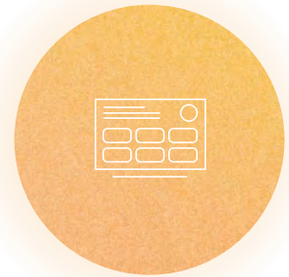
### Automotive

**Makes vehicles, including hybrid and electric cars, safer, smarter, and greener**

- Application Processor (AP)
- Microcontroller Unit (MCU)
- Baseband
- RF Transceiver
- Wireless Local Area Network (WLAN)
- CMOS Image Sensor (CIS)
- Near Field Communication (NFC)
- Radar
- Ultra-wideband (UWB)
- Ethernet Switch
- Power Management IC, etc.

### Digital Consumer Electronics (DCE)

**Enables AI-driven smart devices**



- Application Processor (AP)
- Microcontroller Unit (MCU)
- Wireless Local Area Network (WLAN)
- Bluetooth
- Embedded Flash Memory
- Power Management IC
- Timing Controller (T-CON), etc.

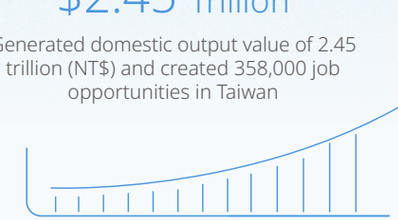
# Sustainability at TSMC

## Economic

**$6,355 Million**
R&D expenditures have grown 3.1-fold compared to ten years ago (US$)

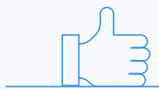
**100%**
Patent approval rate in the U.S. is nearly 100%, ranking first among the top 10 patent holders

**$2.45 Trillion**
Generated domestic output value of 2.45 trillion (NT$) and created 358,000 job opportunities in Taiwan



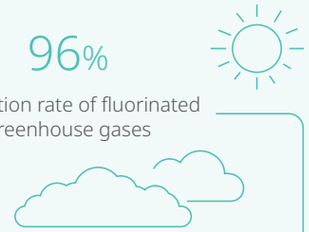
**11,878**
Delivered products to 522 customers through manufacturing excellence

**96%**
Achieved a customer trust and satisfaction rating of 96%



## Environmental

**96%**
Reduction rate of fluorinated greenhouse gases



**99%**
Reduction rate of volatile organic compounds

**810 GWh**
Additional annual energy savings achieved through 1,177 energy-saving measures

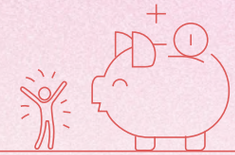
**97%**
Global waste recycling rate

**100%**
Introduced a long-term goal to become water positive by 2040, with 100% completion expected

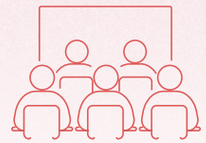
## Social

**$2.441 Billion**
Investment in social engagement initiatives (NT$)

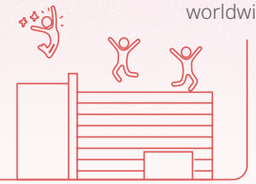
**$301.8 Billion**
Total compensation and welfare provided to TSMC employees globally (NT$)



**10,073**
Employees recruited worldwide



**3,503,894**
Total attendances for training programs



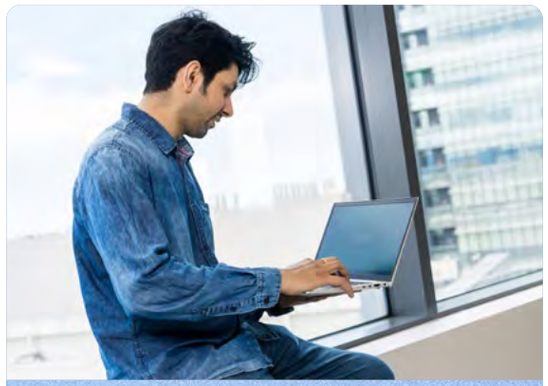
**1,391,674**
Beneficiaries of social engagement programs

# Sustainability Stories

TSMC shapes its sustainability narrative by focusing on meaningful progress it achieves in its journey toward sustainable development. By collaborating with stakeholders, TSMC seeks to create a ripple effect that drives positive change and broader impact.

As “An Innovation Pioneer,” TSMC continually enhances its capabilities, strengthens product quality and competitiveness, and builds strong bonds with customers to earn their trust. Committed to being “A Responsible Purchaser,” the Company works closely with suppliers across a wide range of ESG dimensions, strengthens operational resilience, and accelerates the transition toward net zero. In its role as a “A Practitioner of Green Power,” the Company leverages innovative technologies to increase energy efficiency, while dedicating itself to water resource conservation, pollution control, and circular economy practices in its journey toward green manufacturing.

TSMC embraces global talent, provides competitive compensation and welfare as well as training programs, and cultivates a safe, healthy, equitable, inclusive, and human rights–respecting workplace to become “An Admired Employer.” Grounded in its core business of dedicated semiconductor foundry, the Company, through the TSMC Education and Culture Foundation and TSMC Charity Foundation, coordinates resources from industry, government, and academia to address stakeholder needs and provide resources, under their “Power to Change Society” mantra while driving positive impact.



Innovation Management

## Digital Innovation Enables Global Manufacturing Integration

TSMC’s Digitalized Workflow Platform automates SOPs through code-based translation, elevating consistency in operational efficiency across global sites while facilitating cross-border collaboration between fabs. The platform executes an average of one million tasks each month, establishing a unified global One Team.

→ Learn more

Product Quality

## AI Deployment Cuts Image Review Time by 90%

Leveraging angstrom-level images generated by TEM, TSMC developed a "TEM Image Quality Auto-Inspection System." This system utilizes AI models to assist with image identification operations, comprehensively optimizing image quality and processing efficiency while strengthening process control.

→ Learn more


Customer Relations

## 12-Second FTP Application Upgrades Customer Experience

TSMC-Online™ launched a new "File Transfer Protocol (FTP) Account Service," shortening customer FTP account application time from 3.5 days to just 12 seconds. This automated FTP account management workflow enhances both the security and efficiency of data transmission.

→ Learn more

Innovation Management

### 93% Closure Rate for Supplier Deficiencies Strengthens Resilience

Through its Supplier Total Risk Understanding Simulation Technology (TRUST) model, TSMC effectively consolidates supplier management results and identifies potential vulnerabilities across the supply chain. This enables tiered risk management and consistently enhances risk control performance.

→ Learn more

### 2,900 Ideas Drive Industry-Wide Sustainable Innovation

Committed to advancing industry-wide prosperity, TSMC shares its sustainability culture promotion experience with suppliers, strategically replicating the ESG AWARD program across 27 suppliers, generating over 2,900 innovative sustainability ideas.

→ Learn more

Climate and Energy

### Residual Hydrogen Power Generation Achieves 52.3% Efficiency: A Breakthrough in Green Energy

TSMC initiated the "EUV Process Residual Hydrogen Resource Utilization Preliminary Assessment Project." This initiative features a proton exchange membrane fuel cell that converts excess hydrogen from EUV processes into electricity with 52.3% generation efficiency, enabling more environmentally responsible process management.

→ Learn more

Water Stewardship

### Technology Upgrade Cuts Chemical Use in Wastewater Treatment by 30%

TSMC optimized ammonia-nitrogen wastewater segregation treatment by identifying key concentration intervals, decreasing chemical agent consumption by 30% while reducing waste generation and conserving energy, creating a dual benefit for operational efficiency and environmental protection.

→ Learn more

Circular Resources

## Circular Value Creation: 9,400 Metric Tons of Waste Transformed into Industrial Resources

TSMC's Zero Waste Manufacturing Center in Taichung is now operating, converting process waste into industrial-grade raw materials and producing regenerated electronic-grade chemicals for reuse in semiconductor manufacturing. In 2024, the center processed 9,400 metric tons of waste, yielding products valued at approximately NT$20 million.

→ Learn more

Air Pollution Control

## Innovative Air Pollution Control Technology Reduces Nitrogen Oxide Emissions by 40%

TSMC partnered with suppliers to initiate the Nitrous Oxide Reduction Project, applying reduction-oxidation reactions that introduce methane as a reducing agent into on-site electric thermal treatment systems. This method increased the nitrous oxide abatement rate from 42% to 90% and curtailed nitrogen oxide emissions by 40%.

→ Learn more

Inclusive Workplace

## Everyone as an Inclusion Champion in the Workplace

To encourage employees to turn the inclusive workplace philosophy into actions, the Inclusion Champion Program offers a wide array of activities that foster empathy and raise awareness of inclusion. Through a participants' accumulation of initiatives, the program nurtures champions of an inclusive workplace culture. In 2024, the program recorded 149,565 cumulative participants.

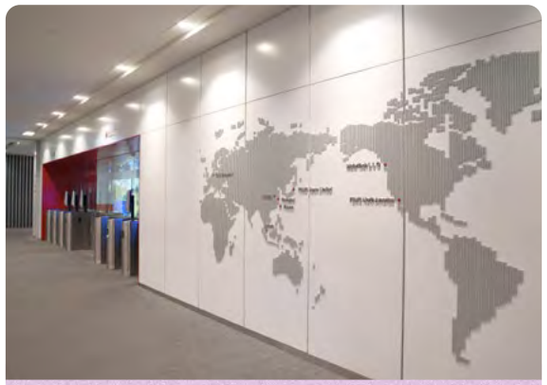
→ Learn more


Talent Attraction and Retention

## Open House Family Day: Experience a Day as TSMCers

TSMC organized Open House Family Days at its domestic and international locations, featuring a broad range of interactive activities. Employees' family members were invited to visit the workplace and observe the wafer fabrication process firsthand, cultivating a sense of belonging and well-being.

→ Learn more



Talent Development

## Satisfaction Score of Senior Manager Learning and Development Program Reaches 90 Points

TSMC has established the Senior Manager Learning and Development Program, offering diverse learning approaches to broaden their horizons and stay attuned to global leadership trends and best practices. The program cultivates leadership capabilities across cultures, generations, and disciplines, equipping senior leaders to drive the Company's continued progress.

→ Learn more

Occupational Safety and Health

## Comprehensive Workplace Protection with 12 Types of Protective Equipment in Diverse Sizes

Dedicated to ensuring workplace safety, TSMC partnered with industry, government, and academia to develop 12 types of multi-size protective gear across four categories. These multi-size options ensure that workers from different sectors can select gear that meets safety standards while offering a proper fit and comfort, maximizing protective performance.

→ Learn more

Social Impact

## Collaborative Efforts to Create Long-Term Social Value

TSMC partners with the TSMC Education and Culture Foundation and the TSMC Charity Foundation, responding to the UN SDGs by investing in five major project areas: "educational innovation, community inclusion, art and cultural literacy, ecological sustainability, and health protection." The Company has also adopted the IMP, a global initiative that provides standards and practices for measuring, managing, and reporting impact in a consistent way, incorporating both the IRIS+ developed by the GIIN and the B4SI framework to establish a comprehensive management and evaluation system and ensure effective resource utilization while contributing to global sustainable development.

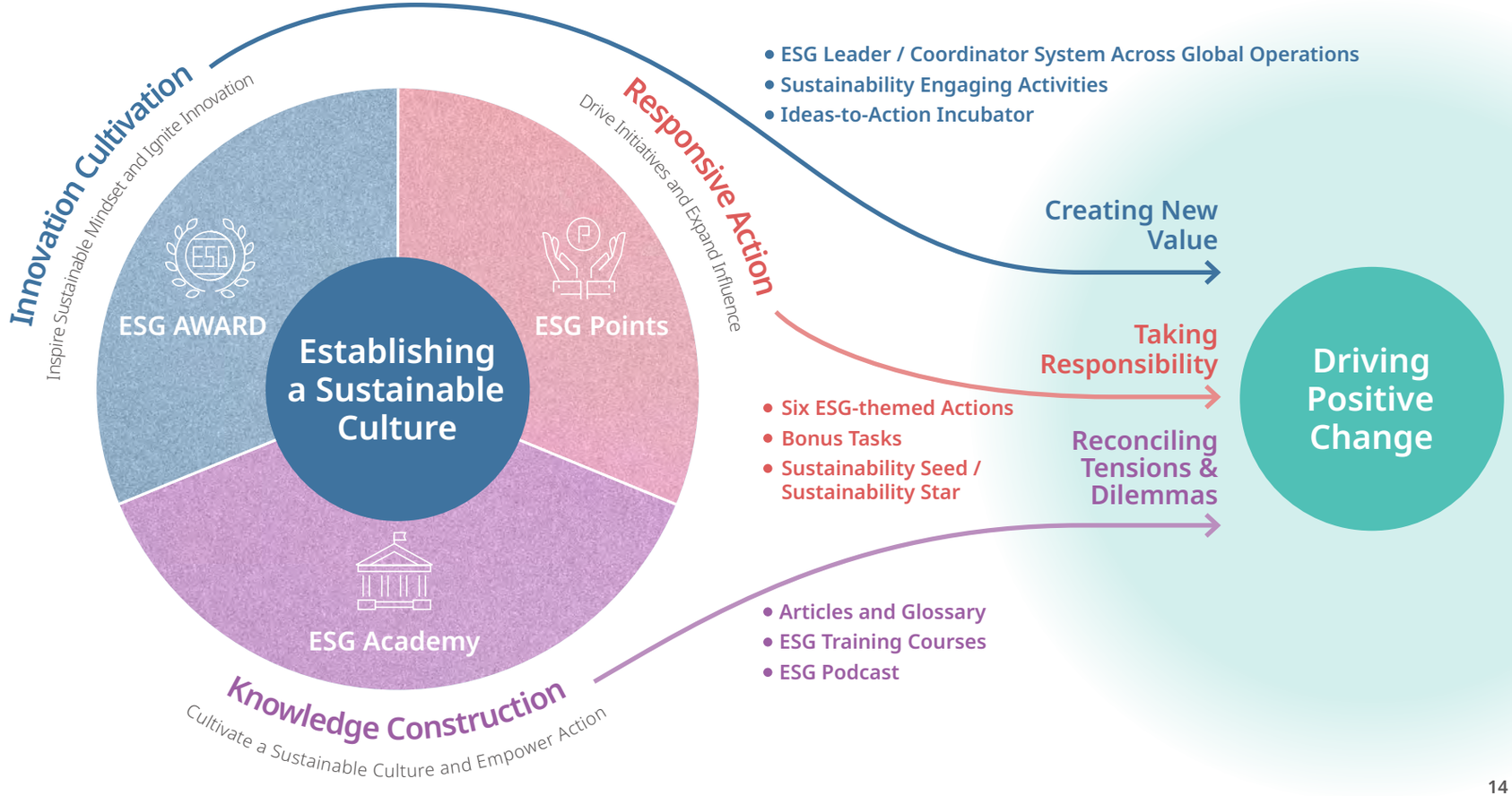
→ Learn more

# Fostering a Sustainable Culture of Innovation and Change through Empowerment

In the turbulent global landscape of the 21st century, businesses must go beyond resilient strategies and innovative technologies to cultivate a sustainable culture that embraces change and evolves with the times. Achieving this requires aligning all team members around shared values and a unified vision, seamlessly integrating these principles into daily operations and practices. Only then can organizations make informed decisions that drive meaningful and positive impact. The OECD's Learning Compass 2030 highlights three essential competencies for navigating future challenges: Creating New Value, Reconciling Tensions & Dilemmas, Taking Responsibility. By developing these capabilities, individuals and organizations can contribute meaningfully to the well-being of themselves, society, and the planet.

TSMC upholds five ESG Directions and has introduced three major strategies: Knowledge Construction, Innovation Cultivation, and Responsive Action. Through a series of empowerment initiatives, the Company aims to deepen employees' knowledge, skills, attitudes, and values, fostering a sustainable culture capable of driving transformative change. Since 2020, TSMC has hosted the ESG AWARD, utilizing a cross-organizational exchange platform to encourage employees to apply new knowledge, insights, and technologies to create new value in addressing sustainability issues. In 2024, TSMC launched diversified courses under the ESG Academy, helping employees explore the complexities and interconnections of sustainability issues. These programs aim to enhance their understanding of the needs and perspectives of various stakeholders, reconcile tensions and dilemmas from diverse viewpoints, and ultimately seek consensus and collaboration. To comprehensively build a "Company-wide ESG" cultural foundation, TSMC also introduced the ESG Points incentive program in 2024. This initiative encourages employees to integrate sustainability thinking into their work and daily lives, evaluate their impact on the environment, society, and others, take responsibility, and engage in meaningful action.

Sustainable competitiveness is pivotal for enterprises to maintain operational resilience in a rapidly evolving world. TSMC fosters transformational capabilities in its employees through its empowerment program, equipping them to face future challenges. The initiative promotes the cultivation and growth of innovation and awareness of change within the organization, gradually transforming these elements into an actionable and sustainable culture that drives positive changes.



# ESG Academy

**Knowledge Construction**

TSMC established the internal learning platform, ESG Academy, with the vision of "Empowering Sustainability for a Better Future." This platform strengthens employees' understanding and implementation of ESG principles. By integrating the latest trends, essential sustainability concepts, and learning resources, the website serves as a central hub for employees to enhance their ESG knowledge.

**2024**
**Starting Year**

**159,600**
**Total Cumulative Participants**

The workshop, which integrated impact theory with project practice, offered meaningful analysis. By examining various factors of "impact" in depth, it provided valuable guidance for planning future initiatives and amplifying the influence of each activity.

**Debby Kuo**
— Employee participant in the Sustainability Impact Workshop


ESG Glossary: Water Positive

## Articles and Glossary

TSMC regularly updates the Weekly "ESG Articles" and Monthly "ESG Glossary," enabling employees to quickly grasp key ESG terms, stay aligned with global trends, and stay attuned to industry developments.

**178**
**ESG articles**

**12**
**ESG terms**

A total of 61 cross-organizational employees participated in the human rights education and training workshop

## ESG Training Courses

In alignment with global sustainability trends and employees' professional needs, TSMC has designed comprehensive learning resources that balance breadth and depth, including five courses covering ESG fundamentals, human rights, and the Net Positive models, as well as three in-person workshops centered on sustainability impact and human rights topics. Starting in 2024, the New Employee Orientation Program features "Introduction to ESG for TSMCers ," enabling employees to quickly understand the Company's core ESG values and laying the groundwork for sustainable actions.

**107,457**
**Cumulative employee participants in ESG courses**


ESG Podcast: Innovation & ESG Equation ft. Cliff Hou, Senior Vice President and Deputy Co-COO

## ESG Podcast

To embed sustainability values into employees' daily lives, TSMC launched the ESG Podcast, featuring dialogues between senior executives and staff. The program offers insights on ESG topics and personal approaches to sustainability, while encouraging employees to align their roles with ESG objectives. In 2024, the podcast welcomed Lora Ho, Senior Vice President and ESG Committee Chairperson, and Cliff Hou, Senior Vice President and Co-Chief Operating Officer, as special guests — demonstrating both top-down and bottom-up sustainability influence.

**41,735**
**Total views of ESG Podcast**

# ESG AWARD

## Innovation Cultivation

The TSMC ESG AWARD functions as TSMC's core platform for advancing sustainability culture, encouraging employees to submit innovative ideas aligned with the Company's five ESG directions and recognizing sustainability achievements across the organizations. By harnessing sustainability, it fosters innovation and drives positive change.

**2020**
**Starting Year**

**4,330**
**Creative Proposals**

**11,418**
**Total Cumulative Proposals**

The ESG AWARD serves as both a catalyst and encouragement, inspiring employees to explore optimization opportunities in their work. It brings green innovation technologies to the forefront and helps co-create sustainable value.

**Howard Ting**
Director of the Facility Division at TSMC

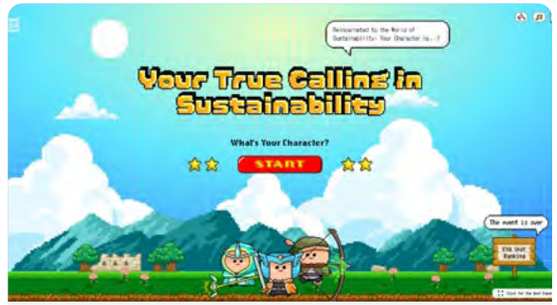

TSMC is dedicated to making ESG an integral part of its employees' DNA.

## ESG Leader / Coordinator System Across Global Operations

To ensure sustainability culture takes root and flourishes, TSMC designates the highest-ranking executives of domestic and overseas organizations as ESG Leaders, with ESG coordinators appointed under their jurisdiction to drive sustainability initiatives. Together, they champion the five categories of the ESG AWARD, embedding ESG values into TSMCers' DNA.

**49**
**Worldwide organizations participated**

**141**
**ESG coordinators**




TSMC launched "Discover Your True Calling in ESG" warm-up activities.

## Sustainability Engaging Activities

By introducing the Octalysis Framework with gamified design and digital resources, TSMC launched two sustainability literacy warm-up activities : "Discover Your True Calling in ESG" and "ESG Parkour." These initiatives guided employees to uncover opportunities for progress in work and daily life while identifying potential areas for improvement. Meanwhile, the Company hosted its first "Proposal Writing Workshop" to foster employees' skills in recognizing underlying issues and articulating their ideas.

**44,764**
**Employees participated**

TSMC dedicates resources to turn ideas into reality through incubation.

## Ideas-to-Action Incubator

The ESG AWARD initiated the Amazing Ideas Award to spark employees' creativity in sustainability. The ESG Department monitors the progress of winning entries on a quarterly basis to support their implementation.
Since 2020, TSMC has aggregated a total of 100 award-winning ideas. Following cross-organizational feasibility assessments, 53 ideas have been supported by company resources and successfully implemented.

**87**
**Ideas passed feasibility assessment**

**53**
**Ideas implemented**

# ESG Points
## Responsive Action

TSMC has established the ESG Points incentive system that consolidates employee-accessible ESG activities and motivates implementation through point accumulation. The program encourages employees to compete for annual honors and sustainability rewards, fostering a positive cycle of "Response, Engagement, and Recognition."

**2024**
**Starting Year**

**115,823**
**Sustainability Actions Taken**

By accumulating ESG Points each month, employees are not only motivated to take action themselves but also inspire their peers to join in. The recognition displayed on the leaderboard allows every employee to see their contribution, reinforcing the belief that their radiance can spark greater change!

**Grace Yi**
2024 ESG Points Sustainability Star

TSMC's overseas subsidiaries encourage employees to participate in ESG-themed actions.

## Six ESG-themed Actions

Through the ESG Points program, employees are encouraged to actively engage in six themed actions: "Contribute to ESG Newsletter Publication, Serve as a TSMC Volunteer, Submit Entries for AMAZING IDEAS of ESG AWARD, Complete ESG Academy Courses, Participate in iCharity Projects, Engage in Company/ Organizational ESG Projects," integrating a sustainability mindset into both work and daily life.

**44,052**
**Employees who initiated ESG actions**

**19.65 Million**
**ESG Points distributed**


TSMC hosts the "Sustainability Parkour" bonus task.

## Bonus Tasks

To diversify ESG engagement and encourage comprehensive action across TSMC's five ESG directions, the Company rolled out five "Bonus Tasks" in conjunction with certain dates such as Earth Day or company-wide ESG campaigns. Employees who completed these time-limited challenges received additional rewards. Through time-bound activities, the program strengthened the link between ESG, daily life, and corporate events — motivating employees to take on the role of ESG practitioners at any given moment.

**23,219**
**Cumulative employees participated**


TSMC Sustainability Seed and Sustainability Star badges.

## Sustainability Seed / Sustainability Star

To heighten motivation, employees who have accumulated 2,000 ESG Points are awarded the "Sustainability Seed" digital badge. The top 20 employees with the highest ESG Points company-wide receive the "Sustainability Star" digital badge, along with a physical certificate, a digital certificate, and a sustainability gift package , recognizing their commitment to driving sustainable action.

**208**
**Sustainability Seeds**

**20**
**Sustainability Stars**

# Awards, Recognitions, and Ratings

### DJSI

- Dow Jones Sustainability World Index for the 24th consecutive year

### WBA

- SDG2000 – The 2,000 Most Influential Companies

### ISS ESG

- "Prime" Rated by ISS ESG Corporate Rating

### UL Solutions

- Platinum Rating for UL 2799 Standard

### AWS

- "Platinum" Class Certification for the 5th consecutive year – Fab 5, Fab 6, Fab 12A, Fab 12B, Fab 14P5, Fab 14P6, Fab 14P7, Fab 15A, Fab 15B, AP3

### FTSE4Good Index

- FTSE4Good Emerging Index component
- FTSE4Good All-World Index component
- FTSE4Good TIP Taiwan ESG Index component

### MSCI ESG Indexes

- MSCI ESG Research – AAA Ratings
- MSCI ACWI ESG Leaders Index component
- MSCI ACWI SRI Index component
- MSCI Emerging Markets ESG Leaders Index

### CommonWealth Magazine

- Talent Sustainability Award: Large Enterprise (Manufacturing) 1st Place

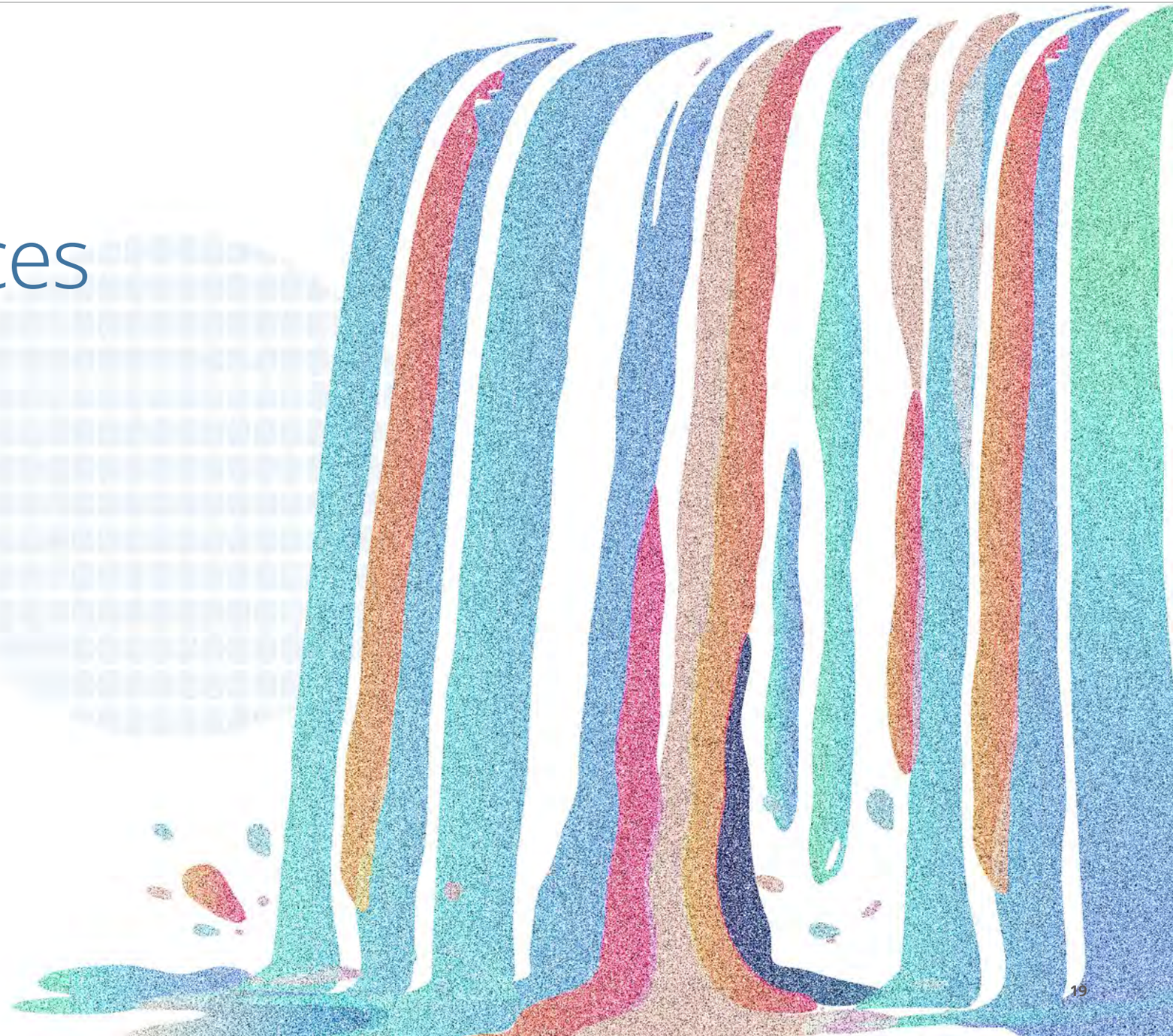
| | |
|---|---|
| **Corporate Knights & As You Sow** | • 2024 Carbon Clean 200™ List |
| **Forbes** | • 2024 World's Best Employers |
| **FORTUNE** | • 2024 World's Most Admired Companies |
| **Times** | • World's Best Companies of 2024 |
| **Extel 2024 All-Asia Executive Team** | • Most Honored Company (Technology/Semiconductors) - 1st Place (buy-side and sell-side) – All-Asia<br>• Best ESG Program (Technology/Semiconductors) – 1st Place (buy-side and sell-side) – All-Asia |
| **Morningstar** | • The Best Sustainable Companies to Own in 2025 |
| **Sustainalytics** | • Company ESG Risk Ratings: Low ESG Risk – Semiconductor Industry |
| **Taiwan Stock Exchange** | • Top 5% in Corporate Governance Evaluation of Listed Companies for the 10th consecutive year |
| **Taiwan Institute for Sustainable Energy** | • The Most Prestigious Sustainability Award – Top Ten Domestic Corporates for the 9th consecutive year<br>• Best Sustainability Report Award<br>• Cyclical Economy Leadership Award<br>• Information Security Leadership Award<br>• Sustainable Supply Chain Leadership Award<br>• Water Management Leadership Award<br>• Climate Leadership Award |

# Sustainable Business Practices



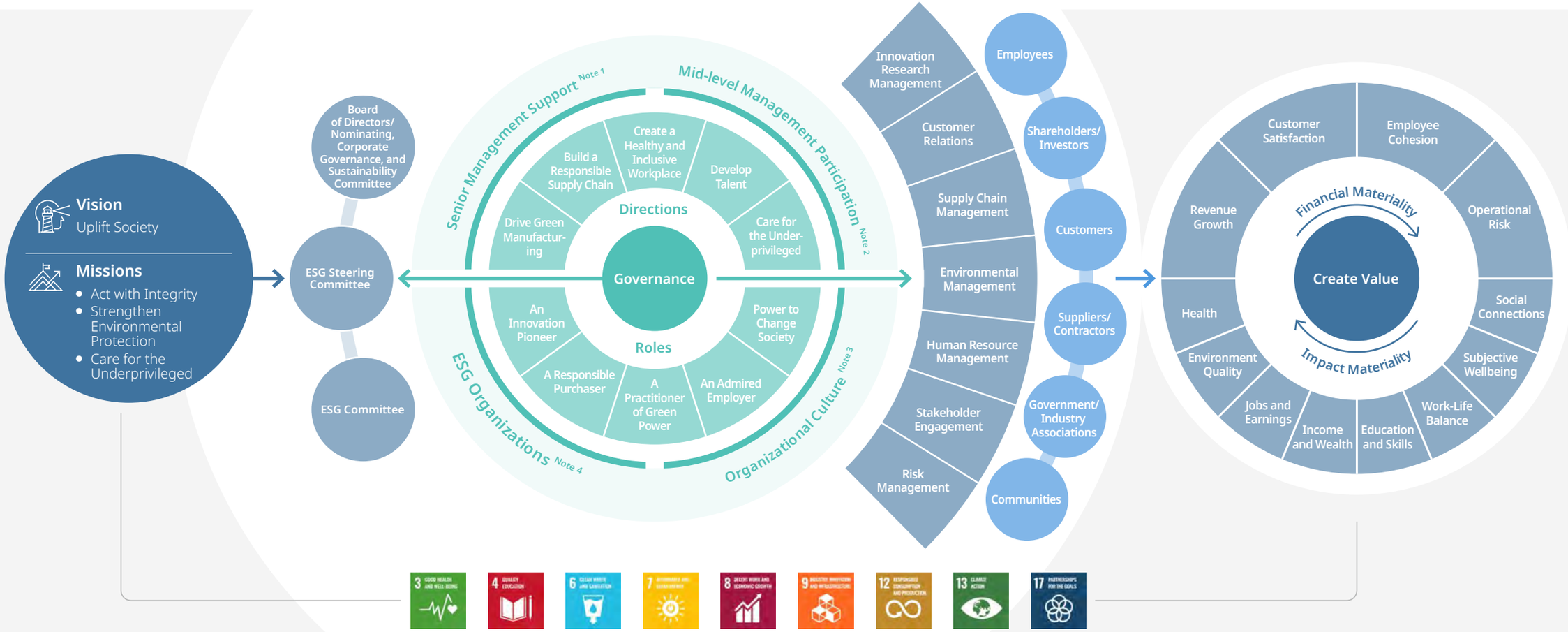
## Sustainability Roles





# ESG Implementation Framework

TSMC's ESG Policy serves as our highest guiding principle for sustainable operations. In alignment with the United Nations Sustainable Development Goals, the Company advances its policy through two major governance platforms under the Board of Directors and its Nominating, Corporate Governance and Sustainability Committee: the ESG Steering Committee and the ESG Committee. Together, these bodies have shaped five ESG directions — Drive Green Manufacturing, Build a Responsible Supply Chain, Create a Healthy and Inclusive Workplace, Develop Talent, and Care for the Underprivileged — as the core pillars of the Company's sustainability efforts. Within this framework, TSMC builds on its five sustainability roles, integrates its dedicated semiconductor foundry services to further develop a diverse range of capabilities, and actively collaborates with stakeholders, including employees, shareholders/investors, customers, suppliers/contractors, government/industry associations, and communities. By applying impact materiality and financial materiality perspectives, the Company generates net positive societal benefits while improving its operational and financial performance to create sustainable value.




Note 1: The Chairman personally engages in and advances ESG efforts, inviting senior executives to lead various functional organizations in proposing sustainability projects based on TSMC's core competences, thereby expanding positive impact.

Note 2: Middle management is the backbone of TSMC's pursuit of sustainability, cooperating across organizations and departments in the face of complex sustainability issues to bring about real change.

Note 3: TSMC fosters an organizational culture that doesn't make promises casually, but devotes itself wholeheartedly once a commitment is made. It sets medium- to long-term goals for sustainability issues, strives for improvement, reviews progress regularly, and endeavors to achieve the best outcomes.

Note 4: ESG Steering Committee and ESG Committee meetings are held regularly to formulate long-term strategies, coordinate interdepartmental resources, and oversee project implementation and performance. The ESG Department collaborates with representatives from functional organizations, focusing on "information disclosure, cultivating culture, and integrated alignment" to ensure continued momentum in sustainable development.

# ESG Management Platform

Guided by the vision and mission set forth in its ESG Policy, TSMC's Board of Directors and its Nominating, Corporate Governance and Sustainability Committee oversee its corporate sustainability efforts, with the ESG Steering Committee and ESG Committee serving as the two primary governance platforms. Chaired by the Chairman of the Board, with the ESG Committee Chair as Executive Secretary, the Steering Committee meets with the executive team each quarter to evaluate ESG issues critical to corporate operations and to establish medium- and long-term strategies and objectives for each issue.

Based on resolutions made by the ESG Steering Committee, the ESG Committee coordinates and links cross-departmental resources, directing the ESG Department and management representatives from across organizations to identify material issues of stakeholder concern relevant to TSMC's operations. Task forces are formed for each issue, combining the Company's competitive advantages and core competencies to formulate corresponding strategies, targets, and action plans. The ESG Committee reports on ESG implementation results and future work plans quarterly to the Board of Directors/Nominating, Corporate Governance and Sustainability Committee, receiving feedback and suggestions to continuously refine its practices. In 2024, the ESG Committee oversaw 101 sustainability projects while promoting corporate sustainability culture through the ESG AWARD program and applying global sustainability trends into daily operations to ensure thorough implementation of ESG strategies.

**The Board of Directors/Nominating, Corporate Governance, and Sustainability Committee**

The highest governing body for sustainable development

**ESG Steering Committee**

- **Chairperson:** Company Chairman
- **Executive Secretary:** ESG Committee Chairperson
- **Members:** Senior Executives from organizations including Operations, Research and Development, Finance, Legal, Materials Management, Human Resources
- **Meetings:** Quarterly
- **Tasks:** Review and formulate TSMC's ESG vision, strategy, and long-term goals under the leadership of the Chairman and executive team; set ESG metrics for senior management compensation; collaborate with the ESG Committee to drive related initiatives and create sustainable value

**ESG Committee**

- **Chairperson:** Senior Executive appointed by Company Chairman
- **Members:** Management Representatives nominated by functional organizations relating to the economy, environment, society and governance
- **Meetings:** Quarterly
- **Tasks:**
  - Identify material issues and formulate action plans
  - Supervise interdepartmental communication and coordinate resource integration
  - Compile ESG-related budgets for all functions
  - Cultivate sustainability literacy and deepen ESG culture
  - Track achievements across various sustainability issues and utilize digital transformation to advance sustainability management

An Innovation Pioneer | A Responsible Purchaser | A Practitioner of Green Power | An Admired Employer | Power to Change Society | Operations and Governance

**ESG Department and Organizations**

Business Development, Customer Service, Environment, Safety and Health, Finance, Human Resources, Information Technology, Materials Management, Risk Management, Investor Relations, Legal, Operations, Public Relations, Quality and Reliability, Research and Development, TSMC Charity Foundation, TSMC Education and Culture Foundation

## Dr. Y.J. Mii

**Executive Vice President and Co-Chief Operating Officer**

TSMC fosters an inclusive environment to cultivate innovative talent, inspiring employees to push boundaries and collaboratively develop world-leading semiconductor technologies. This enables customers to realize their innovations and contributes to a sustainable and better future for the world.

## Y.P. Chyn

**Executive Vice President and Co-Chief Operating Officer**

Dedicated to driving technological innovation, promoting low-carbon transformation, and implementing environmental sustainability, TSMC supports customers in achieving their sustainability goals and collaborates with supply chain partners to increase the positive impact of green manufacturing, leading to shared ecological prosperity.

## Sylvia Fang

**Senior Vice President, Legal and General Counsel/Corporate Governance Officer**

Built on its core value of Integrity, TSMC upholds the highest standards in corporate governance, ethical practices, regulatory compliance, and risk management, while balancing the interests of all stakeholders, in pursuit of sustainable business operations.

## Dr. Michael Wu

**Vice President, Research & Development/ Platform Development**

Technology leadership serves as the cornerstone of TSMC's sustained growth. We've strived to build an open, innovative, and inclusive R&D environment, leveraging digital excellence to unlock employee potential and achieve business sustainability.

## Dr. Kevin Zhang

**Senior Vice President, Business Development and Global Sales, and Deputy Co-COO**

The continuous evolution of semiconductor technologies enables AI to transform human life. We've forged meaningful partnerships with customers worldwide to design a sustainable technology roadmap and develop energy-efficient products, driving a better society.

## Ray Chuang

**Vice President, Operations/Fab Operations I**

By leveraging AI technologies and advanced intelligent manufacturing, TSMC delivers consistent excellence in quality and operational efficiency across its global operations, meeting customer needs worldwide. At the same time, the Company encourages talent development and inclusion, fostering shared growth with society.

## Dr. L.C. Lu

**TSMC Fellow and Vice President, Research & Development/ Design & Technology Platform**

TSMC's Open Innovation Platform® brings together the creative thinking of customers and partners with a common goal of reducing design barriers and cycle time. Through closer and deeper collaboration, more customer emerging products are enabled.

Note: Items are arranged according to the order of corresponding sustainability role sections.

## Dr. Cliff Hou

**Senior Vice President and Deputy Co-COO/ Chief Information Security Officer**

TSMC aspires to serve as a global benchmark for corporate sustainability, and wields its influence across the value chain. The Company joins forces with partners to mitigate environmental, safety, and health risks, bolstering operational resilience and advancing toward a net-zero future.

## Lora Ho

**Senior Vice President, Human Resources**

Globalization brings diverse perspectives and innovative thinking to TSMC. We continue to foster an inclusive environment that respects each employee's uniqueness, inspiring creativity and innovation, and enabling both employee and the Company to grow together.

## Dr. Arthur Chuang

**Vice President, Operations/Facility**

Achieving net zero sustainability is TSMC's objective in driving green manufacturing. The Company's facility operations focus on energy conservation, carbon reduction, zero emissions, diverse water sources with zero environmental impact, and circular resource use with zero waste. These efforts, along with our support for biodiversity, lay the foundation for sustainable operations.

## Dr. F.C. Tseng

**Chairman, TSMC Education and Culture Foundation**

The TSMC Education and Culture Foundation continues to dedicate recourses to three core services: Cultivating the Young Generation, Educational Collaboration, and Arts and Culture Promotion. By incorporating sustainability principles into diverse programs, the Foundation nurtures the next generation, empowering them to become a positive force for societal progress.

## Sophie Chang

**Chairperson, TSMC Charity Foundation**

The TSMC Charity Foundation embraces the motto "Joyful Volunteers," encouraging voluntary participation without mandating employee involvement. Each team shares its experiences and exchanges ideas after activities, fostering greater interest among employees to get involved.

## Wendell Huang

**Senior Vice President, Finance and Chief Financial Officer/ Spokesperson**

Despite persisting macroeconomic uncertainties, TSMC remains dedicated to delivering outstanding financial performance, ensuring sound corporate governance, and bringing long-term profitable growth to investors. Concurrently, we proactively address the needs and expectations of our stakeholders, striving to achieve ambitious ESG objectives with unwavering commitment.

Note: Items are arranged according to the order of corresponding sustainability role sections.

## ESG Reporting to the Board of Directors

### 2024 Achievements

- Increased the use of renewable energy and enhanced green manufacturing performance in response to net zero emissions targets and RE100 commitments
- Integrated water-positive impact into the core climate strategy by utilizing reclaimed water and developing/restoring diverse water sources to mitigate environmental stress
- Implemented the "T.S.M.C. Supply Chain Carbon Reduction Strategy " and incorporated emissions performance into supplier selection criteria to accelerate the supply chain's transition to decarbonization
- Updated its Global Inclusive Workplace Statement , continued supporting the establishment of employee resource groups, and deepened global talent development and growth
- Supported the development of outstanding and competitive semiconductor talent by expanding academia-industry collaboration around the World and promoting STEM education
- Initiated the Eco Plus! Ecological Harmony Program , reinforcing biodiversity efforts by focusing on three aspects — habitat, species, and knowledge
- Published the first Human Rights Report and Sustainability Impact Valuation Report , while updating the Climate and Nature Report , UN SDGs Action Report , and Materiality Analysis Report , strengthening transparency in sustainability disclosures

### 2025 Work Plans

- Set 2025 as the base year to achieve absolute reduction targets for Scope 1–3 emissions aligned with SBTi by 2035
- Require major emission contributors in the supply chain to sign the TSMC Greenhouse Gas Reduction, Emissions Elimination & Neutrality (GREEN) Agreement for Suppliers, strengthening green transition capabilities
- Launch improvement plans based on the company-wide Workplace Human Rights Survey and establish a Supplier Human Rights Management Tracking Platform to deepen value chain governance
- Expand collaborative education programs across all education levels to continuously cultivate semiconductor and STEM talent
- Collaborate with cross-sector partners to implement initiatives in educational innovation, health protection, ecological sustainability, art and cultural literacy, and community assistance, reinforcing social engagement
- Release the inaugural Responsible Supply Chain Report to advance sustainable management practices

## ESG Steering Committee

### 2024 Achievements

- Put sustainable development into action and reviewed ESG practices domestically and internationally, reassessed and adjust mid-to-long-term sustainability goals, continued to align with global sustainability standards, management trends, and corporate best practices
- Assessed the progress of action plans for net zero emissions by 2050, and expanded energy conservation and carbon reduction measures
- Advanced biodiversity initiatives, supported the "Eco Plus! Ecological Harmony Program," and increased stakeholder participation to promote Nature Positive
- Developed carbon management tools and implemented carbon reduction project audits, strengthened emissions reduction progress management for key emission source suppliers, and hosted the first Supply Chain Environment, Safety, and Health Technology Forum, empowering sustainable operations
- Accelerated the Company's culture of sustainability innovation by supporting the fifth ESG AWARD, attracting 4,330 sustainability proposals from organizations and individual employees, a 36.8% increase from the previous year
- Set and supervised budget allocation and financial controls related to corporate sustainability, and coordinated ESG resource demands, allocation, and execution planning

## ESG Committee

### 2024 Achievements

- Achieved and maintained Scope 1 and Scope 2 net zero emissions at all overseas operational sites; promoted diversified renewable energy development to strengthen low-carbon operations
- Introduced reclaimed water into 5nm and 3nm advanced processes ; officially commenced operations of the Taichung Zero Waste Manufacturing Center ; collaborated with the Ministry of Environment on membrane carbon capture technology to accelerate resource circularity
- Established a spectral database for CMR substances, accumulating 273 screening items; fully replaced NMP in the etching process at overseas fabs, advancing green chemical management
- Launched a carbon reduction subsidy project for tier one raw material suppliers in Taiwan, encouraging the replacement or installation of relevant equipment/tools to boost value chain decarbonization
- Conducted a Workplace Human Rights Survey across the Company and, for the first time, incorporated supplier human rights performance into sustainability targets to strengthen human rights management practices
- Developed and promoted personal protective equipment in a range of sizes, and completed protective clothing designs suited to Taiwanese body types to improve workplace safety and comfort
- Continued to engage with social trends through the TSMC Education and Culture Foundation and the TSMC Charity Foundation , contributing to shared prosperity in society

# Materiality Analysis and Stakeholder Engagement

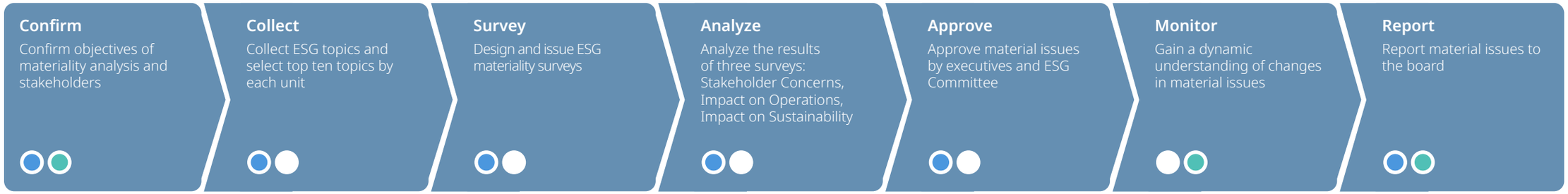
Materiality analysis serves as a fundamental basis for TSMC's preparation of sustainability reports, enhancement of sustainability management, and strengthening of stakeholder engagement. In alignment with GRI 3: Material Topics 2021 under the GRI Universal Standards 2021, as well as the ESRS issued by the WEF and the European Financial Reporting Advisory Group under the CSRD, the Company adopts the Double Materiality principle, grounded in Impacts, Risks, and Opportunities (IRO), integrating three dimensions — Stakeholder Concerns, Impact on Organizations, and Impact on Sustainability — to establish TSMC's Dynamic and Double Materiality (TDDM) methodology. The TDDM framework prioritizes ESG issues based on levels of communication, growth potential, and impact to determine the Company's materiality matrix and guide its sustainability management strategy. For further details, please refer to the latest TSMC Materiality Analysis Report for further details.

Through the TDDM methodology, TSMC performs material issue assessments each year based on varying survey objectives to form a comprehensive survey cycle. In the first year, the Company collects, investigates, analyzes, and redefine material sustainability issues. In the following year, changes in material issues are reviewed, causal relationships between the issues are explored, and the interconnections between material issues and action plans are identified to ensure the effectiveness of the actions. In 2023, TSMC engaged 1,693 internal and external stakeholders, along with over 233 of its managers and employees responsible for driving sustainability efforts, to evaluate issues across three dimensions: stakeholder concerns, impact on organizations, and impact on sustainability. This process identified 14 material issues, which were confirmed by the ESG Committee and reported to the Board of Directors. For each material issue, TSMC has established long-term goals for 2030 and actively tracks performance. Additionally, the Company incorporates material issues into its enterprise risk management process to identify risk factors, trends, severity, and likelihood — enabling the development of an ESG strategic roadmap from both risk and opportunity perspectives, while providing deeper insight into the Company's sustainability impact.

In 2024, building on the survey results, TSMC applied the DEMATEL methodology, inviting 92 managers and staff members responsible for managing and implementing material issues to collectively examine the interrelationships among the 14 material issues. This approach enabled the Company to identify high-impact critical material issues that play a leading role in navigating complex and rapidly evolving sustainability challenges. This allows the Company to assess the effectiveness of current action plans, to continuously enhance its achievement of sustainability strategies, and to ensure that the action plans align precisely with sustainability goals and challenges. Based on the year's analysis, TSMC identified six key material issues and reported the findings along with planned and ongoing actions to the Board of Directors.

TSMC's TDDM methodology, along with the annual materiality analysis process and results, has been verified by the independent third-party organization DNV Business Assurance Co. Ltd. In 2023, the top five material issues identified — Sustainable Supply Chain, Climate and Energy, Talent Recruitment and Retention, Talent Development, and Innovation Management — led the Company's sustainability efforts. In 2024, TSMC identified six critical material issues that exhibit high impact and play a leading role: Innovation Management, Sustainable Supply Chain, Climate and Energy, Business and Human Rights, Talent Recruitment and Retention, and Circular Resources.

## TSMC Materiality Analysis Process



## Process for Determining Material Issues

Dynamic Materiality

Double Materiality

**Step 1**

Identify ESG Issues

Governance **6 Issues**
Economy **5 Issues**
Environment **5 Issues**
Society **6 Issues**

**Step 2**

Stakeholder Concerns

Communication

**6 Types**
Stakeholders

**Step 3**

Impact on Operations

Growth

**4 Dimensions**
Defining the Company's values or operating Impact

**Step 4**

Impact on Sustainability

Impact

**20 Impacts**
Positive & negative impacts on the economy, environment, and people, including impacts on human rights

**Step 5**

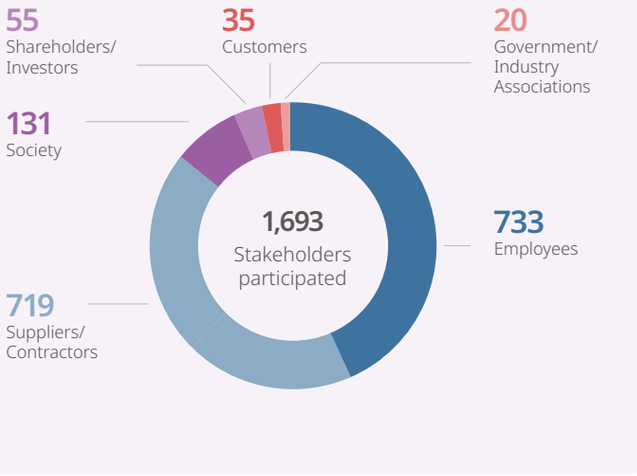
Define Material Issues

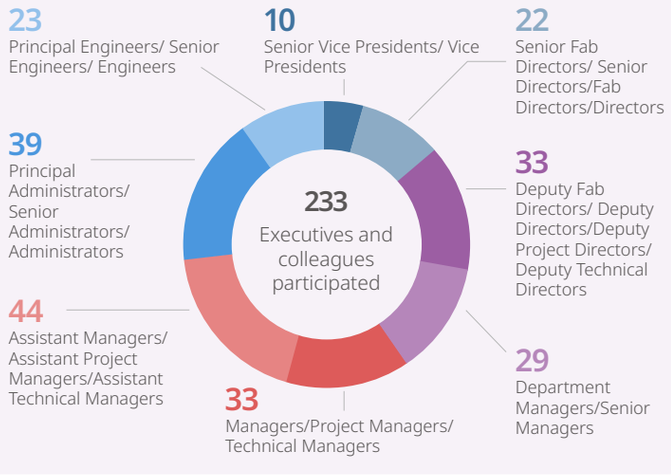
- Internal/External Consultant Confirmation
- Senior Executive Review
- Report to the Board of Directors

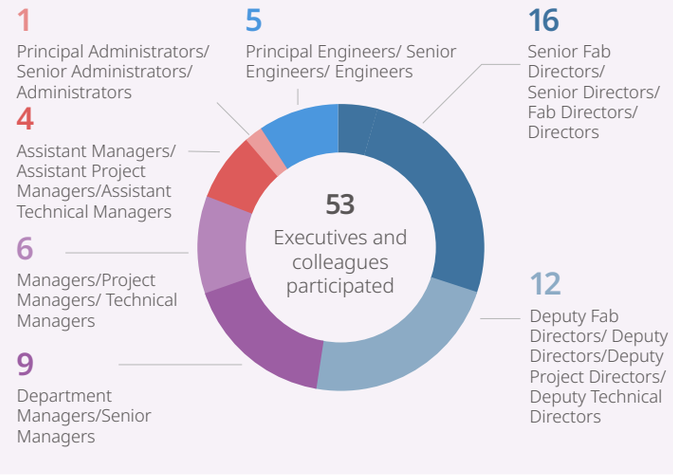
**Step 6**

Review Interrelationships Among Material Issues

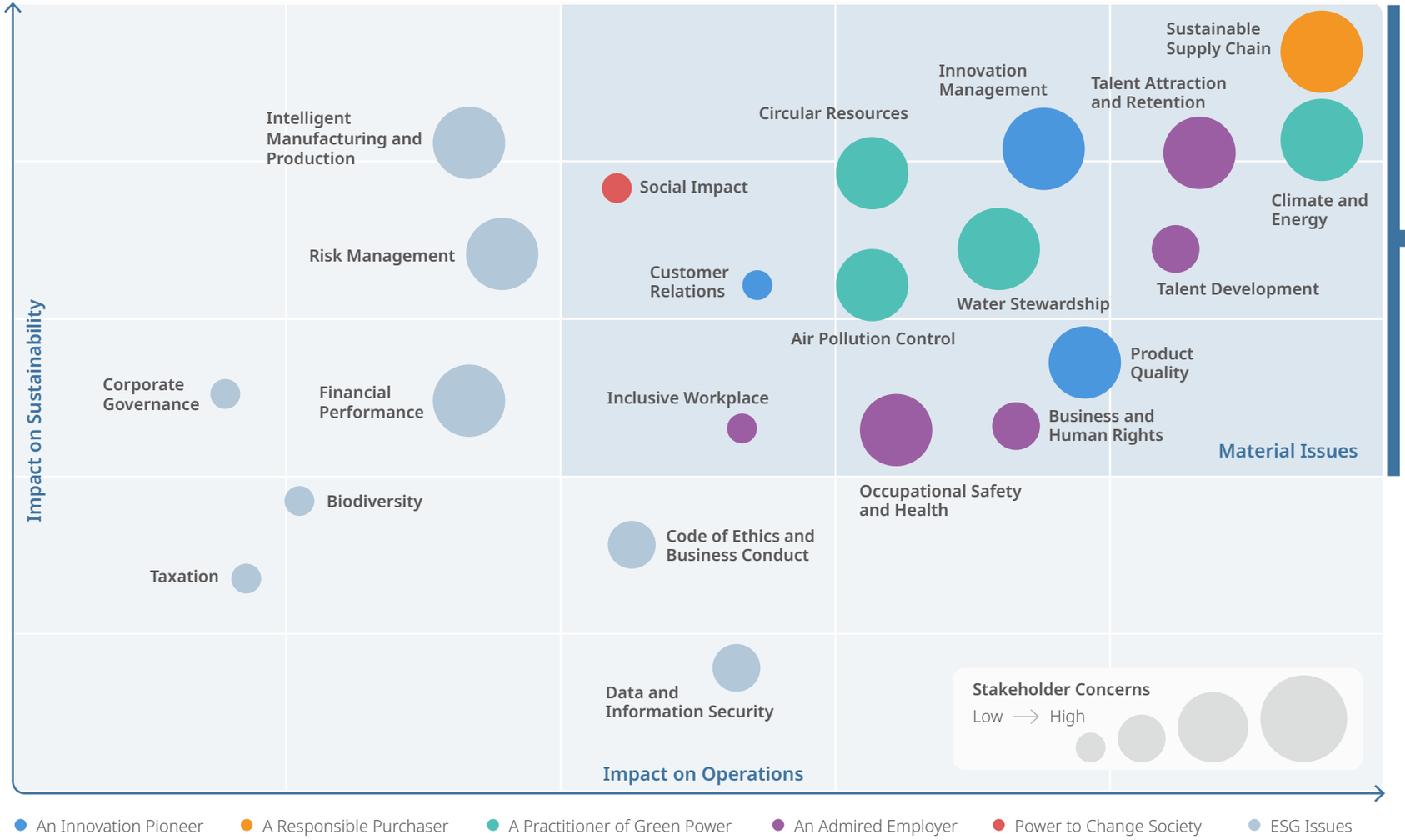
- Understand Stakeholder Concerns
- Plan a Sustainability Strategy Map
- Reinforce External Communication Effectiveness
- Identify Positive and Negative Impacts
- Compile and Disclose the Sustainability Report



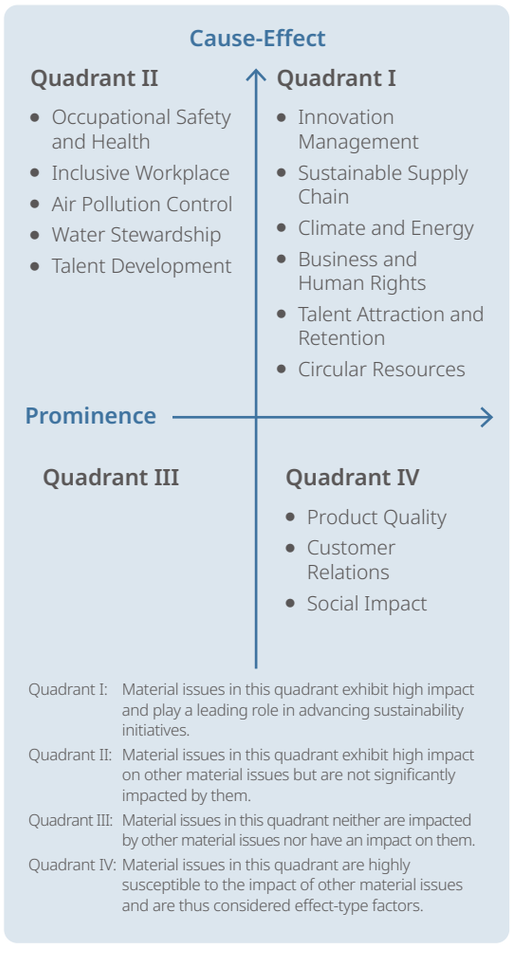



## TSMC Materiality Matrix




## TSMC Material Issues Cause-and-Effect Matrix




Quadrant I: Material issues in this quadrant exhibit high impact and play a leading role in advancing sustainability initiatives.

Quadrant II: Material issues in this quadrant exhibit high impact on other material issues but are not significantly impacted by them.

Quadrant III: Material issues in this quadrant neither are impacted by other material issues nor have an impact on them.

Quadrant IV: Material issues in this quadrant are highly susceptible to the impact of other material issues and are thus considered effect-type factors.

## Material Issues and Value Chain

| Sustainability Roles | Material Issues[Note 1] | GRI-specific Topics | SASB Standards | Upstream[Note 2] | TSMC Operation[Note 3] | | Downstream[Note 4] | Operational Impact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Procurement Stage | Wafer Fabrication | Packaging/ Testing | Customer Use | Revenue Growth | Customer Satisfaction | Employee Cohesion | Operational Risks |
| An Innovation Pioneer | Innovation Management | Indirect Economic Impact and Energy | TC-SC-410a.2 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Product Quality | Customer Health and Safety | TC-SC-410a.1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| | Customer Relations | Customer Privacy | | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| A Responsible Purchaser | Sustainable Supply Chain | Procurement Practices, Supplier Environmental Assessment, Supplier Social Assessment | TC-SC-440a.1 | ✓ | | | | ✓ | | | ✓ |
| A Practitioner of Green Power | Climate and Energy | Energy, Emissions, Economic Performance | TC-SC-110a.1, TC-SC-110a.2, TC-SC-130a.1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| | Water Stewardship | Water and Effluents | TC-SC-140a.1 | ✓ | ✓ | ✓ | | | | | ✓ |
| | Circular Resources | Emissions | | | ✓ | ✓ | | | | | ✓ |
| | Air Pollution Control | Waste | TC-SC-150a.1 | ✓ | ✓ | ✓ | | | | | ✓ |
| An Admired Employer | Inclusive Workplace | Diversity and Equal Opportunity | | | ✓ | ✓ | | | | ✓ | |
| | Talent Attraction and Retention | Economic Performance, Market Presence, Labor/Management Relations, Diversity and Equal Opportunity | TC-SC-330a.1 | | ✓ | ✓ | | ✓ | | ✓ | |
| | Talent Development | Training and Education | | | ✓ | ✓ | | ✓ | | ✓ | |
| | Occupational Safety and Health | Occupational Safety and Health | TC-SC-320a.1, TC-SC-320a.2 | ✓ | ✓ | ✓ | | | | ✓ | ✓ |
| Power to Change Society | Social Impact | Economic Performance, Indirect Economic Impact | | | ✓ | ✓ | | | | ✓ | |

Note 1: Given the multifaceted nature of the "Business and Human Rights" issue and its significance to corporate sustainability, please refer to the TSMC Human Rights Report for details on its value chain impact.
Note 2: Upstream boundaries are raw materials, equipment, and related services purchased by TSMC.
Note 3: TSMC Operations boundaries are wafer fabrication and packaging/testing services offered by TSMC.
Note 4: Downstream boundaries are customer products manufactured by TSMC.
Note 5: "V" signifies the issue has real impact on this stage or that the issue is a spotlight issue.

## Executive Compensation ESG Indicator

TSMC provides Employee Restricted Stock Awards to executives, with a maximum of 110% of their eligible shares each year. 100% of the calculation is based on the company's relative performance to Total Shareholder Return (TSR). The Compensation and People Development Committee evaluates the annual ESG achievement of the TSMC Sustainability Impact (TSI) Indicator and adjusts the eligible shares within a range of ±10%. The TSI Indicator is linked to TSMC's 18 2030 long-term material issues goals, aiming to continuously create long-term shareholder value while enhancing ESG achievements. Through sustainable governance, TSMC strives to drive operational resilience and foster a positive cycle for society.

### Linkage to the Employee Restricted Stock and Performance Evaluation

| Dimension | Weight | Indicators |
|---|---|---|
| Finance | 100% | Total Shareholder Return, TSR |
| ESG Achievement | + /- 10% | TSMC Sustainability Impact, TSI |

### Material Issues and Executive Compensation ESG Indicators

| Sustainability Roles | Material Issues | Weight | Sustainability Impact Indicators | 2030 Goals | 2024 Targets and Achievements[Note 1] | |
|---|---|---|---|---|---|---|
| An Innovation Pioneer | Innovation Management | 10% | Number of undergraduate and graduate students developed through industry-academia collaboration | >35,000 students[Note 2] | >17,000 students | ↑ |
| | | | Number of female high-school students participating in STEM programs | >3,000 students | >2,500 students | ✓ |
| | Product Quality | 3% | Cases of product recalls due to safety concerns | 0 cases | 0 cases | ✓ |
| | Customer Relations | 3% | Customer trust and satisfaction rate | >90% | >90% | ↑ |
| A Responsible Purchaser | Sustainable Supply Chain | 15% | Percentage reduction in suppliers' carbon emissions[Note 3] | 30% | 4% | ✓ |
| | | | Percentage of global local sourcing for indirect raw materials | 67.5% | 63.6% | ↑ |
| | | | Ratio of tier 1 suppliers setting inclusive workplace related policies or statements | 100% | 40% | ↑ |
| A Practitioner of Green Power | Climate and Energy | 10% | Percentage of renewable energy used at all TSMC operation sites | 60% | 13% | ↑ |
| | Water Stewardship | 10% | Reduction in unit water consumption (L/12-inch equivalent wafer mask layer) | 30%[Note 4] | 2.7% | — |
| | Circular Resources | 10% | Reduction in unit air pollutant emissions | 65%[Note 5] | 58% | — |
| | Air Pollution Control | 10% | Waste recycling rate | 100% | 96% | ↑ |
| An Admired Employer | Inclusive Workplace | 7.5% | Women in management | >20% | >18% | — |
| | | | Percentage of women among newly-hired technical professionals | >30% | >26% | ↑ |
| | Talent Attraction and Retention | 7.5% | Rank of "Sustainability Engagement" in the Employee Engagement Survey | Top 25%[Note 6] | -[Note 6] | - |
| | Talent Development | 5% | Annual average hours of learning for employees | 100 hours | 90 hours | ↑ |
| | Occupational Safety and Health | 3% | Incident rate per 1,000 employees | <0.2 | <0.2 | ↑ |
| Power to Change Society | Social Impact | 6% | Cumulative hours of volunteer service | 600,000 hours[Note 7] | 120,000 hours | ↑ |
| | | | Cumulative amount of Matching Donations[Note 8] | NT$ 70,000,000[Note 9] | NT$ 13,600,000 | — |

Note 1: Please refer to each chapter for progress and information.
Note 2: Between 2021 and 2030.
Note 3: Suppliers refer to raw material suppliers, including suppliers of silicon wafers, bulk gases, bulk chemicals, and other chemicals. The reduction ratio of carbon emissions refers to the comparison against the BAU scenario.
Note 4: Using 2010 as the baseline year.
Note 5: Using 2015 as the baseline year.
Note 6: The Employee Engagement Survey is conducted every two years and the result is compared against the WTW Global High Performance Norm.
Note 7: Between 2023 and 2030.
Note 8: Record the actual hours of service received by the unit (excluding empowerment, transportation, etc.). For every hour recorded, NT$300/US$10 will be donated.
Note 9: Between 2023 and 2030.

↑ Exceeded ✓ Achieved — Missed Target

# Stakeholder Communication

## Employees

Concerned with the sustainable development of the Company while valuing meaningful work, a safe and healthy workplace, personal data protection, regulatory compliance, competitive compensation and benefits, continuous professional growth, and work-life balance.

**109**
Silicon Garden Meetings (Labor-management meetings)

**5,169**
Cases handled through internal communication channels

> The tFlex points offer a wide range of applications, allowing me to take courses I might have otherwise hesitated to enroll in. Through this benefit, I truly feel the Company's care for its employees — prioritizing our needs and growth alongside corporate development.
>
> **H.Y. Liu**
> TSMC Employee

> TSMC offers accompaniment leave for prenatal checkups and paternity leave, as well as childcare leave, which has allowed me, as a father, to share caregiving responsibilities with my spouse more flexibly and confidently. As a result, I can pursue my career goals while also being present for my family.
>
> **Juyn-Ming Chang**
> TSMC Employee

### Issues of Concern

- Inclusive Workplace
- Talent attraction and retention
- Talent development
- Occupational safety and health
- Social impact
- Ethics/regulatory compliance
- Risk management

### Communication Channels

- Core Values Survey and Employee Engagement Survey/once every two years
- Workplace Human Rights Climate Survey and Risk-Aware Culture Survey/once every two years
- Employee training (forums, lectures, physical and online courses) / annually
- Silicon Garden Meeting (Labor Management Meeting)/quarterly
- Communication meetings for various levels of managers and employees, e.g. the executive communication meeting, skip levels and communication meetings in individual functions or divisions/quarterly
- Human Resources Business Partner Team/as needed
- Corporate intranet, internal emails, and other announcement channels, eSilicon Garden stories/as needed
- Diverse communication channels, such as Employee Voices for Silicon Garden Meeting, Ombudsman System, Whistleblower Procedures, Irregular Business Conduct Reporting, Sexual Harassment Investigation Committee, Fab Caring Circle, Employee Opinion Box, employee PIP & IT Security mailbox and hotline, Occupational Disease Investigation Committee and Occupational Safety and Health Feedback Channels, etc. /as needed

TSMC Family Day invites employees' families to embark on a wafer adventure.

| Focus Areas | Responses from TSMC |
|---|---|
| Hope to understand the Company's development vision and maintain effective communication | • Established comprehensive employee communication channels to encourage suggestions and strengthen interactions between staff and the Company's management team |
| Expect the Company to foster an inclusive workplace and unlock employee potential | • Developed internal opportunities for diverse group engagement, including the Inclusion Champion Program and the second Global Inclusive Workplace Campaign<br>• Expanded Employee Resource Groups (ERGs) to support employees in achieving self-fulfillment |
| Hope to balance work with family and personal life to achieve mutual growth | • Launched the TSMC ChildCare Benefit Program 3.0 and TSMC Global Flexible Benefit Plan (tFlex) to introduce more flexible policies that support work-life balance<br>• Provided support resources tailored to various mental health needs through the Three-stage Prevention and Care Model , promoting employees' physical and emotional well-being |
| Expect the Company to strengthen environmental, health, and safety culture and protection standards to ensure a secure working environment | • Held the inaugural "Environmental Protection, Safety and Health Month ," enhancing awareness and practice of ESH principles among employees, with over 3,300 total participants |
| Hope to engage in more diverse ESG initiatives and access opportunities for sustainable action | • Organized the 5th TSMC ESG AWARD as a central platform for advancing a culture of sustainability, receiving 4,330 proposals from domestic or overseas employees — a 36.8% increase from the prior year — and invited suppliers to participate in the poster exhibition |
| Hope to access regulatory information and compliance guidelines related to business operations, such as zero tolerance for corruption and conflict of interest | • Offered the "Annual Ethics and Regulatory Compliance " course to reinforce employees' foundational knowledge on compliance, achieving a 100% completion and pass rate, with advanced modules available as electives<br>• Delivered "Antitrust Compliance Training" to the designated business units, with 1,814 employees completing the course and a completion rate of 99% |
| Expect the Company to eliminate workplace bullying and sexual harassment | • Launched the Understanding TSMC's Human Rights Policy – Building a Harassment-Free Workplace and Eliminating Sexual Harassment course, with a completion rate of 97.8%<br>• Promoted the Ombudsman System, Sexual Harassment Investigation Committee, and Whistleblower Procedures, with regular updates presented to the Board of Directors |
| Aim to understand risk management processes, methodologies, and tools to enhance risk management capabilities | • Hosted the first virtual lunchtime seminar on risk management and conducted 16 enterprise risk management workshops across wafer fabs and overseas subsidiaries to raise employees' risk awareness |

## Shareholders/ Investors

Concerned with the investment value of TSMC, including market prospects, growth strategy, capacity planning, profitability, geopolitical development and impact, dividend policies, and sustainability performance.

578
Institutional investors

404
Conferences and meetings

TSMC's leading edge innovations play a critical role in improving energy efficiency and fostering digital connections throughout the world. Although the path to net zero within semiconductor industry is far from clearcut, TSMC is at the very forefront and has demonstrated strong and quantifiable commitment to moving towards carbon free energy.

**Frank Shi, Portfolio Manager**
**Iona Walker, Responsible Investment Analyst**
T. Rowe Price Hong Kong Limited

### Issues of Concern

- Innovation management
- Climate and energy
- Risk management
- Financial performance
- Business and human rights

### Communication Channels

- General shareholders' meeting/annually
- Annual Reports, Sustainability Reports, Theme Reports (Climate and Nature Report, UN SDGs Action Reports, Materiality Analysis Reports, Sustainability Impact Valuation Report, Human Rights Report), and Form 20-F with the U.S. Securities and Exchange Commission/annually
- Earnings conference/quarterly
- Domestic and overseas broker conferences/as needed
- Face-to-face meetings, video conference calls, telephone conference calls and Investor Relations mailbox /as needed
- Major announcements on the Market Observation Post System, and corporate press releases on the Company's website/ as needed

2024 TSMC Annual General Meeting

| Focus Areas | Responses from TSMC |
|---|---|
| The sustainability of AI-related demand, and potential impact of a slowdown in demand | • Communicated TSMC's AI-related opportunities, strategy, and discipline in capacity planning in investor conferences |
| Response to climate change and renewable energy use | • Communicated progress based on the Sustainability Report and Climate and Nature Report |
| Impact of geopolitical development and related regulations on the business, and TSMC's response | • Communicated TSMC's risk management framework, prudent business plans and disciplined capital management strategies in investor conferences |
| Long-term profitability | • Factoring in the positive and negative factors to our gross margin, TSMC continues to believe it can achieve its long-term financial targets of: (1) gross margin of 53% and higher and (2) ROE of 25% and higher |
| Human rights risks and the impacts to TSMC's business | • Published the Human Rights Report to communicate initiatives to mitigate human rights impacts across its operations |

## Customers

Concerned with TSMC's technological development and production planning, including capacity requirements, product quality, and robust customer data protection mechanisms, to support customers in achieving product success and gaining a competitive edge in the market.

**102**
Quarterly assessment meetings

**1,340**
Management-level customer meetings

> TSMC and MediaTek are strategic partners in both business and technology. TSMC has demonstrated outstanding performance and proven to be a trustworthy collaborator.
>
> **MediaTek Inc.**

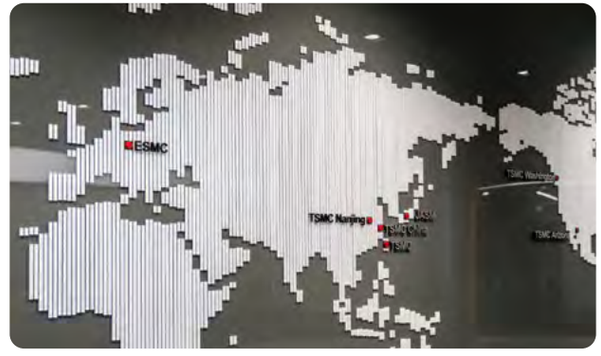
> TSMC always kept its words and commitment. This corporate culture and practice is carried in every level and every TSMC team we interfaced. That is something we can 100% rely on.
>
> **ON Semiconductor**

### Issues of Concern

- Innovation management
- Product quality
- Customer relations
- Risk management

### Communication Channels

- Customer satisfaction survey/annually
- Business and technology assessment/quarterly
- Customer meetings/as needed
- Customer visits/audits/as needed




TSMC continues to expand its global footprint.

| Focus Areas | Responses from TSMC |
|---|---|
| Technology development schedules and plans | • Offered 1,028 process technologies and 161 advanced packaging technologies in line with TSMC's technology roadmap |
| Product quality | • Continued perfecting production technologies and product quality. Reduced engineering defects per one million 12-inch wafers to 26% of 2019 level |
| Capacity planning and production information | • Upgraded the customer self-service wafer order system, TSMC-Online™, to facilitate access to comprehensive technical and production information |
| Business resilience and continuity management | • Underwent 19 customer audits on business continuity planning, achieving an average score of 93 |

## Suppliers/ Contractors

Concerned with TSMC's development of new process technologies, quality enhancement, supply chain resilience, climate change response, environmental protection, occupational safety and health, human rights management, business ethics and code of conduct, and information security standards and development, with the aim of deepening bilateral cooperation to achieve a sustainable supply chain management model.

**220**
Supplier audit and communication meetings

**725**
Suppliers participated in the Supply Chain ESH Training Forum

We firmly believe that carbon reduction is not only an environmental responsibility but also a promise to future generations. We actively adopt green energy and implement energy-saving and carbon mitigation initiatives, working together to build a low-carbon supply chain.

**Alex Chang**
**President**
FUJIFILM Electronic Materials Taiwan Co., Ltd.

We are committed to prioritizing lower-carbon raw materials and significantly lowering emissions through the development of diverse energy-saving solutions and in-house solar power installations. We will continue to collaborate closely with TSMC to drive low-carbon transformation across the industry.

**Masaru Oto**
**Chairman**
MGC Pure Chemicals Taiwan, Inc. (MPCT)

### Issues of Concern

- Climate and energy
- Product quality
- Sustainable supply chain
- Occupational health and safety
- Ethics/regulatory compliance

### Communication Channels

- Supplier Code of Conduct promotion/annually
- Supplier Self-Assessment Questionnaire (SAQ) /annually
- Supply chain environment, safety and health training/annually
- Supplier Human Rights Enhancement Workshop /annually
- Sustainable Supply Chain Environment, Safety and Health Forum, Supply Chain ESH Technical Forum/annually
- Carbon reduction follow-up meeting with major emission contributors/ every two months, semiannually
- Supplier meetings/as needed
- On-site support and audit/as needed
- Supply Chain Employee Grievance Channel/as needed
- Supply Online 360 Global Responsible Supply Chain Platform/as needed

TSMC collaborates with suppliers to conduct occupational safety and disaster prevention simulation training using VR.

| Focus Areas → | Responses from TSMC |
|---|---|
| Expect to develop carbon emissions management capabilities to achieve a green and low-carbon supply chain | • Conducted carbon management training and CDP guidance courses, requiring participation from 135 raw material and equipment suppliers in the Carbon Disclosure Project (CDP)<br>• Developed carbon management tools and collaborated with major emission contributors to propose carbon reduction plans, targeting a cumulative reduction of 2 million metric tons by 2030, with 230,000 metric tons already achieved<br>• Launched the Supply Chain Carbon Reduction Subsidy Program , allocating NT$84 million in its first year |
| Expect to strengthen sustainable risk control and enhance the quality of raw materials | • Achieved 100% completion of TSMC's sustainability self-assessment questionnaire by all tier 1 suppliers; 70 critical suppliers underwent third-party sustainability risk audits, with 55 follow-up audits completed<br>• Guided 10 suppliers in improving production processes and quality<br>• Released TSMC's Sustainable Raw Materials Policy and worked jointly with suppliers to actively promote resource circularity in raw materials |
| Expect to build resilience for sustainable development and grow alongside TSMC | • Launched the TSMC Supplier Sustainability Academy , offering seven major programs with a total of 90 courses, reaching 3.1 million user visits<br>• Held three training sessions and workshops on supply chain human rights, with a total of 966 supplier representatives in attendance<br>• Established a dedicated supplier section at the TSMC ESG AWARD Poster Exhibition for the first time, partnering with suppliers to enhance sustainable development across the industry |
| Expect to establish effective mechanisms for environmental protection, safety, and health management | • Hosted the Sustainable Supply Chain ESH Forum and the Supply Chain ESH Technical Forum, along with multiple guidance programs , to empower suppliers in sustainable operations<br>• Presented awards to recognize suppliers with outstanding ESH performance; in 2024, Air Products San Fu Co., Ltd. received the Supplier EHS Excellence Award, while Chunghwa Precision Test Tech. Co., Ltd. (Pingzhen Plant 1) was honored with the Supplier ESH Improvement Award |
| Expect to keep current with business ethics and regulatory compliance to lay a solid foundation for sustainable management | • Revised the Supplier Code of Conduct, Supplier Sustainability Standards, and the Letter of Assurance on TSMC's Supplier Code of Conduct and Business Ethics Statement, and required 100% of tier 1 suppliers to sign the updated documents |

## Government/ Industry Associations

Concerned with industry and technological development, talent cultivation and management, renewable energy, biodiversity, water stewardship, circular resources, and regulatory trends and responses.

49
Government Agencies

114
Associations

TSMC, a RE100 member since 2020, has driven GW-scale renewables. By moving its RE100 target to 2040, it shows renewables are scalable and good for business. We're excited to keep working with TSMC to boost corporate access to clean power and advance the energy transition.

**Sam Kimmins**
Director of Energy, Climate Group

We encourage companies to refer to the "Trade Secret Sustainable Intelligent Management Self-Evaluation Metrics" advocated by TSMC, to conduct self-assessments and bolster their trade secret management practices.

**Wayne Wang**
Secretary-General, The Allied Association for Science Park Industries

### Issues of Concern

- Innovation management
- Climate and energy
- Water stewardship
- Circular resources
- Talent development
- Corporate governance/ Regulatory compliance

### Communication Channels

- Industry association communication platform/monthly
- Official letters, documents, emails and visits/as needed
- Provision of industry experience and advice, and keynote speeches/as needed
- Conferences (e.g., briefings, public hearings, symposia, seminars, meetups, phone conference) /as needed

TSMC Taichung Zero Waste Manufacturing Center commercial operation ceremony.

| Focus Areas | Responses from TSMC |
|---|---|
| Industry development/ Intellectual property protection/Trade secret safeguarding | • Presented for consecutive 11 years the development trends of advanced semiconductor manufacturing technologies and TSMC's technical expertise to the Annual Tech Fair hosted by United States Patent and Trademark Office. Hundreds of patent examiners attended the meetings<br>• Established the "Trade Secret Sustainable Intelligent Management Center " and shared best practices through public-interest initiatives at the Allied Association for Science Park Industries, advancing intelligent trade secret management and advocacy |
| Renewable energy/ Biodiversity | • Launched the Rooftop Solar Procurement Program to encourage community investment in solar photovoltaic (PV) systems and support the green economy<br>• Joined "Energy Collaborative " to work collectively with industry partners to reduce carbon emissions across the semiconductor sector<br>• Collaborated with industry, government, academia, and research institutions to initiate the "Eco Plus! Ecological Harmony Program ," promoting biodiversity through actions focused on three aspects-habitat, species, and knowledge |
| Water stewardship/ Circular resources | • Expanded the use of reclaimed water , achieving a reclaimed water replacement rate of 17%. Launch the TSMC Arizona Reclaimed Water Plant Project to enhance water resource resilience<br>• Commissioned the Taichung Zero Waste Manufacturing Center into operation and the similar facilities are planned at the Southern Taiwan Science Park; collaborated with suppliers to successfully recycle TMAH waste solution and reuse it in wafer fabrication processes |
| Global talent cultivation/ management | • Promoted domestic and international academia-industry collaboration programs to cultivate top semiconductor talent through STEM education<br>• Engaged with representatives from industry, government, academia, and research institutions across Taiwan, the U.S., Japan, and Germany to exchange insights on TSMC's business model, process technologies, industry trends, and talent management practices |
| Corporate governance and regulatory compliance | • Participation in briefings and networking events on the latest export control regulations for industry practices exchange and to understand Taiwan's current export control landscape and global export control trends<br>• Participation in RMI conference to understand the latest developments in responsible mineral sourcing and compliance-related information |
| Environmental regulatory response, advocacy, and promotion | • Represented the Taiwan Semiconductor Industry Association in discussions with the Ministry of Environment on Sub-regulations of the Climate Change Response Act, the Regulations Governing the Collection of Carbon Fees, the Regulations Governing Self-determined Reduction Plans, and the Designated GHG Emissions Reduction Goals for Entities Subject to Carbon Fees, enhancing regulatory resilience |

## Communities

Concerned with the social impact of the TSMC Education and Culture Foundation, providing educational and cultural resources, creating diversified platforms, and nurturing well-rounded talent for the new era.

Concerned with the TSMC Charity Foundation's establishment of support systems in rural areas, integrating resources from industry, government, academia, and volunteer services to advance educational empowerment, elder care, and environmental conservation.

192
Charity partners

217
Charity programs

We are truly grateful to the TSMC Udreamer Project for providing us with the resources to pursue our dreams. For me, this journey was more than just a competition — it was a meaningful experience of personal growth. Thank you for inspiring us to hold fast to our dreams with greater determination and purpose.

**ReCreate Hub**
Udreamer Project Award-winning Team

We are thankful for the TSMC Charity Foundation's "Care for the Elderly" triangular model, which allows our school's healthcare expertise to collaborate with businesses, expanding our capacity to serve the community.

**Chi-Kang Wang**
Principal, Yuanpei University of Medical Technology

### Issues of Concern

- Social Impact

### Communication Channels

- Volunteer cadre meetings and volunteer activities and services/quarterly
- Project collaboration and visits/15 volunteer activities a week
- Sponsorship of charity projects and educational projects/as needed
- "Sending Love" charity platform/as needed
- TSMC Education and Culture Foundation and TSMC Charity Foundation websites/as needed
- ESG website, ESG Newsletter, ESG mailbox and social media (Facebook and LinkedIn) /as needed
- Irregular Business Conduct Reporting System/as needed

TSMC volunteers guide students to discover the wonders of science through interactive experiments.

| Focus Areas | Responses from TSMC |
|---|---|
| Foster youth development that balances technology and the humanities, empower teachers and students in remote areas to bridge the urban-rural gap, and enriches literary and artistic appreciation | • In 2024, the TSMC Education and Culture Foundation invested NT$144.88 million, focusing on three main strategies: Cultivate the Young Generation, Promote Educational Collaboration, and Promote Arts and Culture. Highlights included holding long term semiconductor courses and launching new university exploration camps for the first time, with the "TSMC Cup- Competition of Scientific Short talk" attracting Chinese-speaking students from seven countries and fostering international scientific exchange. The foundation continued the Udreamer Project, introduced Chinese handwriting and semiconductor workshops into the TSMC Aesthetic Tour and Science Tour programs, and hosted the 21st Hsin-Chu Arts Festival, which featured 39 cultural events that promoted community-driven cultural creation. In addition, its sponsorship of OneSong Orchestra's debut performance in Japan helped build a cultural bridge between Taiwan and Japan |
| Integrate diverse learning resources to support students in remote areas, strengthen social support networks to enhance elder care, and promote environmental education to reduce resource waste | • In 2024, the TSMC Charity Foundation invested NT$457.22 million, joining forces with the public, enterprise, and academic sectors, as well as 17,501 TSMC volunteers, to take action on three key pillars: Empowering Education, Caring for the Elderly, and Protecting the Environment. Initiatives included AI education programs to cultivate future tech talent, and the Job Fair for Senior High and Vocational High School Students, which drew 8,568 participants. The Network of Compassion system promoted a triangular elder care model connecting enterprises, hospitals, and communities. In addition, the foundation supported 13 organizations serving vulnerable populations through green energy initiatives and helped improve energy efficiency in 363 rural elementary schools using TSMC's energy-saving technologies, further advancing environmental education |

# Sustainability Impact

TSMC focuses on its core business, leveraging technological innovation to support customer product success and achieve steady profit growth. In the spirit of "One Earth", the Company is committed to creating economic development that prospers together with environmental sustainability. In its manufacturing operations, TSMC actively boosts energy and resource efficiency, strengthens climate resilience, and protects natural ecosystems and biodiversity, while creating a safe, healthy, and inclusive workplace, enhancing employee wellbeing and competitiveness through generous compensation and benefits, and talent development programs. In supply chain management, the Company drives semiconductor industry development through responsible procurement strategies, creating job opportunities while focusing on human rights protection and collaborating with suppliers to improve energy conservation, water efficiency, and waste reduction as it moves toward a net zero future. Based on the three competitive advantages of "technological leadership, manufacturing excellence, customer trust," TSMC leverages six key capitals — Finance, Manufacturing, Intelligence, Human Resources, Environment, and Society. By adopting a profit and loss mindset from an external perspective and utilizing a causality-driven sustainability impact pathway, TSMC constructs a value creation model founded on the Triple Bottom Line (people, planet, and profit). Employing scientific and systematic methods, the company measures the impact of value chain activities — including upstream procurement, company operations, and customer usage — on human well-being. This approach aims to enhance management decisions and strategic planning, thereby realizing the vision of net-positive sustainability.

## Six Major Capitals

**Finance**
Generate economic value and returns through the effective management of financial resources

**Manufacturing**
Manufacture products and provide services by investing in facilities, equipment, and materials

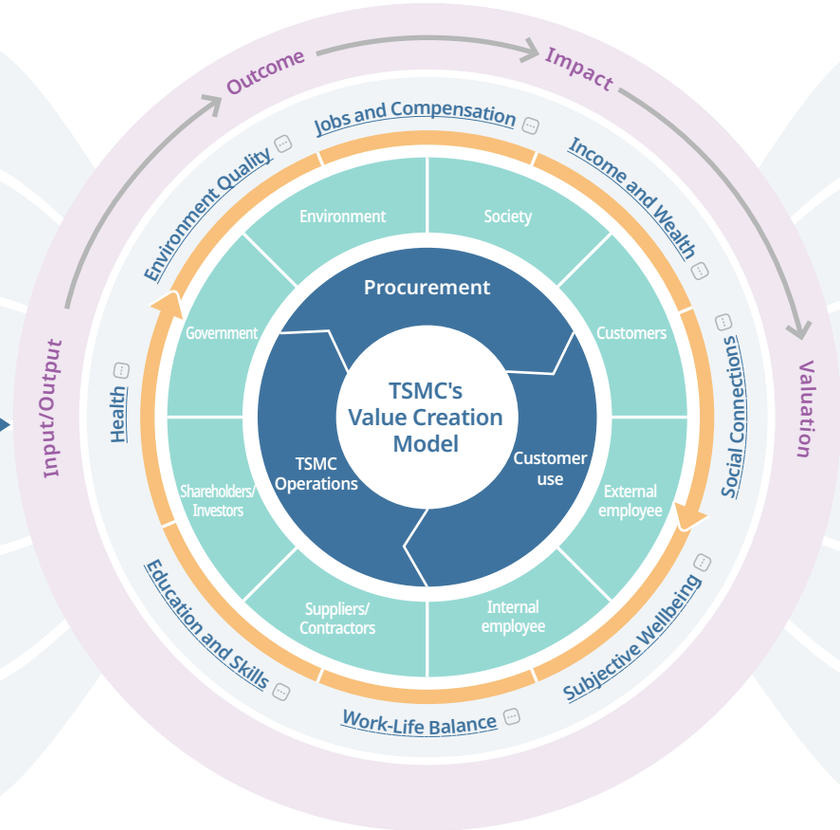
**Intelligence**
Continue to invest in R&D and innovation management by strengthening knowledge and technical capacity

**Human Resources**
Recruit like-minded talent, strengthen talent cultivation, and foster a healthy and safe workplace

**Environment**
Reduce consumption of natural resources and maintain optimal usage efficiency through source management

**Society**
Strengthen interaction with stakeholders and resource allocation to generate profound and positive impacts

## Sustainability Impact Pathway




## Impact Value (NT$)

**Finance**
The investment returns, tax contributions, and profits for employees and suppliers generated from stable financial performance
+ 1,607.6 billion

**Manufacturing**
The opportunities created for long-term collaboration with customers and market expansion from supplier support and cooperation systems that can improve quality and technical capability
+ 653.6 billion

**Intelligence**
The differentiated value created for customer products and services from knowledge-based intangible assets that can promote industry upgrade and technological breakthrough
+ 213.4 billion

**Human Resources**
The additional well-being experienced due to good employment relations, including competitiveness, productivity, innovation, happiness, health, and safety
+ 10.6 billion
− 1.6 billion

**Environment**
The healthy living environment and biodiversity ensured through respecting fundamental environmental rights and contributing to the stability of natural resources, climate, and ecosystems
+ 545.7 billion
− 172.8 billion

**Society**
The common good promoted in society by effecting positive change to community relationships and well-being, human rights, and social equity
+ 2752.9 billion
− 0.75 billion

1st Phase：Value Chain Activity
2nd Phase：Stakeholder
3rd Phase：Well-being Dimension

Impacted Stakeholders: Shareholders/Investors | Customers | Suppliers | Society | Environment | Government | Internal employee | External employee[Note 2]

Positive Impact | Negative impact

Value Chain: Procurement | TSMC operations | Customer use

Based on the "Measuring Business Impacts on People's Well-being and Sustainability" framework by the OECD, TSMC categorizes the impacts of its value chain activities on human well-being into eight dimensions, including Health, Environment Quality, Jobs and Earnings, Income and Wealth, Education and Skills, Work-Life Balance, Subjective Wellbeing, and Social Connections. By referring to internationally recognized methodologies like the Natural Capital Protocol, Social & Human Capital Protocol, ISO 14008: 2019 monetary valuation of environmental impacts and related considerations, IFVI, Harvard Business School Impact-IWA, and VBA, TSMC presents the positive (benefits) and negative (costs) impacts of its value chain activities on the economy, environment, and society in an easily interpretable monetized form. This approach enhances communication with stakeholders, aims to drive mutual prosperity within the industry and economic growth, reduce consumption of environmental resources, promote human rights development and workplace inclusion, and further enhance social well-being. For more details, please refer to the "TSMC Sustainability Impact Valuation Report ."

| Input/Output | | | Outcome | Impact | | | | | | | | Valuation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Causes of the Impact | ESG Issues | Operational Inputs and Outputs (IRIS Metrics) [Note 1] | Impacts on Well-being | Eight Well-being Dimensions: Health | Environment Quality | Income and Wealth | Jobs and Earnings | Education and Skills | Work-Life Balance | Subjective Wellbeing | Social Connections | Impacted Stakeholders | Impact Level |
| Upstream Procurement | Sustainable Supply Chain | Payment to Suppliers for Procurement PI5478 | Procurement demand driving industry supply and demand relationships | | | V | | | | | | | |
| | | | Procurement demand creating supply chain job opportunities | | | V | V | | | | | | |
| | | | Risks of forced labor resulting in loss of freedom and risks to physical and mental health for workers | V | | | V | | | | | | |
| | | | Risks of child labor resulting in loss of access to quality education and future income | | | | V | V | | | | | |
| | | | Social cost of carbon derived from supply chain GHG emissions | V | V | V | V | | | | | | |
| | | | Health and ecosystem losses caused by Supply Chain air pollution emissions | V | V | | | | | | | | |
| | | Assisting suppliers in energy-saving OI6697 | Avoid social cost of carbon derived from mitigated GHG emissions | V | V | V | V | | | | | | |
| | | Assisting suppliers in water-saving OI4015 | Avoid health and ecosystem losses resulting from water resource scarcity | V | V | | | | | | | | |
| | | Assisting suppliers in waste reduction OI7920 | Avoid social cost of carbon, health, and ecosystem losses from waste disposal reduction | V | V | V | V | | | | | | |

Major Capitals: Manufacturing | Environment | Finance | Intelligence | Human Resources | Society

Impacted Stakeholders: Shareholders/Investors | Customers | Suppliers/Contractors | Society | Environment | Government | Internal employee | External employee [Note 2]

Impact Level: Positive Impact | Negative impact

| Input/Output | | | | Outcome | Impact | | | | | | | | | Valuation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Causes of the Impact | ESG Issues | Operational Inputs and Outputs [Note 1] (IRIS Metrics) | | Impacts on Well-being | Eight Well-being Dimensions: Health | Environment Quality | Income and Wealth | Jobs and Earnings | Education and Skills | Work-Life Balance | Subjective Wellbeing | Social Connections | Impacted Stakeholders | Impact Level |
| TSMC Operations | Finance performance/ Innovation Management/ Tax | Net Revenue | FP6510 | Bringing returns to investors and fostering economic growth momentum | | | V | | | | | | | |
| | | Depreciation | FP9573 | Changes in fixed assets generate revenue for suppliers | | | V | | | | | | | |
| | | Amortization | – | Knowledge-based intangible assets help in the development and application of industry technology | | | V | | | | | | | |
| | | R&D Expenses | – | R&D expenses aids in the development and application of industry technology | | | V | | | | | | | |
| | | Tax | FP5261 | Supporting government initiatives for infrastructure expansion and social welfare | | | | | | | | V | | |
| | Climate and Energy | GHG Emissions | OI1479 | Social cost of carbon emissions derived from GHG emissions | V | V | V | V | | | | | | |
| | | Use of Self-generated Renewable Energy | OI2496 | Avoid social cost of carbon derived from GHG emissions | V | V | V | V | | | | | | |
| | | Use of Purchased Renewable Energy | OI3324 | Avoid social cost of carbon derived from GHG emissions | | | | | | | | | | |
| | | Effectiveness of Energy-saving Measures | OI6697 | Avoid social cost of carbon derived from GHG emissions | V | V | V | V | | | | | | |
| | Water Stewardship | Water Consumption | OI0263 | Water resource scarcity leads to health and ecosystem losses | V | V | | | | | | | | |
| | | Use of Reclaimed Water | OI1927 | Avoid health and ecosystem losses resulting from water resource scarcity | V | V | | | | | | | | |
| | | Water Conservation and Water Resource Recycling and Usage | OI4015 | Avoid health and ecosystem losses resulting from water resource scarcity | V | V | | | | | | | | |
| | | Wastewater Discharge | OI0386 | Social cost of carbon, health, and ecosystem losses derived from wastewater disposal | V | V | V | V | | | | | | |
| | Air Pollution Control | Air Pollution Emissions | – | Health, and ecosystem losses derived from air pollution emissions | V | V | | | | | | | | |
| | Circular Resources | Waste Disposal | OI6192 | Social cost of carbon, health, and ecosystem losses derived from waste disposal | V | V | V | V | | | | | | |
| | Talent Attraction and Retention | Employee Compensation and Benefits | OI4724 | Enhance well-being and purchasing power through improved quality-of-life-oriented compensation | | | V | V | | | V | | | |
| | | Employee Support Programs | OI2742 | Achieve work-life balance through family-friendly and life-supportive initiatives | | | | | | V | V | | | |
| | | Incidents of Workplace Sexual Harassment | OI9077 | Cause medical costs and future well-being losses from physical and psychological harm due to sexual harassment | V | | | | | | V | | | |

| Causes of the Impact | ESG Issues | Input/Output: Operational Inputs and Outputs (IRIS Metrics) [Note 1] | | Outcome: Impacts on Well-being | Impact: Health | Environment Quality | Income and Wealth | Jobs and Earnings | Education and Skills | Work-Life Balance | Subjective Wellbeing | Social Connections | Impacted Stakeholders | Valuation: Impact Level |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSMC Operations | Talent Development | Employee Training and Development | OI7877 | Train to enhance skills and employability, leading to increased future earnings | | | | V | V | | | | | |
| | Inclusive Workplace | Employee Compensation Structure | – | Boost salary growth potential through equal opportunities for women in high-paying positions | | | | V | | | | | | |
| | | | | Result unequal opportunities for women in high-paying positions in potential salary compensation costs | | | | V | | | | | | |
| | Occupational Safety and Health | Employees with Improved Health Management | OI4061 | Lifestyle and health improvements through health education | V | | | | | | | | | |
| | | Employee Occupational Accident Incident | OI3757 | Physical and mental impact of workers and healthcare expenditure | V | | V | V | | | | | | |
| | | Employee Occupational Accident Fatality Incident | OI6525 | | | | | | | | | | | |
| | | Contractor Occupational Accident Incident | OI3757 | Physical and mental impact of workers and healthcare expenditure | V | | V | V | | | | | | |
| | | Contractor Occupational Accident Fatality Incident | OI6525 | | | | | | | | | | | |
| | Social Impact | Social Investments | OI1619 | Promotion of local community relations and improvement of life quality | | V | | | V | | | V | | |
| Customer Use | Innovation Management | Benefits of Energy-efficient Products | PI7623 | Assisting customers in product energy efficiency to avoid and mitigate environmental impacts from GHG emissions | V | V | V | V | | | | | | |

Note 1: Impact Reporting & Investment Standards (IRIS) is a standardized framework developed by the Global Impact Investing Network (GIIN) for measuring the environmental, social, and economic performance of enterprises. It enhances the comparability of impact investments.

Note 2: External employees refer to employees of suppliers or contractors, while internal employees refer to employees of TSMC.

Note 3: The environmental and social externalities of the supply chain are based on direct transactions within a single year. Suppliers must have more than three orders annually, with transaction amounts exceeding NT$5 million. This excludes warehouses, hospitals, and suppliers with no further transactions, totaling 1,294 suppliers. Considering industry characteristics and procurement amounts, the Input-Output Model is used to calculate economic benefits, job creation, and salary income resulting from the supply chain's demand-driven effects, as well as associated environmental impacts and human rights risks. This method analyzes potential opportunities and risks in the supply chain based on industry statistics, rather than actual events, with coefficients sourced from The Report on Input-Output Statistics (DGBAS, 2020), EXIOBASE 2 , UNICEF, and the Walk Free database.

Note 4: Environmental externalities are the monetary assessment of possible external impacts from TSMC's purchasing and production. For the costs and economic benefits arising from the implementation of environmental protection projects, please refer to Environmental Cost in TSMC's 2024 Annual Report.

Note 5: Considering the differences in economic conditions among various countries, the value conversion coefficient is adjusted based on Gross National Income measured by Purchasing Power Parity in each region. Fixed inflation and exchange rate adjustment factors are adopted to standardize the valuation in New Taiwan Dollars for the baseline year, ensuring that all influences are measured in a consistent currency value. Due to the updated assessment methods and value coefficients, the benchmark year has been adjusted from 2018 to 2023, and the historical analysis results have been updated accordingly.

Note 6: For information regarding the sustainability impact assessment methodology, definitions of impact indicators, and related analytical outcomes, please refer to the TSMC Sustainability Impact Valuation Report .

| Monetary Value (NT$ Million) | Positive Impact Level |
|---|---|
| >1,000,000 | |
| 500,000 ~ 1,000,000 | |
| 100,000 ~ 500,000 | |
| 50,000 ~ 100,000 | |
| 10,000 ~ 50,000 | |
| 1,000 ~ 10,000 | |
| 100 ~ 1,000 | |
| 0 ~ 100 | |

| Monetary Value (NT$ Million) | Negative impact Level |
|---|---|
| < -1,000,000 | |
| -500,000 ~ -1,000,000 | |
| -100,000 ~ -500,000 | |
| -50,000 ~ -100,000 | |
| -10,000 ~ -50,000 | |
| -1,000 ~ -10,000 | |
| -100 ~ -1,000 | |
| 0 ~ -100 | |

History Data

## Impact Assessment and Management Practices

### Upstream Procurement

TSMC leverages its leadership position in the global semiconductor industry to improve the technology and capability of local suppliers. TSMC employs an input-output model to assess social and environmental externalities arising from its procurement activities. In 2024, TSMC created an output value of NT$2,457.6 billion in the supply chain through procurement, generated 460,000 job opportunities, and NT$292.8 billion in payroll through the supply chain. However, the environmental footprint and risks of human rights violations generated by the supply chain also brought potential social costs of NT$58.1 billion, while guiding suppliers to enhance energy saving, water conservation, and waste reduction performance resulted in NT$1.6 billion in environmental benefits. To ensure the sustainable operation of the supply chain, TSMC conducts hotspot analyses to pinpoint industries and regions with significant impacts. These insights are then integrated into procurement strategies and supplier selection criteria. Through consultation and goal setting, TSMC collaborates with suppliers to identify opportunities for process optimization and environmental footprint minimization. Furthermore, TSMC conducts assessments on critical raw materials, with 147 types analyzed by the end of 2024, continuously exploring opportunities for improvement and driving sustainable transformation of the industry.

### TSMC Operations

TSMC uses a GVA approach to assess the positive impact generated for stakeholders by operations, including net operating profit, taxes, depreciation, and amortization. In terms of social value, TSMC refers to methodologies such as IWA from Harvard Business School and the Impact Statement approach from the VBA to evaluate the positive impact on employees through fair employment opportunities, compensation and benefits that balance quality of life, and future returns generated from training. TSMC also applies Willingness to Pay and Value Transfer methods to calculate the social costs and benefits of occupational injury and health promotion initiatives. For environmental value, TSMC employs EP&L methodology to assess the negative impacts resulting from energy and resource consumption and pollutant emissions during the production process, and the environmental benefits generated by implementing energy-saving measures, deploying renewable energy, and reclaimed water resources.

In 2024, TSMC generated NT$2,241.5 billion in GVA for its stakeholders, encompassing net operating profit, taxes paid, dividends distributed, R&D investments, depreciation, and amortization. These contributions not only enhanced industry technology development, assisted customers in product success, and supported the government in expanding infrastructure and social welfare but also provided quality returns to investors. In the social dimension, total compensation above the living wage amounted to NT$2,331 billion, enhancing employees' happiness and purchasing power. A comprehensive talent training program and career planning improved employee competitiveness, resulting in NT$15 billion in salary growth benefits. Contributions to charitable activities by TSMC and its employees generated societal value of NT$23 billion. Various health promotion activities brought health improvement benefits of NT$500 million. However, occupational accidents and sexual harassment caused physical and mental impacts and medical costs of NT$75.2 million for employees and society. TSMC also analyzed gender-related disparities in salaries and career development across various job categories. In technical roles, female employees benefitted from opportunity advantages, contributing to potential salary growth of NT$2.4 billion. Conversely, in managerial, professional, and assistant roles, gender-related opportunity gaps led to potential compensation costs of NT$1.6 billion. On the environmental front, the resource consumption and environmental footprint generated by production processes resulted in NT$115.5 billion in environmental external costs. To mitigate the environmental impact of operations, TSMC actively integrates green management into daily operations. Through innovative applications in areas such as climate and energy, water management, resource recycling, and air pollution control, TSMC implements measures including source reduction, process energy conservation, circular economy practices, and end-point controls, collectively creating NT$47.2 billion in environmental benefits.

### Customer Use

TSMC continues to develop world-leading energy-efficient semiconductor technologies to help customers produce advanced, energy-efficient products and facilitate the evolution of energy-saving ICT technologies and product applications. The ISTI conducted a model analysis based on global energy consumption, GDP, and the number of electronic products, and found that by 2030, for every kWh of power used in production, TSMC can help save 6.39 kWh of power for other industries and households worldwide. It is estimated that from 2020 to 2030, this assistance in energy conservation globally could increase from 24,800 GWh to 351,400 GWh and will generate a positive impact of NT$1,372.8 billion.
TSMC facilitates global energy conservation by continuing to innovate semiconductor technologies to realize smart applications for a wide range of electronic products. TSMC deployed 288 distinct process technologies and manufactured 11,878 products for 522 customers in 2024 to continue to bring significant contributions to the advancement of modern society.

# Carry Out the UN Sustainable Development Goals

Navigating rapidly evolving industry landscape and global sustainability trends, TSMC upholds its ESG mission of "Acting with Integrity, Strengthening Environmental Protection, and Caring for the Underprivileged." Through the "ESG Implementation Framework ," the Company carries out sustainability governance by focusing on five ESG directions: Drive Green Manufacturing, Build a Responsible Supply Chain, Create a Healthy and Inclusive Workplace, Develop Talent, and Care for the Underprivileged, driving business growth in parallel with sustainability. By collaborating with stakeholders — employees, shareholders/investors, customers, suppliers/contractors, government/industry associations, and communities — TSMC advances the UN Sustainable Development Goals (SDGs), amplifying its positive impact on society and the environment.

Through the "Integrating the Sustainable Development Goals (SDGs) into Corporate Reporting: A Practical Guide " jointly issued by the Global Reporting Initiative (GRI) and the United Nations Global Compact, TSMC has identified nine SDGs that are highly relevant to its operations and core business of dedicated semiconductor foundry. Under the leadership of the ESG Steering Committee, the Company established 22 sustainability initiatives and 62 long-term goals, contributing sustainable momentum to SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 17 (Partnerships for the Goals), working toward a better future where the environment and society thrive together.

To strengthen the alignment of sustainability goals and actions with the SDGs, TSMC referenced the "ISO/UNDP PAS 53002: Guidelines for contributing to the United Nations Sustainable Development Goals (SDGs) ," jointly issued by the International Organization for Standardization (ISO) and the United Nations Development Programme (UNDP). This framework examines the linkage between TSMC's long-term sustainability goals and the SDGs, tracks its annual achievement status, and incorporates the SDGs into operational management. At the same time, the Company demonstrates its commitment and actions in implementing the SDGs through transparent information disclosure, In 2024, TSMC presented concrete SDG accomplishments across five dimensions-Plans, Commitments, Actions, Progress, and Suppliers- according to disclosure frameworks defined by the GRI and Support the Goals. For detailed information, please refer to the "2024 TSMC UN SDGs Action Report."

## ESG Directions → Process and Reporting → TSMC Sustainability Roles

### Drive Green Manufacturing
Implement green production and innovate high-efficiency semiconductor technologies to mitigate climate change and pursue sustainable development

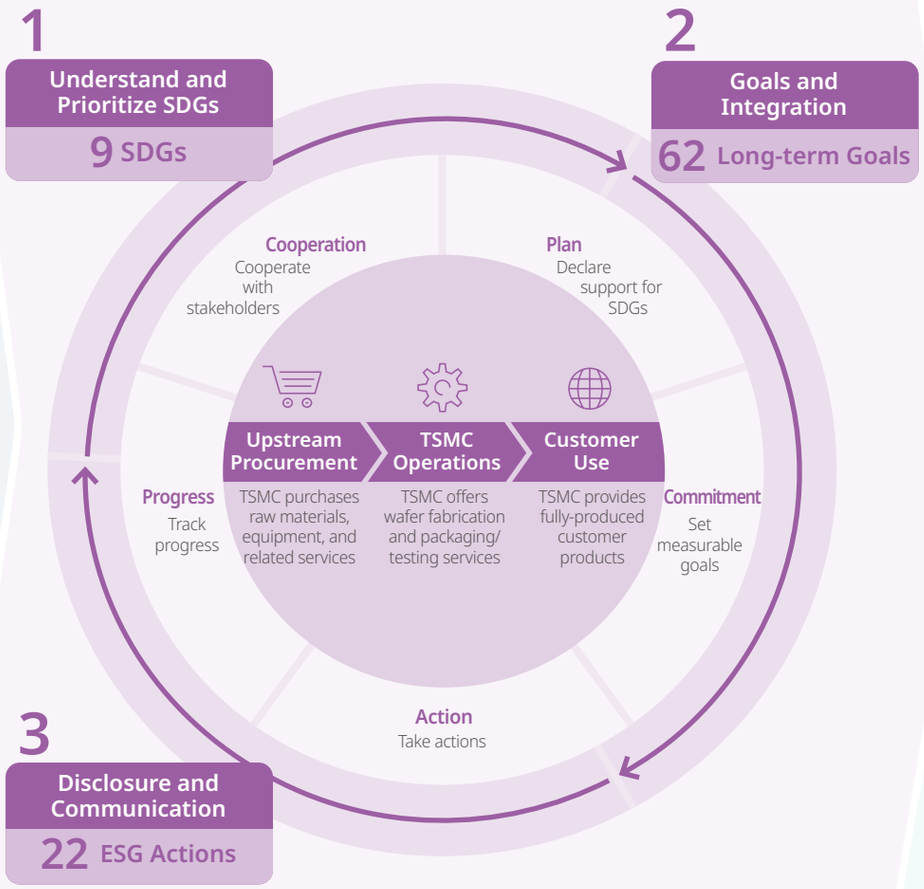
### Build a Responsible Supply Chain
Collaborate with suppliers and contractors to promote sustainable operations and manufacturing standards

### Create a Healthy and Inclusive Workplace
Establish a safe, healthy, equitable and inclusive workplace that respects human rights and unleashes employees' full potential

### Develop Talent
Support career development and collaborate with academia to develop STEAM (Science, Technology, Engineering, Art and Mathematics) programs that cultivate talent

### Care for the Underprivileged
Aggregate resources to deploy educational, cultural and social programs that promote equity and uphold the common good

TSMC identifies the link between SDGs, the five sustainability roles, and value chain stages through three steps. Long-term goals and action plans are then formulated accordingly




### An Innovation Pioneer
As a trusted global provider of professional IC manufacturing services, TSMC works with customers to unleash their innovations through its pioneering business model and robust R&D capabilities. The Company drives countless possibilities for technological advancement and sustainable development throughout the semiconductor industry

### A Practitioner of Green Power
TSMC aims to set the standard for in environmental protection by seamlessly integrating green practices into daily operations. The Company uses innovative technologies to address climate and energy, water stewardship, circular resource management, and air pollution control. TSMC champions comprehensive sustainable actions to strengthen environmental protection, driven by its commitment to coexist and thrive with the Earth's ecosystem

### A Responsible Purchaser
TSMC is dedicated to responsible procurement, working closely with supply chain partners to ensure excellence in technology, quality, delivery, human rights, and environmental safety. In response to the pressing challenges of climate change, the Company continues to enhance green innovation and climate resilience while striving to create a low-carbon semiconductor supply chain

### An Admired Employer
TSMC values its commitment to employees, fostering a people-oriented workplace culture with open communication. The Company actively cultivates an inclusive and safe workplace where employees can continue to learn and grow. TSMC also provides competitive compensation and benefits, striving to be an employer of choice within the semiconductor industry

### Power to Change Society
TSMC, in collaboration with the "TSMC Education and Culture Foundation" and the "TSMC Charity Foundation," is committed to addressing societal needs. By integrating cross-disciplinary resources, TSMC focuses on fostering educational innovation for learners of all ages, promoting community inclusion, cultivating artistic and cultural appreciation, enhancing ecological sustainability and environmental awareness, and advancing health protection — driving meaningful and positive change

# An Innovation Pioneer

As a trusted global provider of professional IC manufacturing services, TSMC works with customers to unleash their innovations through its pioneering business model and robust R&D capabilities. The Company drives countless possibilities for technological advancement and sustainable development throughout the semiconductor industry.

Innovation Management | Product Quality | Customer Relations

**>9,000/>130,000**
Patent applications globally/trade secrets registered

**292**
Innovative testing methods developed for quality and reliability to enhance product, technology, and quality

**1,028/161**
Process and advanced packaging technologies provided to customers

# Innovation Management

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Maintain Technology Leadership**<br>**Continuous investment in advanced technology development to maintain TSMC's technology leadership in the semiconductor industry** | Maintains TSMC's technology leadership and invest 7~9% of revenue into R&D expenses annually[Note 1] | 2nm (N2) process technology in volume production | N2 process technology successfully enters risk production ✓<br>Target: N2 process technology enters risk production |
| | | Maintain TSMC's technology leadership and invest 7~9% of revenue into R&D expenses annually | Maintain TSMC's technology leadership and invest 7.1%[Note 2] of revenue into R&D expenses annually —<br>Target: 8.5% |
| **Protect Intellectual Property**<br>**Patent protection:** Strengthen quality and quantity driven patent management, apply early for patents on next-generation process technologies, and expand the patent protection network to maintain TSMC's technology leadership<br>**Trade secret protection:** Strengthen business operations and intellectual property innovation by recording, consolidating, and utilizing trade secrets with competitive corporate advantages through trade secret registration and management | Over 100,000 global patent grants | Exceeds 9,500 global patent applications | Submitted 9,206 global patent applications ✓<br>Target: > 8,500 |
| | Over 1,000,000 trade secret registrations[Note 3] | Exceeds 100,000 trade secret registrations | Registered 131,335 trade secrets ✓<br>Target: > 60,000 |
| | | | Shared TSMC's trade secret registration mechanism with 48 companies ↑<br>Target: 8 |
| | | | Assisted six companies in successfully building a trade secret registration and management system. ✓<br>Target: 6 |
| | | Exceeds 550 green trade secret registrations | Registered over 559 green trade secret registrations ✓<br>Target: >500 |
| **Enhance Industry-academia Collaboration**<br>**Link academic institutions in Taiwan and overseas by investing resources in campus programs based on a long-term mechanism for interaction to cultivate the next-generation semiconductor talent** | Cultivate more than 35,000 undergraduate and graduate students globally through campus programs that deepen industry-academia collaboration between 2021 and 2030[Note 4] | Cultivate more than 21,000 undergraduate and graduate students globally through campus programs that deepen industry-academia collaboration between 2021 and 2025 | Cultivated over 18,000 undergraduate and graduate students globally through campus programs that deepen industry-academia collaboration between 2021 and 2024 ✓<br>Target: Over 17,000 participants |
| | Organizes STEM workshops for female high school students, engaging over 3,000 participants | Organizes STEM workshops for female high school students, engaging over 2,600 participants | Organizes STEM workshops for female high school students, engaging over 4,000 participants ✓<br>Target: Over 2,500 participants |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: The original target set an annual ratio of R&D expenditure to revenue. Due to fluctuations in economic conditions, TSMC adjusted this goal to a percentage range starting in 2025. For historical data on revenue and R&D spending, please refer to the section titled "Maintain Technology Leadership."

Note 2: Since 2013, TSMC has consistently set new records for both revenue and R&D expenditure. In 2024, the proportion of R&D spending relative to revenue decreased, primarily because revenue growth surpassed the increase in R&D costs. In 2024, total R&D expenditure reached US$6.355 billion, marking a 3.1-fold increase compared to a decade earlier.

Note 3: Due to the number of trade secret registrations exceeding 100,000 for two consecutive years, the long-term target for 2030 has been adjusted from 200,000 to 1,000,000 registrations.

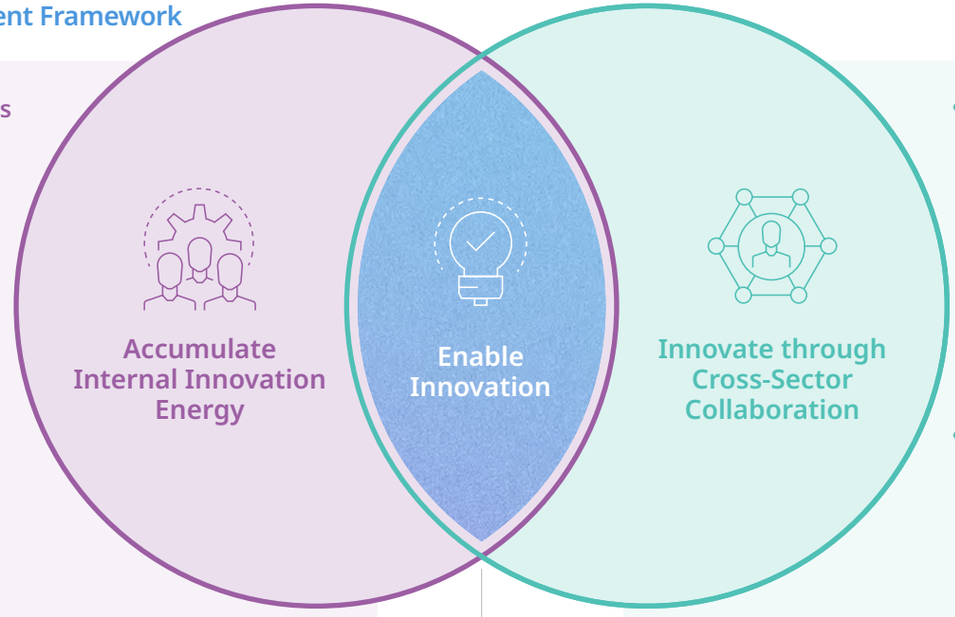
Note 4: Industry-academia collaboration projects include various academic programs, internships, and cooperative education programs.

TSMC pioneered the innovative business model of being a dedicated semiconductor manufacturing services provider. Since its founding in 1987, the Company has significantly lowered entry barriers in the semiconductor industry, fueling rapid growth in the global fabless IC design sector. Committed to innovation as a core value, TSMC fosters a culture of creativity within the company by implementing initiatives like technology forums, proposal competitions, and showcases of exemplary cases. These initiatives foster a work environment that inspires original thinking and motivates employees to continuously reinforce the Company's three key competitive strengths: technology leadership, manufacturing excellence, and customer trust — ensuring its leadership in an era of relentless technological advancement.

As AI technology continues to reshape industries, TSMC remains committed to advancing scientific exploration and technological innovation to enhance overall operational efficiency. In 2024, the Company successfully completed risk production of its 2-nanometer (N2) technology and plans to enter volume production in 2025. TSMC collaborates with customers, suppliers, government partners and academic institutions across various areas, including product development, talent cultivation, and green innovation. These efforts aim to address the fast-paced changes in the semiconductor industry while demonstrating its unwavering commitment to innovation.

## Innovation Management Framework

- **Annual Idea Forums**
  - Operations
  - R&D
  - Quality and Reliability
  - Corporate Planning
  - Finance
- **Total Quality Excellence Conference (TQE)**
- **ESG AWARD**
- **Technology Board Conference**
- **Corporate Research Seminar**




- **Technology Leadership**
- **Intellectual Property Protection**
  - Comprehensive Patent Management Mechanism
  - Trade Secret
- **Intelligent Precision Manufacturing**

- **Innovation Cases**
  - Drive a Major Revolution in TEM Imaging Quality Workflow through Digital Transformation
  - "Box Replacement Program" Builds a Low-Carbon, Inclusive Supply Chain
  - Reuse of Waste Hydrogen from EUV for Green Energy Transition
  - Introduce Reclaimed Water into Advanced Processes
  - The Inaugural Circular Economy Demonstration Center Turns Waste into Gold
  - Optimize Control Equipment Treatment System to Achieve 90% Reduction Rate of $N_2O$

- **Open Innovation Platform® (OIP)**
- **Collaboration with World-Class R&D Institutes**
- **Elementary and Junior High Schools: Inspiring Curiosity and Early Exploration of STEM**
  - TSMC Science Voyage
  - AI Programming Education for Young Learners
  - TSMC for Education

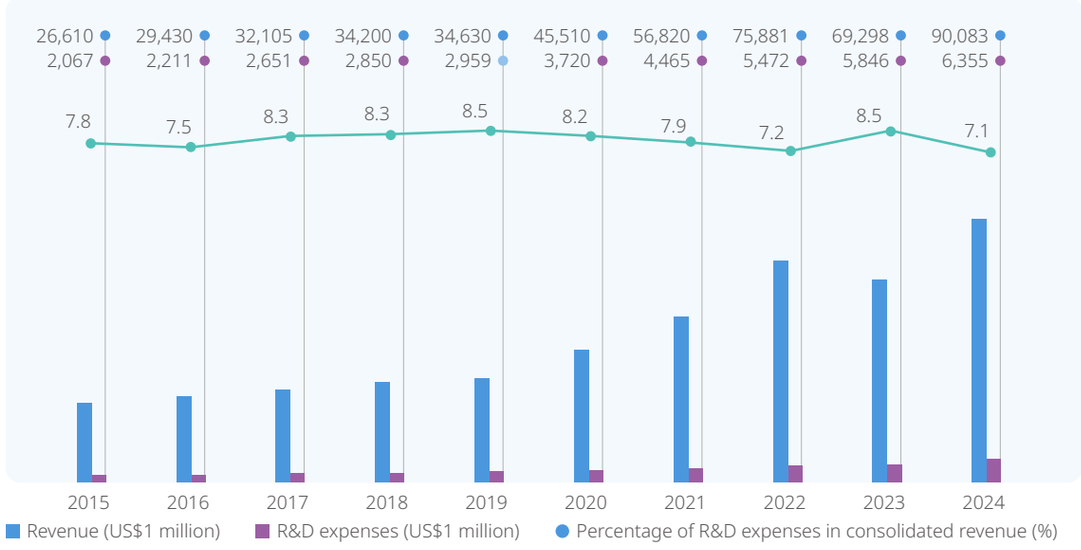
- **High Schools and Vocational Schools: Skill Development and Practical Applications**
  - TSMC High School Semiconductor Mini Courses
  - TSMC Girls in STEM Program for High Schools
  - Operations Equipment Star Program
  - TSMC Cup - Scinarrator- Scientific Presentation Contest
  - Sponsorship of Wu Chien-Shiung, Wu Ta-You, and Marie Curie Science Camps
- **Universities and Graduate Institutes: Technological Research and Professional Development**
  - University Research Center
  - Industry-academia Joint Development Project
  - University Shuttle Program
  - National Academy for Key Fields of Research
  - Semiconductor Curriculum
  - Semiconductor Courses
  - Semiconductor Talent Training Program
  - FinFET Academic Design Foster Package (ADFP)
  - Industry-academia Collaboration in Mechanics
  - Corporate Management Talent Development Program
  - Campus Information Cultivation Project
  - Elite Camp
  - Scholarships

## Technology Leadership

The semiconductor industry is characterized by rapid technological progress, and TSMC is committed to developing next-generation technologies that meet evolving customer demands. In 2024, the Company's annual research and development (R&D) expenditure accounted for 7.1% of total revenue, underscoring its commitment to innovation and its leadership in advanced process technology development. TSMC's R&D efforts are strategically divided into two areas: the central R&D organization and fabs. The central R&D team focuses on pioneering new logic technologies, SoC designs, derivative products, and packaging/system-in-package (SIP) technologies. The team also develops cost-efficient 3D wafer-level system integration solutions. Meanwhile, fab-level R&D teams work on enhancing manufacturing processes to elevate chip performance, boost yields, and lower production costs. In 2024, TSMC achieved significant milestones as its foundational 2nm process technology entered the yield improvement phase. Concurrently, advancements in A16 and A14 technologies led to notable improvements in performance speed, power consumption efficiency, circuit density, and cost-effectiveness. Moving forward, TSMC will continue exploratory research on sub-A14 technologies to provide customers with robust process capabilities for diverse applications.

In 2024, TSMC strengthened partnerships with leading global research institutions, such as the SRC in the United States and Belgium's IMEC. The Company also expanded collaborations with top universities to accelerate semiconductor technology advancements and support the development of future talent.

### Maintain Technology Leadership




Case Study

## Digital Excellence Conference Creates a Win-Win for AI Innovation and Environmental Sustainability

To encourage employees to utilize AI and digital tools for innovation, TSMC has hosted the Digital Excellence Conference since 2023. The event promotes the sharing of digital transformation applications and achievements across its fabs, drawing participation from over 50 fabs and receiving more than 200 entries submitted annually for two consecutive years.

This year's competition mirrored global sustainability trends by introducing the new Green AI Award, which received 46 entries. The Green AI concept centers on addressing the electricity and water consumption issues caused by large-scale AI computations. The award program encourages employees to consider efficient resource utilization while pursuing digital innovation by selecting AI model architectures that align with task requirements to enhance both performance and efficiency, while implementing environmentally responsible principles. Among the four winning entries in 2024, emerging AI technologies such as Digital Twins and Diffusion Models were utilized to create digital simulations of the real world. Combined with the high-speed computing capabilities of Graphics Processing Units (GPUs), these innovations can reduce energy consumption as well as server maintenance and deployment costs, demonstrating the unlimited potential of implementing green innovation through AI technology.

> Participating in this competition made me realize that digital transformation goes beyond achieving performance and precision - it is also about meaningful contributions to environmental sustainability.
>
> **Chih-Wei Chen**
> **2024 Green AI Award Recipient**

Winners of the Green AI Award at the Second Digital Excellence Conference

## Technology Leadership and Innovation

| | 2022 | 2023 | 2024 |
|---|---|---|---|
| **Logic Process Technologies** | Pioneered the industry's first 3nm process technology in high volume production<br>Enhanced 3nm process technology, N3E, successfully entered risk production | Pioneered the industry's first enhanced 3nm process technology, N3E, in volume production | 2nm process technology successfully entered risk production |
| **Specialty Technologies/ Interconnect and Packaging Integration** | Received CoWoS®-S certification for Gen-3 HBM, silicon interposer now contains sub-micron routing layers and integrated capacitors (iCap) so that various chiplets such as SoC, HBM can be placed on it | Received the CoWoS®-S certification for the 3.3x sized mask layer silicon substrate, which can integrate multiple SoCs and Gen-3 HBM and possesses the Gen-2 DTC, to prepare for the production of HPC products of customers | Completed development and launched production of the first CoWoS®-L with a 3.5X mask size; simultaneously initiated a new version with 5.5X mask size interposers to meet growing packaging performance needs |
| | Successfully qualified InFO-PoP Gen-8 for mobile applications with enhanced thermal performance; launched R&D for next generation InFO-PoP, which will introduce backside redistribution layer | Successfully integrated multiple heterogeneous SoC and package stacking of the InFO-M-PoP and had mass production in wearable device-related products | Continued industry leadership in high-volume manufacturing of InFO_PoP packaging for mobile applications. The new feature with backside RDL, was also qualified and ready for volume production |
| | The 55nm BCD technology has refined 5V device quality to elevate mobile power switch performance; simultaneously expanded 40nm, 22nm, and 0.13 μm BCD technologies to address automotive market demands | Extended 0.13 μm and 90nm BCD technologies for vehicle-related applications, with 0.13 μm 45V devices advancing to the reliability verification stage. Successfully launched mass production of 55nm BCD, offering a diverse portfolio of devices tailored for high-performance, low-power mobile devices | Introduced 2nd-generation 40nm BCD technology with newly developed high-voltage devices ranging from 5V to 28V, addressing broader power management market demands. Completed product validation of 6nm FinFET devices operating at 5V, and successfully integrated RF power amplifiers and power management units into system-on-chip (SoC) solutions to meet the requirements of high-end RF power modules |
| | Successfully risk-produced the world's smallest voltage domain global shutter CMOS image sensor chip with 3-wafer stack technology for near infrared and security cameras market | Pioneered the risk production of LOFIC image sensor technology, which has a high dynamic range that can be applied to customers' image sensing of high-end mobile phones and advanced driving assistance system | Utilized third-generation 3D-MiM capacitors to boost the dynamic range of LOFIC pixels by 14dB. Initiated mass production of a 3-wafer stacked backside illumination process, providing greater design flexibility for sensors and image signal processors |
| | 28nm eFlash entered volume production, which can support mobile HPC and high-performance low-leakage platforms | Began volume production of 22nm RRAM as a low-cost embedded non-volatile memories solution for price-sensitive IoT markets | Offered resistive random-access memory (ReRAM) technology as a cost-effective embedded non-volatile memory solution for price-sensitive IoT applications; completed consumer-grade qualification at 12nm and began development at N6 |
| | Successfully qualified InFO-oS Gen-4, which provides more chip partition integration with larger package size and higher bandwidth | InFO-oS Gen-5 passed the certification, which provides more chip partition integration with a larger package size and higher bandwidth | NEW Expanded RF technologies from 6nm to 4nm nodes, integrating them into sub-6GHz RF wireless transceivers and WLAN applications. Through co-optimization of innovative RF design techniques, RF component and circuit performance achieved substantial enhancement |
| | | | NEW Leveraged piezoelectric MEMS technology to extend audio applications into the ultrasonic range, enabling active cooling for high-efficiency chips. Developed next-generation high-voltage capacitive ultrasonic sensors to advance diagnostic imaging quality, with future programs targeting eco-friendly piezoelectric materials |
| | | | NEW Developed second-generation 650V and 100V E-HEMT devices, which passed reliability testing. The 650V version exhibits static resistance degradation below 20%, offering superior reliability and durability that meets stringent automotive electronics specifications |

## Technology Leadership and Innovation in 2024

Semiconductor technology innovation has a profound impact on various aspects of human life. Applications such as HPC and 5G mobile communication advance the AI future and improve quality of life. Semiconductor technology plays a critical role in improving the energy efficiency of end products, accelerating progress toward a low-carbon, sustainable future for both technology and society.

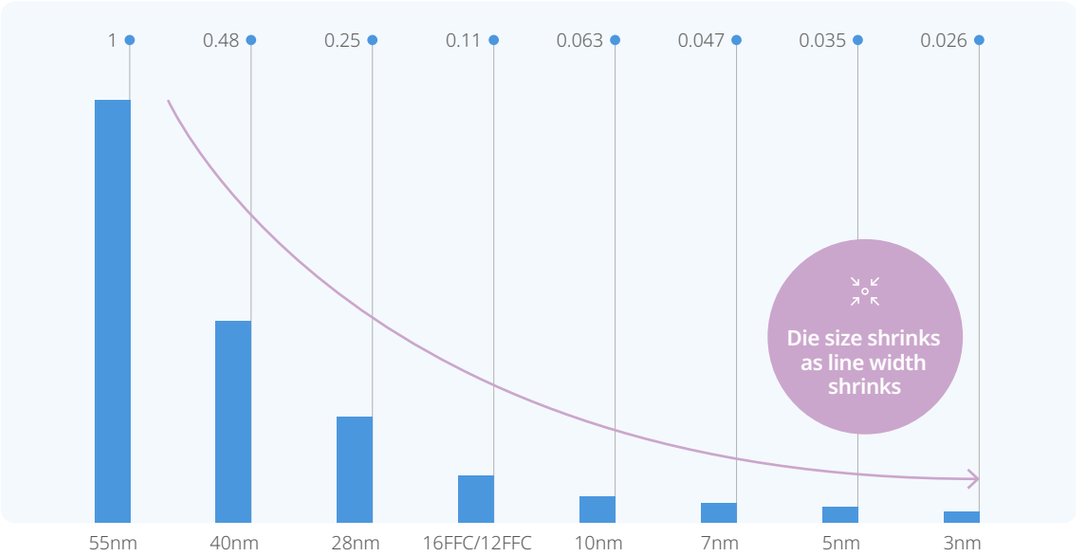
| | Applications | Innovations | Customer Successes |
|---|---|---|---|
| TSMC A16™ technology | HPC | Industry's most advanced nanosheet transistor structure with innovative backside power rail solution | Led the industry to adopt the most advanced process technology |
| 2nm (N2) technology | 5G mobile communications, HPC | First-generation nanosheet transistor technology with full-node strides in performance and power consumption | Led the industry to deliver the most advanced products |
| 3nm FinFET technology family | 5G mobile communications, HPC, Ultra-low power Internet of Things (IoT) | Enhanced 3nm technology, N3E, entered its second year of volume production; N3P technology started volume production; N3X technology, tailored for HPC applications, completed qualification | Led the industry to deliver the most advanced products |
| N4 FinFET technology | 5G mobile communications, HPC | N4P technology entered its third year of volume production; N4X technology, TSMC's first HPC-focused technology, demonstrates the ultimate performance and maximum clock frequencies and entered volume production | Introduced products with industry-leading performance and energy efficiency |
| 6nm ULP N6e® technology | Ultra-low power Internet of Things (IoT), True wireless stereo (TWS), Wearable devices | Entered volume production | Led the industry to deliver the most advanced products |
| 5nm FinFET Automotive (N5A) technology | Automotive | Led the industry with 5nm logic technology and entered risk production | Enabled customers to develop the industry's most advanced driver-assistance systems (ADAS)/autonomous driving (AD) system-on-chip (SoC) |
| 80nm technology for micro-OLED-on-silicon display backplane in augmented reality (AR)/virtual reality (VR) devices | HPC, Ultra-low power Internet of Things (IoT), Wearable devices | Offered extremely high density with over 3,000 pixels per inch (PPI) to enhance vision quality for near-eye applications and entered volume production | Led the industry to deliver the most advanced products |
| Silicon photonics and Compact Universal Photonics Engine (TSMC-COUPE™) technologies | HPC | Can be co-packaged with HPC chips to provide low-power and high-speed data transmission in AI data centers | Led the industry to deliver the most advanced products |
| TSMC-SoIC® (System on Integrated Chip) Chip-on-Wafer (CoW) technology and CoWoS® technology integration | HPC | Led the industry to integrate 3D Si stacking (SoIC) and CoWoS® into a single, compact new system chip with improved performance significantly | Led the industry to deliver products with better performance and energy efficiency |
| Chip on Wafer on Substrate with LSI, CoWoS®-L technology | HPC | Features LSI with higher routing density and embedded deep trench capacitor to facilitate the expansion of HPC products to larger sizes; started volume production | Led the industry to deliver advanced products |
| TSMC-SoW™ (System on Wafer) technology | HPC | Enables wafer-level heterogeneous integration for next-generation AI data center computing chips with better power efficiency, higher bandwidth, and greater chip density; the first-generation (logic integration only) technology entered volume production | Led the industry to deliver advanced products |

5G mobile communications | HPC | Ultra-low power Internet of Things (IoT) | True wireless stereo (TWS) | Wearable devices | Automotive

## Advancing Technology to Unleash Customer Innovation

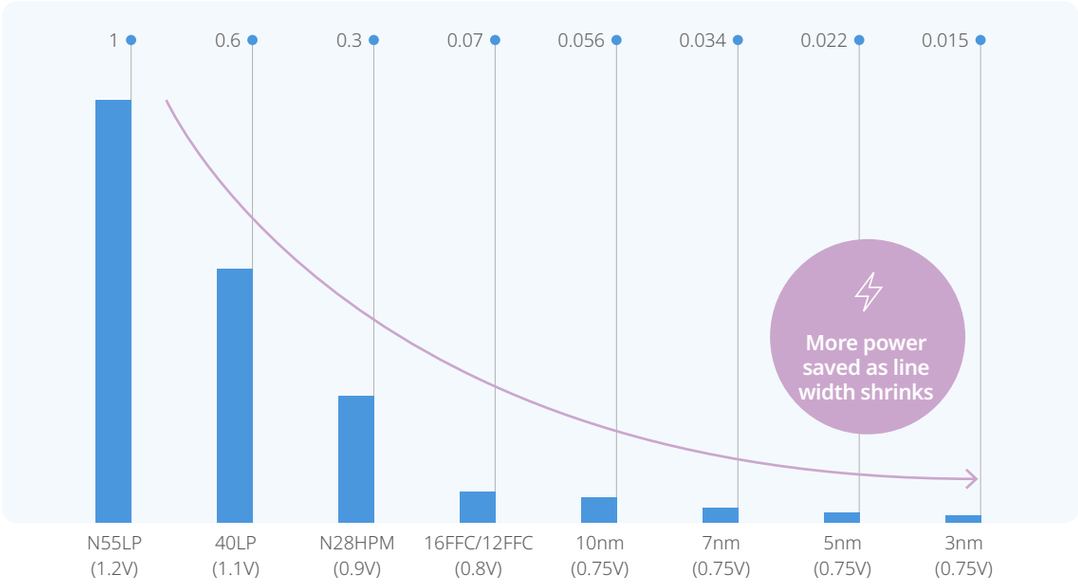
At TSMC, innovation is a core value, ensuring its position as a global leader in semiconductor technology. It unleashes innovation across industries, advancing the economy and civilization, and is committed to being a catalyst for progress in technology and society. As a trusted semiconductor foundry service provider, TSMC is dedicated to maintaining technology leadership by continuously introducing new-generation process technologies with higher chip density and lower power consumption, and providing diverse and comprehensive specialty technologies, as well as advanced 3D chip stacking and packaging services to enable a wide spectrum of chip innovations. In 2024, TSMC deployed 288 process technologies and manufactured 11,878 products for 522 customers and introduced the "Customer Pitch" session at its North America Technology Symposium. This initiative invited eight startup customers to present their unique product ideas, market positioning, and long-term vision to an audience that included 27 venture capitalists. The session was designed to help these startups expand their resources and accelerate growth. In addition, the 2024 Technology Symposium featured an "Innovation Zone" showcasing 41 emerging customers and their cutting-edge technologies and products focused on future AI applications. Highlights included generative AI applications, cloud and edge AI chipsets, server-based networking and power modules, automotive high-speed connectivity and sensing solutions, single-board computer applications, energy-harvesting controllers, and vital sensors. These innovations exemplify TSMC's commitment to fueling the world with boundless momentum for innovation, driving a brighter and more sustainable future.

### Chip Die Size Cross-technology Comparison




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




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

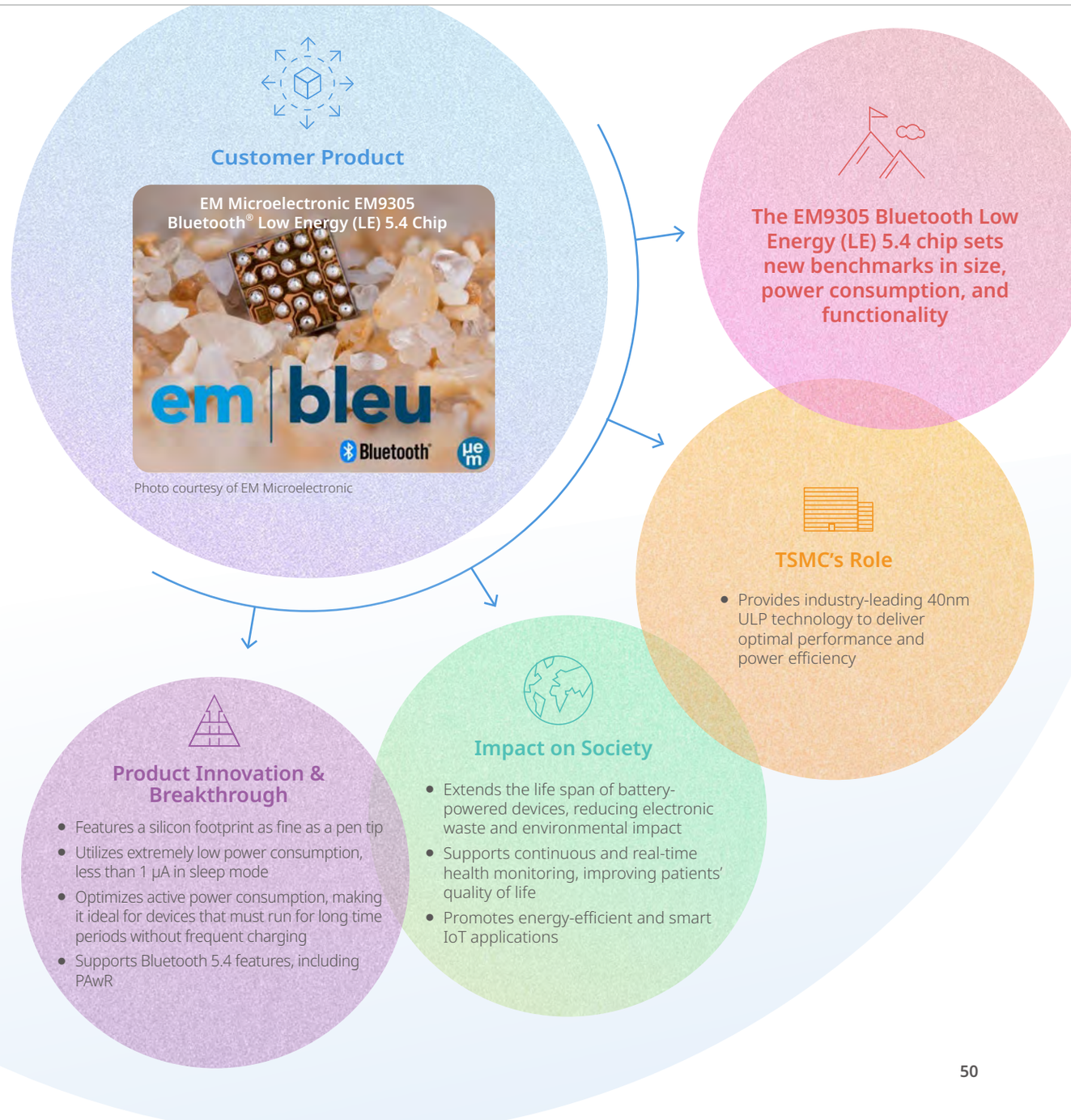
## Empowering Customer Innovation that Advances Sustainable Healthcare

TSMC is dedicated to empowering customer innovation. In 2024, TSMC partnered with EM Microelectronic, utilizing its industry-leading 40nm ultra-low power (40ULP) technology to assist EM Microelectronic in delivering its EM9305 chip. This *Bluetooth*® Low Energy (LE) 5.4 chip, specifically designed for IoT, wearable, and portable applications, features a silicon footprint as small as a pen tip with excellent power efficiency. In sleep mode, it consumes less than 1 μA of power, extending the life of a standard 1.5-volt lithium coin cell battery to over 10 years. This technology is particularly suited for battery-powered devices that require long-term operation without frequent recharging, making significant contributions to health and environmental monitoring applications in compact and portable devices.

The EM9305 has a 36% smaller footprint than its predecessor, EM9304, making it ideal for compact devices, such as healthcare monitors, wearable fitness trackers, and portable environmental sensors. The EM9305 achieves up to 47% greater energy efficiency, extending the battery and overall lifespan of wearables, IoT sensors, and other connected devices, thus reducing electronic waste. Additionally, advanced Bluetooth 5.4 features, such as periodic advertising with responses (PAwR), allow IoT devices to receive information periodically without requiring continuous connection, ensuring both low energy consumption and communication stability.

One of EM9305's most impactful applications is continuous glucose monitoring (CGM), offering innovative solutions to over 500 million diabetes patients around the globe. Traditional glucose monitoring requires multiple daily finger-stick blood tests, but EM9305-enabled CGM devices are more compact, reliable, and energy efficient. Patients more effectively manage their condition because they receive real-time glucose data without frequent invasive testing. The EM9305's Bluetooth LE feature connects to smartphones and other devices, enabling patients to manage their health easily and securely. Advanced encryption and secure pairing ensure safe data transmission, protecting patient privacy. The EM9305 is also applied in smart homes and industrial automation, helping people lead smarter, healthier, and more connected lives. Transformative technologies that enhance life are being advanced through the collaboration between EM Microelectronic and TSMC. This partnership is a testament to the power of innovative collaboration, providing technology that empowers diverse applications that shape a smart, sustainable future.

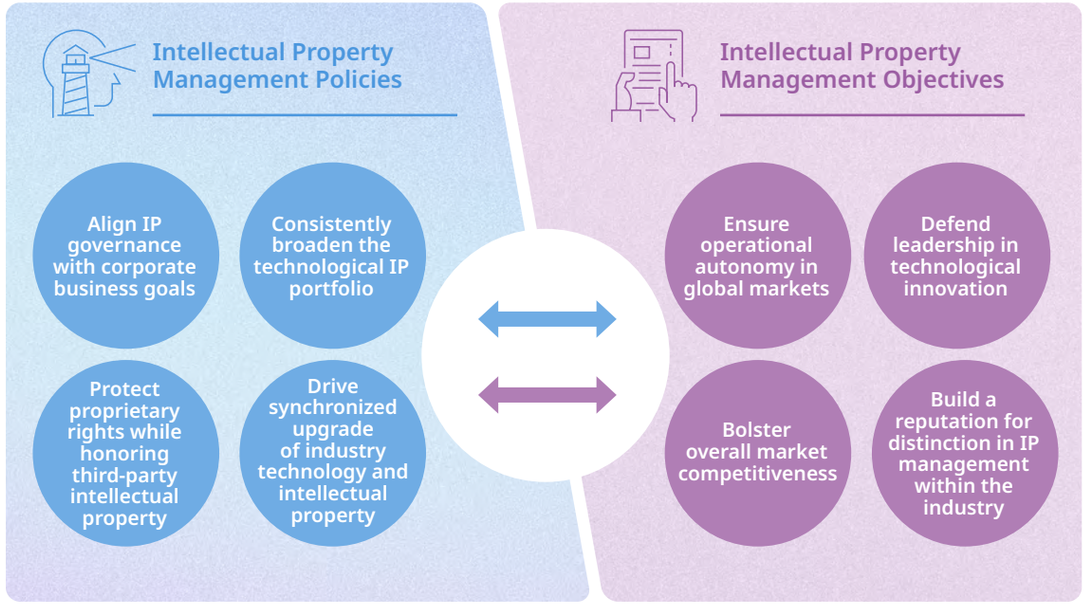
Note: The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by EM Microelectronic is under license. Other trademarks and trade names are those of their respective owners.



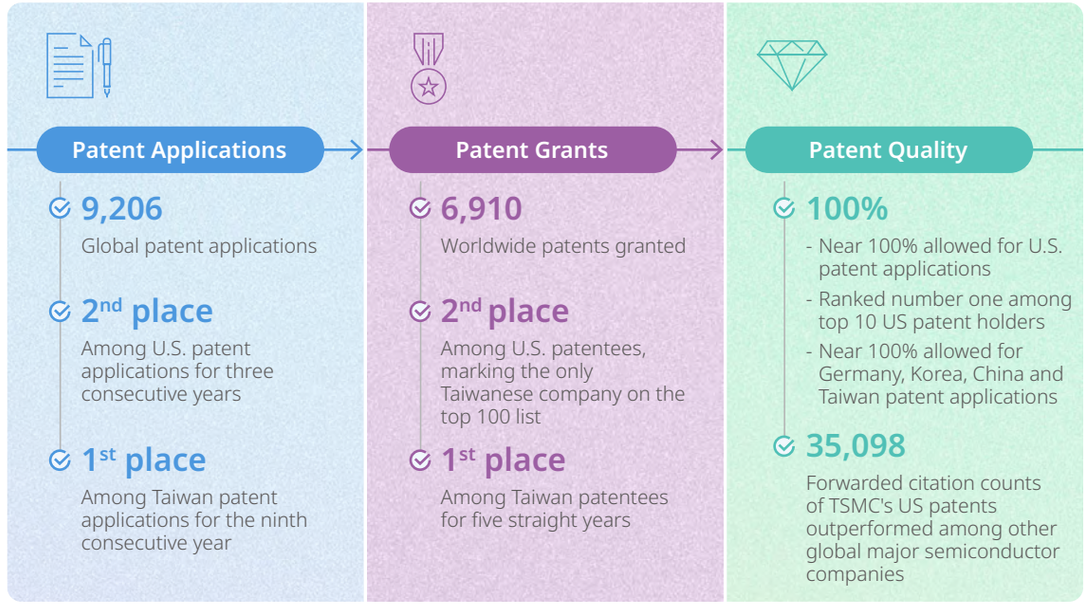
## Protect Intellectual Property Rights

TSMC has established four core intellectual property (IP) management policies and objectives, guided by its business goals and corporate governance principles. The Company adopts a dual-track strategy — leveraging both patents and trade secrets — to safeguard its technological innovations and proprietary business information. This approach strengthens TSMC's three core competitive advantages: technology leadership, manufacturing excellence, and customer trust. Regarding technology leadership, TSMC's IP and R&D teams collaborate closely to define IP output targets that align with the Company's forward-looking and near-, medium-, and long-term technology development roadmaps and execution plans. The Company proactively secures core patents for each generation of process technology — including the latest 2nm and A16 nodes — and actively builds a global patent strategy to maintain its technological leadership. Regarding manufacturing excellence, TSMC has implemented a robust trade secret protection framework to rigorously shield proprietary techniques in production processes, yield optimization, and smart manufacturing. The Company also files patents for critical production technologies, aiming to strengthen its competitive edge through high-value-added manufacturing services. In fostering customer trust, TSMC actively safeguards the confidential information of both the Company and its customers. It continues to expand its global patent portfolio, maintaining a leading position in international rankings. Through adaptable IP strategies and effective dispute resolution, TSMC protects its global operational autonomy while deepening collaborative relationships with customers.

### Intellectual Property Management Policies and Objectives




### 2024 Patent Achievements with Equal Emphasis on Quality and Quantity



## TSMC's Patent Portfolio Development History

### Groundwork Era

- Established patent application management standards and procedures

### Growth Era

- Established a digital patent management system
- Organized annual award ceremony to encourage intellectual property output
- Sent patent engineers to fabs for onsite education and training to promote patent protection

### Exponential Growth Era

- Set patent application goals based on annual R&D investments
- Established a Comprehensive Patent Management Mechanism
- Digital upgrade of the patent management system
- Organized intellectual property promotion serial events for employees

**1987**
- 1st U.S. patent application filed in 1987 approved in the following year

**1998**
- The number of U.S. patent applications in a single year exceeded 500 in 1998

**2011**
- The number of U.S. patent applications in a single year exceeded 1,000 in 2011
- TSMC entered the top 50 U.S. patent application/ grant rankings in 2011

**2015**
- Ranked first in the semiconductor manufacturing group for IEEE's Patent Power Scorecard 2015

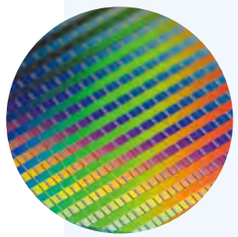
**2016**
- TSMC entered the top 10 U.S. patent grant ranking in 2016

**2019**
- The number of U.S. patent applications in a single year exceeded 3,000 in 2019
- TSMC entered the top 10 U.S. patent application ranking in 2019

**2024**
- The first company to receive the highest certification of Taiwan Intellectual Property Management System (TIPS) certification (AAA).

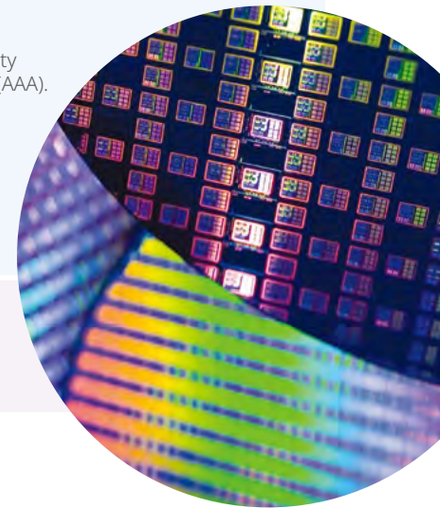
**2023**
- Ranked No.2 in the top 10 U.S. patent application rankings for two consecutive years
- Ranked No.3 in the top 10 U.S. patent grant rankings for two consecutive years

**2024**
- 2nd place: TSMC hit a record high in international patent rankings, claiming second place in both U.S. patent applications and grants
- AAA: TSMC reaffirmed the highest TIPS AAA-level certification
- Top 100: For the fourth successive year, TSMC received recognition from global intellectual property authorities of Clarivate and LexisNexis for its patent volume and strength, securing prestigious positions among the Top 100 Global Innovators and the Global Top 100 Innovation Momentum rankings



### Process Technology Evolution

3 microns to 0.18 microns → 0.13 micron → 90nm → 65nm → 40/45nm → 28nm → 20nm → 16nm → 10nm → 7nm → 5nm → 3nm → 2nm → A16



## Comprehensive Patent Management System

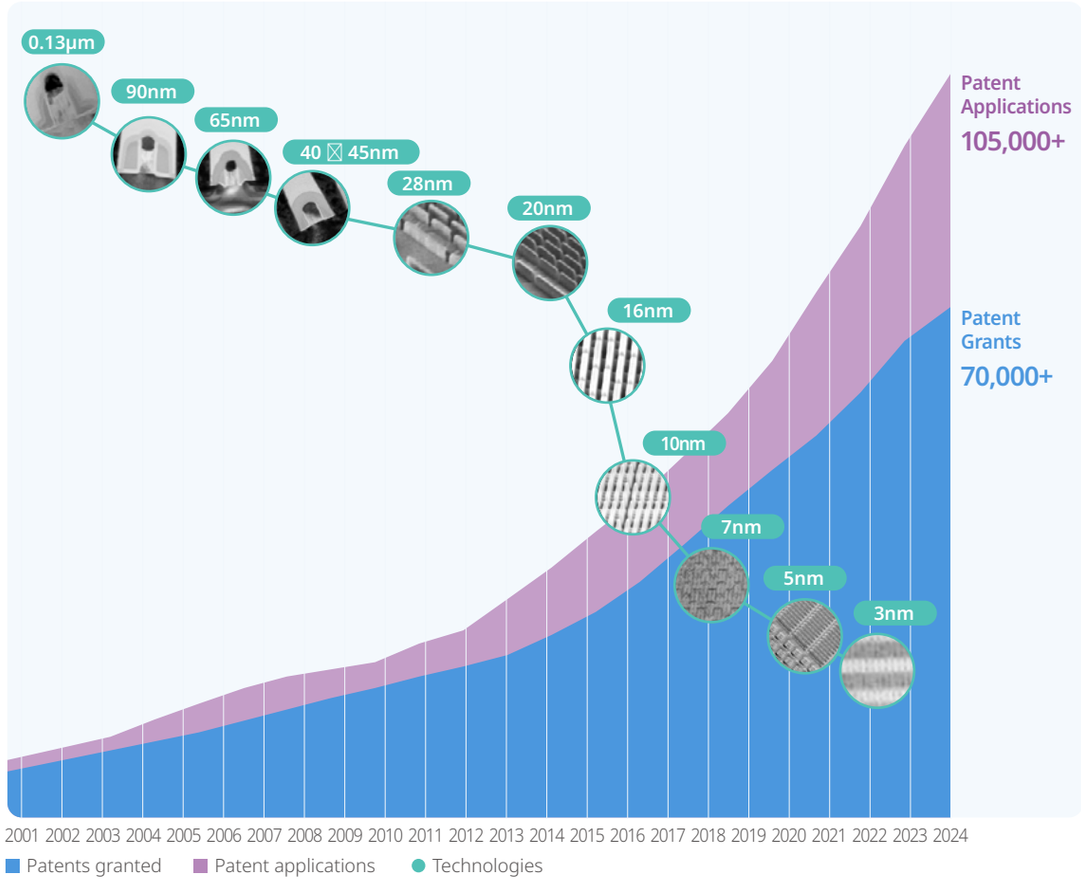
TSMC has a thorough patent management system, leveraging innovative patent strategies, rigorous management protocols, and varied risk controls. The Company designs a near-, mid-, and long-term technological patent roadmap and employs patent maps to monitor and analyze competitive intelligence. To foster innovation, TSMC regularly organizes forward-looking invention forums to identify core technological breakthroughs, resulting in employees submitting strategically valuable emerging key technology inventions. Meanwhile, TSMC focuses on critical technical metrics, expands its patent portfolio, and adopts a tiered system for patent deployment applications and maintenance. By employing goal-oriented patent strategies, the Company implements acquisition and expansion plans, conducts regular reviews, and builds a comprehensive global patent strategy map that prioritizes both scale and quality. This approach optimizes patent assets, securing a strong and competitive market position.

To encourage patent innovation, TSMC has a diverse set of incentive programs. In addition to awarding bonuses for approved patent allowances, the Company establishes annual patent awards to recognize exceptional contributions. For example, the "Prolific Inventor Award" honors employees who have obtained more than 100 U.S. patent allowances during their tenure, with 229 employees have earned this recognition as of 2024. In addition, the "New Inventor Award" acknowledges employees securing their first U.S. patent allowance, with 392 recipients in 2024. TSMC also organizes various annual patent promotion events. In 2024, the "Annual Patent Campaign" attracted 1,132 invention proposals, while 69 on-site training sessions were conducted to help employees refine their patent proposal skills. Additionally, the "Patent Knowledge Quiz" engaged over 2,200 employees, advancing their understanding of intellectual property laws and practices.

### The First Enterprise to Obtain and Maintain the Highest TIPS AAA-Level Certification

The Taiwan Intellectual Property Management System (TIPS), instituted by the Ministry of Economic Affairs, seeks to fortify corporate intellectual property (IP) governance while aligning it with sustainable development goals. In 2021, TSMC became the inaugural company to earn the highest TIPS AAA-level certification, a distinction it successfully renewed in 2024. By participating in the TIPS program, TSMC continuously evaluates and refines its internal IP management structure. The Company supports government efforts to promote TIPS and shares its expertise in IP management. By doing so, TSMC contributes to advancing technological innovation and elevating IP governance across the industry.

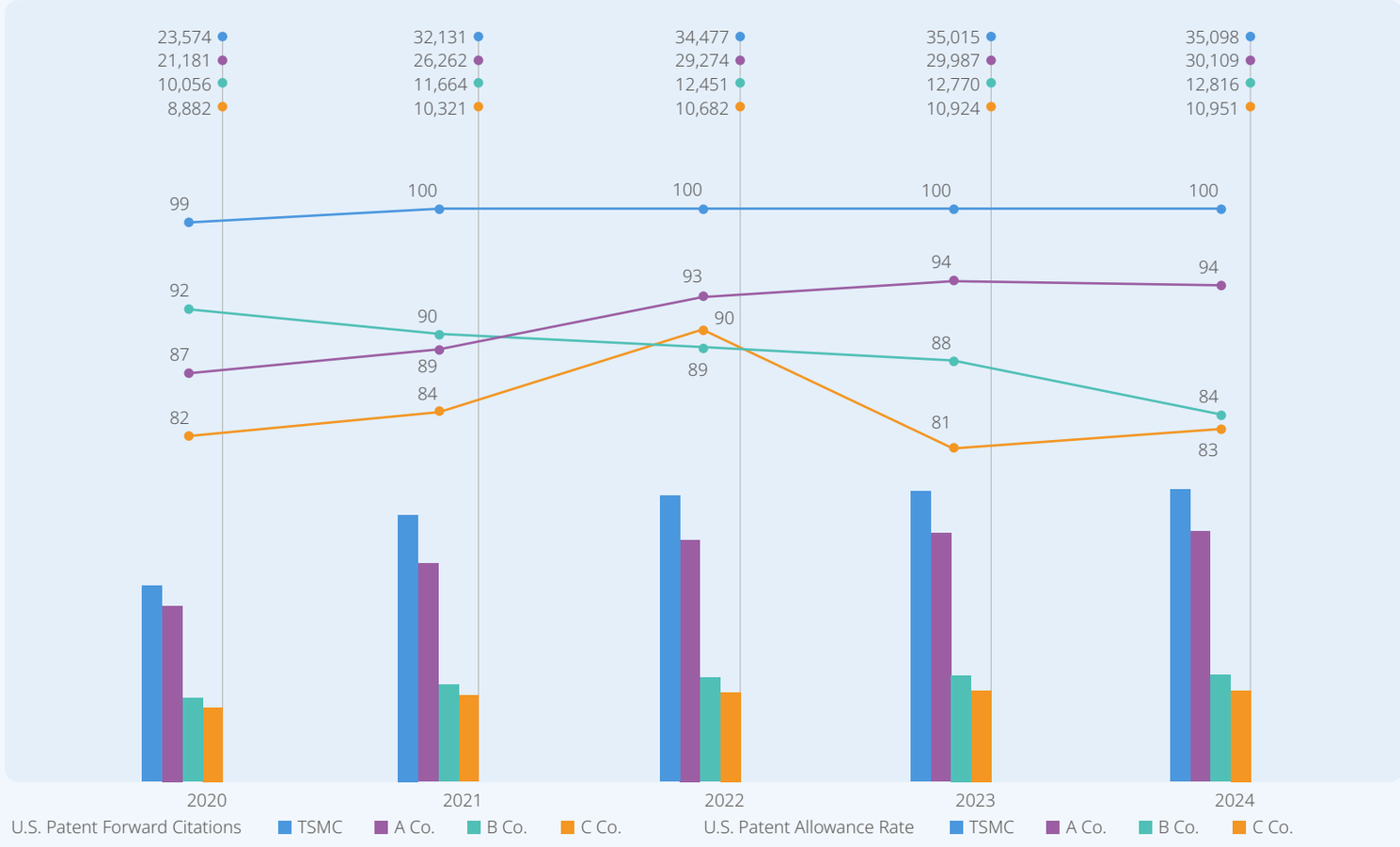
## Strategic Deployment of Forward-looking R&D Patent Portfolio



Case Study

# International Patent Ranking Reaches New Heights

According to the 2024 global patent rankings published by IFI CLAIMS Patent Services, TSMC achieved a historic milestone in its international patent position. The Company secured second place in U.S. patent applications for the third consecutive year and advanced to second place in granted patents, making it the only Taiwanese entity in the global top 100. Regarding patent quality, TSMC achieved an exceptional grant rate of nearly 100% for its U.S. patent applications. Among the top 10 patent holders in patent allowance, TSMC ranked first, significantly surpassing the United States Patent and Trademark Office's average grant rate of 61%. Moreover, forward citations of TSMC's U.S. patents exceeded 35,000 in 2024, outperforming other major semiconductor companies in both grant rates and citation impact. These outcomes highlight TSMC's exceptional expertise in technological innovation and patent management, solidifying its foundation for sustained growth and leadership in the semiconductor industry.



## Trade Secret

TSMC pioneered the Trade Secret Registration System in 2013 to actively fulfill its four key management visions: "IP Strategy, Competitive Advantage, Innovative Culture, and Sustainable Operations." This system protects critical and confidential technologies and business innovations that are vital to the Company's competitive edge. By employing both a robust registration system and an incentive mechanism, TSMC strengthens IP protections while driving sustainable innovation. To address its global expansion, TSMC established the "Trade Secret Sustainable Intelligent Management Center " in 2024, which further enhances the intelligent management system for trade secrets, ensuring comprehensive protection and strengthening the Company's competitiveness in an ever-evolving global landscape.

### Green Trade Secrets Advancing Operational Excellence and Environmental Harmony

As one of TSMC's five key ESG (Environmental, Social, and Governance) directions, "Green Manufacturing" reflects the Company's dedication to integrating sustainability into its daily operations. To foster a culture of green innovation, TSMC established the "Green Trade Secret Registration" initiative, encouraging unique contributions in areas such as climate and energy, water management, resource recycling, and air pollution control. In 2024, 559 green trade secret cases were registered, bringing the cumulative total of 1,872 cases — a testament to the growing importance of green trade secrets. Participation in green trade secret registrations extends beyond energy-saving and water management departments under Facility; employees from research and manufacturing departments are also actively contributing, showcasing the collective commitment across the Company. To reward green innovation achievements, TSMC established the "Green Trade Secret Award," presenting 11 awards to 45 employees in 2024.

### Four Key Visions for Trade Secret Management


### Trade Secret Promotion Milestones

**2020**
- Introduced the "Special Contribution Award" to the Golden Trade Secret Awards and presented personally by TSMC Chairman to employees who have won multiple Golden Trade Secret Awards in order to recognize their exceptional contributions to the Company

**2021**
- Developed four visions for trade secret management: IP Strategy, Competitive Advantage, Innovative Culture, and Sustainable Operation
- Established the "Green Trade Secret Award" and a dedicated "Green Trade Secret Registration Section" to recognize seven key contributions
- Launched the "100% TSR Coverage in Advance Process Volume Production Fabs" project
- Launched the "Trade Secret Management Sharing for Strategic Supply Chain partners" project
- Trade secret registrations reached up to 150,000 cumulatively

**2022**
- Expanded and established the "Trade Secret Registration System Alumni Association "
- Implemented the "Incentive Guidelines to Encourage Green Trade Secret Registration and Public Sharing"
- Launched the "Manufacturing Excellence TSR Project"
- Over 240,000 trade secrets registered cumulatively with over 30,000 unique contributors

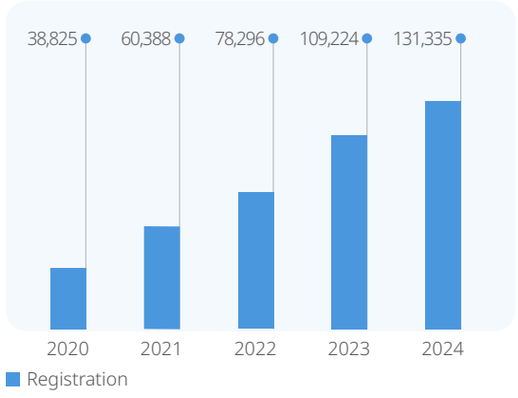
**2023**
- Released the Trade Secret Management 2.0 – "Innovation Talent Scouting Online Merge Offline Service (ITS OMO)"
- Over 340,000 trade secrets registered cumulatively with over 100,000 registrations this year

**2024**
- Established the "Trade Secret Sustainable Intelligent Management Center ," introducing four new systems and integrating them with seven previously developed systems
- Expanded the "Trade Secret Innovation Talent Scouting Online Merge Offline Service ," mentoring 102 prospective inventors, where 22 of which became first time Golden Trade Secret winners
- Through the "Trade Secret Intelligent Management Alumni Association ," shared TSMC's Trade Secret Sustainable Intelligent Management Center and self-evaluation metric with 20 companies

## Trade Secret Awards to Promote Innovation

Between 2013 and 2024, TSMC accumulated an impressive 475,462 trade secret registrations, demonstrating its strength in innovation. To reward quality inventions and innovations, TSMC granted 498 Golden Trade Secret Awards to 2,381 outstanding inventors in 2024. Cumulatively, the Company has presented 3,290 Golden Trade Secret Awards to 7,951 employees over the years. In 2024, TSMC introduced the "Trade Secret Special Contribution Award" to recognize seven employees for their exceptional contributions to trade secret litigation cases. Furthermore, 31 senior employees who served as mentors in the "Trade Secret Innovation Talent Scouting Online Merge Offline Service" received the "Golden Coach Award" for their efforts in nurturing innovative talent and enhancing both the quality and quantity of trade secret registrations.

### Trade Secret Annual Registrations




Case Study

# Pioneering the "Trade Secret Sustainable Intelligent Management Center"

To strengthen the company's competitive advantage and to sustain its innovative culture, TSMC pioneered the "Trade Secret Sustainable Intelligent Management Center " in 2024, introducing four new systems: "Trade Secret Intelligent Monitoring & Matching System, Trade Secret Registration Innovation Index Analytics System, Trade Secret Registration Intelligent Reminder System, and Trade Secret Intelligent Management App." By integrating with seven previously developed systems, the Center's scope covers six main categories of service: Registration Intelligent Integration, Intelligent Infringement Prevention & Monitoring, Intelligent Automatic Service, Artificial Intelligence Utility, Green Trade Secret, and Charitable Sharing & Public Benefit, as well as fifteen self-evaluation metrics under three main indices: 1) Synergistic Index, 2) Optimization Index, and 2) Sustainability Index, enhancing smart management of trade secrets comprehensively. Additionally, during the inaugural "Trade Secret Intelligent Management Alumni Association," TSMC shared its latest practices with 20 companies to inspire industry partners to generate more quality intellectual property innovations.

> Sustainable innovation is a crucial cornerstone for sustainable operations. TSMC pioneered the sustainable and intelligent management of trade secrets, and charitably shared it with its supplier partners. Our company's trade secret management is thus able to optimize continuously, injecting fresh momentum into supply sustainability.
>
> **Huang Chii-Feng**
> Chairman and President of Solar Applied Materials Technology Corp.

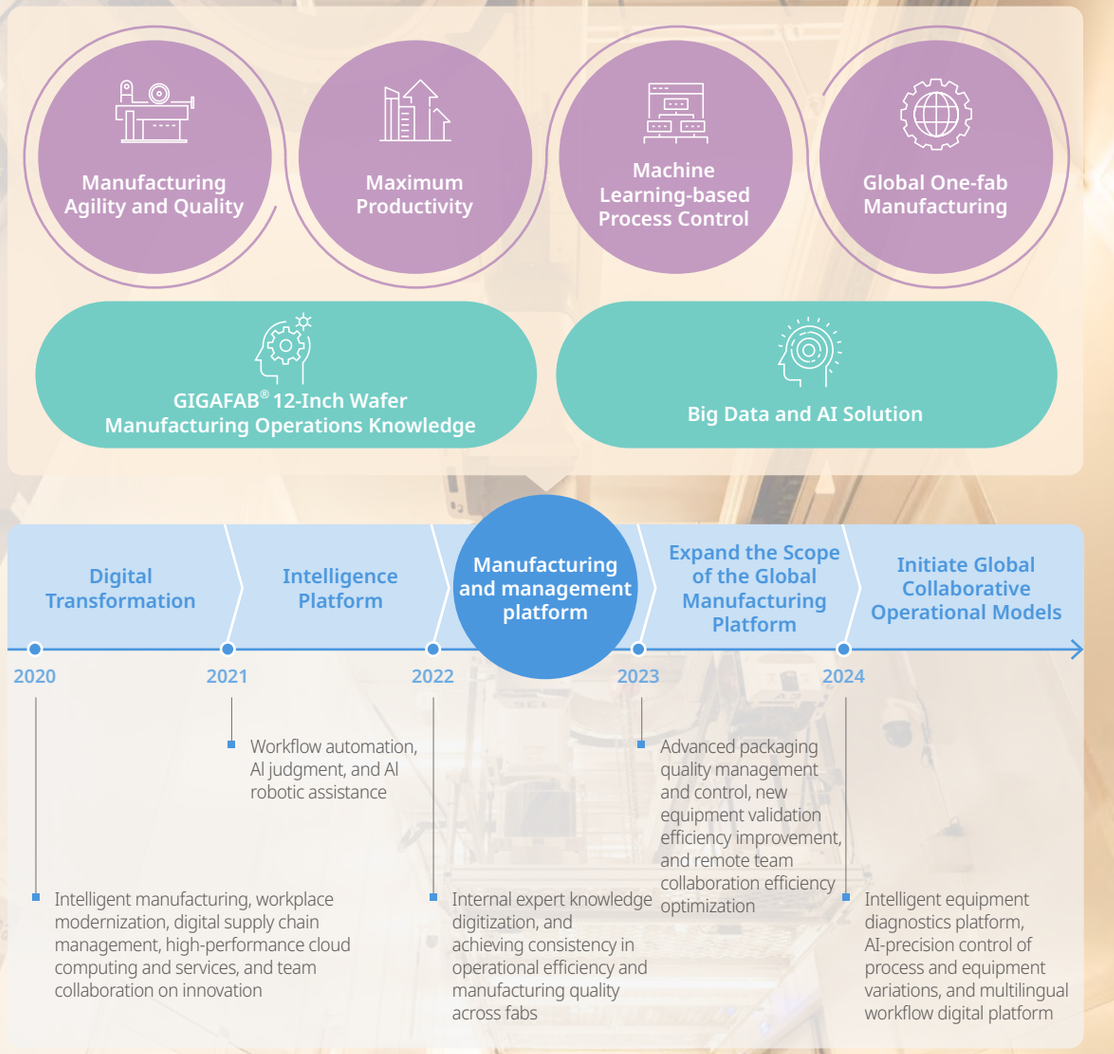

TSMC holds the "Trade Secret Intelligent Management Alumni Association" to Promote Smart Management.

## Intelligent Precision Manufacturing

Intelligent precision manufacturing serves as the cornerstone of TSMC's unwavering commitment to manufacturing excellence. Through its Global Manufacturing and Management Platform, TSMC executes four strategic priorities: Manufacturing Agility and Quality, Maximum Productivity, Machine Learning-based Process Control, and Global One-fab Manufacturing. These efforts ensure consistent operational efficiency and product quality across domestic and overseas fabs. In 2024, TSMC expanded its intelligent manufacturing system to advanced packaging fabs to meet the packaging demands of various product types, enhancing process flexibility while maintaining superior quality and efficiency throughout all production stages — from wafers to dies. By doing so, TSMC reinforces its position as a reliable, long-term provider of technology and capacity within the global semiconductor industry.

Related to Manufacturing Agility and Quality, TSMC successfully integrates smart mobile devices, Internet of Things technology, edge computing, and mobile robotics with its intelligent automated material handling system. This integration has strengthened connectivity across multiple large-scale wafer fabrication plants, significantly enhancing production efficiency, stability, and overall capacity. In its new overseas fabs — TSMC Arizona and JASM — the Company has implemented a new tool testing platform featuring multi-layered quality verification systems. This innovative platform enhances the efficiency and quality of new equipment validation processes, contributing to more mature and stable global production operations. In the area of Maximum Productivity, TSMC tackled the complexity and diversity of semiconductor equipment by introducing an intelligent diagnostic platform. This advanced tool automatically detects productivity anomalies, provides diagnostic recommendations, and delivers operational instructions, enabling faster recovery of normal operations and ensuring optimal productivity.

Through Machine Learning-based Process Control, TSMC addressed the challenges posed by the ongoing shrinkage of integrated circuit line widths by incorporating artificial intelligence into its systems. This innovation resulted in the creation of a Precise Fault Detection and Classification System, Intelligent Advanced Equipment Control, and Intelligent Advanced Process Control, significantly enhancing the precision of both processes and equipment performance. Additionally, TSMC introduced an Intelligent Process Variation Detection and Engineering Analysis System, built upon semiconductor manufacturing knowledge. By leveraging automated diagnostics and self-adjusting mechanisms, this system effectively minimized process deviations, latent defects, and fluctuations in production parameters. In its pursuit of Global One-fab Manufacturing, TSMC continues to maintain its competitive edge in manufacturing excellence through close collaboration with supply chain partners. To ensure consistent production standards and product quality across its global operations, the Company launched a Multilingual Workflow Digital Platform .



Case Study

# Multilingual Workflow Digital Platform Reaches One Million Monthly Executions

As part of TSMC's global expansion strategy, the Company developed the "Workflow Digital Platform" to ensure accurate and consistent implementation of automated standard operating procedures (SOPs) across all fabs. The platform creates a "Global One Team" approach, enhancing collaboration among its multinational sites. With intuitive and efficient low-code technology, users can independently develop SOPs, which are then executed automatically through code translation. In addition to digitizing SOPs, the platform supports multiple languages, such as English, Japanese, and simplified Chinese, enabling employees from diverse linguistic backgrounds to effectively understand and implement SOPs and quickly realize innovative ideas. Through knowledge sharing and systematic training, the platform has been expanded to various fabs. TSMC held 78 training programs that involved 5,335 participants. This platform has been deployed across TSMC's advanced processing and packaging fabs worldwide, since last year, achieving an average of one million monthly executions, significantly reducing reliance on manual operations. The digital platform ensures consistent automation management across global fabs, elevating uniformity in operational efficiency. Additionally, its multilingual capabilities promote workplace inclusivity and cultural diversity, making TSMC an attractive destination for global talent. This initiative not only strengthens the Company's ability to retain top talent but also advances its goal of integrated global manufacturing.

Multilingual workflow digital platform ensures integrated global manufacturing.

## Open Innovation Platform® (OIP)

In the rapidly evolving landscape of semiconductor industry, TSMC is committed to maintaining technology leadership, while driving innovation and efficiency in chip design. TSMC's OIP has cultivated a vibrant ecosystem rooted in longstanding collaboration with EDA Alliance, IP Alliance, DCA, Cloud Alliance, VCA, and TSMC 3DFabric® Alliance. Through TSMC's long-standing and deeply rooted partnership within the semiconductor ecosystem, innovative advancements have been achieved that enable customer designs to drive technology improvement in the industry — from advanced process nodes in 2D IC designs to system-level integration in 3D IC designs. Furthermore, with the emergence of Artificial Intelligence (AI), semiconductors are poised to power an even broader range of design applications, impacting every aspect of people's lives. TSMC's OIP is dedicated to delivering pragmatic and highly efficient AI solutions, enabling customers to adopt these advancements in integrated circuit (IC) & system designs. This approach empowers a broader range of product innovations that enrich people's lives.

During its 2024 OIP Ecosystem Forum, TSMC unveils advancements across its advanced process nodes, specialty, and TSMC 3DFabric® technologies–spanning in the realms of digital, analog, RF (Radio Frequency), multi-physics, multi-die, and silicon photonics. TSMC also demonstrates the extension of its DTCO expertise to the latest advanced technologies, including N3 FinFLEX™, N2 NanoFLEX™, and TSMC A16™ with innovative backside power solution. As silicon process technology progresses, TSMC continues proactive collaboration with our long-term OIP partners to optimize power, performance, and area (PPA). This includes the certification of industry-leading digital and custom design flows for implementation and signoff in 3nm and 2nm technologies, as well as TSMC 3DFabric® packaging technologies such as TSMC-SoIC® (System on Integrated Chips), CoWoS®, and the latest TSMC-SoW™ (System-on-Wafer). These efforts aim to enable customer tape-out success and drive continuous growth in global technology development.

While AI is becoming pervasive in daily routines and business practices, TSMC collaborates with OIP partners to apply AI innovation to the next- generation of EDA tool and IP solutions utilizing TSMC's most advanced process and TSMC 3DFabric® technologies to accelerate the progress in both 2D IC & 3D IC designs. The collaboration with EDA partners not only drives the implementation of Generative AI and Large Language Models (LLMs) in EDA tools and flows, but also enables integration into actual design stages. The examples include optimization of metal schemes for 2D IC and acceleration of digital cell library design. Combined with AI-powered EDA tools and IP libraries and DTCO innovations, OIP enables continuous semiconductor scaling to streamline customer's product design flow while ensuring better quality assurance, design and cost efficiency, thus shortens product cycle time to the market.

TSMC also collaborates with OIP partners to enhance cross-tool interoperability in 3Dblox standard . Together with the integration of AI and STCO, these features help customers simplify 3D IC designs by automated handling of complex tasks and optimizing numerous parameters to facilitate their rollout of differentiated products, thereby establishing a new paradigm for 3D IC designs. In response to the growing demand for higher die-to-die data transmission rates in proliferated AI design applications, TSMC's COUPE™ 3D IC architecture offers low impedance and higher energy efficiency for silicon photonic designs, which is also supported by 3Dblox standard to meet the insatiable increase of data transmission rate in AI era.

## TSMC's Six OIP Alliances

Openness has been the foundation of TSMC's OIP mindset, shaping its collaborative work model with partners of six alliances that make impactful innovation in the semiconductor industry. By infusing the creative thinking of customers and partners across its diverse OIP alliances, TSMC fosters an environment where ideas converge to reduce design barriers and achieve first-time silicon success, shorter design cycle time, faster time-to-market, time-to-volume and time-to-revenue, providing customers with holistic solutions and services.

## 2024 Six OIP Alliances Major Achievements


### EDA Alliance

Provides the certification of Electronic Design Automation (EDA) tools required at various IC design stages and ensures readiness of design reference flows to address the latest requirements of customer designs and process technologies

- Released eight new Design Reference Flows in collaboration with major EDA Alliance partners
- Cumulatively released over 3,700 PDK, 52,000+ technology files, and 71 design reference flows
- Certified EDA tools for N2, N2P, N3E, N3P and TSMC 3DFabric® technologies

### Cloud Alliance

Provides OIP Virtual Design Environment (VDE) and Cloud-based solutions tailored for different design stages, enabling customers to fully utilize high-performance computing resources available in the Cloud and accelerate product design cycles

- Rolled out the first TSMC Cloud Certification project that validates EDA tool's accuracy in the cloud with both major EDA and Cloud partners in TSMC's leading-edge technologies
- Enabled the first cloud-based GPU (Graphical Processing Unit) solution for accelerating optical analysis, achieving more than 10X runtime reduction

### Value Chain Alliance

Integrates design enablement building blocks and provides specific services across the IC value chain, including IP development, front-end and back-end designs, wafer manufacturing, assembly, and testing, to support customer innovation

- The flexible Application Specific Integrated Circuit (ASIC) service model, spanning from design-in to mass production, has enabled over 900 customer chip innovations through collaboration with eight VCA partners worldwide
- Expanded the TSMC 3DFabric® design platform to N2, incorporating UCIe, 3D IC Die-to-Die interface IP integration, and turnkey service capabilities

### IP Alliance

Offers silicon-proven IP portfolios that fulfill TSMC's quality requirements and meet a wide variety of design needs in the semiconductor industry

- Enabled IP partners to develop IPs for N2P and specialty technology nodes, strengthening TSMC's IP portfolio
- Added two new IP Alliance members specializing in High Speed Serializer and Deserializer (SerDes) and specialty Input/Output (I/O)
- Enabled IP partners to develop more advanced UCIe and HBM solutions using TSMC's most advanced TSMC 3DFabric® technologies

### Design Center Alliance

Offers design services ranging from system-level front-end design to back-end physical implementation and verification, assisting customers in adopting TSMC technologies for their designs

- Added four new partners to expand design service support in Asia, North America, and Europe

### TSMC 3DFabric Alliance

Comprises a full spectrum of 3D IC design solutions and services, including memory modules, substrate technology, testing, manufacturing, and packaging, to help customers achieve silicon and system-level innovations using TSMC's 3D silicon stacking and advanced packaging technologies

- Collaborated with four major partners to develop and certify EDA tool features supporting 3D IC design and 3Dblox Standard
- Partnered with four major IP partners to support 3D IC chiplet industry standards including UCIe and HBM interfaces
- Developed substrate technology file with three major partners to improve substrate layout productivity in implementation and verification
- Partnered with three major OSAT (Outsourced Semiconductor Assembly & Test) partners to adopt 3Dblox, enhancing chip integration flows
- Updated 3Dblox syntax and format to accommodate more complex features and support customized design requirements

## Comprehensive Ecosystem Design Solutions

At the 2024 TSMC OIP Ecosystem Forum, a new series of design solutions has been unveiled jointly with OIP alliance partners and customers, incorporating DTCO and AI-powered solutions for advanced 2D IC and 3D IC designs, as well as mobile and high-performance computing (HPC) design applications. To recognize the outstanding support and collaborative achievements of TSMC's OIP ecosystem partners in advancing solutions for N2, TSMC A16™, COUPE™, analog and RF Design Migration, multi-physics, Cloud, IP, and TSMC 3DFabric®, the Company granted eleven awards to its EDA partners, eight awards to its IP partners, one award to its Cloud partner, and four awards to the TSMC 3DFabric Alliance partners.

### Advanced Technology with DTCO and EDA

- Improve energy efficiency and density for next generation AI and mobile chip designs through DTCO
- Collaborates with EDA partners, TSMC develops new algorithms to achieve DTCO-driven PPA optimization in N3 FinFLEX™ and N2 NanoFLEX™
- DTCO innovations and EDA optimization are applied to advanced technologies, enabling continuous semiconductor scaling with improved performance and power efficiency for customer designs

### N2 and TSMC A16™ Technology

- N2 NanoFLEX™ offers DTCO benefits and flexibility, to achieve optimization in customer designs
- TSMC A16™ features Super Power Rail (SPR) with highest performance and energy efficiency offering an innovative and industry-leading backside power delivery solution

### AI Innovation for Chip Designs

- Collaborates with EDA partners on AI-powered design automation for enhancement in PPA and productivity
- AI is applied to optimize analog design, 2D IC metal scheme, 3D IC interface channel & global design resource planning

### TSMC 3DFabric® Solutions

- Validates EDA tool thermal and mechanical stress analysis solutions with TSMC 3DFabric® technology files
- Delivers silicon-validated optical solution in COUPE™ with PDK, design flow, and EDA multi-physics tools
- COUPE™ 3D EDA tools are ready to support customer designs for silicon photonics

Executive Keynote Speeches at the 2024 TSMC OIP Ecosystem Forum

## Enhance Industry-academia Collaboration

Guided by its core principle of "Talent Development" within the framework of five ESG directions, TSMC actively partners with schools across all educational levels, as well as with research and academic institutions, to establish and strengthen campus collaboration programs. At the elementary and junior high school levels, TSMC employs engaging and interactive methods to spark students' interest in STEM fields and foster scientific literacy. For high school and vocational students, the Company offers accessible courses and activities designed to enhance their understanding of semiconductor industry trends and outlooks. At the university and graduate levels, TSMC offers semiconductor curriculum that integrate theoretical knowledge with practical applications, while encouraging faculty engagement in advanced semiconductor research to drive technological innovation. Through these customized educational courses, TSMC collaborates with academia to cultivate skilled talent and enhance the quality and competitiveness of the global semiconductor workforce.

**74,384**
Total beneficiaries

**$782 million**
Total investment (NT$)

**105**
Partner schools worldwide

TSMC's partner schools

### Elementary and Junior High Schools

**Inspiring Curiosity and Early Exploration of STEM**

- TSMC Science Voyage
- AI Programming Education for Young Learners
- TSMC for Education

### High Schools and Vocational Schools

**Skill Development and Practical Applications**

- TSMC High School Semiconductor Mini Courses
- TSMC Girls in STEM Program for High Schools
- Operations Equipment Star Program
- TSMC Cup – Scinarrator-Scientific Presentation Contest
- Sponsorship of Wu Chien-Shiung, Wu Ta-You, and Marie Curie Science Camps

### Universities and Graduate Institutes

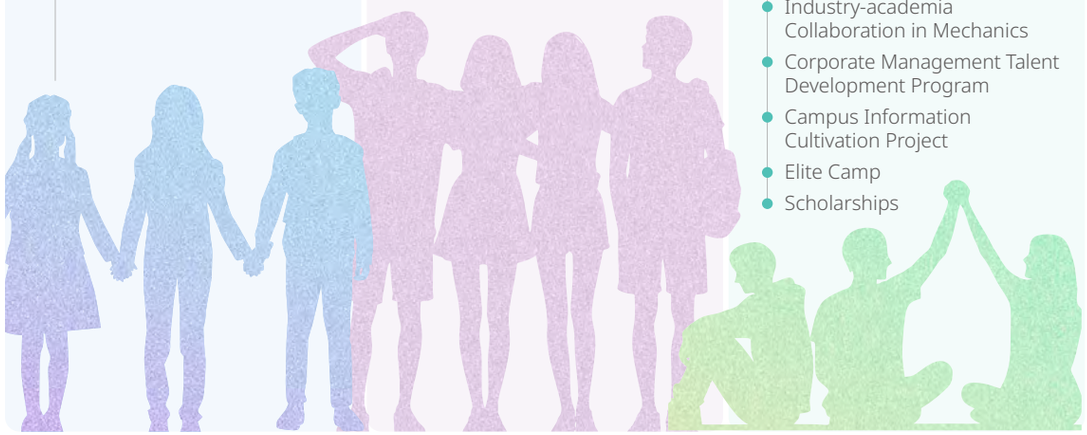
**Technological Research and Professional Development**

**Technological Research**

- University Research Center
- Industry-academia Joint Development Project
- University Shuttle Program
- National Academy for Key Fields of Research

**Professional Development**

- Semiconductor Curriculum
- Semiconductor Courses
- Semiconductor Talent Training Program
- FinFET Academic Design Foster Package (ADFP)
- Industry-academia Collaboration in Mechanics
- Corporate Management Talent Development Program
- Campus Information Cultivation Project
- Elite Camp
- Scholarships



## Elementary and Junior High Schools: Inspiring Interest and Early Exploration of STEM

### • TSMC for Education

Underscoring the importance of nurturing talent at an early stage, TSMC partnered with the Junyi Academy Foundation in 2024 to launch the "TSMC for Education" project. By combining Junyi Academy's expertise in primary and secondary education with TSMC's deep knowledge of the semiconductor industry, the project aimed to meet the learning needs of junior high students. As part of this initiative, the foundation developed an online interactive learning platform called "My Semiconductor Adventure," which systematically introduces students to the basics, functions, and applications of semiconductors, starting with familiar technology products. In 2024, the platform attracted over 39,000 visits, reaching users from all administrative districts in Taiwan, including offshore islands. The course earned a satisfaction score of 4.57 out of 5 and a completion rate of 94.45%, marking it as the top-performing course on the Junyi Academy platform.

Online Interactive Course: My Semiconductor Adventure

## High Schools and Vocational Schools: Skill Development and Practical Applications

### • TSMC High School Semiconductor Mini Courses

The high school years are crucial for students to explore interests and define future career paths. To introduce students to the semiconductor industry during this formative stage, TSMC, by partnering with university professors and high school educators, created semiconductor mini-course: “SEMI: Semiconductor in Our Life” and “Semiconductor Cloud Academy .” These resources, which combine classroom instruction and online self-study materials, provide students with a solid foundational understanding of the field. In 2024, the "SEMI: Semiconductor in Our Life" program expanded to include seven additional partner schools, engaging 808 students. Meanwhile, the "Semiconductor Cloud Academy" broadened its reach by introducing Japanese, English, German, and Simplified Chinese versions alongside the Traditional Chinese curriculum, attracting 2,361 high school learners from Taiwan and abroad. In collaboration with Taiwan National Tsing Hua University and Amazon Web Services Taiwan Ltd., TSMC hosted its inaugural one-day summer camp in 2024. The event featured interactive sessions with guest speakers and an advanced photolithography lab session, allowing students to apply theoretical knowledge in a practical setting. A total of 64 high school students participated, with the program achieving a satisfaction rate of 97%.

The cleanroom tour provides high school students with valuable insights into the semiconductor work environment.

### • TSMC Girls in STEM Program for High School

Since 2020, the TSMC Education and Culture Foundation has hosted the “Journey of Female Scientists” program, which has consistently received enthusiastic responses. In 2024 alone, the program attracted over 1,000 female students. The foundation also organized the “Lean in and Achieve a Better Version of Yourself” career lecture series, where alumnae shared their perspectives on industry trends and personal growth, igniting STEM interest among more than 3,000 female students. To nurture female talent in technology research and development, TSMC launched a “Girls’ High School Student Scholarship” in collaboration with 18 schools, providing substantial resources and support to inspire greater engagement of young women in STEM fields.

### • Operations Equipment Star Program

To help vocational high school students explore semiconductor equipment and facility operations during their studies, TSMC initiated the Operations Equipment Star Program in 2023 in partnership with three vocational high schools. Through campus information sessions, corporate site visits, and scholarships, the program aims to develop students’ practical skills in equipment modification and facility engineering, inspiring a sustained interest in the semiconductor sector and broadening the industry’s talent pool. In 2024, 218 students participated in the program, totaling to 327 participants since its inception.


TSMC holds a contract signing ceremony for the Operations Equipment Star Program at Taiwan National Pingtung Industrial Vocational High School.

## Universities and Graduate Institutes: Technological Research and Professional Development

### • University Research Center

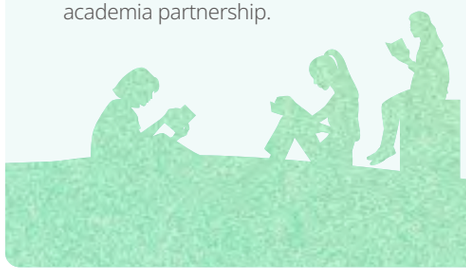
In collaboration with National Yang Ming Chiao Tung University, National Taiwan University, National Cheng Kung University, and National Tsing Hua University, TSMC established research centers focused on pioneering advancements in semiconductor materials, devices, processes, and chip design. The Company supports academia in pursuing innovative research projects and actively cultivates talent in relevant fields. As of 2024, 374 professors and 4,747 outstanding students have joined these efforts, collectively driving technical progress and innovation in semiconductor technology. Additionally, the Company has collaborated with eight prestigious U.S. universities and 12 research centers to accelerate the development of next-generation semiconductor technologies.

### • Industry-academia Joint Development Project

TSMC collaborates with domestic and international universities to conduct industry-academia projects, with focuses on advanced semiconductor materials, devices, fabrication processes, equipment, packaging technologies, green manufacturing, and circuit design. There are currently 319 professors from 11 domestic and 31 international universities working on 391 projects. Since 2013, these partnerships have yielded 311 U.S. patent applications.

### • University Shuttle Program

In 2024, TSMC collaborated with 17 universities worldwide through the University Shuttle Program, providing access to semiconductor fabrication technologies. This initiative enabled faculty and students to execute and validate innovative circuit and system designs. In addition to offering early exposure to industry-standard chip design and manufacturing processes, the program helped students develop practical chip implementation capabilities, communication skills, and problem-solving abilities that are essential for their future careers. Throughout the year, collaborating institutions published 80 research papers spanning diverse fields, including high-speed wireline communication, electron devices, electrical engineering, compute-in-memory, artificial intelligence, security, millimeter-wave systems, biomedical circuits and systems, and the Internet of Things. Notably, 14 of these papers were featured in prestigious academic platforms, including the IEEE JSSC and the ISSCC — widely recognized as the "Olympics of IC Design" — demonstrating the exceptional achievements of this industry-academia partnership.



### Key Academic Collaborators and Research Topics in 2024

National Central University
National Taiwan University
National Tsing Hua University
National University of Singapore
Princeton University
University of California, Los Angeles
University of Michigan
University of Texas at Austin

Note: Partner institutions are listed in alphabetical order based on their English names.

Thanks to the support of TSMC's University Shuttle Program, we were able to validate circuit innovations, publish numerous outstanding papers, cultivate excellent graduate students, and contribute to a positive cycle of growth and innovation within the semiconductor industry.

**Tai-Cheng Lee**
Professor, Department of Electrical Engineering and Graduate Institute of Electronics Engineering, National Taiwan University

Participating in TSMC's University Shuttle Program allowed me to gain early access to and familiarity with chip design and manufacturing processes. This opportunity not only led to a pre-employment offer but also enabled me to seamlessly transition and adapt to the professional environment upon entering the workforce.

**Li-Yu Yeh**
A graduate of National Tsing Hua University, currently a Design and Technical Platform Engineer at TSMC

### • National Academy for Key Fields of Research

In line with the Ministry of Education's Innovation Act for Industry-Academia Collaboration and Talent Cultivation in National Key Fields, TSMC has been actively supporting the establishment of research institutes dedicated to semiconductors and other critical technologies since 2022. These institutes are hosted by National Taiwan University, National Tsing Hua University, National Yang Ming Chiao Tung University, National Cheng Kung University, National Sun Yat-sen University, National Chung Hsing University and National Taiwan University of Science and Technology in Taiwan. In 2024, TSMC allocated over NT$200 million to advance cutting-edge research in Taiwan's semiconductor sector, nurturing top notch talent for research and development.

### • Semiconductor Curriculum

To elevate the caliber of semiconductor professionals, TSMC collaborates with domestic universities to offer semiconductor curriculum spanning six core disciplines: devices/integration, processes/modules, equipment engineering, advanced packaging, intelligent manufacturing, and advanced circuit design. As of 2024, 17 universities are offering a total of 57 curricula, attracting over 12,800 student enrollments. Notably, TSMC designed three specialized courses — "Semiconductor Processes: Equipment and Technologies," "Intelligent Semiconductor Manufacturing," and "Introduction to Semiconductors Lecture Series" — taught by industry experts from the Company. TSMC also provided access to its internal training resources, allowing program participants to attend sessions at its Newcomer Training Center. To date, over 1,840 students have completed the training and successfully passed the assessments.

### • Semiconductor Courses

To inspire greater interest in semiconductor studies among university students, in addition to course collaborations in Taiwan and in the United States, TSMC collaborated with Japan's Kyushu University to launch an eight-week semiconductor program in 2024. The lectures were delivered by managerial-level experts from Japan Advanced Semiconductor Manufacturing, Inc, TSMC Japan Design Technology, Inc, and TSMC Japan 3DIC R&D Center, Inc, covering topics on semiconductor devices, processes, manufacturing, design, and packaging fundamentals, as well as industry applications and emerging challenges. This program provided a learning experience that combined theoretical knowledge with practical application to students from seven universities in the Kyushu-region, with a total of 173 participants successfully completing the courses.

### • Semiconductor Talent Training Program

In response to the global shortage of semiconductor talent, TSMC signed a collaboration agreement in 2024 with Saxony, Germany, and Dresden University of Technology to launch the "Semiconductor Talent Incubation Program Taiwan (STIPT)". This six-month training program in Taiwan aims to equip German students with advanced technical skills and intercultural collaboration capabilities. The first group of 30 exchange students completed semiconductor coursework at National Taiwan University during the first four months; followed by two months at TSMC's Newcomer Training Center, where they studied semiconductor process fundamentals, process control, and equipment basics and components. Through group discussions and case studies, they integrated theoretical knowledge with practical applications. After completing the training, students undertook internships at TSMC's Fab 15A based on their expertise. Guided by seasoned engineers, students acquired comprehensive semiconductor industry learning experiences.


STIPT students participates in a two-month intensive training program at Fab 15A.

### • FinFET Academic Design Foster Package (ADFP)

To bridge the gap between semiconductor design theory and practical application, TSMC introduced the ADFP, a FinFET circuit design toolkit based on the N16 process. In collaboration with OIP partners , TSMC supports universities in transitioning VLSI design education from planar to FinFET technology. By 2024, 150 universities worldwide had adopted the ADFP, with over 350 professors obtaining free licenses, benefiting more than 6,300 students who utilized the toolkit in their courses. In addition, TSMC provided the toolkit to participants in the "University IC Design Competition," enabling them to apply current FinFET architectures in their designs and gain early access to industry-relevant knowledge. At the same time, with the TSMC's N16 and N7 process shuttle programs , the TSMC N16 ADFP has become a global talent cultivation platform for FinFET design, seamlessly integrating education and research to nurture future innovators.

### • Industry-academia Collaboration in Mechanics

As semiconductor processes continue to shrink, the demand for higher packaging quality has grown, establishing heterogeneous integration as a critical driver of advanced packaging technologies in the post-Moore's Law era. Since 2022, TSMC's Quality and Reliability organization, in collaboration with the Advanced Packaging Technology and Service organization, R&D organization, and Fab 18B, has initiated an industry-academia research program. By 2024, this program had engaged three professors and 16 students from Taiwan's National Cheng Kung University and Harvard University in 17 practical case studies. The project focused on fracture mechanics — an underexamined area in semiconductors — to resolve interface delamination and material failure issues encountered in process development and reliability testing. These solutions have been applied in production and process development, with findings published in three international journals. Meanwhile, the Company has recruited five participants from the program, fostering the next generation of talent in advanced packaging technologies.



### • Corporate Management Talent Development Program

Talent develpment and support are essential ingredients for organizations to succeed. In 2024, TSMC partnered with the College of Management at both National Taiwan University and National Yang Ming Chiao Tung University in Taiwan to launch the "Corporate Management Talent Development Program." This initiative explored critical management issues within the global semiconductor industry from an international perspective, emphasizing the seamless integration of academic theory with real-worldapplication. The program adopted case-based teaching approach by TSMC management teamand university professors, fostering students' analytical thinking and innovative problem-solving skills. The program provided a comprehensive and structured learning framework, equipping 81 participants with strategies to navigate industry challenges while reinforcing the Company's commitment to cultivate a diverse and skilled workforce.

### • Campus Information Cultivation Project

TSMC is advancing semiconductor manufacturing by establishing smart fabs and streamlining digital and automated workflows using artificial intelligence and cloud-native technologies. To attract exceptional students interested in the digital transformation of semiconductor manufacturing, the Company, in collaboration with the Department of Computer Science at Taiwan's National Yang Ming Chiao Tung University, launched a postgraduate course titled "Cloud Native Software Development and Best Practices." This program later expanded to include both the Department of Computer Science and the Department of Information Management at National Taiwan University. By 2024, the two universities had delivered four sessions, enrolling 508 students and solidifying TSMC's leadership in information technology education.

### • Scholarships

To nurture outstanding semiconductor talent, TSMC offers scholarships through its partner University Research Centers, encouraging students to engage in cutting-edge semiconductor technology research. Acknowledging the pivotal role of doctoral researchers in driving industrial innovation, the Company established the TSMC Ph.D. Scholarship in 2020 to support exceptional students pursuing doctoral degrees in semiconductor-related disciplines. This program aims to cultivate future industry leaders to maintain Taiwan's competitive edge in semiconductor technology. In 2024, TSMC awarded scholarships to 47 new recipients, bringing the cumulative total to 154 Ph.D. students, of whom 16 have received their doctoral degrees.

### • Elite Camp

To spark enthusiasm for advanced semiconductor fields and encourage STEM undergraduate students to pursue doctoral degrees as afoundation for their future careers, TSMC organizes the annual Elite Camp through its Joint Research Centers. This event delves into semiconductor applications in daily life and explores future technological advancements, deepening participants' understanding of the industry. In 2024, the camp attracted 87 undergraduate students, and the overall satisfaction rate exceeded 90%.

TSMC's Elite Camp encourages students to pursue doctoral degrees in semiconductor research.

# Product Quality

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Enhance Quality Culture**<br>Promote CIT programs to strengthen the internal quality culture | Achieve the annual target for the total number of CIT projects [Note 1] NEW | Achieve the completion of 2,530 CIT projects NEW | Completed 3,118 CIT projects NEW<br>- |
| | | | Generated more than NT$15 billion in value from improvement projects [Note 1]<br>Target: NT$15 billion<br>✓ |
| | Involve outstanding projects in TCIA | Involve at least six outstanding projects in TCIA | Nine outstanding projects in TCIA<br>Target: Six projects<br>↑ |
| Encourage major local raw material suppliers to participate in TCIA to strengthen quality culture and competitiveness of the local supply chain [Note 2] | Encourage major local raw materials suppliers to participate in TCIA, with 60% advancing to finals; among them, wafer manufacturing raw materials suppliers have a 100% participation rate, and advanced packaging raw materials suppliers have 75% [Note 2] | - | 18% of major local raw materials suppliers advanced to the finals of TCIA<br>Target: 20%<br>— Note 3 |
| | | | 71% of wafer manufacturing raw materials suppliers participated in TCIA<br>Target: 100%<br>— Note 3 |
| | | | 80% of advanced packaging raw materials suppliers participated in TCIA<br>Target: 60%<br>↑ |
| **Improve Quality Capability**<br>Develop innovative testing methods to enhance product, technology and production quality | Develop a cumulative total of 3,000 innovative testing methods for quality and reliability | Develop 305 innovative testing methods for quality and reliability | Developed 292 innovative testing methods for quality and reliability<br>Target: 290<br>↑ |
| Require that major raw material suppliers obtain ISO 9001 certification to ensure the implementation of a well-structured quality management system [Note 2] | 100% of major raw material suppliers obtain ISO 9001 certification NEW | 100% of major raw material suppliers obtain ISO 9001 certification NEW | 100% of major raw material suppliers obtain ISO 9001 certification NEW<br>- |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: To better evaluate the effectiveness of promoting of quality culture, starting in 2024, the focus will shift from "generating benefits from improvement projects" to " achieving the annual target for the total number of CIT projects." The annual target for CIT projects were set at 10% of the total number of indirect labor (IDL) personnel in mass production fabs.

Note 2: To strengthen supply chain stability and reliability, TSMC has refined its supplier assistance strategy, shifting focus from cultural advocacy to capability reinforcement. Starting in 2024, the target of "major raw material suppliers obtaining ISO 9001 certification" replaced the previous objective of "participation in TCIA." Major raw material suppliers are those that meet at least one of the following criteria: 1) accounting for 85% of purchasing expenses; 2) being a single-source supplier; 3) maintaining ongoing quarterly trading orders applied to critical processes.

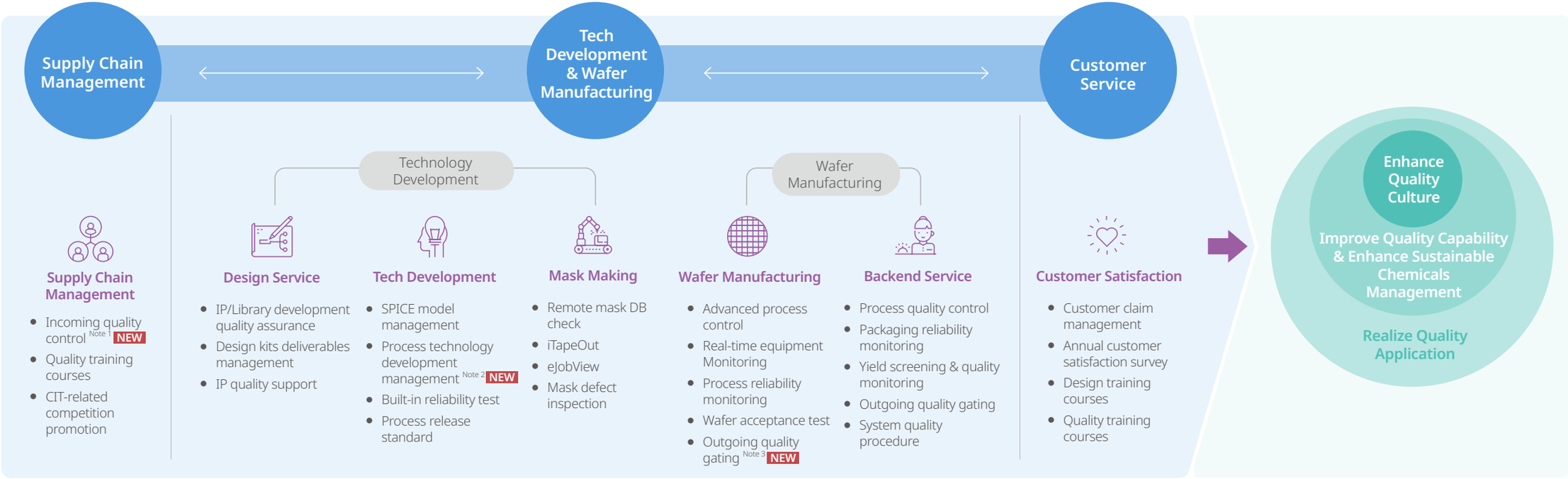
Note 3: Some major local raw material suppliers are unable to participate in TCIA due to insufficient resources.

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Enhance Sustainable Chemicals Management**<br>Develop hazardous substance analysis capabilities in chemical laboratories to ensure occupational health and safety (OHS)<br><br>Strengthen management for hazardous substances to improve green manufacturing | Develop the capability to analyze 100% of CMR substances in materials with potential risks, and assist suppliers of such materials in developing the same capability | Develop the capability to identify and analyze 100% of CMR substances in materials with potential risks, and assist suppliers of such materials in developing the same capability | Developed the capability to identify and analyze 100% of CMR substances in materials with potential risks, and assist suppliers of such materials in developing the same capability ✓<br>Target: 100% |
| | Replace 100% of NMP used in etching processes (using 2016 as the baseline year) | Achieve 100% replacement of NMP in the Company's etching processes. | 100% replacement completed in the etching process in overseas subsidiaries' fabs ✓<br>Target: 100% |
| | No processes involving PFASs that contain more than four perfluorinated carbons | Replace 100% of photoresists containing PFHxA-related substances in VisEra | Replaced 64% of photoresists containing PFHxA related substances in VisEra ✓<br>Target: 64% |
| **Realize Quality Application**<br>Complete quality and reliability certification for advanced process technologies, specialty process technologies, and wafer-level packaging technologies in the design and development stage based on the Company's technology roadmap to ensure quality and safety without any concerns | Complete quality and reliability certification for advanced process technologies, specialty process technologies, and wafer-level packaging technologies in the design and development stage based on the Company's technology roadmap | Complete quality and reliability certification for advanced process technologies, specialty process technologies, and wafer-level packaging technologies per the R&D targets | Completed reliability certifications for N3P process technology, CIS 3-wafer stacking technology, and CoWoS® technology featuring larger interposer sizes ✓ |
| | Zero cases of product recalls by customers due to safety concerns | Zero cases of product recalls by customers due to safety concerns | Zero cases of product recalls by customers due to safety concerns ✓ |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

TSMC is dedicated to delivering outstanding semiconductor manufacturing services to its global customers. To continuously enhance process control, promptly detect abnormalities, and prevent quality issues that could impact customers, TSMC established a comprehensive quality management system based on four key pillars: supply chain management, technology development, wafer manufacturing, and customer service. To ensure the effectiveness of this system, TSMC established an internal quality audit team, nurtured talent certified as ISO 9001 internal auditors, and conducted annual audits across fabs. In 2024, third-party audits further confirmed the system's compliance with ISO 9001 or IATF 16949 standards. TSMC fosters a strong quality culture throughout the Company, encouraging employees to deepen their understanding of quality responsibilities while continuously advancing their expertise in quality-related practices. Regarding customers, TSMC strengthens relationships through diverse communication channels and integrates advanced tools such as SPC and FMEA to monitor production line performance. These proactive measures help minimize the risk of product defects, ensuring customers receive high-quality solutions. In supply chain management, TSMC extends its quality management practices to partners, leveraging its expertise to guide partners toward continuous improvement and enhance raw material quality. Throughout the year, TSMC collaborated with suppliers to finalize technologies such as Diamond Cutting Wire (DCW) and target purification and reuse. The Company is also pursuing innovative carbon reduction strategies, focusing on improving chemical drum packaging materials and developing chlorine-free chemical mechanical polishing (CMP) pads. These initiatives reflect TSMC's commitment to balancing quality and eco-friendly practices. With a robust quality management system as its foundation, TSMC reported zero product recalls initiated by customers due to safety concerns in 2024.

## TSMC Quality Management System




Note 1: Reinforce quality control measures for mixed acid raw materials to tackle particulate contamination, stabilize raw material quality, and ensure seamless production line operations
Note 2: Leverage innovative methods to improve data quality in material quality assessments, enabling the R&D team to gain deeper insights into factors affecting process optimization
Note 3: Optimize the outgoing inspection notification system and monitoring mechanisms to place manual operations, reduce error risks, and significantly increase operational effectiveness

## Enhance Quality Culture

TSMC integrates eight core principles — "Define, Lead, Communicate, Encourage, Select, Integrate, Coach, and Drive" — into its daily operations, establishing a strong foundation for long-term success and sustainable growth. Through its Suggestion Award program, the Company encourages employees to embrace continuous improvement in their work. It also fosters collaboration by promoting "Continuous Improvement Team (CIT)," empowering employees to tackle complex quality issues through dedicated projects. To further inspire participation in quality initiatives, TSMC holds annual "CIT Competitions" at our fabs, along with the company-wide " Total Quality Excellence and Innovation (TQE) Conference." To deepen its quality culture, TSMC sets an annual target for CIT projects, equivalent to 10% of the total number of IDL personnel in mass production fabs. In 2024, TSMC achieved remarkable results by completing 3,118 CIT projects, exceeding its annual target of 2,385 projects. This achievement reflects employees' relentless efforts to practice quality innovation in their daily work, further enhancing TSMC's competitive edge.


- Develop the Quality Policy to establish three core values
  - Internal/external customer satisfaction
  - Quality is everyone's responsibility
  - Strive for excellence
- ✓ Displayed promotional posters on the online "Quality Academy" platform and offline office spaces to improve employees' understanding

- Host a Quality Forum to encourage employees to engage in quality innovations
- ✓ **1,807** employees participated

- Create the Quality Academy platform to inspire innovative ideas
- Design quality posters to strengthen accurate quality awareness
- ✓ The Quality Academy reached **114,843** views
- ✓ **4,262** employees participated in the quality poster campaign NEW

- Establish a hierarchical structure to promote continuous improvement activities
  - Suggestion Award
  - CIT Competition
  - TQE Conference
  - TCIA
- ✓ Awarded **662** proposals through the Suggestion Award program, with a cumulative total of **8,528** projects rewarded since 2009, totaling **NT$15** million in prizes
- ✓ **18** fabs organized the CIT competition
- ✓ Invited major local raw material suppliers to participate in the TQE Conference for the first time NEW
- ✓ Received **eight** Golden Awards, **one** Silver Awards, and **three** Best Improvement and Innovation Awards

- Launch the CIT Outstanding Engineer program to build a talent pool of improvement experts
- Establish the CIT/DOE judge system to enhance the application of quality tools, statistics, and innovative methods, improving project quality
- ✓ Awarded **104** CIT Outstanding Engineer Awards, with a cumulative total to **1,608** since 2000
- ✓ Trained **128** CIT judges and **22** DOE judges

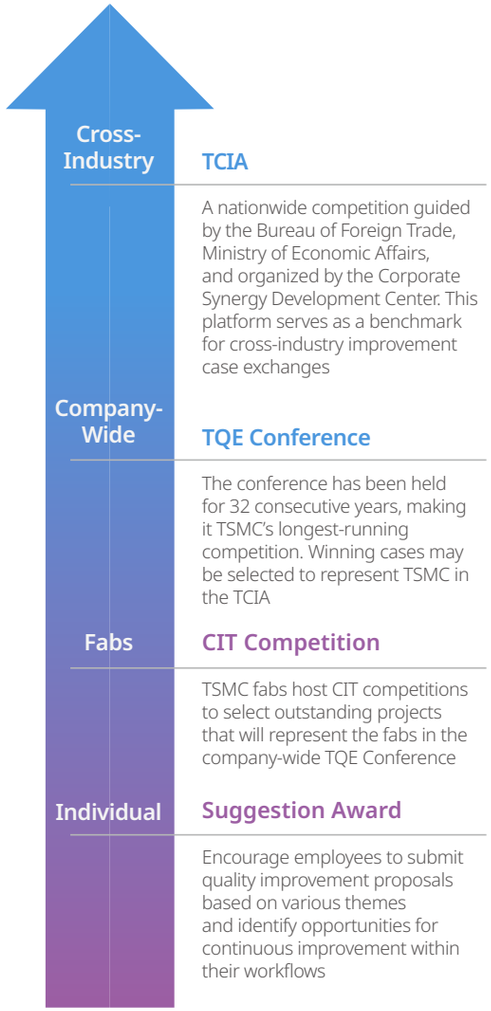
- Incorporate quality culture courses into new employee orientation to raise awareness of quality and corporate core values.
- Introduce multilingual quality courses to strengthen capabilities across international fabs NEW
- ✓ **6,877** employees completed quality culture courses
- ✓ Launched **three** new Japanese quality courses, covering Statistical Process Control, Failure Mode and Effects Analysis, and Lean Manufacturing NEW

- Conduct case studies to guide employees in reflecting and adopting improvement measures.
- CIT/DOE judges assist employees in applying quality tools to solve problems and execute continuous improvement projects.
- ✓ Highlighted **three** quality cases to improve employees' quality awareness and prevent recurrence of mistakes
- ✓ Provided **96** coaching sessions for improving projects

- Advance quality improvement through internal, customer, and third-party audits
- ✓ Quality management system certified annually by a third party

✓ Achievements in 2024

## Promotion Structure of Continuous Improvement Activities




## 2024 TQE Conference-Winning Cases

Quality Improvement
### Global Shutter Image Sensor Yield Improvement

- Optimized grinding thickness
- Introduced innovative thin film deposition

**38%**
**Yield improved**

Production Capacity Improvement
### Equipment Enhancement Leading to Capacity Growth

- Modified thin film chambers
- Developed an AI-driven intelligent tuning system

**22%**
**Capacity increased**

Cost and Production Support
### Optimization of Automated Material Handling System

- Created an automatic recovery mechanism
- Reinforced stocker safety solutions
- Established a real-time damage inventory platform

**34%**
**Seismic recovery time reduced**

Process and Efficiency Improvement
### Significant Progress in R&D Asset Management Standards

- Designed independent R&D assets coding
- Built an asset data system
- Implemented automated data updates with physical control measures

**$6.36 Billion**
**Projected annual benefit (NT$)**

STOP & FIX
### Design Rule Correction and Process Refinement

- Refined design rule syntax and code structure
- Streamlined the deployment process for design rules

**$23 Million**
**Estimated benefit (NT$)**

ESH and Green Corporation
### Fire Protection Pipeline Operation Safety Management

- Verified risk factors in fire protection pipelines
- Developed systematic safety management procedures

**Zero**
**Accidents in fire protection pipeline operations**

Design of Experiment

## Cooling Efficiency Advancement

- Identified improvement opportunities through flow and heat transfer simulation
- Optimized cooling nozzle dimensions through DOE

**50%**
Cooling efficiency improved

Quality Audit

## Refined Audit Methods for Overseas Fabs

- Analyzed differences in engineering documentation between domestic and overseas sites
- Proposed improvement recommendations for overseas operations

Improved quality consistency between headquarters and overseas fabs

Talent Cultivation

## Development of a TSMC Global Newcomer Training Platform

- Systematically integrated diverse remote teaching techniques
- Upgraded instructor foreign language teaching skills and resources
- Improved the quality of newcomer training courses

**18.5%**
Global teaching satisfaction increased

Rising Star

## Product Yield Increase

- Enhanced equipment structure
- Optimized protective layer thickness

**47%**
Yield improved

Assistant Engineer and Module Associate Engineer

## Equipment Efficiency Boost

- Incorporated heat dissipation technologies
- Modified equipment door panels and optimized exhaust systems

**50%**
Equipment abnormalities reduced

Outstanding Proposals from Direct Labor

## Production Line Feeding Mechanism Refinement

- Established a precise tape-out mechanism
- Repurposed excess and obsolete materials for wafer control use
- Implemented new raw material system control mechanisms

**60%**
Annual obsolete inventory decreased

Supplier Quality Category NEW

## Nano Process Quality Optimization

- Strengthened components in analytical instruments
- Improved the stability of analytical systems

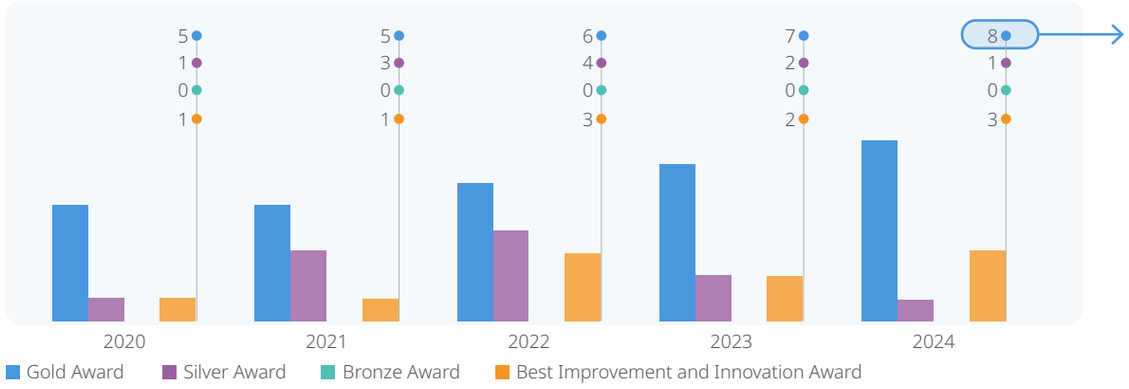
**2%**
Nitrogen contamination in analytical systems reduced

**98%**
Overall product yield increased

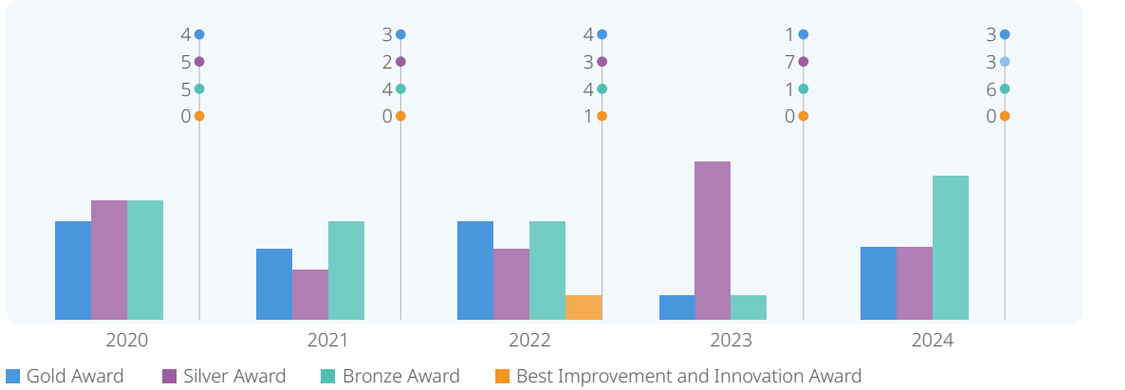
In 2024, TSMC hosts the TQE conference and invites suppliers to participate for the first time, fostering mutual exchange of continuous improvement methods and driving quality innovation.

Beyond its internal quality initiatives, TSMC collaborates with major local raw material suppliers to participate in the TCIA, fostering cross-industry exchanges of improvement techniques and experiences that drive collective progress. In 2024, TSMC achieved a historic milestone, earning eight Gold Awards, one Silver Award, and three Best Improvement and Innovation Awards. Its suppliers also demonstrated excellence, securing three Gold Awards, three Silver Awards, and six Bronze Awards, with the list of recipients publicly available on the TSMC website . Reflecting the spirit of mutual prosperity within the supply chain, TSMC enabled 82% of its major local raw material suppliers to join continuous improvement competitions in 2024. Additionally, the Company introduced a new "Supplier Quality Category" at its internal TQE Conference, actively driving quality innovation across the domestic semiconductor supply network.

## TSMC Participation Record in TCIA




## Major Local Raw Material Supplier Participation Record in TCIA




## 2024 TCIA-TSMC Award-Winning Cases

### Major Breakthrough in Silicon Photonics Chip Mass Production
(Winner of the Best Improvement and Innovation Award)

| | |
|---|---|
| 430% Process uniformity improved | $900 Million Approximate Silicon photonics chip output valued (NT$) |

### Significant Quality Advancement in 5G Communication Chips
(Winner of the Best Improvement and Innovation Award)

| | |
|---|---|
| >79% Yield loss reduced | $130 Million Estimated Improvement benefits (NT$) |

### Quality Enhancement of Communication Chips in Overseas Fabs

| | |
|---|---|
| 7.3% Yield increased | $130 Million Estimated Improvement benefits (NT$) |

### Maximization of EUV Photomask and Wafer Throughput
(Winner of the Best Improvement and Innovation Award)

| | |
|---|---|
| 100% Improved Photomask and wafer throughput | $1.21 Billion Improvement benefits totaled approximately (NT$) |

### Boost in Thin Film Process Capacity

| | |
|---|---|
| 4.9% Capacity expanded | $640 Million Equipment purchase costs reduced approximately (NT$) |

### Optimization of Advanced Process Manufacturing Cycle

| | |
|---|---|
| 12.2% Production cycle shortened | $180 Million Estimated Improvement benefits (NT$) |

### Automation of 8-Inch Wafer Logistics

| | |
|---|---|
| 10% People productivity increased | $140 Million Equipment purchase costs reduced approximately (NT$) |

### Minimization of Personnel Exposure to Chemicals in Operations

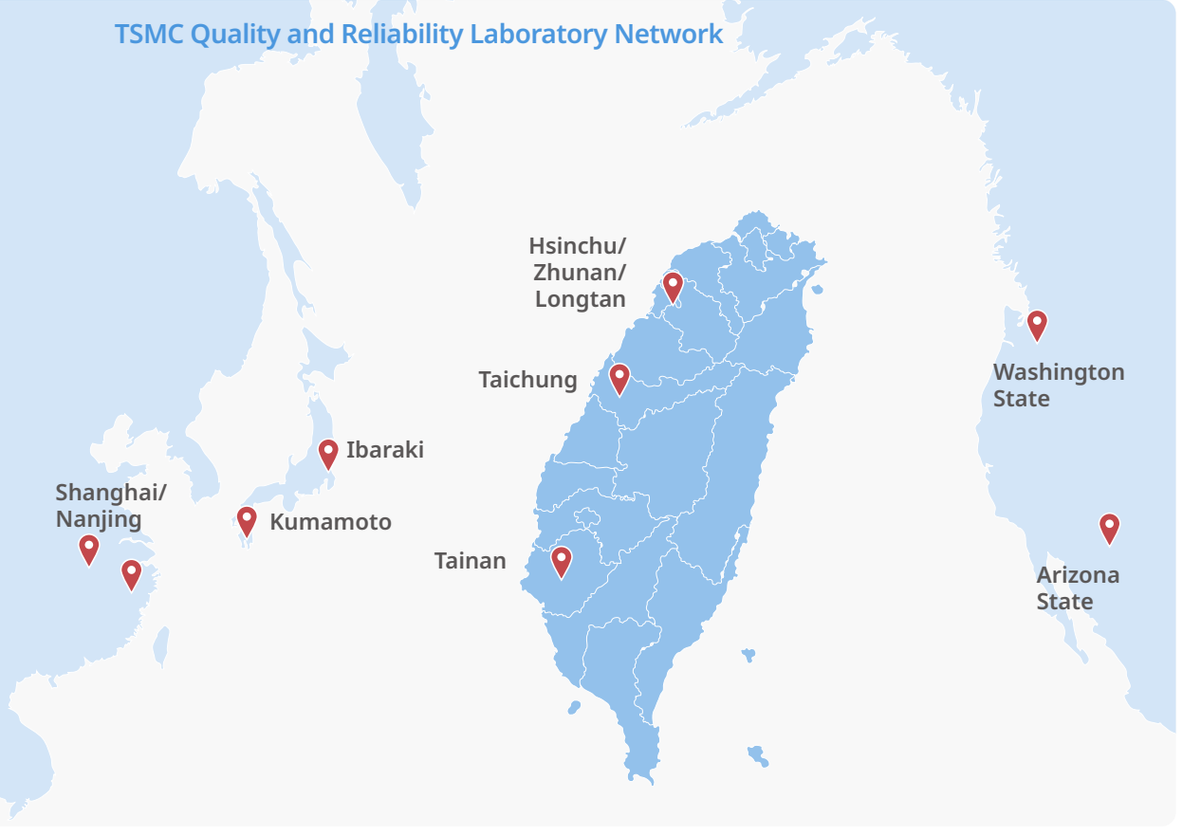
| | |
|---|---|
| 5 chemicals Health risks from five chemicals mitigated | 80% Manual labor time reduced |

## Improve Quality Capability

To reinforce its competitive edge in advanced technology, TSMC continues to invest heavily in the refinement and development of quality-related technologies. In 2024, the Company introduced 292 innovative inspection methods designed to ensure that device characteristics, process yields, and product reliability align with customer expectations. Notably, TSMC unveiled a groundbreaking Time-Dependent Dielectric Breakdown (TDDB) testing, which replaces traditional DC stress with complicate AC stress to more accurately evaluate realistic circuit operation. This approach has been formally verified into JEDEC standards, and as of 2024, the Company has published 10 related articles in international journals, continually leading the industry in advancing testing methods. In addition, in response to the evolution of advanced packaging technologies, TSMC successfully substituted bulk material preparation with thin film deposition techniques for copper — a critical material for advanced packaging interconnects — while optimizing parameters. This innovative approach not only reduces material consumption and shortens preparation time but also generates data that better reflects real-world applications, accelerating reliability analysis and driving product development forward.

In 2024, TSMC not only focused on fostering internal innovation but also continued its collaborations with leading experts from Harvard University and Taiwan National Cheng Kung University to assess the mechanical properties and stress behaviors of advanced semiconductor materials. These partnerships played a pivotal role in accelerating the development of cutting-edge packaging technologies while ensuring production quality and driving technological advancements. Meanwhile, to strengthen the competitiveness of the local supply chain, TSMC conducts rigorous quality inspections on raw materials at key control points across its production lines. Suppliers are required to adopt SPC techniques to process control and the stability of raw material quality. Additionally, all major raw material suppliers must obtain ISO 9001 Quality Management System certification and comply with internationally recognized standards for process change management, evaluations, and quality audits. These initiatives establish a robust foundation for supply chain quality and reliability.

### TSMC Quality and Reliability Laboratory Network




### Sustainable Strategies from the Quality and Reliability Laboratories

| | |
|---|---|
| Advanced Materials Analytic Center (AMAC) | – Develop the capability to identify and analyze 100% of CMR substances and improve source management in suppliers<br>– Evaluate and adopt technologies and materials for advanced processes<br>– Provide an analysis and technology exchange platform to strengthen suppliers' analytical capabilities |
| Chemical Lab | – Accelerate the replacement of hazardous substances and support new fabs in verifying the efficiency of pollution control facility treatmentst<br>– Verify the quality of recycled and reused materials at TSMC to ensure compliance with advanced process requirements, fostering green manufacturing practices.<br>– Validate alternative materials as part of TSMC's efforts to replace high Global Warming Potential (GWP) substances |
| Surface Analysis (SA) Lab | – Develop low-power consumption and high-capacity processes to improve EUV energy efficiency<br>– Select eco-friendly materials as replacements in processes<br>– Develop equipment consumables, reducing costs and extending lifespan by three times |
| Reliability Analysis (RA) Lab | – Complete reliability certification for advanced processes, specialty processes, and wafer-level packaging processes<br>– Develop efficient, energy-saving reliability evaluation methods.<br>– Refine reliability testing methods and processes to reduce odors generated during testing, creating a more pleasant working environment NEW |
| Advanced Failure Analysis (AFA) Lab<br>Process Failure Analysis (PEFA) Lab<br>Packaging & Assembly Failure Analysis (PAFA) Lab<br>Product Failure Analysis (PFA) Lab<br>Scanning Electron Microscopy (SEM) Lab | – Accelerate advanced process development, yield improvement, and product DPPM reduction learning curve (reliability point of view)<br>– Apply for domestic and foreign patents based on innovative inventions<br>– Donate tools to universities and elementary schools, providing training on operation and maintenance to cultivate future tech talent |
| Transmission Electron Microscopy (TEM) Lab | – Focus on the development of Transmission Electron Microscopy (TEM) measurement techniques, fostering industry-academia collaboration projects<br>– Introduce a quality auto-inspection system based on artificial intelligence and machine learning technologies, enhancing work efficiency through digitalization NEW |

## Enhance Sustainable Chemical Management

TSMC adheres to its "Environmental Policy " and "Safety and Health Policy ," actively advancing green chemical management initiatives. The Company follows the principle of "avoid if possible, minimize if feasible" regarding the use of hazardous substances. During the R&D phase and prior to changes in chemical use, TSMC implements a rigorous chemical review process . Hazardous substances are strictly prohibited unless they are indispensable to the process and no substitutes are available. If the use of such substances is deemed necessary, the storage, transportation, usage, and disposal processes should comply with both domestic and international regulations, as well as meet the ESH standards established by customers and the Company. The Corporate ESH Division and Fab Industrial Safety and Environment Protection Department, will verify employee safety, proper waste management, and the absence of environmental contamination risks. Only after obtaining approval from Vice President-level executives of relevant department can the use of these substances proceed.

TSMC places the highest priority on the safety of its employees and supply chain partners. To ensure proper oversight of potentially risky materials, the Advanced Materials Analytical Center has implemented a screening mechanism for CMR substances, continuously expanding its scope as processes evolve. In 2024, the number of screening items increased from 178 to 273, with 24 materials screened, achieving 100% analysis of substances flagged as potentially concerning. TSMC also collaborates with VisEra Technologies Co. to share safer alternatives for high-risk chemicals and offer guidance on safety equipment as part of its CMR management initiatives. Meanwhile, TSMC extends its green management practices across the supply chain, requiring suppliers to comply with the "Supplier Sustainability Standards " and establish hazardous substance management protocols. Through education, audits, and guidance, TSMC assists its suppliers in developing the necessary capabilities to detect and manage CMR substances in materials of concern, fostering a safer and more sustainable ecosystem.

TSMC not only implements stringent environmental protection and health and safety measures for hazardous substances in current processes but also actively explores and evaluates the feasibility of replacing them with non-hazardous or low-risk alternatives. One such compound, N-Methyl-2-pyrrolidone (NMP), commonly used in semiconductor etching and cleaning, poses potential environmental and health risks when trace amounts are discharged into wastewater. Since 2016, TSMC has launched an NMP reduction program, systematically eliminating its use at the source, replacing it with lower-hazard chemicals, and conducting regular monitoring of effluent water quality. In 2024, TSMC's overseas fabs successfully achieved the complete elimination of NMP in etching and cleaning processes, meeting the annual target. Currently, only one specific wet etching process awaits research for an alternative, with full replacement of NMP in etching processes expected by 2025.

Another substance that has drawn global attention in recent years is PFASs. These materials are widely used in both consumer and industrial contexts, including semiconductor manufacturing, due to their process and equipment protection benefits. However, PFASs are characterized by their hazardous nature, environmental persistence, and bioaccumulation potential. Many countries have begun regulating these substances, with certain PFASs — particularly those containing more than six carbon-fluorine (C-F) bonds — already classified as prohibited. TSMC aligns with international trends by adopting four major management strategies . Through proactive planning and early action, the Company is committed to reducing environmental impact and contributing to global sustainability efforts.

TSMC obtained IECQ QC 080000 third-party certification for hazardous substance process management in 2006, reinforcing its commitment to green chemical management. The Company continuously improves its practices through the PDCA management cycle model. This approach ensures the effective management of raw materials and products used in processes, aligning with regulatory standards and customer requirements for hazardous substance control in both processes and final products.

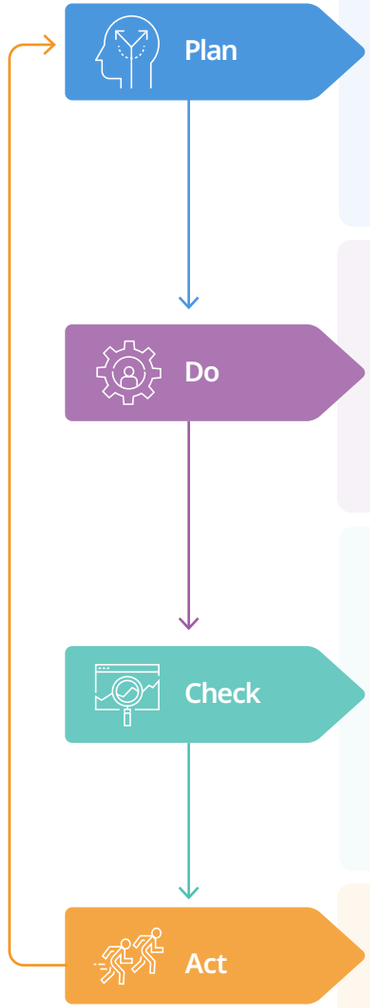
### Key Highlights of CMR Substance Management Support

| Purpose | Practice | Coach | 2024 Achievements |
|---|---|---|---|
| • Establish a robust safety protection network to horizontally expand TSMC's sustainable chemicals management practices to subsidiaries and the supply chain, fostering industry-wide collaboration and shared prosperity | • Subsidiary: Provided TSMC's testing capabilities to support VisEra Technologies Co. in screening high-risk materials<br>• Suppliers: Required suppliers to comply with hazardous substance management regulations outlined in the TSMC Supplier Sustainability Standards | • Subsidiary: Shared measures such as substitutes for high-risk chemicals, protective equipment, and regular workplace environment assessments<br>• Suppliers: Provided education and training programs to strengthen hazardous substance management capacity, while improving management efficiency and quality through audits | ✓ Subsidiary: Assisted VisEra Technologies Co. in completing the CMR substance testing for six materials<br>✓ Continued supporting all suppliers handling materials with potential risks by helping them develop capabilities to detect CMR substances |

### TSMC's PFASs Management Strategy

| | |
|---|---|
| Source Control | Evaluate and replace high-risk, long-chain PFASs with lower-hazard, short-chain or non-PFAS alternatives. Use green procurement to review new materials and suppliers early in R&D or process changes. Require suppliers to confirm materials are free of PFASs with more than four fluorinated carbons and disclose PFASs with four or fewer if contains. |
| Industry Cooperation | Participated in the PFASs response initiatives organized by the World Semiconductor Council and SEMI to collaborate with industry peers and suppliers to research alternative technologies for PFASs applications in semiconductor manufacturing and develop environmental monitoring techniques. |
| Environment Monitoring | Developed PFASs detection technologies and establish in-house monitoring capabilities to track PFASs discharge levels and identify anomalies in environmental emissions. |
| Pollution Control | Develop and implement wastewater separation, concentration, and treatment technologies for trace amounts of PFASs. Strive to minimize environmental discharge. |

## PDCA Cycle for Sustainable Chemical Management




| Tasks | Actions in 2024 |
|---|---|
| **Regulation and Customer Requirements Identification and Registration**<br>Each month, the Corporate ESH Division identifies relevant domestic and international regulations on chemical hazardous substance management, as well as customer requirements. Notifications are sent to relevant units through the internal electronic system, prompting them to implement necessary measures and track improvement progress<br>**List of Banned or Restricted Substances**<br>Compile and update according to regulations, customer requirements, and TSMC's internal policies<br>**Hazardous Substance Replacement Programs**<br>Develop plans and targets based on regulations, customer requirements, and TSMC's internal standards | ✓ The EU added **seven** SVHCs to REACH, and customers amended hazardous substances management measures. TSMC achieved **100%** compliance with all new requirements<br>✓ Participated in the World Semiconductor Council and SEMI PFASs initiatives, actively discussing countermeasures<br>✓ TSMC reviewed its chemical inventory to confirm that none of the newly prohibited Class 1 toxic chemical substances listed by the Taiwan Ministry of Environment Chemicals Administration were in use. This includes PFHxS, its salts, and **147** related compounds NEW |
| **New Material Review**<br>All new chemical materials or changes to existing materials must be reviewed by the Corporate ESH Division and Industrial Safety and Environmental Protection Departments at each fab. Approval is required to confirm compliance with environmental, safety, and health (ESH) regulations before proceeding to R&D evaluation<br>**Implement Hazardous Substance Replacement Programs**<br>Continue executing the NMP replacement program in wet etching processes at overseas fabs. Subsidiary VisEra Technologies Ltd. continues its PFHxA-related material replacement project | ✓ TSMC assessed **299** new chemical substances across domestic and overseas fabs. Of these, **127** received approval, while **102** were rejected due to issues such as suppliers failing to provide required documents, including Safety Data Sheets and TSMC's Green Procurement Questionnaire, or concerns about emissions affecting the efficiency of fab air pollution control systems<br>✓ Overseas fabs completed the elimination of NMP in wet etching processes, meeting the annual target NEW<br>✓ Subsidiary VisEra Technologies Ltd. progressed in its PFHxA substance replacement program, achieving **64%** of its annual target |
| **Raw Material Hazardous Substance Testing**<br>Suppliers are required to provide hazardous substance specification test reports issued by ISO17025 certified labs. TSMC conducts random sampling to verify raw material compliance<br>**Product Hazardous Substance Testing**<br>TSMC annually selects key products from each facility for analysis by external ISO 17025-certified labs<br>**Environmental Measurement**<br>Developed internal capability to detect PFASs levels in water using the US EPA 533, 537.1 standard testing method. Extended this practice to overseas operations NEW | ✓ TSMC employed X-ray fluorescence spectrometers to enhance hazardous substance detection in raw materials, improving sampling efficiency<br>✓ Completed random sampling tests for **103** materials, with all test results meeting TSMC specifications<br>✓ All major products across TSMC fabs underwent hazardous substance testing, with results fully compliant with applicable regulations, customer and TSMC requirements, including the **10** substances under the EU RoHS, **247** SVHCs, and **332** PFASs. All substances were found below detection limits NEW<br>✓ Regular monitoring effluent water discharge across all fabs to track PFASs levels<br>✓ Continued development of PFASs detection technology, enabling the capability to test **30** different PFASs in chemicals, wastewater, and exhaust emissions |
| **Management Review**<br>Quarterly, management from the Quality and Reliability Organization hosts interdepartmental review meetings to evaluate hazardous substance management measures and assess progress toward annual targets | ✓ Achieved annual targets for supplier audits, tracking corrective actions, reviewing new materials, and ensuring compliance in incoming material inspections |

## Realize Quality Applications

TSMC actively implements quality values and applications across three core domains: technology, manufacturing, and services. In the realm of technical quality, TSMC assists customers in integrating product reliability requirements into design considerations during the development phase. In 2024, the Company achieved reliability certification for the N3P process technology, CIS three-wafer stacking technology, and CoWoS® technology with larger interposer sizes. For further information, please refer to Section 5.3.6, "Quality and Reliability," in the Annual Report .

In terms of manufacturing quality, the Quality and Reliability organization collaborates with the Operations organization to leverage advanced artificial intelligence techniques alongside statistical methodologies, continuously enhancing quality tools and strengthening real-time defense systems in wafer fabs. The Quality and Reliability organization also partners with wafer fab to reinforce the application of design rules for automotive products, implement stricter process capability standards for fab production lines and electrical testing, and streamline procedures for managing abnormal wafers. To address automotive customers' stringent DPPM requirements, the organization allocates dedicated resources for assessing customer returns and conducting real-time PFA, persistently optimizing process enhancements to further enhance quality and reliability.

In the realm of service quality, TSMC provides standardized training programs for new processes, enabling customers to efficiently adapt to updated design flows. In 2024, the Company successfully assisted 12 new customers in adopting the N2 process technology and completed training sessions for 1,000 participants, accelerating product design cycles and increasing tape-out success rates. TSMC also offered a comprehensive portfolio of quality training courses, including techniques such as high voltage stress testing, burn-in, and screening. These courses aim to enhance anomaly detection, reduce product defect rates, and minimize return risks. In 2024, TSMC supported 21 customers in developing quality-related expertise, ensuring stable production line performance, reinforcing testing partnerships, and deepening customer relationships.

### Focus Areas for Quality Value Chain Development

**Raw Material Suppliers**

- Utilize Best Known Methods (BKM) to help global suppliers improve the quality of raw materials and build a robust supply chain
- Provide relevant guidance and encourage participation in continuous improvement competitions to enhance the sustainability of the local supply chain
- Offer educational training and audit support to help suppliers develop capabilities for detecting CMR substances in materials
- Launch nine quality-focused courses through the TSMC Supplier Sustainability Academy to encourage suppliers to improve their quality management capabilities

TSMC

**Customers**

- Launch standardized training programs for new processes to accelerate new product design cycles
- Provide a diverse range of courses to develop comprehensive knowledge in quality management, fostering collaboration on quality and reliability improvements
- Develop advanced real-time defense mechanisms to reduce product defects and proactively prevent quality-related incidents

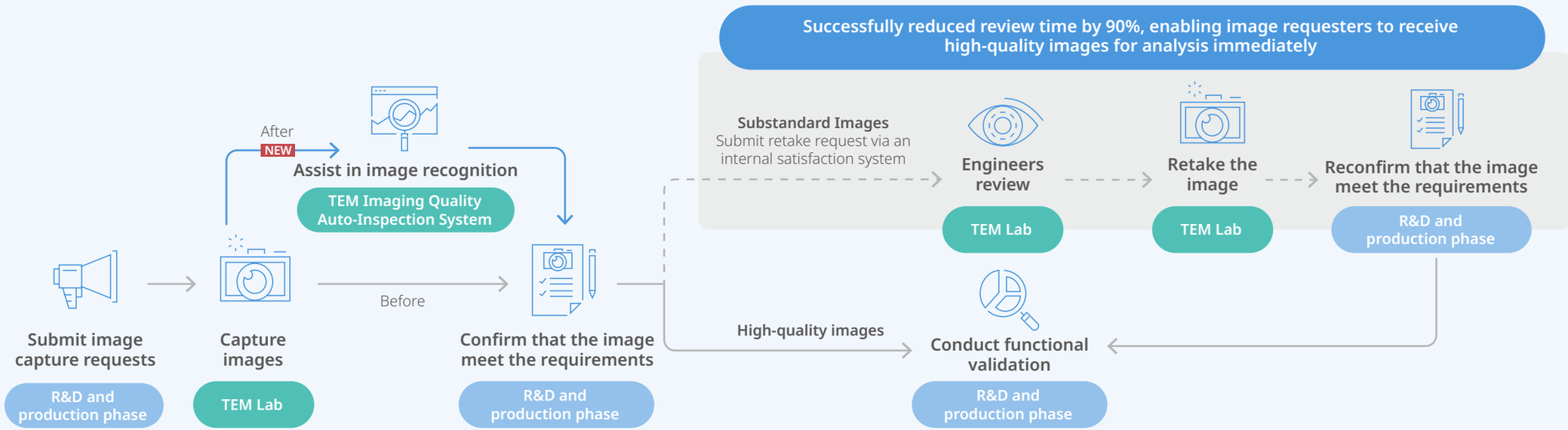
Case Study

# Drive a Major Revolution in TEM Imaging Quality Workflow through Digital Transformation

To achieve efficient production and safeguard product quality, TSMC is dedicated to advancing precise measurement technologies that enable the early detection of process deviations and anomalies, facilitating process control refinement. In response to semiconductor miniaturization trends, TEM deliver an angstrom-level imaging, supporting functional validation of new materials and structures through microstructure analysis, dislocation identification, and chemical composition assessment during both R&D and production phases of advanced processes. In 2024, TSMC established the "TEM Imaging Quality Auto-Inspection System" to elevate analysis quality and efficiency. The system integrates AI models to assist in image recognition, empowering operators to monitor image quality using digital tools. As a result, laboratory engineers' review time has been reduced by 90%, significantly accelerating the image processing workflow.

TSMC's global TEM laboratories produce over 500,000 analysis images monthly. Previously, when image requesters received substandard images, they had to submit retake requests via an internal satisfaction system, which required laboratory engineers to review the images and capture new ones — a process that typically took three to six days. With the implementation of the AI and machine learning-powered "TEM Image Quality Auto-Inspection System," image quality factors such as lighting, contrast, brightness, and structural clarity are automatically evaluated and scored within seconds of capture. The system filters out poor-quality images, such as those that are blurry or excessively dark, ensuring that requesters receive high-quality images for analysis. This innovation has expedited R&D efforts and process improvements, significantly boosting efficiency.

This groundbreaking system has been deployed across TSMC's global TEM laboratories. Future enhancements will incorporate additional inspection criteria, including capture location verification, requirement alignment, and historical data comparisons, progressing toward fully automated operations. These improvements will prevent delays caused by poor image quality, offering robust support for process technology innovation and quality assurance.



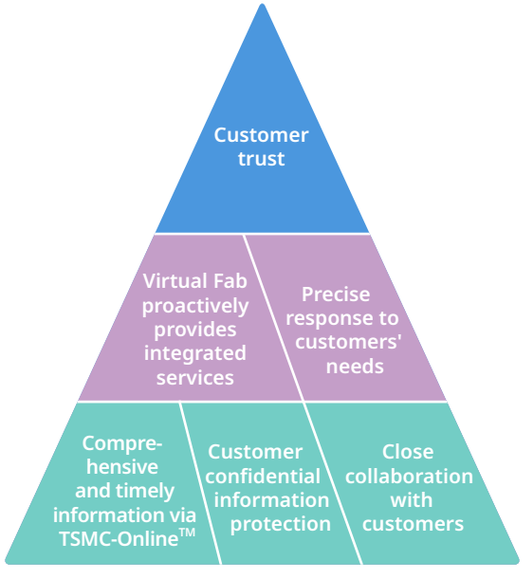
# Customer Relations

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **React with Precise Response**<br>Provide excellent customer service through close collaboration with customers and regular customer meetings/ surveys to understand their requirements and respond to their feedback | Maintain a customer trust and satisfaction rating of over 90% | Maintain a customer trust and satisfaction rating of over 90% | Customer trust and satisfaction rating of 96% ↑<br>Target: Over 90% |
| | Reduce cases of problematic engineering quality to 20% of the level in 2019 for every one million 12-inch wafers shipped | Reduce cases of problematic engineering quality to 30% of the level in 2019 for every one million 12-inch wafers shipped | Reduced cases of problematic engineering quality to 26% of the level in 2019 for every one million 12-inch wafers shipped ↑<br>Target: 30% of the level in 2019 |
| **Establish Virtual Fab Service**<br>Provide comprehensive information promptly to ensure the success of customer's products; strengthen processes and systems to ensure that customer product information receives protection of the highest standard | Provide >1,200 wafer manufacturing and process technologies and >170 advanced packaging technologies in line with the TSMC technology roadmap | Provide >1,062 wafer manufacturing and process technologies and >165 advanced packaging technologies in line with the TSMC technology roadmap | Provided >1,028 wafer manufacturing and process technologies and >161 advanced packaging technologies in line with the TSMC technology roadmap ✓<br>Target: 1,028 wafer manufacturing and process technologies, 153 advanced packaging technologies |
| | Pass customer product information security audits with no major flaws | Pass customer product information security audits with no major flaws | Passed customer product information security audits with no major flaws ✓<br>Target: No major flaws |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

TSMC remains committed to its vision of being the world's leading and most advanced dedicated IC design and manufacturing service provider. Driven by technological innovation and superior service, the Company forms dedicated service teams to ensure seamless communication and coordination with customers. TSMC also accelerates digital transformation by enhancing the functionality of TSMC-Online™, continually improving the customer service experience. In 2024, the Company achieved an outstanding 96% customer trust and satisfaction rating by delivering cutting-edge technology and superior support, empowering its customers to enhance product competitiveness and creating mutual success.

## Customer Service Strategy

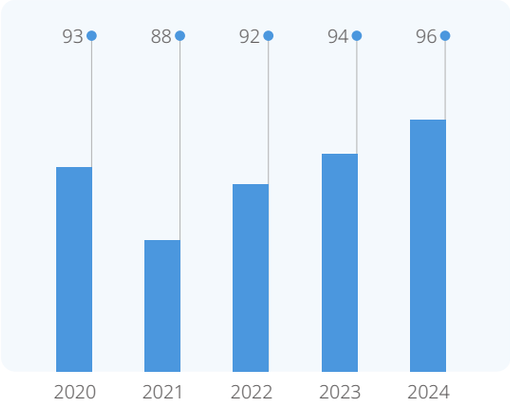



## Precise Response

Customer feedback acts as a critical driver for TSMC's continuous improvement in service quality. The customer service team collects valuable insights through diverse channels, such as ACSS, quarterly review meetings, and irregularly customer engagements. The Company carefully evaluates and analyzes customer feedback to implement targeted improvement plans, further strengthening its partnerships with customers. In 2024, TSMC conducted 1,340 online and in-person executive-level meetings with 223 customers and held 102 quarterly review meetings with 29 customers. Additionally, the ACSS received responses from 197 customers.

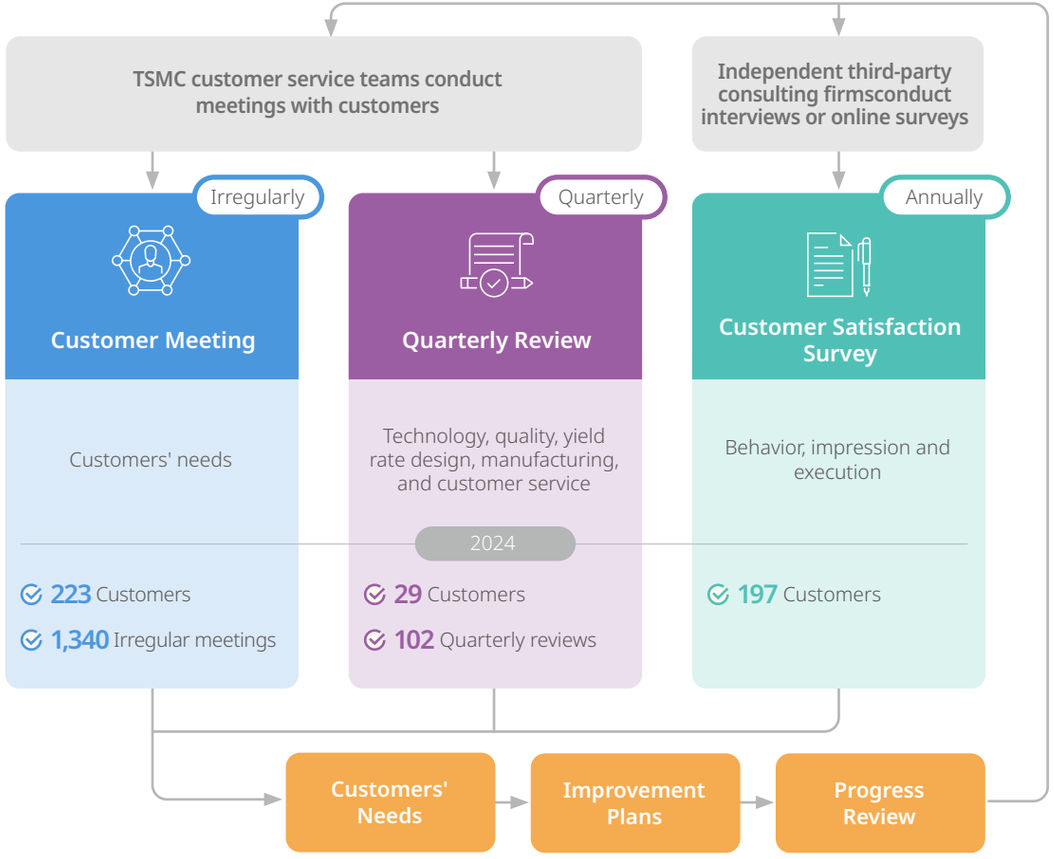
Through in-depth dialogue and close collaboration with customers, TSMC continuously refines its expertise in cutting-edge technology, precision manufacturing, and streamlined service to meet evolving market needs. In 2024, the Company achieved an impressive 96% customer trust and satisfaction rating. The Company also progressed in product quality and yield performance, reducing engineering quality incidents per million 12-inch wafers to 26% of the 2019 level-surpassing the annual target of 30% and advancing toward the 2030 goal of 20%. To further strengthen customer engagement, the Company's customer service team actively improves its approaches through case studies and scenario-based practices, ensuring accurate identification and efficient responses to diverse customer requirements.

## Annual Customer Trust and Satisfaction Index




Note: Customer satisfaction rate figures include TSMC fabs in Taiwan as well as its overseas subsidiaries

## Diverse Communication Channels for Customers



## Virtual Fab Service

TSMC remains dedicated to advancing semiconductor design and process technologies, actively pursuing its vision of becoming "Everyone's Foundry." As wafer processes and technologies evolve, the Company continually enhances its customer self-service portal, TSMC-Online™, to provide customers with efficient access to and manage of manufacturing-related data. In 2024, TSMC-Online™ averaged over 55,000 monthly visits, fostering greater convenience and operational efficiency through seamless digital collaboration.

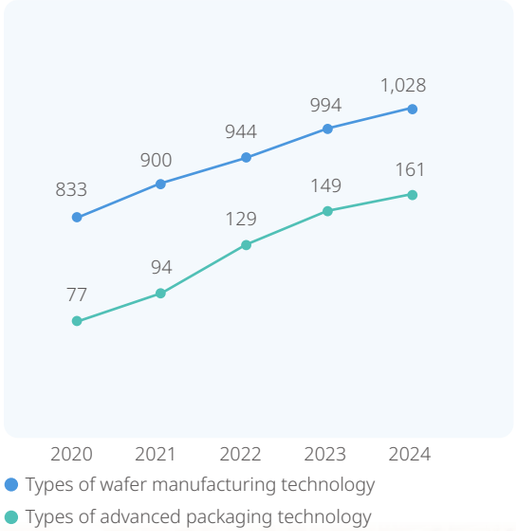
In 2024, TSMC provided customers with access to 1,028 wafer manufacturing technologies and 161 advanced packaging processes, aligning with evolving technology roadmaps and addressing diverse product needs. To further protect customer interests, the Company adheres to global cybersecurity standards and has earned ISO 27001 ISMS certification. TSMC also implements rigorous information protection policies and standardized protocols , ensuring the confidentiality of customer information is protected to the highest standards, comparable to those of their own facilities.

In 2024, TSMC introduced a new CSFT platform, designed to enhance the protection of GDS information and improve system efficiency through a streamlined, one-stop solution. The platform offers three key features: access control, a secure and compliant operating environment, and progress tracking. Over the course of the year, the platform successfully processed more than 140,000 GDS transfers, marking a significant advancement in information security.

As a trusted provider of logic IC technology and capacity worldwide, TSMC remains dedicated to innovation and delivering high-quality products. Committed to its customer-first approach, the Company strives to be a reliable, long-term partner, collaborating with global stakeholders to achieve a sustainable future.

> TSMC is the most trusted provider of foundry services in the semiconductor industry.
>
> **Sony Semiconductor Solutions Corporation**

## Types of Technology for Customers




Note: The customer satisfaction rates include data from TSMC fabs in Taiwan and overseas subsidiaries.


Case Study

# New FTP Service: Upgraded Cybersecurity and Customer Experience

Data transmission security and efficiency are fundamental to TSMC's partnerships with its customers. In 2024, TSMC launched a new FTP account service within the TSMC-Online™ customer self-service portal. This innovation reduced the FTP account application process from 3.5 days to just 12 seconds, while strengthening cybersecurity protections. Since its introduction, a total of 944 FTP accounts have been successfully activated.

FTP is an essential tool for transmitting critical information between TSMC and its customers. To enhance efficiency and security, the Company's customer service team conducted a comprehensive review of existing FTP account usage, streamlining the system by retaining 4,200 active accounts out of over 25,000 records--an 84% reduction in system load. By implementing automated FTP account management processes , TSMC has created a more efficient account management model, strengthening partnerships with customers through superior service.

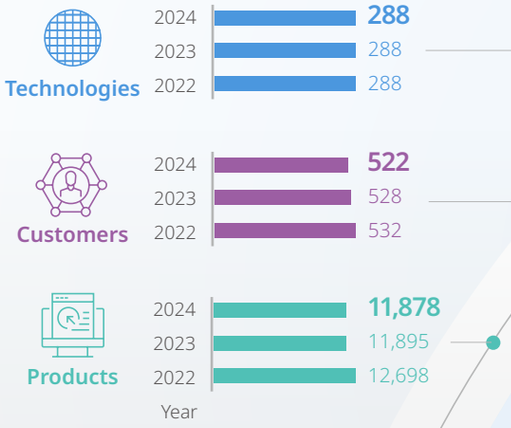
## Highlights of the New FTP Account Service Process

| | Traditional Process | New FTP Account Service |
|---|---|---|
| Account Creation | TSMC personnel handled account applications on behalf of customers, with approval and verification processes requiring up to 3.5 days | Customers can now apply for accounts independently, completing the process in just **12** seconds |
| Information Security Control | Manual review of FTP IP addresses for security compliance required an additional 1.5 days | The system now conducts real-time automatic security checks, blocking risky IP addresses to protect and enhance file transfer security |
| Regular Maintenance | Incomplete customer FTP data made updates and management challenging | TSMC reviewed FTP account requirements and implemented an automated system to deactivate long-unused accounts, ensuring optimal server resource utilization |

## TSMC Delivers Unrivalled Manufacturing Excellence

**~17 Million**

2024 total managed capacity reached approximately 17 million 12-inch wafer equivalents





| | Fab 2 | Fab 3 | Fab 5 | Fab 6 | Fab 8 | Fab 10 | Fab 11 | Fab 12 | Fab 14 | Fab 15 | Fab 16 | Fab 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 24 | 59 | 25 | 51 | 39 | 42 | 21 | 76 | 80 | 29 | 12 | 12 |
| | 63 | 119 | 55 | 139 | 158 | 148 | 32 | 139 | 262 | 188 | 63 | 45 |
| | 877 | 1,067 | 289 | 1,051 | 1,791 | 1,626 | 326 | 1,014 | 2,252 | 1,282 | 205 | 262 |

# A Responsible Purchaser

TSMC is dedicated to responsible procurement, working closely with supply chain partners to ensure excellence in technology, quality, delivery, human rights, and environmental safety. In response to the pressing challenges of climate change, the Company continues to enhance green innovation and climate resilience while striving to create a low-carbon semiconductor supply chain.

Sustainable Supply Chain

**$84 Million**
Subsidy for Supply Chain Carbon Reduction Projects (NT$)

**100%**
Response rate of suppliers invited to participate in CDP

**3.1 Million**
TSMC Supplier Sustainability Academy cumulative users

# Sustainable Supply Chain

## Strategies

### Improve Sustainability Risk Management

TSMC requires all suppliers to adhere to the TSMC Supplier Code of Conduct, taking actions to improve labor rights, safety and health, environmental protection, business ethics, and the efficiency of the management system; the Company has also taken the initiative to help suppliers continue to improve their core capabilities to reduce risks of disruption to business operations

| 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|
| Achieve an average human rights rating of Grade B (score 85) on the SAQ for tier 1 suppliers[Note 1] NEW | Achieve an average human rights rating of Grade C (score 78) on the SAQ for tier 1 suppliers NEW | Achieve an average human rights rating of Grade C (score 77) on the SAQ for tier 1 suppliers NEW - |
| Ensure 100% of tier 1 suppliers[Note 1] stipulate inclusive workplace related policy or statement[Note 2] | - | 100% of tier 1 suppliers stipulate inclusive workplace related policy or statement ↑<br>Target: 40% |
| Annually ensure 100% of tier 1 suppliers[Note 1] complete the SAQ[Note 3] | - | 100% of tier 1 suppliers complete the Sustainability Management Self-Assessment Questionnaire ✓<br>Target: 100% |
| Ensure 100% significant suppliers[Note 4] receive Code of Conduct audits by RBA-certified agencies every year[Note 3] | - | A total of 70 significant suppliers completed third-party supplier audits with an annual completion rate of 100% ✓<br>Target: 70 significant suppliers |
| Ensure 980 sessions of S.H.A.R.P. audits toward high risk significant suppliers at a pace of 120 sessions a year[Note 3] | - | Completed 150 sessions of S.H.A.R.P. audits toward high risk significant suppliers ↑<br>Target: 110 sessions |
| Ensure a cumulative total of 300 raw materials suppliers[Note 5] participate in the annual emergency response drill (Base year: 2016)[Note 3] | - | 22 raw materials suppliers participated in the annual emergency response drill, bringing the cumulative total to 212 ↑<br>Target: Cumulative total 210 |
| Ensure a cumulative total of 1,500 suppliers[Note 5] participate in the Environmental Safety and Health (ESH) training programs (Base year: 2016)[Note 3] | - | 725 suppliers participated in the ESH training programs, bringing the cumulative total to 1,879 ↑<br>Target: Cumulative total 1,300 |
| Ensure 100% high risk significant suppliers complete Safety and Health consultation[Note 3] | - | Ensure 100% high risk significant suppliers complete Safety and Health consultation[Note 6] ✓<br>Target: 100% |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: Tier 1 suppliers: Suppliers trading directly with TSMC with more than three orders per year, with order amounts exceeding NT$5 million, excluding suppliers related to warehousing, hospitals, or those with no further transactions, to ensure the questionnaire's applicability. The number of tier 1 suppliers meeting this definition was 1,294 in 2023 and 1,429 in 2024. To enhance information transparency and the comprehensiveness of management practices, the survey results and management actions for the 1,294 tier 1 suppliers in 2023 are disclosed, along with the total number of tier 1 suppliers in 2024.

Note 2: This indicator achieved its 2030 Targets ahead of schedule and will therefore be removed starting from the next year. Ongoing management actions will continue to be disclosed in the main text.

Note 3: To better highlight supplier management performance, indicators related to routine operations will be removed starting in 2025. Instead, outcomes will be presented in the main text.

Note 4: Significant Supplier: Suppliers accounting for the top 85% of the purchasing expenses or of a single-source purchase, or suppliers recognized as significant by TSMC after assessing multiple risk indicators, including the suppliers' market shares, inventory levels and characteristics, and potential environmental, social, and governance negative impact risks.

Note 5: Mainly involving suppliers in Taiwan.

Note 6: In 2023, TSMC conducted 99 supplier audits and consultations, among which one supplier scored below 70 and another scored below 60 (suppliers scoring below 60 will have their qualifications revoked). The consultation and corrective actions were completed in 2024.

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Improve Sustainability Risk Management**<br>TSMC requires all suppliers to adhere to the TSMC Supplier Code of Conduct, taking actions to improve labor rights, safety and health, environmental protection, business ethics, and the efficiency of the management system; the Company has also taken the initiative to help suppliers continue to improve their core capabilities to reduce risks of disruption to business operations | Increase Taiwan local sourcing: 68% for indirect raw materials | Source 65.5% of indirect raw materials locally | Sourced 65% of indirect raw materials locally<br>Target: 64.9% ↑ |
| | Increase overseas subsidiaries local sourcing: 52.5% for indirect raw materials[Note 7] NEW | Source 35.6% of indirect raw materials locally NEW | Sourced 33.1% of indirect raw materials locally NEW - |
| | Increase global local sourcing: 67.5% for indirect raw materials[Note 8] | - | Sourced 64.6 of indirect raw materials locally<br>Target: 63.6% ↑ |
| | Increase Taiwan local sourcing: 60% for spare parts | Source 45% of spare parts locally | Sourced 46.0% of spare parts locally<br>Target: 41.0% ↑ |
| | Continue to diversify production plant sites and assess new suppliers; develop 185 multi-source supply solutions (Base year: 2018) | Complete the development of 165 multi-source supply programs | Completed the development of 155 multi-source supply programs<br>Target: 155 programs ✓ |
| | Ensure a cumulative total of 145 local raw materials suppliers receive consultation on process advancement and quality improvement (Base year: 2016) | Ensure a cumulative total of 95 local suppliers receive consultation on process advancement and quality improvement | Ten suppliers received consultation on process advancement and quality improvement, bringing the cumulative total to 85<br>Target: 10; cumulative total 85 ✓ |
| | Supplier due diligence on responsible mineral sourcing: 100% of the minerals used are sourced responsibly | Supplier due diligence on responsible mineral sourcing: 100% of the minerals used are sourced responsibly | 100% responsible mineral sourcing<br>Target: 100% ✓ |
| | Audit a cumulative total of 30 suppliers ( ≧ 3 suppliers per year) for due diligence on responsible mineral sourcing | Complete audits on ≧ 3 suppliers for due diligence on responsible mineral sourcing | Completed audits on 3 suppliers for due diligence on responsible mineral sourcing<br>Target: ≧ 3 suppliers ✓ |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 7: To improve transparency in localized procurement information, a new management indicator for the local procurement ratio of overseas subsidiaries was introduced in 2024. The data covers TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, and JASM.

Note 8: In response to the new goal for localized procurement by overseas subsidiaries, this goal will be divided into separate targets for Taiwan and overseas subsidiaries starting next year.

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Promote Green and Low-carbon Supply Chains**<br>TSMC continues to reduce its environmental impact and external costs, mitigate the effects of climate change and resource depletion by leading suppliers in establishing reduction targets on power and water consumption, waste generation, and carbon emissions, propelling the sustainable development of supply chains | Reduce supplier[Note 9] carbon emissions by 30% from what they would be in the absence of action (Comparing result from theBAU scenario) | Reduce supplier carbon emissions by 8% comparing to BAU scenario | Reduced supplier carbon emissions by 4% comparing to BAU scenario ✓<br>Target: 4% |
| | Suppliers invited to participate in CDP in the year should achieve an average score of B and a response rate of 95% | Suppliers invited to participate in CDP in the year should achieve an average score of B- and a response rate of 100% | Suppliers invited to participate in CDP[Note 10] in the year achieved an average score of B- and a response rate of 100% ↑<br>Target: average score of B- and a response rate 98% |
| | Ensure 100% of high energy consumption suppliers[Note 11] receive ISO 14064 GHG Emission verification (Base year: 2021) | Ensure 92% of high energy consumption suppliers receive ISO 14064 GHG Emission verification | 90% of high energy consumption suppliers received ISO 14064 GHG Emission verification ↑<br>Target: 88% |
| | Provide consultation on power reduction for suppliers[Note 5] and reduce energy consumption by a total of 1,500 GWh (Base year: 2018) | Reduce supplier energy consumption by a cumulative total of 1,150 GWh | Reduced supplier energy consumption by a cumulative total of 1,026 GWh ↑<br>Target: 900 GWH |
| | Provide consultation on water reduction for suppliers[Note 5] and reduce water consumption by a cumulative total of 150 million metric tons (Base year: 2020) | Reduce supplier water consumption by a cumulative total of 65 million metric tons | Reduced supplier water consumption by a cumulative total of 54.86 million metric tons ↑<br>Target: 50 million metric tons |
| | Reduce waste production among local major suppliers[Note 12] by 42% (Base year: 2014) | - | Reduced waste production among local major suppliers by 42% ↑<br>Target: 40% |
| | Provide consultation on waste reduction for suppliers[Note 5] and achieve an average waste recycling rate of 86%[Note 13] NEW | Achieve an average waste recycling rate of 81% NEW | Achieved an average waste recycling rate of 80% NEW - |
| | Require tier 1 suppliers[Note 1] to establish phase-out plans for regulated materials[Note 14], with a 100% completion rate NEW | Require tier 1 suppliers to establish phase-out plans for regulated materials, with a 73% completion rate NEW | - - |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 9: The suppliers are raw material suppliers, including silicon wafers, bulk gases, bulk chemicals and other chemical suppliers.

Note 10: Suppliers invited to participate in CDP in 2024: A total of 135 suppliers of raw materials and equipment met the top 75% of procurement categories and expenditures.

Note 11: High energy consumption suppliers: Suppliers in Taiwan whose energy consumption at a single site >5 GWh/year.

Note 12: Mainly focusing on suppliers in Taiwan producing 80% of the waste in raw materials. Calculation formula: A/(A+B)(%), where A represents the waste reduced by the factory in that month (metric tons), and B denotes the waste produced by the factory in that month (metric tons). In response to the new goal to "guide suppliers in waste reduction actions and average waste recycling rates," this target will be merged with the new goal starting next year.

Note 13: To fully reflect suppliers' waste reduction outcomes, starting in 2025, the survey scope will expand from local suppliers with significant waste generation to all suppliers in Taiwan, with regular monitoring of their average waste recycling rate.

Note 14: Regulated materials include PFOS, PFOA, and NMP.

TSMC is dedicated to building a sustainable supply chain. Through collaboration with suppliers, the Company continuously demonstrates its influence. Referencing the Due Diligence Guidance for Responsible Business Conduct issued by the OECD, TSMC consistently refines its four guiding principles: "Management and Commitment, Identification and Assessment, Mitigation and Improvement, and Communication and Cooperation." With the dual strategies of "Improving Sustainability Risk Management" and "Promoting Green and Low-Carbon Supply Chains," TSMC partners with suppliers to strengthen operational resilience. TSMC requires suppliers to adhere to the Company's Supplier Code of Conduct and to complete an SAQ to enhance suppliers' self-management capabilities. Meanwhile, the Company actively advances human rights governance and inclusivity within the supply chain. By 2024, TSMC achieved 100% adoption of inclusive workplace related policies or statements among its tier 1 suppliers ahead of schedule and, for the first time, incorporated supplier human rights management performance into its long-term sustainability goals. In line with its green manufacturing mission, TSMC leads suppliers in setting targets for energy conservation, water savings, waste minimization, and carbon emissions reduction to mitigate environmental impact. In 2024, the Company launched several initiatives, including a Supply Chain Carbon Reduction Subsidy Project, Phase II of Joint Procurement of Renewable Energy, and the inclusion of carbon-reduction performance as a key criterion in supplier selection, all advancing toward the goal of net zero emissions. In 2025, TSMC is set to publish its first Responsible Supply Chain Report to further share the challenges and achievements of sustainable supply chain management with stakeholders.

## Supplier Sustainability Management Organization

To establish a comprehensive sustainable supply chain management framework, TSMC's ESG Steering Committee formulates the vision and strategies for supply chain management, while the ESG Committee implements its resolutions. The Materials Management Organization and the Corporate ESH (Environment, Safety, and Health) Division have set up dedicated units, including the Responsible Supply Chain ESG Management Team, Supply Chain Sustainability Program Team, and Supply Chain ESH Management Team, to implement various ESG actions and audit management of suppliers, for which the scope covers Fabs in Taiwan and overseas subsidiaries, and the ESG Committee Chairperson shall regularly report to the Board on the supply chain performance, supplier ESG programs and risk management progress.

**Four Guiding Principles of Sustainable Supply Chain Management**

**Management and Commitment**
TSMC requires suppliers to comply with the TSMC Supplier Code of Conduct including human rights management, extending these principles to their upstream suppliers. Meanwhile, the Company improves sustainability awareness of its procurement buyers and internal colleagues to enhance the sustainability guidance capacity

**Identification and Assessment**
Incorporate sustainability performance into the supplier selection mechanism, implement assessments for new supplier collaboration, evaluate performance and risks, and conduct screening and management practices, thoroughly examine whether suppliers meet standards across various aspects, and formulate corresponding management measures accordingly

**Mitigation and Improvement**
Invest resources in factory construction plans during the suppliers' factory construction stage and improve suppliers' resilience through on-site audits, online resource sharing platform, improvement consultation, regular follow-ups, and energy-saving and carbon reduction recommendations

**Communication and Cooperation**
Conduct supplier engagement through Supply Online 360, TSMC Supplier Sustainability Academy, supplier forum/workshop, Supply Chain Employee Grievance Channel, and diversified methods to bring joint improvement via mutual communication

## Improve Sustainability Risk Management

To address semiconductor industry growth, TSMC continues to strengthen its supplier sustainability risk management. The Company has established mechanisms for supplier evaluation, selection, and auditing to ensure that suppliers meet regulatory requirements in the areas of environment, society, and governance. Furthermore, TSMC collaborates with suppliers to develop sustainability management systems and goals, providing a range of resources and support to enhance supplier sustainability performance and supply chain resilience. Meanwhile, in line with TSMC's global presence, the Company strategizes its raw material procurement and promotes the upgrading of local suppliers. By managing risks at their source, the Company aims to prevent potential losses and minimize possible impacts.

### Improvement in Supplier Sustainability Management

- **Supplier Code of Conduct and Sustainability Standards**

As a member of the Responsible Business Alliance (RBA), TSMC employs the latest version of its Code of Conduct as a foundation to continually refine and update the Company's Supplier Code of Conduct, as well as its Letter of Assurance on TSMC's Supplier Code of Conduct and Business Ethics Statement across five key areas: Labor, Health and Safety, Environment, Ethical Standards, and Management Systems. These updates tighten regulations pertaining to supply chain energy consumption, greenhouse gas emissions, and the hiring of former TSMC employees by suppliers. All new suppliers are required to sign these documents to be eligible for partnership, and the Company mandates

that tier 1 suppliers strictly adhere to them. TSMC encourages tier 1 suppliers to ensure that their upstream suppliers, contractors, and service providers also adopt and implement these guidelines effectively. In addition, the Company continually optimizes its Supplier Sustainability Standards based on these principles. The 2025 revision will place greater emphasis on human rights governance, energy consumption, and greenhouse gas regulations, further improving supply chain management.

## • Supplier Human Rights Governance

In response to global attention on human rights issues, TSMC actively promotes human rights governance across its supply chain. The Company aligns with the six key human rights dimensions recommended by the UNDP: Governance and Security, Labor Rights, Products and Services Liability, Environmental Rights, Voice and Participation, and Gender Equality. To strengthen supplier human rights assessments, TSMC enhances the SAQ human rights questionnaire, audits and rates tier 1 suppliers' human rights management practices, and integrates these evaluations into sustainable supply chain management indicators. In 2024, TSMC hosted two online courses — " Supply Chain Human Rights Policy and Management Plan" and " Guidelines on Respecting Human Rights for Taiwanese Enterprises and Supply Chains" — as well as a "Supplier Human Rights Enhancement Workshop." These sessions covered the scope and management approaches of business and human rights issues, global supply chain human rights trends and regulations, and provided detailed explanations of the SAQ human rights questionnaire to deepen suppliers' understanding of human rights governance. A total of 966 suppliers participated, with an average satisfaction rate of 98%.

Building on its commitment to inclusive supply chain development, TSMC achieved its long-term goal earlier than planned in 2024 by ensuring that 100% of tier 1 suppliers established inclusive workplace related policy or statement. Five suppliers earned Women-Owned Business diversity certification. Furthermore, TSMC hosted its inaugural "Supplier inclusive workplace related Workshop," engaging 191 suppliers to share the Company's inclusive workplace related achievements and inviting leading companies to present success stories, thereby creating a more inclusive supply chain.

TSMC hosts its inaugural Supplier Human Rights Enhancement Workshop.

## • Supplier Management Workforce Training Program

Supplier management personnel serve as TSMC's frontline representatives when dealing with suppliers and play a pivotal role in advancing supply chain sustainability. To deepen their knowledge of supplier management and sustainable supply chains, TSMC collaborated with suppliers to participate through courses such as Taiwanese Enterprises and Supply Chain Human Rights Standards and the Supplier Human Rights Enhancement Workshop to raise human rights awareness. In 2024, the Company launched its first training programs on EU CBAM Analysis, Shaping Sustainable Business Models, Global Audit Programs, and other related courses, thus boosting supplier management personnel's expertise in carbon management and auditing. Additionally, TSMC continued its CDP Supply Chain Program courses, motivating supplier management personnel to understand and prioritize supplier carbon disclosure. Consequently, the supplier CDP response rate reached 100% for the first time.

**Payment Practice**

TSMC places a strong emphasis on ensuring timely payments to all its partners. To avoid any delay in payments, TSMC strictly manages and controls the process across various stages, including procurement requirements (estimate sheet confirmation and budget application), procurement orders (payment conditions and trade conditions), delivery (freight arrangement), acceptance (completion report), payment requisition (payment information), and payment. TSMC continually improves its practices based on feedback from stakeholders, identifying causes of delays, regularly tracking progress, and implementing concrete improvement measures to ensure payments are completed on schedule. In 2024, TSMC made payments according to the agreements between both parties. For additional information on accounts payable, please refer to the 6.1 Financial Overview section in the Annual Report.

## 2024 Supplier Management Workforce Training Courses

| Courses | Contents | Objectives | Participants |
|---|---|---|---|
| NEW EU CBAM Analysis | • Global net zero trends<br>• Overview of the EU CBAM<br>• Corporate response strategies | • Help procurement buyers understand the role of international carbon tariffs in the global net zero trend and their impact on businesses | 104 |
| NEW Shaping Sustainable Business Models: Material-Driven Design | • Introduction to circular economy and sustainable business models<br>• Introduction to sustainable materials and matchmaking models<br>• Case Studies on Circular Economy Coaching | • Use the Sustainable Materials Library as a case study to introduce the principles of circular economy and sustainable raw materials, enhancing procurement buyers' foundational knowledge<br>• Use the Chemical Leasing Model as an example to develop supplier management personnel's skills in supply chain technology and business model consulting | 146 |
| CDP Supply Chain Program | • Introduction to the CDP Supply Chain Program<br>• Benefits of corporate environmental disclosure through CDP<br>• TSMC's CDP requirements and targets for suppliers<br>• Disclosure process and common issues | • Provide CDP training to supplier management personnel with no prior experience<br>• Educate procurement buyers on environmental information disclosure and its significance<br>• Improve communication between procurement buyers and suppliers to increase supplier CDP questionnaire response rates | 12 |
| NEW Global Audit Program | • Sustainability audit provisions<br>• Supplier audit methodologies and applications | • Train procurement buyers in China, the U.S., Japan, and Europe as audit specialists to support the Company's global manufacturing expansion<br>• Strengthen local suppliers' supply chain management expertise and response speed | 8 |
| NEW Advanced Training on the Application of Semiconductor Process Materials | • Research and development of Integrated Fan-Out (InFo) processes, and materials<br>• Introduction to semiconductor process equipment and applications<br>• Semiconductor process materials and applications | • Enhance the semiconductor industry knowledge of the Supplier Healthiness Assessment Rectification Program audit teams to improve auditors' understanding of semiconductor technologies, equipment, and materials applications<br>• Identify potential risks and opportunities to facilitate improvement requirements during on-site audits | 8 |

## Supplier Selection and Assessment

### • New Supplier Collaboration Evaluation

To ensure that partnerships with new suppliers are fair, transparent, and aligned with ethical standards, TSMC established a rigorous evaluation process. Before initiating collaboration, the Company assesses suppliers through an impartial third party to ensure the business capacity and ethical conduct of suppliers. The Company requires suppliers to sign the Letter of Assurance on TSMC's Supplier Code of Conduct and Business Ethics Statement, ensuring the legality and integrity of their business operations. TSMC also conducts on-site visits to confirm suppliers' delivery capabilities and assess supply risks in the areas of Supply Chain Risk, Quality and Reliability, Environmental Safety and Health, and Fire Safety System. Based on these assessments, the Company identifies potential hazards and employs them as a reference for supplier selection, safeguarding both parties' interests and facilitating a smooth partnership. Additionally, TSMC requires suppliers to sign Supplier Agreements and an Electronic Transaction Declaration. In 2024, it further tightened supplier cybersecurity requirements, implementing measures such as equipment entry management, account usage control, file transfer management, data protection, and information security risk management and improvement requirements. These efforts enhance supply chain security and stability, laying a solid foundation for the Company's long-term growth.

### • Supplier Performance Evaluation

For suppliers who pass the screening and evaluation process, TSMC undertakes performance assessments based on the type of raw materials, including silicon wafers and raw materials used in production processes. The assessment focuses on five major areas: quality, cost, delivery, service, and sustainability. Each quarter, the Company's Materials Management Organization, Corporate Analytical Laboratories, Nano-Materials Center, and Corporate ESH Division score the top suppliers for each raw material category. TSMC holds scoring discussion meetings every six months and provides a summary of the scores at the end of each year. The Company shares the scoring results internally for reference and also feeds them back to suppliers to help them identify their operational strengths and areas needing improvement.

## Supplier Performance Evaluation Dimensions

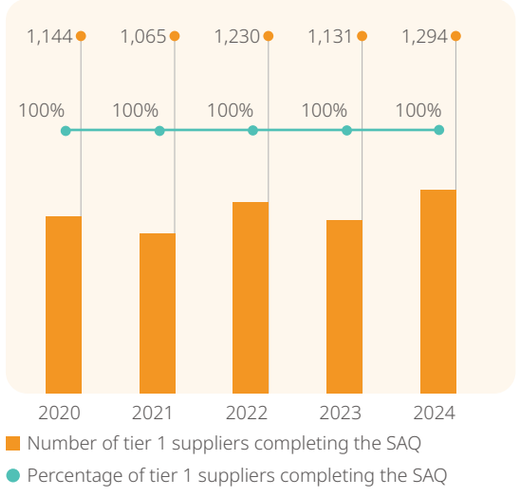
| QCDSS | Quality | Cost | Delivery | Service | Sustainability |
|---|---|---|---|---|---|
| Materials Management Organization | - | ✓ | ✓ | ✓ | ✓ |
| Corporate Analytical Laboratories | ✓ | - | - | - | - |
| Nano-Materials Center | ✓ | - | - | - | - |
| Corporate ESH Division | - | - | - | - | ✓ |

## Supplier Risk Assessment, Selection, and Management Practices

TSMC implements a three-phase risk assessment and screening process for suppliers to evaluate their current development status and take corresponding management actions. The Company requires 100% of tier 1 suppliers to complete the SAQ annually and considers the results a key factor in selecting significant suppliers, based on which it establishes an annual audit candidate list. According to the 2023 SAQ results from 1,294 tier 1 suppliers, the findings reveal the following: in terms of "Human Rights Risk and Management," 6% of suppliers have not established a non-discrimination statement, and 5% have not set up a confidential grievance process; in the "Health and Safety" category, 1% of suppliers lack an accident investigation process; and regarding "Fire Safety Equipment Design and Maintenance," 10% of suppliers have flammable areas without automatic fire extinguishing systems. Additionally, in 2024, the Company introduced two new assessment items: the "Facility Corrosion Management Survey" and the "Transportation Management Survey" to tighten risk control. The results show that 2% of suppliers operate in a corrosive environment but have not developed an anti-corrosion plan, and 6% of suppliers fail to check tire tread before transportation operations.

Based on the 2024 assessment results, the Company identified 609 significant suppliers (387 tier 1 significant suppliers and 222 smelters among non-tier 1 significant suppliers). Among these, 112 suppliers are classified as high risk significant suppliers. Regarding audit findings identified in high risk significant suppliers, the Company implements corrective and preventive actions and continuously tracks their resolution until closure. All suppliers with potential risks have undertaken improvement plans, and none have had their partnerships terminated due to substantial and negative impacts. Additionally, to monitor the operations of smelters among non-tier 1 significant suppliers, TSMC requires them to submit due diligence documents to ensure no risks of human rights violations or environmental damage exist.

### Supplier SAQ Implementation Results




### Supply Chain Three-phase Risk Assessment and Selection

**Individual Management Practices**

**Phase 1 — All Suppliers**

Based on the business relationship between TSMC and suppliers, conduct investigations and analyze the categories of supplier products and services (direct and indirect raw materials, equipment, facilities, and outsourcing vendors, etc.) and their locations. Use major criteria to screen out the Tier 1 qualified suppliers and require them to examine their own performance on business, environment, society, governance, sector-specific, commodity-specific, country-specific, and sustainability and potential risks through SAQ

- All suppliers must sign TSMC's Supplier Code of Conduct and comply with TSMC's risk management requirements
- 100% of tier 1 suppliers complete the SAQ to ensure continuous operational capability
- Tier 1 suppliers are required to establish phase-out plans for regulated materials

**Phase 2 — Significant Suppliers**

TSMC reviews the results of the tier 1 suppliers' SAQ investigation and simultaneously considers comprehensive risk indicators such as " accounting for 85% of procurement expenditures, single procurement source or market share evaluation, product inventory level and characteristics, potential environmental, social, and governance negative impact risks," to screen significant suppliers and include them in the annual audit candidate list

- Significant Suppliers need to complete the SAQ survey and be included in the list of annual audit candidates. Even if suppliers with audits completed are not included as the audit target for the following year, TSMC continues to track their improvement practices
- A third-party organization certified by RBA performs the Supplier Code of Conduct audit for 70 significant suppliers

**Phase 3 — High Risk Significant Suppliers**

Identify high risk significant suppliers via the Risk Assessment Form , for which the aspects considered include whether their business, environmental protection, safety and health, fire protection, society, governance, industry, product, region/country, sustainability have the risk of potentially negative impact. On-site, remote, or document audits are also performed to ensure all risks are under control and improved

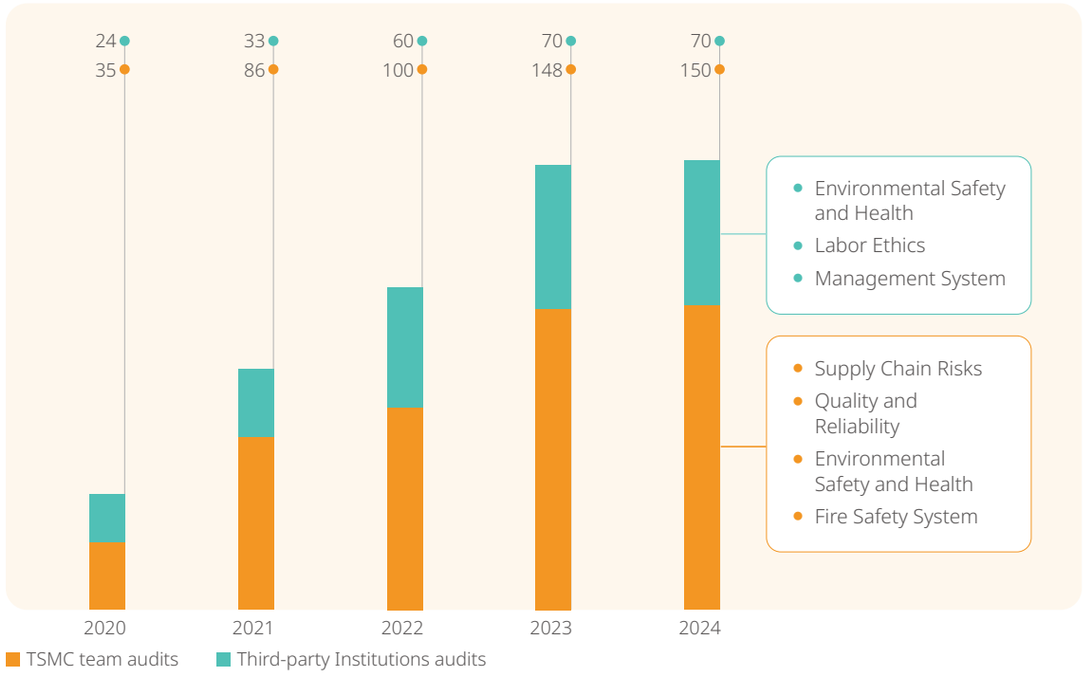
- Understand the actual risk status through on-site (including re-audit and focus consultation), remote, or document audits and propose corresponding improvement measures within the prescribed period according to the audit results
- TSMC has completed 103 high-risk significant supplier safety and health counseling sessions

## Supplier Audit and Consultation Program

### • Audit Implementation and Continuous Improvement

TSMC utilizes the "Supplier Risk Assessment Form" to identify supplier risks. The Supply Chain Sustainability Program Team and the Supply Chain ESH Management Team form the Supplier Healthiness Assessment Rectification Program (S.H.A.R.P.) audit team. This team categorizes audits into six aspects: Supply Chain Risk, Quality and Reliability, Environmental Safety and Health, Fire Safety System, Labor Ethics, and Management System. They undertake on-site or remote audits and engage an RBA-certified third-party organization to perform comprehensive health checks, pinpointing potential risks and improvement opportunities. The Company requires suppliers to submit improvement plans and timelines, regularly provides guidance, and tracks progress. In response to the newly added "Transportation Management Survey" in the SAQ for 2024, the Company carried out 18 transportation operation audits for suppliers that frequently transport hazardous materials to the fab. Additionally, the Company implemented the "New Facility Audit Program " and "Maintain-As-New Project " to promote suppliers' self-management and continuous improvement capabilities. In 2024, the Company completed a total of 220 audits for high risk significant suppliers (150 conducted by TSMC and 70 by third-party organizations), effectively monitoring supplier risk status, enhancing sustainability management capabilities, and lessening potential environmental and social impacts.

### Supplier Healthiness Assessment Rectification Program




TSMC joins forces with suppliers to enhance ESH management capabilities.

## 2024 High Risk Significant Suppliers Audits and Areas for Improvement

**Auditors**

TSMC S.H.A.R.P. Team and RBA-certified Third-Party Institutions

**Audit sessions**

220
Sessions toward high risk significant suppliers

**Audit Methods**

202
On-site sessions

18
Remote sessions

| | Distribution of Audit Violations | Major Audit Findings | Improvement Results of TSMC Suppliers |
|---|---|---|---|
| Supply Chain Risks | 13% / 81% / 6% | • Failure to regularly inspect the plant's power supply equipment and lack of defined criteria for replacing outdated equipment<br>• Lacking emergency response protocols or failing to conduct practical drills.<br>• Failing to implement a regular inspection mechanism for critical parts related to manufacturing, production, and quality measurement | ✓ Establish a regular inspection mechanism and develop criteria for replacing outdated equipment based on inspection outcomes and root cause analysis<br>✓ Formulate emergency response protocols, incorporating notification procedures and conducting drills<br>✓ Periodically count and update inventories of critical components |
| Environmental Safety and Health | 13% / 41% / 46% | • Improper management of fall risks during work at heights, such as failure to implement comprehensive fall protection measures<br>• Failure to install interlocks, appropriate covers, and guards on equipment with entanglement or nip hazards<br>• Improper selection, use, and maintenance of personal protective equipment (PPE) by personnel | ✓ Install safety lifelines, sturdy guardrails, and anchorage points; personnel must wear safety harnesses and remain hooked throughout the entire operation<br>✓ Implement physical protective measures and conduct regular inspections to ensure their effectiveness<br>✓ Establish a personal protective equipment (PPE) management program and conduct re-training on the program |
| Quality and Reliability | 10% / 79% / 11% | • Not fully documenting or tracking annual maintenance activities<br>• Severe corrosion in the plant or the existing rust removal mechanisms have not been assessed for their effectiveness in relation to the surrounding environmental conditions<br>• Failing to establish preventive maintenance frequencies and inspection protocols for equipment and parts based on their criticality levels | ✓ Properly record the maintenance or servicing work hours and frequencies of equipment in the plant, and coordinate with regular meetings. Define standards for rust removal and painting, evaluating corrosion rates and conditions of different gadgets<br>✓ Classify equipment and parts based on critical parameters and service life, or add new inspection items to achieve preventive maintenance objectives |
| Fire Safety System | 4% / 33% / 63% | • Explosion-proof electrical devices and proper piping configurations have not been implemented within the explosion-proof zone<br>• Failing to apply firestopping materials in breached fire compartments or using incorrect installation methods<br>• Not properly activating loop disconnection alerts in the fire alarm system | ✓ Inspect electrical devices in explosion-proof areas, using appropriate explosion-proof equipment and techniques<br>✓ Carry out a plant-wide inspection to identify compromised fire compartments and seal them using certified firestopping methods<br>✓ Check and repair fire alarm disconnection circuits, activate the disconnection alarm switch, and inspect the DIP switches after each disconnection alert |
| Labor Ethics | 4% / 12% / 84% | • Not providing necessary facility accommodations for individuals with disabilities<br>• Failing to establish a policy governing the acceptance or offering of gifts | ✓ Provide facilities for individuals with disabilities and improve their work environments<br>✓ Create a policy on gift acceptance and giving, specifying value limits and frequency |
| Management System | 0% / 5% / 95% | • Neglecting to convey the TSMC Supplier Code of Conduct to upstream vendors<br>• Not establishing grievance channels or anonymity protection mechanisms | ✓ Distribute the Supplier Code of Conduct to upstream raw material vendors and require them to sign and return it<br>✓ Establish grievance handling procedures along with regulations for protecting anonymity in complaints |

■ Priority Findings[Note 1] ■ Major Findings[Note 2] ■ Minor Findings[Note 3]

Note 1: Priority findings may present higher risks of production halt, life, serious illegal affairs, or systematic failure. For example: lacking a response mechanism for an unexpected halt in production lines, environmental pollution, hiring child labor, or forced labor.

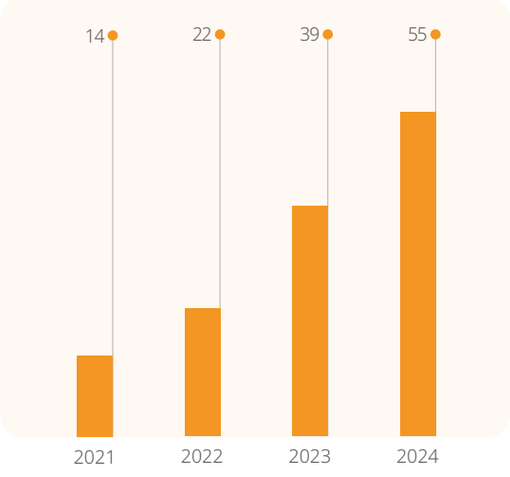
Note 2: Major findings refer to significant differences between implementation and proper ESH procedures, such as daily operations not adhering to ESH procedures.

Note 3: Minor findings refer to risks other than priority or major violations, such as incomplete training records or incomplete ESH procedures.

## Re-audit and Focus Consultation Projects

TSMC continuously strengthens supplier operational resilience through re-audits and targeted consultation programs. These initiatives tackle issues identified in previous audits and implement improvement plans focused on production line and product quality, equipment maintenance, and component management. In 2024, the Company completed 55 re-audit sessions. Furthermore, TSMC established selection criteria for potential audit candidates based on "supply chain risk and quality and reliability" factors, optimizing the efficiency of audit resource allocation. For further details, please refer to the "TSMC Responsible Supply Chain Report ."

### Number of Suppliers Re-audited Over the Years




## Supplier Re-audit Process and Results

### Summarize Findings from the Previous Audit

- Process and production line operations leading to contamination, adversely affecting product quality
- Inadequate regular maintenance and insufficient methods for managing equipment failures
- Missing quality control checkpoints in certain manufacturing processes
- No safety stock established for critical parts, and their importance to processes not defined

### Arrange for Re-audit

**Pre-Audit Communication**

- A pre-audit meeting outlines that this audit will analyze historical audit data to compile supplier optimization recommendations aimed at achieving industry-average quality standards
- On-site briefings clarify improvement directions, ensuring all supplier levels grasp objectives and initiate corrective measures

**General Re-Audit Procedures**

- Offer recommendations for process enhancements and perform thorough, exhaustive inspections
- Implement a regular tracking mechanism, defining and reviewing operational procedures
- Deliver consulting services to ensure work standards meet supplier needs

### Improvement Result in 2024

| | | |
|---|---|---|
| Enhance production cleanliness management | Suppliers 12 | Tighten quality control 20 Measures |
| Decrease unexpected production halts | Suppliers 18 | Management initiatives 38 |
| Reduce quality deviations at their sources | Suppliers 6 | Optimize quality control checkpoints 6 |
| Define critical part categories and establish documentation systems, to prevent production delays caused by part shortages | Suppliers 14 | Strengthen critical component parts 23 Measures |

TSMC provides guidance at supplier facilities.

## New Facility Audit Program

TSMC adopts a risk-tracing approach to minimize potential improvement costs, incorporating into its audit scope supply chain partners who have either constructed new facilities or become official suppliers within their first year of partnership. The Company establishes design standards for new facilities based on government regulations, Best Known Methods (BKM), and audit experience. These standards encompass Business Continuity Plan (BCP), production line design, quality management, fire protection measures, environmental health and safety, and green supply chain practices. From the design phase of facility construction, TSMC integrates quality requirements and coordinates audit activities with suppliers' construction timelines in stages. Through surveys, on-site interviews, and inspections, the Company ensures that suppliers adhere to the intended facility design direction. In 2024, the Company enhanced engagement by organizing additional exchange meetings for newly completed facilities and added power stability assessments to the design standards. These efforts help suppliers address potential electrical issues that could disrupt operations during the design phase. During the year, TSMC completed 18 audits of newly constructed supplier facilities, bringing the cumulative total to 49 since 2021.

### Business Continuity Plan

Mandate that suppliers establish and practice internal business continuity plans, incorporating measures such as disaster response strategies for facilities and contingency protocols for supply interruptions

### Production Line Design

Fortify the management of the circulating pump production line by adopting an online monitoring system in place of manual calculations

### Quality Management

Refine filter planning management for **seven** suppliers, allocating sufficient space and preserving flexibility for future specification changes

### Power Stability NEW

Power outage risks were identified in **seven** newly constructed factories, and all deficiencies have been fully addressed


### Green Supply Chain Practices

Introduce the installation of magnetic levitation variable-frequency chillers at new facilities, anticipating a reduction of **4,000** metric tons of carbon emissions annually across the supply chain

### Environmental, Health and Safety

Advance the design of **five** suppliers' large-scale utility equipment by incorporating fall prevention, seismic resistance, and environmental protection features to bolster facility protection

### Fire Protection Measures

Deploy smoke detection sensors to enable early fire detection, thereby increasing evacuation time and response opportunities for personnel

## Maintain-As-New Empowers Suppliers for Sustainable Operations

To bolster the resilience of the supply chain, TSMC supports the Maintain-As-New Project initiative which aids local suppliers in developing a systematic management framework for their operational sites, concentrating on three primary areas: facility repairs, maintenance services, and equipment upgrades. Through these efforts, suppliers gain greater capacity to address unforeseen challenges. By the end of 2024, the project has assisted five suppliers, resulting in a marked decrease in production line irregularities — from 513 incidents in 2022 to 82, marking an 84% decline. Furthermore, the replacement of obsolete chiller systems has yielded annual energy savings of 1.155 million kWh and a carbon reduction of 572.2 metric tons.

### Facility Maintenance

- Comprehensive structural reinforcement
- Implement of rust removal
- Implement of process damage
- Workforce allocation and coordination

### Repair and Maintenance

- Project revision and reinforcement
- Confirmation of project execution
- Maintenance order statistics
- Execution of personnel training

### Equipment Replacement

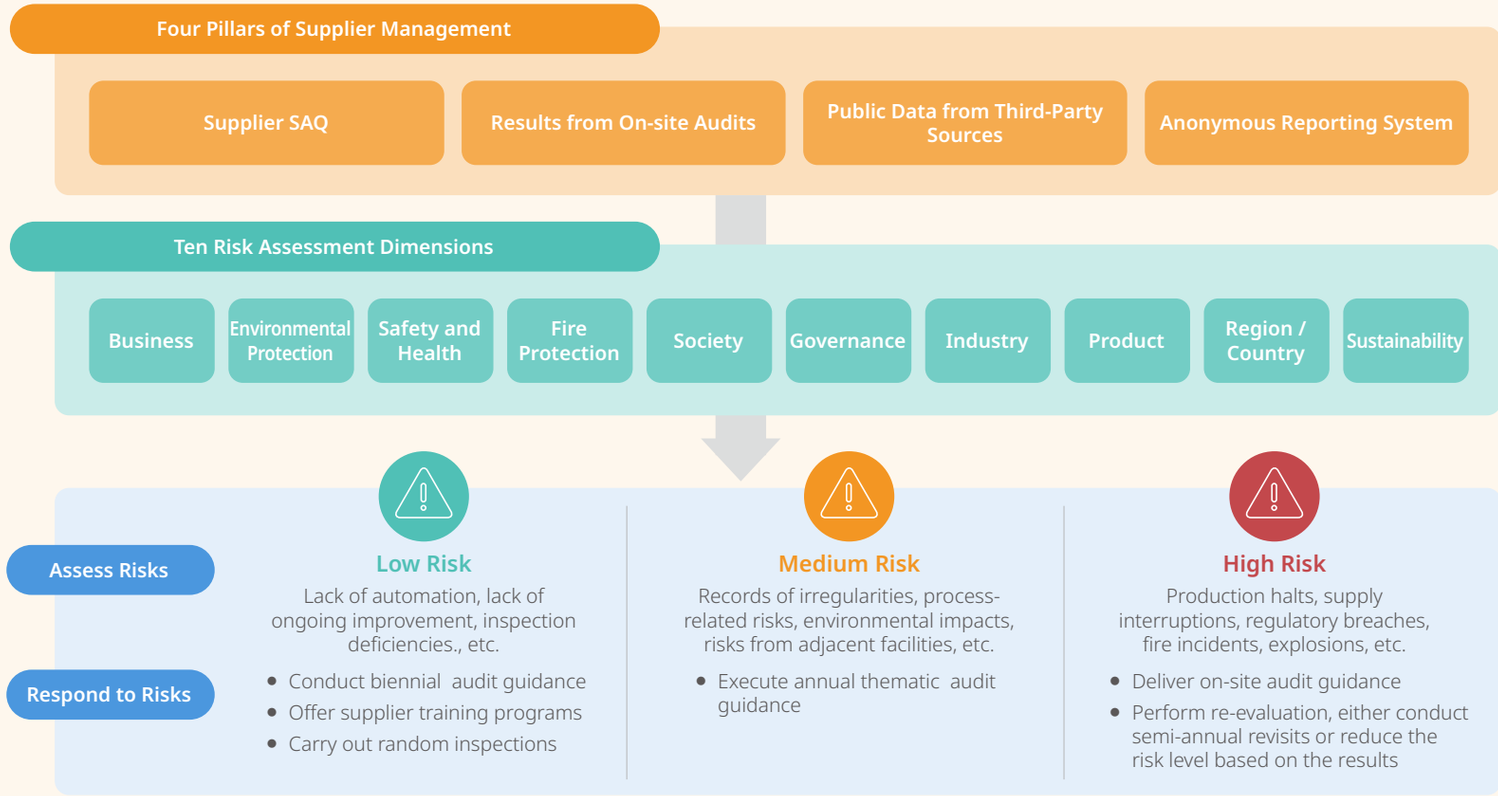
- Pipe and valve replacement
- Replacement of electrical equipment
- Upgrades of rotating equipment
- Critical material management

Case Study

# Achieve Breakthrough in Risk Management with 93% Closure Rate for Audited Supplier Deficiencies

TSMC strives to mitigate sustainability risk within the supply chain. In 2024, the Company introduced the "Supplier TRUST Model – Comprehensive Risk Assessment Technology," which merges four essential supplier management strategies: supplier SAQ, on-site audit outcomes, publicly accessible third-party information, and an anonymous reporting system. Utilizing historical supply chain risk assessment data, the Company pinpointed potential weaknesses and established a tiered risk classification approach based on 10 assessment dimensions. This structure applies tailored levels of scrutiny to boost risk oversight efficacy. High-risk concerns undergo immediate prioritization and on-site audits, whereas medium- and low-risk matters receive ongoing improvement initiatives and educational sessions, respectively. Throughout this year, the Company successfully detected 49 significant suppliers previously unaudited by TSMC and scheduled on-site audits. Consequently, audited suppliers achieved a 93% resolution rate for identified shortcomings, solidifying TSMC's capacity to oversee supply chain risks effectively.

## Supplier TRUST Model – Comprehensive Risk Assessment Technology



## Improvement in Suppliers' Resilience and Capacity

TSMC partners with suppliers to advance sustainable development via multiple avenues. Through Supply Online 360, the Company provides access to the Supplier Sustainability Academy and a specialized grievance channel. Suppliers also gain from educational sessions, forums, workshops, and tailored audit support, cultivating reciprocal sustainability capabilities and forging a more robust partnership foundation.

### • TSMC Supplier Sustainability Academy

TSMC converts its operational and manufacturing expertise into digital resources, freely sharing them with suppliers and the public through the Supplier Sustainability Academy's seven core modules. In 2024, all 10 "Contractor ESH Bluebook " online courses were rolled out, organized along a pre-, during-, and post-work timeline to deliver concise guides that assist contractors in applying workplace scenarios and bolstering their environmental, safety, and health (ESH) knowledge. Moreover, the Company launched its inaugural Inclusive Workplace course and mandated "Product Carbon Footprint" as a required course for tier 1 suppliers. To date, a total of 90 courses have been offered, achieving 3.1 million engagements. For additional information, please refer to the TSMC Responsible Supply Chain Report .

### • Suppliers' Reporting Procedure

TSMC, guided by a people-centric approach, implemented a Supply Chain Employee Grievance Channel on the Supply Online 360 homepage, available to all supplier personnel. The Company safeguards the confidentiality of whistleblower identities and case details, fostering a more supportive workplace environment throughout the supply chain. In 2024, the channel received seven reports: three addressed wage payment disputes and ambiguous overtime definitions, while four involved business conflicts, unequal treatment, and labor insurance concerns. Upon receipt, the Company directed each case to the appropriate department for action, gathered feedback from whistleblowers where applicable, and mandated that suppliers address deficiencies in line with the Supplier Code of Conduct. For details on grievance handling processes, please refer to the TSMC Responsible Supply Chain Report .

## Improvement in the Management of the Supply Chain on Environmental Safety and Health

TSMC has developed multiple training programs to enhance suppliers' capabilities in ESH self-management based on a four-step framework: standards and system establishment, audit and violation tracking, consultation and training, and supplier follow-up consultation. Beyond the regular Sustainable Supply Chain ESH Forum, the Company launched the first Supply Chain ESH Technical Forum in 2024, engaging 175 suppliers alongside experts from industry, government, and academia for in-depth presentations and technical exchanges. The forum featured suppliers with innovative ESH management techniques, who shared approaches such as selecting protective gear for loading and unloading powdered toxic substances, developing integrated construction safety systems, and implementing hydrogen production with carbon recovery methods. The Company also presented its carbon reduction program for major emission contributors, leveraging circular economy examples to encourage collaborative learning and elevate green ESH management capabilities across the supply chain.

### Reporting Procedure

**Supplier Employees**
- Supply Chain Employee Grievance Channel

→

**TSMC Grievance Handling Committee**
- Investigation and supervision
- Penalty
- Report to TSMC's top supervisor of supply chain management for a penalty

→

**Suppliers**
- Examine problems and make improvements
- Implement improvement measures

TSMC actively empowers suppliers, laying the foundation for sustainable development.

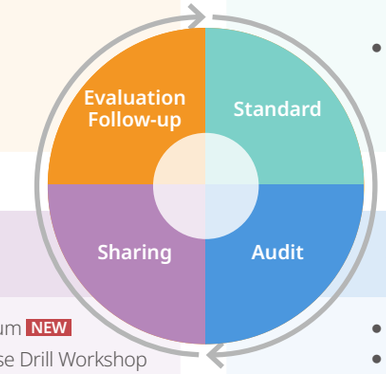
## Improvement in Supply Chain ESH Management

### Supplier Follow-up Consultation

- Significant supplier focus consultation
- Follow-up evaluations for high-fire-risk suppliers
- Supplier Senior Executive Environmental, Safety and Health (ESH) Improvement Program

### Standard and System Establishment

- Constantly update the Supplier Code of Conduct and Sustainability Standards
- Supplier leadership commitment to the Code of Conduct and Sustainability Standards
- Introduce fire protection and ESH design to new factories
- Establish supplier ESH risk matrix



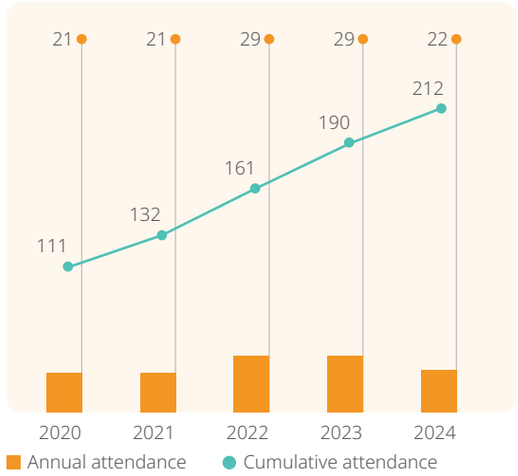

### Consultation and Training

- Supply Chain ESH Technical Forum NEW
- Factory Fire Emergency Response Drill Workshop
- On-site Assessment and Guidance for Public Hazardous Materials Management NEW
- Interactive Course on EHS and Fire Safety for Suppliers
- Interactive Course on "Greenhouse Gas Scope 3"
- Sustainable Supply Chain Environment, Safety and Health Forum
- Supplier Emergency Response Observation
- Energy Saving and Carbon Reduction Guidance
- Water Saving and Carbon Reduction Guidance

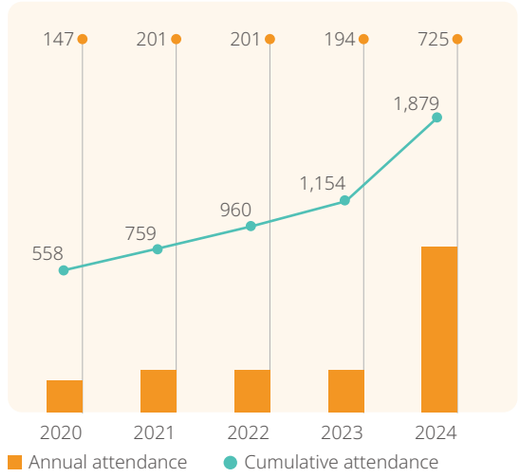
### Audit and Violation Tracking

- Supplier ESH/fire protection audit
- Violations mitigation and follow-up
- Supplier abnormal event project audit NEW
  - Electrical fire incident involving cleanroom garments
  - Supplier wastewater bypass discharge incident

## Number of Suppliers Observing TSMC Annual Emergency Response Drills

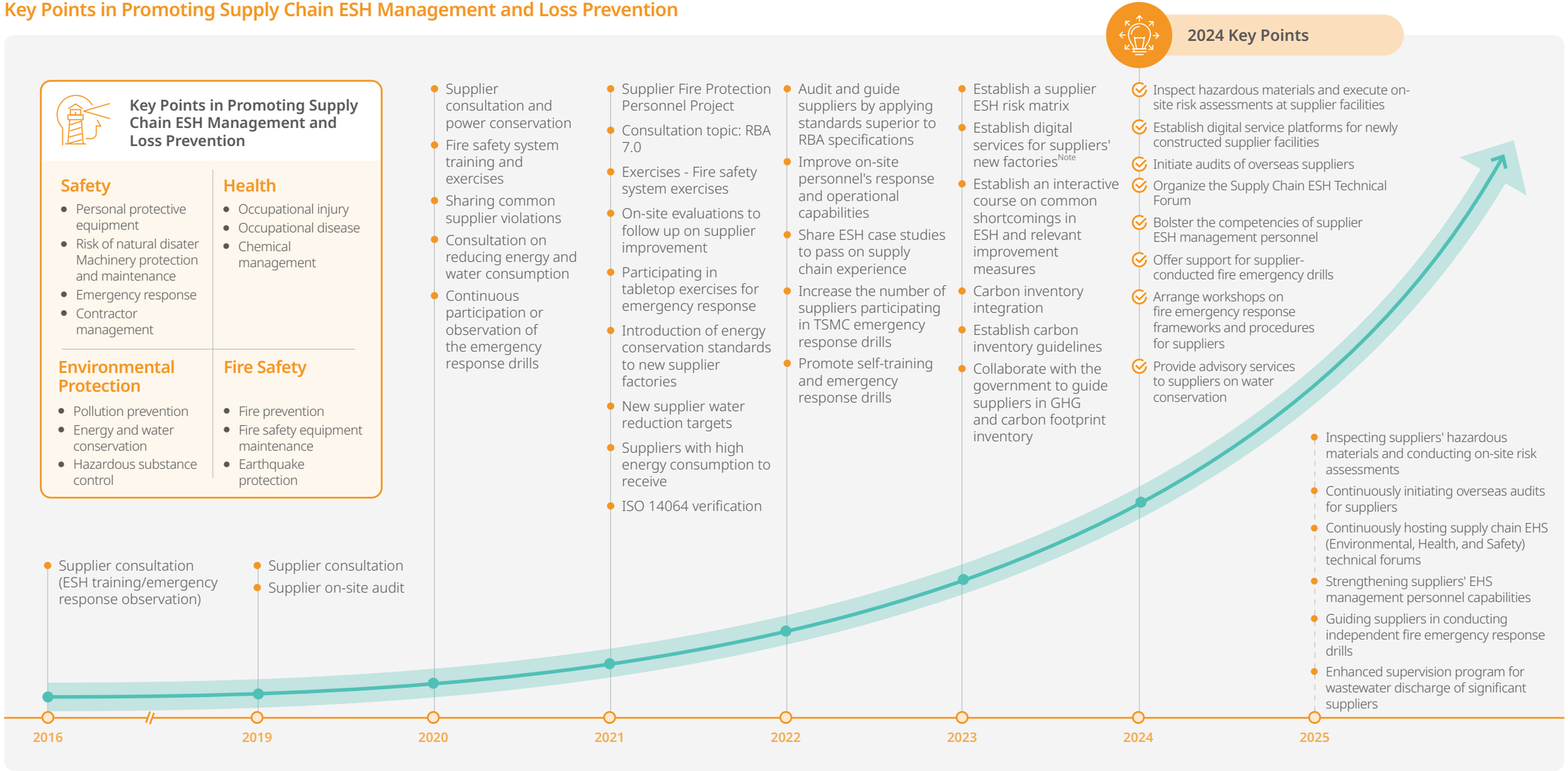



## Number of Suppliers Participating in ESH Training




TSMC conducts on-site audits at supplier facilities.

## Key Points in Promoting Supply Chain ESH Management and Loss Prevention




Note: The digital service for suppliers' new factory construction will be integrated into the Supplier TRUST Model in 2025

## Supply Chain Technical Quality Improvement

TSMC collaborates with suppliers to identify and address capacity shortfalls, quality defects, and process optimization needs. Through coordinated efforts between the Materials Management Organization, Quality and Reliability, Operation, and relevant business units, the Company implements advance process instruments and technologies, elevates material product quality, and fosters local vendors' technical capabilities, generating mutual advantages.

### 2024 Supply Chain Management Challenges and Solutions

| | Technology and Parts | Capacity | Quality and Measurement Technology |
|---|---|---|---|
| **Issues/Challenges** | • The percentage of locally produced high-level spare parts for several advanced processes is low as local suppliers lack critical technologies<br>• Parts of specific advanced machinery have to be sent abroad for repair and maintenance, which affects production schedules | • Capacity insufficient to meet advanced process requirements | • Measurement technology insufficient to meet advanced process requirements |
| **Mitigation and Improvement** | ✓ Assemble a team of experts to provide consultation for local suppliers, offer technical support, and assist in certification, ensuring that supplier technology developments are consistent with TSMC's business needs<br>**32** Suppliers | ✓ Production line expansion and process advancement<br>**10** Suppliers | ✓ Add analytical instruments<br>✓ Introduce advanced instruments<br>✓ Improve the quality of materials and products<br>**10** Suppliers |
| **2024 Performance** | ✓ Develop parts for **136** advanced processes | ✓ New factories supply a sufficient number of raw materials upon volume production, meeting TSMC quality requirements<br>✓ Assist new suppliers to establish the Best Known Method (BKM) for inferior quality improvement | ✓ Zero product returns<br>✓ Assisted new suppliers to increase detection thresholds<br>✓ Assisted new suppliers to acquire capabilities for IC material analysis |

## Procurement Arrangement of Main Raw Materials

TSMC closely monitors global raw material market trends and has formulated a thorough management strategy for key raw material procurement, anchored in four principles: diverse sources of materials, quality control, local procurement, and sustainable operations, to minimize supply disruption risks. To address capacity constraints, quality shortcomings, and potential supply chain vulnerabilities, TSMC adjusts its global market positioning, expands sourcing diversity, and actively elevates local procurement levels. Meanwhile, in accordance with the Supplier Sustainability Standards, TSMC mandates that suppliers incorporate sustainable development into their operations and supports their efforts in advancing material development, process innovation, quality enhancement, and energy conservation with carbon reduction. For comprehensive details, please refer to "5.3.5 Raw Materials and Supply Chain Management " section in the Annual Report.

### Key Management Actions for Main Raw Materials

| Management Dimension \ Main Raw Materials | Silicon Wafers | Process Chemicals | Photolithography Materials | Gases | Grinding Fluid, Grinding Pad, Diamond Discs |
|---|---|---|---|---|---|
| Diverse Sources of Materials | ✓ | | | ✓ | |
| Quality Control | ✓ | ✓ | ✓ | | ✓ |
| Local Procurement | | ✓ | | ✓ | ✓ |
| Sustainable Operations | ✓ | ✓ | ✓ | ✓ | ✓ |

## Promote Constant Upgrade of Local Supply Chains

TSMC promotes local procurement across all operational sites, encompassing six categories: equipment, components, raw materials, facility systems, automation, and goods. The Company has established independent procurement units at overseas subsidiaries, such as TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, and JASM to aid local suppliers in upgrading technology and quality, cutting costs, and diminishing carbon emissions. Concurrently, localized procurement objectives have been defined at each site to reinforce global capabilities for regional material supply.

### Global Fab Supply Chain Management Actions

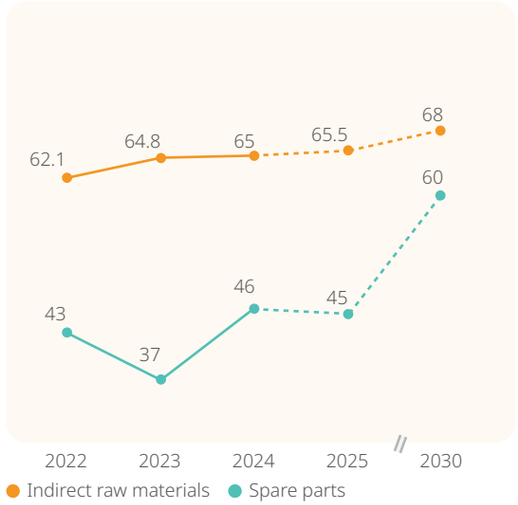
**Setup procurement targets**
Continue to promote or maintain the local procurement percentage to achieve long-term goals

**Improve technical quality**
Actively improve the technology and quality of suppliers for critical equipment, spare parts, and raw materials to improve local procurement volume

**Invitation for factory establishment**
Invite suppliers from different countries to establish production, R&D, and training units at TSMC's production sites

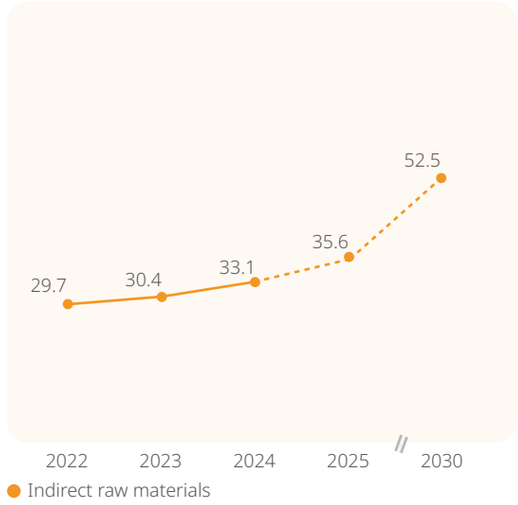
### Percentage of Taiwan Local Sourcing

Unit: %




### Percentage of Overseas Subsidiaries Local Sourcing

Unit: %




## Sustainable Raw Materials

Sustainable raw materials represent a vital component in achieving sustainable development. Beyond its commitment to managing sustainable chemicals, TSMC, in 2024, released the "Sustainable Raw Materials Policy" and formed a task force for managing sustainable raw materials. The Company conducts risk assessment for suppliers and raw materials and prioritize the materials for sustainability certification management by SAQ. It conducts supplier assessments on sustainable raw materials, evaluating risks related to human rights, workplace safety, fire prevention, regional politics, and natural disasters. Following the identification of annual key audit candidates, the Company offers guidance to suppliers and incorporates sustainable raw material inventories into its audit team and RBA project reviews. The objective is to prioritize the supplier's adoption of recycled metals and third-party certified sustainable raw materials during the development phase, thereby increasing their share in suppliers' production inputs. Meanwhile, the Company partners with suppliers to vigorously promote the recycling of raw material resources, developing multiple electronic-grade recycling processes. By the end of 2024, the Company had successfully created recycling and reuse solutions for three chemical types, reclaimed wafers, and copper-manganese (CuMn) alloy targets to electronic-grade standards. This closed-loop approach mitigates operational risks and amplifies the value of resource recovery. Moreover, the Company examines, assesses, and identifies potential opportunities for phasing out regulated materials within the supply chain, establishing the long-term sustainability target of completely eliminating regulated materials from tier 1 suppliers.

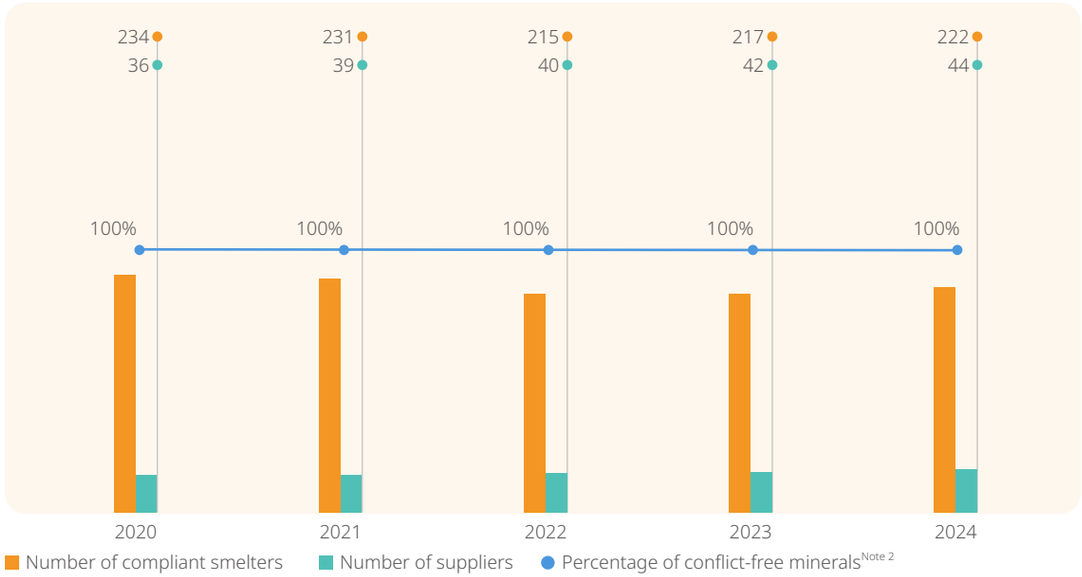
TSMC collaborates with suppliers to develop electronic-grade CuMn alloy targets.

## Responsible Minerals Sourcing

Complying with Rule 13p-1 of the U.S. Securities Exchange Act of 1934 promulgated by the U.S. SEC, TSMC ensures that human rights, health, and the environment in mineral production areas are not violated by purchasing conflict-free raw materials from reliable sources. The Company has adopted legal compliance measures, including the establishment of a due diligence framework following the Model Supply Chain Policy for a Responsible Global Supply Chain of Mineral from Conflict-Affected and High-Risk Areas published by the OECD. At the same time, TSMC is one of the staunchest supporters of the RMI and GeSI. The Company adheres to the RMAP promulgated by such organizations, requiring suppliers to procure conflict-free raw materials.

TSMC requires suppliers to comply with the responsible minerals sourcing policy and sign the statement of responsible minerals for products containing tin, tantalum, tungsten, and gold. Since 2017, TSMC has also disclosed the source smelter for the cobalt used in its products to clients. In 2023, cobalt was formally added to the Supplier Management Standard to ensure that suppliers comply with the sourcing policy. Since 2021, TSMC has audited three suppliers of tin, tantalum, tungsten, and gold annually, ensuring that suppliers formulate and implement conflict-free minerals management processes and conduct due diligence on upstream suppliers. For the latest disclosure documents, please visit TSMC's official website or the US SEC website.

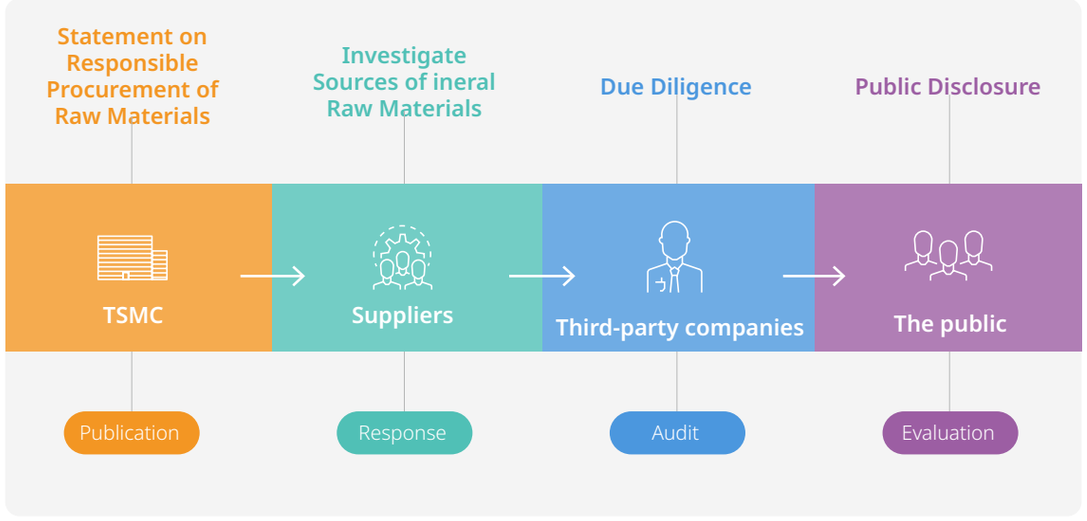
### Conflict-free Minerals Due Diligence[Note 1]




Note 1: Figures from tier 1 Suppliers of TSMC fabs in Taiwan, TSMC Washington, LLC, TSMC (China), TSMC (Nanjing), and VisEra.

Note 2: Legally compliant means smelters and refiners in TSMC's supply chain sourced the tin, tantalum, tungsten, and gold, have been fully audited. Vetted and certified under the RAMP.

### Responsible Minerals Management Process



## Promote Green and Low-carbon Supply Chains

As the Company expands globally, the low-carbon supply chain plays an increasingly pivotal role in its net zero blueprint. In 2024, the Company upgraded its Supply Chain Carbon Management — which encompasses the five dimensions of Create Transparency, Optimize for $CO_2$, Engage Suppliers, Push Low-carbon Ecosystems, Establish Internal Carbon Reduction Mechanisms — to the new "T.S.M.C. Supply Chain Carbon Reduction Action Guide." This guide employs four specific approaches as its blueprint: Tracking, Support, Motivation, and Creativity, to help suppliers progressively achieve their carbon reduction targets.

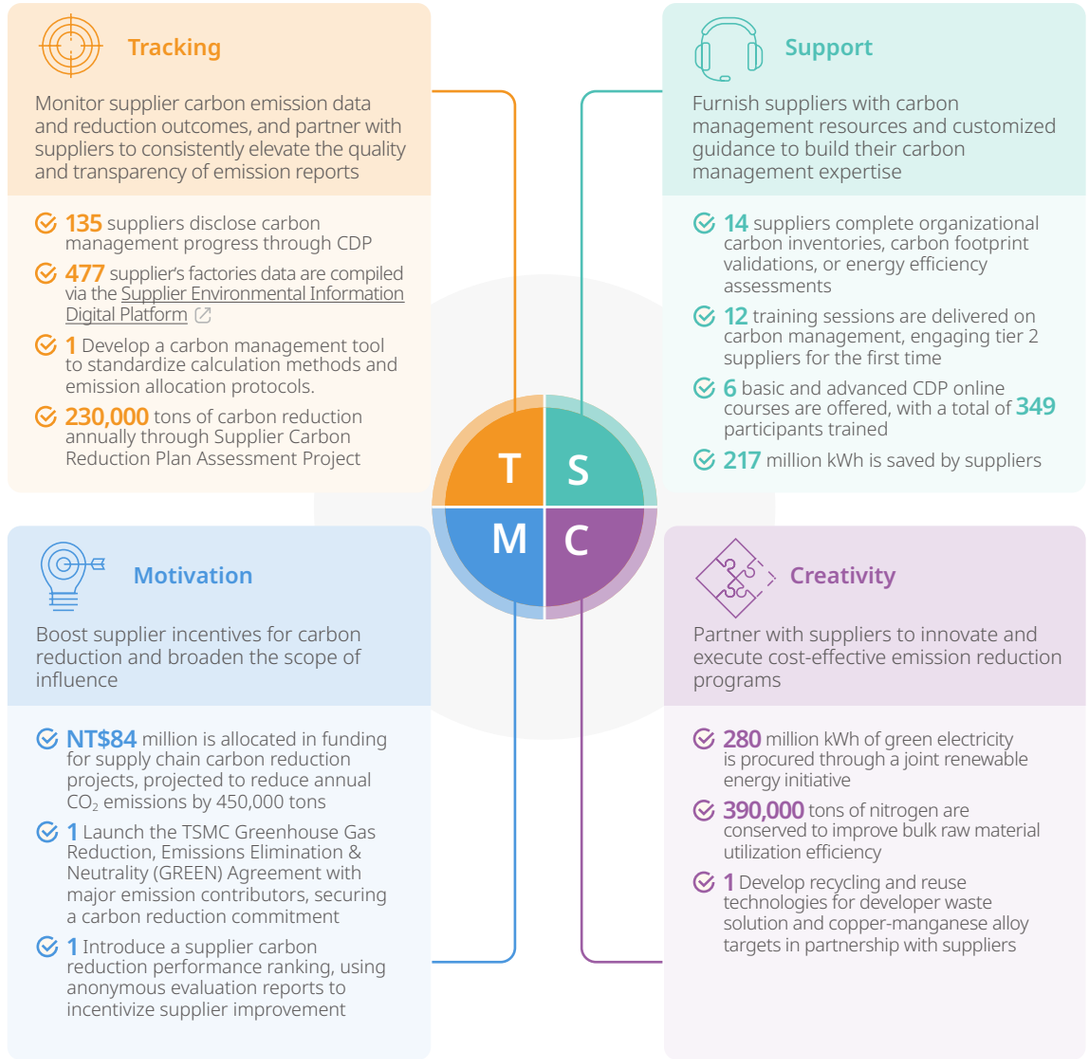
### Track Performance and Transparency Enhancement

In 2024, the Company invited suppliers accounting for the top 75% of its procurement spending on raw materials and equipment to report their carbon management progress via the Carbon Disclosure Project (CDP). A total of 135 suppliers participated, achieving a 100% response rate (up from 98% in 2023) and securing an average score of B- (consistent with 2023). According to survey results, 92% of respondents had established emission reduction targets (rising from 71% in 2023); 72% disclosed carbon emissions from "purchased goods and services," the largest category under Scope 3 emissions (up from 60% in 2023); 37 suppliers earned Science Based Targets (SBT) certification (compared to 20 in 2023), and 17 joined RE100 (up from 16 in 2023). Together, these suppliers represented 54% of the Company's total procurement expenditure.

To elevate the quality of raw material data, TSMC created the Supplier Environmental Information Digital Platform to gather environmental details from supplier factories and products. From 2023 to 2024, this initiative compiled information from 477 facilities and 245 products, which the Company utilizes for product environmental footprint assessments and environmental profit and loss analysis. To strengthen management of decarbonization progress among major emission contributors, the Company launched the TSMC Supplier Emission Management Tool in 2024 , a standardized platform that provides emission calculation processes and planning references. This tool is made available to suppliers to assist in the formulation of their carbon reduction strategies.

To ensure major emission contributors effectively implement carbon reduction plans , the Company launched the Supplier Carbon Reduction Plan Assessment Project in 2024. This effort involved on-site engagements with 27 major emission contributors, specifically verifying their emission reduction progress, carbon mitigation computations, and emissions data accuracy. Working alongside external consultants, the Company also identified energy conservation and carbon abatement opportunities, exchanged insights on upstream supply chain management, and explored trends in renewable energy procurement. Annually, the Company collaborates with major emission contributors to formulate emission reduction plans. In 2023 and 2024, these plans targeted reductions of 900,000 and 1.1 million metric tons of $CO_2e$, respectively, with verified annual emissions reductions totaling 230,000 metric tons to date.

### T.S.M.C. Supply Chain Carbon Reduction Action Guide



## Support for Supplier and Specialized Service

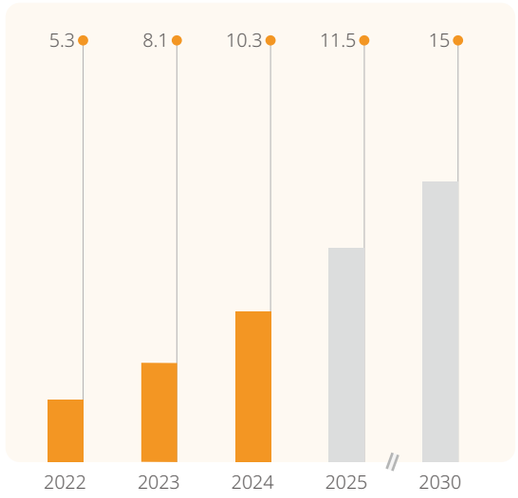
To expedite suppliers' shift to low-carbon operations, TSMC consolidated internal and external resources to deliver customized support. In 2024, it continued to promote the 1+N Carbon Management Project , assisting 14 suppliers in performing factory greenhouse gas inventories, product carbon footprint calculation, and pinpointing energy-saving opportunities. For the first time, this support extended to tier 2 and higher-tier suppliers. The initiative also offered 12 training sessions on carbon management, addressing topics like circular economy, energy trends, decarbonization strategies, and energy management, with 261 participants from 48 suppliers, including seven tier 2 suppliers, advancing supply chain carbon governance from a 1+N to an N+N structure.

In 2024, TSMC arranged six online CDP courses at introductory and advanced levels to help suppliers refine questionnaire responses, engaging 349 attendees. Together with external consultants, the Company hosted a full-day in-person workshop delving into critical topics such as “risk and opportunity disclosures, governance, business strategies, and environmental performance tied to climate change,” with 95 local supplier representatives participating. Additionally, a training program on internal auditing for ISO 14064-1 Greenhouse Gas Inventories certified all 40 supplier attendees upon completion.

TSMC actively expanded Scope 3 emissions inventories and reinforced data accuracy, while aiding suppliers in overseeing emissions across their supply networks. In 2024, the Company invited 41 suppliers to participate in GHG Protocol Scope 3 inventory training sessions and hosted upstream raw material emissions management workshops. These initiatives shared TSMC's expertise in supply chain carbon management and stakeholder engagement, while demonstrating key emission source identification and carbon abatement quantification methods. Through continued guidance to enhance green performance, suppliers achieved an additional 217 million kWh in electricity savings in 2024, accumulating a total of 1.026 billion kWh. The proportion of high-energy-use suppliers certified under ISO 14064 Greenhouse Gas Accounting and Verification rose from 84% in 2023 to 90% in 2024. Furthermore, in collaboration with suppliers, the Company intensified efforts in water conservation and waste management. That year, suppliers recorded an incremental water savings of 12.28 million cubic meters, with a cumulative total of 54.86 million cubic meters, while achieving an average waste recycling rate of 80%.

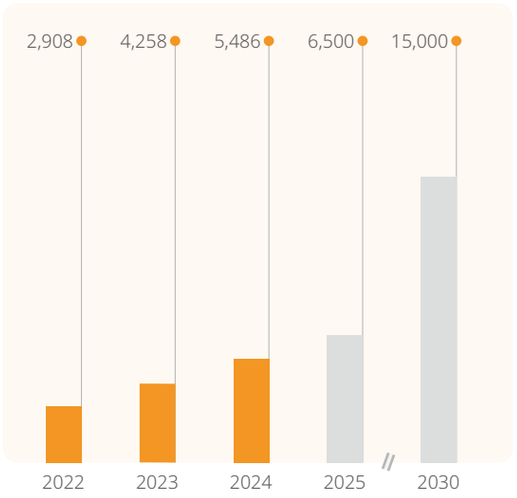
### Cumulative Total Energy Consumption Reduced

Unit: 100 GWh



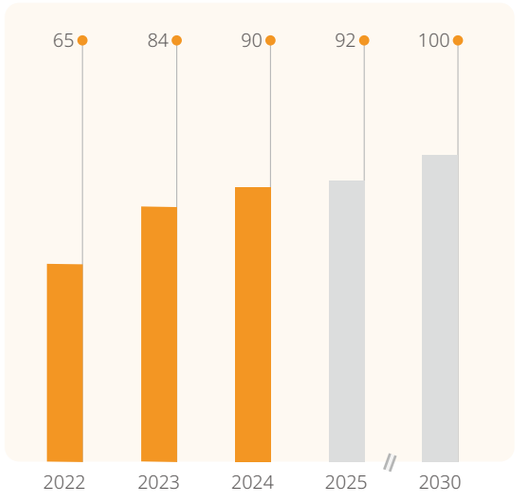

### Cumulative Total Water Consumption Reduced

Unit: 10,000 metric tons



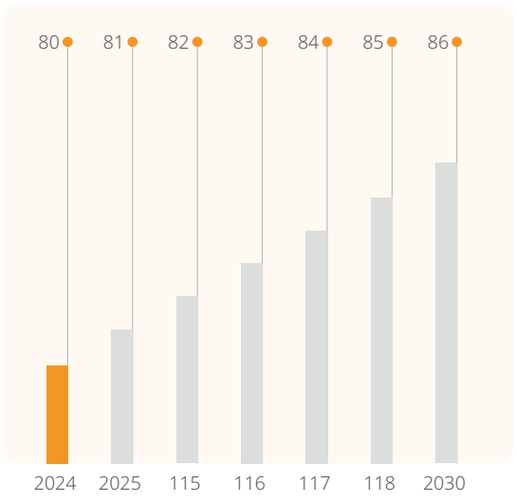

### Percentage of ISO 14064 Verification

Unit: %




### Waste Recycling Rate

Unit: %



## Motivate Enhancement and Magnify Impacts

To expedite equipment upgrades among suppliers and achieve tangible emissions reductions, TSMC introduced the Supply Chain Carbon Reduction Subsidy Project in 2024. This initiative allocated a total of NT$84 million to support 26 suppliers in implementing measures to mitigate Scope 1 and Scope 2 emissions within their operational boundaries. Beyond financial incentives, to hasten supply chain decarbonization, TSMC plans to incorporate carbon reduction performance into supplier selection criteria starting in 2025. The Company will closely monitor supplier commitments to emission reductions and renewable energy adoption rates. Meanwhile, major emission contributors must sign a TSMC Greenhouse Gas Reduction, Emissions Elimination & Neutrality (GREEN) Agreement for Suppliers, pledging specific 2030 emission reduction targets, and complete third-party verification of product carbon footprints by 2026. Non-compliant suppliers face potential reductions in business interactions or partnership termination, with agreement signings set to commence in 2025. To foster ongoing progress, the Company has instituted a supplier carbon performance assessment framework. It will regularly evaluate key performance indicators (KPIs), such as the success rate of abatement plans and the proportion of renewable energy usage, and incorporate findings into supplier performance reviews. Additionally, the Company will release anonymized industry-specific reports comparing decarbonization progress, motivating suppliers to accelerate their net zero efforts.

TSMC subsidizes suppliers in deploying solar photovoltaic systems.

## Creativity Collaboration and Green Innovation

TSMC continues its close partnership with suppliers, launching the second phase of the Joint Renewable Energy Procurement Program in 2024. Recognizing innovation as a key driver for boosting carbon reduction benefits, the Company collaborated with suppliers to improve nitrogen utilization efficiency, develop technologies for recycling electronic-grade chemicals, and advance circular solutions for electronic-grade metal materials. By introducing cutting-edge technologies and innovative partnership models, the Company identified emissions abatement opportunities and established sustainable business practices.

### 2024 Green Innovation Cooperation Project

**Joint Renewable Energy Procurement for Suppliers**

- Engage **12** major emission contributors in joint procurement efforts, securing a total of **280** million kWh of renewable electricity, further raising the share of clean energy within the supply network

**Nitrogen Efficiency Optimization Across Manufacturing fabs**

- Initiate source reduction of nitrogen by implementing high-efficiency gas pumps, substituting nitrogen with low-carbon dry air alternatives, and optimizing equipment parameter settings to maximize nitrogen usage efficiency, resulting in a **390,000**-tonne reduction in nitrogen consumption, equivalent to a carbon reduction of **59,000** tons

**Recycling of Electronic-Grade Chemicals**

- Develop a recycling process for Tetramethyl Ammonium Hydroxide (TMAH), a key component in electronic-grade photoresist developers, projected to reduce the annual purchase of new solutions by **24,000** tones once fully implemented

**Circularity of Electronic-Grade Metal Materials**

- Introduce a purification and regeneration technology for copper-manganese (CuMn) alloy targets, expected to save over **700** metric tons in annual emissions while supporting material circularity in semiconductor manufacturing

Case Study

## TSMC Successfully Extends ESG AWARD to 27 Suppliers

The TSMC ESG AWARD stands as the central platform for advancing the Company's sustainability culture, motivating domestic and overseas employees to submit ideas closely tied to the Company's five ESG directions. The Company acknowledges outstanding organizational sustainability performance and generates positive social impact. Dedicated to driving industry-wide mutual benefits, the Company began encouraging suppliers to work with its Material Supply Chain Management Division on proposals starting in 2023. In that year and 2024, TSMC collaborated with 52 and 81 suppliers, producing 74 and 193 ESG AWARD proposals, respectively.. The Company also proactively shared its sustainability culture promotion experience with suppliers, successfully prompting 16 tier 1 suppliers, both domestically and internationally, to launch their own internal ESG AWARD programs. Among them, six tier 1 suppliers further extended the initiative to 11 tier 2 suppliers, resulting in more than 2,900 proposals overall. To strengthen ESG impact, the Company presented the ESG Partner Award to suppliers who excelled in hosting ESG AWARD activities. During the fifth TSMC ESG AWARD, 16 tier 1 suppliers were invited to partake in the poster exhibition, fostering an exchange of innovative ideas that stimulated further opportunities for ESG partnerships.


TSMC invites suppliers to participate in the 5th ESG AWARD Poster Exhibition for the first time.

Case Study

## "Box Replacement Program" Builds a Low-Carbon, Inclusive Supply Chain

TSMC Circular Box Alliance's Box Replacement Program links TSMC, social enterprises, suppliers, and social welfare organizations through an innovative ESG-driven collaboration model to boost resource circularity and foster both environmental and social well-being. Initiated in 2023, the program supported PackAge+, a social enterprise founded by a team that previously represented TSMC and won an ATCC award, while cultivating young talent. In collaboration with Dafon Environmental Technology Co., Ltd., the Company transformed in-plant plastic waste into eco-friendly circular boxes, thereby increasing material recovery and lowering carbon emissions. The initiative also enlisted social welfare groups to handle box cleaning, generating employment opportunities for individuals with disabilities. By the close of 2024, 10 consumables suppliers have participated in the Box Replacement Program, adopting circular boxes in place of single-use cardboard boxes. The effort resulted in the use of 46,367 circular boxes, achieving a carbon reduction of 17.6 metric tons.

TSMC utilizes circular boxes to enhance resource recycling.

# A Practitioner of Green Power

TSMC aims to set the standard for in environmental protection by seamlessly integrating green practices into daily operations. The Company uses innovative technologies to address climate and energy, water stewardship, circular resource management, and air pollution control. TSMC champions comprehensive sustainable actions to strengthen environmental protection, driven by its commitment to coexist and thrive with the Earth's ecosystem.

Climate and Energy | Water Stewardship | Circular Resources | Air Pollution Control

## Reclaimed Water

Successfully integrated into 5nm and 3nm manufacturing processes

## Zero Waste Manufacturing Center

Launched and projected to reduce annual outsourcing of waste processing by 130,000 metric tons

## 0

Abnormal occurrence: No incidents reported in air pollution control equipment

# Climate and Energy

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Strengthen Climate Resilience**<br>Develop climate change response and measure to reduce the impact of climate risks | 0 days of production interruption due to climate disasters | 0 days of production interruption due to climate disasters | **0 days of production interruption due to climate disasters** ✓<br>Target: 0 days |
| **Drive Low-carbon Manufacturing**<br>Continue to use best available technology to reduce emissions of greenhouse gases (GHG) and become an industry leader in low-carbon manufacturing | Reduce unit GHG[Note 1] emissions by 30% compared to the base year (metric ton of carbon dioxide equivalent ($MTCO_2e$)/12-inch equivalent wafer mask layer) by 30%, and restore GHG emissions to the 2020 level (Base year: 2020) | Reduce unit GHG emissions (metric ton of carbon dioxide equivalent ($MTCO_2e$)/12-inch equivalent wafer mask layer) by 10% (Base year: 2020) | **Increased unit GHG emissions (metric ton of carbon dioxide equivalent ($MTCO_2e$)/12-inch equivalent wafer mask layer) by 19%** —[Note 2]<br>Target: 10% (Base year: 2020) |
| **Use Renewable Energy**<br>Continue to purchase renewable energy and install solar-energy power systems to achieve target of 100% renewable energy use | 60% of the electricity consumption at all company operational sites comes from renewable energy | 20% of the company's total electricity consumption comes from renewable energy, while overseas subsidiaries use 100% renewable energy | **TSMC overseas sites used 100% renewable energy[Note 3]; accounting for 14.1% of TSMC's power consumption** ↑<br>Target: TSMC overseas sites used 100% renewable energy; accounting for 13% of TSMC's power consumption |
| **Increase Energy Efficiency**<br>Plan and implement new energy-saving measures each year to increase energy efficiency | Cumulative energy-saving rate reaches 18% between 2016 and 2030 through new energy-saving measures | 15.5% cumulative energy-saving rate | **Cumulative energy-saving rate reached 15%** ✓<br>Target: 15% |
| | Double energy efficiency after five years of volume production for each process technology[Note 4] | Energy efficiency of 3nm process technology increases by 0.2 times in the 2nd year of volume production | **Energy efficiency of 5nm process technology was 0.6 times higher in the 5th year of volume production** —[Note 2]<br>Target: Energy efficiency of 5nm process technology doubles in the 5th year of volume production |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: The statistical data covers the Scope 1 and Scope 2 GHG emissions. The categories of GHGs include $CO_2$, $CH_4$, $N_2O$, HFCs, PFCs, $SF_6$, and $NF_3$.

Note 2: For the reason for the failure, please refer to "Drive Low-carbon Manufacturing ."

Note 3: Definition of renewable energy use: Self-generated renewable energy, purchased renewable energy, renewable energy certificates, and carbon credits produced by renewable energy

Note 4: Energy efficiency is the product equivalent per kWh of power. (12-inch equivalent wafer mask layer/kWh)

To reach the target of net zero emissions by 2050, TSMC promised to accelerate the progress of RE100, procure high-quality carbon credits, and implement various energy conservation and carbon reduction measures. In 2024, the Company promoted the "roof-mounted PV procurement project" and "maximal renewable energy installation project for existing fabs" to expand the areas for PV installation, and the renewable energy consumption throughout the year increased to 3,610GWh. The same year, the Company also joined the EC jointly initiated by the SEMI and SCC to promote development of sustainable energy. Furthermore, TSMC plans to mark 2025 as reference year to achieve the absolute reduction requirements set in the Paris Agreement by proposing plans that comply with the SBTi in 2026.

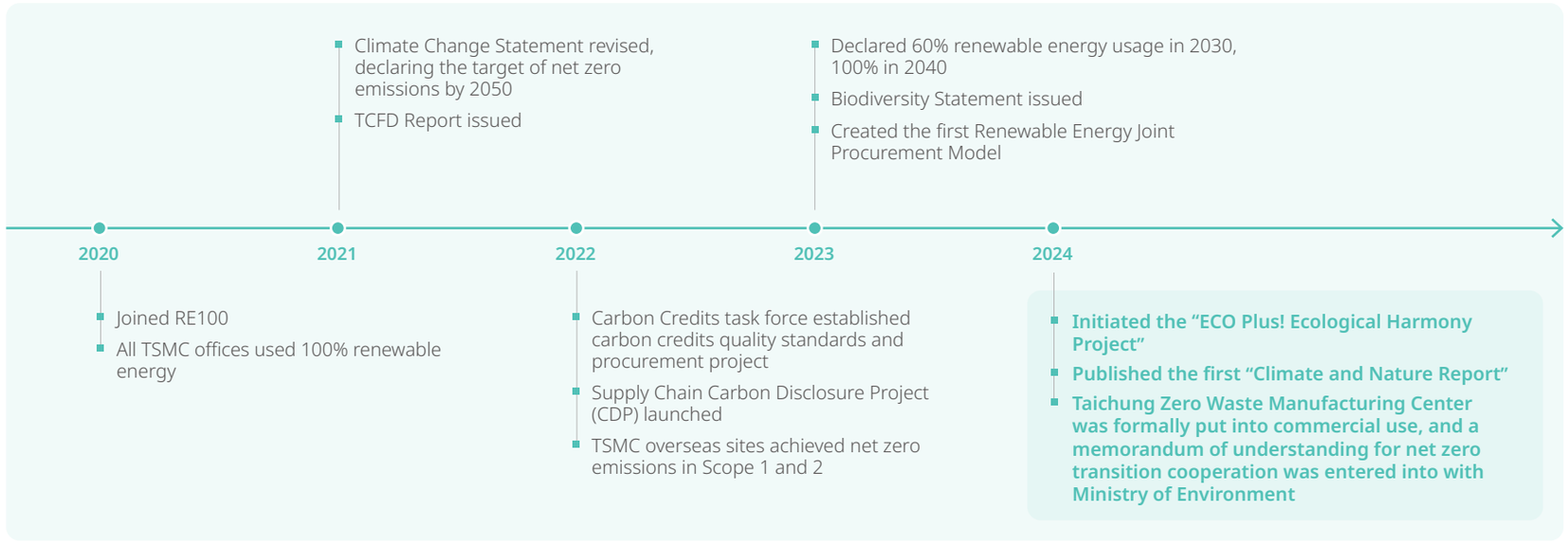
Facing impacts on the eco-environments caused by climate change, TSMC also initiated the "Eco Plus! Ecological Harmony Program" in 2024 and published the first "Climate and Nature Report " to strengthen biodiversity conservation actions. For supply chain management, TSMC formulated the "TSMC Supply Chain Carbon Reduction Action Strategy " and required major emission contributors to sign the GHG emissions reduction agreement, driving the green transition of the overall industry chain and working together to achieve net zero sustainable development.

## Strengthen Climate Resilience

In light of intensifying global weather conditions, resilience in disaster response is the key to sustainable business operations. According to the "Global Risk Report " published by the WEF in 2025, environmental-related risks account for 50% of the top ten global risks over the next decade, making them the highest proportion. These include the top four risks: Extreme Weather Events, Biodiversity Loss and Ecosystem Collapse, Critical Changes to Earth Systems, Natural Resource Shortages, and the tenth-ranked, Pollution."

Through regular and systematic risk assessments, TSMC identifies potential impacts and opportunities, actively implementing the "climate risk adaptation standards," to mitigate the potential effects of climate-related disasters. In 2024, TSMC successfully achieved its goal of zero production interruptions. To improve the organization's climate resilience, TSMC will include Water Positive in its core strategy to respond to climate change. In 2024, the Company continued to increase reclaimed water consumption and planned to establish a reclaimed water plant in TSMC Arizona. Meanwhile, TSMC reinforced the technology of recycling and reuse of waste resources through the Taichung Zero Waste Manufacturing Center and developed electronic-grade chemicals in cooperation with suppliers to be reused by TSMC and strived to implement a business model that facilitates environmental sustainability.

## Summary of Response Measures for Climate Change



## Identify Climate/Natural Risks and Opportunities

TSMC convenes representatives from internal departments and external experts every two years to identify and update climate-related risks and opportunities based on the framework of the Recommendations of the TCFD. During the workshop held in 2024, in addition to recognizing the physical climate risks associated with typhoons, TSMC introduced ten nature-related risks and four nature-related opportunities to assess and reduce the Company's dependency on and impact to the natural environment. This was done to conduct materiality identification effectively.

### Opportunities and Response Strategies for Climate/Nature Risks – Transition Risks

**Transition Risks**

| Risk / Opportunity | Crucial Countermeasures |
|---|---|
| ⚠ Total GHG emissions and carbon taxes/carbon levy<br>⚠ Renewable Energy Regulations and Procurement<br>⚠ Taiwan is estimated to charge additional recycling facilitation fees in response to amendments of regulations NEW<br>◎ Participate in renewable energy programs / Participate in carbon trading markets | ✓ Set aggressive carbon reduction targets: commit to net zero emissions from global operations by 2050<br>✓ Establish a renewable energy task force to collaborate with related associations and government agencies to accelerate the development of renewable energy and realize green energy diversification strategy<br>✓ Work with associations to propose suggestions to the government about building a carbon credit market |
| ⚠ Net zero emissions<br>⚠ Turn to technologies/business directions with low impacts on nature NEW<br>◎ Obtain rewards and cooperation from the public sector<br>◎ Develop low-carbon products and services; increase energy efficiency in customer products | ✓ Map out the Company's net zero emissions roadmap, formulate net zero emissions strategies, and enforce related measures<br>✓ Continue carrying out GHG reduction actions and participate in government carbon offset programs for carbon reduction to earn carbon credits<br>✓ Establish carbon credit purchase strategy and implement net zero measures for overseas fabs<br>✓ Continue investing in R&D resources to develop energy-saving products |
| ⚠ EIA commitments<br>⚠ Reputational risk at the EIA stage due to negative impacts on nature NEW<br>◎ Promote water efficiency and diversification<br>◎ Transition to the operation of recycling and reuse to reduce the dependence and impacts on nature NEW | ✓ Diversify water sources and increase using reclaimed water<br>✓ Strengthen water resource management and continue to expand for AWS certified fabs |
| ⚠ Uncertainties in new energy-saving/carbon reduction technologies<br>◎ Improve plant energy efficiency<br>◎ Transition to high-efficiency production for the reduction of dependence and impact on nature NEW | ✓ Continue to promote energy-saving and carbon reduction actions and track facility outcomes every quarter through the Energy Saving and Carbon Reduction Committee<br>✓ Build green factories, obtain green building certificates, and share experiences with external parties |
| ⚠ Impact on corporate reputation<br>⚠ Reputational risk from failing to meet nature-related commitments NEW<br>⚠ Reputational risk due to suppliers' negative impacts on nature NEW<br>◎ Enhance corporate reputation | ✓ Stick to green manufacturing and green innovation, and enhance the Company's green image through transparent disclosure |
| ⚠ Increase in the attention paid to nature issues by customers/investors NEW<br>◎ Nature-positive actions that support ecological restoration and boost brand value NEW<br>◎ Recover/protect/conserve ecosystems or habitat NEW | ✓ Establish a biodiversity team to carry out relevant evaluations of biodiversity and initiate the "Eco Plus! Ecological Harmony Program" to promote seven biodiversity protection and promotion actions by adopting habitat, species, and knowledge as the three major aspects<br>✓ Publish the "Climate and Nature Report" to disclose biodiversity conservation strategies and actions |

The identification results indicate that the top three risks related to climate issues are: "Net zero emissions, environmental impact assessment commitments, and the uncertainties of the development of new energy-saving and carbon-reduction technologies." The top three opportunities are: "Promoting low-carbon green production, developing low-carbon products and services/improving customer product energy efficiency, and enhancing resilience against natural disasters." For nature-related issues, the top three risks are: "Shifting towards technologies/operations with low environmental impact, reputational damage caused by negative impacts on nature (direct operations — environmental impact assessments for expansion), and reputational damage caused by negative impacts on nature (direct operations — corporate commitment goals)." The top three opportunities are: "Transforming into highly efficient production to reduce dependency on and impact on nature, restoring/protecting/conserving ecosystems or habitats, and enhancing corporate reputation through actions that promote positive growth for nature (ecosystem restoration)."For detailed measures addressing each risk and opportunity, please refer to the "TSMC Climate and Nature Report ."

## Opportunities and Response Strategies for Climate/Nature Risks – Physical Risks

**Physical Risks**

| Risk / Opportunity | Crucial Countermeasures |
|---|---|
| Floods (TSMC operations)<br>Floods (supply chain)<br>Droughts (TSMC operations)<br>Droughts (supply chain)<br>Typhoons (TSMC operations) NEW<br>Typhoons (supply chain) NEW<br>Shortage in water resource supply NEW<br>Increase resilience against natural disasters | Assess flood and drought risks at fabs, formulate and carry out risk mitigation measures<br>Request suppliers to evaluate the flood and drought risks of their operational facilities and implement risk reduction actions<br>Establish comprehensive water monitoring system and emergency response processes and hold regular drills<br>Establish and implement fab typhoon monitoring system, pre-typhoon inspection measures, and emergency response procedures<br>Require suppliers to establish typhoon monitoring system, pre-typhoon inspection measures, and emergency response procedures<br>Promote industrial reclaimed water, civil reclaimed water, and diverse water resource development to reduce regional water consumption pressure |
| Rising temperature<br>Drive low-carbon green manufacturing | Establish the Energy Saving and Carbon Reduction Committee, led by senior executives, to reduce greenhouse gas emissions |
| Impact of air composition in external environments of new fabs NEW | Confirm the equipment procurement specifications of new fabs in advance through data collection and analysis to avoid equipment performance risks during the operating stage |
| Shortage of renewable energy supply NEW<br>Damage to environments caused by the supply of renewable energy NEW | Evaluate diverse renewable energy sources<br>Include the development conditions for renewable energy sites into the scope of ecological check and evaluation<br>Examine whether the site has any potential impact when purchasing renewable energy; if yes, require the energy supplier to adopt corresponding protective measures |

Identification of new nature-related risks and opportunities by TSMC in 2024.

## TSMC Climate and Nature Management Framework

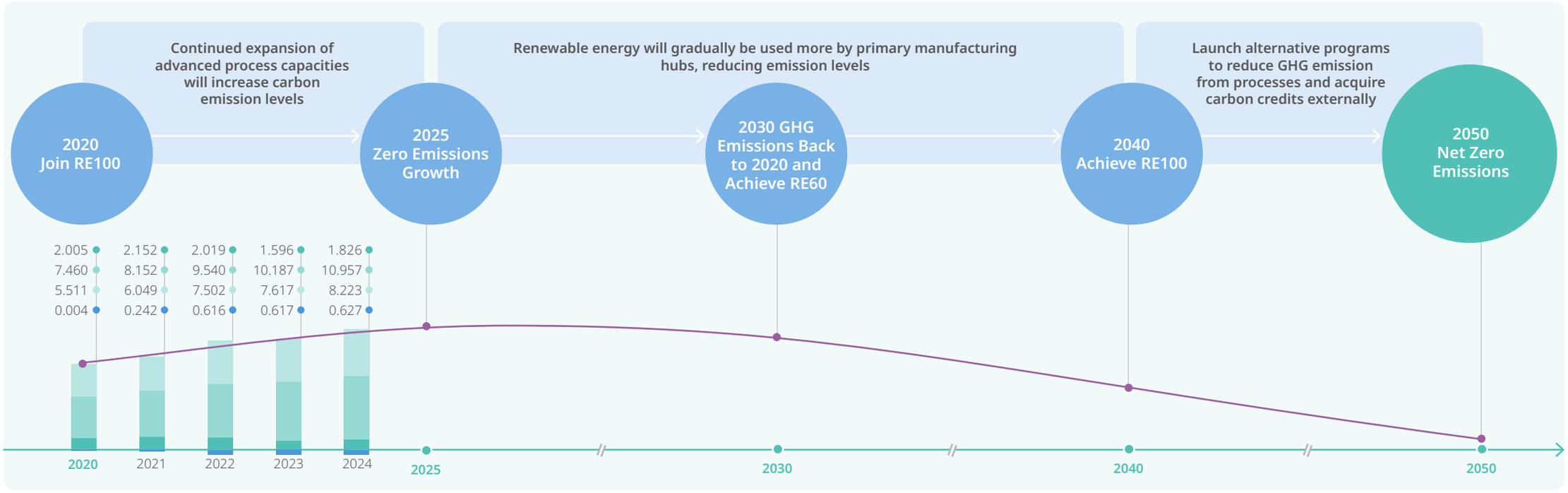
| | Corporate Management Strategies and Actions | 2024 Execution Summary |
|---|---|---|
| Governance | • The Board will regularly review risks and opportunities related to climate change | ✓ Review the implementation progress at each stage for increasing the renewable energy usage ratio<br>✓ ESG Steering Committee confirmed the application for SBT and provided instructions to departments to formulate the implementation plan and financial project NEW<br>✓ Energy Saving and Carbon Reduction Committee defined the five major energy conservation teams and adopted the achievement rate of annual energy conservation targets and the level of innovation for energy conservation ideas as the indicators to encourage the inspiration and implementation of energy conservation measures<br>✓ The chairperson of Risk Management Steering Council reported to Audit and Risk Committee regarding the net zero transition, water resources, power supply risks, natural disasters, regulations, and other issues of the Company related to climate change |
| Strategies | • Organize interdepartmental discussions and identify short-, mid-, and long-term climate risks and opportunities | ✓ Planned and carried out 1,177 energy-saving measures across eight major categories, saving additional 810 GWh. See "Increase Energy Efficiency" for more information<br>✓ Promoted "Green Energy for Charity Project" to install photovoltaic (PV) systems for charity organizations and schools in remote townships. See "Renewable Energy Systems" for more information |
| | • Assess the potential financial and operational impact on TSMC from major climate risks and opportunities | ✓ Completed financial impact qualitative assessment of major climate risks and opportunities and implemented financial impact quantitative assessment of financial impact of major climate risks. See "TSMC Climate and Nature Report" for more information |
| | • Conduct scenario analysis and assess SBT and net zero emission reduction blueprint and actions | ✓ See "TSMC Climate and Nature Report" for more information |
| | • Assist suppliers in enhancing awareness and adaptability to climate risks, develop and implement specific carbon reduction actions | ✓ Required major emission contributors to execute GHG emission reduction agreement and commit to the reduction targets NEW<br>✓ Implemented "TSMC Supply Chain Carbon Reduction Action Strategy" to assist suppliers in achieving the carbon reduction targets NEW |
| Risk Management | • Use TCFD and TNFD frameworks to develop a process for identifying climate/nature risks NEW | ✓ Evaluated the qualitative and quantitative financial impact of major climate/nature risks/opportunities discussed in the climate/nature risk/opportunity workshop |
| | • Set up and implement response measures based on climate risk identification and prioritized result | ✓ Reported assessment results of the climate risks/opportunities and response plans to the ESG Committee Chairperson |
| | • Integrate climate risk identification and assessment in the ERM process | ✓ See "6.2 Risk Management" in the annual report for more information |
| Metrics and Targets | • Set management indicators related to climate change | ✓ See "Climate and Energy Strategies, Goals, and Outcomes" for more information |
| | • Through ISO 14064 annual inventory and disclosure of GHG emissions, review the impact on the Company's operations and assess the risks of Scope 1, Scope 2, and Scope 3 and related mitigation strategies | ✓ Continued to implement carbon reduction measures based on various inventory and evaluation results. See "Drive Low-carbon Manufacturing" for more information |
| | • Set climate change management targets and review progress and performance | ✓ Set climate and energy targets for 2030 to have implementation performance regularly reviewed by senior executives. See "Climate and Energy Strategies, Goals, and Outcomes" and "GHG Reduction Standard Practices" for more information |

## Drive Low-carbon Manufacturing

TSMC reviews its overall carbon reduction efforts through the GHG inventory results certified by a third party annually. In 2024, the Company's total GHG emission was 21,006,442 $tCO_2e$. Direct emissions from Scope 1 processes, such as F-GHGs and nitrous oxide processes, accounted for 9%; indirect GHG emissions in Scope 2 from electricity use, which was the major emission source, accounted for 52%; indirect GHG emissions from the value chain in Scope 3 accounted for 39%, mainly from upstream activities related to raw materials production, energy, and transportation. In response to the increase in the production capacity in advanced processes, GHG emissions increased by 8% from the preceding year, and emissions per unit product increased by 19% from the preceding year, which failed to achieve the annual target. TSMC will continue to enhance the introduction of various energy conservation and carbon reduction measures and increase the consumption of renewable energy .

TSMC continues to implement GHG reduction standard practices. In 2024, the Company replaced and newly installed 3,436 local scrubbers on the manufacturing end, used carbon-neutral natural gases to reduce direct emissions of 390,000 $tCO_2e$, added nine new green factories with green building certificates, with a cumulative of 51 factories obtaining the LEED Gold Certification or above in 2024. As for reduction actions for scope 3, TSMC established "TSMC Supply Chain Carbon Reduction Action Strategy " that comprises "performance tracking, support provision, motivation improvement, and innovative cooperation" in the hope of realizing decarbonization and creating a green semiconductor industry chain.

### Roadmap to Net Zero Emissions



## GHG Reduction Standard Practices

### Scope 1
**Direct GHG Emissions**

Processes that use F-GHGs and nitrous oxide

- Optimize gas quantity used in production
- Low Global Warming Potential Gas Substitution Project
- Install Point-of-Use abatement equipment for F-GHG and nitrous oxide
- Use carbon-neutral natural gas

| | |
|---|---|
| 3,436 Units | Fully installed equipment with reduction technology for the newly established F-GHGs and nitrous oxide processes |
| 96% | Installed/replaced 44 units of equipment with reduction technology for the existing F-GHG processes, and the reduction rate of F-GHGs reached 96% |
| 390,000 Metric tons | Fabs in Taiwan recorded 0 emissions from the consumption of natural gases and reduced carbon by 390,000 metric tons |

### Scope 2
**Indirect GHG Emissions (From Purchased Energy)**

Energy usage

- Build green buildings
- Enhance energy usage efficiency
- Use renewable energy
- Incorporate energy-saving and low-carbon emission designs into next-generation process equipment

| | |
|---|---|
| 1 | The green building verified area won the No. one in global semiconductor industry; together with the newly added certification of nine buildings, achieved the accumulated total of 51 LEED buildings and 31 EEWH buildings certifications, respectively |
| 1,177 Items | The energy efficiency of advanced technology processes was more favorable than peers with similar technologies [Note 1]. TSMC implemented 1,177 items of energy saving measure and effectively conserved 810 GWh of power, equivalent to a carbon reduction of nearly 400,000 metric tons |
| 1 | The Company introduced the unique Next Generation Semiconductor Manufacturing Tool Energy Conservation Project worldwide, completed a total of 236 energy saving projects, and conserved a total of 1,000 GWh of power |
| 3,610 GWh | TSMC consumed approximately 3,610 GWh of renewable energy worldwide, accounting for 14.1% |

### Scope 3
**Indirect GHG Emissions (Value Chain)**

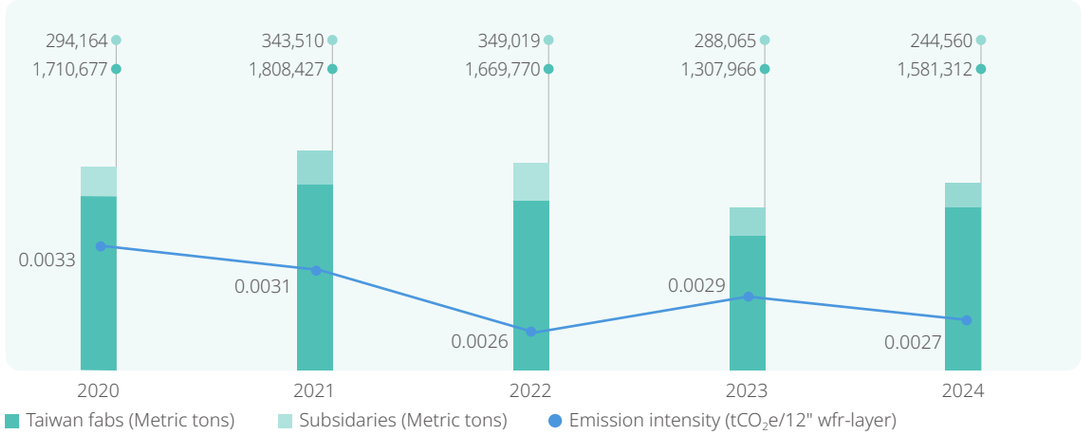
Raw material production, energy-related activities upstream, and transportation

- Require suppliers to pass the external verification
- Raw material carbon footprint reduction
- Participate in the CDP supply chain project
- Optimize transportation scheduling
- Carbon reduction subsidy project

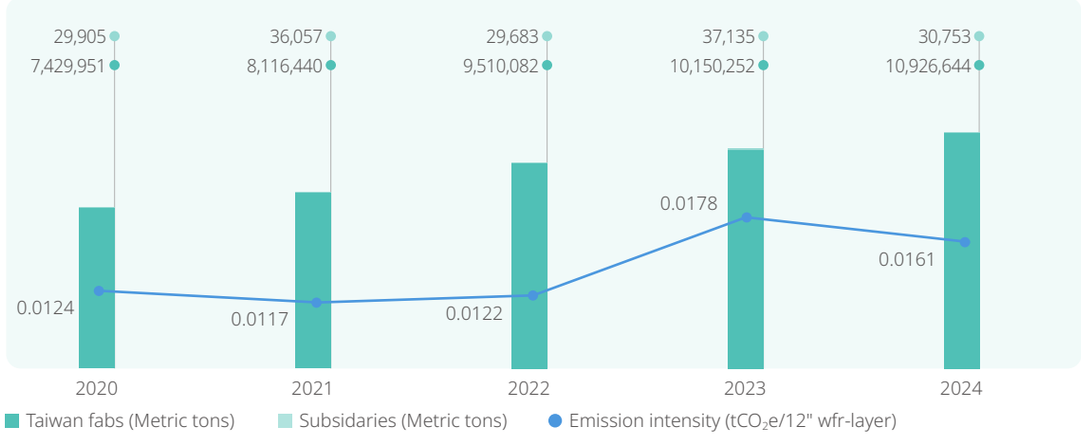
| | |
|---|---|
| 90% | High energy consumption suppliers [Note 2] shall pass GHG inventory and third-party verification, and the verification rate reached 91% |
| 107,000 Metric tons | Guided suppliers to set energy saving targets and take actions; achieved an additional annual energy conservation of 217 GWh, equivalent to a carbon reduction of 107,000 metric tons |
| 100% | Invited critical material and equipment suppliers [Note 3] to disclose carbon reduction targets and progress with a response rate of 100% |
| 14,000 Metric tons | Improved the delivery schedule for processing tools and replaced air freight with ocean freight, reducing GHG emissions by 14,000 metric tons |
| 450,000 Metric tons | Provided a subsidy of NT$84 million to support suppliers in replacing or purchasing new equipment. A total of 26 suppliers passed the evaluation and brought an overall carbon reduction investment amount of NT$5.5 billion and a carbon reduction of 450,000 metric tons |

Note 1: Figures from the Joint Steering Committee (JSTC) report of the World Semiconductor Council
Note 2: High Energy Consumption Suppliers: Suppliers that use power more than 5GWh/year in a single factory
Note 3: Definition of critical material and equipment suppliers: Suppliers accounting for the top 85% of material and equipment purchasing expenses

## Scope 1 GHG Emissions

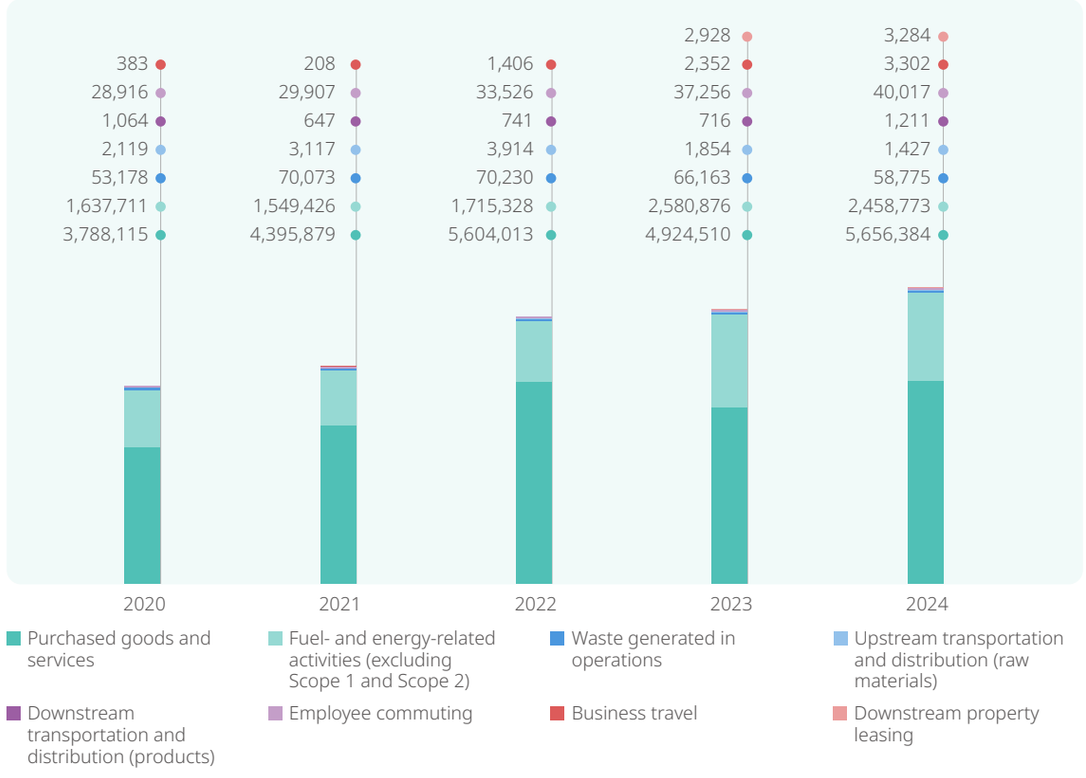



## Scope 2 GHG Emissions




## Scope 3 GHG Emissions

Unit: Metric tons




Note 1: The GHG emissions data for Scope 1 and Scope 2 include the parent company and all subsidiaries of TSMC.

Note 2: Scope 1 inventory data adopted business control approach as the inventory basis; 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories IPCC Fifth Assessment Report (GWP 100) were applied from 2020 to 2024.

Note 3: GHG emissions data for Scope 3 covered TSMC fabs in Taiwan (including the R&D Center and Zero Waste Manufacturing Center), TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, JASM, TSMC Japan 3DIC R&D Center, and VisEra.

Note 4: In term of electricity emission factor, TSMC fabs in Taiwan (including the R&D Center) and VisEra adopted 0.494 kg $CO_2e$/kWh as announced by Ministry of Economic Affairs in 2023; TSMC (China) adopted average emission factor of power grids in Shanghai City of 0.5849 kg $CO_2e$/kWh in 2022; TSMC (Nangjing) adopted national electricity average emission factor of 0.5366 kg $CO_2e$/kWh; TSMC Washington, LLC adopted average emission factor of 0.288 kg $CO_2e$/kWh based on the electricity grids in the western and northwestern regions of the United States; JASM and TSMC's 3DIC R&D Center in Japan adopted Tokyo electric power's emission factor of 0.408 kg $CO_2e$/kWh.

## Product Carbon Footprint

TSMC conducts carbon footprint and water footprint assessments every three years and has passed ISO 14067 and ISO 14046 verifications. According to the results of the carbon footprint assessment in 2024, the wafer manufacturing stage had the greatest environmental impact, accounting for 84%, while the raw material stage accounted for 16%. The carbon footprint of products across various technology nodes in mature process fabs (7nm and above) increased compared to 2020, primarily due to global economic downturn in 2023, which led to lower-than-expected capacity utilization rates, and the expansion of the raw material inventory scope. The carbon footprint of the advanced 5nm process decreased compared to the previous assessment, primarily owing to the increased demand for advanced processes and the successful implementation of energy saving and carbon reduction measures. Regarding the unit wafer water footprint, both mature and advanced process fabs showed reductions compared to 2020. For further analysis of water consumption and water quality indicators, please refer to "Product Water Footprint ".

In 2024, TSMC adopted the "Carbon Handprint" conceptual methodology proposed by Finland's VTT Technical Research Centre and Lappeenranta University, supported by the CLC. Unlike the carbon footprint, which primarily evaluates the carbon emissions generated during an organization's operational processes, the carbon handprint is used to measure an organization's positive contributions to reducing carbon emissions. According to estimates from Taiwan's ISTI, referencing studies from the ACEEE and Oxford Economics, TSMC's reduction of 400,000 metric tons of carbon emissions during its production processes, combined with the energy-saving effects enabled by ICT products utilizing TSMC chips in six major smart applications , contributed to saving 141 billion kilowatt-hours globally in 2024. This is equivalent to reducing 59.62 million metric tons of carbon emissions, representing the positive impact of TSMC's carbon handprint.

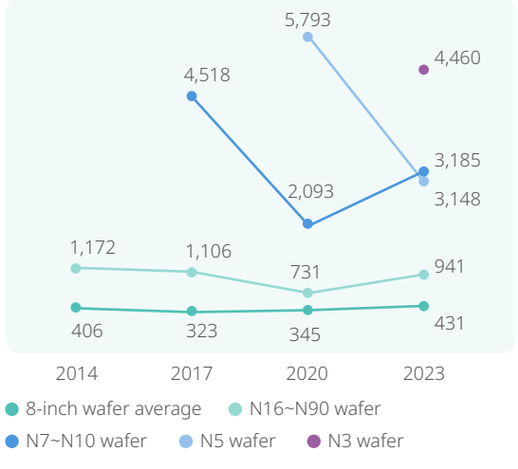
### Sources of Carbon Handprint

- Improving energy and resource efficiency during product manufacturing to provide customers with lower-carbon products
- Utilizing innovative solutions to reduce environmental impact

Through positive thinking, businesses are encouraged to move beyond simply "reducing their own carbon footprint" to actively "reaching out to assist customers and upstream and downstream supply chains in reducing their carbon footprint," thereby creating a greater impact on carbon reduction

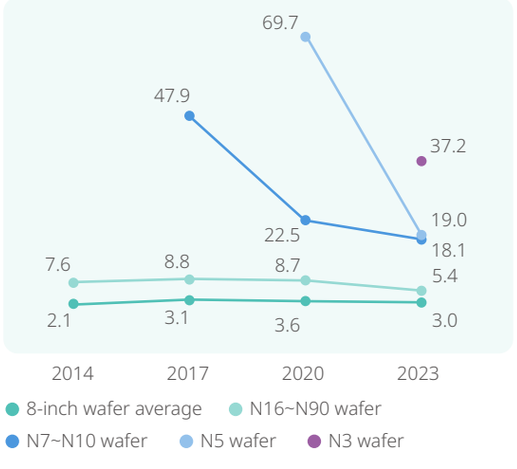
### TSMC Product Carbon Footprint

Unit: Kg $CO^2e$ / Wafer




### TSMC Product Water Footprint

Unit: $m^3$/unit-wafer





TSMC is committed to enhancing energy and resource utilization efficiency in its production processes.

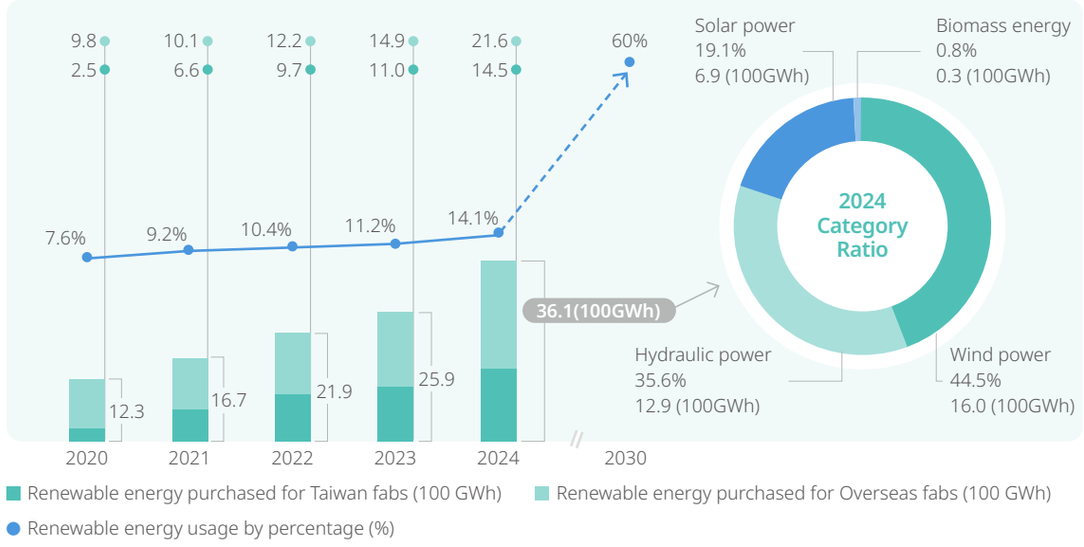
## Use Renewable Energy

In 2024, TSMC's Taiwan fabs increased renewable energy consumption to 1,450 Gwh. At the same time, the Company maintained 100% renewable energy usage in its global offices and offset 100% of $CO_2$ emissions generated from overseas sites. TSMC has achieved zero electricity-related carbon emissions for its overseas subsidiaries for seven consecutive years. In 2024, TSMC continued to promote the diversification of renewable energy development by launching the "Rooftop Solar Power Procurement Project." Through this initiative, the Company actively purchased photovoltaic systems installed on building rooftops, aggregating small-scale green energy resources. This effort also encouraged community investments in constructing solar power systems, fostering a green economy.

As of 2024, TSMC has cumulatively signed contracts for 4.4 GW of renewable energy procurement, which is estimated to reduce carbon emissions by approximately 5.23 million metric tons annually. Starting in 2025, TSMC is expected to receive electricity from offshore wind power, marking the first case in Taiwan of offshore wind energy being supplied to private enterprises. Additionally, TSMC continues to participate in the Ministry of Economic Affairs and Taiwan Power Company's "Green Energy Allocation Sandbox Program." This program treats all fabs of a single corporate entity as a unified user group, allowing the purchased renewable energy to be flexibly allocated based on the actual usage needs of each fab. This approach removes the limitations of the original renewable energy transfer mechanism, which required specifying the fixed installed capacity of renewable energy to be transferred to each plant in its supply contract, thereby enhancing the efficiency of renewable energy utilization.

In 2024, TSMC joined the Energy Collaborative, an initiative launched by SEMI and the Global SCC. This organization brings together industry forces to collaboratively explore low-carbon energy regulations in the Asia-Pacific region and eliminate supply barriers. The goal is to reduce carbon emissions in the semiconductor industry and promote environmental sustainability.

### Renewable Energy Consumption and Ratio




### Renewable Energy Development Timeline

**2020**
- Completed one of the first renewable energy wheeling transactions in Taiwan, purchasing 1,230 GWh of renewable energy
- First semiconductor company to join the RE100
- Signed the world's largest PPA (920 MW)

**2021**
- Committed to achieving 40% of the Company's electricity consumption as renewable energy by 2030

**2022**
- Established diverse supply of renewable energy by including a small-scale hydroelectric station and start supply in December

**2023**
- Brought forward the 2050 target of 100% renewable energy coverage in the Company to 2040
- Promised 60% renewable energy coverage in 2030
- Pioneered supply chain renewable energy joint procurement model
- Participated in the green power allocation sandbox project

**2024**
- **Joined the "Energy Collaborative" jointly initiated by SEMI and SCC**
- **Initiated the "roof-mounted PV procurement project" and "maximal renewable energy installation project for existing fabs"**

## Renewable Energy Systems

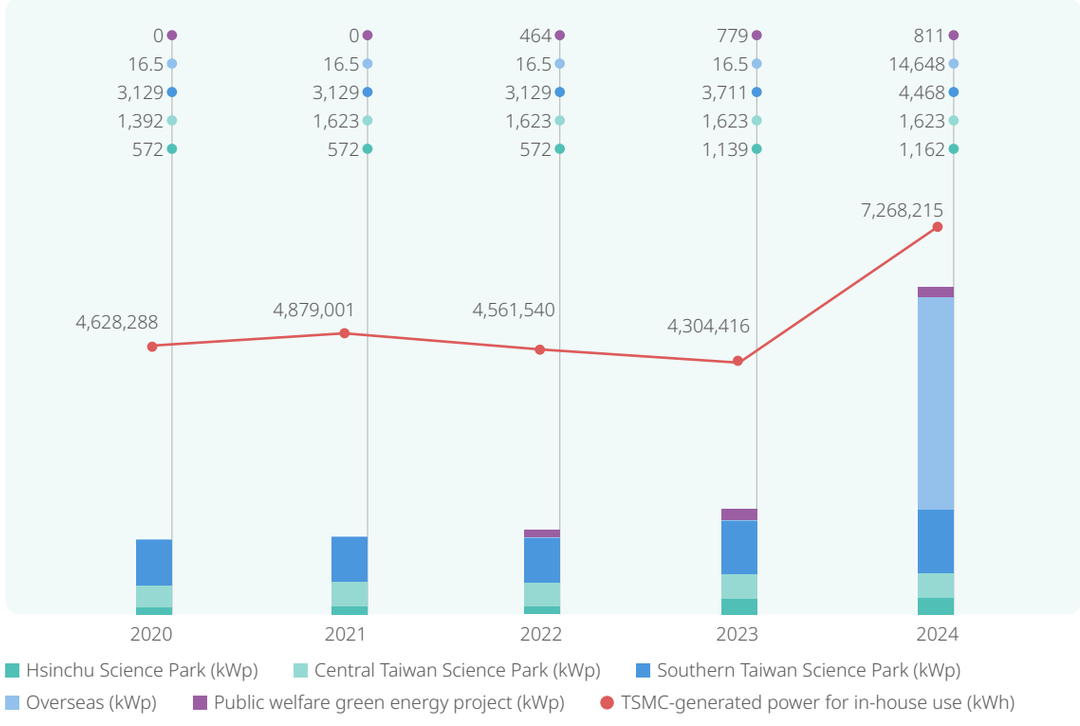
While purchasing renewable energy externally, TSMC also installs solar photovoltaic systems to generate zero-carbon renewable energy for internal use. In 2024, TSMC launched a three-year "Existing Facility Renewable Energy Maximization Project," which involves installing solar photovoltaic systems on rooftops of office buildings, parking towers, and ground parking lots at existing facilities. This project is expected to add over 2,600 kilowatts of peak power capacity. In 2024, TSMC's total installed solar panel capacity reached 15,912 kilowatts of peak power, generating approximately 7.27 million kilowatt-hours of renewable energy and reducing carbon emissions by 3,591 metric tons. Additionally, to enhance the recycling value of decommissioned solar photovoltaic modules, Phase 4 office building rooftops and Phase 8 parking shelters at Fab 18 adopted the "new detachable circular solar photovoltaic modules" developed by Taiwan's ITRI for the first time. These modules enable the complete extraction of high-purity silver, silicon wafers, and glass panels, increasing resource recovery efficiency and promoting environmental friendliness.

TSMC has also expanded its scope of shared benefits by continuing to promote the "Public Welfare Green Energy Program" in 2024. Through the TSMC Charity Foundation, the company facilitates collaboration between its facilities management teams, partner vendors, government agencies, and universities to provide free assistance in installing solar power systems for social welfare organizations and rural schools. All proceeds from the sale of generated electricity are fully returned to these organizations and schools. In 2024, the program added eight new sites, with an installed capacity of approximately 811 kilowatts of peak power and a generation of about 925,000 kilowatt-hours. The proceeds amounted to approximately NT$3,999,000, which were given back to the benefiting institutions and schools.

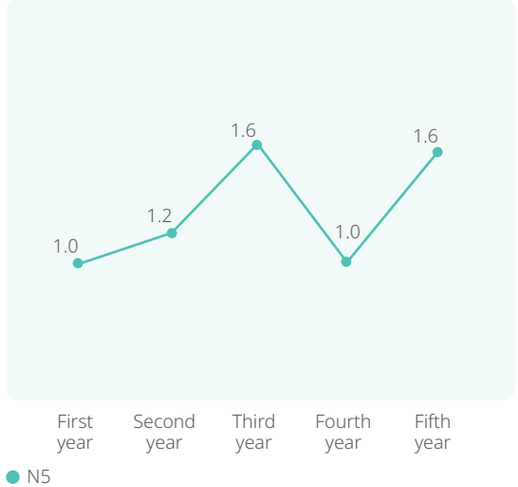
## Increase Energy Efficiency

TSMC comprehensively promotes green manufacturing. Apart from the existing Net Zero Center, Zero Waste Center, and Water Resource Center, the Company added the Sustainable R&D Center and Environmental Monitoring Center in 2024 to focus on the R&D and application of emerging technologies that promote sustainable development and reinforce the control technologies and quality testing capabilities in the hope of accelerating the transition progress. To create energy conservation opportunities, TSMC defined its five major energy conservation teams and commended fabs with excellent achievements and innovative energy conservation actions through the Energy Saving Annual Award. For the first time, the 2024 trophies were made with environmental considerations in mind, incorporating recycled waste glass as a key material. The design features a sapling motif to symbolize the concept of green sustainability.

### TSMC Renewable Energy Installed Capacity and Power Generation for In-house Use




### Energy Efficiency of Process




Note 1: The standardized baseline for energy efficiency is the values taken from the first year of volume production.
Note 2: The datas cover fabs in Taiwan. (excluded the R&D Center)

In addition, to improve employees' awareness of energy management, TSMC organized three sessions of energy conservation and carbon reduction workshops in Hsinchu, Taichung, and Tainan fabs in 2024. Themes included energy conservation and carbon reduction technologies, international carbon fee issues, carbon reduction pathway, and other policies. The sessions attracted 837 participants. TSMC also created 18 promotional posters on energy transition and net-zero emissions to help employees understand the Company's efforts and actions in energy conservation and carbon reduction, demonstrating its commitment to environmental sustainability.

## Five Major Green Manufacturing Centers

### Sustainable R&D Center
Set up green manufacturing directions and targets and cooperate with the government and the academic sector to carry out R&D and verification of sustainable technologies, establish relevant methodologies and promote the applications

### Net Zero Center
Cooperate with suppliers to develop and introduce innovative energy conservation technologies and promote energy conservation and carbon reduction measures

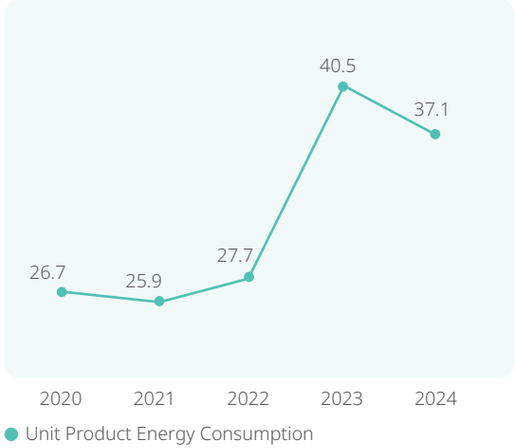
### Zero Waste Center
Recycle waste and make it into electronic-grade raw materials and industry-grade products, realizing zero waste through resource circulation

### Water Resource Center
Formulate the Water Positive strategies, develop diverse water resources, introduce new water management technologies, and promote environmental education courses

### Environmental Monitoring Center
Execute the self-inspection of recycled air discharge, water management, GHG and waste to build a comprehensive protection system

## Unit Product Energy Consumption

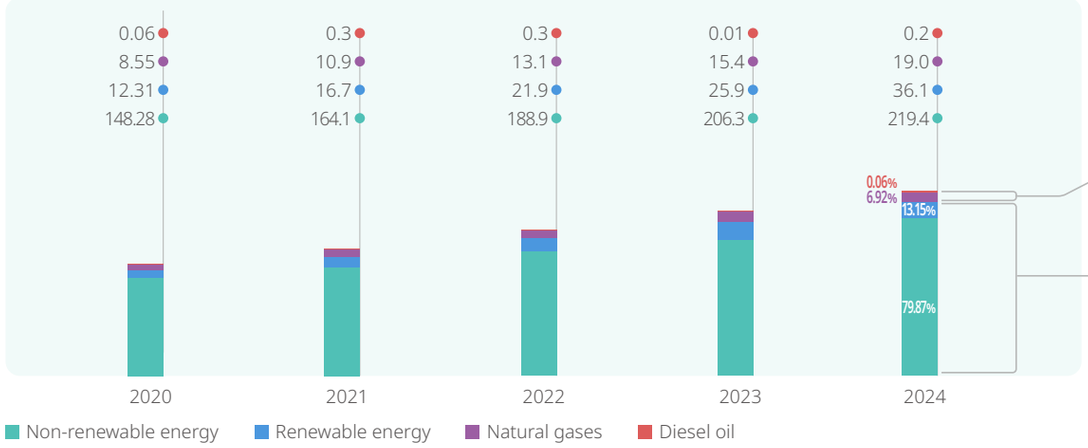
Unit: kWh/12-inch equivalent wafer mask layer




Note 1: The datas cover fabs in Taiwan (including the R&D Center), TSMC (CHINA), TSMC (Nanjing), TSMC Washington, LLC, JASM, and VisEra.
Note 2: Diesel and natural gas are not used for production and are excluded from the calculation.

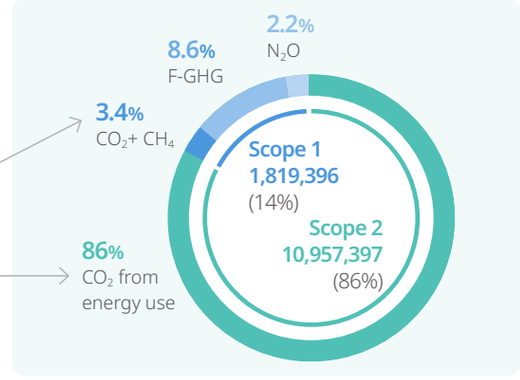
## Total Energy Consumption

Unit: 100 GWh




Note 1: (Import) LNG = 9,000 kcal/m³; vehicle diesel = 8,642 kcal/L; 1 kcal = 4,186.8 J; 1 kWh = 860 kcal ≒ 3,600 kJ
Note 2: GHG emissions from fabrication processes include only direct emissions (scope 1) and indirect emissions from electricity use (scope 2); GHG emissions datas for Scope 1 and Scope 2 cover TSMC fabs in Taiwan (including the R&D Center and Zero Waste Manufacturing Center), TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, JASM, TSMC Japan 3DIC R&D Center, subsidiaries or offices in the U.S./Europe/Canada/Japan and South Korea, and VisEra.
Note 3: The Scope 1 inventory datas adopted business control approach as the inventory basis; the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse GaseInventories (GWP) was adopted from 2020 to 2024.
Note 4: Renewable energy includes solar power, wind power, biomass energy, and hydroelectric energy.

## GHG Emissions from Manufacturing Processes



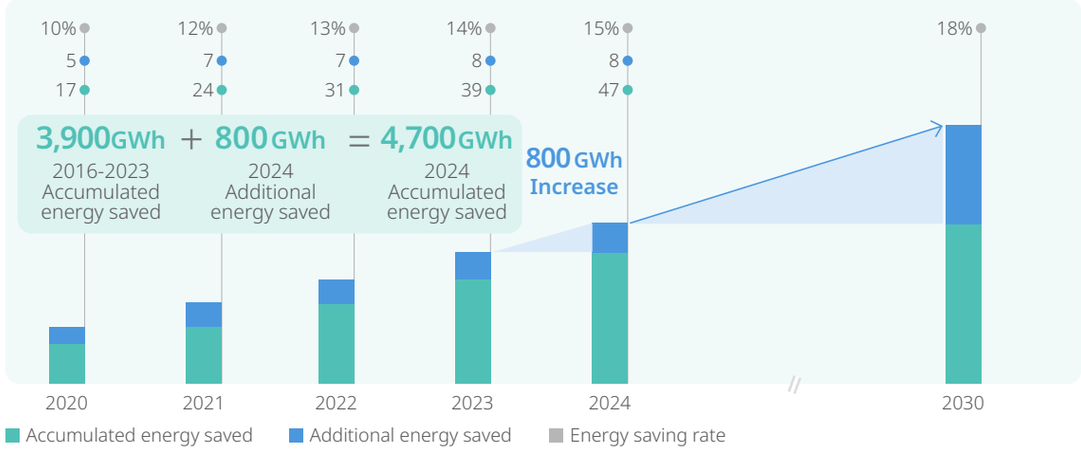
## Expand Energy-saving Measures

In 2024, TSMC's total energy consumption was 27,456 GWh, with purchased electricity, natural gases, and diesel accounting for approximately 93.0%, 6.9%, and 0.1%, respectively. TSMC continues to invest resources in improving energy efficiency. In 2024, TSMC implemented 1,177 energy conservation measures across eight categories, achieving a 15% energy-saving rate and conserving 810 GWh in electricity. Energy conserved in 2024 was the equivalent of reducing 400,000 metric tons of carbon emissions and saving NT$3.04 billion in energy costs. As of 2024, the "Energy Conservation Action Project for Next Generation Fab Tools" launched in 2018, has validated and applied 236 energy-conservation programs to over 100 advanced process equipment types. Combined with cross-site energy-saving measures, the initiative has collectively saved one billion kilowatt-hours of electricity.

In addition to its Taiwan facilities, TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, and JASM also implemented energy-saving projects in 2024, collectively saving 35 million kilowatt-hours of electricity. TSMC Arizona is expected to join the energy-saving efforts in 2025, further expanding the green benefits.

### Total Energy Consumption

Unit: 100 GWh




Note: 1 kWh = 3,600 kJ

### Five Major Energy Conservation Teams with Continuous Innovation

| | Advanced Processes R&D Team | 12-inch Wafer Fab Team | Advanced Backend and 8-inch Wafer Fab Team | EUV Team | Facility Team |
|---|---|---|---|---|---|
| Targets (Including Existing and Future Tools) | Next Generation 3nm/2nm | 12-inch wafer fabs (including overseas fabs) | Backend fabs and 8-inch wafer fabs (including overseas fabs) | EUV tools | Shared facilities not used for production |
| Missions | • Develop energy-efficient components<br>• Optimize programs<br>• Compile tool specifications | • Replace and upgrade equipment with low energy efficiency<br>• Optimize programs | • Replace and upgrade equipment with low energy efficiency<br>• Compile specifications for new tools in backend fabs | • Optimize programs<br>• Develop energy-efficient components | • Upgrade equipment with low energy efficiency<br>• Develop smart energy conservation systems<br>• Compile specifications for new tools |
| Achievements from Key Programs in 2024 | ✓ Adopted high-performance equipment for new tools; the use ratio of energy-saving pumps was approximately 99%, and the use ratio of chillers was approximately 98%<br>✓ Continued to implement the "low global warming potential gas substitution project"; it is estimated that the consumption of HFCs will be reduced by approximately 16% in 2024 | ✓ Continued to promote the "hot water recycling system for wafer cleaning tools 2.0" with a term of eight years, which saved 13.64 kWh of electricity and reduced 6,700 metric tons of carbon | ✓ Implemented the "high-performance pump/chiller" replacement plan, and the energy conservation rate was approximately 30% to 50% | ✓ Introduced the optimal designs for the operating scheduling for EUV tools, and the power consumption per wafer was reduced by approximately 30% | ✓ Introduced Next Generation FFU to improve operating efficiency, and the average energy conservation rate was approximately 6.1% NEW<br>✓ Introduced low energy consumption and high-efficiency local scrubbers, and the GHG reduction rate reached 95% |

## Energy Conservation Measures

A total of **1,177 Measures**

### Facility Equipment

- Smart lighting in clean rooms
- Changed to yellow LED lighting+

| 40 | 39.87 GWh | 19,696 Metric tons |
|---|---|---|
| Energy-saving measures | Conserved in electricity | Reduced of $CO_2$ |

**Lighting Energy Savings**
All Fabs

- AI powered chilled water energy saving system
- Replace cold water with PCW for cooling air compressors throughout first- and second-stage compression

| 14 | 108.55 GWh | 53,623 Metric tons |
|---|---|---|
| Energy-saving measures | Conserved in electricity | Reduced of $CO_2$ |

**A.C. Energy Savings**
All Fabs

- High efficiency transformers

| 41 | 75.03 GWh | 37,064 Metric tons |
|---|---|---|
| Energy-saving measures | Conserved in electricity | Reduced of $CO_2$ |

**Increased Performance**
All Fabs

- Energy-saving mode for uninterrupted power supply system
- Cooling fan for battery cabinet to conserve energy
- Use standby mode for local scrubbers

| 17 | 57.57 GWh | 28,439 Metric tons |
|---|---|---|
| Energy-saving measures | Conserved in electricity | Reduced of $CO_2$ |

**Standby Energy Savings**
All Fabs

### Manfacturing Tools

**Energy Usage Management**
All Fabs

- Reduce PCW and exhaust emissions from manufacturing processes
- CDA flow smart control mechanism

| 211 | 76.98 GWh | 38,028 Metric tons |
|---|---|---|
| Energy-saving measures | Conserved in electricity | Reduced of $CO_2$ |

**Unit Replacement**
All Fabs

- Replace with new high-efficiency, energy-saving pumps and chillers

| 367 | 76.16 GWh | 37,623 Metric tons |
|---|---|---|
| Energy-saving measures | Conserved in electricity | Reduced of $CO_2$ |

**New Units Specs**
12-inch Fabs/ Advanced Backend Fabs

- Use high-efficiency, energy-saving auxiliary equipment and components for new equipment
- Optimize water usage and exhaust settings

| 359 | 336.05 GWh | 166,009 Metric tons |
|---|---|---|
| Energy-saving measures | Conserved in electricity | Reduced of $CO_2$ |

**Equipment Adjustments**
All Fabs

- Replace tool components with energy-saving components
- Hot DI water circulation system

| 128 | 40.96 GWh | 20,234 Metric tons |
|---|---|---|
| Energy-saving measures | Conserved in electricity | Reduced of $CO_2$ |

Note: The carbon emission equivalent factor is 0.494 kg $CO_2e$ per kWh; 1 kWh = 860 kcal = 3,600 kJ

## Strengthen Nature and Biodiversity Protection

TSMC places great importance on environmental sustainability, guided by its Biodiversity Statement . The Company aligns with the TNFD framework and its recommended assessment methodology, following the four-step process of Locate, Evaluate, Assess, and Prepare (LEAP). This approach helps TSMC understand the interdependencies, reliance, and impacts between its global facilities, local suppliers in Taiwan, and surrounding ecosystems. It also facilitates the identification of areas with potential for biodiversity conservation. In 2024, TSMC collaborated with industry, government, academia, and research partners to launch the "Eco Plus! Ecological Harmony Program ." Centered on three key pillars — habitats, species, and knowledge — the initiative aims to promote biodiversity protection and awareness through concrete actions.

In 2024, under the "Habitat" pillar, TSMC completed assessments of potential ecological corridor areas and developed a strategy for eco-friendly farming on Dadushan. The Company also engaged with stakeholders to exchange management practices for OECM. Under the "Species" pillar, TSMC carried out resource demand evaluations for the conservation of Squalidus Banarescui and Ring-necked Pheasants, as well as improvement planning for the rehabilitation ponds at the Central Taiwan Science Park facilities. Under the "Knowledge" pillar, efforts included the completion of surveys covering 13.3% of priority sampling areas in Taiwan Bird Atlas, accumulating bird sound recognition data in Taiwan using the Merlin App, training 277 volunteer bird surveyors, and hosting information sessions for the "Biodiversity Scholarship and Proposal Grant" in northern, central, and southern Taiwan. Additionally, in collaboration with the Ministry of Education, TSMC organized 33 iNaturalist promotional events, attracting a total of 1,071 student participants.

In addition, TSMC continued to promote the Plant A Tree Program in 2024 and planted a total of 110,851 trees and 292,730 shrubs. For the first time, the program incorporated volunteer leave, inviting TSMC employees to participate in the “Good to Have You” tree planting and beach cleaning activities on World Earth Day, International Day for Biological Diversity, and World Environment Day. A total of 443 employees participated, planting over 1,760 saplings, and cleaning approximately 1,691 kg of marine debris. In terms of environmental education, TSMC enhanced awareness of conservation among employees and the public through specialized courses and guided tours at the "TSMC Central Taiwan Science Park Ecological Zone" and the "TSMC Southern Taiwan Science Park Reclaimed Water Facility Environmental Education Learning Zone." In 2024, a total of 1,930 participants took part in these activities. For more information on TSMC's extended efforts in nature and biodiversity conservation, please refer to the “Climate and Nature Report .”

Case Study

### Introduce the FFU to Improve the Operating Efficiency from 55% to 60%

The cleanrooms within wafer fabs require extremely high air cleanliness levels. Fan filter units are utilized to effectively filter tiny particles in the air, creating a stable airflow field and ensuring the quality of the process environment. To enhance operational efficiency, TSMC collaborated with suppliers to optimize the fan structure while maintaining the original dimensions (120 cm × 120 cm) and operational specifications (airflow speed greater than 0.45 meters per second). This optimization involved increasing the fan blade diameter from 400 mm to 448 mm, combined with flow field simulations of the volute air duct to confirm a reduction in turbulence. Additionally, the rotation mode was changed from an inner rotor to an outer rotor, enhancing torque on the shaft and thereby increasing airflow. This improvement successfully raised operational efficiency from 55% to over 60%, with an estimated power consumption reduction of 0.018 kW per unit. In 2024, the optimized units were successfully implemented in Phase 1 of Fab 20 and Phase 1 of Fab 22, achieving electricity savings of 3.3 million kilowatt-hours.

TSMC improves the structure of fans for dust-free rooms to improve energy conservation benefits.

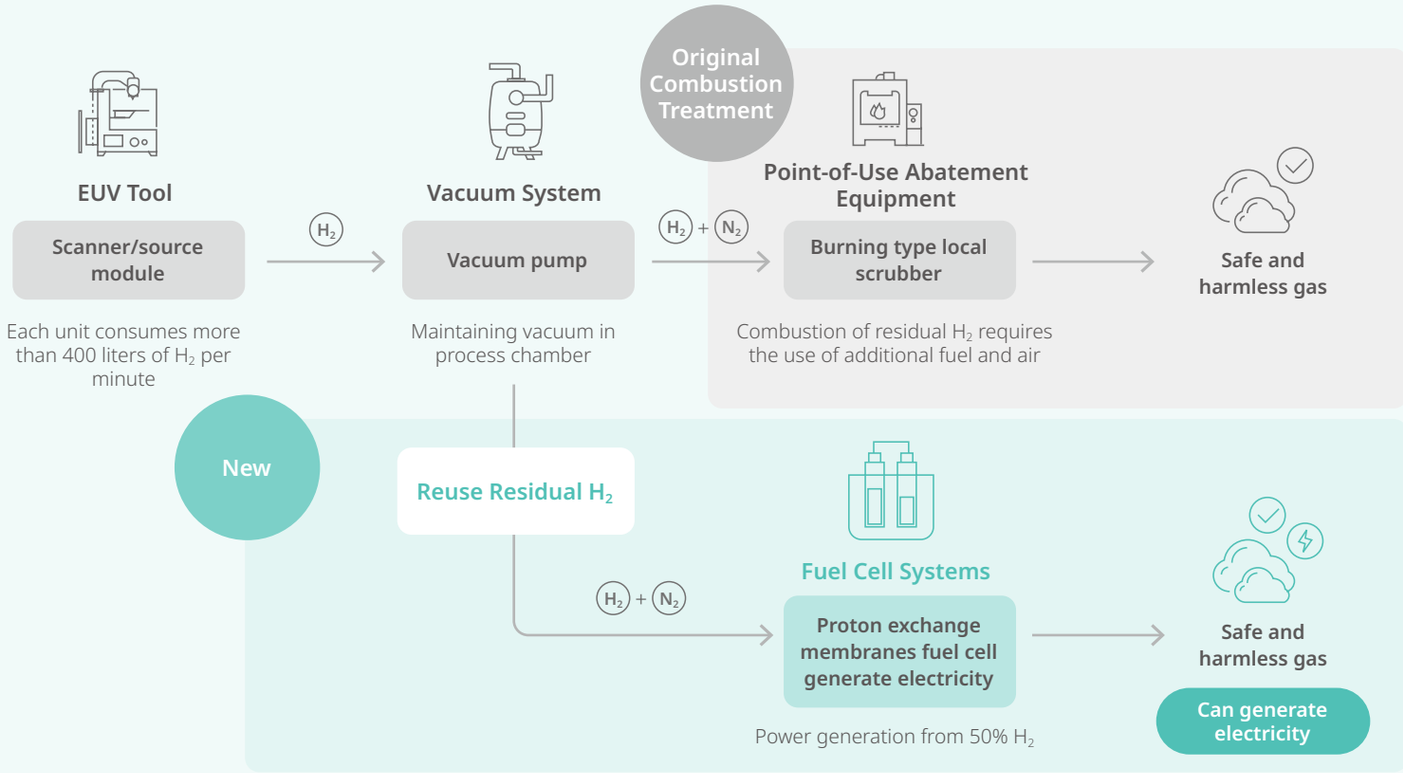
Case Study

# Reuse of Waste Hydrogen from EUV for Green Energy Transition

The EUV process requires hydrogen to maintain the cleanliness and stability of the light source, with each machine consuming over 400 liters of hydrogen per minute. The current method for handling excess hydrogen involves adding fuel or air and using combustion-based on-site treatment equipment to process the residual hydrogen. To enhance the efficiency of hydrogen utilization, TSMC collaborated with the Green Energy and Environmental Research Laboratories at the ITRI to advance the "Preliminary Assessment Project for Resource Utilization of Excess Hydrogen in EUV Processes." Together, they developed a 10-kW Proton Exchange Membrane Fuel Cell, which converts the chemical energy in excess hydrogen into electrical energy. Testing under conditions of 50% hydrogen concentration and a flow rate of 240 liters per minute achieved a power generation efficiency of 45%.

In 2024, TSMC further developed a 30-kW fuel cell system, achieving a power generation efficiency of 52.3% under conditions of 50% hydrogen concentration and a flow rate of 320 liters per minute. The system also became the first in the industry to obtain the SEMI S2 certification for semiconductor manufacturing equipment safety, health, and environmental standards. Looking ahead to 2025, TSMC plans to design and conduct safety evaluations for a 150-kW fuel cell system. The goal is to fully convert excess hydrogen from the EUV process into electricity, enhancing energy utilization efficiency and promoting more environmentally sustainable process management.

## EUV Process Residual Hydrogen Reuse Procedure



# Water Stewardship

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Manage Water Resource Risks**<br>Enforce climate change mitigation policies; implement water conservation and water shortage adaptation measures | Reduce unit water consumption[Note 1] by 30% (L/12-inch equivalent wafer mask layer) (Base year: 2010) | Reduce unit water consumption by 2.7% (L/12-inch equivalent wafer mask layer) (Base year: 2010) | Increased unit water consumption by 14.3% (L/12-inch equivalent wafer mask layer) — Note 2<br>Target: Reduce unit water consumption by 2.7% |
| | >65% global Water Positive achievement rate NEW | >17% global Water Positive achievement rate NEW | - - |
| **Develop Diverse Water Resources**<br>Develop water reclamation technologies; continue to practice water conservation and use reclaimed water during manufacturing | >60% replacement of water resources with reclaimed water[Note 3] | 15% replacement of water resources with reclaimed water | 17% replacement of water resources with reclaimed water ↑<br>Target: 14% |
| **Innovative Water Pollution Prevention Technology**<br>Improve the efficiency of water pollution control and removal of water pollutants | Water pollution composite indicator reduction rate[Note 4] of >60% | Water pollution composite indicator reduction rate of 60% | Water pollution composite indicator reduction rate of 63% ↑<br>Target: 60% |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: Unit water consumption = Unit tap water consumption
Note 2: For the reason for the failure in achievement, please refer to "Strengthen In-house Water Reclamation and Water Use Efficiency."
Note 3: Replacement of water resources = consumption of reclaimed water/(consumption of reclaimed water + consumption of tap water)
Note 4: Nine key pollutants were identified, including Chemical Oxygen Demand (COD), fluoride, suspended solids (SS), ammonia nitrogen, nitrate nitrogen, arsenic (As), boron (B), copper (Cu), and cobalt (Co). These pollutants were used as indicators for assessing the reduction of overall pollution concentrations and the effectiveness of pollution prevention measures.

TSMC actively implements sustainable water resource management. The Company published its Water Statement and included Water Positive as one of the long-term goals for the water management of all TSMC fabs around the world. Through the use of reclaimed water and the development and restoration of diverse water resources, TSMC mitigated environmental impacts generated from operations. In 2024, the reclaimed water consumption verification for 5- and 3-nanometer process technologies was completed and has been fully implemented at the Tainan plant. The overseas JASM site has restored five million $m^3$ of groundwater and continues to expand its scope. In addition, TSMC has optimized its water pollution prevention performance to allow the average reduction rate of PFASs to reach 95% through the introduction of absorbent filter technology so as to facilitate environmental protection and sustainable development.

## TSMC Water Consumption in Three Science Parks

### Hsinchu Science Park

Daily Supply to Science Park: 610 thousand $m^3$/day

12.6%

Water Consumption: 77 thousand $m^3$/day

### Central Taiwan Science Park

Daily Supply to Science Park: 1.55 million $m^3$/day

3.7%

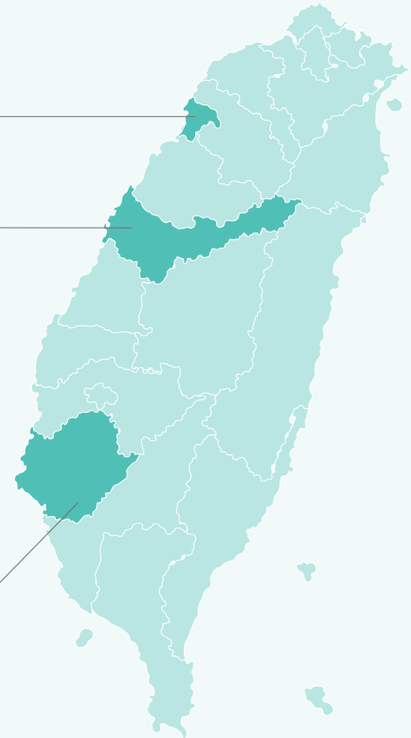
Water Consumption: 58 thousand $m^3$/day

### Southern Taiwan Science Park

Daily Supply to Science Park: 972 thousand $m^3$/day

12.7%

Water Consumption: 124 thousand $m^3$/day



2024 Status

| Water signal from the Water Resource Agency | Government response measures | TSMC response measures |
|---|---|---|
| Blue<br>Normal water levels | Stable supply and demand | • Monitor WRA reservoirs supply for TSMC fabs<br>• Host drills regularly |
| Green<br>Fairly severe | Farmers encouraged to suspend Farming | • Drought emergency response team in operation<br>• Check water resources and water truck capacity<br>• Spontaneously save water by 5% |
| Yellow<br>First stage | • Reduce water pressure at specific times<br>• Suspended irrigation water in certain areas | • Reduce water consumption by 7%<br>• Water truck drills |
| Orange<br>Second stage | Reduce water supply to industrial users by 5-20% | • Activate water trucks<br>• Reduce water consumption by 7-20% |
| Red<br>Third stage | Water rationing by district | • Activate water trucks<br>• Reduce water consumption by 7-20% |

Resource: Water Resources Agency, Ministry of Economic Affairs

## Manage Water Resource Risks

Each year, TSMC makes use of the WRI water risk assessment tool to identify the water risk levels of the regions where its facilities are located. Based on the 2024 assessment results, TSMC fabs in Taiwan, TSMC (Nanjing), JASM, and VisEra are rated as mid-to-low risk, and TSMC Washington, LLC is rated as low risk. TSMC (China), despite being in a region with abundant water resources, is rated as high risk as it faces challenges due to significant variations in raw water quality. Similarly, TSMC Arizona, located in a desert climate zone, is also categorized as a high-risk area.

In addition to strengthening TSMC (China)'s water treatment systems to improve water quality, TSMC began planning a reclaimed water plant project for TSMC Arizona in 2024 to address local water resource risks. This initiative leverages advanced reclaimed water testing and implementation verification conducted at TSMC's Taiwan sites as a demonstration for the Arizona plant. TSMC is also evaluating the promotion of local water resource restoration to reduce environmental and operational risks. Furthermore, during the construction phase of its facilities, TSMC raises site elevations and installs flood gates to mitigate potential water-related risks. The Company also incorporates existing measures, such as water recycling and reuse practices and wastewater treatment systems, into its planning and design. TSMC regularly reviews regional water usage ratios and water condition data to implement timely response measures when necessary.

### Water Resource Management and Technological Development

TSMC's Water Resource Center oversees water usage within its fabs, develops diverse water resource initiatives, and manages related technologies. In 2024, the Taichung fabs (Fab 15A and Fab 15B) and Tainan fabs (Fab 6, Fab 14A Phase 7, and Fab 14B Phases 5 and 6) underwent annual audits in accordance with the AWS's sustainable water management standards, while the Hsinchu fabs (Fab 5, Fab 12A, Fab 12B, and Advanced Backend Fab 3) completed its three-year recertification process. All facilities maintained Platinum-level performance.

To achieve sustainable water resource management, TSMC has established close collaboration and communication with governmental agencies, academic institutions, and suppliers. In 2024, TSMC conducted feasibility assessments with the Water Resources Agency of the Ministry of Economic Affairs and local government water bureaus on various water resource initiatives, such as municipal reclaimed water, desalinated seawater, brackish water, and river restoration projects. Additionally, TSMC partnered with academic institutions to study regional water resource development potential and advance new technologies. In 2024, TSMC and National Chung Hsing University jointly executed three industry-academia collaboration projects: reducing biological sludge combined with

### WRI Risk Identification

| Overall WRI Risk Index | | TSMC Assessment | TSMC Assessment Results | | TSMC Response Measures | |
|---|---|---|---|---|---|---|
| Frequency | • Water risk<br>• Decreasing underground water levels<br>• Interannual variation<br>• Seasonal variation<br>• Drought<br>• Flood risks<br>• Tsunami risks | Flood risk | Low risk | 1 Facility | Facility Design | • Elevate facility<br>• Install flood gates |
| Quality control | • Coastal erosion<br>• Untreated water bodies | Water risk | Mid-to-low risk | 19 Facility | Water Management | • Establish emergency response procedures<br>• Develop diverse water sources<br>• Introduce reclaimed water into processes<br>• Set water pollution composite indicator |
| Regulation and reputation | • Drinking water quality<br>• Sanitary conditions<br>• Sustainable investment index | Water quality risk | High risk | 2 Facility | | |

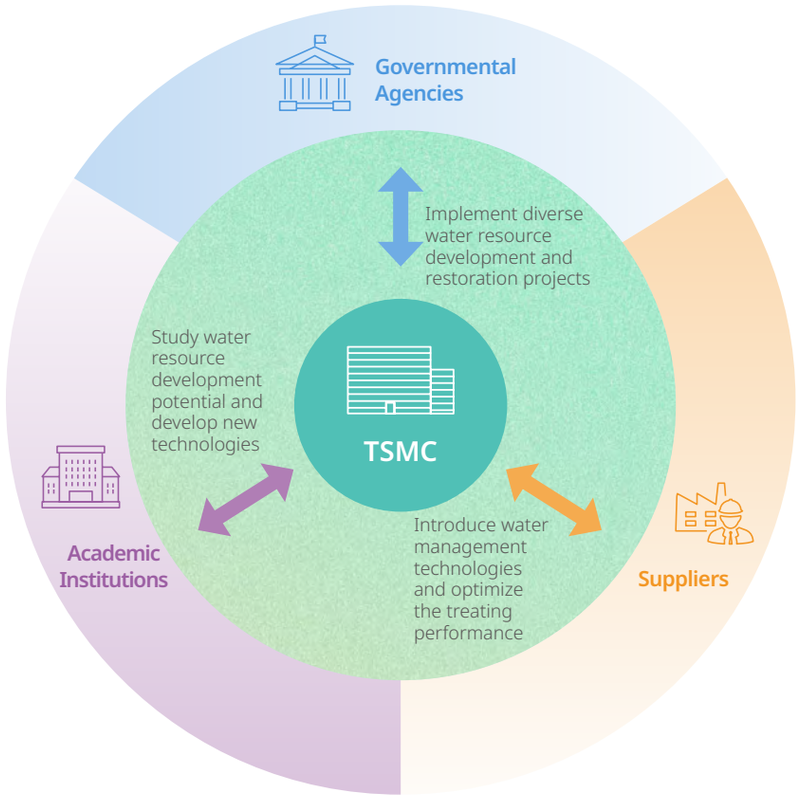
Note: In 2024, JASM was rated as being in a medium-to-low risk area, while TSMC Arizona was rated as being in a high-risk area

biogas recovery, recovering copper ions from wastewater, and electrochemical water quality analysis to enhance water treatment technology capabilities. Furthermore, through collaboration with suppliers, TSMC has developed innovative pollution prevention measures and optimized treatment efficiency to achieve optimal operational performance and promote environmental sustainability.

## Water Positive

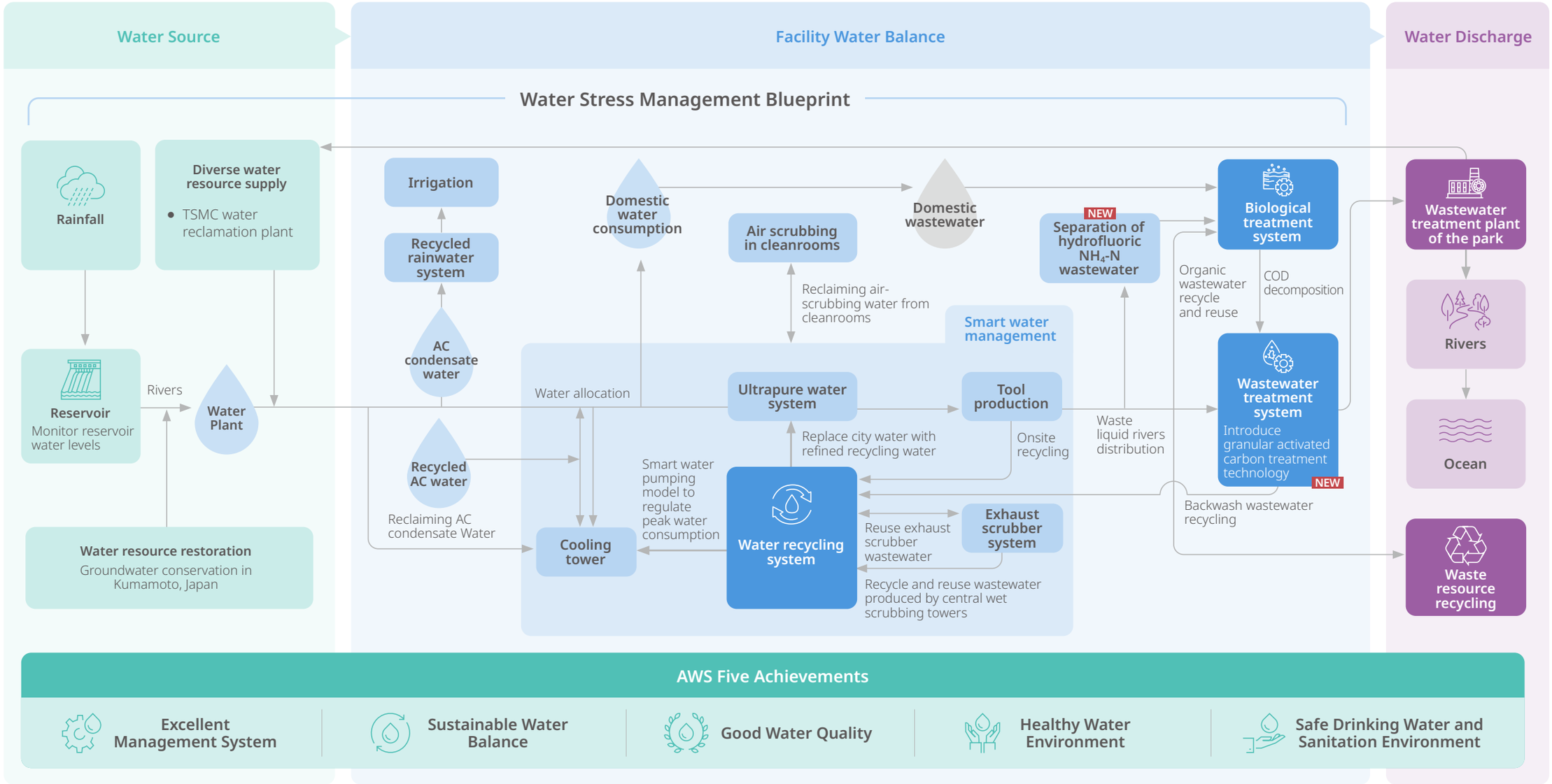
The concept of water positive refers to a scenario where the amount of water restored by a company exceeds the amount of water it consumes. In response to the growing severity of global climate change, TSMC has incorporated water positive into its core global water resource management strategies in 2024. In addition to expanding the use of reclaimed water, TSMC continues to participate in desalination plant projects promoted by the Water Resources Agency of the Ministry of Economic Affairs in Hsinchu and Tainan. In 2024, TSMC signed a purchase agreement for 45,000 cubic meters of water per day to alleviate regional water resource pressure and enhance supply resilience. For its overseas facilities, JASM, located in Kumamoto, Japan, benefits from abundant groundwater resources. TSMC actively promotes groundwater recharge projects in the region, restoring five million cubic meters of groundwater in 2024 — equivalent to three times JASM's water consumption — achieving water positive status for the area.

### TSMC Water Management Cooperation Model




TSMC S.T.S.P. Reclaimed Water Plant

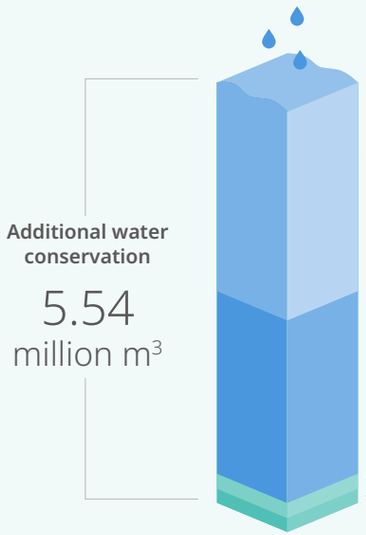
## Water Balance and Supply Chain Environmental Relationship



## Strengthen In-house Water Reclamation and Water Use Efficiency

TSMC utilizes a diversified water supply integration platform to manage water usage information across its fabs and implement four major water-saving measures: "Decreasing Water Discharge Loss from the System, Reducing Facility System Water Consumption, Increasing Wastewater Recycling by Facilities, and Improving Water Production Rate of the System." In 2024, TSMC achieved an additional water savings of 5.54 million cubic meters, with the total amount of recycled water from its recovery systems reaching 284.6 million cubic meters. In 2024, TSMC's water consumption per unit product was 161.0 liters per 12-inch wafer equivalent (measured by photomask count), which represents an 8.7% reduction compared to 2023. However, this figure remains higher than the baseline year (2010), which was 140.9 liters per 12-inch wafer equivalent. The increase is primarily due to the addition of several new facilities in 2024, including Phase 1 of Fab 20, Phase 1 of Fab 22, Phase 1 of TSMC Arizona, Phase 1 of JASM, and Advanced Backend Fab 6B. Although these facilities have not yet begun formal production, they still have fixed water consumption, contributing to the higher water usage per unit product. To address this, TSMC will continue to increase the use of reclaimed water and develop diverse water resource initiatives to further reduce reliance on tap water supplies.

### Water-saving Measures and Achievements in 2024



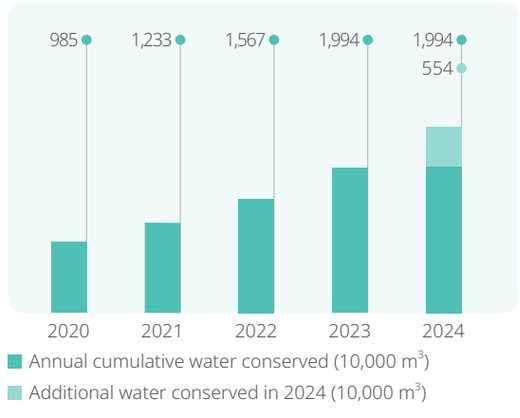

**Increase Wastewater Recycling by Facilities**
Recycled back-wash water 679,000 m³ (12.26%)
Recycled other wastewater 1,418,000 m³ (25.6%)
Recycled water refined into industrial water 458,000 m³ (8.26%)

**Improve Water Production Rate of the System**
Increase the water production rate of RO recycling systems 769,800 m³ (13.9%)
Improve usage efficiency of recycled water 1,466,300 m³ (26.5%)

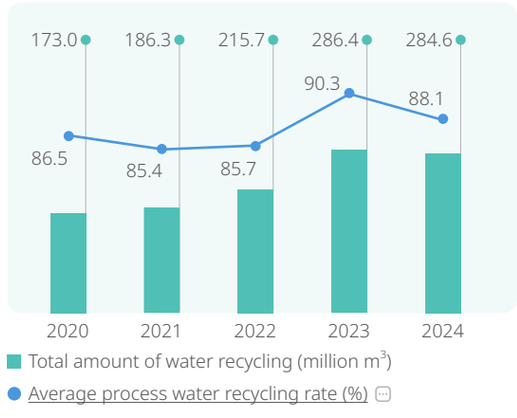
**Reduce Facility System Water Consumption**
Reduce backwashing water of cooling towers and sand filters by 2,000 m³ (0.04%)
Replace tap water used by MAUs with reclaimed water of 379,000 m³ (6.85%)

**Decrease Water Discharge Loss from the System**
Recycled from MAU drain 364,000 m³ (6.58%)

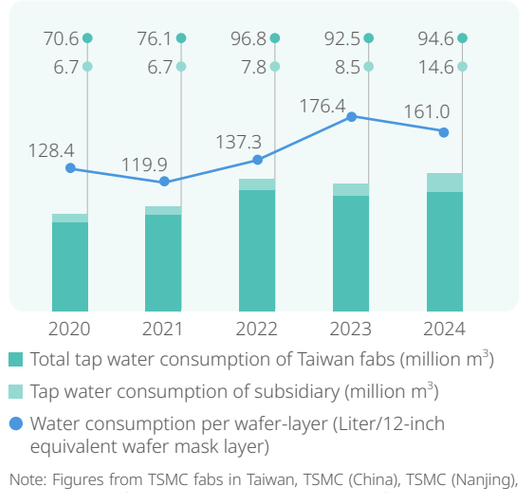
### Annual Water Conservation




### Water Recycling and Usage Efficiency

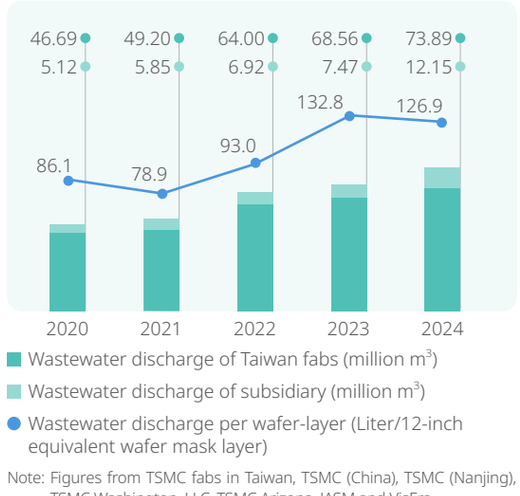



### Tap Water Consumption and Water Consumption per Wafer-layer




Note: Figures from TSMC fabs in Taiwan, TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM and VisEra

### Wastewater Discharge per Unit

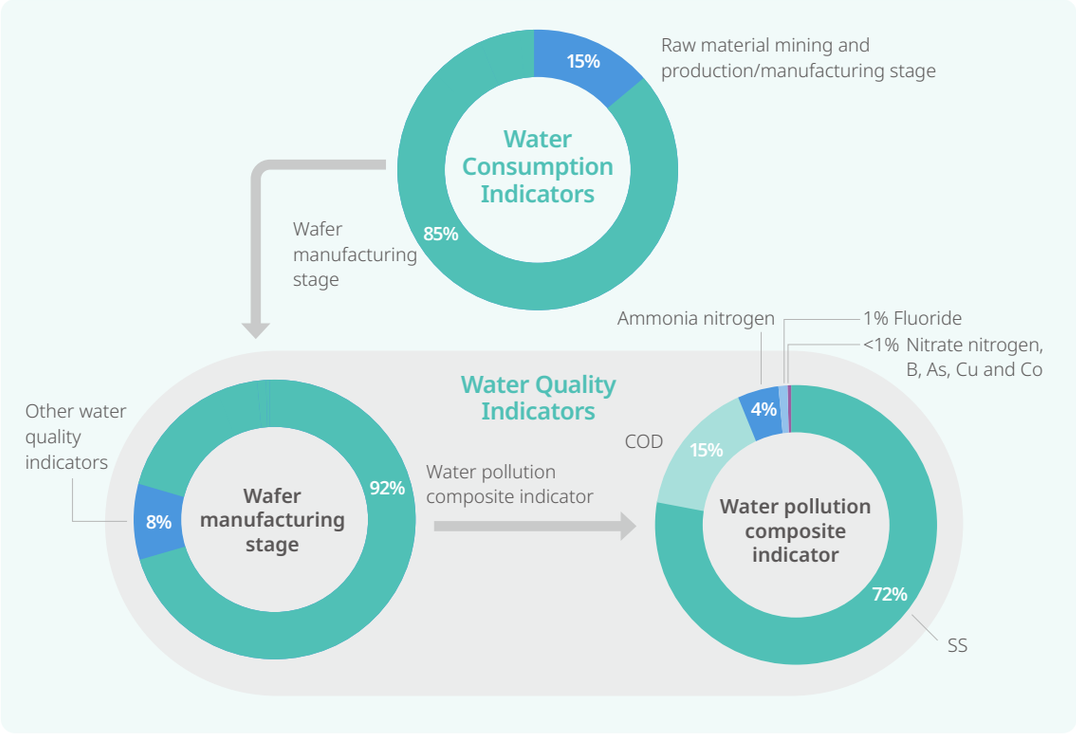



Note: Figures from TSMC fabs in Taiwan, TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM and VisEra

## Product Water Footprint

TSMC conducts a product water footprint survey every three years and obtains ISO 14046 third-party verification to refine its water resource management practices both internally and across its supply chain. The water footprint survey is divided into water consumption and water quality indicators. Based on the 2024 survey results, for the water consumption indicator, TSMC's fabs accounted for 85%, primarily due to direct water usage within the facilities. Suppliers of raw materials accounted for the remaining 15%, mainly including chemical suppliers, raw silicon wafer providers, and bulk gas suppliers. For the water quality indicator, the primary water pollutants during the wafer manufacturing phase were suspended solids (72%), chemical oxygen demand (15%), and ammonia nitrogen (4%). Compared to the 2021 survey results, the proportion of water consumption during the wafer manufacturing phase increased due to the expansion of fabs, which raised water demand. TSMC will continue to implement water-saving measures in manufacturing processes to reduce consumption. For the water quality indicator, TSMC regularly reviews overall pollutant concentration reductions and control measures through the Water Pollution Comprehensive Index Reduction Rate. Additionally, TSMC is developing new wastewater treatment technologies to enhance pollutant removal efficiency, thereby reducing the product water footprint.

### Product Water Footprint Distribution Map




## Environmental Education

TSMC upholds the spirit of coexistence between corporate operations and environmental ecosystems by promoting sustainable water resource utilization through environmental education. Currently, TSMC operates two environmental education facilities certified by the Ministry of the Environment: the "TSMC Central Taiwan Science Park Ecological Park" and the "TSMC Southern Taiwan Science Park Reclaimed Water Plant Environmental Education Learning Park." To deepen the promotion of water resource conservation, TSMC has designed water resource learning courses tailored for upper elementary school students, junior high school students, and adults. In 2024, TSMC held 63 sessions with 1,930 participants. Additionally, in 2024, TSMC organized in-person activities for employees, such as "Understanding Reclaimed Water Plant Tours," and developed an online course on "Water Resource Management," which is scheduled to launch in 2025. These initiatives aim to enhance employees' knowledge of water resources and empower them to take action to protect the environment.


TSMC is committed to promoting environmental education.

## Develop Diverse Water Resources

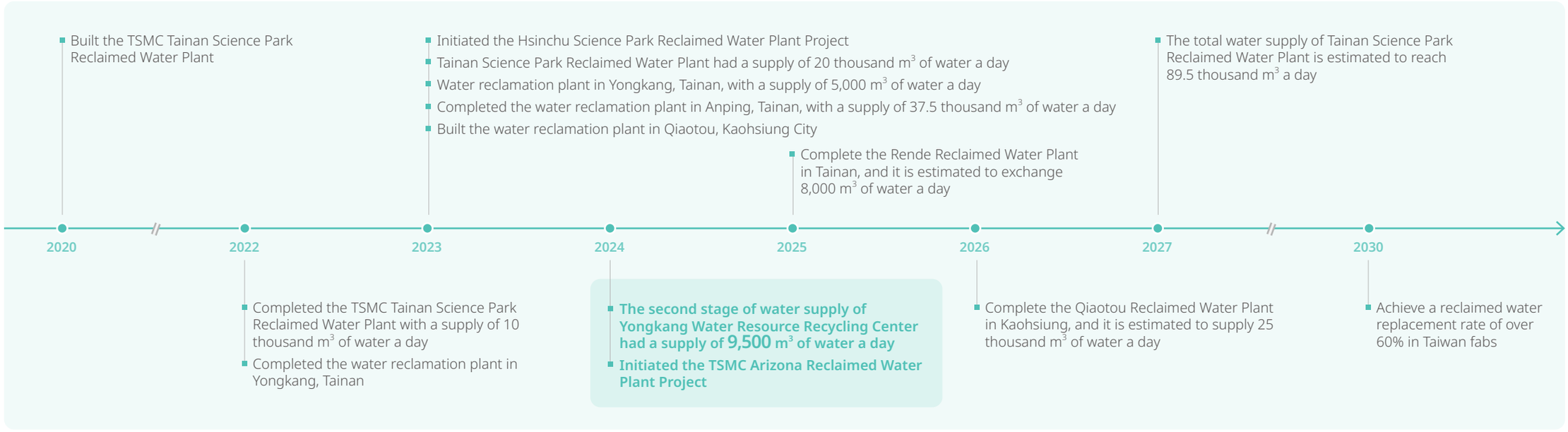
TSMC is committed to maximizing the efficient use of every drop of water. In addition to implementing water-saving measures in manufacturing processes, TSMC actively invests in the development of reclaimed water technologies. To ensure that water quality meets the specifications and cleanliness requirements of manufacturing processes, reclaimed water is initially used for secondary purposes. Gradually, through validation processes, reclaimed water is introduced into manufacturing, starting with mature processes and progressing to advanced processes.

After two years of effort, TSMC successfully achieved the use of reclaimed water for its 5-nanometer and 3-nanometer processes in 2024, enhancing the efficiency of water resource utilization.

In 2024, TSMC Tainan Science Park Reclaimed Water Plant, Yongkang Water Resource Recycling Center, and Anping Reclaimed Water Plant collectively supplied 67 thousand $m^3$ of recycled water daily. The Tainan fabs cumulatively consumed 19.65 million $m^3$ of reclaimed water, reducing tap water consumption by 31%. TSMC is committed to further increasing the use of reclaimed water, with municipal reclaimed water being a key component of this effort. However, due to geographical constraints, not all municipal wastewater treatment plants are able to produce reclaimed water for supply to TSMC fabs. To alleviate regional water supply pressure and support the government's diverse water resource development policies, TSMC has collaborated with the Tainan City Government on an innovative "Water Exchange" management model. Under this model, reclaimed water from the newly constructed Rende Reclaimed Water Plant will be allocated to water recipients arranged by the government, while TSMC will cover the premium costs. The Rende Reclaimed Water Plant is expected to be completed and operational in 2025. Through the joint efforts of all parties, this initiative aims to contribute to the sustainable development of regional water resources.

At the same time, TSMC is extending its experience in using reclaimed water from its Taiwan fabs to overseas operations. In 2024, TSMC launched the TSMC Arizona Reclaimed Water Plant project and began assessing near zero liquid discharge testing. By minimizing wastewater discharge, this approach aims to further enhance water recycling rates and strengthen the resilience of the fab in dry climates.

### Reclaimed Water Development and Material Supply Schedule



Case Study

# Introduce Reclaimed Water into Advanced Processes

After the official commissioning of the TSMC Southern Taiwan Science Park Reclaimed Water Plant in 2022, TSMC began planning the use of reclaimed water for manufacturing processes. To ensure wafer quality, TSMC established a rigorous reclaimed water quality verification procedure. Initially, reclaimed water was used for secondary purposes to observe its water quality stability. A small-scale ultrapure water system was then used to simulate the ultrapure water produced from reclaimed water, ensuring it met semiconductor manufacturing standards. Once the water quality was verified to exceed required specifications, reclaimed water was introduced into the ultrapure water systems of mature manufacturing fabs to produce ultrapure water that meets wafer process requirements. This initiative was gradually expanded to advanced fabs utilizing 5-nanometer and 3-nanometer processes.

The operations and facility teams at TSMC's Tainan fabs conducted wafer trial production for all manufacturing processes, with each process requiring approximately three months of testing to ensure that the quality of wafers produced using reclaimed water was consistent with those made using traditional water sources. Only after passing the quality verification process could reclaimed water be approved for use. Following a two-year validation process, TSMC successfully introduced reclaimed water into the most advanced semiconductor manufacturing processes in 2024. This complex and time-consuming procedure demonstrates TSMC's commitment to quality and its responsibility to customers, ensuring that the use of reclaimed water does not compromise its exceptional product quality. Through these efforts, TSMC contributes to the sustainable development of the semiconductor industry.

TSMC introduces reclaimed water into fabs with advanced processes.

## Innovative Water Pollution Prevention Technology

TSMC continues to advance wastewater resource management by establishing 38 wastewater diversion systems based on the composition and concentration of process wastewater for recycling and reuse. Additionally, TSMC has developed technologies such as biological membrane treatment systems, hypochlorous acid mixing systems, and high-gravity rotary beds to effectively treat wastewater that cannot be recycled before discharging it to the wastewater treatment plants in the industrial parks. In 2024, the overall wastewater pollution reduction index reached 63%, surpassing the annual target of 60%. To ensure the stable operation of pollution control equipment, the wastewater treatment system is equipped with backup and early warning mechanisms. In the event of system failures, backup equipment is immediately activated to ensure continuous operation and achieve the goal of zero failure in pollution prevention. In 2024, no abnormal wastewater discharge incidents occurred.

In response to Taiwan's regulatory requirement to include total phosphorus in effluent standards starting in 2027, TSMC plans to proactively incorporate total phosphorus into its wastewater management indicators by 2025. The Company will utilize wastewater diversion technology to recover phosphorus-containing wastewater, which will then be handed over to waste treatment contractors for concentration and purification into phosphoric acid solvents. This approach not only reduces the total phosphorus concentration in wastewater to meet industrial park regulatory standards but also promotes the development of a circular economy.

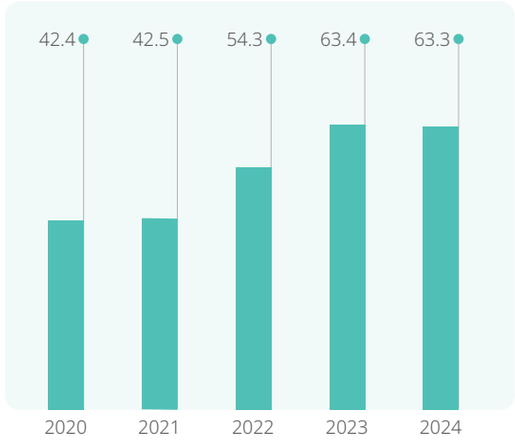
### Develop New Wastewater Treatment Technology

TSMC continues to innovate in pollution prevention technologies to ensure its water resource management keeps pace with advancements. In 2024, TSMC collaborated with National Taiwan University, ITRI, and suppliers to introduce drinking-water-grade bituminous coal GAC adsorption filtration technology for treating PFASs process wastewater, achieving an average removal rate of up to 95%. The system installation for existing fabs is expected to be completed by 2025, and this technology will become the standard design for wastewater systems in new fabs.

Following the modification of the high-gravity rotating bed equipment to enhance the reduction rate of IPA in organic waste liquids, TSMC in 2024 further expanded the scope of this technology's application. By utilizing the high-speed centrifugal force generated by the ultragravity rotary bed to improve mass transfer efficiency, the technology was applied to ammonia nitrogen wastewater treatment at the Advanced Backend Fab 6. This process enabled ammonia nitrogen to more effectively combine with sulfuric acid to form ammonium sulfate, achieving a 95% ammonia nitrogen removal rate. Experimental results showed that the ammonium sulfate quality could be maintained without requiring a concentration process, effectively simplifying operational procedures. Simultaneously, TSMC optimized the diversion mechanism for ammonia nitrogen wastewater treatment. Low-concentration wastewater is treated using biological systems, while high-concentration wastewater utilizes MD technology. This approach eliminates the need for RO concentration, enhancing wastewater treatment efficiency, reducing chemical usage, and minimizing environmental impact.

### Water Pollution Composite Indicator Reduction Rates

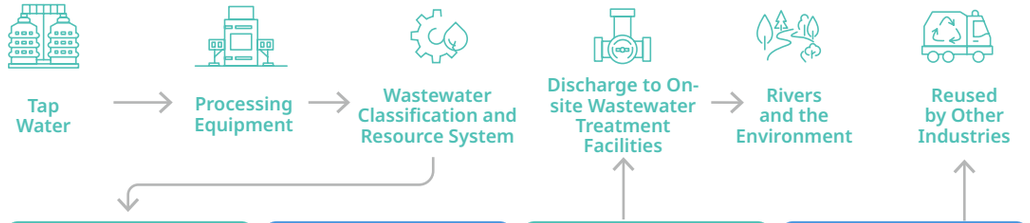
Unit: %




Note: Figures from TSMC fabs in Taiwan


TSMC extends the application of high-gravity rotating packed bed technology to ammonia nitrogen wastewater treatment.

## Wastewater Classification and Resource System




| | 38 Different Types of Liquid Classified | 9 Recycling Systems | 13 Types of Wastewater Treatment | 8 Products Recycled |
|---|---|---|---|---|
| Hydrofluoric (HF) Acid Wastewater | • HF acid wastewater (2 types)<br>• Ozone-containing HF acid wastewater<br>• Manufacturing process scrubbing water | • Hydrofluoric (HF) acid wastewater<br>• Local scrubber wastewater recycling | • Chemical coagulation treatment of HF acid<br>• HF (including ammonia) treatment<br>• Biological treatment of HF acid wastewater | • Calcium fluoride<br>• Fluorite Cryolit |
| Acidic, Caustic, and Organic Wastewater | • Deionized water<br>• Ozone-containing deionized water<br>• Acidic wastewater (2 types)<br>• Ozone-containing acidic wastewater<br>• Caustic wastewater<br>• Ozone-containing Caustic wastewater<br>• TMAH wastewater<br>• Organic wastewater (2 types) | • Acidic wastewater recycling<br>• Ozone-containing acidic wastewater recycling<br>• Caustic wastewater recycling<br>• Caustic wastewater upcycling<br>• Organic wastewater recycling | • Acidic and Caustic wastewater treatment<br>• $NH_4$-N wastewater treatment and recycling<br>• TMAH liquid waste recycling<br>• Biological treatment system for organic wastewater | • Ammonium sulfate<br>• TMAH |
| CMP Wastewater | • Electroplating wastewater<br>• CMP wastewater (2 types)<br>• Copper-containing CMP wastewater<br>• Cobalt-containing CMP wastewater | • Chemical coagulation recycling of CMP wastewater<br>• Copper-containing CMP wastewater upcycling | • CMP wastewater treatment<br>• Copper-containing CMP wastewater treatment<br>• Cobalt-containing CMP wastewater treatment | • Silicon aluminum oxide |
| High concentration Liquid Waste | • Other wastewater (16 types)<br>• Waste sulfuric acid<br>• Waste copper sulfate<br>• Cobalt-containing liquid | | • Waste-$H_2SO_4$ reclamation<br>• Copper-containing electroplating wastewater recycling<br>• Cobalt-containing electroplating wastewater recycling | • Sulfuric acid<br>• Copper bar<br>• Cobalt bar |

Case Study

# Optimization of $NH_4$-N Wastewater Treatment to Reduce Electrical Conductivity by Approximately 40% in Estimation

TSMC actively addresses ammonia nitrogen wastewater by employing reverse osmosis technology to remove dissolved substances and increase the relative concentration of ammonia nitrogen, as well as utilizing membrane degassing treatment to enhance removal efficiency. However, since the reverse osmosis process requires additional chemical agents and equipment operation, TSMC has adopted a more environmentally friendly approach to reduce chemical usage by implementing diversion treatment for different concentrations of ammonia nitrogen wastewater. Through collaborative testing between production line and facility teams, TSMC successfully identified key concentration ranges: low-concentration wastewater is routed to biological systems, while high-concentration wastewater is treated using membrane degassing systems. This optimized process eliminates the need for reverse osmosis concentration, while simultaneously reducing chemical usage, waste generation, and energy consumption. According to 2024 trial results at Fab 20, the conductivity of ammonia nitrogen wastewater treated via the diversion process is estimated to decrease by approximately 40%, and chemical usage is expected to be reduced by about 30%, achieving the dual benefits of improved efficiency and environmental protection.


TSMC conducts $NH_4$-N wastewater separation based on the concentration to improve treatment efficiency.

# Circular Resources

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Source Reduction**<br>Promote waste reduction by source separation and require vendors to provide low chemical consumption equipment | Outsourced waste[Note 1] amount per wafer production in Taiwan: ≦ 0.50 (kg/12-inch equivalent wafer mask layer) | Outsourced waste amount per wafer production in Taiwan: ≦ 1.11 (kg/12-inch equivalent wafer mask layer) | Outsourced waste amount per wafer production in Taiwan: 1.15 (kg/12-inch equivalent wafer mask layer) ↑<br>Target: ≦ 1.17 |
| | Outsourced waste amount per wafer production in overseas subsidiaries: ≦ 1.10 (kg/12-inch equivalent wafer mask layer) NEW | Outsourced waste amount per wafer production in overseas subsidiaries: ≦ 1.36 (kg/12-inch equivalent wafer mask layer) NEW | Outsourced waste amount per wafer production in overseas subsidiaries: 1.38 (kg/12-inch equivalent wafer mask layer) NEW |
| **Enhance Circular Economy**<br>Collaborate with vendors to develop new waste recycling technology to increase the amount of waste recycled and reused | 70% In-house recycling rate | In-house recycling rate ≧ 33% | 29%[Note 2] In-house recycling rate —<br>Target: ≧ 33% |
| | Reduce the $CO_2$ emissions from waste treatment to the same as 2020 emission levels[Note 3] (53,178 metric tons) | Promote three projects to reuse instead of incinerate | Promote three projects to reuse instead of incinerate and reduce carbon emissions by 483 metric tons[Note 4] ✓<br>Target: three projects |
| | 100% Waste recycle rate | Waste recycling rate 97% | Waste recycling rate 97% ↑<br>Target: 96% |

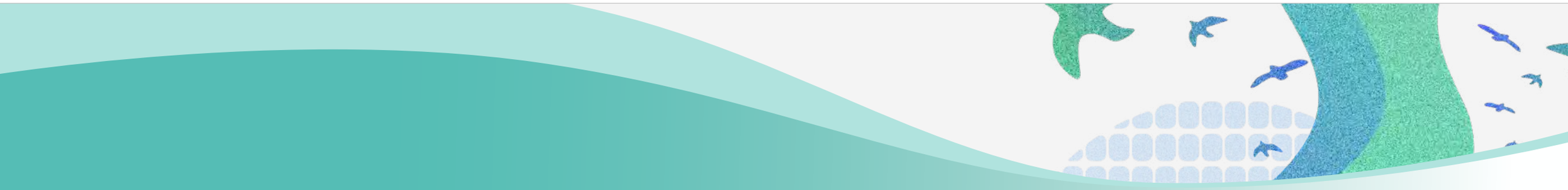
Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: Outsourced waste refers to wastes disposed of or reused based on the application of a company with approval from the competent authority of the industry.

Note 2: For the reason of missing target, please refer to "Enhance Circular Economy ."

Note 3: Carbon emissions derived from waste incineration including removal and treatment. According to the carbon emission calculation results for 2024, emissions from incineration are the main source, accounting for approximately 87%. Therefore, the carbon emissions calculated here refer to those generated during the incineration process.

Note 4: The estimation is based on the emission factor for general business waste (incineration) at 0.737kg $CO_2$e/kg. The source of the emission factor: Open data platform of the government (Renewable Resource Center, Southern Taiwan Science Park)



| Strategy | 2030 Goals | 2025 targets | 2024 achievements |
|---|---|---|---|
| **Strengthen inspection and Guidance**<br>Enhance contractor capabilities in self-management and implementing resource recycling through inspection, guidance, and tracking with applied technologies | All waste contractors shall acquire ISO 14001 or other international EHS Management certification[Note 5] | 90% of waste contractors shall acquire ISO 14001 or other international EHS Management certifications | 89% of waste contractors shall acquire ISO 14001 or other international EHS Management certifications ↑<br>Target: 88% |
| | All waste contractors shall finish building the System of Waste Intelligent Fast Track (S.W.I.F.T.)[Note 6] | 48% of waste contractors shall finish building the System of Waste Intelligent Fast Track (S.W.I.F.T.) | 44% of waste contractors shall finish building the System of Waste Intelligent Fast Track ↑<br>Target: 35% |
| | Increase the percentage of Excellent and Good waste contractor evaluation results to 90%[Note 7] | Increase the percentage of Excellent and Good waste contractor evaluation results to 90% | Increase the percentage of Excellent and Good waste contractor evaluation results to 88% ✓<br>Target: 88% |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

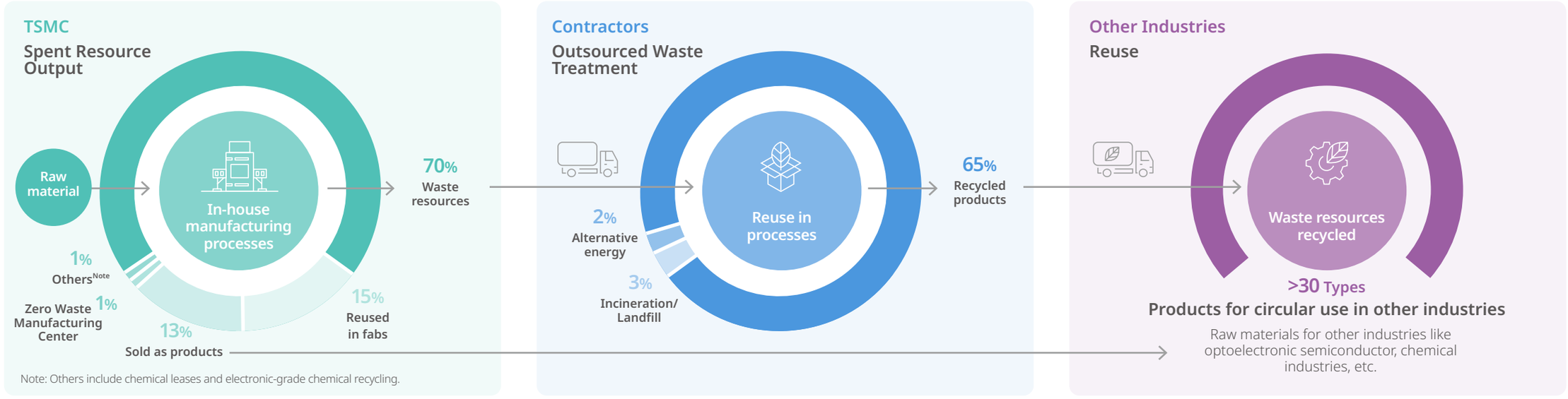
Note 5: TSMC requires waste treatment contractors to obtain at least ISO 14001 or ISO 45001 certifications three years after it becomes a qualified contractor as the basis for standardized management. Waste treatment contractors include waste treatment and recycling contractors. Government-owned enterprises, public-to-private enterprises, enterprises operating under the Act for Promotion of Private Participation in Infrastructure Projects, wholesale and retail industry, items exempted from on-line reporting, timber waste, lubricant waste, waste cooking oils, kitchen waste contractors not included in the aforementioned contractors.

Note 6: Only include TSMC-certified waste treatment contractors that have been working with TSMC for three years. Waste treatment contractors include waste treatment and recycling contractors. Government-owned enterprises, public-to-private enterprises, enterprises operating under the Act for Promotion of Private Participation in Infrastructure Projects, wholesale and retail industry, items exempted from on-line reporting, timber waste, lubricant waste, waste edible oils, food waste contractors not included in the aforementioned contractors.

Note 7: The evaluation does not include items exempt from itemized online reporting, nor does it include wholesale businesses, manufacturers stationed in the Zero-Waste Manufacturing Center, retail businesses, or contractors handling waste wood, waste lubricants, waste cooking oil, or kitchen waste.

By adopting the three major strategies of source reduction, circular economy, and inspection guidance, the Company proactively implements the targets of "minimizing waste, maximizing resource recycling, and optimizing contractor management." In 2024, the waste recycling rate (including overseas subsidiaries) reached 97%, while landfill rates for fabs in Taiwan remained below 1% for 15th consecutive year. This successfully extended the validity of the highest UL 2799 platinum certification for fabs in Taiwan and fulfilled the commitment in the "Environmental Policy." In 2024, TSMC further expanded its circular economic commitment and announced in November the official operation of the Taichung Zero Waste Manufacturing Center, the first integrated energy and resource circulation site in the semiconductor industry worldwide. TSMC cooperated with suppliers to recycle and produce electronic-grade TMAH and IPA and develop aluminum-plastic separation technology to allow the discarded packaging bags to be recycled and reused so as to continue innovating on the value-in-use of resources through diverse circular economic production models.

## TSMC Waste Life Cycle Management Procedure




Note: Others include chemical leases and electronic-grade chemical recycling.

**In-house waste management**

- Source separation and collection procedure
- Waste output tracking and in-house reduction project
- Resource recycling equipment
- Zero Waste Manufacturing Center
- Chemical leasing
- Zero waste to landfill, UL 2799 certification
- New contractor selection procedure
- Annual evaluation standards
- Waste management practice forum

**Waste clean-up**

- TSMC GPS satellite fleet system
- Automated waste disposal declaration platform
- 2.0 Operations enhancement project
- Clearance safety forum NEW

**Treatment and reuse operation**

- Electronics-grade chemicals
- Industry cooperation to co-create resources project
- Annual inspection plan
- Quarterly inspection plan
- ISO 14001 certification plan
- System of Waste Intelligent Fast Track

**Recycled product transport**

- Cloud reporting platform

**Recycled product flow**

- Monthly tracking report
- Cloud reporting platform
- Track and compare with declared information

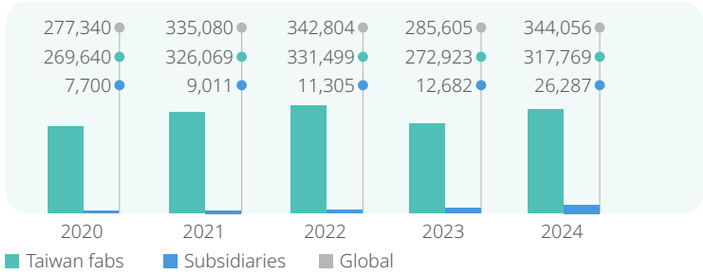
● Waste treatment contractor management project

## 2024 Total waste production 1,104,391 Metric tons

| | General waste | Hazardous waste |
|---|---|---|
| **97%** Note 1 Recycled waste (1,067,782 Metric tons) | | |
| Recycled materials (65%) | 290,279 Metric tons | 432,876 Metric tons |
| Reused in fabs (15%) | 0 Metric tons | 163,696 Metric tons |
| Converted to products and sold (12%) | 90,423 Metric tons | 42,327 Metric tons |
| Zero Waste Manufacturing Center (1%) | 9,101 Metric tons | 373 Metric tons |
| Energy recovery (fuel blending) (3%) | 23,102 Metric tons | 6,342 Metric tons |
| Others Note 2 (1%) | 636 Metric tons | 8,627 Metric tons |
| **3%** Non-recyclable waste (36,609 Metric tons) | | |
| Incineration (3%) | 28,915 Metric tons | 4,402 Metric tons |
| Landfill(<0.5%) | 1,760 Metric tons | 1,532 Metric tons |

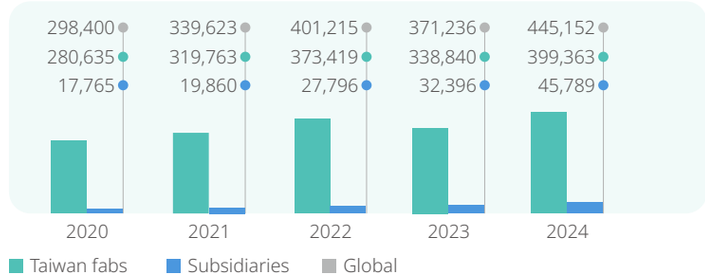
### Outsourced General Waste

Unit: Metric tons/year



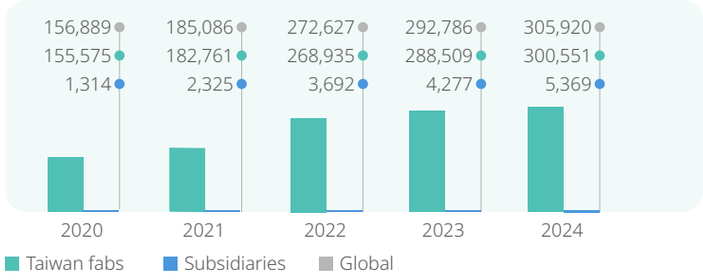

### Outsourced Hazardous Waste

Unit: Metric tons/year



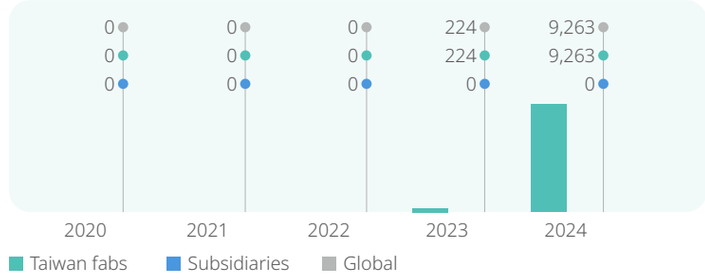

### In-house Recycled Resources Note 3

Unit: Metric tons/year



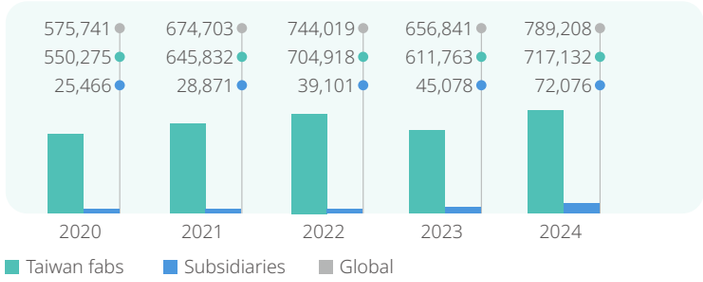

### Other Measures Note 4

Unit: Metric tons/year



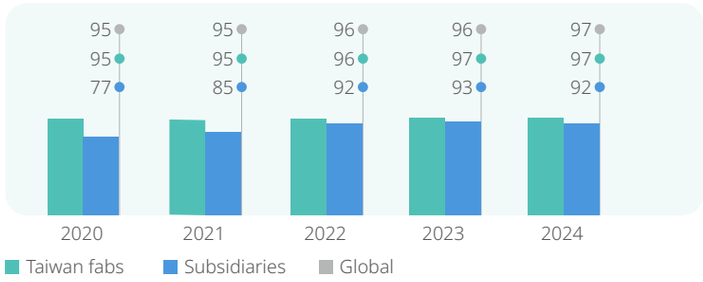

### Outsourced Waste

Unit: Metric tons/year



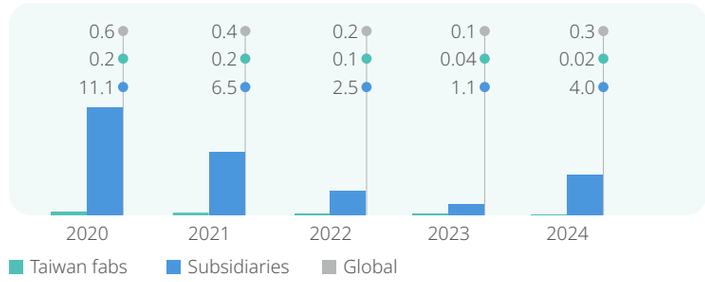

### Waste Recycling Rate

Unit: %




### Percentage of Waste Sent to Landfills

Unit: %




Note 1: The data include TSMC fabs in Taiwan, TSMC (China), TSMC (Nanjing), TSMC Arizona, TSMC Washington, LLC, JASM, and VisEra.
Note 2: Includes 571 metric tons chemical leasing, 8,692 metric tons electronic-grade chemicals
Note 3: In-house recycled resources include reused in fabs, converted to products and sold, and Zero Waste Manufacturing Center.
Note 4: Includes chemical leasing, electronic-grade chemicals recycling

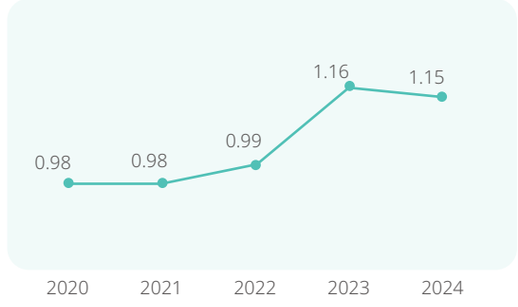
## Source Reduction

"Source reduction" is one of TSMC's key strategy to minimize waste output. The "Waste Management Task Force" integrates cross-organizational collaboration between Facility, Process, and Resource recycling management departments, focusing on the PDCA management cycle model. At the beginning of each year, reduction targets and improvement plans are set, including adjustments to production parameters, optimization of process technologies to reduce raw material usage and in-house recycling and reusing as the prioritized to extend their lifecycle. TSMC also utilizes a unit waste generation management system to monitor waste generation and reduction progress. TSMC holds regular meetings to track the implementation status and effectiveness of these initiatives. In 2024, TSMC executed a total of 235 waste reduction projects for production equipment, reducing over 17,000 metric tons of waste.

Sulfuric acid is widely used in wafer cleaning processes within semiconductor manufacturing, making it a primary source of process waste liquid. Building on the waste reduction experience of adjusting the acid discharge mode for wet etching equipment in 2023, TSMC further expanded this approach horizontally to high-temperature wet etching equipment in 2024. By inspecting the equipment pipelines' resistance of high-temperature and corrosion and continuously monitoring the temperature changes and pH levels of waste liquid collection tanks, TSMC successfully reduced approximately 3,400 metric tons of sulfuric acid waste without compromising the quality of the original processes.

### Outsourced Unit Waste Disposal per Wafer Trend

Unit: Kg/12-inch equivalent wafer mask layer




Note: The data include TSMC fabs in Taiwan and VisEra.

## TSMC Waste Reduction Management Mechanism

**Data Inspection and Planning**
Based on the variations in waste generation across different fabs, develop reduction projects and set annual targets

**Experiments and Operation**
Conduct experiments and trials on reduction plans


**Continuous Improvement**
Review the gap between performance and target to improve deficiencies and solve anomalies

**Control and Measurement**
Control raw material usage, waste generation and concentration

## Waste Reduction Measures and Results in 2024

**Manufacturing Equipment Waste Reduction**
>17,000 Metric tons

| | |
|---|---|
| Chemical use time/flow reduction | 132 |
| Process simplification solution | 35 |
| Life cycle extension of chemicals | 51 |
| Chemical alternatives | 1 |
| Others | 16 |

+

**In-house recycling**
>300,000 Metric tons

| | |
|---|---|
| Copper/cobalt containing liquid electrolysis | 2 |
| Ammonium sulfate crystallization | 1 |
| Silicon-containing liquid dehydration by filter press | 1 |
| Sulfuric acid reclamation | 1 |
| Hydrofluoric acid reclaim | 1 |
| Fluoride sludge recovery | 1 |
| Silica sludge recovery | 1 |
| Isopropanol waste liquid recovery | 1 |
| Solvent waste liquid recovery | 1 |

=

**310,000**
Metric tons
Reduced waste

**245**
Introduced waste reduction measures

## Enhance Circular Economy

TSMC is dedicated to creating a green circular system by developing and adopting resource recycling technologies through its "Turning Waste into High Value Products" action plan. This initiative converts waste materials such as sulfuric acid, copper sulfate, cobalt sulfate, ammonium sulfate, hydrofluoric acid, and silicon-containing waste liquids into regenerated products for reuse within its facilities or sale to related industries. In 2024, the total amount of resources recycled at TSMC's Taiwan facilities reached approximately 291,000 metric tons, generating benefits of about NT$1.95 billion. Additionally, in 2024, TSMC conducted equipment upgrades and process optimization tests for resource recycling, which resulted in the in-house resource recycling rate falling short of the original target. For sulfuric acid waste treatment, TSMC adopted a nitric acid temperature control method, which uses temperature control to reduce reagent consumption, accelerate the reaction, and minimize residual byproducts. This approach shortened reaction time by 50%, thereby improving operational efficiency and producing high-quality industrial-grade sulfuric acid. TSMC continues to enhance reuse technologies and product quality.

Regarding the "Electronic-Grade Chemical Recycling Program," in 2024 , TSMC collaborated with suppliers to successfully convert TMAH waste into electronic-grade products for reusing within its facilities. In December, the development of electronic-grade IPA was also completed. The demonstration project for leasing regenerated activated carbon has been concluded, with a total of 770 metric tons of regenerated activated carbon leased, resulting in a carbon emission reduction of 5,100 metric tons . In 2025, TSMC plans to integrate the achievements of electronic-grade chemical reuse and collaborate with the Ministry of Environment to draft management methods for leasing liquid chemicals. Additionally, in November 2024, TSMC's Taichung Zero Waste Manufacturing Center officially commenced operations. Beside TSMC's organic solvent thermal recovery facility, the center partnered with suppliers to establish four processing facilities for calcium fluoride sludge, silicon oxide sludge, and isopropanol recycling. These facilities are estimated to reduce 130,000 metric tons of waste outsourcing annually. The Southern Taiwan Science Park Zero Waste Manufacturing Center is expected to be completed in 2027, further enhancing resource recycling capabilities.

Regarding the "Outsourced Waste Resource Recycling" plan, in 2024, TSMC implemented three incineration-to-reuse projects, including: converting organic sludge through thermal treatment into CLSM ; purifying waste aluminum etching liquid to regenerate industrial-grade phosphoric acid; and separating waste aluminum-plastic packaging bags to produce aluminum materials and plastic pellets, which are used in the manufacturing of bicycles and plastic products. Through green innovation, TSMC is giving new value to waste resources.

In addition to implementing circular economy practices during the production phase, TSMC also enhances employees' knowledge of resource recycling through training courses. These courses cover topics such as waste classification principles, waste-related regulations, and ISO 14000 environmental management standards. In 2024, a total of 44 sessions were held, with approximately 24,000 participants. TSMC also launched its first "TSMC Eco-Partner" trilogy campaign, which included lending of reusable cups, promoting the use of personal eco-friendly utensils, and supporting delivery services with eco-certifications. The initiative encouraged employees to reduce the use of single-use tableware and participate in eco-friendly delivery actions, with around 260,000 participants. Following the success of using discarded wafer carrier boxes as raw materials to create business card holders in 2023, TSMC developed 100% recycled ID card holders in 2024. These were showcased and gifted during the 5th TSMC ESG AWARD event, integrating the concept of resource regeneration into employees' daily lives.

Case Study

### Refining Purification and Electrolysis Technology for Recycled Electronic-Grade TMAH

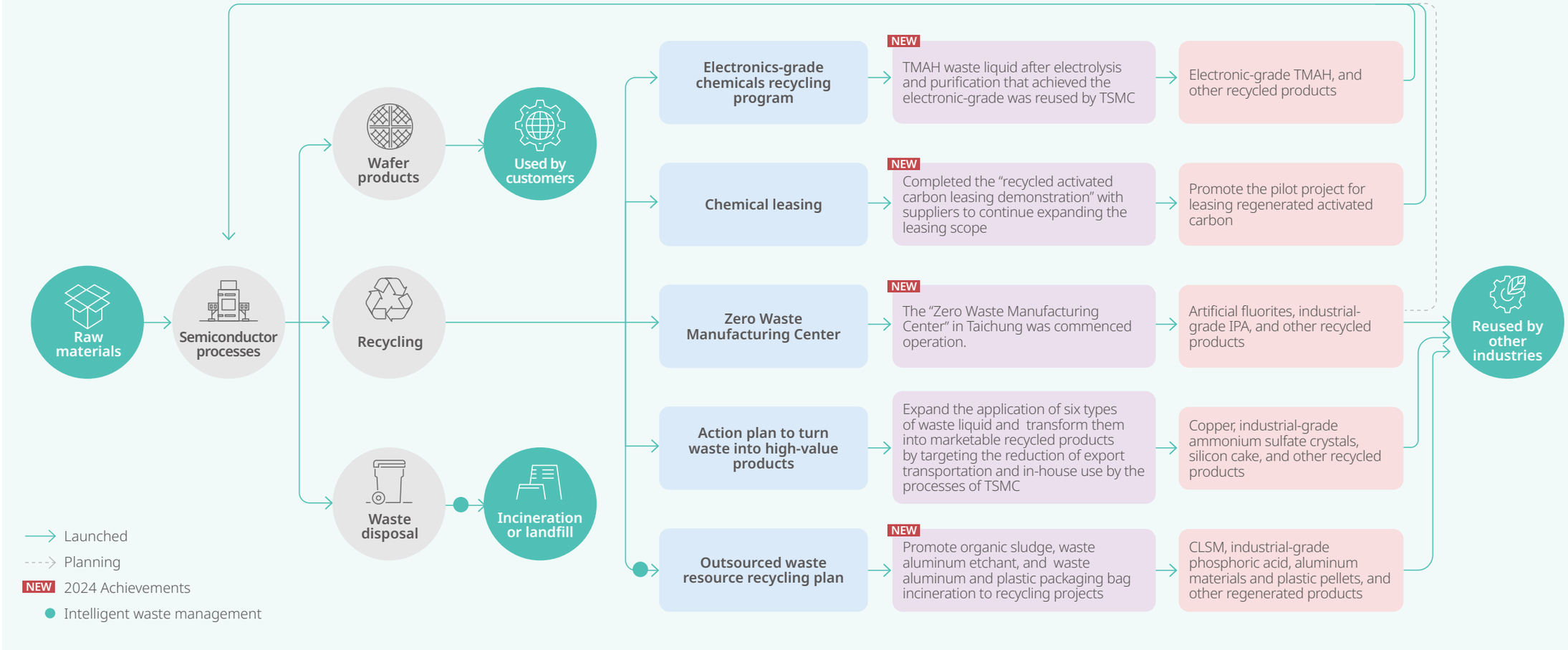
In response to the rapid development of advanced processes and the increasing demand for TMAH chemicals, TSMC collaborated with suppliers to conduct research on recycling TMAH waste liquid to enhance recycling rates. This effort included developing purification technologies capable of effectively removing impurities from waste liquid and improving electrolysis and filtration processes. In 2024, TSMC successfully regenerated electronic-grade TMAH that meets the quality standards for internal manufacturing processes . The recycled TMAH was introduced into Fab 12A, Fab 14A, Fab 14B, and Fab 15A, reducing the procurement of new liquid by approximately 1,100 metric tons and cutting carbon emissions by 6,600 kilograms . Additionally, TSMC developed electronic-grade IPA and continues to research new technologies for purifying waste liquids such as diluents, phosphoric acid, and hydrofluoric acid into electronic-grade materials, further advancing sustainable resource initiatives.

TSMC collaborates with suppliers to develop electronic-grade TMAH.

## Practices for Circular Economy

**1,680.77 Million**
Savings from reducing waste in 2024 (NT$)

**1,072.66 Million**
Benefits from recycling waste in 2024 (NT$)



Case Study

# Upgrade Aluminum-Plastic Separation Technology Revitalize Discarded Packaging Bags

To maximize the benefits of resource recycling, TSMC launched the Rebirth Initiative – an outsourced waste resource recycling program – in collaboration with suppliers. This initiative focused on research for recycling and reusing waste aluminum-plastic packaging bags and successfully developed a technology that completely separates the aluminum foil layer from the plastic layer . In December 2024, TSMC obtained approval for reuse from the Southern Taiwan Science Park Administration, with plans to implement the technology across all Taiwan fabs in 2025. This effort is estimated to reduce incineration volumes by 1,350 metric tons annually. Additionally, TSMC repurposed the separated plastic pellets to produce notebook covers and backs made from 100% recycled materials. These notebooks were created using eco-friendly paper certified by the FSC and were given as gifts during the 2025 Global Technology Symposium. This initiative imbues recycled resources with commemorative value.

TSMC recycles discarded aluminum-plastic packaging bags (left) and reproduced them into plastic pellets (middle) and aluminum materials (right).

Case Study

# TSMC Eco-Eat Delivery Certification

To encourage employees to participate in eco-friendly initiatives, TSMC launched "eco-eat delivery certification" activities. The activities cover six key criteria: "using biodegradable straws, delivering with insulated boxes/bags, obtaining government eco-certifications, offering pre-order drink services with personal cups, providing reusable cup services, and offering bulk beverage services." A total of 64 businesses participated in the effort. During the activities, employees who purchased items from certified eco-friendly delivery businesses could accumulate points and earn chances to win prizes. This initiative aimed to reduce plastic usage and foster a green lifestyle.


TSMC encourages employees to bring their own cups to support environmental protection initiatives.

Case Study

# The Inaugural Circular Economy Demonstration Center Turns Waste into Gold

Adhering to a "zero waste through resource recycling" philosophy, TSMC has established the Taichung Zero Waste Manufacturing Center , which includes four major recycling and processing facilities. These facilities convert waste generated from manufacturing processes into industrial-grade raw materials and evaluate the development of recycled electronic-grade chemicals for reuse in semiconductor manufacturing. The initiative is expected to reduce outsourced waste processing volumes by 130,000 metric tons annually. In 2024, the center processed 9,400 metric tons of waste, generating NT$80 million in benefits. Additionally, TSMC has collaborated with Taiwan's Ministry of Environment to develop "Thin-Film Carbon Capture Technology," using the Taichung Zero Waste Manufacturing Center as the country's first demonstration site. This technology will be applied to general waste thermal treatment (incineration) facilities in the future, further expanding green impact through innovative technology.

## Four Major Recycling and Processing Mechanisms of Taichung Zero Waste Manufacturing Center

**Solvent Thermal Recovery Plant**
Generate "steam" after pyrolysis and heat recovery to serve as the auxiliary energy of the Taichung Zero Waste Manufacturing Center

**Fluoride Recycling Plant**
Generate "artificial fluorite" after drying, mixing, granulation and shaping to serve as the fluxing agent for the iron and steel industry

**Taichung Zero Waste Manufacturing Center**

**Silica Recycling Plant**
Generate "mineral powder" after drying, roasting, soaking, and surface modification to serve as raw materials for ceramic industries and construction material

**Isopropanol Recovery Plant**
Generate "industrial-grade/ electronic-grade IPA" after distillation and purification to serve as the raw materials for other industries or the semiconductor industry


## Strengthen Audit Guidance

To ensure proper waste transportation and fulfill source management responsibilities, TSMC requires transportation contractors to comply with the guidelines outlined in the Supplier Transportation Management White Paper . Additionally, TSMC uses a dedicated GPS satellite fleet tracking system to monitor the waste transportation process, implementing transparent management practices. To enhance operational safety, TSMC further strengthened its "Waste Transportation Operations Improvement Project 2.0" in 2024. The Company hosted its first transportation safety seminar for liquid tanker contractors, covering topics such as personal protective equipment usage, transportation operation precautions, emergency response procedures, and common operational deficiencies. Furthermore, a quarterly training system was established to help transportation personnel familiarize themselves with operational processes and improve safety awareness. Personnel are required to complete training and pass tests before being allowed to operate within the facilities. In 2024, TSMC conducted annual on-site audits for 46 transportation contractors, achieving a 100% audit rate for liquid tankers, sludge vehicles, and hazardous waste transport vehicles. A total of 38 deficiencies were identified and corrected, including three related to company operational management, 12 related to transportation personnel training management, ten related to vehicle safety, and 13 related to transportation operation procedures.

Regarding waste treatment contractors, TSMC implemented the Waste Treatment Contractor Sustainability Enhancement Project through cross-organizational collaboration. The process began with a written review and on-site inspections across six key dimensions to carefully select partner contractors. For qualified contractors that pass the selection process, annual audits and guidance are conducted based on 156 audit criteria across eight dimensions. Finally, contractor operations are evaluated annually through three key dimensions, which serve as the basis for replacement assessments. In 2024, TSMC conducted on-site audits for 69 waste treatment contractors , achieving a 100% audit rate, and completed improvements for 98 deficiencies . The proportion of contractors rated as "Excellent" or above increased from 86% in 2023 to 88% in 2024, with 32% rated as "Outstanding." Additionally, 89% of contractors have obtained international certifications such as ISO 14001 for environmental, safety, and health standards. Furthermore, TSMC continues to assist contractors in establishing intelligent waste tracking systems. By 2024, 44% of waste treatment contractors had completed system implementation, leveraging digital transformation to enhance management efficiency.

## Waste Clean-up Improvement Project 2.0 for the Improvement in Contractor's Operational Safety

### Before Clean-up Contractor Selection

- Establish a standardized selection procedures to examine the qualification of contractors
- Establish personnel and vehicle certification systems to ensure the familiarity of personnel with the operations and the vehicle specifications

### During Clean-up Operation Observation

- Examine the compliance of the on-site tank truck operations based on document data, vehicle specifications, and operating procedures
- Require the contractor's supervisor to follow the vehicle for self-audits to reinforce the management during the clean-up processes

### After Clean-up Annual Audit

- Fully examine the management and operations of contractors through annual audits
- Combine the annual education and training plans of personnel with the annual inspection plans of tank trucks and strengthen accident case promotion and self-inspections of tank trucks
- Conduct clearance safety forum for waste transportation to strengthen awareness of safety culture NEW
- Quarterly training sessions and online tests to help familiarize employees with operational procedures NEW

## Waste Treatment Contractor Sustainability Enhancement Project

### Contractor Selection six Main Aspects

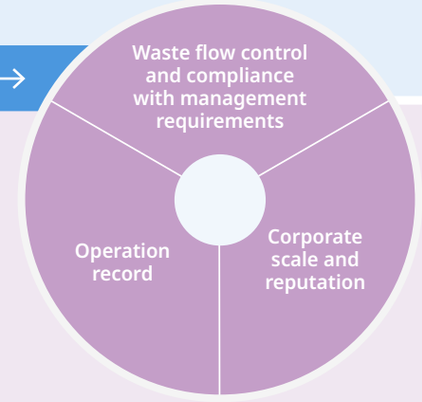
- Environmental safety&health department
- Purchasing department
- Waste management section


### Contractor Inspection eight Main Aspects

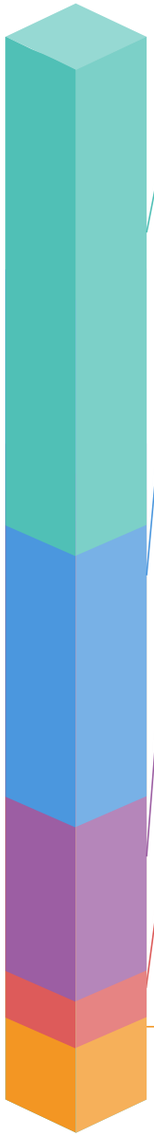
- Industrial safety and environmental protection
- Waste management section


### Annual Evaluation three Main Aspects

- Environmental safety&health department
- Waste management section
- Purchasing department
- Legal department

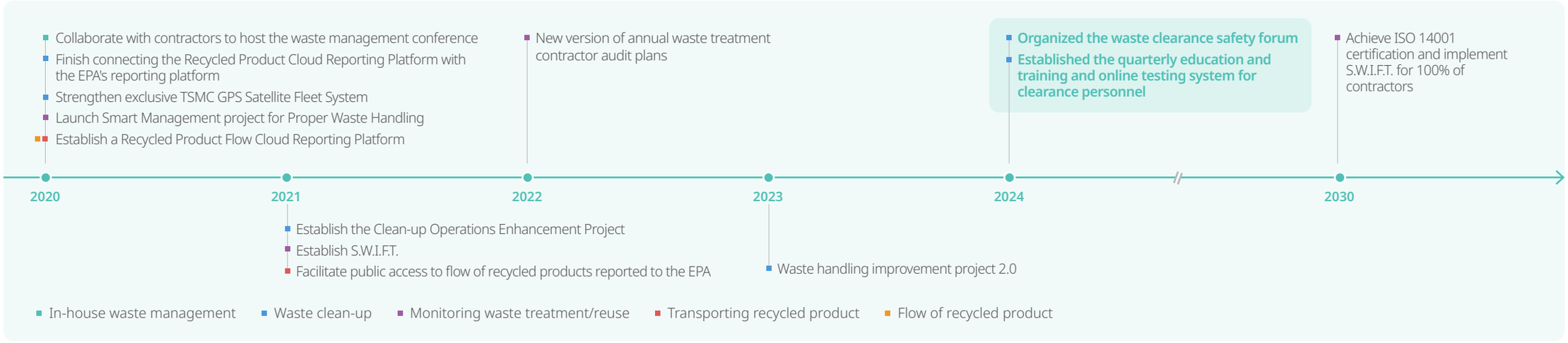


## Waste Treatment Contractor Audit and Guidance Results in 2024

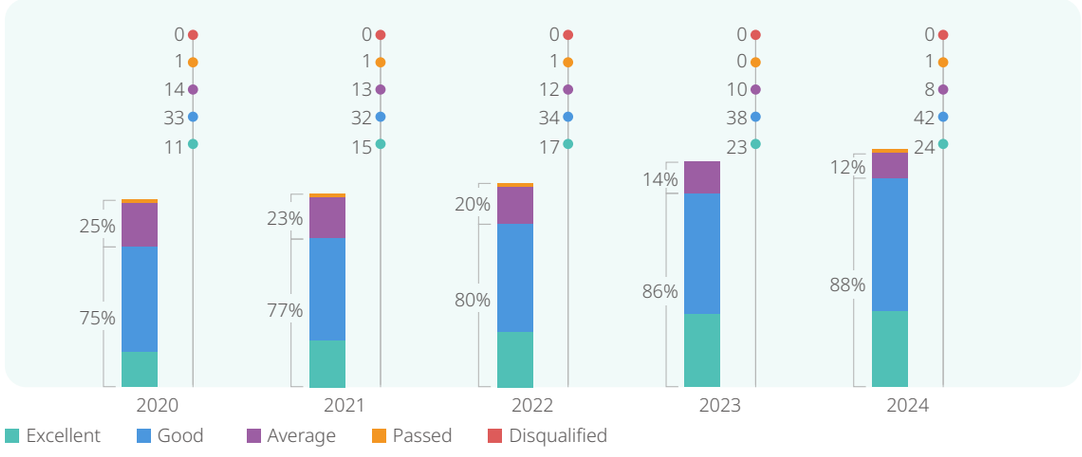


| | | Legal Compliance | On-site Environment/ Operational Improvement | Establishing Regulations and Procedures |
|---|---|---|---|---|
| Waste Management | 46% 45 Cases | Add due diligence requirements<br>Correct false declarations<br>Amend waste disposal contracts<br>Add recycled product sales contracts | Correct erroneous labels in waste storage areas<br>Extend the storage period of the monitoring system<br>Improve waste storage environment | |
| Safety and Health Management | 26% 25 Cases | Formulate workplace environmental monitoring items and frequency based on the hazards and level of risk exposure and arrange special health check | Enhance compliance of on-site chemical labeling with the safety data sheet content<br>Optimize safety protection equipment<br>Reinforce the education and implementation of wearing personal protective equipment<br>Implement hazardous machinery and equipment check | Improve the environmental safety and health management audit plan and implement the PDCA principles<br>Execute the training for personnel in charge of hazardous chemicals |
| Wastewater Management | 17% 17 Cases | Adjust the scope of the water pollution prevention and control plan to comply with on-site practices<br>Conducting wastewater testing items according to water pollution prevention and control plan<br>Correct false declarations<br>Implement the patrol inspection system of dedicated personnel and systemize the records | Enforce wastewater meter records<br>Improve the signs of discharge point and wastewater pipeline<br>Implement equipment maintenance based on the water pollution prevention and control plan<br>Regularly calibrate detection instruments according to the requirements | |
| Air Pollution Management | 3% 3 Cases | | Correct the air pollution pipeline signs to comply with the requirements of the license<br>Conduct the pollution source regular record-taking<br>Regularly calibrate detection instruments according to the requirements | |
| Safety Certificate Management | 8% 8 Cases | Increase the certificates employee with first-aid/ occupational safety supervisors to comply with regulations<br>Ensure the training compliance of operating personnel of machinery and equipment | | |

## TSMC Waste Treatment Contractor Management Milestones

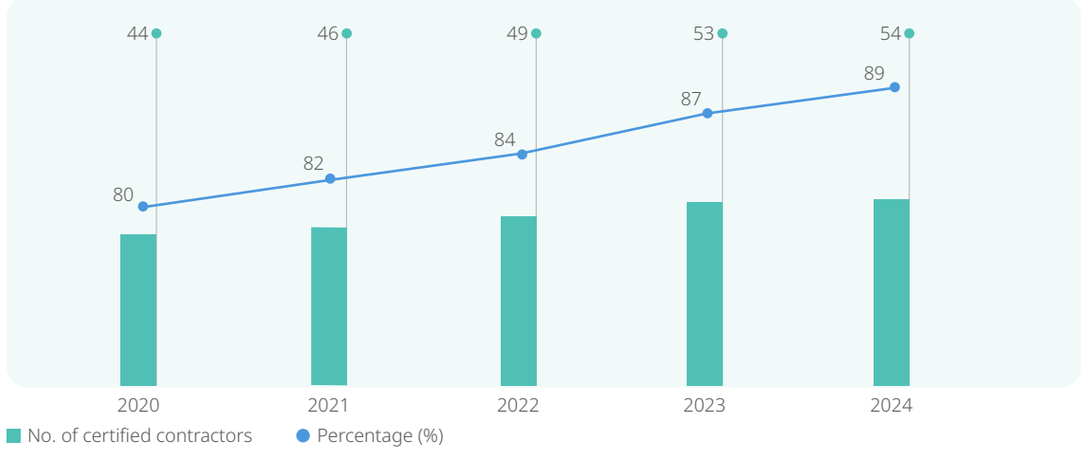



## 2024 Waste Treatment Contractor Evaluation Results




Note: The total score is 100 points: greater than 90 points are Excellent; 80-89 points are Good; 70-79 points are Average; 60-69 points are Passed; less than 60 points are Disqualified.

## ISO-certified Waste Treatment Contractors



# Air Pollution Control

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Adopt Best Available Technology**<br>Adopt the Best Available Technology to control the pollutants emitted from TSMC operations and minimize environmental impact | Reduce the unit air pollutant emissions[Note 1] by 65% (Base year: 2015) | Reduce the unit air pollutant emissions by 58% | Reduced the unit air pollutant emissions by 47%[Note 2] — Target: 58% |
| | Reduction rate of volatile organic gases: >99% | Reduction rate of volatile organic gases: >98.6% | Reduction rate of volatile organic gases: 99% — Target: >98.6% |
| **Strengthen Monitoring for Air Pollution Control Equipment**<br>Leverage backup systems and dual-track management, along with pollutant monitors, to ensure that the equipment works as intended and to prevent abnormal occurrences | Report <1 abnormal occurrence in air pollution control equipment | Report <1 abnormal occurrence in air pollution control equipment | Reported 0 abnormal occurrences in air pollution control equipment — Target: <1 |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | Exceeded | Achieved | Missed target

Note 1: Air pollutant emissions include the total emissions of eight gases: VOCs, $H_2SO_4$, HCl, $HNO_3$, HF, $H_3PO_4$, $Cl_2$, and $NH_3$.

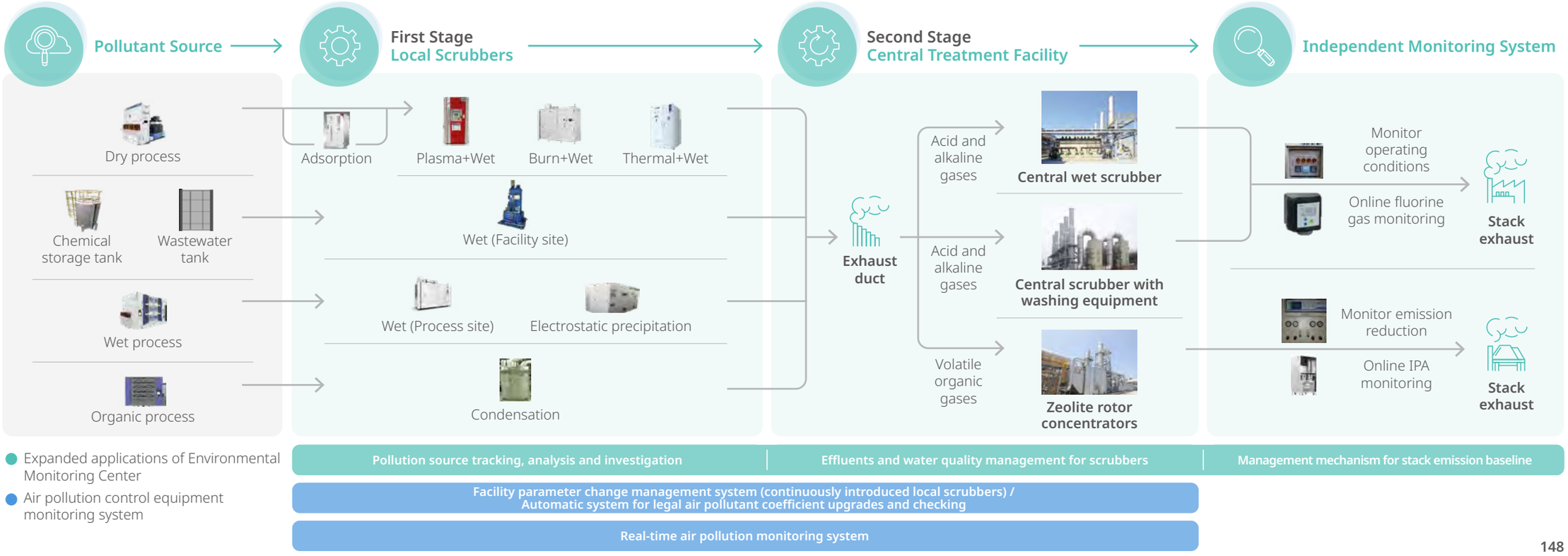
Note 2: TSMC failed to achieve the annual goal for wafer unit consumption primarily due to the fixed air pollution emission of Fab 20 Phase 1, Fab 22 Phase 1, TSMC Arizona Phase 1, JASM Phase 1, and Advanced Backend Fab 6B even if they have not been formally put into production (mass production) in 2024. TSMC will continue to invest in resources to mitigate the environmental impacts with the optimal and feasible technology.

TSMC is committed to achieving the goal of minimal air pollutant emissions by implementing source separation and multi-stage treatment technologies while actively strengthening the treatment performance of control equipment. In 2024, TSMC cooperated with suppliers to renovate electric-heating local scrubbers and successfully increased the reduction rate of $N_2O$ to 90% and reduced the discharge of $NO_x$ by 40%. In addition, it expanded the sampling test application of the Environmental Monitoring Center, added waste recycling testing technologies, and organized the first "self-sampling training workshop" to cultivate the self-sampling capabilities of on-site personnel. The number of traceability and improvement verification cases increased by 27% from 2023, showing the continuous advances in the control effects of equipment and environmental quality.

## Adopt Best Available Technology

Air pollutants generated from the manufacturing of semiconductors are mainly acid, alkaline, and volatile organic gases. To effectively control air pollution emissions and improve treatment efficiency, TSMC adopted classification and reduction of emission from sources and strengthened treatment of terminal control equipment to achieve BAT with the multi-phase system. Exhaust gases are separated based on their properties - toxic, corrosive, flammable, acid and alkaline gases with high concentration, and perfluorocarbon GHGs at the first stage. The gases are introduced to high-efficiency local scrubbers for processing. The gases with low acid/alkaline concentrations will then be sent to central scrubbers for rinsing and neutralization in the second stage. Depending on their boiling points, volatile organic gases may be sent to condensation-type scrubbers first and then to zeolite rotor concentrators for adsorption to further reduce their discharge.

### Air Pollution Control Procedures



## Different Types of Local Scrubbers

| Process | Semiconductor Fabrication | Target Pollutant | Control Technologies | Equipment | Reduction Rate | Real-time Parameter Monitoring |
|---|---|---|---|---|---|---|
| Dry process | Epitaxial dry etching | Corrosive gases | Burn-wet |  | >99% | • Natural gas flow<br>• Oxygen flow<br>• Circulating water flow<br>• Inlet pressure |
| | | Perfluorocarbons | Burn-wet (Large-capacity) |  | | |
| | Dry etching | Corrosive gases | Plasma-wet |  | >95% | • Current amperage<br>• Circulating water flow<br>• Inlet pressure |
| | | Perfluorocarbons | | | | |
| | | Flammable gases | | | | |
| | Thin film | Corrosive gases | Thermal-wet with chemical dosing |  | >95% | • Reactor temperature<br>• Circulating water flow<br>• pH value<br>• Inlet pressure |
| | Diffusion | Perfluorocarbons | | | | |
| | Sputtering | Perfluorocarbons | | | | |
| | | Hydrochloric acids | Thermal-wet with chemical dosing (Add high-efficiency spray device) | | Hydrochloric acids >87%<br>Particulate matters >86% | |
| | | Particulate matters | | | | |
| | Ion implantation sputtering epitaxy | Toxic gases | Adsorption |  | >95% | • Pressure difference of local scrubber<br>• Inlet pressure |
| | Thin film | Nitrous oxide ($N_2O$) | High-temperature thermal+wet |  | >90% | • Reactor temperature<br>• Circulating water flow<br>• Inlet pressure |
| Wet process | Wet etching | Corrosive gases | Wet + chemical dosage |  | >95% | • Differential pressure of local scrubber<br>• Circulating water flow<br>• Inlet pressure<br>• pH value |
| | | Organic gases | | | | |
| | | Alkaline gases $PM_{2.5}$ | Wet electrostatic precipitation |  | >90% | • Inlet pressure<br>• Corona voltage<br>• Corona current |
| Organic process | PR stripping | High boiling point organics | Condensation |  | Specific high boiling point organics >95% | • Differential pressure of local scrubber<br>• Condensation temperature |
| Storage tanks | Chemical Storage tank | Corrosive gases | Wet + chemical dosage (Facility site) |  | >95% | • Differential pressure of local scrubber<br>• pH value<br>• Circulating water flow<br>• Inlet pressure |
| | Wastewater tanks | Acid and alkaline gases | | | | |

### Source Reduction and Management - High Efficiency Local Scrubbers

In response to the development of advanced process technology, raw materials and chemicals used by wafer processes have been increasing. To prevent by-products derived from new processes from causing air pollution risks, TSMC performs secondary reviews through its New Tool and New Chemical Review Committee. In 2024, a carried out a total of 351 reviews, including the review of 170 new tools and 181 new chemicals. The first review focuses on the evaluation of risks related to new chemicals and the establishment of the control system, while the second review tests and confirms the impacts of the discharge on the environment to select appropriate discharge separation methods and local scrubbers, including electrical heating, burning, plasma, wash with agents, absorption, condensation, washing, and other equipment for treatment in advance, implementing the reduction in air pollution emissions.

At the same time, TSMC continued to cooperate with suppliers to study the $NO_x$ reduction technologies of different local scrubbers. TSMC has further upgraded thermal type, burner type and plasma type local scrubbers, using the redox reaction method, uniform combustion temperature control method, and the multi-stage heating method to reduce 60% of the NOx discharge for a single fab as a whole. In 2024, the methods have been introduced into Fab 12B, Fab 14A, Fab 15A, and Fab 18B, and have been included in the standard design for new fabs. In addition, to improving air emission quality, TSMC further promoted the "$N_2O$ reduction project" to adopt $CH_4$ as

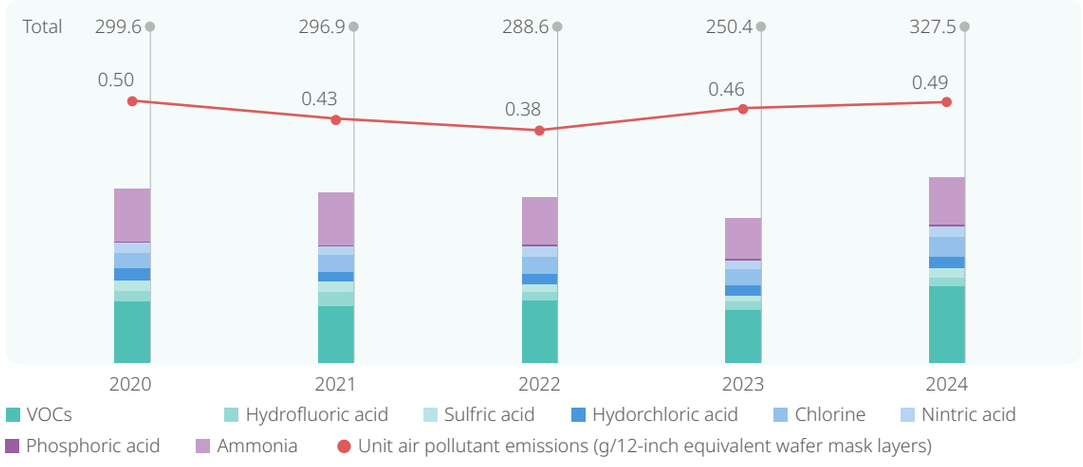
the reducing agent to generate hydroxyl radical, which can react with $N_2O$ and facilitate its decomposition, under pyrolysis through the reformation of the electric-heating local scrubbers. According to the test, the reduction rate of $N_2O$ increased from 42% to 90%, and the emissions of $NO_x$ also reduced further by 40%, which passed the feasibility review of the New Tool and New Chemical Review Committee and improved eco-friendliness.

### Strengthen Management of Terminal Prevention Facilities - Central Scrubbers

After the first-stage treatment, acid/alkaline gases are channeled to central treatment facilities for scrubbing and acid/alkali neutralization to remove pollutants in the second stage. Exhaust gases from wet processes that emit large amounts of acid/alkaline gases are sent to a central scrubber connecting washing tower to improve pollutant removal through two-stage washing. New fabs promote "dual zeolite rotor concentrator." However, when concentrated gases adsorbed by rotors enter thermal oxidizers, pyrolysis can remove volatile organic gas pollutants but may also produce $NO_x$ pollutants. In 2024, new Fab 20, Fab 22 Phase 2, and Advanced Backend Fab 5B introduced the low-$NO_x$ burner, which was included as a standard design, to reduce the $NO_x$ discharge through the low oxygen combustion and flow control technologies. In 2024, the reduction rate of volatile organic gases reached 99%, continuously improving the performance of air pollution control.

## Historical Emissions and Emissions Per Unit of Production

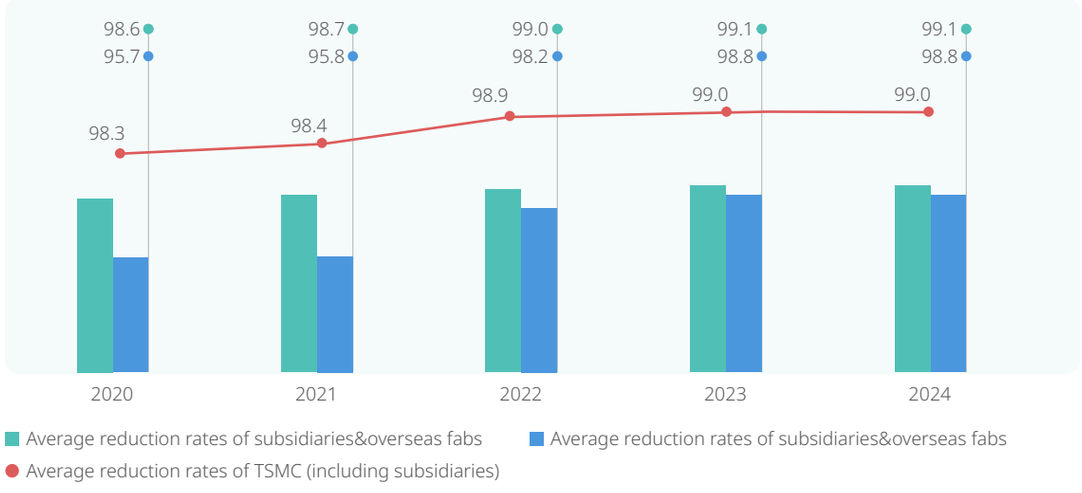
Unit: Tons/year




Note: TSMC air pollutant emissions are reported in accordance with local laws and regulations

## Historical Volatile Organic Gas Reduction Rates

Unit: %




Note: The data scope covers TSMC fabs in Taiwan, TSMC (China), TSMC (Nanjing), JASM, and VisEra. TSMC Washington, LLC and TSMC Arizona are not required toinclude reduction information in accordance with local regulations.

TSMC continues to optimize the effectiveness of air pollution control equipment.

## Timeline of Air Pollution Prevention Systems

● Local scrubber ● Central scrubbers ● Zeolite rotor concentrators

**2020**
- Add chemical dosing system to scrubbers to wastewater tank scrubbers
- Introduce wet electrostatic precipators
- Introduce Smart Control Parameters for Single Zeolite Rotor Concentrators to existing facilities
- Introduce the Improvement Program for Inefficient Thermal Oxidizer of Zeolite Rotor Concentrators

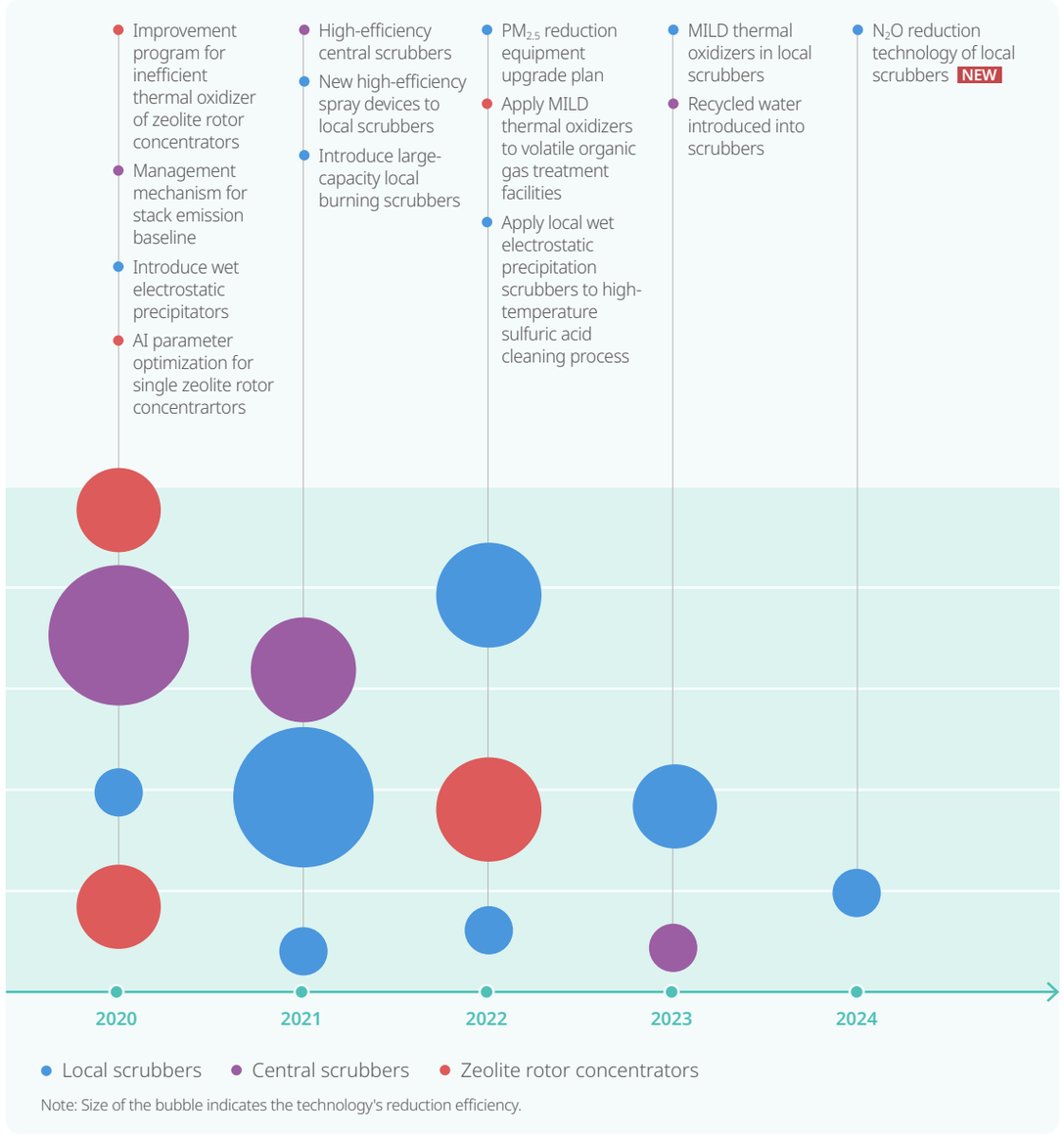
**2021**
- Add high-efficiency spray equipment to thermal wet scrubbers
- Introduce High-Efficiency Central Scrubbers to new facilities
- Introduce the Improvement Program for Inefficient Thermal Oxidizer of Zeolite Rotor Concentrators

**2022**
- $PM_{2.5}$ Reduction Equipment Upgrade Plan
- Introduce large-capacity burning equipment
- Apply MILD thermal oxiders to volatile organic gas treatment facilities

**2023**
- Apply local wet electrostatic precipitation scrubbers to high-temperature sulfuric acid cleaning process
- Develop real-time air pollution monitoring system
- Improve burning local scrubbers to reduce $NO_x$ emissions

**2024**
- Introduce recycled water into scrubbers
- **Develop the $N_2O$ reduction technology with a reduction rate reaching 90%**

## Prevention Technology Feasibility and Reduction Effectiveness Evaluation




Note: Size of the bubble indicates the technology's reduction efficiency.

## Expand the Application of the Environmental Monitoring Center and Initially Adopt Self-sampling Education

TSMC's Environmental Monitoring Center monitors and controls the three major application aspects, including air emissions, effluents, and surrounding areas, and improves equipment control and treatment performance. In response to the official operation of the Taichung Zero Waste Manufacturing Center in 2024, to accurately grasp the components/ingredients of waste, the Environmental Testing Center added the application aspect of "waste recycling." The sludge testing technology was initially developed to analyze waste liquids from various chemicals. Over time, it expanded its testing methods to improve the quality of recycled products and facilitate the development of the circular economy. In 2024, it continued to expand the testing scope, established the $PM_{2.5}$ testing method for stacks, added total phosphorus and $NO_3$-N testing for effluents, and added organic photochemical precursor testing for surrounding areas to comprehensively grasp the discharge and environmental quality of fabs.

In addition to developing diverse testing technologies, the Environmental Monitoring Center also provides verification for pollution emissions and improvements to control equipment across various fabs. To enhance the efficiency of air pollution mitigation and shorten the confirmation time, TSMC organized the first "self-sampling training workshop" in 2024 to cultivate the self-sampling capabilities of employees from the Facility Division and Industrial Safety and Environmental Protection Department regarding exhaust pollutants that contain inorganic acids (including sulfuric acid, nitric acid, hydrochloric acid, phosphoric acid, and hydrofluoric acid) and ammonia through the source of pollutants, sampling purpose and method described by lecturers, together with practical training and on-site exercises. A total of 14 sessions were organized, training 74 participants. The number of traceability and improvement verifications increased by 27% from 2023, further strengthening overall pollution control effectiveness.

## Four Major Application Aspects of the Environmental Monitoring Center

### Air Emissions
- Emission stack management system
- Traceability investigation
- Air pollution data digitalization and anomaly tracking
- $PM_{2.5}$ testing NEW
- Self-sampling training NEW

### Surrounding Area
- Monitor surrounding areas with air quality vehicles
- Set up fixed testing stations at Zhunan, CTSP, and Tainan Science Park
- Organic photochemical precursor testing NEW


### Effluents
- Effluent and scrubber water quality management system
- Water pollution data digitalization and anomaly tracking
- Total phosphorus and $NO_3$-N testing NEW

### Waste Recycling
- Sludge testing NEW

## Strengthen Monitoring of Air Pollution Prevention Equipment

TSMC is dedicated to maintaining the efficiency of air pollution control equipment and has installed additional measures, such as total hydrocarbon monitors and online monitoring instruments for isopropanol and fluorine gas, at various emission outlets to rigorously oversee monitoring values and actual emissions. Additionally, TSMC utilizes systems like the "Automated Verification System for Air Pollution Reporting Legal Coefficients," the "Facility Parameter Change Management System," and the "Facility Monitoring and Data Collection System" to track operational parameters of control equipment. By leveraging automated comparison and verification functions, TSMC ensures the accuracy of reporting information, preventing data loss or errors caused by human oversight. In response to process advancements and fab expansion needs, TSMC continued its updates to the Facility Parameter Change Management System initiated in 2023. In 2024, key control parameters of onsite treatment equipment at Fab 20 and Phase 2 of Fab 22 were incorporated into change management processes, ensuring operational stability of the equipment.

To maintain air pollution control equipment at its optimal operating status, at least one backup system is installed for all equipment to operate by adopting the “N+1” model. Meanwhile, the monitoring system and anomaly alert system are also established for the Facility Division and Industrial Safety and Environmental Protection Division to immediately carry out emergency repair or turn on the backup equipment, together with the assistance of the UPS, to minimize the risks of losses and achieve the target of zero failure in control equipment. In 2024, there was no air pollution control equipment anomaly, or punishment or expenses due to the violation of the Air Pollution Act.

**Case Study**

### Optimize Control Equipment Treatment System to Achieve 90% Reduction Rate of $N_2O$

Different tail gases are generated from wafer manufacturing, and appropriate local scrubbers are adopted for burning and reduction based on their characteristics. With the burning temperature of the existing electric-heating local scrubbers being insufficient, the reduction rate of $N_2O$ was worse than expected. Therefore, TSMC cooperated with suppliers to initiate the “$N_2O$ reduction project” to introduce methane into electric-heating local scrubbers by adopting the reduction-oxidation reaction to serve as the reducing agent. Methane generates hydroxyl radicals under high temperatures and can react with $N_2O$ to facilitate its decomposition and, in turn, improve the reduction efficiency. Meanwhile, methane can reduce $NO_x$ to $N_2$ to reduce the discharge of $NO_x$ and achieve double benefits.

In 2024, ITRI, a third-party verification department, carried out the test at TSMC. The $N_2O$ reduction rate of electric-heating local scrubbers increased from 42% to 90%, and the NOx discharge can be further reduced by 40%. It also passed the SEMI S2 and the feasibility review of the New Tool and New Chemical Review Committee of TSMC. As of December, it has been introduced into Fab 12A, Fab 12B, Fab 14A, Fab 14B, and Fab 15A and included in the standard design for new fabs to improve the air pollution processing ability.


TSMC works closely with suppliers to renovate electric-heating local scrubbers to improve the reduction rate of $N_2O$.

# An Admired Employer

TSMC values its commitment to employees, fostering a people-oriented workplace culture with open communication. The Company actively cultivates an inclusive and safe workplace where employees can continue to learn and grow. TSMC also provides competitive compensation and benefits, striving to be an employer of choice within the semiconductor industry.

Inclusive Workplace | Talent Attraction and Retention | Talent Development | Occupational Safety and Health

## 100.5 hours

Annual average employee learning hours increased by 17.7%

## Top 25%

Total compensation ranked within the top 25% in the industry

## 17 Models

Collaboration among industry, government, and academia to launch diverse sizes of protective equipment

# Inclusive Workplace

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Establish an Open-Style Management System**<br>Fulfill Core Values and Business Philosophy and continue to shape an inclusive culture | Rank in the top 25% for Inclusive Workplace; the rank is determined by comparing results from the Employee Engagement Survey[Note 1] against the Global High Performance Companies Norm | Rank in the top 50% for Inclusive Workplace; the rank is determined by comparing results from the Employee Engagement Survey against the Global High Performance Companies Norm | - [Note 1] |
| **Unleash the Potential of Diverse Talent**<br>Provide resources to support diverse talent to grow and flourish | Women in management: ≧ 18% [Note 2]<br>Women account for 30% of all newly-hired fresh graduates technical professionals | Women in management: ≧ 15.2%<br>Women account for 27% of all newly-hired fresh graduates technical professionals | Women in management: 14.6% — Note 3<br>Target: 15%<br>Women account for 28.7% of all newly-hired fresh graduates technical professionals ↑<br>Target: 26% |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: The Employee Engagement Survey is issued once every two years and will be issued next in 2025.

Note 2: Based on next 5-year headcount growth and assumptions of past 3-year female turnover rate, hiring ratio, and promotion rate, the target for proportion of women in management has been adjusted from previous 20% to 18% in 2030, with the expectation to reach 20% by 2035.

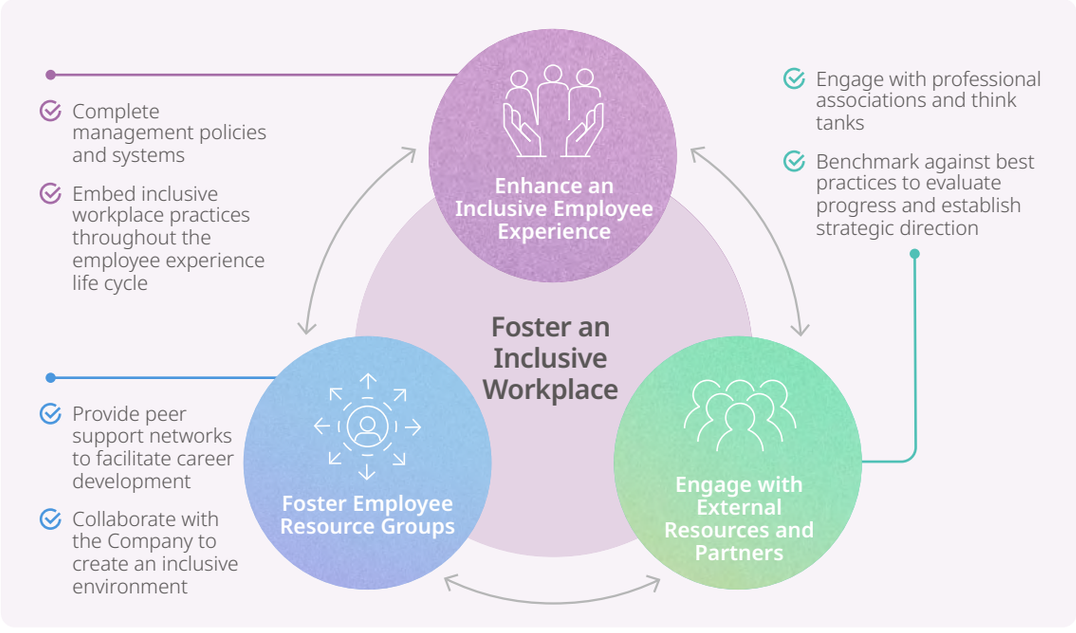
Note 3: Despite not meeting the target for 2024, there was a 0.5% improvement compared to the previous result in 2023. For the talent retention strategies, please refer to "Talent Attraction and Retention."

TSMC is committed to providing solutions for the world's most challenging technological innovations, accelerating global technological progress, and encouraging all employees, regardless of background or identity, to contribute their strengths at all levels. Creating an inclusive workplace aligns with the Company's core values and business philosophy and is crucial to the Company's future success. In 2023, the Company released its TSMC People Vision "We Provide an Inclusive Environment to Inspire Passion and Enable the Best in You. " Through the TSMC Global Inclusive Workplace Statement and a series of initiatives promoting workplace inclusion, the Company enhances employees' understanding and extends these practices throughout its supply chain , fostering a mutual benefit to TSMC and society.

## Establish an Open-Style Management System

Based on the Open-Style Management System in the TSMC Core Value and Business Philosophy , the Company attracts and retains like-minded, outstanding talent from around the world through three main philosophies: "enhancing an inclusive employee experience, fostering employee resource groups, and engaging with external resources and partners." This approach fosters a work environment where every employee feels valued and a sense of belonging. At each stage of the employee life cycle, the Company continuously reviews relevant processes and policies to ensure diverse talent recruitment channels and cultivation systems, while also raising employee awareness through employee resource groups to promote understanding and collaboration among employees. Additionally, TSMC actively aligns with international standards while establishing cooperative relationships by engaging with external resources and partners .

## Three Strategic Approaches



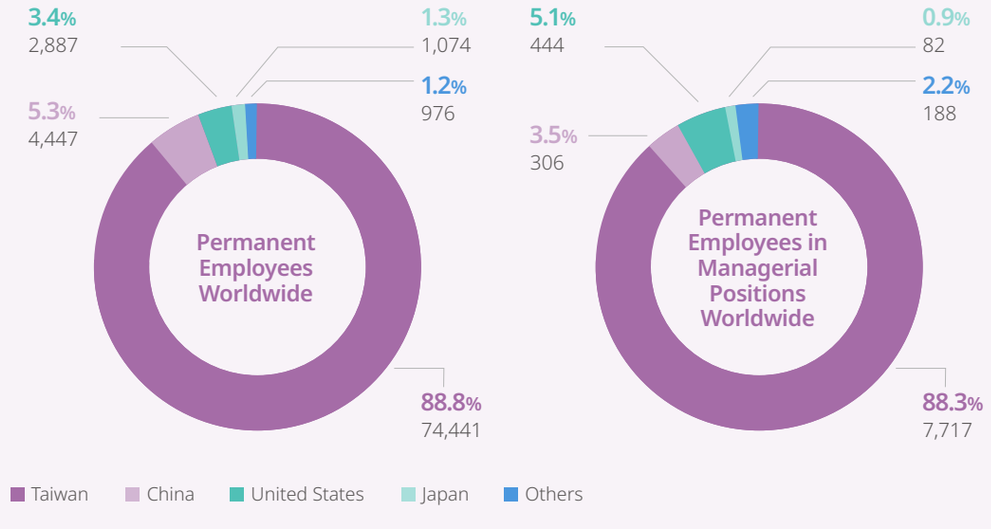


Colleagues from around the world gathered to partake in cross-culture celebration curated by Global Family@tsmc.

## Diverse Workforce

TSMC is dedicated to cultivating an inclusive workplace, encouraging open communication among employees from various cultural, professional, and personal backgrounds to spur innovation and competitiveness. Guided by a merit-based philosophy, the Company ensures that no differential treatment or discrimination occurs in recruitment or promotion on the basis of gender, age, disability, religion, race, ethnicity, nationality, political affiliation, or sexual orientation. In 2024, TSMC continued to expand its global presence — not only stepping up local talent recruitment and development, but also actively extending its talent acquisition efforts across Japan, the United States, Europe, and Southeast Asia. As of 2024, the Company employed 84,512 people worldwide, with permanent employees representing 51 nationalities and accounting for over 98% of the total workforce, primarily based in Taiwan, China, the United States, and Japan. By region, 87.06% of employees were located in Taiwan, 7.48% in other parts of Asia (including China, Japan, and South Korea), 5.36% in North America, and the remainder in Europe.

### Distribution of Permanent Employees Worldwide by Nationality in 2024



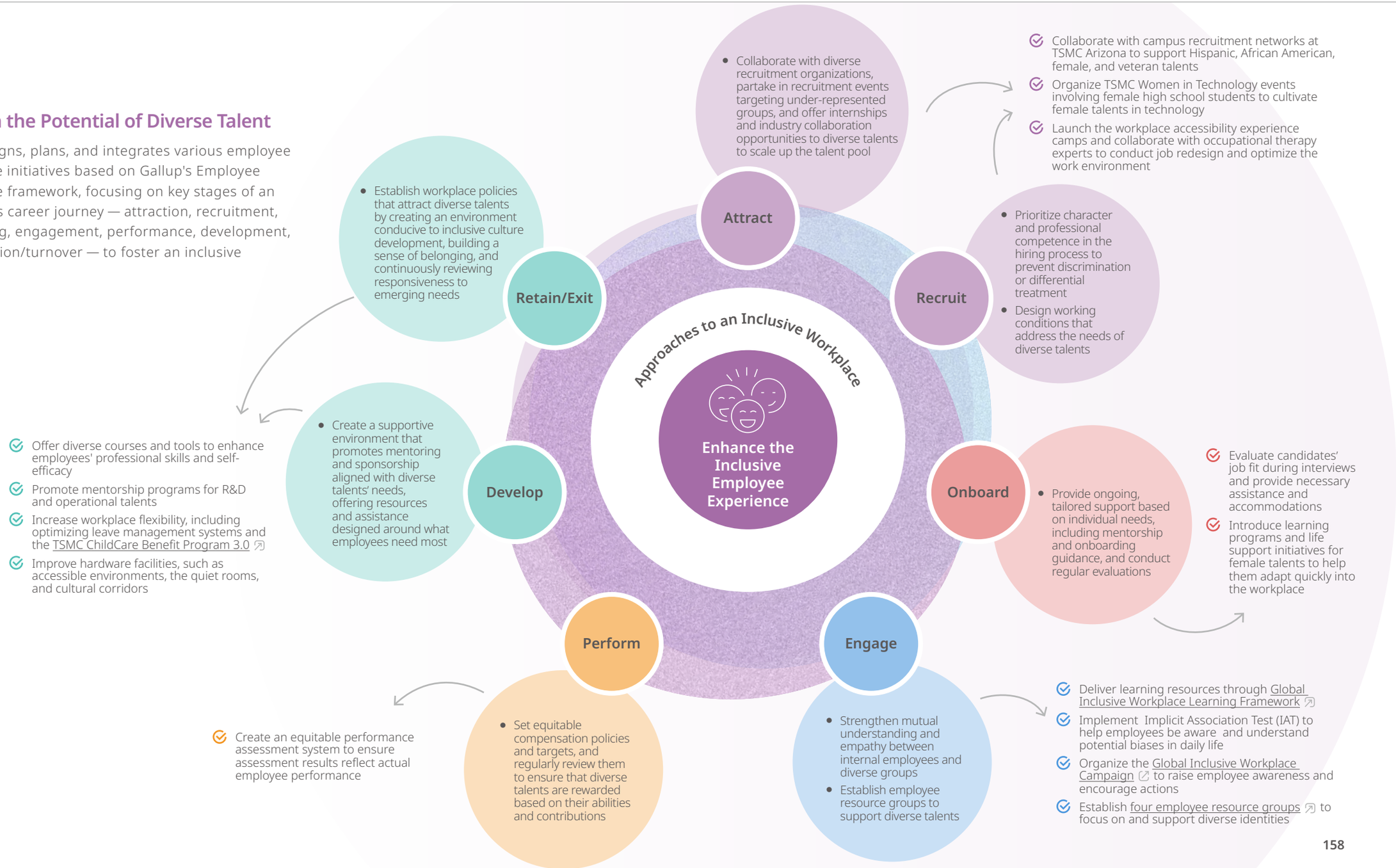

### Global Workforce Structure in 2024

| Category | | Male | Female | Total [Note 4] |
|---|---|---|---|---|
| Global Employees - Employment Contracts | Permanent Employees [Note 1] | 55,589 (66.3%) | 28,236 (33.7%) | 83,825 (99.2%) |
| | Temporary Employees [Note 2] | 417 (60.7%) | 270 (39.3%) | 687 (0.8%) |
| Global Employees - Employment Types | Full-time Employees | 55,820 (66.3%) | 28,388 (33.7%) | 84,208 (99.6%) |
| | Part-time Employees | 186 (61.2%) | 118 (38.8%) | 304 (0.4%) |
| Permanent Employees - Position | Managers | 7,461 (85.4%) | 1,276 (14.6%) | 8,737 (10.4%) |
| | Professionals | 31,514 (77.9%) | 8,963 (22.1%) | 40,477 (48.3%) |
| | Assistants | 8,961 (87.8%) | 1,246 (12.2%) | 10,207 (12.2%) |
| | Technicians | 7,653 (31.4%) | 16,751 (68.6%) | 24,404 (29.1%) |
| Permanent Employees - Education | Ph.D. | 2,742 (88.1%) | 370 (11.9%) | 3,112 (3.7%) |
| | Master | 31,528 (77.6%) | 9,096 (22.4%) | 40,624 (48.5%) |
| | Bachelor | 16,473 (65.8%) | 8,563 (34.2%) | 25,036 (29.9%) |
| | Other Higher Education | 2,192 (35.0%) | 4,065 (65.0%) | 6,257 (7.5%) |
| | High School | 2,654 (30.2%) | 6,142 (69.8%) | 8,796 (10.5%) |
| Permanent Employees - Age | 18~30 | 20,662 (70.6%) | 8,622 (29.4%) | 29,284 (34.9%) |
| | 31~50 | 31,665 (64.2%) | 17,687 (35.8%) | 49,352 (58.9%) |
| | 51+ | 3,262 (62.9%) | 1,927 (37.1%) | 5,189 (6.2%) |
| Permanent Employees - Work Location | Taiwan Fabs and VisEra | 48,195 (66.0%) | 24,784 (34.0%) | 72,979 (87.1%) |
| | Asia [Note 3] | 4,083 (65.1%) | 2,188 (34.9%) | 6,271 (7.5%) |
| | North America | 3,267 (72.6%) | 1,230 (27.4%) | 4,497 (5.4%) |
| | Europe | 44 (56.4%) | 34 (43.6%) | 78 (0.1%) |

Note 1: Permanent employees refer to those who have signed contracts with no fixed term, as defined according to the GRI Standards.
Note 2: Temporary employees are those who have signed fixed-term contracts.
Note 3: Asia includes Shanghai, Nanjing, Japan, and South Korea.
Note 4: Figures rounded to one decimal place may not sum to 100%.

## Unleash the Potential of Diverse Talent

TSMC designs, plans, and integrates various employee experience initiatives based on Gallup's Employee Experience framework, focusing on key stages of an employee's career journey — attraction, recruitment, onboarding, engagement, performance, development, and retention/turnover — to foster an inclusive workplace.



## Support Employee Resource Groups

### • Employee Resource Groups

Through employee-led Employee Resource Groups (ERGs), TSMC provides experience-sharing platforms for talents from diverse backgrounds, thus enhancing their sense of belonging while promoting personal growth and career development. Furthermore, by uniting allies who support the cause, these groups encourage colleagues to advocate and speak up regardless of their personal identities, thereby fostering mutual understanding, decreasing prejudice, and promoting an inclusive environment.

From 2022 to 2024, TSMC established four ERGs Women@tsmc, Global Family@tsmc, Accessibility@tsmc, and Veterans@tsmc (exclusively in the U.S.), focusing on gender, ethnicity/nationality, disability, and protected U.S. veteran identity, respectively. Each ERG is sponsored by at least one executive to ensure alignment with TSMC's People Vision while supporting advocacy efforts. To broaden employee awareness and encourage their participation, the Company mounted an internal campaign in 2024, featuring an introductory video and survey about the ERGs, which reached employees worldwide, garnered over 28,000 responses, and over 90% of colleagues expressed their supports, becoming allies.

## 2024 Employee Resource Group Key Developments

### Women @tsmc

**Mission**

Connecting and developing women at TSMC to unleash their potential, be true and a better self

**Progress in 2024**

In 2024, Women@tsmc established cross-functional and cross-industry networks to support women's career development through a range of initiatives, including interdisciplinary female speaker series, tech forums, and the Female Caring & Mentoring Program. In addition to the central chapter, corporate functions at TSMC headquarters and global sites have successively established chapters. Each local Women@tsmc chapter designs unique activities suited to the needs of female employees in the region. Since its inception in 2022, Women@tsmc impacted more than 35,000 employees worldwide. The group also acts as a communication bridge between employees and the Company, leveraging the Female Caring & Mentoring Program to understand diverse talents' needs and translate them into flexible workplace policies, such as remote work and the TSMC ChildCare Benefit Program 3.0, to support employees in balancing work and family at various life stages

Thank you all for the collective efforts over the past three years. We've been so fortunate to create and share many wonderful new beginnings together. I look forward to achieving more and better versions of you, me, and her.

**Lie-Szu Juang**
**Member of Women@tsmc**

### Global Family @tsmc

**Mission**

Dedicated to welcome and support global talents as they adjust to their new work and life chapter in TSMC, fostering a global inclusive workplace that enables all unique background and experiences to come together and unleash their full potential

**Progress in 2024**

In 2024, the group hosted Cross-Cultural Celebration at TSMC's R&D Center, where foreign colleagues voluntarily shared diverse cultures from various countries, attracting nearly 300 participants. Throughout the year, the group organized 6 welcome sessions as well as guided visits to the TSMC Museum of Innovation and Vice president sharing forum which helped over 500 colleagues connect, adapt, and thrive at TSMC. GlobalFamily@tsmc also collaborated with TSMC Charity Foundation to introduce cross-cultural experiences to local elementary schools, bringing India's vibrant festival traditions into classrooms. To further assist international employees, a bilingual Living Assistant Handbook was launched via the company intranet, providing resources to help foreign colleagues and their families navigate life and culture in Taiwan. Through ongoing initiatives, including self-organized events, GlobalFamily@tsmc continues to enhance employees' sense of belonging and foster a culture of inclusion and mutual support

I enjoyed having a chance to network with other TSMC employees in a multi-language environment. As an international hire, finding networking opportunities within TSMC are limited. Global Family helped me connect with employees from various fabs and departments.

**Fong Abraham**
**Member of Global Family@tsmc**

### Accessibility @tsmc

**Mission**

Connect and support the disabled talents as they integrate and develop in the workplace, as well as to increase the understanding of accessibility and inclusive workplace topics for all employees, with the goal to realize TSMC's People Vision

**Progress in 2024**

In 2024, Accessibility@tsmc partnered with external organizations to host three themed seminars and established shared learning platforms such as book clubs to deepen colleagues' understanding of accessibility issues, empathy, and inclusion awareness. Through member meetings and other events, the group fostered workplace connections and reinforced coworkers' sense of belonging. In collaboration with the public utility and service department, the group optimized accessibility infrastructure, successfully completing 456 basic accessibility facility improvements across 24 fabs

Being part of Accessibility@tsmc has given me the opportunity to meet many outstanding individuals with disabilities, including TSMC colleagues and external speakers, who fearlessly embrace both the beauty and challenges of life with passion. Priceless!

**Yung-Sheng Chang**
**Member of Accessibility@tsmc**

### Veterans @tsmc (U.S.)

**Mission**

Foster career growth, community outreach, and personal development within our organization. Our commitment encompasses veteran recruitment, career development, outward engagement, and retention, ensuring that those who have bravely served our nation continue to thrive and succeed in their professional careers

**Progress in 2024**

In 2024, Veterans@tsmc planned to strengthen TSMC's support for U.S. veterans by boosting community engagement, veteran recruitment, career development, and retention efforts. Key initiatives included a mentorship program pairing interns and researchers with veteran mentors at TSMC and establishing peer groups to promote experience-sharing and help veterans navigate workplace challenges

As a daughter, granddaughter, and niece of former U.S. Military veterans, I am proud to be a part of a company which recognizes and invests in the veteran community. Diversity spans beyond what the naked eye can see; the road that each person travels to have arrived where they are today impacts who they are and how they think, feel, and act. These various ways of expression and thought is what makes us stronger and better, together!

**MJ Brosowske**
**Member of Veterans@tsmc**

## • Empower Employees — from Awareness to Action

In 2024, TSMC continued to collaborate with Employee Resource Groups to host the Global Inclusive Workplace Campaign , centering on three key themes: Action, Equity, and Allyship. The Company invited experts from various sectors to demonstrate practical applications of these concepts, transforming the approach from public commitments and awareness-raising to taking concrete actions that drive changes. The year's events attracted over 6,000 participants in total.

Moreover, the Company has further strengthened platforms to promote employee participation in inclusive workplace initiatives, including an internal website and the Inclusion Champion program , which rewards employees for sustained engagement and action. The website serves as a centralized hub, offering employees seamless access to inclusion-related programs, post-event reports, company commitments, and learning resources from the employee perspective, unrestricted by time or location. Launched at headquarters in September 2024, it garnered 26,182 page views by year-end and is slated for expansion to global operational sites.

Regarding learning resources, TSMC established a dedicated Global Inclusive Workplace Learning Framework — B.E.A.R. — in 2024, transforming concepts into practical skills to empower employees in applying them in their work and life. B.E.A.R. stands for Build Interpersonal Trust, Embrace Diverse Perspectives, Adopt Two-Way Communication, and Realize Adaptability & Flexibility. To realize the concept of an inclusive workplace, the Company launched the “T-Bear Embarks on an Inclusive Workplace Learning Journey” series, featuring online courses, experiential workshops, and globally online live-streamed master classes. By offering diverse and versatile learning approaches, the Company sparked employees’ motivation and enjoyment in learning the four key features of B.E.A.R.. The campaign recorded a total of 31,179 participants, with an average satisfaction score of 95.6 points.

In addition, the Company continues to promote "Inclusive Leadership Workshops" for different management levels, covering topics from introducing inclusive workplace concepts, raising self-awareness of unconscious biases, discussing real-world cases, and developing action plans to demonstrate inclusive leadership within teams. In 2024, the workshop series conducted 162 sessions with a cumulative attendance exceeding 3,723 participants.

## Engage with External Resources and Partners

To promote an inclusive workplace, TSMC continues to collaborate and exchange ideas with professional associations and think tanks. By sharing its own experiences and benchmarking against best practices, TSMC strives to continuously improve inclusive workplace initiatives and supports advocacy efforts on key issues.

### Gender

Endorse GSA's Women Leadership Initiatives through campus lectures, recruitment events, and mentorship programs to cultivate female leadership in the semiconductor industry and foster networks for knowledge sharing. Collaborate with the SWE to close the gender gap in STEM by engaging and recruiting female talents through multiple channels

**Partner Organizations**

- Global Semiconductor Alliance (GSA)
- The Society of Taiwan Women in Science and Technology (TWiST)
- Society of Women Engineering (SWE)

### Disability

TSMC joined Disability:IN in 2024 and attended its global annual conference to exchange insights with leading corporations on disability inclusion in the workplace, and sat on Disability:IN committees/ councils to share implementation practices with global peers

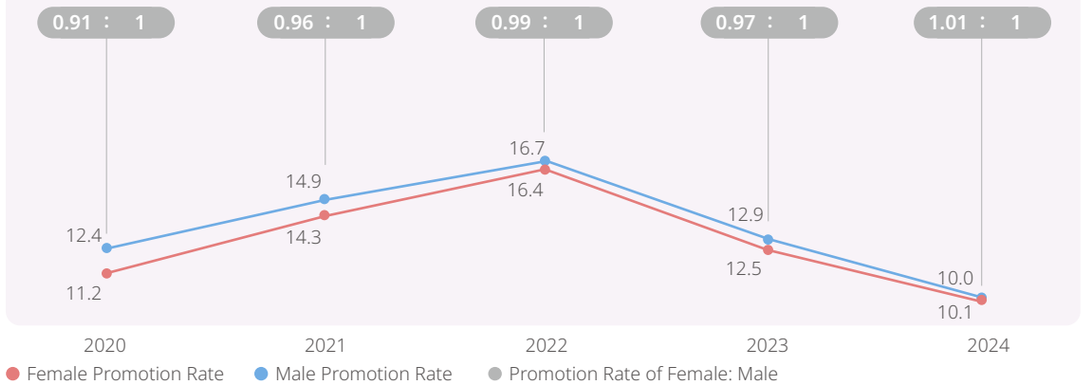
**Partner Organizations**

- Disability:IN

TSMC continues to unlock talent potential and actively boosts workforce diversity. In 2024, the number of women in STEM positions reached 26,153, constituting 33% of the permanent workforce. Among newly-hired technical professionals, females represented 28.7%. Moreover, female managers comprised 14.6%, contributing to a culture of workplace diversity.

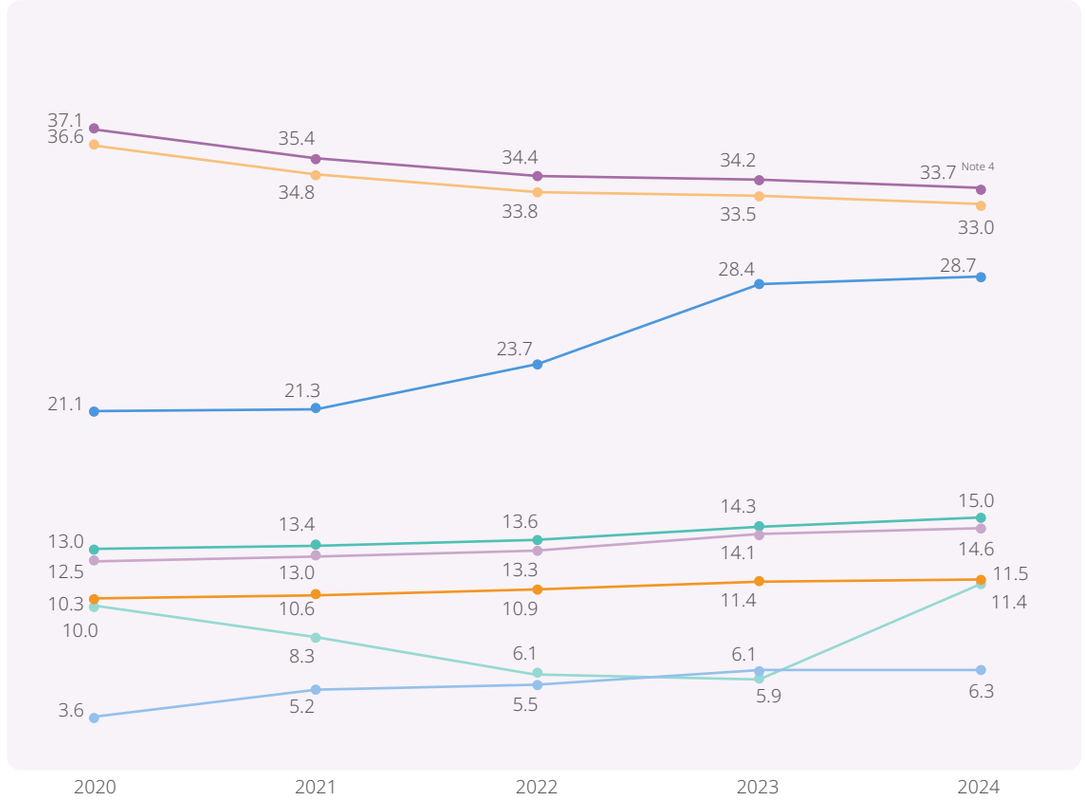
## Promotion Rate by Gender

Unit: %




## Percentage of Female Employees

Unit: %




Note 1: Junior management positions include first-line managers while top management positions include Vice Presidents and higher.
Note 2: Newly-hired fresh graduates technical professionals include all newly-hired technical professionals with less than one year of recognized experience.
Note 3: TSMC Academy members with outstanding achievements, insights, or breakthroughs in specific fields or experts with outstanding contributions to TSMC.
Note 4: The percentage of female employees declined in 2024 because new hires were mainly engineers and there was a significantly lower number of female engineers compared with male engineers in the labor market.
Note 5: Management positions in revenue-generating functions include managers of R&D, operations, Q&R, sales, and other units.
Note 6: STEM positions include R&D, operations, Q&R, information technology, and information security employees, and other units.

## Compensation Ratio by Gender

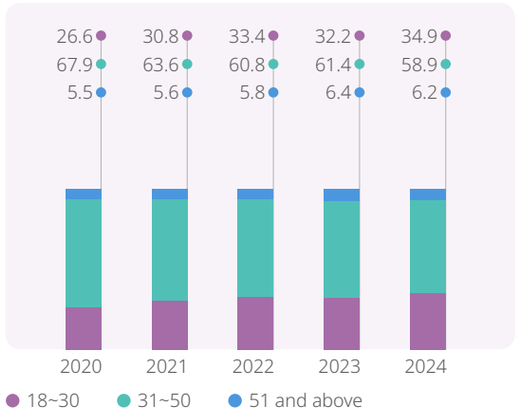
| Region/Subsidiary | Positions | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| Taiwan | Managers | 0.97:1 | 0.97:1 | 0.97:1 | 0.97:1 | 1:1 |
| | Professionals | 0.93:1 | 0.93:1 | 0.93:1 | 0.92:1 | 1.01:1 |
| | Assistant | 0.97:1 | 0.93:1 | 0.91:1 | 0.92:1 | 0.88:1 |
| | Technicians | 1.13:1 | 1.14:1 | 1.15:1 | 1.18:1 | 1.03:1 |
| China | Managers | 0.96:1 | 1:1 | 0.96:1 | 1.11:1 | 0.97:1 |
| | Professionals | 0.88:1 | 1:1 | 0.99:1 | 1.04:1 | 0.99:1 |
| | Assistant | 0.91:1 | 1.14:1 | 1.19:1 | 1.12:1 | 1.03:1 |
| | Technicians | 1.11:1 | 1.16:1 | 1.13:1 | 1.11:1 | 0.99:1 |
| North America[Note] | Managers | - | - | - | - | 0.90:1 |
| | Professionals | - | - | - | - | 0.98:1 |
| | Assistant | - | - | - | - | 0.96:1 |
| | Technicians | - | - | - | - | 0.97:1 |
| Europe[Note] | Managers | - | - | - | - | 0.81:1 |
| | Professionals | - | - | - | - | 1.14:1 |
| | Assistant | - | - | - | - | - |
| | Technicians | - | - | - | - | - |
| Japan[Note] | Managers | - | - | - | - | 0.88:1 |
| | Professionals | - | - | - | - | 1.01:1 |
| | Assistant | - | - | - | - | 0.92:1 |
| | Technicians | - | - | - | - | 0.95:1 |
| VisEra | Managers | 0.71:1 | 0.69:1 | 0.69:1 | 0.71:1 | 0.85:1 |
| | Professionals | 0.86:1 | 0.85:1 | 0.91:1 | 0.87:1 | 0.90:1 |
| | Assistant | 1.06:1 | 1.18:1 | 1.18:1 | 1.17:1 | 1.11:1 |
| | Technicians | 1.03:1 | 1.04:1 | 1.05:1 | 1.01:1 | 0.95:1 |

Note 1: Starting from 2024, the grouping will be updated and within each category, the ratio for each job grade will be calculated first and then averaged to avoid skewing in the overall figures.
Note 2: The headcount size of Korea is not sufficient in each job category for conducting analysis.

## Percentage of All Employees

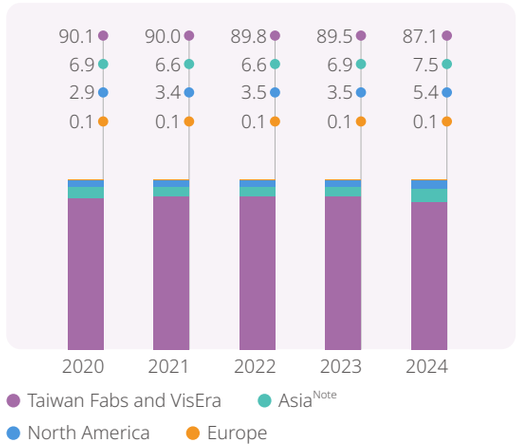
### Age

Unit: %



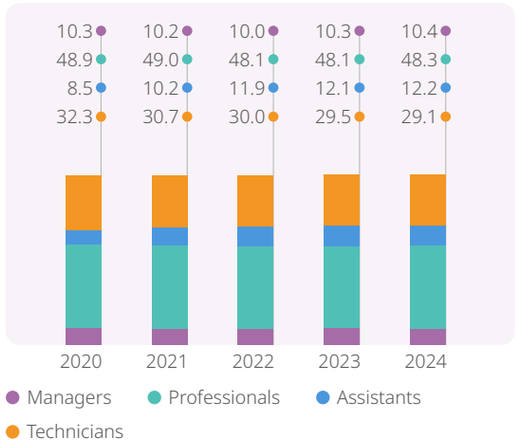

### Work Location

Unit: %



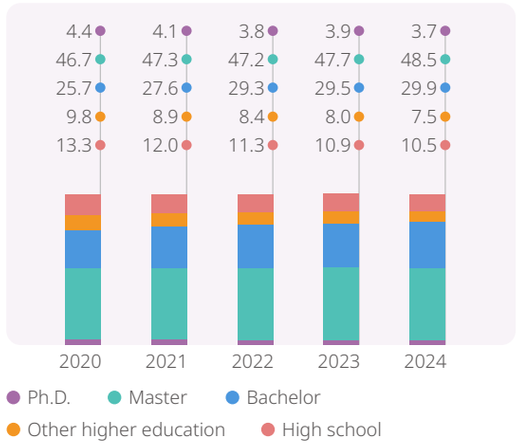

### Position

Unit: %




### Education

Unit: %



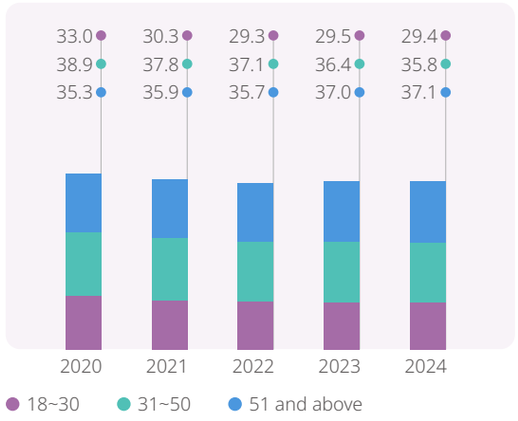

Note 1: Asia includes Shanghai, Nanjing, Japan, and South Korea.
Note 2: Rounded to one decimal place, the total may not equal 100%.


TSMC invites internationally renowned film director Ang Lee to elaborate the topic of diversity and inclusion through the lens of cinema.

## Percentage of Female Employees

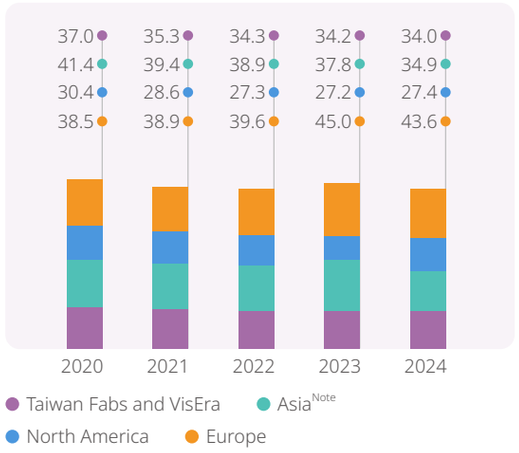
### Age

Unit: %



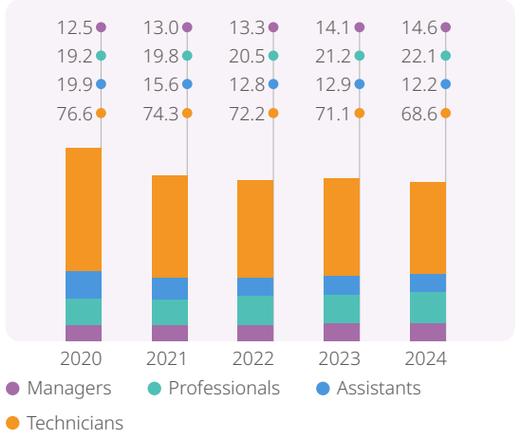

### Work Location

Unit: %



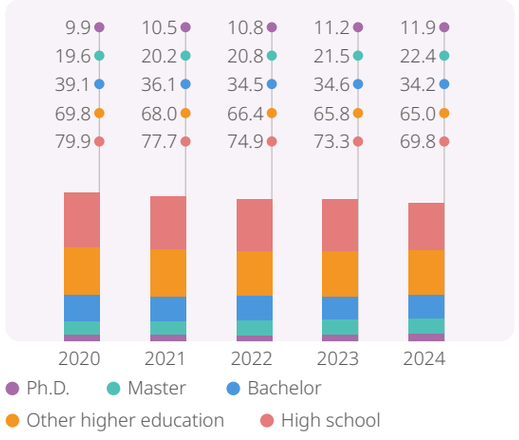

### Position

Unit: %




### Education

Unit: %




Note: Asia includes Shanghai, Nanjing, Japan, and South Korea.

TSMC invites the Paralympic judo silver medalist Li Kai-Lin to share the importance and impact of being an "ally" through personal experiences.

Case Study

# Inclusion Champion Program

To encourage employees to participate and transform inclusion concepts into concrete actions, TSMC unveiled the Inclusion Champion Program in 2024. This incentive mechanism was first implemented at Taiwan facilities, offering online courses, experiential events, and expert lectures. These events help employees develop self-awareness, practice active listening, build empathy for others, and cultivate inclusion consciousness — nurturing a sense of belonging and psychological safety. Employees earn recorded credits for participating in activities during the program period and can achieve different reward levels such as Gold, Silver, and Bronze Champion status, becoming advocates for an inclusive workplace.

During the reward period from July to December 2024, the program recorded a total of 149,565 participant engagements. These activities heightened employee awareness and promoted collaboration. TSMC plans to gradually expand the program to global operational sites in 2025, helping employees understand and implement inclusive workplace practices.

> Through these activities, I've learned to reduce personal bias in both life and work. By communicating with an open mind, I've been able to deepen emotional bonds with those around me and help create a friendlier, more inclusive environment.
>
> **Nuria Lu**
> **Gold Champion**

> One person alone can only do so much, but by bringing people together and aligning with the Company, we can set this ball of goodwill in motion with greater momentum.
>
> **T.M. Hung**
> **Gold Champion**

## Initiatives in Inclusion Champion Program

**Expert-led Lectures**
Share life experiences of persons with disabilities and caregivers; explore global trends and practical approaches to workplace inclusion; facilitate interdisciplinary discussions on inclusive workplaces; enhance positive communication skills in the workplace

**Experiential Activities**
Celebrate multicultural festivals; host visually impaired judo experiences

**Workshops**
Promote TSMC's Global Inclusive Workplace Statement; facilitate dialogue among ERGs; introduce the global inclusive workplace learning framework

**Learning Videos**
Introduce ERGs and accessible facility design and proper usage


The Inclusion Champion Program encourages employees to take concrete actions and become drivers of an inclusive workplace.

# Talent Attraction and Retention

| Strategy | 2030 Goals | 2025 Targets | 2024 Achievements | |
|---|---|---|---|---|
| **Fulfill the Core Value**<br>Offer employees quality jobs and strengthen employee commitment | Conduct a Core Values Survey every two years to reinforce core values[Note 1] | - | - | |
| | - Achieve over 95% employee satisfaction with the implementation of Integrity NEW | - | Achieve 93% employee satisfaction with the implementation of Integrity NEW<br>Target: 95% | — Note 2&3 |
| | - Attain over 95% employee satisfaction with the fulfillment of Commitment NEW | - | Attain 92% employee satisfaction with the fulfillment of Commitment NEW<br>Target: 95% | — |
| | - Reach over 95% employee satisfaction with the practice of Innovation NEW | - | Reach 92% employee satisfaction with the practice of Innovation NEW<br>Target: 95% | — |
| | - Secure over 95% employee satisfaction with efforts to build Customer Trust NEW | - | Secure 97% employee satisfaction with efforts to build Customer Trust NEW<br>Target: 95% | ✓ |
| | Conduct an Employee Engagement Survey every two years to reinforce core values; Rank in the top 25% for Sustainably Engaged; rank is determined by comparing results from the Employee Engagement Survey against the Global High-Performance Norm | Rank in the top 50% for Sustainable Engagement in the Employee Engagement Survey against the Global High Performance Companies Norm | - | |
| | Maintain position top 25% among industry peers in total compensation | Maintain position above top 25% among industry peers in total compensation | Maintained position above top 25% among industry peers in total compensation<br>Target:25% | ✓ |
| | Less than 10% total turnover rate | Less than 10% total turnover rate | Total turnover rate:3.5%<br>Target: ≦ 10% | ✓ |
| | Less than 10% new hire (<1 year) turnover rate | Less than 13% new hire (<1 year) turnover rate | New hire turnover rate (<1 year):8.9%<br>Target: ≦ 14% | ✓ |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: The original target focused on Commitment. Given that all four core values form the foundation of TSMC's operations, the target scope was adjusted to encompass all four dimensions.
Note 2: This percentage represents the proportion of respondents who selected "Tend to Agree" or "Agree" among all survey participants.
Note 3: Each year, over 5,000 new employees from various generations and regions join TSMC. For dimensions where targets were not met, the Company will continue to step up cultural integration efforts to help new hires adapt quickly and grow in tandem with TSMC.

In response to the rapid evolution of technology and the emergence of a new generation of talent, TSMC remains focused on developing advanced technologies while actively cultivating its workforce. To support its global expansion and maintain a competitive edge, the Company recruited a total of 10,073 new employees in 2024 and created 7,291 quality job opportunities. By offering competitive compensation, benefits exceeding legal requirements, and a healthy, inclusive work environment, the Company ensures employees feel valued and empowered to realize their full potential. Furthermore, through newcomer care measures, TSMC helps employees quickly adapt to the workplace, continuously injecting innovative momentum into R&D, manufacturing, and customer service operations.

## Fulfill Core Values

### Ensure Core Values

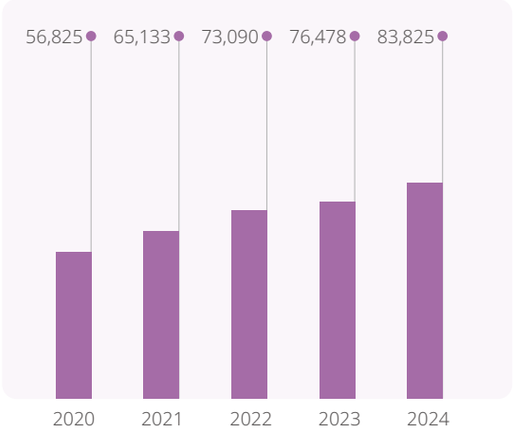
TSMC founder, Dr. Morris Chang established the company's four core values — Integrity, Commitment, Innovation, and Customer Trust. The current Chairman and CEO, C. C. Wei, is dedicated to communicating with employees through a variety of channels — including the corporate intranet, videos, and meetings — to ensure these values are implemented in daily work practices. The Company also further advances the Culture Refresh Program, which, as of 2024, has hosted over 500 case discussion workshops globally. These sessions foster a shared understanding of TSMC's core values across regions and generations, build internal cultural literacy, and help attract and retain like-minded high-caliber talent.

TSMC conducts the Core Values Survey biannually and collected a total of 71,706 valid responses in 2024, achieving a 91% response rate. The surveys cover employees from TSMC and its subsidiaries, excluding VisEra Technologies Company Ltd. due to its differing industry backgrounds. The 2024 results showed that 97% of employees were satisfied with the implementation of Customer Trust, while satisfaction levels for Integrity, Commitment, and Innovation reached 93%, 92%, and 92%, respectively. Despite falling short of the Company's 95% satisfaction target, both Commitment and Innovation improved by 2% compared to 2022. Based on the survey findings, TSMC will unveil Culture Refresh Program 2.0 in 2025 to continue fostering a high-quality work environment and implementing its core values.

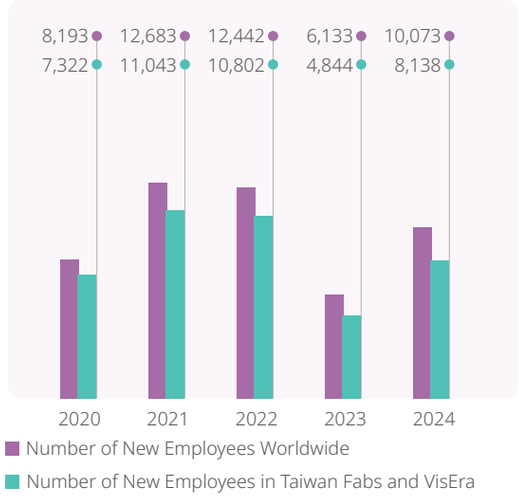
### Strong Talent Pool

TSMC is committed to becoming a company that employees can take pride in. As of 2024, the global workforce totaled 84,512 individuals, consisting of 83,825 permanent employees and 687 temporary employees in terms of employment contracts. When considering employment type, there were 84,208 full-time employees and 304 part-time employees.

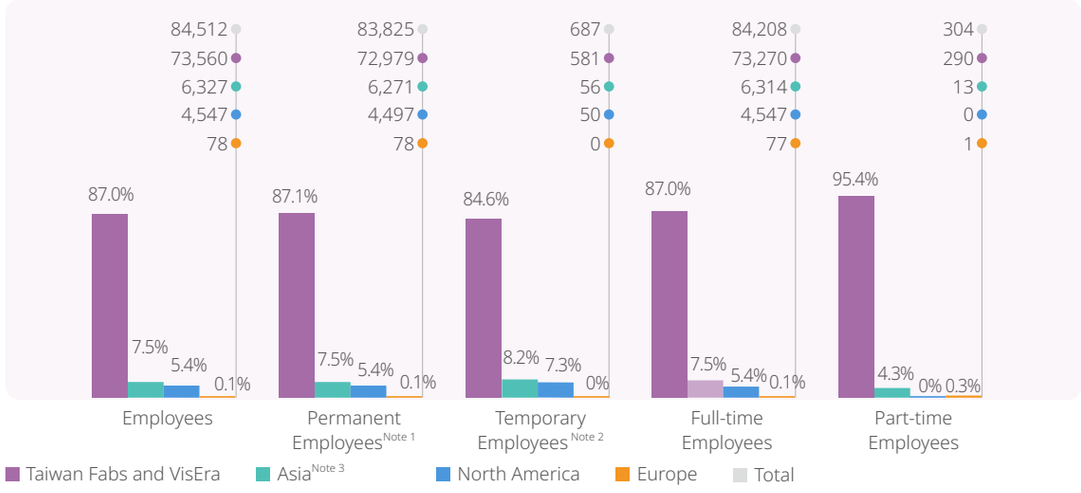
### Number of Permanent Employees Worldwide




### Number of New Employees




### Workforce Type Distribution - by Work Location




Note 1: Permanent employees refer to those who have signed contracts with no fixed term, as defined according to the GRI Standards.
Note 2: Temporary employees are those who have signed fixed-term contracts.
Note 3: Asia includes Shanghai, Nanjing, Japan, and South Korea.
Note 4: Rounded to one decimal place, the total may not equal 100%.

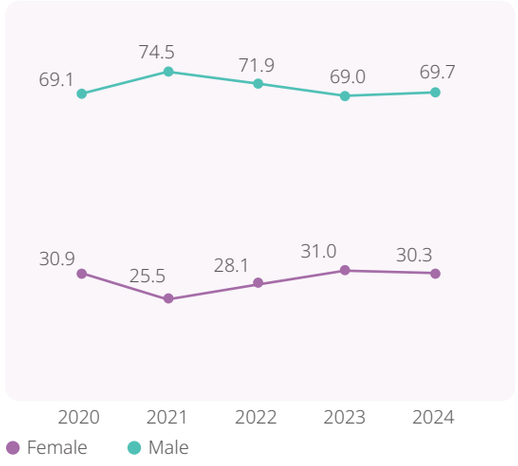
## Ratio of New Employees

### Management level Note 1

Unit: %

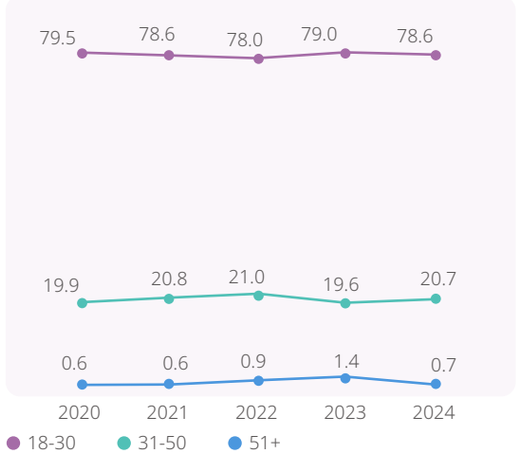

### Gender

Unit: %



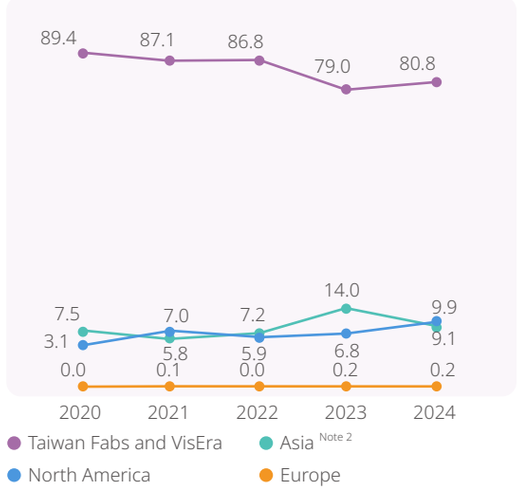

### Age

Unit: %




### Location

Unit: %




Note 1: Junior management positions include first-line managers while top management positions include Vice Presidents and higher. All other levels are classified as experienced management.

Note 2: Asia includes Shanghai, Nanjing, Japan, and South Korea.

Note 3: Rounded to one decimal place, the total may not equal 100%.

## • Strengthening Diversity in Talent Recruitment

Guided by a shared vision and values, TSMC places equal importance on character and competence in talent selection. The Company adheres to a merit-based recruitment approach and prohibits any form of discrimination based on gender, age, disability, religion, race, ethnicity, nationality, political affiliation, or sexual orientation. While prioritizing local talent in its global recruitment efforts, the Company balances advanced technology development with workforce diversity at its Taiwan fabs and subsidiary VisEra by actively seeking both professionals and recent graduates, alongside international specialists with unique expertise as part of its strategic hiring plan.

### » Support the Career Development of Female Tech Talent

To attract female specialists in STEM fields and raise the proportion of female newcomers in technical roles, TSMC continued its "Walk Together and Show Your Uniqueness" female career-sharing event in 2024, drawing 117 female university students. The Company also hosted three sessions of "Girl's Talk" for female interns, with a total of 193 participants. In addition, female engineers were invited to appear in the video "I'm a TSMC equipment engineer — Women's power at TSMC" which garnered over 1 million views. These initiatives provided opportunities for engagement between employees and university students, enabling participants to explore their potential and hone their professional skills through shared experiences. The Company also made its debut at the annual conference of the Society of Women Engineers, highlighting its flexible workplace initiatives and showcasing opportunities for women in the semiconductor industry.

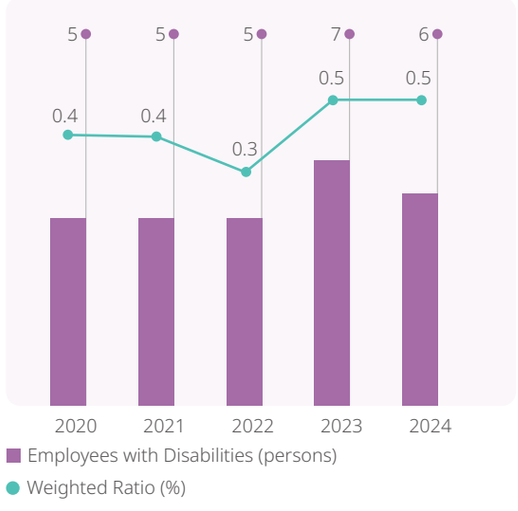
### » Disabled Employees

TSMC actively recruits and supports employees with disabilities. In 2024, it hosted its first two "Accessible Education Center Student and Counselor Visit" events, inviting employees with disabilities to share their workplace experiences. These events drew participation from 81 students and counselors across 11 schools. In collaboration with university centers for accessible education and government labor departments, the Company also organized four recruitment briefings for individuals with disabilities and took part in two government-sponsored job fairs for disabled talent, thereby expanding recruitment channels for talent with disabilities. To enable smooth workplace integration, TSMC continued to conduct the "Accessible Workplace Experience Camp" and "Accessible and Disability-Friendly Workplace Workshops." Through the guidance of occupational therapists, these programs facilitated recruitment efforts and promoted a proper understanding of working with colleagues with disabilities, thereby fostering positive interaction models. Additionally, the Company launched its inaugural online course titled "Introductory Tips for Interacting with Persons with Disabilities," enabling all employees to access knowledge on the topic without time or location constraints. In 2024, TSMC employed 499 individuals with mild to moderate disabilities and 108 individuals with severe disabilities. After weighted adjustment, the proportion of employees with disabilities stood at 1.0% annually. While TSMC's subsidiary VisEra shares the same commitment, its nature of operations hindered it from reaching the 1% target for the year, resulting in the payment of shortfall subsidies to meet the law.

## Employees with Disabilities – Taiwan


Note: Calculated based on the number of insured persons in the company stipulated by the Bureau of Labor Insurance

## Employees with Disabilities - VisEra




### » Global Internship Program

TSMC's Summer DNA Internship Program, founded on the core pillars of Development, Navigate, and Advance Offer, offers diverse learning opportunities to students worldwide. The program continues to employ bilingual instruction and has enhanced its dedicated internal website to offer rich online resources that support interns' self-directed learning. In 2024, the program engaged 813 interns, including 154 from overseas institutions and 70 international students, marking a rise of over 110% from the previous year. Participants came from 10 countries, with 282 female students, accounting for 34.6% of total interns. To address global talent deployment needs and promote cross-cultural exchange and inclusion, the Company launched its inaugural cross-cultural exchange competition, interns from various countries form mixed teams to share their perspectives on TSMC. The program also features traditional Taiwanese games and local culinary tastings to help international interns adapt to Taiwanese culture. Upon completion of the program, 544 interns met the eligibility criteria for advance offers. Among them, 307 demonstrated outstanding performance, as evaluated by their supervisors, and received advance offers, representing 56.4% of qualified participants. Of those selected, 122 were female interns, accounting for 39.7%.

### » Global Top-tier Professionals and Campus Recruitment

TSMC is actively recruiting top talent globally by partaking in major international semiconductor conferences and overseas recruitment events to establish a worldwide talent network. In 2024, TSMC partnered with 28 universities across Singapore, Malaysia, Japan, and India, holding on-site recruitment campaigns, online briefings, and career talks, where managers shared industry insights and career experiences, as well as conducted job interviews with students. In the United States, TSMC attended career fairs at 19 top universities, hosted company information sessions, and organized career networking dinners, attracting over 3,000 students. In Europe, the Company engaged with institutions of higher education and government agencies in the Czech Republic and Germany to lay the groundwork for future collaborations and participated in campus recruitment fairs and hosted information sessions in Poland. To promote international exchange and talent development, TSMC offers the DNA Summer Internship Program, providing professional growth opportunities for young talent worldwide.

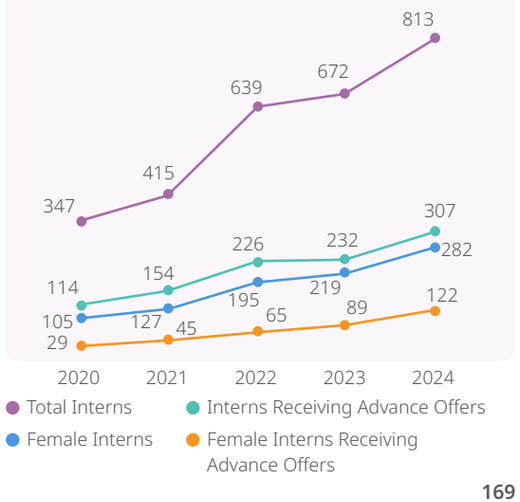
### » Apprenticeship Program

To cultivate talent for the semiconductor industry and create job opportunities in Arizona, TSMC Arizona rolled out a technician training system through an apprenticeship initiative in 2024. The program aims to recruit talent in four categories: facility management, equipment maintenance, process engineering, and wafer manufacturing. Scheduled to commence in April 2025, this program will collaborate with community colleges and local educational institutions to develop approximately 130 technical specialists through on-the-job training, technical mentorship, and personal and professional development initiatives. Participants have opportunities to earn certification, professional technician credentials, and associate degrees, with TSMC Arizona offering wage and tuition assistance.

### » Assimilate Foreign Employees

In 2024, the Company employed 1,614 foreign nationals, representing 1.9% of its global workforce, with foreign employees constituting 4.5% of all new hires. To facilitate swift workplace adaptation for international staff, TSMC offers Taiwan relocation support, dependent housing assistance, children's education guidance, exclusive newcomer orientation, and rewards for receiving Chinese certification. Additionally, TSMC extends invitations to foreign employees and their families to join employee resource groups such as Global Family@tsmc and the India Cultural Study Club, and organizes cultural celebrations including American Thanksgiving and Indian Diwali. The Company has also established a Cultural Diversity Corridor and Multi-faith Spaces where employees can perform religious rituals or engage in quiet activities such as meditation. In 2024, TSMC launched an Intercultural Intelligence Program, which consisted of 73 in-person courses and 15 online resources, making these courses available to all employees starting in June 2024 to foster effective communication and collaboration across diverse cultural backgrounds. Throughout 2024, the in-person courses delivered 186 sessions with 2,721 total participants and achieved a 96.3 recommendation score; the online resources registered 2,805 completions. Through these learning initiatives, the Company aims to equip employees with positive mindsets for navigating diversity in cross-cultural work environments.

## Interns Receiving Advance Offers in Taiwan Fabs and VisEra



The DNA Summer Internship Program helps international interns adapt to Taiwanese culture through traditional games.

The Cultural Diversity Corridor aims to promote understanding and mutual respect among employees from diverse cultural backgrounds.

Women's career sharing events help students rediscover themselves and build confidence.

Overseas colleagues integrate into the TSMC family.

## Enhance Employee Engagement

### • Two-Way Communication Channels

TSMC values employee feedback and has established effective communication channels to encourage the sharing of suggestions, which are essential for improving management practices. Additionally, the Company strengthens interaction and communication between management and employees to enhance employees' sense of belonging and cohesion with TSMC.

### Internal Communications

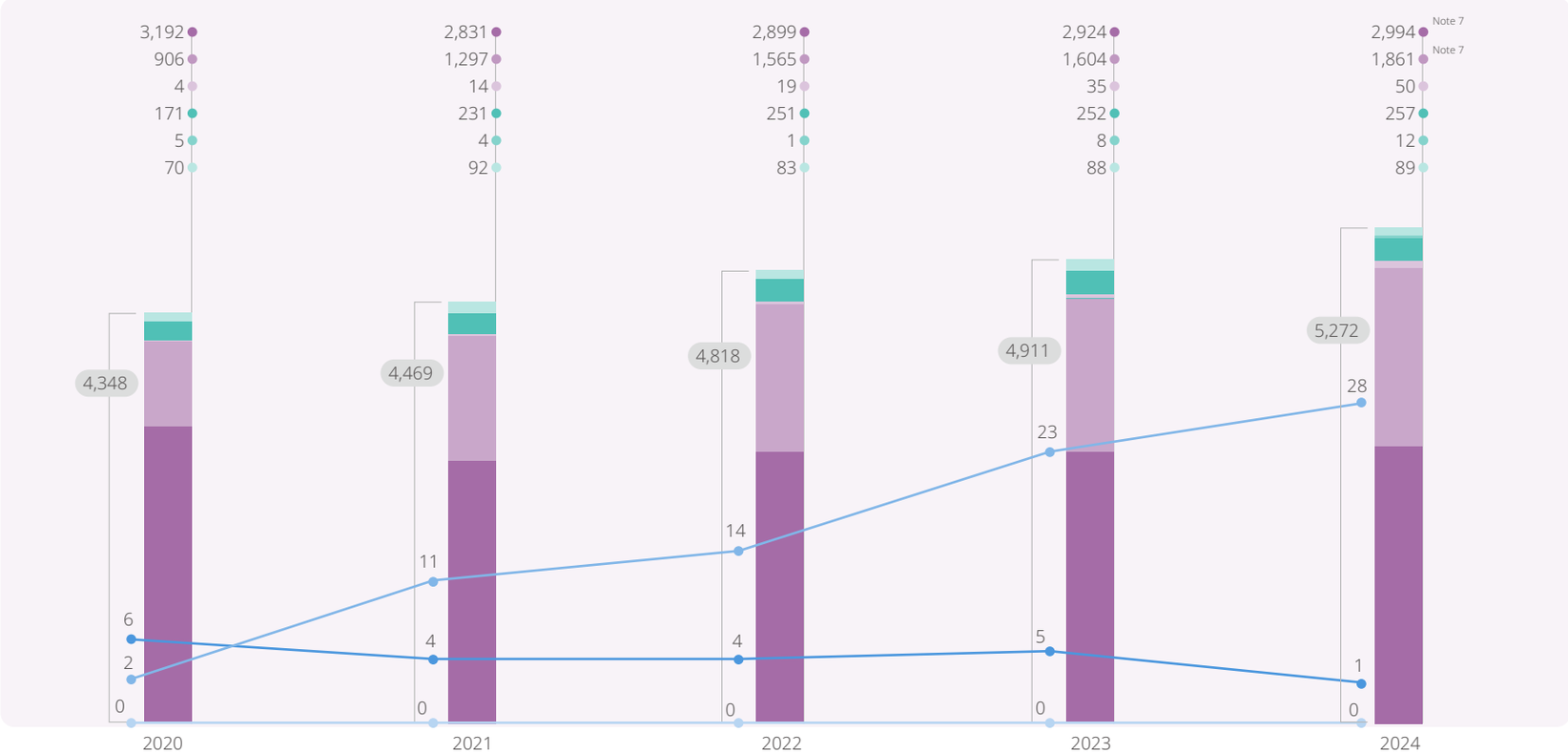
| | Channels | Person in Charge | |
|---|---|---|---|
| Employees | **Face-to-Face Meetings**<br>• Chairman's/CEO's communication meeting<br>• Silicon Garden Meeting (labor-management meeting)<br>• Communication meetings in individual functions/divisions<br>• Functional activities | Managers of All Levels | Board of Directors and Management Team |
| | • Employee portal<br>• Employee survey<br>• HR area service team<br>• eSilicon Garden Newsletter | Human Resources | |
| | **Employee Voice Channels**<br>• Ombudsman System<br>• Employee Opinion Box<br>• Whistleblower procedures<br>• Fab Caring Circle<br>• Irregular Business Conduct Reporting System<br>• Sexual Harassment Investigation Committee<br>• Employee Voices for Silicon Garden Meeting (labor-management meeting) | System/ Committee Chair/ Vice President | |

## • Employee Feedback Channels

In 2024, TSMC received 5,272 employee feedback and grievance submissions, including 50 complaints through the Sexual Harassment Investigation Committee, 257 via the Ombudsman System, 12 under the Whistleblower Procedures, and 89 through the Irregular Business Conduct Reporting System . All cases were promptly addressed, responded to, and monitored by designated departments.

Of the sexual harassment complaints, 28 were substantiated upon investigation by the committee. Employees engaging in improper conduct received disciplinary actions ranging from job reassignment to termination, depending on the severity of violations. The Company also rendered relevant assistance and protection according to complainants' needs. In response to government regulatory updates, TSMC in 2024 introduced a new course titled "TSMC Human Rights Policy- Build a Workplace Free of Sexual Harassment " which covers common forms of potential harassment behaviors while emphasizing protective mechanisms and reporting channels available to employees experiencing such situations. Furthermore, one case of professional ethics violation was confirmed upon investigation. Those involved may face punishments including termination, probation, removal from management positions, or bonus cancellation based on the nature of the misconduct. The Company continues to promote ethical standards through educational training programs. In 2024, all 77,293 designated employees completed the " Annual Business Ethics and Regulatory Compliance Course (including Personal Data Protection Act-related contents)," achieving a 100% completion rate.

### Cases Reported through Employee Voice Channels[Note 1]




Note 1: Fab Caring Circle, Employee Opinion Box, Ombudsman System, Sexual Harassment Investigation Committee, Irregular Business Conduct Reporting System cover all TSMC facilities.
Note 2: Addresses employee's concerns regarding work and personal lives, primarily catering to direct labor.
Note 3: Offers a channel for employees to raise issues and provide feedback on their work and work environment.
Note 4: Offers a dedicated reporting channels to promote a harassment-free workplace.
Note 5: Provides a reporting avenue for significant management, financial, auditing, and ethical issues, overseen by the Audit Committee.
Note 6: For reporting channels related to violations of professional ethics, significant management misconduct, workplace violence, and other incidents, the reported cases include both external reports and internal employee reports.
Note 7: Starting from 2024, the number of submissions to the Fab Caring Circle and Employee Opinion Box at each site will include reports from TSMC's overseas fabs.

## Respect Freedom of Association and Hold Regular Labor-Management Meetings

In addition to offering diverse channels for employee feedback, TSMC fully respects all employees' freedom of association. In its fabs in Taiwan, the Company conducts legally mandated "Silicon Garden Meetings" (labor-management meetings), with new meetings convened for Fab 20, Fab 12B, and Fab 22 in response to operational expansion in 2024. Currently, TSMC operates 25 Silicon Garden Meeting units across Operations, R&D, and Support organizations, collectively covering 87.3% of its global workforce.

In regularly scheduled Silicon Garden Meetings, both corporate and employee representatives are invited to participate. During these sessions, the Company provides operational updates, while any changes to work rules affecting employee rights require approval from both labor and management representatives. Employee representatives also share feedback collected from colleagues, enabling two-way communication on matters of concern. Through balanced representation in these meetings, TSMC believes that it can further strengthen effective communication between the management team and employees.

## 2024 Improvement Measures

**Establish an open-style management system to foster a respectful work environment, encourage employees to share ideas, and support managers in accepting feedback and responding appropriately**

- **Open Communication:** Held Inclusive Leadership Workshops and cross-level meetings to better understand employee challenges. Strengthened the Buddy Program to support new employees in adapting to the work environment
- **Respectful and Trust-Based Management Culture:** Conducted TSMC Caring training for harassment-free workplace to raise employee awareness of a friendly workplace and prevent misconduct. Additionally, adjusted meeting practices, launched Mistake-Tolerant Culture Workshops, and established a reward platform to encourage innovation

**Enhance work efficiency and effectiveness by helping employees maintain the energy needed for daily tasks**

- **Digital Transformation:** Developed and deployed an expert system to boost overall operational efficiency
- **Employee Wellness Programs:** Reduced inefficient work processes to avoid prolonged presence in the workplace

**Motivate employees through non-monetary rewards and help remove work obstacles to improve retention**

- **Non-Financial Rewards:** Planned and implemented initiatives such as the "Instant Reward System," "Fab Honor Roll," and "Innovation and Teamwork Awards"
- **New Hire Retention:** Facilitated onboarding and integration through the Buddy Program, with continuous support for new employees

## • Employee Engagement

Dedicated to a people-centric corporate culture, TSMC has conducted the Employee Engagement Survey every two years since 2021, with the goal of ranking in the top 25% for Sustainable Engagement in the 2030 survey against the Global High Performance Companies Norm. Despite the 2023 survey results showing that Sustainable Engagement did not reach the top 25% target, there was a 2-percentage-point improvement compared to 2021. For 2024 improvement actions, please refer to the table titled "2024 Improvement Measures." The next survey is scheduled for 2025.

## Compensation and Benefits

### • Provide Competitive Compensation Packages

TSMC's compensation package includes a base salary, allowances, cash bonuses, and profit-sharing schemes. In 2024, the average annual compensation of a newly graduated TSMC engineer with a master's degree at Taiwan fabs and VisEra was higher than NT$2 million. The average compensation of direct laborers was higher than NT$1 million, which is four times the minimum monthly wage in Taiwan. Compared to the previous year, the average and median salaries for full-time employees at the Taiwan fabs both increased in 2024.

In addition to cash compensation, starting from 2022, regular employees of TSMC and its 100%-owned subsidiaries may participate in the Global Employee Stock Purchase Plan and in 2024, extended the coverage to include all permanent employees of majority-owned overseas subsidiaries. TSMC offers a 15% stock purchase subsidy, employees are encouraged to participate in the Company's long-term success. The program has achieved a participation rate of over 85% globally.

The Company has increased total compensation and benefits for employees from around NT$140.8 billion to NT$301.8 billion between 2019 and 2024, and average compensation and benefits per employee from NT$2.47 million to NT$3.57 million during the same period. According to the Employee Engagement Survey conducted in 2023, 84% of colleagues believe that the Company provides reasonable overall rewards

and compensation. This result is better than that of global high-performance companies (66%) and high-tech companies (61%) participating in the Willis Towers Watson survey, indicating that besides offering competitive compensation in the market, TSMC's rewards are also recognized by colleagues as being reasonable.

In 2024, TSMC's revenue and profits continued to grow steadily. The cash bonuses and profit-sharing schemes allocated for Taiwan fabs were valued at NT$140,592.56 million, and the annual salary adjustment also took place as planned in 2024.

### » Reward Programs

The incentive program for TSMC facilities in Taiwan is implemented over two years. Cash bonuses are paid quarterly to provide timely incentives, and profit-sharing is paid annually in the following year to encourage long-term service and continuous contribution. The incentive programs of overseas regions are designed in consideration of local cultures and markets and are given out through annual cash bonuses or long-term one- to three-year schemes. In 2024, the median total compensation of TSMC employees globally (excluding pension and other benefits) was approximately NT$2.46 million, which was 1/384 of the CEO's total compensation. The median of the CEO's annual total compensation percentage increase and the annual average total compensation percentage increase was around 49:1.

### » Corporate Officer Shareholding Guidelines

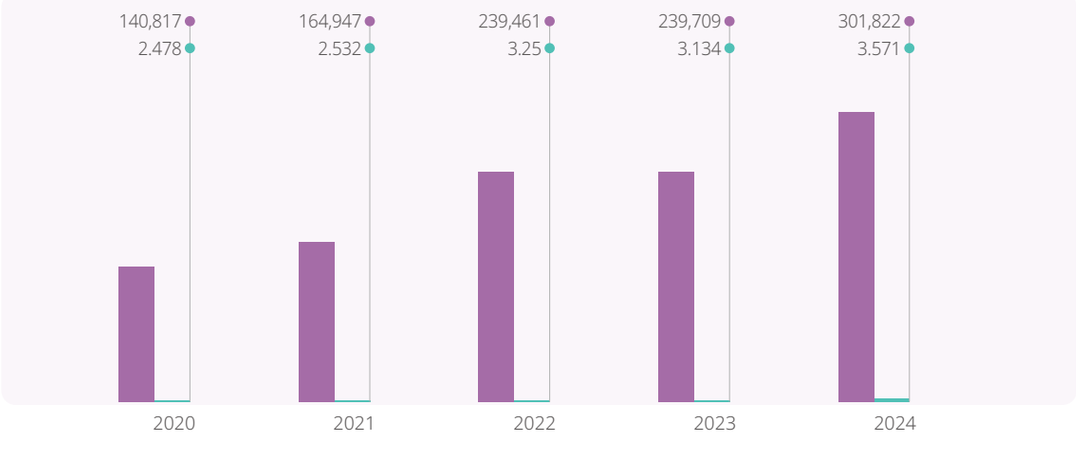
TSMC believes that the long-term ownership of company shares by corporate officers helps align their interests with those of all shareholders; therefore, the Company formulated the Corporate Officer Shareholding Guidelines in 2020. The required value for the Chairman, CEO, and other corporate officers' holding of TSMC shares is proportional to their annual base salary. Officers shall achieve the required value within three years of their appointment and maintain the required value for the entire period of their employment.

### » The Linkage to the Executive Compensation and Performance Evaluation

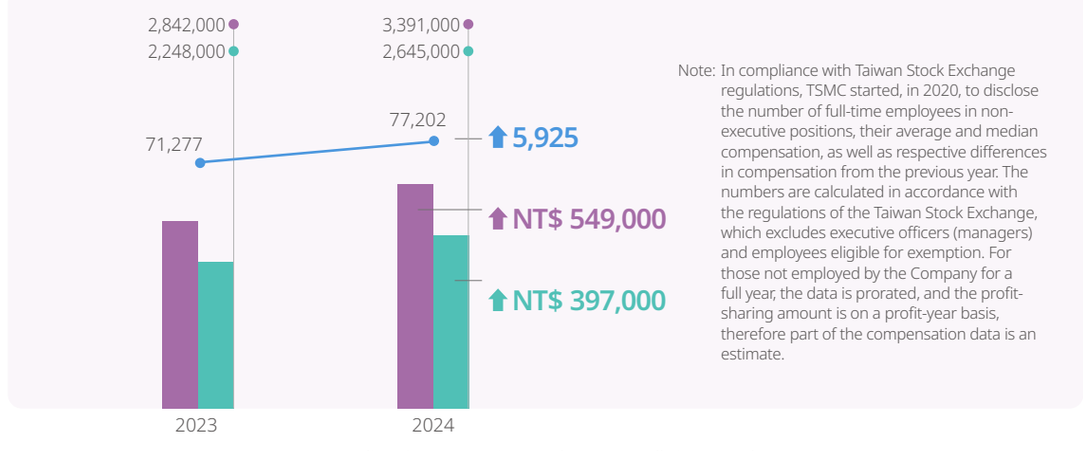
The compensation of TSMC's CEO and vice presidents is governed by the Company's bonus policy, which covers the achievement of both corporate operational goals and personal annual objectives. Corporate goals include financial indicators and non-financial indicators. Personal annual objectives include operational goals and ESG achievements. The Employee Restricted Stock Awards provided has a vesting period of three years (for details, please refer to "4.6.1 Status of Employee Restricted Stock" in the Company's 2024 Annual Report). The corporate performance indicators are the relative total shareholder return (TSR) of the company compared to the TSR of the S&P 500 IT Index, with the company's ESG achievements as a modifier. Through these two clear quantitative indicators, we strengthen management's long-term and continuous creation of shareholder value while improving ESG performance, which strongly correlates with the Company's overall performance.

## Compensation and Benefit Expenses

Unit: NT$ Million




## Average and Median Compensation




Note: In compliance with Taiwan Stock Exchange regulations, TSMC started, in 2020, to disclose the number of full-time employees in non-executive positions, their average and median compensation, as well as respective differences in compensation from the previous year. The numbers are calculated in accordance with the regulations of the Taiwan Stock Exchange, which excludes executive officers (managers) and employees eligible for exemption. For those not employed by the Company for a full year, the data is prorated, and the profit-sharing amount is on a profit-year basis, therefore part of the compensation data is an estimate.

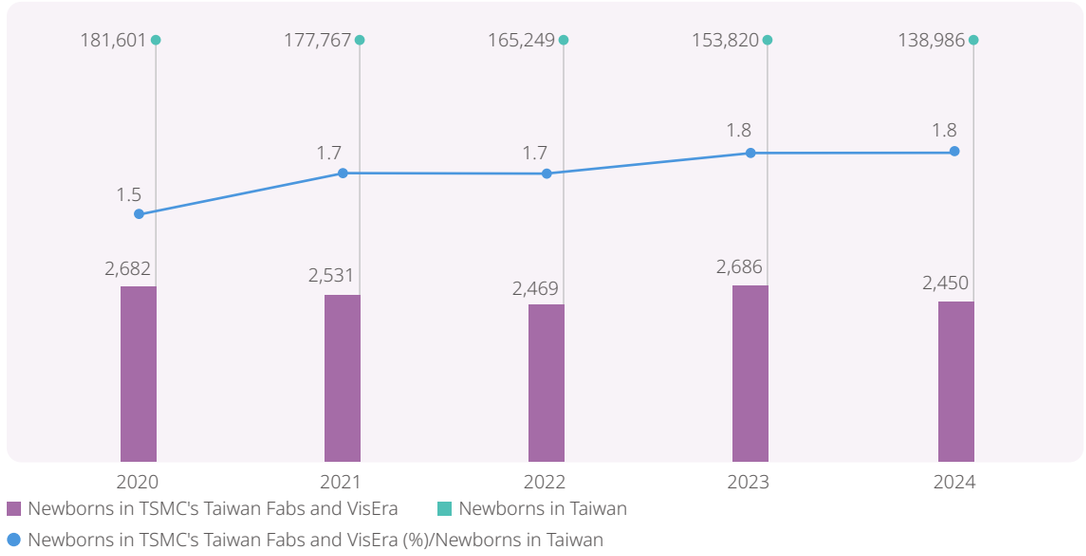
## • Providing Comprehensive Benefits

### » Maternity Benefits

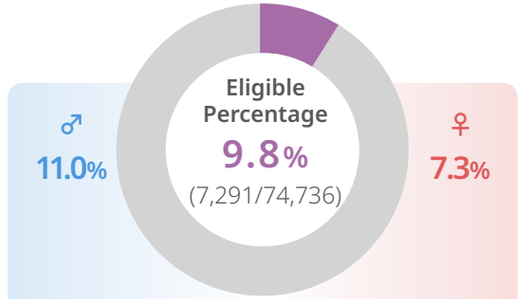
TSMC provides lactation rooms to support the breast milk collection needs of female employees. Besides providing parental leave in accordance with local laws and regulations for employees after childbirth, the Company also offers a comprehensive leave management system so that employees have flexibility in making use of their vacation days to take care of their children. In 2024, a total of 7,291 employees in Taiwan and VisEra were eligible for unpaid parental leave, constituting 9.8% of employees. Among them, 631 employees applied for unpaid parental leave, with an expected return-to-work figure of 656 for the entire year. Out of these, 572 employees expected to returned to work either on schedule or in advance, resulting in a return to work rate of 87.2%. As for the retention rate after returning, of the 552 employees who returned to work in 2023, a total of 483 remained at TSMC as of the end of 2024, achieving an 87.5% retention rate .

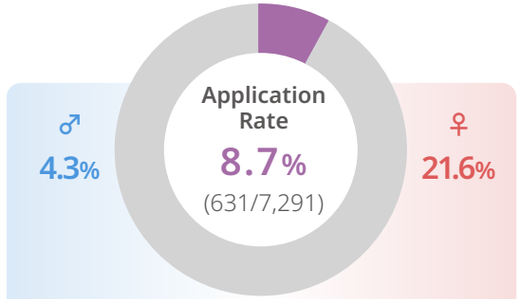
In 2024, the number of employees in TSMC's Taiwan fabs and VisEra aged between 20 and 64 accounted for 0.49% of Taiwan's population of the same age group. During the same time, the number of employees' newborns was 2,450, which was 1.8% of the total number of newborns in Taiwan, an example of the Company's outstanding benefits in mitigating the impact of sub-replacement fertility in Taiwan.

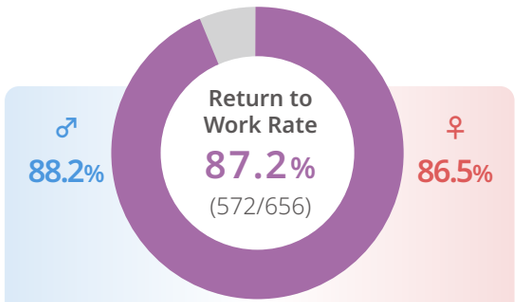
### Newborns in TSMC's Taiwan Fabs and VisEra

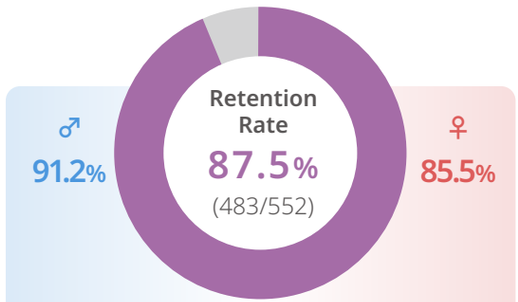



### Unpaid Parental Leave in TSMC's Taiwan Fabs and VisEra - Application, Return to Work, and Retention Rate



## » TSMC ChildCare Benefit Program 3.0

To increase support for employees' family responsibilities, the Company started to plan the TSMC ChildCare Benefit Program 3.0 in 2024, with official implementation at its Taiwan fabs starting in 2025. The program delivers corresponding resources for every stage — from pre-pregnancy, pregnancy, and childbirth to early childhood (below age 1, ages 2–6, and under age 12). It also offers fertility education sessions and parenting consultation services, aiming to create a family-friendly workplace environment.

## » Establish TSMC Kindergarten

TSMC supports employees in balancing family responsibilities and career development by operating four on-site kindergartens across its fabs in Hsinchu, Taichung, and Tainan. These facilities accommodate up to 528 preschool children aged 2 to 6, providing a safe and high-quality learning environment, with courses built around four key pillars: theme-based science education, immersive food and agricultural education, life-oriented language education, and interactive parenting education. Moreover, the Company offers childcare services from 7 a.m. to 8 p.m., aligning with employees' work schedules to help enhance their work-life quality.

Dedicated to improving the educational performance of its kindergartens, TSMC has earned recognition from both parents and external stakeholders. The Company prioritizes enrollment for employees' children and, starting in 2023, also opened registration to children of employees from its subsidiaries and affiliated companies. In 2024, enrollment further expanded to include children of staff from the Hsinchu Science Park Bureau, National Yang Ming Chiao Tung University, National Tsing Hua University, and neighboring companies, contributing to the shared prosperity within the community.

## » Solid Pension System

TSMC offers a defined benefit pension plan in compliance with Taiwan's Labor Standards Law and has established a Labor Pension Fund Supervisory Committee. Since July 1, 2005, the Company has provided a defined contribution plan under the Labor Pension Law while instituting employee retirement regulations based on local laws in overseas operational locations. The supervisory committee holds quarterly meetings as required by law to oversee pension affairs and deposit funds into pension reserves according to individual retirement plans. Meanwhile, annual pension actuarial assessments are conducted by actuarial consulting firms to meet disclosure requirements for listed companies, ensuring adequate pension allocations to protect employees' future retirement benefits. For specific contribution rates and amounts, please refer to TSMC's Consolidated Financial Statements for details.

## Overview of TSMC Childcare Benefit 3.0

### Pre-pregnancy
- 1 day of fertility treatment leave for each treatment NEW
- Up to 1 day of leave for egg freezing NEW

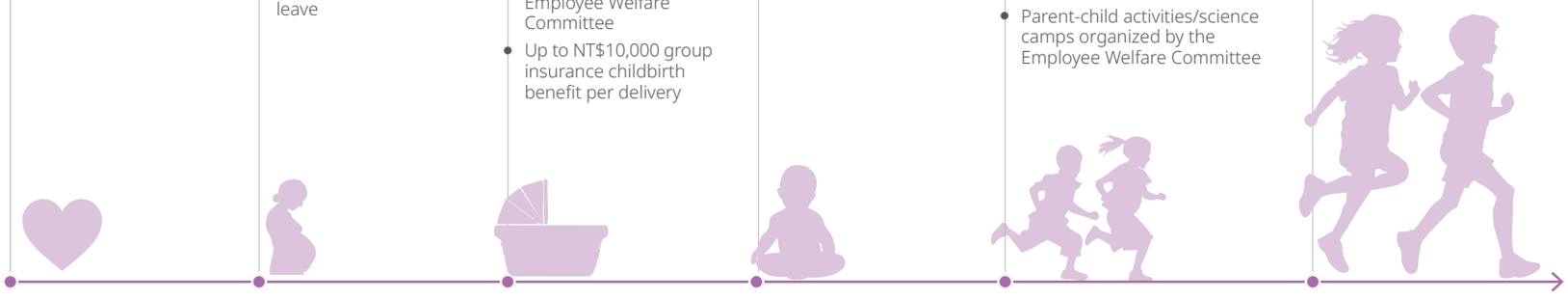
### Pregnancy
- Designated parking spaces for pregnant women
- 7 days of prenatal check-up leave
- 10 days of paternity leave

### Childbirth
- 12 to 20 weeks of maternity leave, based on the number of births
- NT$10,000 childbirth allowance from the Employee Welfare Committee
- Up to NT$10,000 group insurance childbirth benefit per delivery

### Under 1
- Set up lactation rooms
- Apply for day shift to accommodate breastfeeding needs

### Under 6
- Up to 7 days of childcare leave per year NEW
- 10 days of adoption leave within 1 year of adoption NEW
- Establish kindergartens in H/TC/T sites
- Parent-child activities/science camps organized by the Employee Welfare Committee

### Under 12
- Up to 7 days of WFH per year NEW



## Pension Contributions and Reserve Status

### Defined Benefit Plans

In Taiwan facilities and VisEra, pensions are calculated based on employees' years of service and average salary for the last six months before retirement, in accordance with the Labor Standards Law. The pension contribution amount is remitted to the Labor Pension Fund Supervisory Committee, which deposits it in a dedicated account at the Bank of Taiwan under the committee's name

**Pension Reserve Status in 2024**

- Taiwan facilities and VisEra contribute 2% of total monthly employee salaries to the Employee Pension Fund
- As of the end of 2024, the fair value of plan assets for Taiwan facilities was NT$ 10,751.503 million. In accordance with the above regulations, the amount recognized as expenses by TSMC in 2024 was NT$275.68 million. The amount to be contributed in the future as required by law has been accounted for as an accrued pension liability, totaling NT$ 7,580.66 million as of the end of 2024
- As of the end of 2024, the balance in the old labor pension system reserve account at VisEra was NT$ 3,639,523

### Defined Contribution Plans

In Taiwan facilities and VisEra, employee retirement regulations are established according to the Labor Pension Act, and funds are contributed to individual pension accounts at the Bureau of Labor Insurance. Overseas subsidiaries also contribute funds at a specific rate of total monthly salaries of local employees to pension management entities

**Pension Reserve Status in 2024**

- In Taiwan facilities, funds were contributed at 6% of employees' monthly salaries to their individual labor pension accounts. The total pension contributed by all global entities, including overseas subsidiaries, recognized as expenses in 2024, amounted to NT$5,932,269,000

## New Employee Assimilation and Retention

### • New Employee Adaptation Program

To accelerate the integration of new employees and improve retention rates, TSMC continued its New Employee Adaptation Program in 2024. This program, structured around "workplace dynamics, communication, and stress management," delivers in-person courses titled "New Employee Success" for those who have been with the Company for four months but less than a year. This course aims to help newcomers grasp workplace dynamics, effective communication skills, and strategies for workplace adjustment. In 2024, a total of 88 sessions were held with 2,801 participants, achieving an average satisfaction score of 96 points. Additionally, the online lectures, "Workplace Soft Skills for Generation Z," provide guidance on stress management, techniques for cultivating a growth mindset, and strategies to tackle workplace challenges. A total of 4,601 completions were recorded, with the course receiving an effectiveness rating of 96 points.

### • New Employee Support Initiative

To support new employees in integrating into the organization and to provide timely resources, the Company administers a multilingual WeCare Survey — available in Traditional Chinese, Simplified Chinese, English, and Japanese — to regularly gauge how new employees are adapting across global sites. The survey is complemented by AI HR chatbot Bonnie, which offers learning resources and counseling information through online conversations and a user-friendly interface, helping newcomers quickly access the information they need. In 2024, the WeCare Survey recorded 28,937 self-initiated responses from new hires, while Bonnie facilitated 261,012 conversations — a 71% increase from 2023.

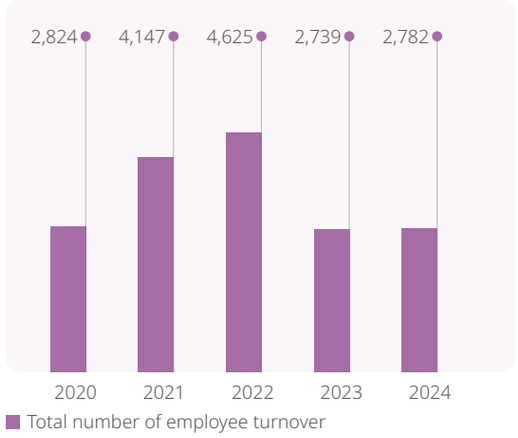
### • Buddy Program

Buddies play a crucial role in supporting new employees in adjusting and staying with the Company. The in-person course, "The 3 Key Factors of Being a Good Buddy" equips buddies with the right mindset, core skills, and empathy techniques to effectively support new employees' growth. In November 2023, TSMC launched the Buddy Management System (BMS), enabling managers to assign certified buddies — who have undergone personality assessments and completed required training courses — to assist new employees. In 2024, the Company integrated the BMS with the AI HR chatbot Bonnie across its Taiwan facilities to optimize process efficiency by reminding managers to complete Buddy assignments promptly. That same year, Buddy training courses and the BMS were expanded to overseas subsidiaries, including TSMC(China), TSMC(Nanjing), TSMC Arizona, and JASM. By the end of 2024, TSMC had fostered a total of 13,144 certified buddies globally.

## Maintain Healthy Turnover Rate

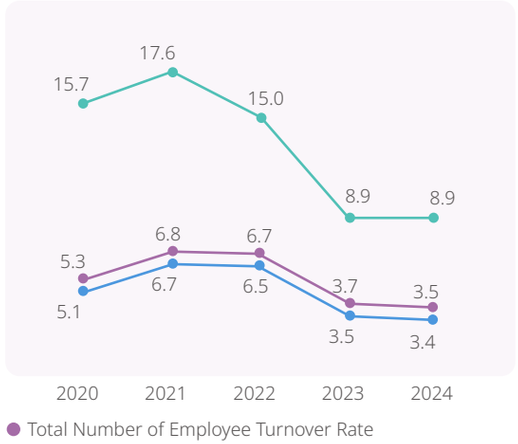
Influenced by overall economic conditions, the Company's overall employee turnover rate stood at 3.5% in 2024, a 0.2 percentage point decrease from 2023, while the one-year turnover rate for new hires remained consistent at 8.9%. TSMC will continue to implement newcomer orientation training and support measures to retain outstanding talent and foster mutual growth.

### Total number of employee turnover




### Employee Turnover Rate

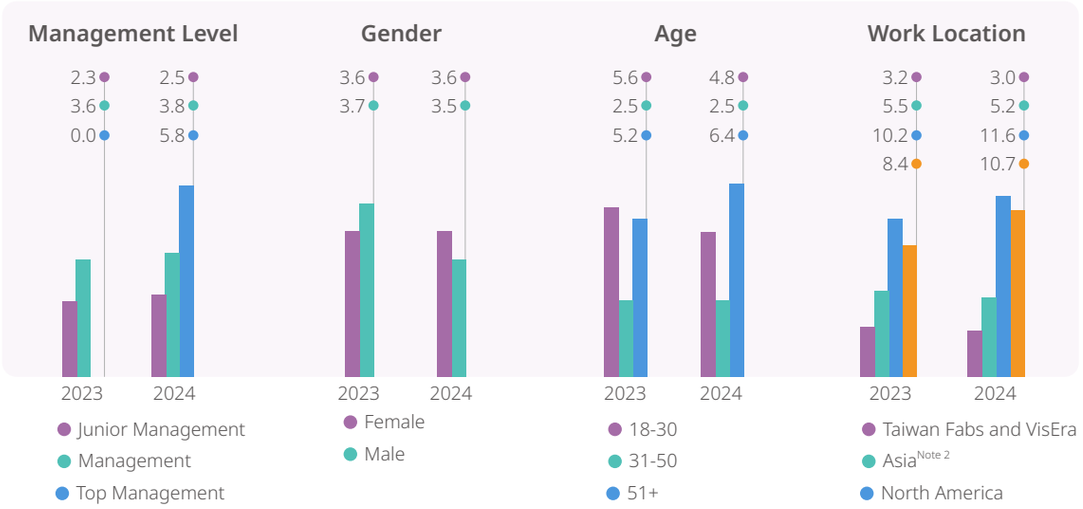
Unit: %




Note: Starting from 2021, the new hire turnover rate (<1 year) includes data from VisEra.

### Turnover Rate - by Management Level, Gender, Age and Work Location Note 1

Unit: %




Note 1: TSMC's turnover rate calculation includes retirements.
Note 2: Asia includes Shanghai, Nanjing, Japan, and South Korea.

# "TSMC Family Day,""Open House Family Day" Creates Mutual Benefits for Employees, Families, and Communities

TSMC has long organized TSMC Family Day outings, inviting employees and their families to enjoy time together at theme parks. In 2024, the TSMC Family Day events drew 92,985 participants — an 8% increase from the prior year.

To strengthen the bond between employees and their families and foster a workplace filled with belonging and happiness, TSMC launched the "Open House Family Day" in 2024, encouraging all organizations to invite employees' family members to visit the Company and experience their loved ones' daily work life. In addition to the enthusiastic response from TSMC's fabs in Taiwan, overseas fabs also embraced this program by designing a wide array of activities suited to local cultures. By the end of 2024, 31 organizations across the globe have held a total of 60 Open House Family Day events, attracting over 17,000 participants.

In Taiwan, family members toured the TSMC Museum of Innovation to learn semiconductor basics, joined challenge games to explore the campus, and even suited up in cleanroom gear to observe the wafer manufacturing process firsthand — experiencing the workday through employees' eyes. At the end of the event, employees and their families created sustainable keepsakes together: bonsais made from trimmed branches on campus, or upcycled gifts crafted from copper, cobalt, and cryolite recovered from recycled wastewater — mementos of a fulfilling and inspiring day. Overseas fabs incorporated local traditions and built closer ties with surrounding communities. For instance, TSMC (Nanjing) held a charity sale featuring artwork by students from Wujiang School, while JASM welcomed local residents to learn how TSMC protects groundwater. These activities promoted deeper engagement between families, the community, and the Company — strengthening a collective sense of mutual well-being.

TSMC will continue promoting both types of family engagement events to strengthen bonds between employees and their loved ones and build a more supportive workplace.

> Thank you for organizing the Family Day — it gave my parents the chance to visit the place where I've worked for 27 years. They were so proud to see my workplace and to be part of the TSMC family.
>
> **TSMCer**

> I didn't realize my son was a hero protecting the planet — I'm so proud of him!
>
> **TSMCer's Family Member**

TSMC (China) employees demonstrate their preservation of traditional culture through personal participation.

TSMC Arizona employees share semiconductor knowledge with their children.


TSMC employees and their families enjoy an "Open House Family Day."

# Talent Development

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Unleash Employees' Potential and Innovation**<br>Enable self-learning and create positive impact to the Company and society | Achieve an annual average of 100 hours of learning in employees, including 12 hours dedicated to non-technical skills training [Note 1] NEW | Achieve an annual average of 92 hours of learning in employees, including 7 hours dedicated to non-technical skills training [Note 1] NEW | Achieved an annual average of 100.5 hours of learning in employees ↑<br>Target: 90 hours |
| **Equip Employees with Future Capabilities**<br>Prepare employees with skills needed for the future and build a talent pool | Fill over 80% of manager positions through internal promotions | Fill over 80% of manager positions through internal promotions | Filled 88.7% of manager positions through internal promotions ✓<br>Targets: ≧ 80% |
| | Fill over 50% of vacancies through internal transfers | Fill over 50% of vacancies through internal transfers | Filled 58.1% of vacancies through internal transfers ✓<br>Targets: ≧ 50% |
| | 60% completion of the talent pipeline within two years for fab directors/directors | 50% completion of the talent pipeline within two years for fab directors/directors [Note 2] NEW | Reviewed 97.6% of the talent pipeline for fab directors/directors ↑<br>Targets: 95% |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: TSMC has introduced a new target for non-technical skills learning hours to emphasize the equal importance of non-technical skills and technical training in talent development.

Note 2: As of 2024, the Company's talent pipeline assessment for fab directors/director and above has reached nearly 100%. To support future growth and development amid its global expansion and increasing job positions, TSMC will adjust its targets starting in 2025.

TSMC remains committed to its People Vision by inspiring employees' best performance and establishing a stable talent supply system to ensure sustainable business growth. To fulfill this vision, the Company outlined two key strategies based on its "Talent Development Model": "Unleash Employees' Potential and Innovation" and "Equip Employees with Future Capabilities."

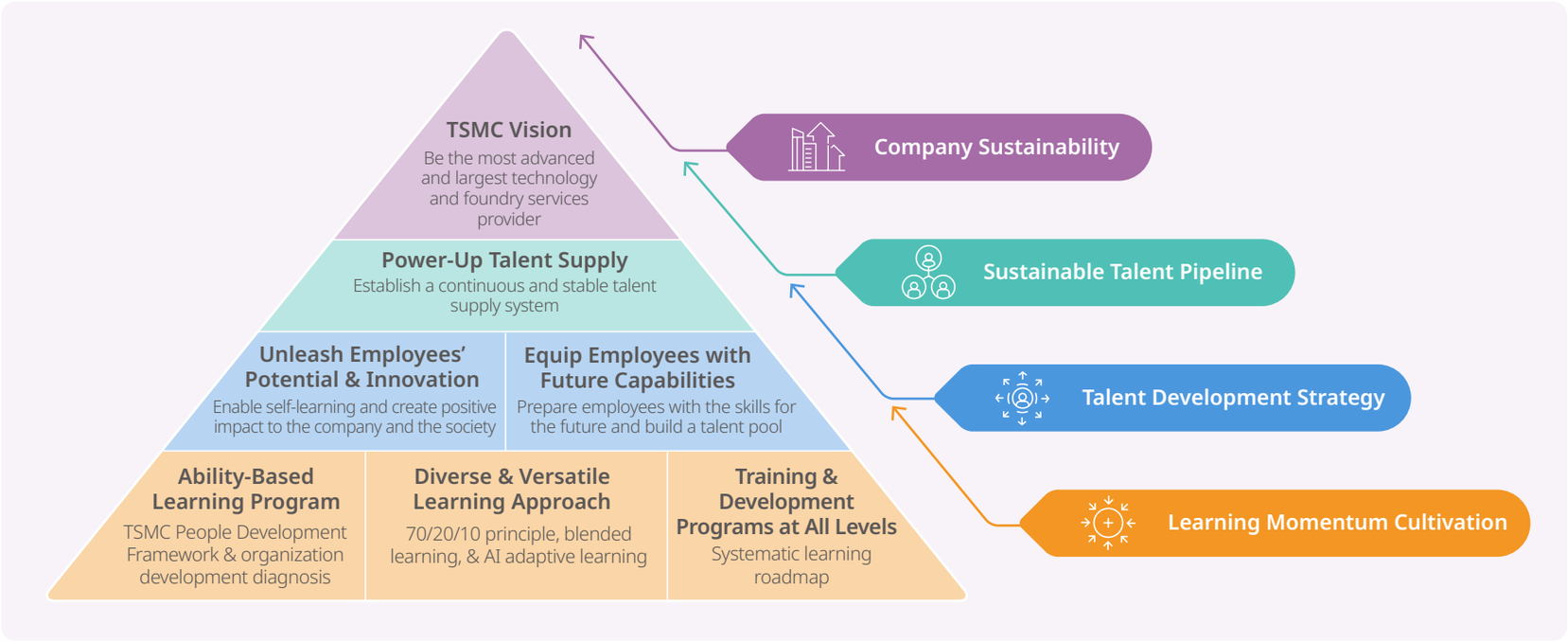
## Unleash Employees' Potential and Innovation

To motivate employees to release their potential and drive innovation for long-term individual and organizational development, TSMC provides diverse learning resources and channels. The Company encourages employees to create personalized learning plans and strengthens their self-directed learning through a variety of learning programs. For personal effectiveness, employees can voluntarily partake in the Personal Effectiveness Program, which focuses on four general capabilities: innovation, performance achievement, teamwork, and learning agility. In 2024, the program offered 237 in-person courses with a total of 6,400 participants. In terms of language learning, employees can assess their proficiency through testing and sharpen their English skills in listening, speaking, reading, and writing through a combination of business English workshops, live online sessions, E-Learning, and one-on-one English consultations. In 2024, the Language Learning Program attracted 82,652 trainees. The Company also designed elective courses for managers, featuring local and international experts to refine their leadership and decision-making capabilities. The Manager Elective Program delivered 127 in-person courses, engaging 3,402 participants. TSMC aims to promote employees' self-directed learning through these resources, creating positive impacts for both the Company and society. In addition, TSMC has developed its own generative AI, "tGenie," designed to empower employees to leverage AI tools for efficiently resolving diverse workplace challenges. This not only enhances work efficiency but also accelerates technical learning and knowledge accumulation, further fostering professional growth and the cultivation of innovative capabilities among its talent.

## Equip Employees with Future Capabilities

Proactively cultivating employee capabilities and building talent pipelines play a critical role in driving TSMC's business growth. To equip engineers with the necessary skills and knowledge, the Operations organization's Engineer Training Committee designs phased learning roadmaps offering diverse courses in regulations, technical skills, management, and personal effectiveness for different career stages, ensuring continuous talent development. In 2024, the program targeted 58,316 employees, achieving a 100% participation rate and recording over 1,042,888 total attendances. To cultivate future global R&D leaders, TSMC's R&D organization rolled out an intensive one-year program centered on "leadership, strategic thinking, and innovation," combined with project implementation to develop cross-departmental collaboration abilities among mid and senior-level talents. A total of 97 trainees participated in the program, contributing to 286 cumulative training hours. The Corporate Information Technology organization also prepared department managers for the next level of strategic planning and decision-making. The courses focused on properly framing problems, understanding root causes through effective questioning, and exploring viable solutions. Upon completion, 68 participants were required to present annual strategic reports to demonstrate their corporate strategic planning capabilities aimed at driving organizational effectiveness and continued development.

### TSMC Talent Development Model



In terms of management development, TSMC provided targeted support to facilitate new managers' role transition while strengthening their leadership skills, enabling them to effectively lead frontline teams and contribute to long-term organizational development. In 2024, the program reached 1,129 target employees, achieving a 98.7% participation rate and recording a total attendance of 9,311. Recognizing the critical role of department managers as key links in the organizational hierarchy, the Company combines internal and external instruction with everyday management scenarios for newly appointed department managers (within their first year) to understand the transition of their role and management responsibilities while nurturing their management skills. Through diverse learning approaches, managers are supported in developing four core management competencies: "effective team leadership, decision-making and risk management, talent development and empowerment, and innovation." As of 2024, 212 newly appointed department managers from the Operations and R&D organizations completed this training. To ensure a stable talent supply, the Company implements a " fab directors/directors Talent Pipeline Inventory," achieving a 97.6% completion rate by 2024. Simultaneously, TSMC launched a "Senior Manager Learning and Development Program" to help executives develop broader perspectives and focus on critical issues that positively impact their organizations.

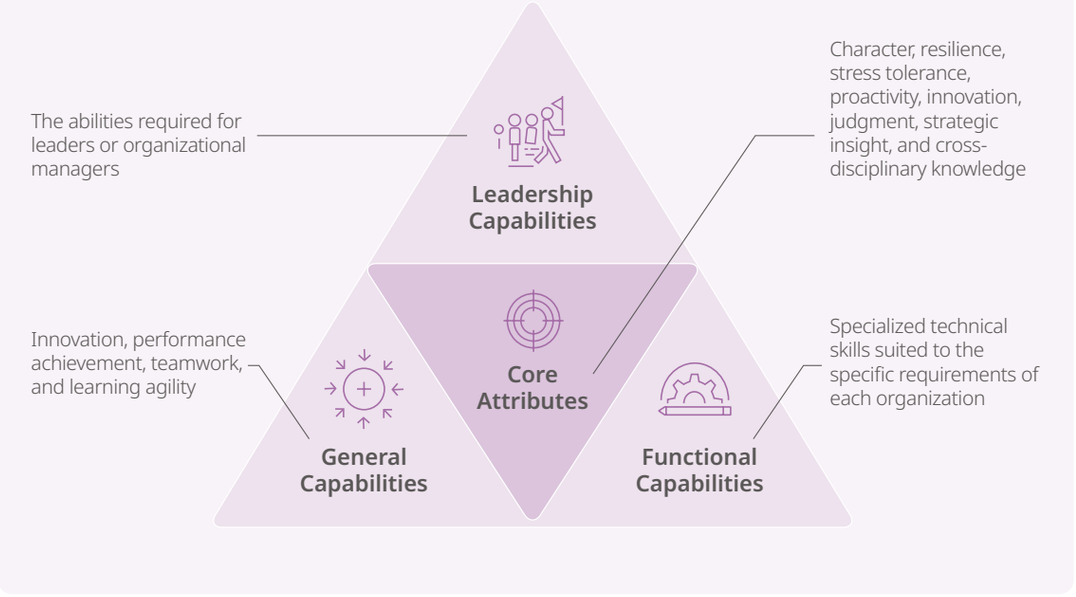
In line with its two primary strategies, TSMC adopts an ability-based learning program, diverse and versatile learning approaches combined with training and development programs at all job levels to spark employees' learning motivation, boost their competitiveness, and foster mutual growth with the Company.


Senior managers focus on the long-pole challenge of teamwork during the course.

## Ability-Based Learning Program

The Company leverages its "TSMC Capability Model" for talent selection and cultivation. It mandates that employees exhibit "core attributes" and engage in ability-based learning programs to develop three key skill sets: general capabilities for professional and personal contexts, leadership capabilities for managing work and managing people/organization, and functional capabilities for specialized job functions. To address diverse learning needs across organizations, TSMC performs organizational development diagnosis and creates tailored programs. By integrating its capability model with organizational development programs, the Company aims to support employees' comprehensive capability development while maintaining its competitive advantages in the market. In 2024, 33 organizations participated, completing 85 sessions with 2,185 participants, achieving the recommended score of 94 points. In 2025, the Company will continue gathering annual organizational development needs and encourage broader participation by sharing the benefits of these training programs.

### TSMC Capability Model



Case Study

# Senior Manager Learning and Development Program

As TSMC continues its global expansion across Taiwan, Japan, the United States, and Europe, the Company faces increasingly complex challenges and a more diverse talent base. Senior managers must possess cross-cultural, cross-generational, and cross-disciplinary leadership and management capabilities to fully leverage their expertise, unleash innovation potential, and maintain the Company's competitiveness and sustainable growth. To address this need, TSMC established the Senior Manager Development Committee in 2024, which is responsible for overseeing the succession planning of senior talent, ensuring a proper talent pipeline, and formulating the Senior Manager Development Program. As part of these efforts, the committee launched the Senior Manager Learning and Development Program to broaden participants' perspectives through diverse learning approaches, equipping them with insights into global leadership trends and best practices, fostering cross-disciplinary leadership, igniting passion and motivation among senior managers, and empowering them to lead the Company's continued growth.

Rooted in the TSMC Talent Development Model, the Senior Manager Learning and Development Program comprises three core modules: Leading Self, Leading Others, and Leading the Business, covering three key themes: Leadership Style, Team Collaboration, and Business Acumen. It offers a mix of self-enrollment courses and a year-long learning journey tailored to different participant groups. Renowned domestic and international speakers — including bestselling authors in business management — guide trainees in enhancing their leadership and management capabilities, unlocking team potential, and promoting continuous development. Beyond classroom learning, participants benefit from tailored mentorship and professional coaching, where internal mentors and external coaches provide individual guidance to help them apply what they've learned in their work. Senior management (Vice President level and above) also shares their strategic vision and career experiences, offering valuable experience and direction to trainees. In 2024, the program engaged 100 participants, achieving an average satisfaction score of 90 points. Through this journey, participants emerged as leaders with broader global perspectives, forward-looking vision, and cross-domain leadership capabilities.

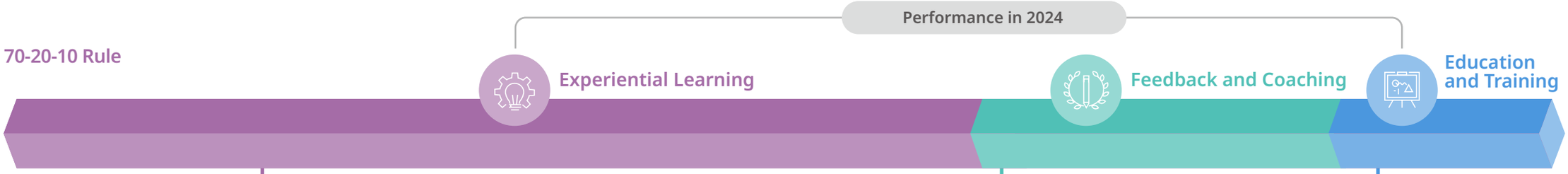
Senior managers exchange learning insights during the Changing Leadership simulation activity.

> Learning to engage in open and meaningful conversations with team members, as well as mastering techniques to motivate both myself and others, has greatly contributed to boosting team morale and productivity.
>
> **K.B. Thei**
>
> Participant of On Becoming a Happier Leader Course

> The course emphasizes the importance of focusing on people beyond task execution, enhancing our ability to lead with empathy and insight.
>
> **Sean Ma**
>
> Participant of Changing Leadership Course

## Diverse and Versatile Learning Approach

TSMC adopts the 70-20-10 Rule, centering around three major dimensions: Experiential Learning, Feedback and Coaching, and Education and Training. By integrating a blended learning approach, the Company provides employees with diverse and versatile resources for learning and development. Employees are encouraged to apply acquired knowledge to both professional and personal contexts, thereby boosting job performance and laying a solid foundation for future career advancement.




### 70%

#### Dual-track Development of Management and Professional Technical Skills

- Implemented a diverse and comprehensive personnel development framework, reinforcing a dual-track system for managerial and technical professional positions, allowing employees to learn and enhance their abilities at work and enabling employees to develop according to their characteristics and expertise

#### Internal Promotions, Transfers, and Rotations

Knowledge transfer through talent mobility:

- **88.7%** of manager positions were filled through internal promotions
- Transfer and rotation rates for managers and professionals were **40.1%** and **40.1%**, respectively
- **58.1%** of job vacancies were filled through internal transfers
- Internal transfers reached **32,596**

### 20%

#### Buddy System

- More than **10,000** new employees benefited from the Buddy Program, accelerating their understanding and adaptation to the corporate culture, with continuous feedback and advice provided during their employment

#### Mentor System

- Encouraged employees to learn from outstanding senior colleagues, with mentors offering work or personal adaptation guidance

#### Performance Feedback and Development

- Provided various performance feedback and development tools, enabling employees to set goals and update their progress at any time through Goal Management and Individual Development Plan . Managers can provide real-time feedback, guidance, and recognition; Performance Management and Multi-sourced Feedback (including managers, peers, and subordinates) also contribute to continuous improvement and career development. In 2024, the completion rate for eligible employee performance evaluations during the evaluation period reached **100%**

### 10%

#### Learning Programs

Offered diverse learning resources for leadership, functional, and general capabilities based on employees' roles and expertise.

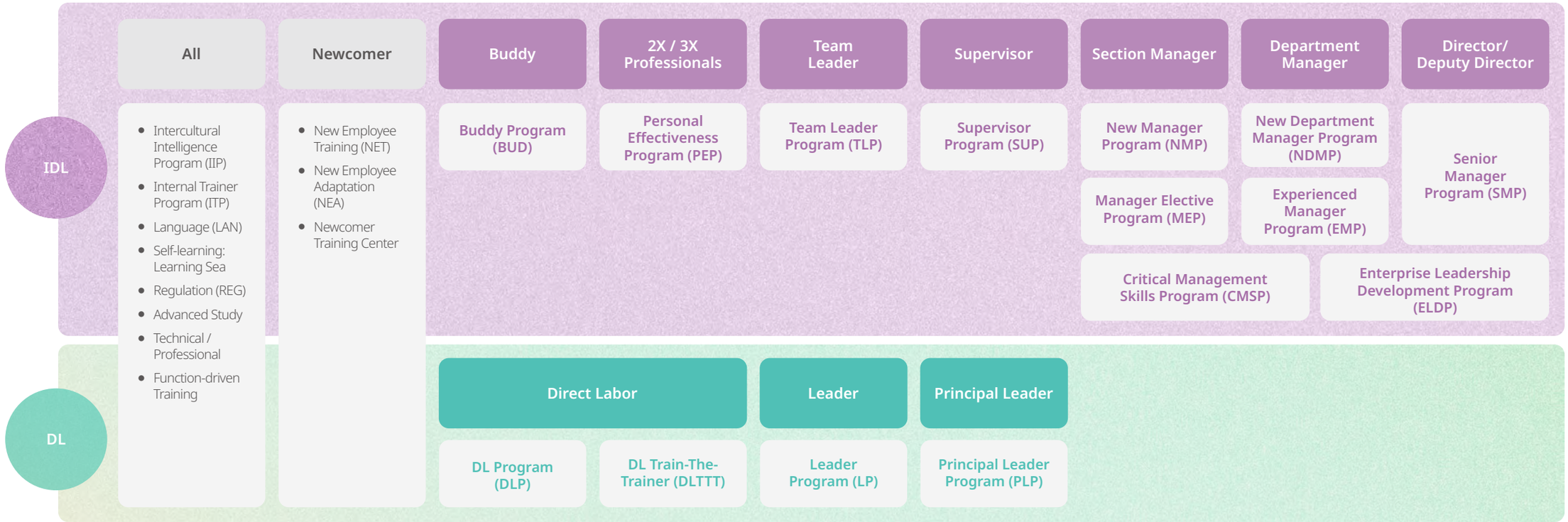
- Conducted **10,038** in-person courses (including face-to-face and live online), with **73,509** individuals completing the training (including current employees, former employees, and employees on unpaid parental leave), involving a total of **945,668** participants.
- Provided **35,596** online resources (including internal and external learning platforms), with **85,889** individuals completing the training (including current employees, former employees, and employees on unpaid parental leave), involving a total of **2,496,971** completions.

## Training and Development Programs at All Levels

TSMC implements a comprehensive talent development program based on its Capability Model to support employees in advancing their careers. New hires participate in the New Employee Training, which introduces the Company's vision, mission, core values, and available resources. They also attend sessions at the Newcomer Training Center, where they acquire essential semiconductor knowledge and skills. Upon onboarding, employees engage in the New Employee Adaptation Program to develop a professional mindset, strengthen communication and collaboration, and learn stress management techniques. Additionally, employees can enroll in the Personal Effectiveness Program as needed to further cultivate four general capabilities: innovation, performance achievement, teamwork, and learning agility. For direct labor personnel, TSMC offers the Direct Labor Program, which strengthens process comprehension, quality awareness, and self-management.

When indirect labor personnel advance to managerial roles, they are required to complete the New Manager Program, which builds essential frontline supervisory skills. Also, the Company offer the Experienced Manager Program and Senior Manager Program to refine their management and leadership capabilities. Direct labor personnel acquire frontline management skills through the Leader Program and Principal Leader Program. Through tiered training and development plans aligned with job levels, the Company supports employees in both career growth and professional development.

### Internal Learning Roadmap-Corporate and Functional

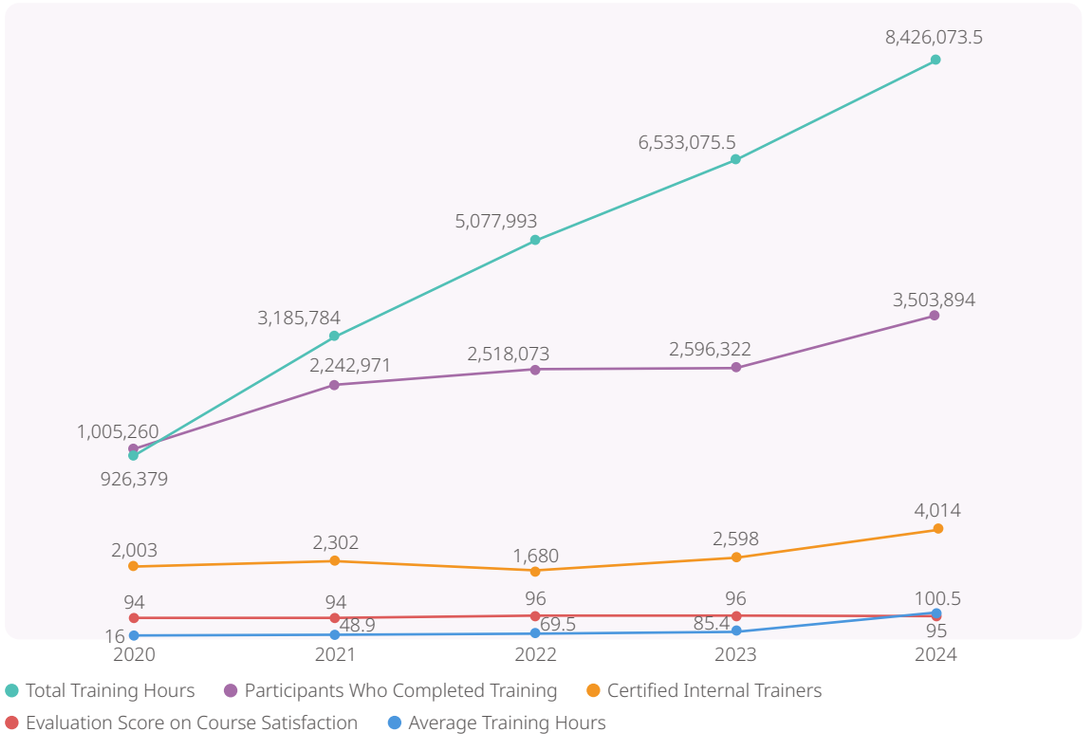


## Learning and Development Metrics and Evaluation

### • Training Metrics

TSMC is committed to administering diverse learning programs suited to both individual and organizational needs. Through in-person courses, online courses, and a wide range of internal and external resources, the Company hones employees' soft and hard skills, elevates their performance, and drives positive impacts on both corporate and societal development. In 2024, the average annual learning hours for employees reached 100.5 hours, representing a 17.7% increase from the prior year. The Company's total training expenditure amounted to NT$1.1 billion, averaging NT$13,395 per employee, reflecting a 15.4% rise compared to the previous year.

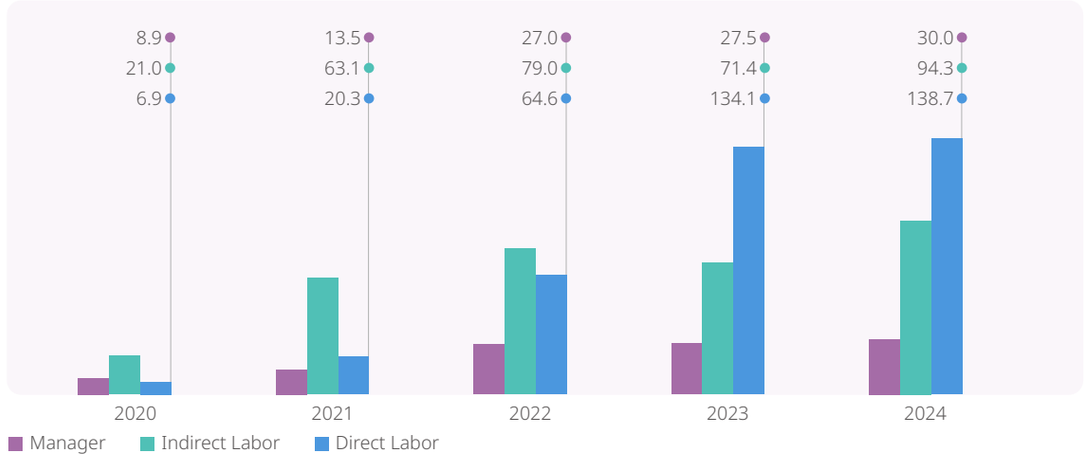
### Historical Training Index




Note 1: Starting in 2022, certified internal instructors who obtained repeated certifications are counted only once.
Note 2: The calculation period for internal trainers runs from July 1, 2023 to June 30, 2024.

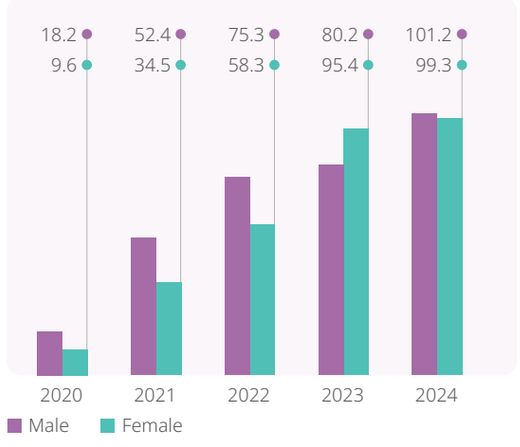
### Average Training Hours per Person - by Job Function

Unit: Hours



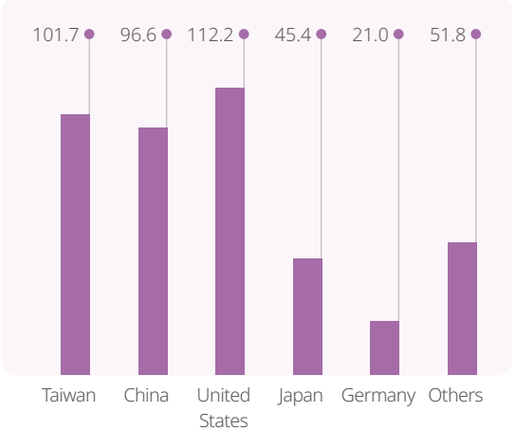

### Average Training Hours per Person - By Gender

Unit: Hours




### Average Training Hours per Person - By Nationality

Unit: Hours



## Evaluation Model

TSMC employs the Kirkpatrick Model's four levels of evaluation to validate training effectiveness. In 2024, all courses conducted by the Organization Planning and Development Division met the criteria for Level 1 (Response), with an average recommendation score of 96.1 points. In terms of course effectiveness, on-the-job training programs organized by various organizations typically achieve Level 2 (Learning) or Level 3 (Behavior), enabling trainees to understand and apply knowledge in their daily work. The Company integrates Level 4 (Outcome) into its employee performance management and development systems, showcasing training effectiveness through internal metrics such as employee promotions and transfers.

### Kirkpatrick Model


| | | Achievements in 2024 |
|---|---|---|
| Level 1 Response Evaluation | After the class, participants evaluate the course content design, trainers, administrative services, and satisfaction with the overall course benefits | Course recommendation rating: **96.1** points |
| Level 2 Learning Evaluation | The effectiveness of participants' learning is assessed via tests, practice, exercises, homework, action plans, etc. | **100%** completion rate for post-training assessments in the Operations organization's certification training (e.g., the completion rate of advanced process fabs and shift certification programs)<br>Average score of post-training assessment: **99.2** (e.g. for courses hosted by the Organization Planning and Development Division) |
| Level 3 Behavior Evaluation | After training, managers and colleagues of the participants observe whether they have applied the newly acquired knowledge to their work | **100%** completion rate of training under the Learning Roadmap Training Program (as conducted by the Operation Engineer Training Committee)<br>**36.8%** increase in submissions for corporate awards (e.g. TSMC ESG AWARD) |
| Level 4 Outcome Evaluation | Business benefits of training | Filled **88.7%** of manager positions through internal promotions<br>Filled **58.1%** of job vacancies through internal transfers<br>**96%** customer trust and satisfaction index |

Case Study

# Cultivate Internal Trainer & Excellent Trainer Award

One of the key drivers of TSMC's sustainable development is maintaining an adequate and high-caliber talent pool. To this end, the Company not only actively introduces external learning resources, but also places great emphasis on cultivating internal trainers. By sharing personal experiences and imparting professional knowledge, these trainers support employee learning and unleash their potential, helping the Company continuously develop top talent. Between July 2023 and June 2024, TSMC engaged 4,014 internal trainers to train over 460,000 employees.

To comprehensively and systematically enhance the teaching capabilities of internal trainers, the Company has developed the Internal Trainer Program, built around three essential teaching skills: delivery, facilitation, and design . The "delivery" module focuses on clearly communicating professional knowledge, presenting with confidence, and strengthening virtual teaching techniques to foster learner engagement. The "facilitation" module empowers trainers to inspire trainees, manage interactive environments, and provide constructive feedback. The "design" module explains how to structure and organize teaching content and enhance instructional presentation design, making it easier for trainees to better absorb professional information. In 2024, the program delivered 52 sessions with 928 participants and achieved an average satisfaction score of 98 points. To recognize and encourage the contributions of internal trainers, the Company established the TSMC Excellent Trainer Award, now in its 18th year, recognizing trainers with exceptional teaching results every year and encouraging outstanding employees to pass on their experience. Through their teaching passion, they have cultivated many exceptional talents, contributing to the Company, industry, and society.

TSMC organizes the "TSMC Excellent Trainer Award" to recognize the dedication and contributions of its internal trainers.

> As a leader in industrial technology, we recognize the growing importance of nurturing talent from within. With an increasingly diverse range of courses, we need more internal trainers to join us in cultivating future talent.
>
> **Lora Ho**
> Senior Vice President, Human Resources

# Occupational Safety and Health

| Strategies | 2030 Goals | 2025 Targets | 2024 Achievements |
|---|---|---|---|
| **Promote Safety Culture**<br>Advocate for a human-centered safety culture, manage safety risks, and establish an intrinsically safe working environment | Incident Rate per 1,000 Employees: <0.2 | Incident Rate per 1,000 Employees: <0.2 | Incident Rate per 1,000 Employees: 0.133 ✓<br>Target: <0.2 |
| | Disabling Injury Frequency Rate (FR): <0.3 | Disabling Injury Frequency Rate (FR): <0.4 | Disabling Injury Frequency Rate (FR): 0.26 ✓<br>Target: <0.4 |
| | Disabling Severity Rate (SR): <3 | Disabling Severity Rate (SR): <4 | Disabling Severity Rate (SR): 3 ✓<br>Target: <4 |
| **Provide Comprehensive Health Management**<br>Prevent occupational diseases and promote comprehensive health management for employees | 0 cases of occupational disorders caused by exposure to chemicals | 0 cases of occupational disorders caused by exposure to chemicals | 0 cases of occupational diseases caused by exposure to chemicals ✓<br>Target: 0 |
| | Employees with abnormal blood lipids, blood pressure, and blood sugar: ≦ 11%, 13.5% and 2.5% | Employees with abnormal blood lipids, blood pressure, and blood sugar: ≦ 11%, 13.5% and 2.5% | Employees with abnormal blood lipids, blood pressure, and blood sugar: 10.9%, 13.2%, and 1.8% ✓<br>Target: <11%、13.5%、2.5% |
| | Employees with reported high stress levels: <9% | Employees with reported high-stress levels: <9% | Employees with reported high-stress levels: 6.3% ✓<br>Target: <9% |
| **Build Internal- External Alliances**<br>Collaborate with external parties to establish a safer working environment across the supply chain | Assist all high-risk contractors[Note] to obtain ISO 45001 certification for occupational safety and health management system | Assisted 100% of high-risk contractors to obtain ISO 45001 certification for occupational safety and health management system | Assisted 100% of high-risk contractors to obtain ISO 45001 occupational safety and health management system certification ↑<br>Target: 90% |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note: Assistance will be ongoing as TSMC works with new contractors for high-risk operations each year, including operations in out confined spaces, live-line work, hot work, and gas/chemical pipeline-cutting operations.

TSMC promotes safety and health at all levels to improve the health of workers through a clear division of labor between organizations in the Company. All fabs and subsidiaries, including TSMC (China), TSMC (Nanjing), TSMC Washington, and VisEra, have obtained ISO 45001 Occupational Safety and Health Management System certification. TSMC Arizona, JASM, and other overseas fabs plan to obtain the certification this year. In addition, fabs in Taiwan applied for separate TOSHMS certifications to actively improve workplace safety and protect employee health. In addition, TSMC also assisted high-risk contractors in obtaining ISO 45001 Occupational Safety and Health Management System certification, and contractors are required to confirm the status of ISO 45001 adoption at their annual consultation meeting with each fab.

In 2024, 100% of high-risk contractors received ISO 45001 occupational safety and health management system certification.

TSMC is committed to creating a safe, healthy, and inclusive working environment. To effectively control occupational safety and health risks, the Corporate ESH Division cooperated with the R&D Department in 2024 to establish a chemical and mixed acid hazard identification system to identify potential high health hazards substances and calculate the harmfulness of mixed chemicals. In addition to identifying risks to minimize exposure risks for operating personnel and improving chemical hazard notices, the project also strengthened safety awareness for employees. In 2024, for the first time, TSMC recognized fabs with excellent performance in safety culture promotion at its annual safety and health forum. In addition, TSMC also strengthened employees' awareness of safety culture through forums, lunchtime lectures, and promotional poster exhibits, as well as sharing and exchange with experts in industry, government, and academia.

To build a safe working environment, TSMC cooperated with its supply chain to develop personal protective equipment in diverse sizes , cooperated with industry, government, and academic sectors in developing and promoting diversified sizes and versions of protective clothing, and shared its achievements at the International Conference on Occupational Hygiene and theAsian Network of Occupational Hygiene.. In 2024, with the expansion of TSMC's overseas fabs, the "Overseas Expatriate Health Management Team " established by the headquarters set up a worldwide health network to provide support and assistance for expatriates and employees on business trips 24 hours a day. TSMC expanded the scale of World Mental Health Month and added on-site professional psychologists to provide a wide variety of care based on different cases and requirements. At the same time, TSMC continued to care for the health and well-being of contractors and introduced on-site ambulances and emergency medical technicians available 24 hours a day to new construction sites to provide emergency treatments and ensure that workers who require care receive professional medical services immediately.

**Internal Control for Safety and Health** ← Inward

**Corporate ESH Division**
Formulate corresponding company-wide blueprints, management protocols, and SOPs

→ Outward **Collaborate with External Stakeholders to Reduce Occupational Safety and Health Risks**

### All Departments
Collaboration and execution

### Wellness Center
Advance health promotion

- Healthcare
- Employee assistance
- Health improvement
- Early warning for occupational diseases

### New Construction Site
Responsible for the safety and health of new fabs

- Construction site safety behavior guidelines
- Construction site safety and environmental management

### Fab-level Industrial Safety and Environmental Protection Division
Promote safety and health-related activities

- Formulate and promote fab-related items according to the fab-level environmental safety and health policy
- Prevent physical , chemical, ergonomic, and work-related incidents and diseases in the fabs
- Assess and improve safety and health-related risks
- Formulate job hazard analysis, exposure assessment, and control measures
- Spearhead fab-level occupational disease prevention investigation and health promotion
- Convene fab-level Occupational Safety and Health Committee meetings
- Manage contractors
- Assist subsidiaries in developing regulations for environmental safety and health and set execution targets
- Support the emergency response of leased or borrowed fabs or offices

- Formulate policies, targets, and solutions
- Create and update environmental safety and health-related management procedures, standards, or technologies, and establish performance indicators in conjunction with environmental safety and health promotion management units in the fabs
- Oversee various departments to identify and control occupational safety and health risks, and conduct annual audits on environmental safety and health risk management and regulatory compliance in the fabs
- Convene quarterly corporate-level Occupational Safety and Health Committee meetings
- Communicate company-wide environmental safety and health regulation and policy-related issues with external stakeholders; represent the Company in domestic and overseas environmental safety and health regulation and policy meetings
- Create a sustainable supply chain in conjunction with the Procurement, Quality, and Reliability Department
- Spearhead the Occupational Disease Investigation Committee meetings to prevent occupational disease throughout TSMC
- Collaborate with health promotion units to devise health promotion goals for workers
- Establish management rights and responsibilities for the leasing and borrowing of facilities outside the fab area, as well as the risk identification of compliance with environmental safety and health regulations
- Serve as the incident commander when a major abnormality or incident occurs across the fabs, and assist in crisis management and emergency response
- Assist subsidiaries in establishing environmental health and safety policies
- Assist in responding to external questionnaires and audits related to environmental health and safety
- Study and promote technologies and protections beneficial to improving environmental protection, safety, and health NEW
- Provide education and training related to environmental protection, safety, and health NEW

### Government, TSIA & SEMI Organizations
Collaborate to build a healthy and safe workplace

### Suppliers and Contractors
Enhance safety and health performance across the supply chain through guidance and collaboration

## Safety and Health Measures

TSMC establishes safe workplaces, follows health and safety measures in compliance with the Safety and Health Policy, reinforces safety and health measures through potential hazard identification, assessment, and risk control, and uses the Safety Performance Index (SPI) to track safety and health performance. These measures have created a management system that continuously improves, minimizes workplace risks, and establishes a safe, healthy, and sustainable working environment.

| Items | Safety and Health Efforts in 2024 | SPI [Note 1] | Taiwan Fabs | Overseas Fabs [Note 2] | VisEra |
|---|---|---|---|---|---|
| **Regulatory Updates** | • Tracked the latest regulations and compliance in all fabs, for a total of **23** changes to safety and health regulations<br>• In response to overseas expansion, a regulatory update system was adopted covering the regulatory databases of U.S. federal/state laws and Japanese laws related to environmental safety and health | ✓ | ✓ | ✓ | ✓ |
| **Safety and Health Education** | • All TSMC sites have completed hazard notification/education. Complete digital records are retained to comply with safety and health regulations and emergency response needs. Those performing hazardous operations have obtained licenses to operate in compliance with relevant laws [Note 3]<br>• The TSMC Contractor ESH Bluebook was developed into interactive online courses, which were launched at the TSMC Supplier Sustainability Academy. Courses include cautionary reminders for fabs, wall demolition operations, high-pressure water cutting operations, reminders for general operations, tool operating requirements, electroplax opening operations, welding operations, overhead operations, supply transportation, and hand tool usage requirements. 23 courses were completed in 2024. Courses were also integrated with a initial/refresher training certification system for contractors, requiring them to complete courses to obtain their certification card NEW | ✓ | ✓ | ✓ | ✓ |
| **Risk Identification and Assessment** | • Performed comprehensive workplace hazard identification an assessments, developed safety and health management plans, and conducted in-depth workplace analyses, observations, and operational safety evaluations. These efforts included health management analyses for employees and contractors. Identified risks were classified into varying levels of severity to facilitate effective management, tracking, and implementation of measures to control, prevent, or reduce hazards and risks. A total of **39,719** cases hazard assessment were completed as part of this initiative [Note 4] | ✓ | ✓ | ✓ | ✓ |
| **Procurement Management** | • All chemicals used by chemical analysis instruments were assigned TSMC material numbers for management to ensure the use of chemicals is duly tracked | ✓ | ✓ | ✓ | ✓ |
| **Change Management** | • Completed **4,591** cases of change management with zero related incidents | ✓ | ✓ | ✓ | ✓ |
| **Chemical Management** [Note 5] | • All new chemicals underwent safety review processes before entering facilities. **181** new chemicals were evaluated and introduced with zero related incidents and without introducing any IARC group 1 carcinogens<br>• Enlisted a chemical analysis laboratory to analyze whether hazardous substances in new chemicals contain carcinogens, mutagens, reprotoxic substances, or ingredients banned internationally to ensure that employees are not exposed to risks of chemicals with high health hazards and cause environmental discharge anomalies<br>• Ensure employees' health and safety with no environmental discharge anomalies<br>• Plan for new chemical online education courses in 2025<br>• Establish a chemical and mixed acid crisis identification system to identify high-risk substances and assess mixture hazards to reduce the exposure risks of employees NEW | ✓ | ✓ | ✓ | ✓ |
| **Tool Management** | • Evaluated and introduced **170** new tools with zero related incidents<br>• Cooperate with the R&D organization and equipment and tool suppliers for next-generation EUV tools to conduct safety risk assessment in terms of tool size and changes in hydrogen volume to control risks NEW | ✓ | ✓ | ✓ | ✓ |
| **Contractor Management** | • Contractors engaged in a total of **700,154** constructions in the fabs, of which **89,530** were high-risk operations and complied with management requirements<br>• In 2024, **55,766** contractors entered/exited TSMC daily [Note 6]. To improve the effectiveness of safety and health management, TSMC regularly hosted a contractor health and safety communication meeting (Contractor 100) to recognize outstanding contractors, supervisors, and industrial safety personnel<br>• TSMC examined the construction management status of contractors and amended the TSMC Contractor ESH Bluebook to help contractors better understand safety and health codes | ✓ | ✓ | △ [Note 7] | ✓ |
| **Compliance Audit** | • Internal audits revealed **2,609** shortcomings, which were corrected within the specified time | ✓ | ✓ | ✓ | ✓ |
| **Emergency Response** | • Created a cross-fab CCTV platform in Taiwan and a smartphone application for emergency evacuation roll calls. In the event of an emergency, other fabs can obtain real-time information on the disaster area via CCTV and assist in emergency response; meanwhile, employees can use the smartphone application to report their locations to shorten the time of the roll calls | ✓ | ✓ | ✓ | ✓ |

Note 1: TSMC adopts the Safety Performance Index (SPI) to quantitively manage and supervise safety and health performance.
Note 2: The scope of overseas fabs covers TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, and JASM.
Note 3: 2024 Training Statistics : Trainees include both employees and contractors.
Note 4: Risk Identification and Assessment : Foster a safety culture where employees and the Company protect each other and encourage employees to speak up and offer suggestions for occupational safety. Classification management and tracking are used to control, prevent, or reduce hazards to cultivate a friendly and safe workplace.
Note 5: TSMC Chemical Management Procedures .
Note 6: The scope of calculation for contractors covers fabs in Taiwan, TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM, and VisEra, and covers the number of contractor personnel who enter fabs in Taiwan for new fab construction.
Note 7: △ refers to partial compliance; the number of persons from contractors is calculated as per Note 6, excluding the number of contractors for the construction areas of overseas fabs.

✓ Completed

## Promote Safety Culture

An analysis of employee disabling injury statistics reveals that the majority of injuries are due to a lack of safety awareness and the failure to implement management regulations. To help employees value safe behavior, TSMC continued to enhance its safety culture by highlighting three key focus areas: Reinforce Employees' Day-to-day Safety Awareness, Strengthen Safety Communication, and Develop Safety Awareness Training. In addition to updating monthly safety and health posters, distributing printed materials and, producing quarterly safety and health videos, TSMC engaged in daily communication with production line personnel in the Operations organization to address safety and health issues and enhance safety awareness.

In 2024, safety culture seed personnel from all organizations introduced the "Safety Moment" course across all fabs and shared it during handover meetings to enhance employees' safety awareness . Additionally, TSMC launched its first "Environmental Protection, Safety and Health Month " activity in 2024, holding a series of themed forums, lunchtime lectures, and promotional poster exhibits. In addition to raising colleagues' attention to ESH issues, the forum also invited a wide range of stakeholders, such as government agencies, experts, scholars, suppliers, and contractors, to participate, with a total of more than 3,300 participating, deepening the ESH culture and protection standards of employees and partners. To further develop workplace safety culture, TSMC also utilized digital technologies for promotion. In 2024, it designed a safety and health AI website, adopting a AI digital customer service function to answer safety and health questions raised by employees in worldwide fabs at all times, and developed a mobile application version to meet employees' need for safety knowledge through a wide range of channels.

### Safety Performance Index

TSMC's Safety Performance Index (SPI) is classified into four levels , including active and passive indices . The active indices encourage employees to participate in health and safety activities, while the passive indices show the number of safety-related failures and false alarms found in safety and health self-evaluation. In 2024, blue light (excellent) indices accounted for 84.2%, representing an increase of 4.1% from 2023, which was reflected in the decrease in false alarms from 19 incidents in 2023 to 18 incidents in 2024. The incident rate per 1,000 employees declined to 0.133 from 0.156 in 2023; furthermore, when a false alarm occurs, in addition to applying the 3L5W (Three-Legged Five Whys) Tool to conduct an investigation, the Company also interviews relevant personnel, analyzes and inspects the equipment, and tests the materials using the false alarm reporting and investigation procedure . Relevant documents and records are reviewed, or the scene is reconstructed to identify the direct, indirect, and fundamental root causes of the incident. This process helps uncover opportunities for improvement and prevents similar incidents from reoccurring.

TSMC proactively establishes an intrinsically safe working environment.

Case Study

# Personal Protective Equipment with Diverse Sizes Protect Worker Safety

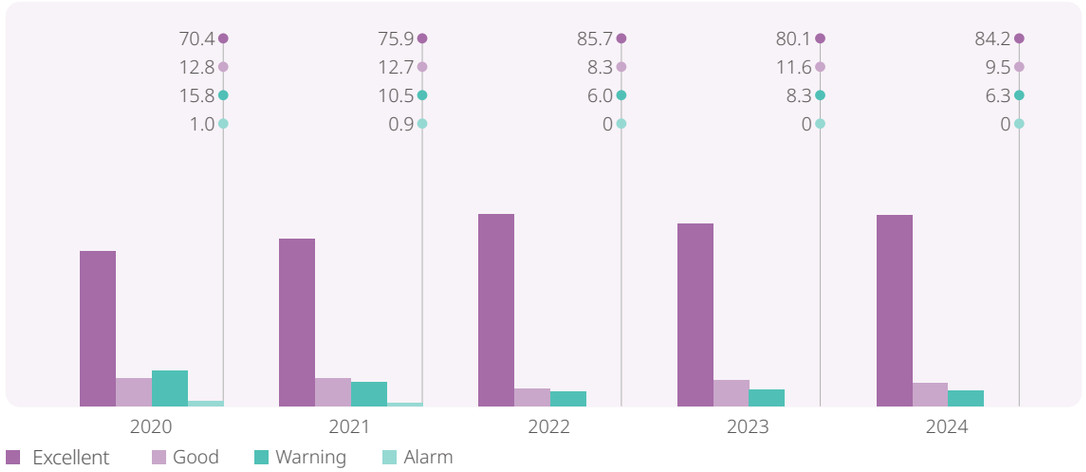
Aligned with TSMC's people-oriented philosophy, the Company has strived to create healthy, safe, and inclusive workplace environments. To address tripping, vision blocking, and inconvenience in tool operation for employees and resident vendors due to ill-fitting personal protective equipment sizes, TSMC performed a survey among 5,388 employees and 1,074 resident vendors in 2024. After gaining an in-depth knowledge of their requirements, TSMC first introduced five type of adjustable head protective equipment under three categories and body protective equipment in sizes S and M from overseas.

As existing protective equipment in the market fails to meet workers' needs, TSMC worked with the Institute of Labor, Occupational Safety and Health, Fu Jen Catholic University, Chang Jung Christian University, 17 protective equipment suppliers, and relevant experts and scholars representing a total of 136 cooperating partners, to develop 12 types of new hand and foot protective equipment under four categories in diverse sizes. Half-sizes were added to the selection of antistatic shoes, and protective gloves in sizes S and M suitable for petite workers were provided to ensure that workers select fitting, comfortable, and safe sizes to achieve optimal protection. In the future, TSMC aims to reproduce, promote, and expand the influence of these achievements at domestic and international safety and health seminars and equipment exhibitions and plans to develop diverse protective equipment suitable for Asians to create friendly and safe workplaces by joining forces with industry, government, and academic sectors.

Protective equipment of various sizes improves the effect of protection.

## Safety Performance Index Chart

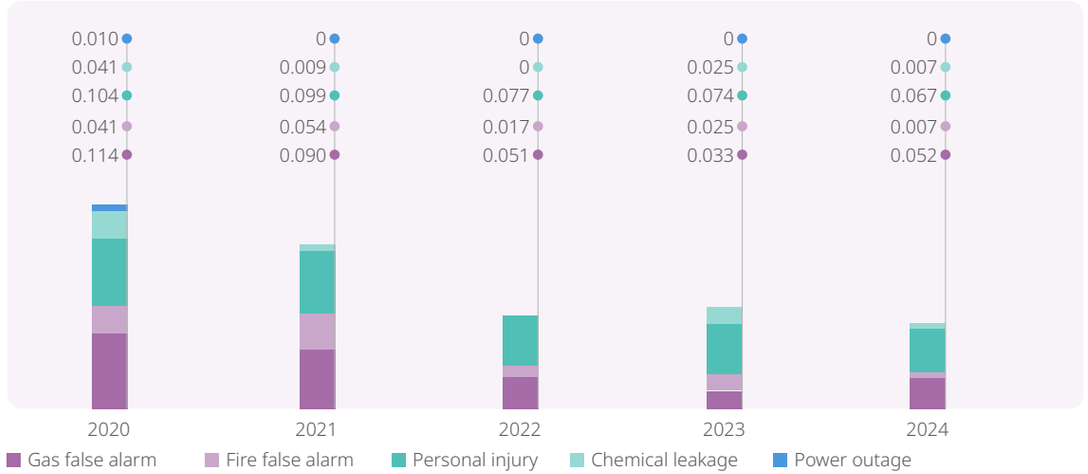
Unit: %




Note: Data includes fabs in Taiwan, TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM, TSMC Japan 3DIC R&D Center, and VisEra.

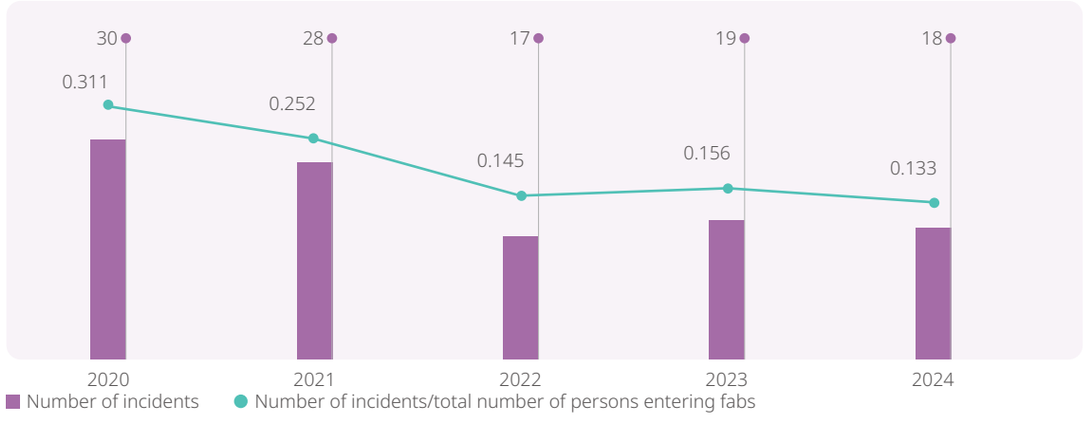
## Historical Incident Type Analysis

Unit: Number of incidents by type/incident rate per 1,000 employees




Note: For the incident type analysis by per 1,000 employees, the number of persons covers employees and contractors. Employee calculation includes all employees of TSMC; contractor calculation includes fabs in Taiwan, TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM, TSMC Japan 3DIC R&D Center and VisEra.

## Historical Incidents and Incident Rate per 1,000 Employees




Note: Starting from 2020, total number of people entering fabs for the calculation of the incident rate per 1000 persons includes employees and contractors. Employee calculation included all employees of TSMC; contractor calculation includes fabs in Taiwan, TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM, TSMC Japan 3DIC R&D Center and VisEra.

TSMC adheres to the Safety and Health Policy to continuously enhance safety and health measures.

## False Alarm Improvement Highlights in 2024

### Reducing Fire Alarms

There was one false fire alarm caused by malfunction in the battery of a power-assisted cart

**Improvement Measure**

- TSMC formulated safety management regulations on "lithium batteries for powered equipment," specifying that the battery type shall be lithium iron phosphate, battery cells, battery packs, and chargers. The certification specifications shall comply with local regulations and international standards. The cover of battery packs shall be made with incombustible material and shall be included in the inspection items of the safety change review

### Reduce Injuries

Nine contractor injuries occurred. The injuries were primarily caused by personnel's unsafe conduct, such as lack of safety awareness or failure to follow SOPs

**Improvement Measures**

- For finger injuries caused by automatically closing fire doors, TSMC redefined the closing speed of door closers, and included it as an inspection item for regular maintenance for regular inspections
- For crushing accidents caused by falling ice water pipe valve, revised hoisting methods and added operational safety notices
- Required hoisting companies to redefine inspection items and methods of hoisting components, including confirming the load safety factor, restricting non-related personnel from entering the hoisting area, and taking shifts for pad hoisting to avoid having overlapping work at the same time
- To maintain the safety of hoisting personnel, TSMC required contractors to add the duties of hoisting personnel and the location in relevant documents at the consultative organization meeting before construction and the hazardous machines license on the day of construction. It is also specified in the hoisting plan that non-hoisting personnel may not enter the restricted area before hoisted materials are completely fixed in place
- Continued to develop AI hazard identification technologies and combined them with existing image equipment to introduce them into all fabs

### Reduce Chemical Leakage Alarms

One chemical pipe valve leakage occurred

**Improvement Measure**

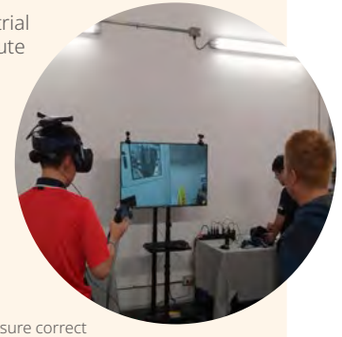
- To enhance safety, the valve material was updated to a design without metal screw. Sealing inspection standards for valve boxes were incorporated as part of regular inspection routines, and the sealing joint strips of valve boxes are now replaced on a regular basis

### Reduce Gas Alarms

There were seven false gas alarms caused by operational errors or failure to comply with SOP. The special gas was shut down immediately after the early warning gas alarm was triggered and did not leak into the environment preventing potential personnel casualties or environmental pollution

**Improvement Measures**

- Required on-site operating personnel to re-participate in pipeline valve operation training to strengthen compliance with SOP and increase operation familiarity, and added a pipeline valve fixing SOP specifying that the components to be removed shall be classified into different colors for management, and exclusive teaching materials were created to require personnel to redo training and evaluation
- Cooperated with the Industrial Technology Research Institute to develop virtual reality (VR) training to strengthen resident contractors familiarity with exchanging hazardous gas cylinders; in the future, testing models will be added and included in the personnel skill certification



VR training to ensure correct exchange of cylinders

## Statistical Analysis of Disabling Injuries Among Employees

The Occupational Safety and Health Act and important disabling injury indicators issued by the Global Reporting Initiative (GRI) use Disabling Severity Rate (SR) and Disabling Injury Frequency Rate (FR) as primary indicators. In 2024, there were 37 disabling injuries among employees, with 397 workdays lost. Of these, 27 cases of disabling injuries among men resulted in the loss of 336 workdays, and 10 cases of disabling injuries among women resulted in the loss of 61 workdays. The employee injury rate was 0.05%. Men suffered from a higher number of work-related disabling injuries and lost workdays compared with women. The types of injuries were mostly falls, primarily due to stepping on parts dropped when entering fabs to perform tool repair. The disabling injuries of women were mainly musculoskeletal injuries.

**Improvement Measures**

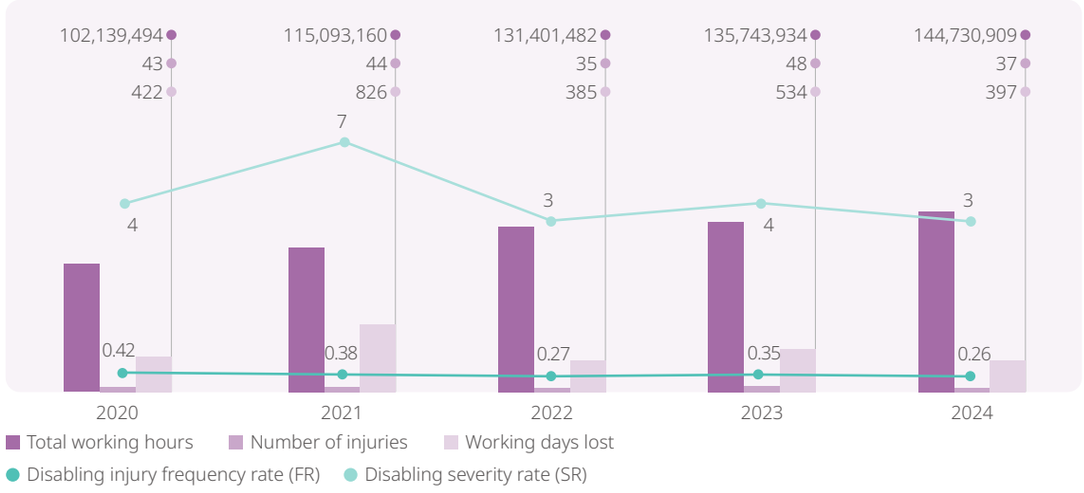
**Improvement for falls**

Falls were mainly due to an unsafe environment and insufficient safety awareness. In 2025, TSMC will comprehensively examine the evenness, lighting, supply stacking conditions, dangerous environment alert labels, and anti-slip facilities in work areas and continue the "Safety Moment" campaign to improve employees' safety awareness through safety culture promotions.

**Musculoskeletal injuries**

Musculoskeletal injuries mainly resulted from poor posture while lifting. TSMC continues to conduct preventive safety promotion by combining video and audio teaching materials with the "Safety Moment" campaign. In 2025, it will consider introducing strength training activities (i.e., the combined gait, balance, and sense coordination training) to reinforce employees' reactivity and strength.

### Total Working Hours, Number of Injuries and Working Days Lost



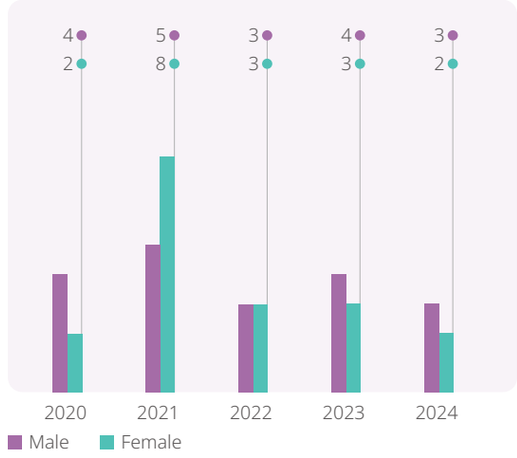

Note 1: According to the Occupational Safety and Health Act, disabling injury frequency rate (FR)/disabling severity rate (SR) are defined as any diseases, injuries, disabilities, or deaths of workers caused by buildings, machinery, equipment, raw materials, materials, chemicals, gases, vapors, and dust at the place of duty, or as a result of work activities, or due to other occupational causes. Other unrelated injuries in the workplace, such as falling in the cafeteria or parking lot, are not considered work injuries.

Note 2: Data includes fabs in Taiwan, TSMC (China), TSMC (Nanjing), and VisEra.

### Disabling Injury Frequency Rate by Gender

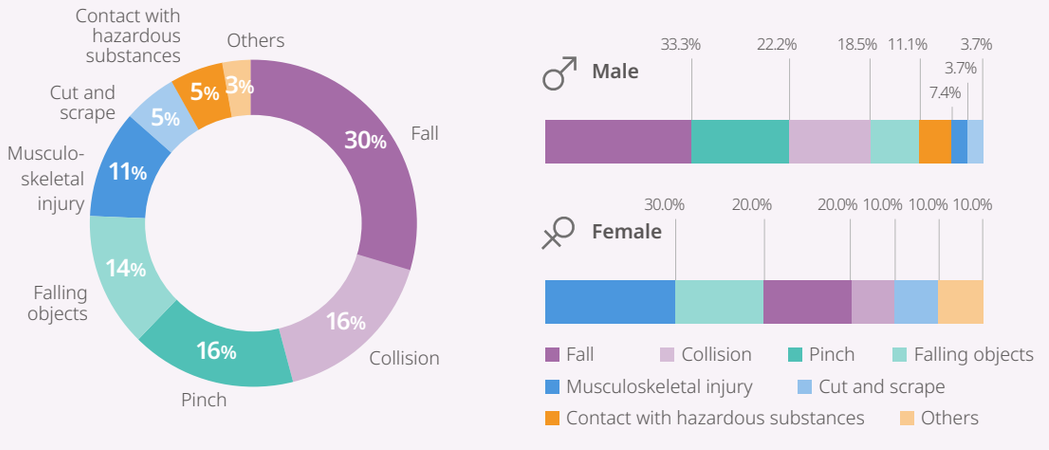

Note: Data includes fabs in Taiwan, TSMC (China), TSMC (Nanjing), and VisEra.

### Disabling Severity Rate by Gender

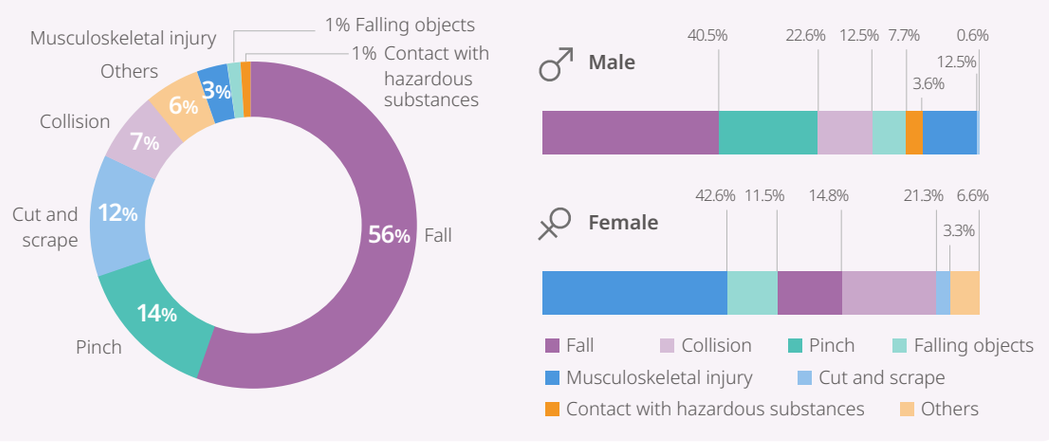



Note: Data includes fabs in Taiwan, TSMC (China), TSMC (Nanjing), and VisEra.

## Disabling Injury Frequency Rate by Injury

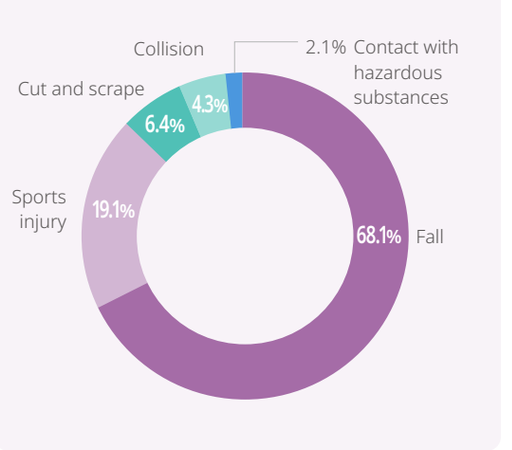



## Disabling Severity Rate by Injury

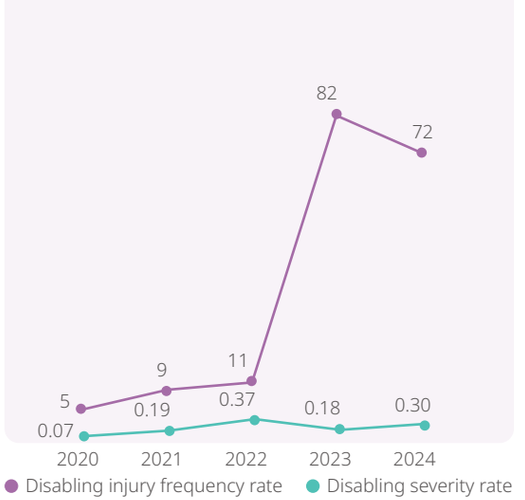



## Ratio of Non-work-related Injuries

Unit: %




## Disabling Injuries of Contractors at TSMC's Worksites




Note: Data includes fabs in Taiwan, TSMC (China), TSMC (Nanjing), and VisEra.

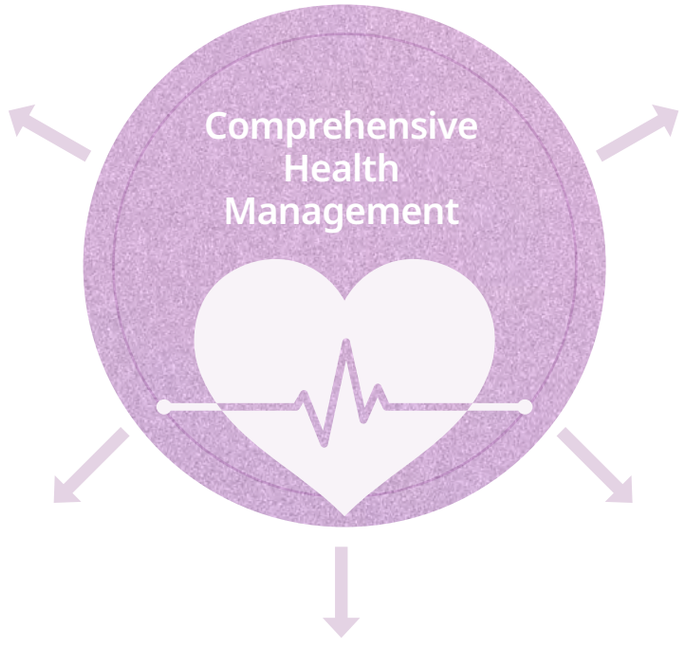
In 2024, 47 non-work-related injuries occurred, resulting in the loss of 964 workdays. Fall injuries accounted for the highest proportion (78.1%) with 32 occurrences, resulting in a loss of 572 days; 26 incidents were falls caused by personal reasons such as missteps on stairs, not paying attention while walking or exiting vehicles, or low blood sugar. Six falls were caused by environmental factors, mostly uneven or wet ground; the root causes was identified and remediated. In response to non-work-related injuries, safety culture initiatives will continue to be offeredimproving employees' safety awareness and reduce injuries caused by personal factors.

### Statistics on Contractors Disabling Injuries at TSMC Worksites

In 2024, a tragic accident occurred during expansion work on facility ice water pipelines, resulting in the death of contractor. The incident was caused by injured sustained from falling pipelines. Despite being hospitalized, the individual unfortunately passed away, leading to a total workday loss of 6,000 days. In light of this, TSMC re-examined relevant processes, revised the hoisting methods when installing ice water valves, added new safety notices for operations, including confirming the building structure for fixing the hoisters, loading strength, and overload protection system, and ensured that the fixation point has a strength greater than the overload protection specifications to prevent the occurrence of similar occupational safety accidents.

## Providing Comprehensive Health Management

Key objectives for TSMC includes improving physical and mental health while building supportive and safe working environments. TSMC cares for employees' physical and mental health through health check-ups, health risk management, occupational disease prevention, healthcare and support, and health promotion. In addition to having Wellness Centers with 24-hour services at its fabs in Taiwan and China that are above regulatory requirements, TSMC Arizona and JASM also began offering Wellness Centers with 24-hour services in 2024. At the same time, in response to business trips and personnel deployment at domestic and overseas operating sites, TSMC enhanced the connection between Wellness Centers worldwide and assigned 185 physicians, registered nurses, psychologists, and other professional occupational health personnel to reinforce health assistance for global employees. In addition, occupational health physicians provided onsite services a total of 2,114 sessions for fabs in Taiwan, together with local and international hospitals, health exam providers, psychotherapy clinics, clinics, health service institutions, occupational medicine institutions, and other medical resources. TSMC spent nearly NT$500 million to care for employees' physical and mental health in 2024. To offer employees healthier lifestyles, TSMC implemented working hour control for groups with high-health risks, promoted occupational disease prevention, and continued to provide advanced project health check-ups for employees to assist them in early discovery, early treatment, and smooth return to their duties. The Company also organized fast walking, weight loss, health education lectures, and other health improvement activities, In 2024, more psychologists collaborated with TSMC to enhance mental health care for employees, and the Company held a World Mental Health Month activity to commit to creating an energetic and happy working atmosphere.




### Health Check-up

- Physical examinations for **10,056** new employees
- Annual regular health check-ups for **62,243** people
- Special hazardous operation health check-up for **8,730** people
- Special hazardous operation health check-up exceeding regulatory requirements for **5,409** people
- Health check-up for **17** overseas assignees
- Employee health check-ups for **44,990** people
- Manager health check-ups for **4,515** people
- **31,616** people received self-paid health check-ups at fabs
- Free four-cancer screening for **863** construction site contractors

### Health Promotion

- Held online fast walking challenges and weight control competitions, with participation from **21,423** and **8,208** people, respectively. Nearly 70,000 healthy meals provided per month
- Held health expert lectures to share sports/sleep/nutrition-related topics and provided individual consultation for **22,643** participants
- Provided sports arenas, gyms, aerobics classrooms, ball courts, and diverse courses; used over a million times by employees and their families
- Established four new clubs, for a total of **47** sports clubs.
- More than **40,000** persons participated in the Sports Festival, and nearly **30,000** employees and their families participated in TSMC Sports Day

### Healthcare and Support

- Provided **4,718** employees with psychological/legal/financial consultation services
- Cared for **1,309** individual employees reporting mental stress in health check-ups
- Provided **598** employees who came to Taiwan for training with health management and medical care assistance
- **22,400** visits to clinics in Taiwan and China
- 24-hour emergency medical treatment and follow-up for **879** people

### Health Risk Management

- Abnormal condition tracking of general and special hazardous operation health checkup exceeding regulatory requirements for **22,017** people
- Respiratory assessment for **23,393** people
- Maternal health management for **637** people
- Post-injury/illness reinstatement evaluation for **490** people

### Occupational Disease Prevention

- Prevention and management of ergonomic musculoskeletal disease for **272** people
- Physical/chemical exposure disease prevention and grading management of special hazard operation personnel for **3,438** people
- Prevention and management of cerebral and cardiovascular diseases for **5,149** people
- Biological disease prevention for **287** people

Case Study

# Following Employees' Footprints to Create a Global Health Network

To support the healthcare of employees assigned overseas, on business trips, and training, TSMC created a brand-new global health network according to the cultures, medical practices, and the healthcare accessibility of each region. The "Overseas Assignee Health Management Team " was established in 4th quarter of 2024 to connect the Wellness Centers of domestic and overseas fabs, group insurance of the Company, and resources from cooperating hospitals as well as professional international medical assistance agency to offer a variety of health examinations and follow-up services while providing 24-hour assistance for medical care overseas and follow-up support for both employees and their family members. Considering Japan's stringent medical referral system and language barriers, the Overseas Assignee Health Management Team organized four information sessions at JASM to assist employees in understanding and making good use of the health and medical resources provided by the Company and ensure they receive proper support when needed. In 2024, in collaboration between the Overseas Assignee Health Management Team, JASM Wellness Center, and professional international medical assistance agency, the team successfully assisted employees deployed to Japan in receiving local medical treatment and returning to work. Additionally, the team worked closely with JASM's Industry Safety & Environmental Protection Dept, Human Resources, Legal, Wellness Center, and Payroll & Benefit Management Section to discuss the differences in insurance between Japan and Taiwan and assist employees in applying for insurance claims, occupational leave, work adjustment, and other benefits. In 2024, a total of 34 assigned employees and their families used professional international medical assistance agency services, and the offerings are expected to be expanded to other overseas fabs in 2025.

Information session for JASM global health network cooperation model.

Case Study

# World Mental Health Month to Promote Workplace Positivity

TSMC is committed to creating a work environment of physical and mental harmony. In response to World Mental Health Day on October 10th, TSMC expanded the scale of its World Mental Health Month activities and offered three online lectures with "Three Good Things" as the theme. The first lecture guided employees to use a happiness scale to evaluate their own emotions and cultivate the habit of exploring three good things in their daily lives. The second and third lectures invited employees to share and appreciate the three good things recorded by one another to encourage employees to actively express positivity and shape a cycle of positive exchanges. After the end of the activity, limited "mood meter" souvenirs were provided to encourage employees to record their feelings through a scale of seven emotions to identify emotional changes and, in turn, improve mental resilience. A total of 8,564 persons participated in World Mental Health Month activities, and the overall satisfaction score reached 96.3%.


The mood meter helps employees record their moods.

## Caring for the Health of Contractors and Partners

TSMC actively promotes the health management of project contractors for fab construction and provides comprehensive health services and high-quality working environments to contractors and partners by taking six major healthcare actions, including vaccination/blood donation, health management system, follow-up care system, on-site physician services, free health check-ups in the construction area, and availability of professional medical consultants. In 2024, TSMC collaborated with the Hsinchu branch of National Taiwan University Hospital and signed the "New Fab Construction Health Management Advancement MOU " to reinforce health management and offer care for fab construction projects, striving to protect the health of contractors and partners.

### Vaccination

- Work with local hospitals and clinics to organize flu and COVID-19 vaccinations; 182 persons were vaccinated
- Organized the "Group Vaccination Activity" NEW

### On-site Physician Service

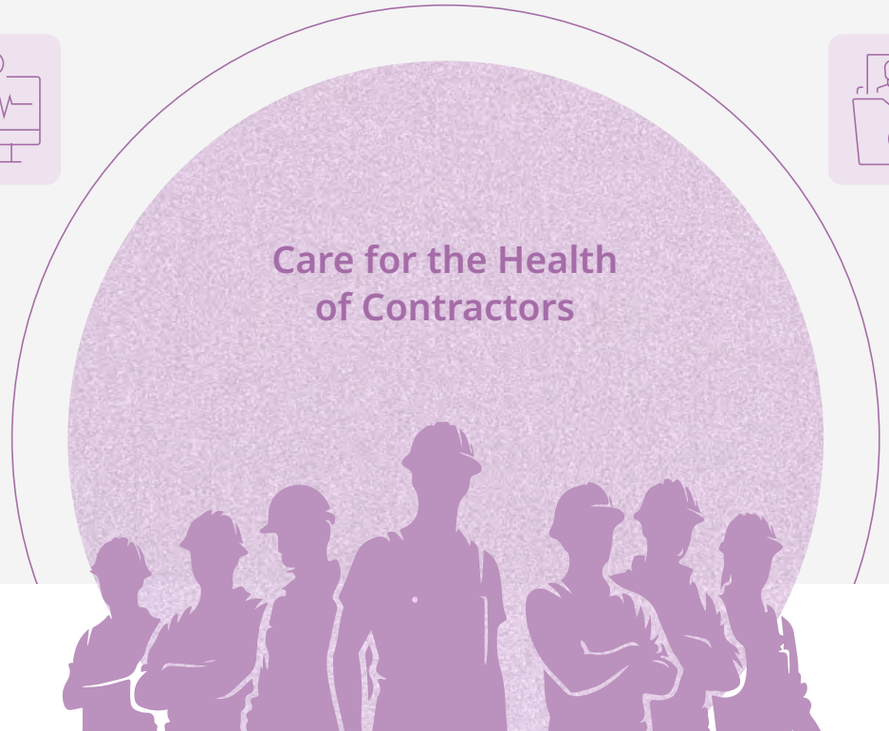
- On-site health service by occupational health physicians; 38 sessions were organized, benefitting 481 persons
- Provide professional services for the four major labor health protection plans , carry out the adequacy evaluation for work allocation, and provide health consultation services

### Health Management System

- Use the "health management system for high-risk construction groups" to identify personnel with high health risk

### Free Health Check-ups in the Construction Area

- Provide accessible health check-ups. Apart from the screening of four cancers (oral cavity cancer, colorectal cancer, breast cancer, and cervical cancer) and hepatitis B/C, screening for AIDs was added, and a total of six sessions were organized, benefiting 863 persons
- Based on health check-up results, the residing physician and nursing team provides consultation to contractors and partners for hospitalization and care and offers health education services




### Follow-up Care System

- The care team evaluates the type of work and work environment of personnel and visits the site to care for personnel with high-health risks, benefitting a total of 14,339 persons
- Promote the "blood pressure before work" campaign to provide care to fab construction partners NEW

NEW

### Professional Medical Consultant

- Invite NTUH Hsin-Chu Branch to serve as professional consultants for health and emergency management of construction sites NEW

## Prevent Occupational Diseases

TSMC is committed to the prevention of occupational diseases. The Company collaborated with occupational disease physicians and external experts to identify and manage five major potential risk factors: chemical, physical, ergonomic, biological, and social/mental in accordance with the Occupational Disease Risk Identification Procedures to build a healthy and safe work environment.

### Occupational Disease Prevention and Achievements

#### Ergonomics

Continued to work with occupational physicians to reduce operational hazards, aligned with international identification tools, and established ergonomic operation continuity identification guidelines

**New Measure in 2024** NEW

- Introduced the Key Indicator Methods (KIM2019), added three types of ergonomic operation evaluation dimensions, refined the classification of ergonomic risks, established an electronic record keeping platform, and established ergonomic operation continuity identification guidelines for fabs

**Achievements**

- Completed **1,101** items in the ergonomic operation continuity identification guidelines according to different operating models, categories, and behaviors of 8-inch and 12-inch fabs and advanced backend fabs

**Existing Measures**

- Arranged occupational physicians visits to loading sites at TSMC fabs in Taiwan and kept visiting records on a digital platform to pass down the experiences
- Used computerized ergonomic risk assessment systems to identify operations with high ergonomics risks
- Promoted office ergonomic engineering and provided appropriate assistive devices
- Conducted health surveys and tracked employees who requested muscle soreness patches, and reached out to and arranged meetings with occupational physicians for employees on leave for musculoskeletal pains
- Analyzed departments where many people in the same unit have applied for leave due to muscle aches to determine if operations involved ergonomic risks

**Achievements**

- Arranged seven on-site visits by occupational physicians, achieving a 100% improvement completion rate
- Employees affected by soreness were cross-referenced with the computerized ergonomic risk assessment system; none were found to be working in areas with ergonomic or potential ergonomic risks
- Provided five assistive devices with ergonomic engineering designs to employees, including computer stands, external screens, and wireless keyboards and mouses to provide a comfortable office space
- Added **15** operational inspection records and improvement achievements
- **165** employees were impacted by soreness and participated in the ergonomic risk exposure survey; two employees were assisted with suspected ergonomic risk factors to make work adjustments
- Six people continued to use muscle soreness patches to treat body aches in the same location; an evaluation by an occupational physician determined that the illness was unlikely to be work-related, and the Wellness Center provided health education to help mitigate their discomfort

#### Chemical

Implement chemical source control, improved digital systems, and continued to reduce the exposure risks of manual chemical operations

**New Measure in 2024** NEW

- Introduced the i-SDS chemical safety database to establish the complete quantitative and semi-quantitative chemical exposure evaluation model to digitally track historical exposure and the level of classification management

**Achievements**

- Completed the digital hazard identification of **254** mixed chemicals and posted the corresponding Globally Harmonized System of Classification and Labeling of Chemicals and Safety Data Sheet at operating sites based on the risks identified for workers to identify hazards and make emergency responses
- Optimized four exposure evaluation systems to connect to exposure evaluations by identifying similar exposure groups

**Existing Measures**

- Chemical management: Please refer to TSMC's Chemical Management Procedure
- Continued to improve the exposure risks of employees' manual chemical operations
- Based on the analysis of chemical exposure risk and the frequency/nature of the operation, approximately 2% of the contractors may be exposed to high health risk substances [Note]; TSMC observes such operations and assesses the risks
- Examined the applicability of personal protective equipment each year to ensure that employees choose the correct protective equipment based on the use characteristics and occasion
- Continued to arrange occupational physicians to assist contractors in the fabs to conduct on-site surveys and identify chemical exposure risks in the workplace
- Requested contractors with abnormal special health check-up results to voluntarily report them to TSMC

**Achievements**

- Confirmed that four work sites where contractors may be exposed to high health risk substances comply with safety and health management regulations; in addition, the sites are equipped with good ventilation and protective equipment is worn by workers; hence, there are no exposure concerns
- improved methods and processes for three non-contact operations. In addition, three such operations were changed to auto supply and allocation and have entered the engineering improvement stage
- Personnel working inside TSMC fabs did not have any health concerns about chemical exposure
- Added **11** compliant protective equipment for employees' use
- Received **0** cases of unusual results for special health check-ups
- **0** cases of occupational diseases caused by exposure to chemicals

Note: Refers to carcinogens, mutagens, and reprotoxic substances

## Social/Mental

Enhance the cerebral and cardiovascular disease prevention and management program

### Existing Measures

- Offered occupational leave to employees with medium/high health risks in Taiwan and China facilities for free advanced health check-ups to help them prevent cerebral and cardiovascular diseases
- Flagged those with advanced health check-ups [Note 1] as a high-risk group and actively managed their medical treatment and working hours
- Used the health management system integrated with the latest employee health check-ups and working hours to evaluate health risks; in addition to informing employees, supervisors and HR were reminded to adjust workloads for said employees
- If the employees exhibit abnormalities over time, the system will automatically remind employees, supervisors, and HR via e-mail

### Achievements

- In total, **11,876** employees in Taiwan fabs received advanced imaging examinations, of which **1,637** were classified as moderately or highly abnormal. Employees received re-examination and health education based on the degree of their abnormality. Of these, **330** people who refused re-examination were given health guidance via physician interviews, telephone interviews, or written reviews. Furthermore, **157** people were required to limit working hours or adjust work content according to the doctor's orders, and work distribution was facilitated
- Tracked working hours of employees every month to manage **5,071** people with medium/high health risks, and to make sure that they comply with doctor's orders. Arranged health guidance for **1,634** people through approaches such as doctor's interviews, telephone interviews, or written reviews, and other traditional risk factor health guidance. In total, work hours or work content adjustment was implemented for **806** persons

## Biological

Track CDC updates to provide employees with the latest health information

### Existing Measures

- Continued to track communicable diseases domestically and abroad and establish preventive/response measures for notifiable diseases; the Disease Prevention Committee continued to develop anti-pandemic countermeasures and reporting mechanisms
- Continued to enforce reporting mechanism for non-notifiable diseases and provided up-to-date information on seasonal flu and dengue fever
- Provided disease prevention toolkits to employees on business trips to areas with disease outbreaks

### Achievements

- Effectively managed a total of **287** instances of notifiable diseases and non-notifiable diseases to contain the spread
- Distributed **35** disease prevention toolkits to employees going on business trips

## Physical

Continue to manage and control the identification of physical exposures in the environment and reinforce safety protection behaviors

### New Measure in 2024 (NEW)

- Optimized safety and physical protection against particle escape in the wafer-breaking operation in compliance with the statutory permissible exposure limit

### Achievement

- Identified a total of seven improvement opportunities under three categories, including independent compartment, negative pressure dust collection, and optimization of operational processes

### Existing Measures

- Developed a measurement system for ionizing radiation levels, established a full-time control mechanism for radiation sources, and restricted individuals with pacemakers from operating such equipment
- Process equipment is tested for non-ionizing radiation levels every six months
- Automated outdoor heat hazard risk alert system

### Achievements

- There were **0** cases of radiation exposure
- Non-ionizing radiation measurement results showed electric field and magnetic field strength were far below the ACGIH TLV [Note 2] standard, and all items were normal
- Set up central temperature and humidity monitoring equipment in five areas to digitally connect and convert the heat hazard risk index and level. When the heat hazard reaches level 2 or above, SMS and e-mails are automatically dispatched, and corresponding heat hazard preventive measures are initiated

Note 1: ECG, cardiac/carotid echo, CT coronary angiogram for the Agatston score.

Note 2: Measurement results of non-ionizing radiation (including electric field and magnetic field strength) lower than the threshold limit values (TLVs) defined by the American Conference of Governmental Industrial Hygienists (ACGIH) means that workers exposed to the environment are not negatively affected.

## Building Internal - External Alliances

As a leader in the global semiconductor industry, TSMC proactively cooperated with business partners and industry, governmental, and academic sectors to promote occupational safety and health with the aim of exerting its influence to improve society and serve as a benchmark for the industry. In 2024, TSMC organized the first Safety and Health Forum with "Intrinsically Safe Designs" as the theme to share four major topics, including "Construction Safety to Operation Safety," "Contractor Management," "Adopting AI Technology for Disaster Prevention and Effective Tools Management," and "Chemicals." The Occupational Safety and Health Administration, Hsinchu Science Park Bureau, SAHTECH, university professors, and other experts were invited to join forum discussions, and safety and health personnel of companies in Hsinchu Science Park were invited to participate in the forum to jointly build a friendly and healthy workplace through sharing and exchange.

## Fab Construction Safety Management Process and Mechanism

During the fab construction project stage, contractors, the construction site Safety and Health Committee, and the Safety Management Center establish a fab construction project consultative organization to protect labor safety by adopting a three-level management system. Contractors are required to submit a Construction Safety Protection Plan and Risk Assessment before each construction project, analyze risks through step-by-step analysis of work content or operational hazards by taking into account construction methods, procedures, tools and equipment, safety and health facilities, protective equipment and management regulations to comprehensively identify work environments or operational hazards. TSMC cooperated with fab construction project organization partners to invest resources in preventing operational risks and take action on safety and health based on the three major aspects of safety management, safe behaviors, and safe environments. TSMC also requires contractors to duly comply with and implement construction requirements based on the "Contractor ESH Bluebook on Fab Construction" to protect the safety and health of contractors and partners inside and outside the fab.

## Fab Construction Project Safety Management for Contractors

### Safety Management

#### Existing Measures

- Fab construction projects across Taiwan organized six joint toolbox meetings, with participation from over **29,178** persons, to improve safety culture and build consensus
- Fab construction projects across Taiwan organized **12** emergency response drills with participation from **936** persons, to save precious lives by familiarizing themselves with responses under different disaster scenarios

#### New Measures in 2024 NEW

- Each fab construction project adopted **24**-hour on-site ambulances and emergency medical technicians to ensure timely response during the critical golden hour of rescue
- The fab construction team in Kaohsiung cooperated with a Japanese construction company to improve safety management. **24** foremen from the contractors formed the Construction Site Staff Council to promote 6S activities and visual labels, and held monthly communication meetings to improve the safety awareness of personnel and the construction site environment
- A total of **1,045** sessions have been conducted on construction safety for the main contractors, focusing on four key aspects: personnel protection, work permits, risk hazards, and equipment safety to foster a cohesive approach to safe operations

### Safe Behaviors

#### Existing Measures

- Continue to focus on six high-risk operations. The main contractor or the Safety Management Center will appoint dedicated personnel to conduct construction audits and supervise and curb risks
- TSMC collaborated with the main contractor and the consultative organization to promote a "take blood pressure before work" campaign and cared for **393,970** persons

#### New Measures in 2024 NEW

- Improved the basic first aid knowledge and capabilities of fab construction management personnel and organized training courses for basic life support, advanced cardiac life support, and AED. **64** sessions were organized, and a total of **1,630** persons completed the training
- Promoted technology-assisted hazard prevention training. Fab construction projects in Hsinchu and Kaohsiung cooperated with ITRI to set up the "eXtended Reality VR Training Classroom" for forklifts, aerial work platforms, and mobile cranes. Based on post-learning statistics, satisfaction reached **80%**

### Safe Environment

#### Existing Measures

- Continued heat hazard prevention measures. Fab construction projects across Taiwan organized 54 "cool summer" activities and distributed **11,956** popsicles or cold beverages
- Maintained the connection between the air pollution facility environmental protection monitoring platform and the alert and sprinkler system for suspended particulates. In 2024, the linkage was established at four places for **100%** dust control

#### New Measures in 2024 NEW

- Eight fab construction projects set up **161** AEDs at construction areas, and obtained "AED Certification" from the Ministry of Health and Welfare
- Set up new, comfortable container cabin toilets that provide automatic flushing equipment, which significantly improved the quality of mobile toilets, and overall satisfaction reached **88%**

Case Study

# Professional Healthcare and Timely Rescue to Improve Construction Site Safety Management

As TSMC continues to build new fabs, it is also committed to improving the medical care and first aid systems at construction sites to ensure the health and safety of all contractors and partners. In 2024, it worked alongside the National Taiwan University Hospital (NTUH) Hsinchu Branch to improve construction site safety in five major categories: Health Risks, Physical Monitoring Before and After Work, Emergency Care Processes, Follow-up Care, and Education and Training. For emergency care processes, 24-hour on-site ambulances and emergency medical technicians were introduced to fab construction projects across Taiwan, and AEDs were installed to improve emergency response. Meanwhile, the project also emphasized the importance of real-time reporting of poor health conditions. After promotions and advocacies, the personnel recovery rate after real-time reporting reached 100%. For education and training, TSMC organized a variety of first aid courses to improve the capabilities of on-site frontline contractors. 1,301 and 326 persons completed the AED first aid training and basic life support training, respectively. In addition, 11 onsite nurse practitioners at fab construction projects completed advanced cardiac life support training at NTUH. Through cooperation with professional medical institutions and investments in 24-hour first aid resources, TSMC demonstrates the importance it places on construction site safety management in the hope of collaborating with different sectors to protect the life safety and health of contractors and partners.

> Word of appreciation: I appreciate TSMC for introducing 24-hour on-site ambulances and emergency medical technicians, allowing me to escape from danger in an accident. I deeply feel TSMC's comprehensive care for construction site safety and labor health.
>
> **TSMC new fab construction contractor representative**


24-hour on-site ambulances for fab construction projects

# Power to Change Society

TSMC, in collaboration with the "TSMC Education and Culture Foundation" and the "TSMC Charity Foundation," is committed to addressing societal needs. By integrating cross-disciplinary resources, TSMC focuses on fostering educational innovation for learners of all ages, promoting community inclusion, cultivating artistic and cultural appreciation, enhancing ecological sustainability and environmental awareness, and advancing health protection — driving meaningful and positive change.

**Social Impact**

**TSMC Education and Culture Foundation** | **TSMC Charity Foundation**

**1**

Launch of the "Eco Plus! Ecological Harmony Program" to promote biodiversity mainstreaming

**61,598 Participants**

Engaged in arts and culture promotion initiatives

**186,210 Seniors**

Benefited from care programs for senior living alone

# Social Impact

In line with its ESG Policy , TSMC has long collaborated with the TSMC Education and Culture Foundation and the TSMC Charity Foundation to devote itself to social engagement. To closely monitor the essence and impact of various issues, listen to and respond to stakeholder concerns, and align with international frameworks and standards, the Company in 2024 reassessed its programs and defined issue categories, focusing on five core areas — educational innovation, community inclusion, art and cultural literacy, ecological sustainability, and health protection. By corresponding with the United Nations Sustainable Development Goals (SDGs), TSMC has adopted an integrated, diverse, and strategic approach to social engagement to bring about positive change.

**1,391,674 persons**
Beneficiaries of social engagement programs

**10.69 million**
Matching donation (NT$)

**17,501**
Volunteers accumulated

**91,787 hours**
Volunteer hours accumulated

**217**
Charity programs

**192**
Charity partners

**Five Core Areas**
**2,440.58 million**
**Total Investment**

**Educational Innovation**
$1716.16
(70.3%)

**Community Inclusion**
$409.15
(16.8%)

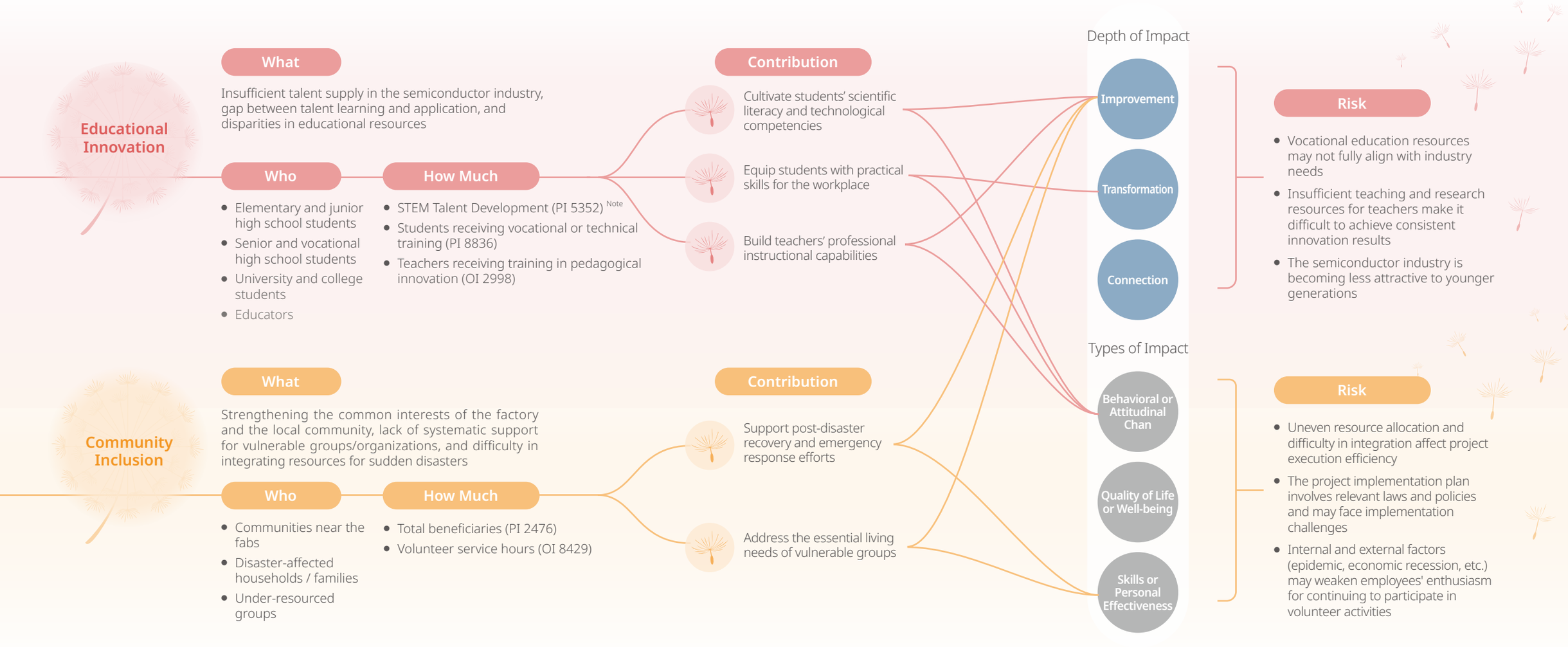
**Art and Culture Literacy**
$71.97
(2.9%)

**Ecological Sustainability**
$227.68
(9.3%)

**Health Protection**
$15.62
(0.6%)

Unit: NT$ million

To strengthen the overall effectiveness of resource allocation, TSMC not only continuously tracks the impact of its long-term social engagement but also broadened the scope of the Impact Management Project (IMP) introduced in 2023. By applying five key dimensions — What, Who, How Much, Contribution/Impact, and Risk — and integrating the Business for Societal Impact (B4SI) framework and Impact Reporting and Investment Standards (IRIS) metrics, the Company has created a systematic approach to social impact management, which enables comprehensive evaluation, oversight, and disclosure of how each project affects society and the environment, ensuring that every investment delivers lasting and positive value.




Note: In the IRIS+ framework, OI refers to indicators measuring social or environmental outcomes, PI denotes performance indicators, and PD represents indicators evaluating the implementation process

## Art and Culture

**What**

Challenges in preserving traditional culture, low accessibility to popular arts, insufficient cultural resources

**Who**

- Arts and cultural organizations
- Community members
- Students

**How Much**

- Participants in arts and cultural events (PI 2476)
- Sponsoring outstanding artists or organizations (Custom)

**Contribution**

- Foster public appreciation for arts and culture
- Provide resources to nurture artistic talents

## Ecological Sustainability

**What**

Biodiversity reduction, habitat destruction, threats to the survival of endangered species, lack of environmental awareness, and environmental and resource issues have become urgent challenges around the world

**Who**

- Ecosystems and the environment
- Elementary and junior high school students
- General public

**How Much**

- Greening area through tree planting (Custom)
- Bees raised on company premises (Custom)
- Species under conservation on premises (PD 6429)
- Participants in citizen science education (OI 2998)
- Volunteers trained in ecological and environmental conservation

**Contribution**

- Restore biodiversity by protecting species and habitats
- Raise environmental awareness in local communities

## Health Protection

**What**

Insufficient health care resources for the elderly population; difficulty in obtaining comprehensive support for the health of contractors in the construction area; and inequality in health literacy and action.

**Who**

- Senior citizens
- Contractors at work sites

**How Much**

- Seniors receiving health and medical services (OI 9417)
- Contractors at work sites receiving health support services (OI 9417)

**Contribution**

- Elevate access to health resources for the elderly
- Improve the well-being of contractors at work sites

### Depth of Impact

- Improvement
- Transformation
- Connection

### Types of Impact

- Behavioral or Attitudinal Chan
- Quality of Life or Well-being
- Skills or Personal Effectiveness

**Risk**

- Arts development requires consistent resource support
- Cultivating artistic talent demands significant time and resources

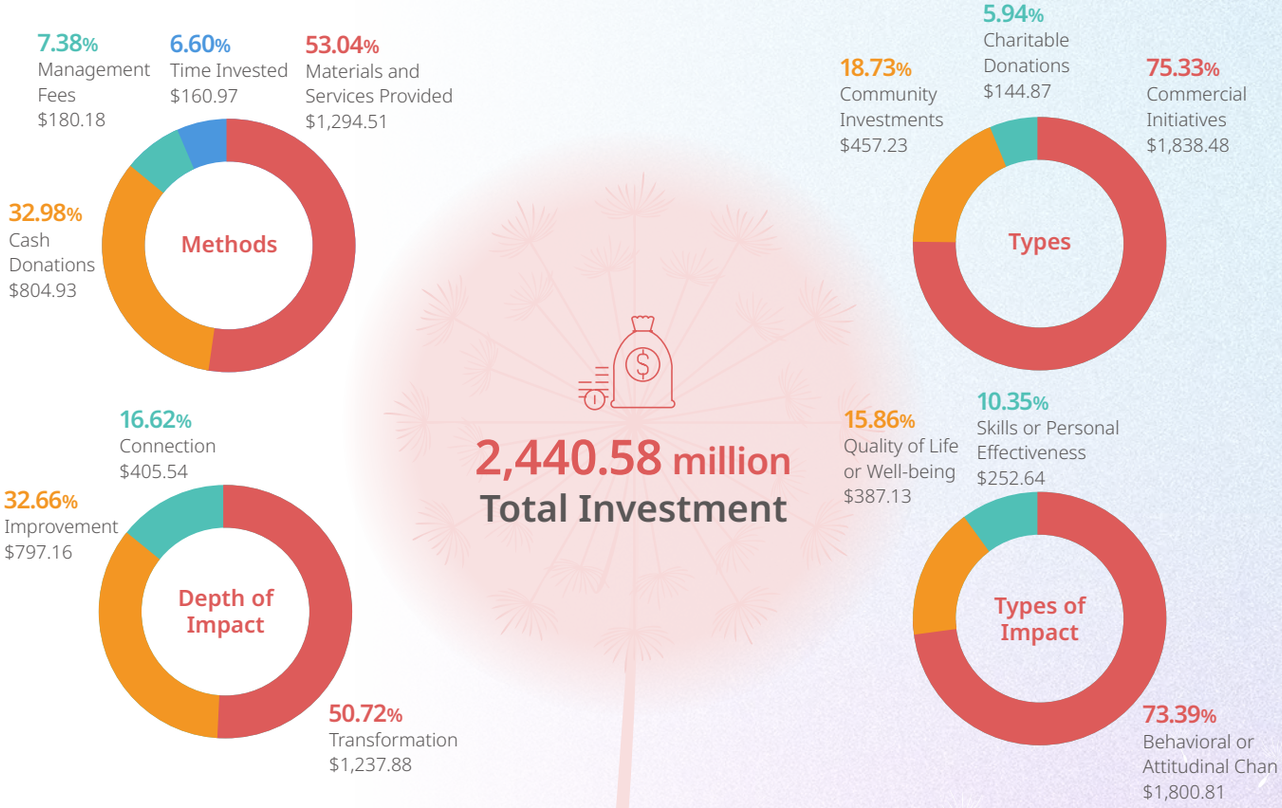
**Risk**

- Environmental protection requires long-term investment and is unlikely to produce short-term results
- Corporate and government policies may impact ecological conservation implementation
- Conflicts between development and ecological protection impede conservation projects
- Public participation and environmental education outcomes remain difficult to quantify

**Risk**

- Tensions may arise between health data management and privacy protection
- Community healthcare systems often face shortages in personnel and funding
- Frequent turnover among contractors at work sites makes long-term tracking difficult
- Awareness of health and safety culture among contractors at work sites may be insufficient

Under its established management framework, the Company in 2024 partnered with its two foundations to unite employees, community allies, supply chain partners, cross-industry enterprises, local governments, academic institutions, healthcare organizations, and nonprofit entities to create diverse avenues and opportunities for social engagement, which have mobilized 17,501 TSMC volunteers who dedicated 91,787 hours. The Company's total social investment reached NT$2.31158 billion, benefiting approximately 1,391,674 individuals. In alignment with the SDGs, TSMC allocated 62.46% of its resources annually to SDG 4 (Quality Education) followed by 9.30% to SDG 17 (Partnerships for the Goals). The Company also endorsed SDG 1 (No Poverty), SDG 3 (Good Health and Well-being), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), SDG 10 (Reduced Inequalities), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), and SDG 15 (Life on Land). Dedicated to maximizing its societal impact, TSMC continues to fulfill its commitment to shared prosperity through concrete actions, contributing to global sustainable development with the power of business.




Unit: NT$ million

## Resource Invested Corresponding to SDGs

- $4.06 | 0.17% — No Poverty
- $174.38 | 7.15% — Good Health and Well-being
- $1443.72 | 59.15% — Quality Education
- $85.16 | 3.49% — Affordable and Clean Energy
- $81.11 | 3.32% — Decent Work and Economic Growth
- $150.05 | 6.15% — Industry, Innovation and Infrastructure
- $4.06 | 0.17% — Reduced Inequalities
- $12.17 | 0.50% — Sustainable Cities and Communities
- $101.39 | 4.15% — Climate Action
- $169.55 | 6.95% — Life on Land
- $214.94 | 8.81% — Partnerships for the Goals

# TSMC Education and Culture Foundation

| Strategy | 2030 Goals | 2024 Targets | 2023 Achievements |
|---|---|---|---|
| **Cultivate Young Generation**<br>Hold educational events; provide diversified educational platforms | Ensure the number of overall youth competition event participants is higher than that of the previous year | Ensure the number of overall youth competition event participants is higher than that of the previous year | **Youth competition events attracted a total of 6,823 participants, reduced by 1,230 participants from 2023** Note 2<br>Target: The number of youth event participants is higher than that of the previous year |
| | Hold ≧ 30 popular semiconductor activities with ≧ 3,000 participants annually | Hold ≧ 30 popular semiconductor activities with ≧ 2,000 participants annually | **Held 69 TSMC Journeys of Female Scientists Lectures, with 3,132 participants** ✓<br>Target: Hold ≧ 30 popular semiconductor science activities with ≥ 2,000 participants |
| | Invest ≧ NT$45 million[Note 1] in resources annually | Invest ≧ NT$40 million[Note 1] in resources annually | **Invested NT$42.84 million** ✓<br>Target: Invest ≧ NT$35 million in resources annually |
| **Promote Educational Collaboration**<br>Cooperate with educational organizations to narrow the gap in educational resources | Continue to cooperate with educational organizations and invest ≧ NT$35[Note 1] million in resources | Continue to cooperate with educational organizations and invest ≧ NT$30 million in resources | **Invested NT$31.52 million** ✓<br>Target: Invest ≧ NT$25 million in resources annually |
| **Promote Arts and Culture**<br>Hold art festivals to foster local art groups | Sponsor ten local talented artists or art groups | Sponsor ten local talented artists or art groups | **Sponsored 20 local groups, 7 International groups** ↑<br>Target: Sponsor ten local talented artists or art groups |
| | ≧ 3,000 participants for Chinese in-person opera activities | ≧ 2,000 participants for Chinese in-person opera activities | **Chinese in-person opera activities > 14,551 participants** Note 3 ↑<br>Target: ≧ 2,000 participants for Chinese in-person opera activities |
| | Ensure the annual number of beneficiaries for arts and cultural events is ≧ 30,000 people[Note 1] | Ensure the annual number of beneficiaries for arts and cultural events is ≧ 20,000 people[Note 1] | **Arts and cultural events > 64,159 participants**[Note 3] ↑<br>Target: Ensure the annual number of beneficiaries for in-person arts and cultural events is ≧ 20,000 people |

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: Given the significant improvement in program outcomes in recent years, both the funding and participant numbers for 2025 and 2030 are expected to increase. Accordingly, next-year and long-term targets have been raised

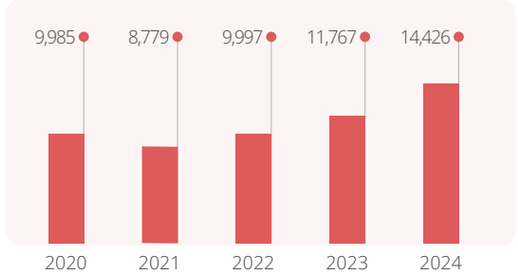
Note 2: Due to the impact of declining birth rates and shifts in social and cultural trends, participation in humanities-related activities and competitions has slightly decreased compared to previous years. In response, the implementation policy will be appropriately adjusted in 2025 to promote participation in competitions

Note 3: The diversity of themes and performance formats in traditional opera and arts and cultural activities successfully attracted a broader audience, resulting in achievements for 2024 that surpassed the originally set targets

The TSMC Education and Culture Foundation, guided by its three core strategies — Young Generation Cultivation, Educational Collaboration, and Arts and Culture Promotion — strives to deepen scientific and humanistic learning, foster artistic development, cultivate cultural literacy among students and the public, inspire sensitive and creative thinking, and advance cultural heritage and fulfill societal values. In 2024, the Foundation, in collaboration with local governments, academic institutions, and other partners, implemented diverse talent cultivation and cultural preservation projects, including arranging university lab visits for female high school students to broaden their scientific horizons; launching semiconductor and calligraphy workshops to deepen learning experiences for elementary school children; and sponsoring a performance of the classic Kunqu opera, held for the first time in Kaohsiung, Taiwan, to nurture public appreciation for the arts. The Foundation also expanded international partnerships by exclusively supporting a performance by the OneSong Orchestra in Kumamoto, Japan — home to TSMC's subsidiary, JASM — cementing Taiwan–Japan cultural ties through music. In total, the Foundation invested NT$144.88 million in 2024, benefiting 641,659 participants. For more information on activities and sponsorship programs, please visit the official website of the TSMC Education and Culture Foundation.

## Donation by the TSMC Education and Culture Foundation

Unit: NT$ ten thousand




## Strategy and Action

### Cultivate Young Generation

- Cultivate Future Scientific Talent
- Create Diverse Platforms for Young Generations

### Promote Educational Collaboration

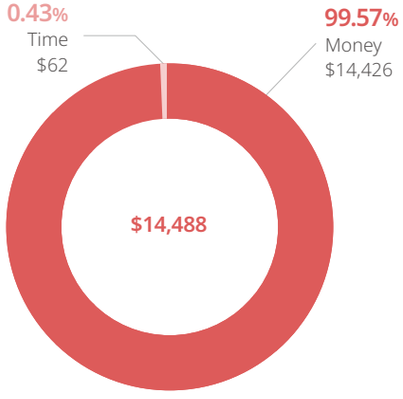
- Empower Teachers and Students in Rural Areas
- Establish Scholarships to Nurture Economically Disadvantaged Future Talent

### Promote Arts and Culture

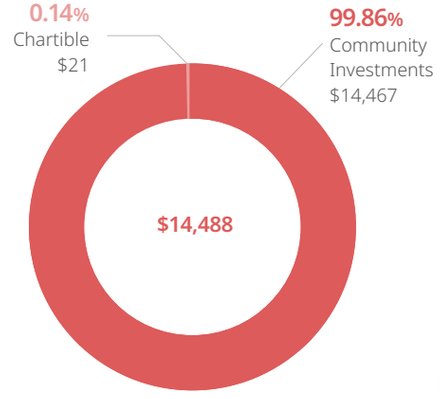
- Support Arts and Cultural Performances
- Promote and Preserve Traditional Opera

## TSMC Education and Culture Foundation Contributions

### What We Contributed

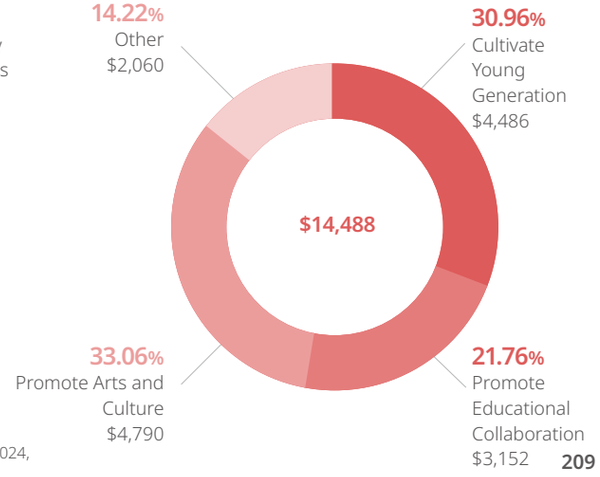



### How We Contributed




### Focuses of Contributions

Unit: NT$ ten thousand




Note:The value of corporate volunteering equals the total volunteer service hours multiplied by the average hourly wage of TSMC employees in 2024, including time dedicated to popular science education programs organized by the TSMC Education and Culture Foundation

Cultivate Young Generation

## What We Want to Solve

Domestic education often lacks literature, art, science, and exploration courses. As a result, students do not have a holistic education that integrates technology and humanities and thus lack the comprehensive skills required for future talents

## How We Respond

Organize competitions, science camps, lectures, and proposal competitions for senior high school and college students to inspire their interest in science and develop their cultural qualities. At the same time, the aim is to boost their self-confidence, insight, and problem-solving capabilities

## Our Actions

- Cultivate Future Scientific Talent
- Create Diverse Platforms for Young Generations

# Cultivate Future Scientific Talent

## Guide Female High School Students into the World of Technology

Since 2020, the TSMC Education and Culture Foundation has hosted the TSMC Journey of Female Scientists program, offering museum tours, hands-on scientific activities, and interactions with industry experts to inspire female students to explore technology fields and deepen their understanding of the semiconductor and STEM sectors. To date, the initiative has attracted 4,587 participants. In 2024, the Foundation continued organizing science camps, expanding outreach to female students from girls' and comprehensive high schools across Taiwan to delve into scientific discovery. Furthermore, the curriculum progressed from foundational high school-level science to university-level research, including a joint semiconductor course developed in conjunction with the Department of Physics and the Center of Science Education at National Chung Hsing University, drawing a total of 1,275 participants.

Students experience the research environment in a university laboratory.

### Guided Exhibitions

Participants tour the World of Semiconductors and the TSMC Museum of Innovation, led by female scientists and TSMC women engineers, offering firsthand observation of industry applications

### Hands-On Popular Science Workshops

Through practical activities in chip design, optoelectronic technologies, and electronic components, students strengthen their understanding of technology and inquiry abilities

### Female Scientist Forums

Women leaders from academia and industry share their career journeys to encourage students to pursue paths in STEM fields

### Higher Education Showcase

Experience five experiments , laying the groundwork for future studies in science and technology

Students apply hands-on activities to understand academic theories.

After visiting the laboratories through the TSMC Journey of Female Scientists, I became inspired to explore the STEM fields.

**Student of the Affiliated Senior High School of National Chung Hsing University**

The Female Scientist Forum organized by the TSMC Education and Culture Foundation has motivated me to work harder in discovering a field I truly enjoy.

**Student of National Lan-Yang Girls' Senior High School**

## Disseminate Popular Science Through Creative Expression

To cultivate scientific literacy and communication skills among high school students, the TSMC Education and Culture Foundation has since 2013 sponsored the TSMC Cup - Competition of Scientific Short Talk organized by the Center for the Advancement of Science Education at National Taiwan University, which has reached its 11th edition in 2024. The event features two major contests: the Scientific Creative Expression Competition and the Popular Science Book Review Essay Contest, aiming to encourage students to convey scientific concepts through spoken presentations and written narratives, while also fostering a growth mindset. This year's competition attracted a record 564 participants and expanded internationally for the first time, drawing high school students from Japan, South Korea, Malaysia, Thailand, Vietnam, Indonesia, and China. Submissions from overseas accounted for 20% of the total entries.


Malaysian students demonstrate outstanding scientific creativity and communication.

- **Scientific Creative Expression Competition**
  Participants reinterpret and articulate designated scientific concepts through creative means, reinforcing comprehension and communication skills
- **Popular Science Book Review Essay Contest**
  Contestants read designated popular science books and compose review essays, fostering scientific literacy and self-directed learning

### International Expansion

The program extended to seven countries for the first time, utilizing science communication to bridge linguistic and cultural differences and facilitate global exchange

### Integration of Sustainability Issues

Centered on the theme "Sustainability and Chemistry," the initiative guided students in exploring sustainability issues and considering how chemical applications contribute to sustainable development


Students share scientific knowledge through creative expression.

This competition not only challenged our scientific knowledge but also combined video production and live Q&A sessions, which was truly interesting!

**Participant team from Stella Matutina Girls' High School, Taichung**

Originating in Taiwan, the competition now welcomes students from Malaysia, Indonesia, and South Korea. It has grown beyond a contest to become a platform for international scientific exchange.

**Wei-Pang Huang**
Director of the Center for the Advancement of Science Education at National Taiwan University

## Advance AI and Science Education in Tandem

The TSMC Education and Culture Foundation has long sponsored the Wu Ta-You Science Camp, Wu Chien-Shiung Science Camp, and Madame Curie Chemistry Camp, providing aspiring young people with opportunities to explore scientific knowledge in depth and engage with leading experts from Taiwan and abroad. In 2024, the three science camps focused on artificial intelligence (AI) and scientific advancement. In collaboration with nine academic institutions, the camps featured 18 distinguished experts and academics who guided students through the latest technology applications and research trends, attracting a total of 332 students taking part.

### Wu Ta-You Science Camp

**Focus on AI and Health Technologies**

Inviting 11 international AI experts from entities such as Google, SNAP Research, and Harvard Medical School, the camp led participants to explore the application of AI in scientific research and healthcare. The event attracted STEM students from Taiwan, China, Hong Kong, and Malaysia. Through hands-on practice and discussions, participants deepened their understanding of technological developments.

Highlight

- Panel discussions and forums
- Trending technologies and topics
- Creative ideation competitions

AI Application and Debate Contest

### Wu Chien Shiung Science Camp

**Build Foundational AI Capabilities Through Instruction by Leading Academic Experts**

Four international scientists, including Nobel laureates and top experts from the University of California, Berkeley, and Stanford University, were invited to give lectures. They provided in-depth analysis of cutting-edge scientific advances and research experiences, inspiring students to explore the fields of physics, chemistry, and biomedical sciences, as well as to develop fundamental AI literacy and capabilities for future scientific careers.

Highlight

- Subject-specific lectures
- Physics experimental exploration

A Masterclass by Prof. Martin Chalfie

### Marie Curie Science Camp

**Emphasize Hands-On Practice and AI Innovation**

Combining theory and practice, the camp cultivated participants' scientific application skills. Experts and academics from Academia Sinica, National Taiwan University's Artificial Intelligence Center, and Chang Gung University College of Intelligent Computing were brought in for discussions. This not only enhanced participants' experimental skills but also taught them how to utilize AI to drive future scientific innovations.

Highlight

- Laboratory operations
- AI innovation challenges
- Interdisciplinary critical discussions

AI Innovative Application Challenges

# Create Diverse Platforms for Young Generations

## Let Dreams Illuminate a Sustainable Future

The 9th TSMC Udreamer Project adopted the theme "Sustainability: Our Choice," drawing participation from 397 students across 126 teams from 55 universities and colleges. Nine teams ultimately stood out and were awarded a total of NT$3 million in prize money. Their proposals covered diverse areas, including new immigrant culture, regional revitalization, sports sustainability, and cultural preservation — demonstrating the capacity of young people to respond to societal needs with innovative thinking. In addition to the grants, the TSMC Education and Culture Foundation invited employees to serve as mentors, offering professional guidance and sharing real-world experience throughout the nine-month project. In 2024, 121 employees signed up for the mentorship program, marking a 75% increase from the previous year. Since its launch in 2016, the project has enabled 3,482 students to pursue their dreams and turn ideas into viable plans. Moreover, this year's program incorporated children's picture books for the first time into a special exhibition that conveyed the spirit of the Terra Carta Sealm while featuring a drawing competition, themed lectures, and collaborative creation sessions between international illustrators and elementary school students in Taiwan, which attracted 1,747 participants in total, further advancing the impact of sustainability education.

The 9th TSMC Udreamer Project Showcases Special Exhibition: "I Decide — Making Dreams Come True".

- **Annual Initiative**
  Empower young people to take sustainable action and realize social innovation through the Udreamer Project
- **TSMC Visit**
  Explore sustainable technologies and innovative applications through corporate visits
- **Mentorship Program**
  Corporate professionals serve as mentors to support and guide young people throughout their journey

### Strengthening Sustainability Education

Mounted the special exhibition featuring children's picture books, in alignment with TSMC's recognition as the world's first semiconductor company to receive the Terra Carta Seal

The 9th Udreamer Project features its first-ever special exhibition inspired by children's picture books.


Students brainstorm eco-friendly solutions to mitigate the environmental impact of single-use containers.

TSMC is a place where dreams are built, shaped, and fulfilled. I hope to gradually realize my own aspirations here as well.

**Participant shortlisted in the preliminary round**
9th Udreamer Project

Thank you to the TSMC Education and Culture Foundation for organizing such a meaningful event, which has once again fostered our growth and touched our hearts.

**Chih-Ping Hsu**
TSMC Mentor

## Foster Cultural Vitality Through Literature and Calligraphy

The TSMC Education and Culture Foundation has continued to work on literature and calligraphy education and identify potential talent by organizing the TSMC Youth Literature Award, TSMC Novella Award, TSMC Youth Calligraphy and Seal-Carving Competition, and TSMC Penmanship Competition to facilitate both cultural heritage and innovation. In 2024, the four competitions collectively received 6,033 entries in literary and calligraphic arts, bringing the cumulative total to 24,385 submissions over the years — demonstrating the Foundation's longstanding commitment to the arts and literature.

| TSMC Youth Literature Award | TSMC Novella Award | TSMC Youth Calligraphy and Seal-Carving Competition | TSMC Penmanship Competition |
|---|---|---|---|
| 2,602 entries 2024 Achievements<br>16,354 entries Cumulative Achievements | 151 entries 2024 Achievements<br>898 entries/ 21 emerging writers discovered Cumulative Achievements | 397 entries/ 20 creative lesson plans 2024 Achievements<br>6,878 entries/ 88 creative lesson plans Cumulative Achievements | 2,863 entries/ 1,819 exhibition attendees 2024 Achievements<br>167 entries Cumulative Achievements |
| High school students | Chinese-speaking youth worldwide | High school students junior high and high school teachers | Junior high and high school students and elementary school teachers |
| Short stories, prose, modern poetry | Novellas | Calligraphy, seal carving | Penmanship |
| Annually | Biennially | Annually | Annually |
| Introduced the Rising Sun Literary Award to support emerging Taiwanese writers | Discovered emerging Chinese-language authors | Promoted calligraphy and papermaking craftsmanship | Promoted penmanship with the theme "Message Transmission" |
| Fostered literary creativity and encouraged original writing among youth | Advanced novella creation while identifying new talent in Chinese literature | The only competition in Taiwan promoting the aesthetics of Chinese characters, calligraphy, and seal carving | Strengthened penmanship skills and improved written expression |


Fang-Churng Tseng, Chairman of the TSMC Education and Culture Foundation (left), presents the award.

Students creates "Pine-Citrus Paper" using pineapple and citrus fibers and copied classic calligraphy pieces.

## Create Interdisciplinary Dialogue Between Literature and Film

The TSMC Education and Culture Foundation exclusively sponsored the Hsien-Yung Pai Literature Lectures at National Tsing Hua University, partnering with the Department of Chinese Literature, the Center for General Education, and the Center for Language Education at National Tsing Hua University to guide students in exploring adaptations and interpretations of literary classics, broadening their literary perspectives. In 2024, led by Professor Hsien-Yung Pai, the program invited 15 distinguished experts from the arts and cultural sectors to deliver lectures analyzing cinematic adaptations of Chinese and Western literary works, inspiring students to develop diverse viewpoints on literature and digital media and drawing a total of 2,146 attendees. To expand the program's educational reach, the Foundation compiled previous years' lectures into audiovisual materials available on both National Tsing Hua University's OpenCourseWare platform and the Foundation's official YouTube channel, allowing the public to appreciate the fusion of literature and film. From 2019 through 2024, the video content accumulated a total of 190,446 views.


The literature lecture at National Tsing Hua University delivered by Hsien-Yung Pai is highly cherished by students.



Arts and culture experts inspire students' understanding of visual narratives through analysis of creative works.

# Promote Educational Collaboration

## What We Want to Solve

Schools in remote townships in Taiwan are faced with long-term shortage of teachers and educational resources, resulting in low academic achievement among students. Students from underprivileged homes are trapped by financial circumstances, hence they are unable to explore and turn their lives around

## How We Respond

Collaborate with educational organizations from both the private and public sectors to expand curriculum development and promotion, as well as assist in the training of teachers in remote townships to improve the learning motivation and effectiveness of underprivileged students. Scholarships are also provided for disadvantaged students to reduce their financial burden

## Our Actions

- Empower Teachers and Students in Rural Areas
- Establish Scholarships to Nurture Economically Disadvantaged Future Talent

## Empower Teachers and Students in Rural Areas

### Inspire Students Through Art and Science

Since 2002, the TSMC Education and Culture Foundation has worked to bridge the urban-rural education gap through the Aesthetic Tour, offering students in remote areas opportunities to engage with art and culture. In 2010, the Foundation launched the Science Tour, guiding upper-grade elementary students from rural regions across Taiwan to visit major science museums and enhance their understanding of natural sciences. In 2024, the Foundation scaled up the scope of both programs. The Aesthetic Tour invited renowned Taiwanese calligraphers as lecturers to lead a newly introduced Chinese Character Writing Workshop, guiding 1,771 senior students from 51 schools in exploring the art of calligraphy. Meanwhile, the Science Tour leveraged TSMC's semiconductor expertise by launching a Semiconductor Workshop. Together with professors from the Department of Physics at National Tsing Hua University, the program employed easy-to-understand experiments to help 1,857 students from 53 schools explore the world of semiconductors.

**Educational Exhibition Visits**
Organize visits to art museums and science exhibition halls, offering hands-on artistic activities and technology experiences to create a diverse learning environment

**Exploring the Beauty of Calligraphy**
Through calligraphy copying sessions and cultural tours, students experience the aesthetic and historical significance of Chinese characters, bringing them closer to traditional art

**Unveiling the Mysteries of Semiconductors**
Through hands-on practice and concept analysis, students learn the basic principles of semiconductors and experience how technology is applied in everyday life

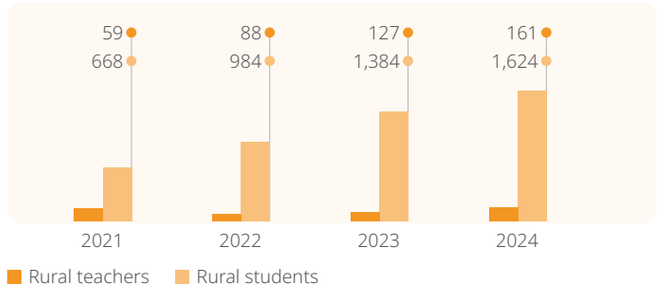
School children experience Chinese character writing and felt the cultural craftsmanship.

School children stimulate their interest in learning through semiconductor experiments.

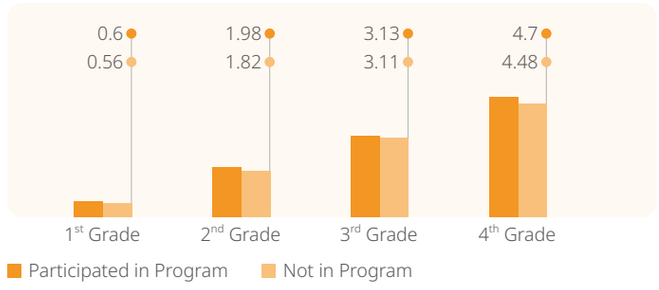
## Empowering Educators to Strengthen Students' Learning Abilities

In 2021, the TSMC Education and Culture Foundation joined hands with the Commonwealth Magazine Education Foundation and the Prof. Hwawei Ko Reading Research Center at National Tsing Hua University to launch the five-year Teach and Learn Program. This initiative supports the professional growth of educators and bolsters instructional effectiveness in rural schools. By incorporating innovative teaching methods, the program nurtures students' capacity for self-directed learning as well as their reading literacy and character development. In 2024, the Foundation not only continued its commitment to lesson planning support and teacher training but also offered classroom teaching materials, aiming to alleviate teachers' preparation burden and enhance learning performance among students. In 2014, a literacy proficiency assessment was conducted with 1,500 students from remote areas who were participants in the Teach and Learn Program. The results revealed that fourth-grade students who had consistently received teaching plans from Teach and Learn Program since the early grades demonstrated superior literacy skills in this test, significantly outperforming students from schools did not join Teach and Learn Program. This highlights the substantial impact of the Teach and Learn Program in enhancing teaching quality by optimizing language proficiency instruction provided by primary school teachers in remote regions.

### The number of participating teachers and students has grown annually




### Students involved in the program have shown significant improvement in literacy skills




Through the Teach and Learn Program, teachers grow alongside their students.

(Image Credit: Yi-Hsiu Lo)

**Support for Teachers' Professional Development**
Assist rural teachers in designing lesson plans and assessments; offer winter and summer workshops to strengthen instructional strategies

**Facilitation of Professional Exchange**
Establish an online collaborative lesson planning community for teachers to share knowledge, exchange resources, and demonstrate teaching

**Enhancement of Reading Literacy**
Design strategic reading and writing courses to cultivate students' critical thinking, information literacy, and independent learning skills

After engaging with the Teach and Learn Program lesson plans by the TSMC Education and Culture Foundation, I began experimenting with diverse teaching methods, bringing more variety into student learning.

**Participating teacher**

Being part of the online collaborative lesson planning community provides not only professional support and suggestions, but also encouragement from like-minded peers.

**Participating teacher**

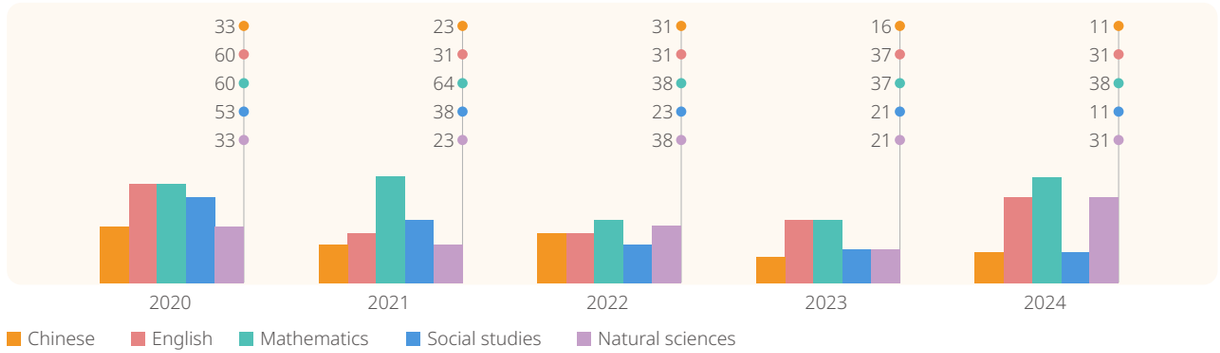
Professional training upgrades educators' professional skills and teaching quality.

## Cultivate Students' Character and Cultural Literacy

The TSMC Education and Culture Foundation has long been dedicated to promoting literacy education and literary awareness. Through the KIST (KIPP Inspired School in Taiwan) initiative at Emei Bilingual Junior High School and the TSMC Youth Literature Camp, the Foundation has established a well-rounded learning journey that integrates academic learning, character education, and cultural literacy, aiming to support students in achieving balanced growth. Over the past five years, the program has applied problem-based learning alongside the cultivation of seven core character strengths — determination, optimism, enthusiasm, self-discipline, gratitude, social intelligence, and curiosity to consistently elevate students' academic performance and self-directed learning abilities. Results from Emei's subject assessments show a marked decline in the proportion of students performing at Level C, indicating measurable progress attributed to the initiative. Meanwhile, to further cultivate literary appreciation, the TSMC Youth Literature Camp in 2024 specifically designated Emei Bilingual Junior High School as its venue, welcoming students from the Taoyuan, Hsinchu, and Miaoli regions, as well as those from three KIST-affiliated rural schools. With acclaimed literary authors as mentors, the program offered courses in reading, writing, and creative expression to deepen junior high students' literary appreciation and cultivate a new generation of youth equipped with diverse thinking and a broad cultural outlook.

### Emei Bilingual Junior High School Comprehensive Assessment Program for The Students - Ratio of Grade C Students

Unit: %




- **Problem-based Learning**
  Develop students' interdisciplinary thinking, logical reasoning, and capacity for independent study
- **Literary Creation Guidance**
  Invite acclaimed authors as mentors to lead participants through the creative writing process
- **Intergenerational Dialogue**
  Recruit university students as counselors to cultivate literary interest through cross-generational interaction

**Curriculum Integrated with Local Industry**

Incorporated Oriental Beauty tea into educational content, including the establishment of a tea ceremony

Authors guide students in creative writing through composition lessons.

Students discover the beauty of literature through engaging and interactive activities.

The TSMC Education and Culture Foundation is concerned about the remote communities by investing both resources and care. Today, the literature camp has become the top choice among local students, significantly enriching the cultural atmosphere.

**Tzu-Li Chen**
Principal of Emei Bilingual Junior High School

The TSMC Education and Culture Foundation has designed this camp for junior high students, giving them early access to rich literary courses and the chance to interact directly with authors.

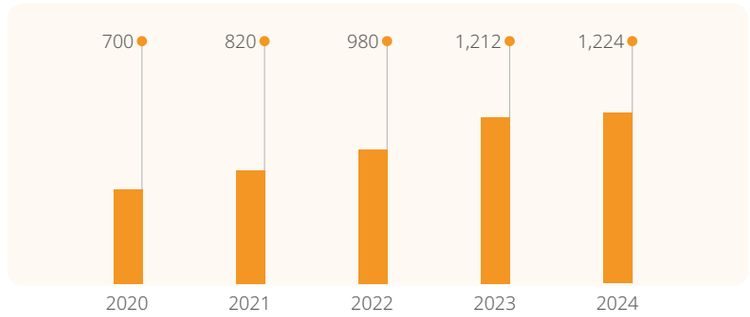
**Hsin-Hung She**
Author and Literature Camp Mentor

## Establish Scholarships to Nurture Economically Disadvantaged Future Talent

The TSMC Education and Culture Foundation has maintained a longstanding commitment to supporting high-achieving students from economically disadvantaged backgrounds. Through its scholarship fund for students from low-income families, the Foundation ensures consistent access to educational resources, enabling recipients to pursue their studies with confidence while broadening their horizons and preparing for greater opportunities ahead. In 2024, the Foundation continued its financial aid initiatives at five universities across Taiwan, including the Sunrise Program at National Tsing Hua University, the Sunflower Program at National Central University, the Cheng Star Program at National Cheng Kung University, the South Star Program at National Sun Yat-sen University, and the Chia Star Program at National Chung Cheng University. A total of 102 students benefited from this funding, with scholarships awarded amounting to NT$12.24 million.

### Total Scholarship Funding Increases Year by Year

Unit: NT$ ten thousands




Graduates' dinner gathering for the Sunflower Program at National Central University.

**Scholarships and Equipment Support**
Provide scholarships and laptops to ensure students can pursue their studies without worries and increase their learning efficiency

**Career-Industry Connection Opportunities**
Offer part-time jobs and internships at TSMC to familiarize students with industry trends and broaden their future career paths

### Ongoing Monitoring and Support

Track students' financial situations, academic performance, and daily conduct through regular gatherings and school learning reports, providing timely assistance"

I am deeply grateful to the TSMC Education and Culture Foundation for being the pillar of my dreams. It has allowed me more time to explore and heal myself.

**Scholarship Recipient Cheng Star Program**
National Cheng Kung University


An invitation for outstanding students to experience the enchantment of traditional arts.

Promote Arts and Culture

## What We Want to Solve

Improve predicaments faced by domestic art groups such as inadequate resources, loss of audience and heritage, and foster the public's interest in traditional arts and cultural activities to popularize the art and make it an integral part of life

## How We Respond

Apply digital technology to organize high-quality offline and online arts and cultural activities, sponsor exceptional domestic art groups, provide a performance stage, as well as organize rich, diverse programs and activities to raise the public's interest in art appreciation and Chinese opera

## Our Actions

- Support Arts and Cultural Performances
- Promote and Preserve Traditional Opera

# Support Arts and Cultural Performances

## A Cultural Feast Nurtures Community Vitality

In 2024, the TSMC Education and Culture Foundation hosted the "TSMC Hsin-Chu Arts Festival" for the 21st consecutive year, promoting cultural co-creation through literature, music, theater, and other art forms while infusing local communities with artistic vitality. Centered on the theme "Crossing — Inner Worlds," this year's festival explored the interdisciplinary artistic integration and spiritual inspiration. A total of 39 events drew 26,382 participants, bringing the arts into communities near TSMC's fabs in Hsinchu, Taichung, and Tainan, elevating public cultural literacy and deepening their appreciation for the arts. The Foundation also collaborated with the Taichung Cultural Affairs Bureau and UNITAS Publishing in curating the exhibition "Strange Tales — The Truth Within the Unreal, Embracing Human Experience," which reinterpreted the classical Chinese fantasy literature "Strange Tales from a Chinese Studio" through interactive performances. Its intricate design of "intertwined reality and fantasy" immersed viewers in the stories' magical allure. Beyond presenting quality artistic performances, the Hsin-Chu Arts Festival facilitated in-depth exchanges between young artists from home and abroad and local communities, creating culturally rich living spaces.

**Nurturing Emerging Artists**
Provide performance and exhibition opportunities for emerging artists, linking creativity with society to sustain cultural development

**Facilitating Interdisciplinary Artistic Integration**
Combine literature, music, and theatrical forms to explore diverse artistic facets and broaden audience perspectives

**Innovative Special Exhibition Presentation**
Guide audiences of all ages to experience classic literary charm through interactive devices and immersive performances


Renowned Taiwanese opera artists deliver a performance.


Students view story films through interactive exhibition design.


Visitors experience artistic charm via immersive and interactive devices.


GuoGuang Opera Company collaborate with student participants in a Peking Opera performance.

## Music Connects Taiwanese and Japanese Cultures

The TSMC Education and Culture Foundation has long dedicated itself to artistic development. Since 2020, the Foundation has annually sponsored the OneSong Orchestra to host large-scale outdoor New Year concerts, bringing Taiwanese music to international audiences and nurturing the next generation of musical talent. In 2024, the Foundation expanded its sponsorship to Japan for the first time, exclusively funding the OneSong Orchestra's appreciation concert in Kumamoto, deepening Taiwanese-Japanese cultural exchange and demonstrating the borderless influence of art. The Kumamoto concert marked the first stop on OneSong Orchestra's "World's Top 10 Concert Halls Tour." Beyond showcasing Taiwan's unique cultural charm through high-caliber performances, the event featured a guest appearance by the Kumamoto Prefectural First High School Choir, adding a cultural highlight to Taiwan-Japan collaboration and attracting approximately 1,000 local attendees. For further project details, please refer to the ESG e-newsletter "JASM Joins Hands with TSMC Education and Culture Foundation to Support Community Engagement and Shared Values ."

## Humanistic Dialogue Across Time and Space

Since 2014, the TSMC Education and Culture Foundation has organized the "TSMC Lectures" to disseminate Eastern and Western humanistic and philosophical thought. Through presentations by academics and experts, these events guide audiences to explore historical, philosophical, and literary topics while enriching their cultural understanding. In 2024, the Foundation specially invited renowned author Prof. Yan Lianke to Taiwan for a special lecture using the Chinese literary classic "Strange Tales from a Chinese Studio" as an entry point to examine human nature and compare Eastern and Western supernatural literary works. This approach led audiences to reassess reality's authentic and fictional elements, demonstrating literature's profound perceptiveness. Throughout 2024, the lecture series comprised three public specialized presentations and one internal company cultural lecture, attracting 876 individuals in total and heightening both public and employee attention toward classic literature and humanistic critical thinking.

**Themed Lectures**
Analyze classic texts to guide the audience in gaining deeper insight into human nature and exploring the similarities and differences in Eastern and Western literary narratives

**Corporate Lectures**
Deepen employee humanistic thinking as cultural lectures at TSMC

The TSMC Education and Culture Foundation sponsor OneSong Orchestra performance in Kumamoto, Japan.

The Kumamoto concert feature a special performance by the Kumamoto Prefectural First High School Choir.

Attendees gain deeper comprehension of literary classics through the TSMC Lectures.


The TSMC Education and Culture Foundation hosted themed lectures to advance humanistic awareness.

## Promote and Preserve Traditional Opera

### 20th Anniversary Tour of the Kunqu Classic

The TSMC Education and Culture Foundation has dedicated itself to preserving and promoting traditional opera, and has long supported the Youth Version of The Peony Pavilion, a production led by Taiwan's literary giant Hsien-Yung Pai, which has successfully attracted more young people to Kunqu Opera through innovative interpretations of the work and to experience its unique artistic charms. In 2024, the Youth Version of The Peony Pavilion marked its 20th anniversary with a first-ever staging at the National Kaohsiung Center for the Arts. This special event featured a three-day, nine-hour full-length performance, allowing Chinese opera enthusiasts in southern Taiwan to immerse themselves in Kunqu's refined elegance and the quintessential expression of classical theatrical aesthetics. For more details on the project, please refer to the ESG e-newsletter: "TSMC Education and Culture Foundation Sponsors the Premiere of the Youth Version of The Peony Pavilion to Celebrate the 20th Anniversary of the Performance and Bring Traditional Chinese Opera to a Wider Audience ."

The Youth Version of the Peony Pavilion premiered in Kaohsiung, Taiwan

The TSMC Education and Culture Foundation promotes Chinese opera culture, fostering cultural literacy among the general public

### Cultivate the Next Generation of Chinese Opera Talent

The TSMC Education and Culture Foundation has actively established the roots of traditional opera by collaborating with GuoGuang Opera Company, National Tsing Hua University, and Tunghai University to launch the three-year Chinese Opera on Campus Program. With focus on three dimensions — knowledge of Chinese opera, script appreciation and analysis, and demonstration and instruction in Peking Opera performance techniques — the program aims to sustain cultural heritage while expanding next-generation audiences. Since its inception in 2021, the initiative has guided 336 students in experiencing the beauty of Chinese opera as a performing art. Inspired by the coursework, participating students have voluntarily founded Peking Opera clubs on their university campuses, demonstrating enthusiasm for traditional arts. In 2024, these students staged the classic play "Chun-Tsao Braving the Court" at the Taiwan Traditional Theatre Center, drawing an audience of 595 people. They also delivered a featured performance during the Hsin-Chu Arts Festival, marking a new chapter in the history of traditional arts education in Taiwan. Additionally, the Foundation launched the online radio program Tales from Chinese Opera, designed to introduce traditional opera to a broader public. To date, it has garnered over 1,022,711 listens, substantially increasing both its outreach and accessibility.

**Cross-disciplinary Opera Collaboration**
Integrate technology, multimedia, and contemporary theater elements to present traditional Chinese opera in a refreshed format

**Digital Transmission and Outreach**
Partner with IC Radio Broadcasting to launch Tales from Chinese Opera, a radio series that introduces Peking Opera to younger audiences

**Engaging Schools and Communities**
Extend Chinese opera education beyond campuses into local neighborhoods to popularize traditional Chinese opera

Throughout the journey from audience member to performer, the greatest reward has been the hard work during countless rehearsals and the laughter we shared together. I'm grateful to the TSMC Education and Culture Foundation for making traditional arts feel within reach.

**Kuan-Ling Cheng**
student of Tunghai University

**From Spectator to Performer**
Students master Peking Opera's stylized movements, vocal techniques, and expressive language, culminating in public performances that showcase their learning outcomes

Students deliver a formal performance of a classic Peking Opera piece.

Students dedicate themselves to rehearsals and deeply explored the essence of Peking opera.

# TSMC Charity Foundation

| Strategy | 2030 Goals | 2024 Targets | 2023 Achievements |
|---|---|---|---|
| **Empower Education**<br>Integrate multiple learning resources, explore career, and collaborate across industries partners to unleash the potential of rural students in an attempt to cultivate professional skills, and promote employment matching | 20,000+ hours3 of educational volunteerevery year | 20,000+ hours of educational volunteer every year | 27,990 hours in educational volunteer<br>Target: 20,000+ hours[Note 3] ↑ |
| | At least NT$18 million in annual donations [Note 1] to underprivileged people | At least NT$18 million in annual donations to underprivileged people | NT$17.80 million in donations<br>Target: at least NT$16 million ↑ |
| | Benefit 50,000+ children in rural areas | Benefit 32,000+ children in rural areas | 35,051 children in rural areas benefited<br>Target: 32,000+ children ↑ |
| **Care for the Elderly**<br>Through the cooperation of medical institutions and social welfare organizations, we aim to enhance the accessibility of elder care service in rural areas | Serve seniors living alone 80,000 times[Note 2] every year via the Network of Compassion | Serve seniors living alone 55,000 times every year via the Network of Compassion | Services offered 186,210 times[Note 5]<br>Target: 50,000 times ↑ |
| | 400,000 meal deliveries via the Network of Compassion | 350,000 meal deliveries via the Network of Compassion | Meals delivered 292,325 times<br>Target: 340,000 times — Note 4 |
| **Protect the Environment**<br>Partnering with corporates and university volunteers, we engage in environmental education, waste reduction initiatives, and support energy-saving for campuses and institutions | Benefit individuals 100,000+ times every year via the Cherish Food Project | Benefit individuals 72,000+ times every year via the Cherish Food Project | Benefited individuals 46,916 times<br>Target: 70,000+ times — Note 4 |
| | Offer environmental protection-related volunteer services at least 1,200 times every year | Offer environmental protection-related volunteer services at least 1,200 times every year | Volunteer services offered 1,128 times<br>Target: 1,100+ times ↑ |
| | Install solar panels for 6 social welfare institutions every year | Install solar panels for 6 social welfare institutions every year | Solar panels installed for 13 institutions[Note 5]<br>Target: 6 institutions ↑ |
| | Change LED light tubes for 240 elementary schools every year | Change LED light tubes for 240 elementary schools every year | LED light tubes changed for 363 elementary schools [Note 5]<br>Target: 240 elementary schools ↑ |

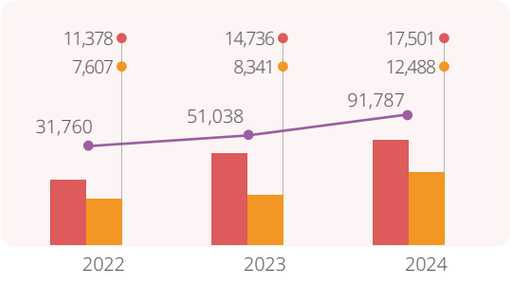
Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed target

Note 1: Resource contributions include both monetary donations and in-kind materials
Note 2: The target description was revised to reflect the inclusion of elderly individuals living alone as well as those in long-term care institutions.
Note 3: The recorded hours include time dedicated to transportation and preparation required for involving in and carrying out volunteer activities
Note 4: The originally planned resource allocation was adjusted due to other corporate entities contributing resources to the partner organization during the same period
Note 5: The number of beneficiary organizations rose accordingly due to the higher actual annual budget allocation for the "Public-interest Green Energy Program"

The TSMC Charity Foundation has long collaborated with local governments, academic institutions, medical establishments, and cross-sector enterprises to advance social welfare. The Foundation focuses on three core strategies: Empower Education, Care for the Elderly, and Protect the Environment. By training both current and retired TSMC employees as volunteers, it supports a wide range of outreach programs. In 2024, the Foundation continued to dedicate substantial personnel and resources to offer students from remote areas opportunities to explore career pathways and gain industry internships. It also extended an Aging Community Care Model to its subsidiary JASM in Kumamoto Prefecture, Japan, and, for the first time, invited supply chain partners to participate in elder care programs. Moreover, the Foundation assisted rural schools and social welfare organizations in developing solar power feed-in tariff models and partnered with university volunteers to replace classroom lighting with LED tubes in underserved areas. It also promoted energy-saving, water conservation practices, and environmental education to minimize energy and resource consumption. Throughout the year, the Foundation invested a total of NT$457.22 million, reaching 750,032 beneficiaries. For more details on its public engagement and charity sponsorship programs, please visit the TSMC Charity Foundation's official website .

## Total Number of Volunteers[Note 1], Number of Volunteered Sessions, Volunteered Hours

Unit: People / person time / hours




Note 1: Volunteers participating in the TSMC Charity Foundation's volunteering activities include TSMC's current employees, former employees, retired employees, family members of employees, employees of partner corporations, and students under University Social Responsibility (USR) programs.

## Strategy and Action

### Empower Education

- Deliver Appropriate Resources to Bridge Educational Gaps
- Input Resources to Build a Supportive Care Network

### Care for the Elderly

- Innovative Smart Healthcare Model Energizing Senior Volunteers Program

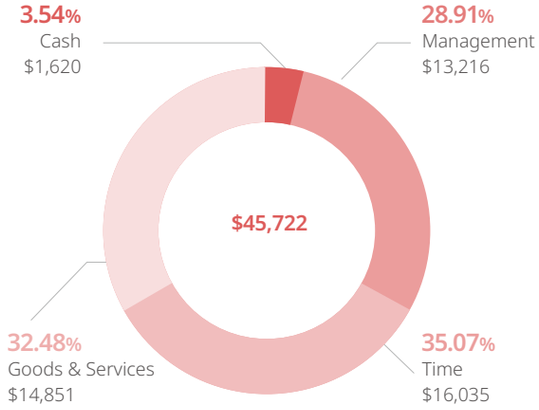
### Protect the Environment

- Advance Public-interest Green Energy and Sustainable Operations
- Promote Energy Conservation and Environmental Awareness

## TSMC Charity Foundation Contributions

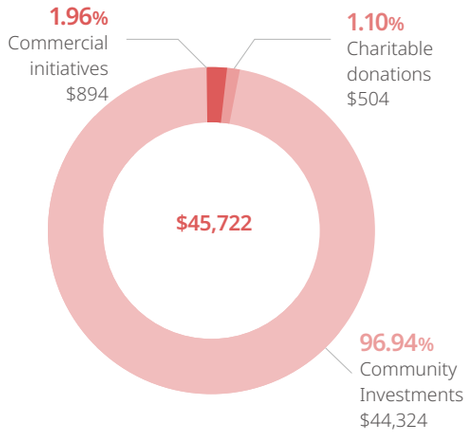
Unit: NT$ ten thousand

### What We Contributed[Note 2]



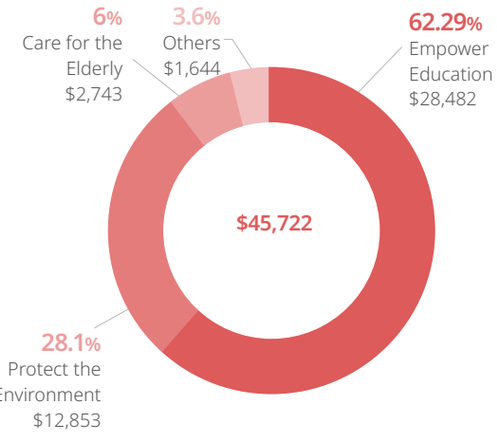

Note 2: The value of corporate volunteering equals the total TSMC volunteer hours multiplied by the average hourly wage of TSMC employees in 2024.

### How We Contributed[Note 3]




Note 3: According to the Dow Jones Sustainability Indices (DJSI), events are classified under Commercial Initiatives, Charitable Donation and Community Investment; all of the contributions are shown in the monetary unit of New Taiwan Dollar (NT$).

### Focuses of Contributions



Empower Education

## What We Want to Solve

Due to insufficient social resources in rural areas, students do not have access to a complete range of learning opportunities and day-to-day living support. These circumstances create barriers to their adaptive development, exacerbate poverty and disparity in education, and increase the hidden costs of forced job transitioning as a result of career path mismatch

## How We Respond

Raise funds to support disadvantaged families; integrate government-industry-academia resources; craft multi-phase empowerment strategies and corresponding action plans; work with businesses to organize job matching and empowerment camps and job exploration fairs; and provide vocational high school students with employment opportunities and assist them in career development

## Our Actions

- Deliver Appropriate Resources to Bridge Educational Gaps
- Input Resources to Build a Supportive Care Network

# Deliver Appropriate Resources to Bridge Educational Gaps

The TSMC Charity Foundation has long-term supported remote communities by offering diverse educational resources, fostering vocational education, and facilitating youth employment opportunities, accompanying students throughout various stages of their academic journey. By leveraging TSMC volunteers' technological expertise, the Foundation provides digital learning resources and advances popular science education to strengthen rural students' science knowledge. Meanwhile, program activities incorporate traditional values of filial piety and ethics, with interactive parent-child portrait-drawing sessions forging an intergenerational bond and deepening students' appreciation for cultural heritage, laying a root for humanities education. Furthermore, the Foundation collaborates with local governments and integrates cross-industry resources to launch comprehensive support programs encompassing career exploration, skills training, and internship-to-employment pathways, empowering rural students to navigate career paths, align with industry practices, and draw up a solid career path.

Elementary school

## Integrate Technology and Humanities Education

Amid the exponential growth of AI technologies and the Ministry of Education's curriculum guidelines putting growing emphasis on technological literacy, the TSMC Charity Foundation mobilized TSMC volunteers to apply their technical expertise and creativity in designing a "Science and AI Education" course series that blends engaging activities, generative pre-trained transformer (GPT) models, and programming languages, enabling schoolchildren in remote areas to acquire foundational technological knowledge and practical skills through interactive learning. Beyond offering tutoring in science, mathematics, and language subjects, the Foundation incorporates values of filial piety and ethics into its programs, using family portrait drawing activities to foster intergenerational understanding and communication.

### Science and AI Education

**49**
Sessions

**1,478**
School children participated

### Storytelling Volunteers

**682**
Sessions

**2,728**
Hours

### Filial Piety Education

**14**
Sessions

**344**
Participants

Elementary school students explore the fundamentals of AI through engaging,hands-on science projects.

A parent and child jointly present their self-portrait artworks.

> The after-school guided reading sessions helped children grasp basic life knowledge and integrate it into their daily lives.
>
> **Hsiang-Wei Tsao**
> TSMC Storytelling Volunteer

Junior high school

## Guide Students in Career Exploration

The TSMC Charity Foundation extends its empowerment resources to junior high students by organizing the "Parent-Child Career Exploration and Hands-on Vocational Workshop for Junior High School Students." These sessions help students gain a deeper understanding of the vocational education system and future career trends, allowing them to explore their interests and strengths as a reference when deciding between general or vocational high schools. Additionally, through the "World of Jobs, Road to Employment" program, the Foundation offers a career guidance platform featuring insights from over 100 industry professionals, combined with career interest assessments, job fairs, and employment matching resources. These efforts have broadened rural students' horizons, supported their exploration of future career paths, and equipped them with essential livelihood skills.

**Parent-Child Career Exploration**

**3,073**
Participants

**Hands-on Vocational Workshop**

**54**
Students

> The TSMC Charity Foundation's involvement has helped parents recognize the value of vocational education.
>
> **Kung-Jung Lee**
> Principal of Catholic St. Joseph Technical High School

> Participating in the TSMC Charity Foundation's workshop gave me a clearer understanding of which career path suits me.
>
> **Student**
> Participant of Catholic St. Joseph Technical High School

Parent-child career exploration strengthens connections and fosters meaningful dialogue between parents and children.

Vocational High School

## Build Job-Ready Skills Through Hands-On Training

The "Job-Ready Express Camp" is a 30-hour hands-on training program designed by the TSMC Charity Foundation specifically for vocational high school students to equip them with familiarity in industry environments, practical job skills, and technical expertise. For students who have completed the training and passed the final assessment, the program further facilitates job placements — satisfying industry talent needs with the goal of enabling students to "find employment upon graduation." In 2024, five companies offered training opportunities, with 168 students passing assessments and successfully entering the workforce.

**Job-Ready Express Camp**

**168 students**
Completed training

> After joining the Job-Ready Express Camp, I learned how to interact with customers and better understand their needs.
>
> **Student participant**
> National Douliou Vocational High School of Home Economics & Commerce

Partner companies offer hands-on training opportunities, allowing students to find employment upon graduation.

Students interact with enterprises at job fairs, expanding their career options.

Vocational High School

## Link Enterprises for Job Opportunities Matching

In 2024, the TSMC Charity Foundation partnered with local governments and 173 companies to host eight sessions of the "Job Fair for Vocational High School Students," offering 4,740 job openings and attracting 8,568 participants. These events effectively bridged the gap between talent cultivation in schools and workforce demands in industry, enabling students to gain deeper understanding of various professions and career paths. By encouraging early career planning, the program laid a solid foundation for students' post-graduation employability.

### Job Fair for Vocational High School Students

**173**
Companies participated

**3,052**
Job placements

I hope students will stay in their hometowns, develop specialized skills, and contribute to local industries while building stable careers.

**Pin-Hung Chen**
Chairman of Chenglin Agarwood Biomedical International Co.

We're grateful to the TSMC Charity Foundation for helping students better understand the practical skills required by industries and broaden their career perspectives.

**Yung-Chang Hsu**
Principal of National Douliou Vocational High School of Home Economics & Commerce

## TSMC Participating Units

TSMC storytelling volunteers, Specialty Technologies Organization, Legal Affairs Division, Intelligent Engineering Center, Intelligent Manufacturing Center, Yield Enhancement Project under the R&D Division, Advanced Packaging Technology and Services, Corporate Planning Organization, Enterprise Information Technology Division, Quality and Reliability Organization, Product Engineering Division, Product Derivative Technology Development Division, E-Beam Operation Division, Fab 2, Fab 3, Fab 5, Fab 8, Fab 12A, Fab 12B, Fab 14A, Fab 14B, Fab 15B, Fab 18A, and Fab 18B.

## Cooperating Units

104 Corporation, SEMI, Panasonic Taiwan Co, Chenglin Agarwood Biomedical International Co, Pingtung County Government, Ho Tai Development Co, National Chiatung Agricultural Vocational Senior High School, National Taiwan University, Kun Shan University, MOE K-12 Education Administration, MOE K12EA Filial Piety Education Resource Center, Cuncyue Hot Spring Resort, Industrial Technology Research Institute, Hsinchu County Fusing Elementary School, Hsinchu County Jinping Elementary School, Hsinchu County Jaudung Elementary School, Hsinchu County Lufong Elementary School, Fushan International Hotel Management Consulting Co, Kaohsiung City Government, Taichung City Siwei Elementary School, Tainan City Government, Tainan Municipal Beishih Elementary School, Tainan Municipal Guangrong Experimental Elementary School, Tainan Municipal Songlin Elementary School, Tainan Municipal Shulin Elementary School, Taitung County Government, Taitung County Catholic St. Joseph Technical High School

## Input Resources to Build a Supportive Care Network

The TSMC Charity Foundation supports public welfare by establishing a transparent and user-friendly donation platform that links corporations and their employees. This approach ensures that resources are directed efficiently to nonprofit organizations, students, and employee families in need, helping them maintain a stable livelihood. At the same time, the Foundation actively introduces both hardware and software learning tools to under-resourced schools, aiming to raise the quality of education and strengthen students' digital competencies, and help them overcome learning barriers, broaden their horizons, and create greater opportunities for the future.

### Three-Pronged Approach to Social Care

The TSMC Charity Foundation has established a donation mechanism through the iCharity Platform and launched three assistance programs for philanthropic work. The Community Support initiative created a dedicated fundraising account to provide financial aid to economically disadvantaged groups. The Employee Well-being program enables immediate fundraising for TSMC employees and their families facing major life crises, helping them through difficult times. Meanwhile, the Regular Donations campaign mobilizes TSMC staff to take practical actions to contribute to non-profit organizations that lack access to educational resources.

### Resource Deployment to Bridge the Urban-Rural Education Gap

To raise educational quality in rural areas, the TSMC Charity Foundation introduced digital teaching resources, donated refurbished computers, and established network and hardware infrastructure for computer classrooms, helping teachers and students become proficient with digital tools for teaching and learning. In 2024, the Foundation continued its partnership with the Association of Literacy Education, Taiwan, where TSMC volunteer teams designed card-based lesson plans for "the School of Future Competencies" program, enabling students to develop self-directed learning and problem-solving abilities through games, ultimately creating more efficient learning environments.

**iCharity Platform**

**71,768**
Number of donations

**NT$79.51 million**
Donation amount

**School of Future Competencies Program**

**6 schools**
Participating

TSMC employees support fundraising campaigns by responding to regular donations.

Through game-based learning, students engage with diverse texts and broaden their horizons while narrowing the gap in resources and learning environments.

**Wan-Ting Huang**
Teacher at Kaohsiung City Namasia Junior High School Economics & Commerce

### TSMC Participating Units

Fab 2, Fab 5, Fab 8, Fab 12A, Fab 12B, Fab 14A, Fab 14B, Fab 15B, TSMC volunteers, Intelligent Manufacturing Center, Product Engineering Division, Product Derivative Technology Development Division, E-Beam Operation Division, Manufacturing Quality & Reliability Division

### Cooperating Units

Junyi Academy Foundation, You Ming Steel Co, Teach For Taiwan, Microsoft Taiwan Corp, Association of Literacy Education, Taiwan, Taiwan Basegarden Development Association, Taiwan Indigenous Baseball Development Association, First International Computer, Inc, Catholic St. Joseph Technical High School

Care for the Elderly

## What We Want to Solve

As Taiwan's elderly population increases rapidly, the needs of healthcare and long-term care are growing every year, creating greater burden on welfare services and society. In regions where resources are scarce and in remote areas that lack service locations, access to resources is relatively difficult. Moreover, due to structural change of families in Taiwan, today there are more seniors living alone, who may experience a range of health hazards arising from the feeling of loneliness and lack of care and companionship over an extended period of time

## How We Respond

Build the Network of Compassion system to bring together medical and social welfare institutions, effectively allocate long-term care resources, and extend services to the fields of home health care and companionship. Organize health activities for communities, make long-term care services more prevalent and local, and help seniors maintain physical and mental health

## Our Actions

- Innovative Smart Healthcare Model Energizing Senior Volunteers Program

# Innovative Smart Healthcare Model Energizing Senior Volunteers Program

The TSMC Charity Foundation is committed to advancing senior wellness and elder care by integrating resources, fostering cross-sector collaboration, and mobilizing volunteer services to establish age-friendly support systems that enhance their physical and mental well-being. Meanwhile, the Foundation promotes intergenerational learning and international medical cooperation, leveraging smart healthcare solutions to address the challenges of an aging population, while encouraging retired TSMC employees to participate in volunteer activities, sustain social engagement, and affirm personal value.

## Connecting Resources to Enhance Age-Friendly Support

In 2024, the TSMC Charity Foundation, through the Network of Compassion platform, collaborated with 15 healthcare systems and service locations across Taiwan to support 14 social welfare organizations in establishing care networks. The program included the installation of 118 air purifiers, enhancing the living and working environments for both care recipients and providers, and ensuring that seniors living alone received comprehensive attention and adequate support.

### Network of Compassion

**186,210**
Donation

**6**
Cities and counties covered

## Triangular Model Safeguards Senior Health

The TSMC Charity Foundation integrates resources from three sectors — corporations, hospitals/academic institutions, and social welfare organizations — to launch a Community Care Model for the Elderly. In collaboration with National Yang Ming Chiao Tung University and Taipei Municipal Guandu Hospital, the Foundation established community-based Smart Fitness Clubs for Seniors, training student volunteers to serve as exercise instructors and empower the elderly to manage their own health proactively. In 2024, the model was extended internationally through partnerships with the Kumamoto Prefectural Government in Japan, along with local authorities, hospitals, and universities, aiming to enhance health promotion in local ageing communities.

### Smart Fitness Clubs for Seniors

**1,632**
Elderly participants

**28**
Exercise instructors

The TSMC Charity Foundation extends its care efforts to Kumamoto, Japan.

We are grateful for the TSMC Charity Foundation's experience sharing and resource coordination. We look forward to collaborating on an age-friendly community and making Kikuchi District the most livable town for seniors in Japan.

**Takatoshi Yoshimoto**
Mayor of Kikuyō Town, Kumamoto Prefecture, Japan

The TSMC Charity Foundation has demonstrated pivotal influence and proactive actions in the field of geriatric healthcare services.

**Liang-Kung Chen**
Superintendent of Taipei Municipal Guandu Hospital and Professor at National Yang Ming Chiao Tung University

## Intergenerational Learning and Care Between Youth and Seniors

To encourage corporate volunteers to actively participate in community service, five suppliers joined with the TSMC Charity Foundation in the Youth-Senior AI Co-Learning program. Through collaboration across industry, academia, and healthcare, the program leverages interactive AI-based motion sensing and hand-foot coordination game applications to deliver physical stretching knowledge, offer health monitoring alerts, and help caregivers track the physical well-being of elderly participants in real time. Simultaneously, the interactive technology-based learning model allows seniors to share educational experiences with their grandchildren, fostering intergenerational communication and exchange.

### Youth-Senior AI Co-Learning

**5**

Participating suppliers

Seeing the smiles and gratitude of the seniors has given me a profound understanding of the value of volunteer service.

**En-Chu Yang**
Volunteer

### TSMC Participating Units

Human Resources Organization, Materials Management Organization, Fab 3, Fab 8, Fab 12A, Fab 12B, Fab 14A, Fab 14B, Fab 15A, Fab 15B, Fab 23 (Japanese subsidiary), Product Engineering Division, Product Derivative Technology Development Division, Quality & Reliability Organization, Intelligent Manufacturing Center, E-Beam Operation Division

### Cooperating Units

Kikuyō Town, Kumamoto Prefecture, Japan, Fooyin University, Kumamoto University, National Yang Ming Chiao Tung University, Merck Ltd, United Industrial Gases Co, FUJIFILM Electronic Materials Taiwan Co, Sense & Beauty Dental Center, Ardentec Corp, LCY Chemical Corp, Taipei Veterans General Hospital, Taipei Municipal Guandu Hospital, MOHW Fongyuan Hospital, MOHW Miaoli Hospital, MOHW Tainan Hospital, MOHW Hengchun Tourism Hospital, MOHW Jianan Psychiatric Center, Mennonite Christian Hospital, Old Five Old Foundation, Lin Tseng Lien Welfare and Charity Foundation, Mennonite Social Welfare Foundation, Tainan Sin-lâu Hospital, China Medical University Hospital, Taiwan Puli Care Association

TSMC suppliers engage in volunteer service to support senior citizens.

TSMC retirees participate in volunteer skills training.

Protect the Environment

## What We Want to Solve

Climate change impacts the natural environment, threatens specific species, and tests whether vulnerable groups have stable support systems in place to cope with environmental disasters, energy inequalities, or nutritional deficiencies

## How We Respond

Combine our concern for the environment, ecology, and society and join forces with the government, industry, and academia to help minority groups in effectively managing resources, reducing energy consumption, and developing renewable energy. Promote environmental and energy-saving education through volunteer services

## Our Actions

- Advance Public-interest Green Energy and Sustainable Operations
- Promote Energy Conservation and Environmental Awareness

# Advance Public-interest Green Energy and Sustainable Operations

Since 2020, the TSMC Charity Foundation has been implementing the Green Energy Program by collaborating with local governments and vocational schools. Through the Solar Energy Generation Project, the Foundation assists social welfare organizations and rural schools in installing solar photovoltaic systems, easing their electricity costs while generating a stable source of operational income. Additionally, the LED Energy-saving Retrofit Project improves campus lighting quality, creating a better learning environment for schoolchildren while contributing to energy savings and carbon reduction goals. The program also offers underprivileged students hands-on opportunities to install LED lighting, enabling them to gain technical knowledge, practical experience, and fair compensation — laying a solid foundation for future career development.

University volunteers install energy-saving LED lights at rural elementary schools.

## Green Energy for Sustainable Operations

The TSMC Charity Foundation supports social welfare institutions in installing solar photovoltaic systems to cut electricity costs and generate consistent income through energy sales, fostering long-term operations. As of 2024, the Foundation has completed 29 solar power installation sites, yielding NT$9.04 million in total sales[Note 1] revenue — laying the groundwork for continued development of social welfare organizations.

### Solar Energy Generation Project[Note 1]

**13**

New installation sites, generating NT$4 million in annual electricity sales

The TSMC Charity Foundation install solar panels on the rooftops of a rural elementary school.

## Energy Saving Retrofits to Brighten the Future of Learning

In collaborative with technical universities, the TSMC Charity Foundation assists rural schools in replacing outdated lighting with LED energy-saving fixtures. These upgrades create brighter, more comfortable learning environments while reducing energy consumption and lowering operational costs for schools, achieving dual benefits of environmental friendliness and educational support.

### LED Energy-Saving Retrofit Project[Note 2]

**363**

Schools participated

**NT$7.3 million**

Saving[Note 2] NT$7.3 million electricity costs annually

We are grateful to the TSMC Charity Foundation for assisting Chihpen Junior High School in replacing outdated lighting fixtures, which has significantly improved classroom illumination, reduced eye strain for students, helped us cut electricity costs, and fulfilled energy conservation and carbon reduction goals.

**Jui-Yin Cheng**
Principal of Taitung County Chihpen Junior High School

Our classrooms have become brighter, helping us stay more focused and easing eye fatigue during lessons. I'm truly grateful for the TSMC Charity Foundation's care and support!

**Student Wu**
Taitung County Guang Ming Elementary School

## Cooperating Units

Kun Shan University, Ming Chi University of Technology, National Taipei University of Technology, National Formosa University

Note 1: Electricity sales proceeds are determined by multiplying the annual power generation (kWh) X Taipower's feed-in tariff rate, based on the installed solar capacity (kW) of each site.

Note 2: Electricity savings are calculated as: (number of replaced light tubes × wattage reduced per tube) × estimated electricity usage hours per school × electricity rate per kWh.

## Promote Energy Conservation and Environmental Awareness

The TSMC Charity Foundation is committed to cultivating volunteers in energy conservation, ecology, and guided tours who share energy-saving technologies and environmental conservation practices with the community. Energy saving volunteers apply advanced tools to help schools and organizations assess electricity usage and optimize energy efficiency. Ecology volunteers raise awareness about environmental protection and biodiversity through explanation and interactive games. Guided tour volunteers demonstrate how semiconductors drive technological progress and transform everyday life, while also explaining how energy- and water-saving practices used in manufacturing processes can be applied to daily routines — inspiring students to adopt innovative and creative thinking toward green sustainability. In addition, the Foundation implements the "Cherish Food for Charity Program," which promotes efficient resource allocation and eco-friendly practices, fostering a more sustainable lifestyle.

### Adopt Energy-Saving Technologies to Increase Energy Efficiency

- TSMC employees have formed an energy-saving volunteer team that leverages advanced tools and technologies to perform energy assessments and efficiency optimization in schools and institutions with conservation needs. These efforts help educational facilities lower electricity costs while also advocating energy and water conservation practices to students in remote areas, heightening their environmental sustainability awareness and generating ecological value.

**Energy-saving Volunteers**

| 32 | 320 |
|---|---|
| Participants | Hours |

**Fab Volunteers**

| 910 | 7,280 |
|---|---|
| Participants | Hours |

### Strengthen Ecological Protection and Environmental Awareness

- TSMC employees have established ecology volunteer groups that actively advocate environmental education and biodiversity topics. At ecological education venues at fabs and the Tainan Jacana Ecological Education Park, these volunteers guide students and the public through interactive tours and experiential activities to recognize the significance of environmental protection and biodiversity, deepening the impact of environmental education.

**Guided Tour Volunteers**

| 682 | 2,728 |
|---|---|
| Participants | Hours |

**Ecology Volunteers**

| 186 | 744 |
|---|---|
| Participants | Hours |

Students explore semiconductor applications through interactive devices.

Ecological volunteers acquire plant-related knowledge in the ecological park.

We look forward to the harmony between technology and ecology for sustainability and a better future together.

**Pi-Fang Chi**
TSMC volunteer

We appreciate TSMC volunteers' in-depth, professional tour of the ecological park's unique features, which guided the public in discovering the beauty of nature.

**Wen-Chen Lee**
Director of Jacana Ecological Education Park, Guantian, Tainan

### Cherish Food for Charity Enables Efficient Resource Utilization

- Through the Cherish Food for Charity Program, the TSMC Charity Foundation collaborates with local food enterprises to recover products that are nearing expiration or have minor visual defects but remain safe for consumption. These food items are distributed to after-school remedial classes, elderly individuals living alone, students in remote areas, and social welfare organizations. The program not only minimizes food waste but also mitigates the environmental impact of food disposal, thereby contributing to more efficient resource allocation.

**316**
Participating organizations

**37,376**
Benefited individuals

Regularly provide snacks to tutoring classes, ensuring students stay nourished and energized after school

### TSMC Participating Units

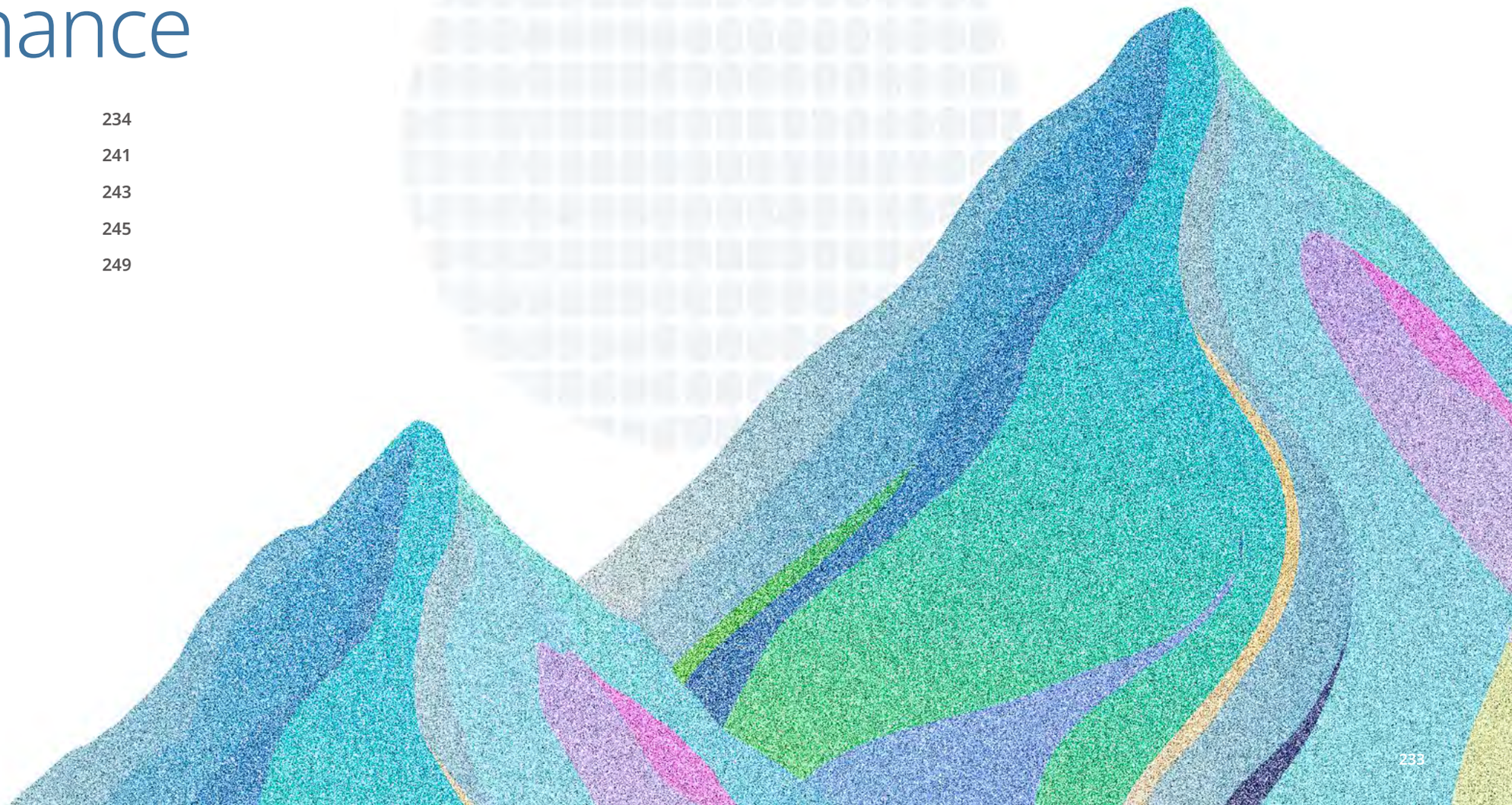
Corporate Planning Division, Quality & Reliability Division, Facility Division, Intelligent Manufacturing Center, Fab 6, Fab 12A, Fab 15B, Advanced Packaging Technology & Service Division

### Cooperating Units

Lao Xie Zhen Co, Chi Mei Frozen Food Co, Laurel Enterprises Corp, Hunya Foods Co, Jacana Ecological Education Park, Hsin Tung Yang Co, Lian Hwa Foods Corp, National Museum of Natural Science, Taichung Metropolitan Park

# Operations and Governance

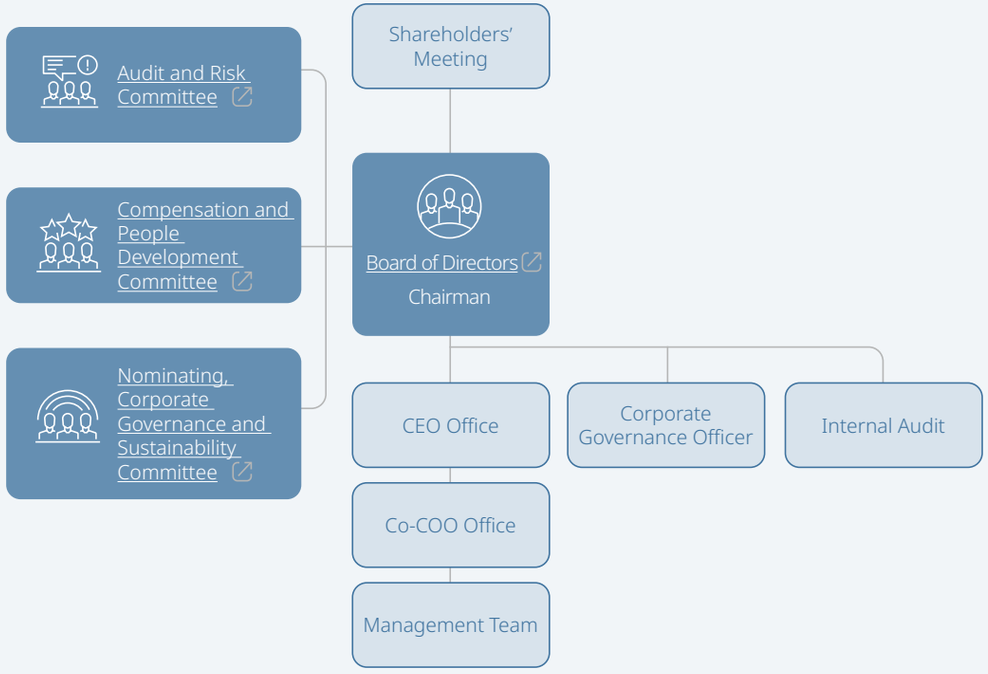




# Corporate Governance

TSMC advocates and acts upon the principles of operational transparency and respect for shareholder rights. We believe that the basis for successful corporate governance is a sound and effective Board of Directors. In line with this principle, TSMC Board of Directors delegates various responsibilities and authority to three Board Committees, Audit and Risk Committee, Compensation and People Development Committee, and Nominating, Corporate Governance and Sustainability Committee. Each Committee's chairperson regularly reports to the Board on its activities and recommendations.

## Governance Structure




## Board

Inheriting the spirit of TSMC's Founder, Dr. Morris Chang's philosophy on corporate governance, under the leadership of Chairman Dr. C.C. Wei, TSMC's Board of Directors takes a serious and forthright approach to its duties and is a dedicated, competent and independent Board.

TSMC's Board of Directors consists of ten distinguished members with a great breadth of experience as world-class business leaders or professionals. We deeply rely on them for their diverse knowledge, personal perspectives, and solid business judgment. TSMC shareholders elected TSMC's 16th Board of Directors at its 2024 Annual Shareholders' Meeting on June 4, 2024. The current board members are: Chairman Dr. C.C. Wei, Dr. F.C. Tseng, Mr. Chin-Ching Liu (Representative of National Development Fund, Executive Yuan) , as well as seven Independent Directors : Sir Peter L. Bonfield, Mr. Michael R. Splinter, Mr. Moshe N. Gavrielov, Dr. L. Rafael Reif, Ms. Ursula M. Burns, Ms. Lynn L Elsenhans, and Dr. Chuan Lin.

TSMC's Board consists of a diverse, multinational group of professionals from other industries and academia, including citizens from Taiwan, Europe and the U.S. Two female directors sit on the TSMC Board, and the Board's independence is illustrated by the fact that 70% of the Board's members are Independent Directors, with no marital or within second degree of kinship relationships among the directors.

## Nomination and Election Directors

TSMC established the "Guidelines for Nomination of Directors ," which detail the procedures and criteria for the nominating, qualifying and evaluating director candidates for consideration by the Board of Directors. Additionally, the "Corporate Governance Guidelines " outline the criteria for evaluating candidates for election by shareholders. These criteria include professional knowledge, experience, business judgment, commitment to the Company's core values, and reputation for ethical conduct and leadership. Diversity of backgrounds (including gender, age, and culture) of Board members shall also be considered. The "Nominating, Corporate Governance and Sustainability Committee" will recommend Independent Director candidates to the Board of Directors for nomination. The independence of each Independent Director candidate is also considered and assessed under relevant laws. Directors shall be elected pursuant to the candidate nomination system. The tenure of office for Directors shall be three years. Under R.O.C. law, in which TSMC was incorporated, any shareholders holding one percent or more of our total outstanding common shares may nominate their own candidate to stand for election as a Board member. This democratic mechanism allows our shareholders to become involved in the selection and nomination process of Board candidates. The final slate of candidates is put to the shareholders for voting at the relevant annual shareholders' meeting.

## Continuing Education/Training of Directors in 2024

The major training methods of Directors include: at quarterly Board meetings, TSMC management presents updates on the Company's business, regulatory developments and other information; at quarterly Audit and Risk Committee meetings, TSMC's General Counsel and the Company's independent auditors provide regulatory update reports and legal compliance status; Directors participate in externally-provided training courses as needed; and the Company arranges speeches or training on politics, economics, and regulatory compliance, etc. In 2024, the Company arranged two training courses for the Directors, which are "Governing cyber security risks" and "Antitrust and competition law update". For further information, please refer to "Continuing Education/Training of Directors in 2024 " section in the Annual Report.

## Functional Committees

The Audit and Risk Committee assists the Board in fulfilling its oversight of the quality and integrity of the accounting, auditing, reporting, and financial control practices, as well as risk management of the Company. Under R.O.C. law, the membership of audit committee shall consist of all independent directors. The Committee also engaged a financial expert consultant in accordance with the rules of the U.S. Securities and Exchange Commission.

The Compensation and People Development Committee assists the Board in discharging its responsibilities related to TSMC's compensation and benefits policies, plans and programs, in evaluation of compensation of TSMC's directors of the Board and executives, and the review of the pipeline planning of the Company's senior executives to ensure the long-term sustainability of the Company. The Chairman of the Board and the Chief Executive Officer are invited by the Committee to attend all meetings and are excused from the Committee's discussion of their own compensation. Currently, the Committee consists of four Independent Directors.

The Nominating, Corporate Governance and Sustainability Committee assists the Board in strengthening the selection mechanism for directors, building diversified and professional board, selecting candidates for nomination to be elected as independent directors to the Board, and advising on corporate governance and sustainability matters. Currently, the Committee consists of the Chairman of the Board and three Independent Directors.

## Board and Functional Committees Performance Assessment

In 2024, TSMC conducted regular Board performance self-evaluation in form of written questionnaires for the Board, individual directors, and Functional Committees. For the results of each performance assessment, please refer to "Board of Directors' Performance Evaluation Implementation Status " section in the Annual Report.

| Title/Name | Board of Director | Audit and Risk Committee | Compensation and People Development Committee | Nominating, Corporate Governance and Sustainability Committee |
|---|---|---|---|---|
| Chairman C.C. Wei | Chairman | | | ● |
| Director F.C. Tseng | ● | | | |
| Director Chin-Ching Liu (Representative of National Development Fund, Executive Yuan) | ● | | | |
| Independent Director Sir Peter L. Bonfield | ● | Chair | ● | |
| Independent Director Michael R. Splinter | ● | ● | Chair | |
| Independent Director Moshe N. Gavrielov | ● | ● | ● | |
| Independent Director L. Rafael Reif | ● | ● | | ● |
| Independent Director Ursula M. Burns | ● | ● | ● | |
| Independent Director Lynn L. Elsenhans | ● | ● | | ● |
| Independent Director Chuan Lin | ● | ● | | Chair |
| Jan C. Lobbezoo | | Financial Expert Consultant | | |

For more details of "Corporate Governance", please refer to TSMC's Annual Report and www.tsmc.com

# Ethics and Regulatory Compliance

## Ethics

"Integrity" is one of TSMC's core values. TSMC established its "TSMC Ethics and Business Conduct Policy" ("Ethics Code") to be the guide for operating TSMC's business with integrity. At the same time, by establishing the "Supplier Code of Conduct" and "Supplier Sustainability Standards", providing online courses such as "Supplier Code of Conduct – Ethics", "TSMC Integrity Guidelines" available on TSMC Supplier Sustainability Academy, and hosting seminars at TSMC Sustainable Supply Chain ESH Forum, TSMC extends and demonstrates the value of "integrity" throughout its supply chain. In addition, TSMC published its "TSMC Anti-Corruption Commitment" on the TSMC website to specifically emphasize TSMC's firm compliance with its core value of integrity.

TSMC established the "Complaint Policy and Procedure for Certain Accounting & Legal Matters", making multiple reporting channels available for internal and external voices, and accepting anonymous reports. All reported incidents collected from these reporting channels are properly recorded, confidentially investigated, well traced, while enhancements to TSMC practices are made where applicable. TSMC keeps individual identities confidential and prohibits any retaliation on any individual who in good faith reports a suspected violation or participates in an investigation.

Furthermore, TSMC has established an Ethics Committee that oversees the implementation of TSMC Ethics Compliance Activities and investigations and disciplinary actions for reported incidents. The committee holds a meeting every quarter and may hold additional meetings as needed. Any employee who violates the Ethics Code is subject to disciplinary actions in accordance with TSMC procedures, up to and including termination of employment, and will negatively affect his/her annual performance reviews (including bonus adjustment). In 2024, one incident was verified upon investigation and determined for disciplinary action by the Ethics Committee.

## Regulatory Compliance

With TSMC's operations expanding globally, it is even more important to comply with laws and regulations, domestic or international. TSMC closely monitors any domestic and international policies and legal trends that may have a significant impact on its business and finances, and aims to formulate and implement corresponding compliance plans in a timely manner to ensure that all businesses comply with the laws of various countries. Additionally, TSMC strengthens its compliance framework through a series of measures, including regulation checks, legal tracking, regulation identification, compliance reviews, the development and updating of internal policies, as well as compliance education and training initiatives.

## 2024 Achievements

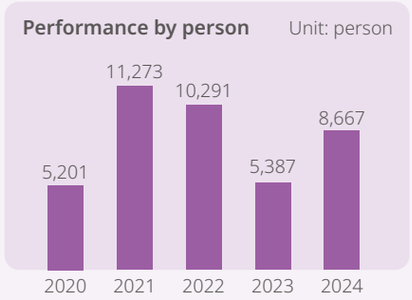
### Ethics and Regulatory Compliance

- Regulatory Compliance: According to the definition of material regulatory violation under Taiwan Stock Exchange Corporation Procedures for Verification and Disclosure of Material Information of Companies with Listed Securities. In 2024, TSMC did not receive any reports related to insider trading, money laundering, or other finance, accounting or antitrust matters, nor did TSMC receive any complaints concerning breach of customer privacy and loss of customer data, or any material regulatory violations (where a fine exceeds NT$1 million), including non-monetary sanctions
- More information related to TSMC ethics and regulatory compliance, please refer to the 3.5 Ethics section and 3.6 Regulatory Compliance section in the Annual Report

### Raining and Conflict of Interest Declaration

**Ethics Training Course for Newcomers**

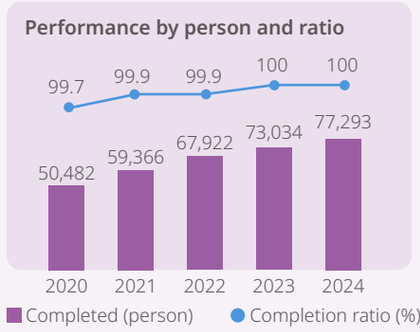
New employees in Taiwan sites (including contractors)




Note: The course completion period is from January 1, 2024 to December 31, 2024

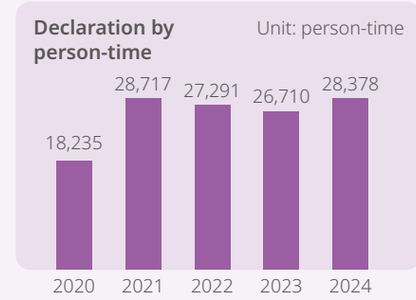
**Annual Ethics and Compliance Training Course**

All employees (including subsidiaries)




**Conflict of interest declaration / Declaration of Compliance with the Ethics Code**

The designated new employees, managers or employees who are required to declare by TSMC



## Risk Management

The TSMC Risk Management Policy , approved by its Board of Directors and signed by the chairman and CEO, outlines TSMC's commitment in maintaining a proactive and robust Enterprise Risk Management (ERM) system to safeguard the interests of TSMC and its stakeholders. TSMC adopts a balanced risk-reward management strategy which aims to optimize business returns while ensuring long-term sustainable value for its stakeholders. TSMC references the ISO 31000:2018 risk management system and the "Enterprise Risk Management-Integrated Framework" by COSO (Committee of Sponsoring Organizations of the Treadway Commission) to establish its risk governance organization, integrating operational and business processes to strengthen overall risk management capabilities (including risk identification, assessment, response, monitoring, and review). TSMC cultivates a culture of risk awareness and systematically implements risk management practices to strengthen resilience in a dynamic business environment. For details on the ERM framework and risk governance organization, please refer to "6.2 Risk Management " section in the Annual Report.

TSMC's risk management involves both the Board of Directors and management to integrate effective risk management practices into business decisions and operations across the Company. The Board of Directors is responsible for risk governance and has authorized the Audit and Risk Committee (ARC) to review TSMC's ERM framework. At the executive level, the risk management governance structure includes the risk management steering committee, the risk management executive council, taskforces and the risk management division. Assisting the ARC in establishing and overseeing a proactive and effective risk management system, the risk management division works with each function in applying the ERM framework to assess and mitigate risks throughout TSMC by monitoring and implementing risk related policies and guidelines, as well as rolling out initiatives to support the implementation of ERM framework. Every six months, following the risk management division's reporting to the ARC, the ARC Chairperson reports to the Board of Directors on TSMC's risk profile and risk mitigation.

TSMC continues to enhance its risk management capabilities through various initiatives under the Risk Academy, established to raise the risk competency and capabilities for all levels of employees in TSMC. This includes organizing the inaugural Risk Management Training for Board. In 2024, as part of the Lunchtime Talk series, external experts are invited to share insights on global economic prospects and semiconductor industry risks. To enhance strategic alignment, TSMC organized the first Risk Management Council Day with the theme "Enhancing Resilience," ensuring risk management champions have a shared understanding of TSMC's risk priorities, emerging risks and mitigation strategies. Risk management is embedded as part of the performance evaluation of the members of the Risk Management Steering Committee and Executive Council. Additionally, TSMC strengthened its operational resiliency through the validation of the business continuity management plans, through a table top exercise under a unified scenario. TSMC continues to reinforce risk communication through risk management newsletters, workshops and training to raise risk awareness and risk competency. For details on risk management, please refer to "6.2 Risk Management " section in the Annual Report.

### Risk Management Initiatives and Achievements in 2024

**NEW — Governing Cyber Security Risk Training for Board**

Strengthen fiduciary accountability relating to cyber security oversight and building cyber risk literacy, building cyber resilience from the top down

**14** Board of Directors and Executives participated

**NEW — Risk Management Lunchtime Talk**

Enhance awareness of risks and implications posed from external market factors

**390** Employees participated

**NEW — Risk Management Champion Day**

Ensure Risk Management Champions have a shared understanding of priorities, emerging risks and mitigations, to enhance strategic alignment

**48** Risk Management Champions and Taskforce Leads participated

**NEW — Embedment of risk management indicators in performance evaluation**

Heighten risk management accountability and risk ownership, aligning performance with company's goals

**1** Risk management is incorporated into the individual performance evaluations of the members of the Risk Management Steering Committee and Executive Committee

**Business Continuity Management Tabletop Exercises**

Validate the effectiveness of crisis and business continuity management procedures to improve preparedness and resilience

**1** Conducted exercises under a centralized scenario

**13** Cross-function and fab Business Continuity Management (BCM) exercises

**62** Business Continuity Management documents reviewed and approved

**ERM workshops for Fabs/ Subsidiaries**

Enhance implementation of risk management framework, reinforcing risk identification, assessment, mitigation and monitoring

**16** In-person workshops conducted

**647** Managers and members of the risk management task force participated

**Online Risk Management and Business Continuity Management Training**

Equipped employees with risk management framework, methodologies and tools, cultivating a risk-aware culture

**4** Risk Management Newsletters issued

**15,090** Employees participated

## Material Issues and Risk Management

| | Innovation Management | | Product Quality | Customer Relations | Sustainable Supply Chain |
|---|---|---|---|---|---|
| **Risk Aspects/Types**<br>Strategy<br>Operation | Failure to foresee changes in technologies or develop innovative technologies | Patent Protection - R&D results unprotected due to lack of patent | Yield loss due to lack of quality controls | Inability to fulfil customer's technology, capacity demand | Concentrated sourcing and suppliers non-compliant with TSMC or regulatory requirements |
| **Risk Evaluation and Mitigation Measures** | Advanced processes involve increasingly complex technologies, higher production costs, and more complicated supply chains. The Company's competitive edge and market share could suffer if we are unable to identify technological changes and develop new technologies<br>Please refer to Innovation Management section | TSMC protects R&D results with patents to ensure we remain technological leaders in the industry and to protect the operational freedom of TSMC and our customers across the world. Inadequate patent protection could impact TSMC's technological competitiveness<br>Please refer to Innovation Management section and 6.2 Risk Management section in the Annual Report | Wafer quality control grows increasingly difficult as products become more complex. Inability to detect defects could incur a loss to our customers and impact company reputation<br>If defects remain undetected in raw materials, it could lead to scrapping the final product, impacting customers and operations<br>Please refer to Product Quality section | Failing to meet the customer's requirements may lead to losing market shares.<br>Close engagements with customers to comprehend customer and application requirements and roadmap.<br>Please refer to Customer Relations section | Disruptions in the supply chain (for raw materials or equipment) could impact Company operations and our commitment to customers<br>Please refer to Sustainable Supply Chain section and TSMC Responsible Supply Chain Report |

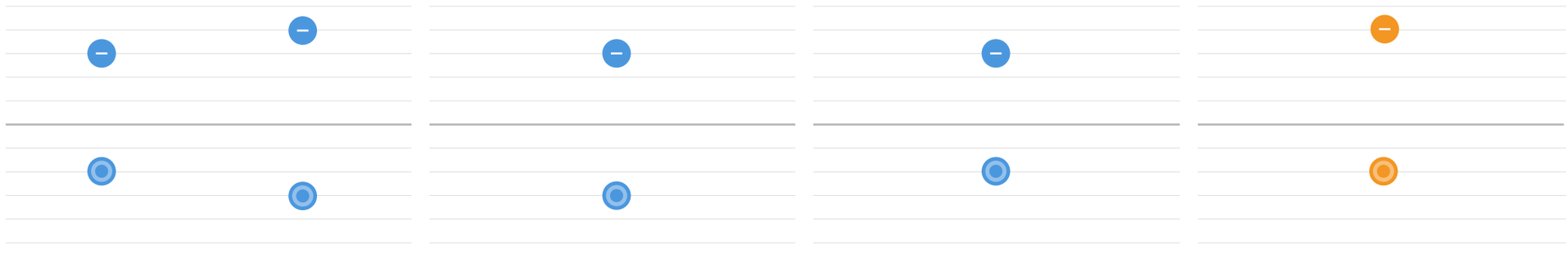
**Likelihood and Trend**[Note 1]

Upwards / Sideways / Downwards

Almost Certain
Likely
Possible
Unlikely
Rare

**Impact**[Note 2]

Catastrophic
Major
Moderate
Minor
Insignificant



Note 1: Likelihood and trend are defined as follows: "almost certain": may occur within 1 year; "likely": may occur within 3 years; "possible": may occur within 5 years; "unlikely": may occur within 10 years; "rare": may occur within 30 years

Note 2: Impact is defined as follows: "Catastrophic": loss exceeding 10% of assets/revenue; "Major": loss of 5-10% of assets/revenue; "Moderate": loss of 3-5% of assets/revenue; "Minor": loss of 1-3% of assets/revenue; "Insignificant": loss of less than 1% of assets/revenue

| | Climate and Energy | | Water Stewardship | Circular Resources | Air Pollution Control |
|---|---|---|---|---|---|
| **Risk Aspects/Types**<br>Strategy<br>Operation | Operational impact from climate disasters, increasing GHG emissions, regulations against GHG emissions, and other requirements | Power Shortage or Outage | Water shortage or suspension, and environmental impact from wastewater | Suppliers failing to properly handle waste leading to pollution | Environmental impact from pollutant emissions |
| **Risk Evaluation and Mitigation Measures** | Increasing demands from stakeholders to increase usage of renewable energy could increase costs and, if requirements are not met, fab construction progress and customer orders could be impacted<br>Please refer to Climate and Energy section and TSMC Climate and Nature Report | Unstable power supply will limit production capacity and disrupt operations.<br>Please refer to Climate and Energy section and TSMC Climate and Nature Report | Unstable water supplies will limit production capacity, TSMC will therefore be unable to satisfy customer demands Anomalies in effluents will pollute the environment and negatively impact company reputation<br>Please refer to Water Stewardship section | Waste management vendors failing to handle waste in compliance with regulations may subject TSMC to liabilities for waste cleanup and environmental recovery, impacting company reputation<br>Please refer to Circular Resources section | Improper use or failure of air pollution control equipment could result in excess emissions, penalties from the authorities, and impact on company reputation<br>Please refer to Air Pollution Control section |
| **Likelihood and Trend**[Note 1]<br>Upwards<br>Sideways<br>Downwards | Almost Certain<br>Likely<br>Possible<br>Unlikely<br>Rare | | | | |
| **Impact**[Note 2] | Catastrophic<br>Major<br>Moderate<br>Minor<br>Insignificant | | | | |

Note 1: Likelihood and trend are defined as follows: "almost certain": may occur within 1 year; "likely": may occur within 3 years; "possible": may occur within 5 years; "unlikely": may occur within 10 years; "rare": may occur within 30 years
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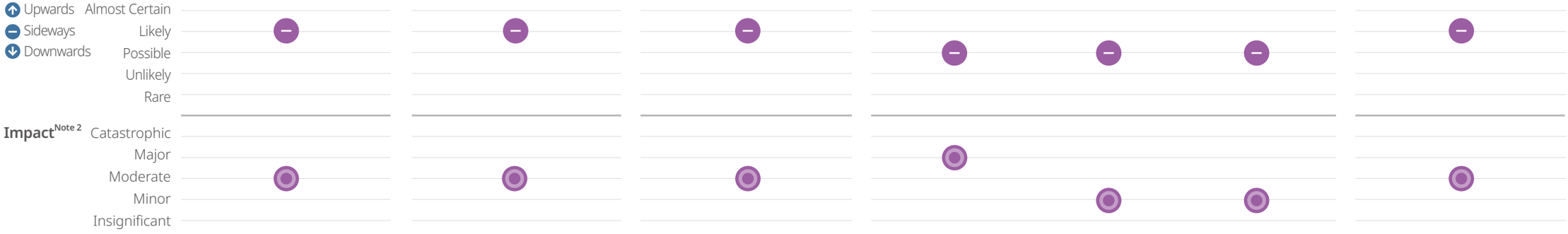
| | Inclusive Workplace | Talent Attraction and Retention | Talent Development | Occupational Safety and Health | | | Business and Human Rights |
|---|---|---|---|---|---|---|---|
| **Risk Aspects/Types**<br>Strategy<br>Operation | Failure to uncover TSMC employees' full potentials | Failure to attract or retain a sufficient number of high-quality talents | Talents failing to progress with evolving landscapes | Natural calamities or man-made disasters such as earthquakes or fires | Occupational diseases and injuries from chemical hazards | Pandemic | Failure to protect the human rights of TSMC employees and suppliers |
| **Risk Evaluation and Mitigation Measures** | Company's understanding of society and grasp of various aspects of the market may suffer if the mix of employees is unable to reflect the current social landscape, further impacting the Company's competitive advantage<br>Please refer to Inclusion Workplace section | Company operations could suffer from failure to attract and retain a sufficient number of high-quality talents when needed<br>Please refer to Talent Attraction and Retention section | The Company's competitive advantage and growth momentum could suffer if talents fail to progress with evolving landscapes<br>Please refer to Talent Development section | Natural calamities and man-made disaster such as earthquakes and fires could damage the Company's equipment and result in disrupted operations and financial losses | Employees could suffer from injuries and diseases due to non-compliance to safety guidelines | Cluster infections of pandemic could result in disrupted operations | Company reputation, employee morale, talent recruitment, customers' interests could suffer from the lack of proper protection for the human rights of our employee and suppliers.<br>Please refer to Business and Human Rights section and TSMC Human Rights Report |
| | Please refer to Occupational Safety and Health section and 6.2 Risk Management section in the Annual Report | | | | | | |

**Likelihood and Trend**[Note 1]




**Impact**[Note 2]




Note 1: Likelihood and trend are defined as follows: "almost certain": may occur within 1 year; "likely": may occur within 3 years; "possible": may occur within 5 years; "unlikely": may occur within 10 years; "rare": may occur within 30 years

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# Financial Performance

TSMC understands that a solid financial foundation is essential for corporate sustainability. By developing prudent business strategies, adhering to disciplined capital management, and consistently delivering strong financial performance, TSMC has successfully created long-term economic value and built a solid financial base. Although macroeconomic and geopolitical uncertainties weighed on consumer sentiment and the overall end-market demand in 2024, TSMC delivered strong financial performance due to its technological leadership and the robust demand for AI-related products from its customers. The performance underscores TSMC's ability to leverage its financial strength to execute its corporate sustainability plans effectively, benefiting a wide range of stakeholders, including shareholders, employees, customers, suppliers, government entities, industry associations, and communities at large.

Transparency and timely financial reporting are pivotal in enhancing communication with investors and bolstering their confidence in TSMC's long-term investment value. In addition to the regular disclosure of its latest financial results, the Company also sets clear and measurable strategic financial objectives and continues to deliver results that are aligned with its long-term financial targets. In addition, TSMC is dedicated to achieving sustainable and healthy returns that not only enable the company's continued investments to support customers' growth, but also ensure profitable returns for shareholders. Looking ahead from 2024 to 2029, TSMC expects (1) its long-term revenue growth, measured in US dollar terms, to approach a compound annual growth rate (CAGR) of 20%, (2) its long-term gross margin to be 53% and higher, and (3) ROE to be 25% and higher across the cycle.

To support these growth opportunities and maintain a strong financial foundation, TSMC has strategically raised capital. Since 2020, the company has issued NT$413.0 billion in NT dollar-denominated and US$17.5 billion in US dollar-denominated corporate bonds, securing favorable pricing terms. These efforts have well positioned the company to seize future growth opportunities while enabling TSMC to uphold the highest credit ratings in the semiconductor industry.

| AA- | Aa3 | twAAA |
|---|---|---|
| Standard & Poor's (S&P) Ratings | Moody's Ratings | Taiwan Ratings |

## Four Strategies To Increase Long-term Investment Value

**Continue to invest in technology leadership**

- 13.0% — CAGR in R&D investment [Note 1]
- 7.7% — CAGR in R&D headcounts [Note 1]

**Provide excellent manufacturing services and capacity support**

- ~17 Million — Total capacity was approximately 17 million 12"-equivalent wafers in 2024
- 12.1% — CAGR in capital expenditures [Note 1]

**Pursue revenue and market share growth**

- 13.6% — CAGR in net revenue [Note 1]
- 34% — Of the "Foundry 2.0" [Note 2] industry output value produced in 2024

**Maintain or improve profitability and investment return**

- 16.1% — CAGR in net income [Note 1]
- 27.4% — Average ROE [Note 1]
- 3.1 Trillion — Cumulative cash dividends (NT$) (2004 - 2024)

Note 1: 2015 - 2024
Note 2: TSMC defines "Foundry 2.0" as all logic wafer manufacturing, packaging, testing, mask-making and other related technologies.

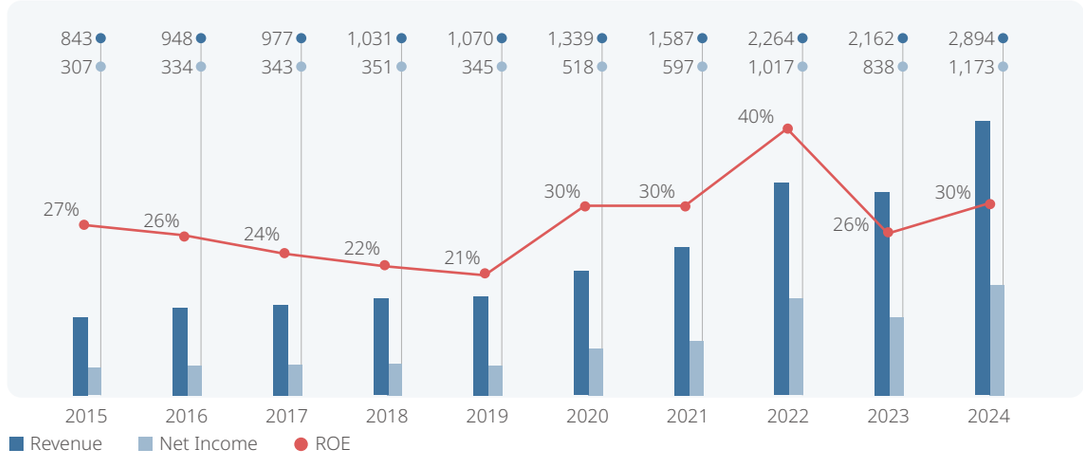
Since going public in 1994, TSMC has been profitable every year, with its market capitalization growing steadily. As of December 31, 2024, TSMC's market capitalization reached NT$29.1 trillion, or approximately US$886.0 billion.

TSMC's strong financial performance allows the Company to distribute profits to shareholders through cash dividends. In 2024, TSMC's Board of Directors approved an increase in the quarterly cash dividend from NT$3.50 to NT$4.00 per share in May, with an additional increase to NT$4.50 per share in November. Consequently, TSMC's shareholders received a total of NT$14.00 per share in cash dividends in 2024, and they can expect to receive at least NT$17.50 per share in 2025. Between 2004 and 2024, TSMC has distributed a total of NT$3.1 trillion, or approximately US$102.2 billion, in cash dividends.

In the future, TSMC intends to maintain a sustainable quarterly cash dividend, and to distribute the cash dividend each year at a level not lower than the year before.

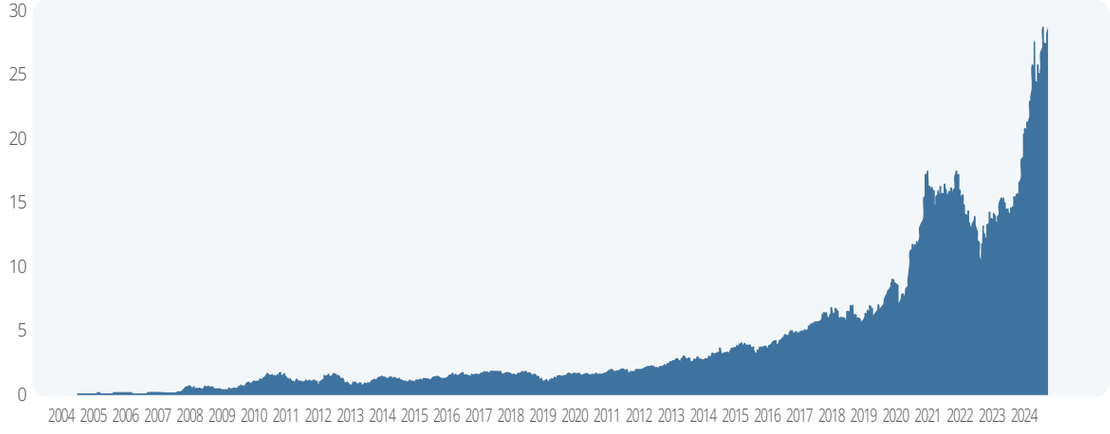
## Financial Performance

Unit: NT$ billion

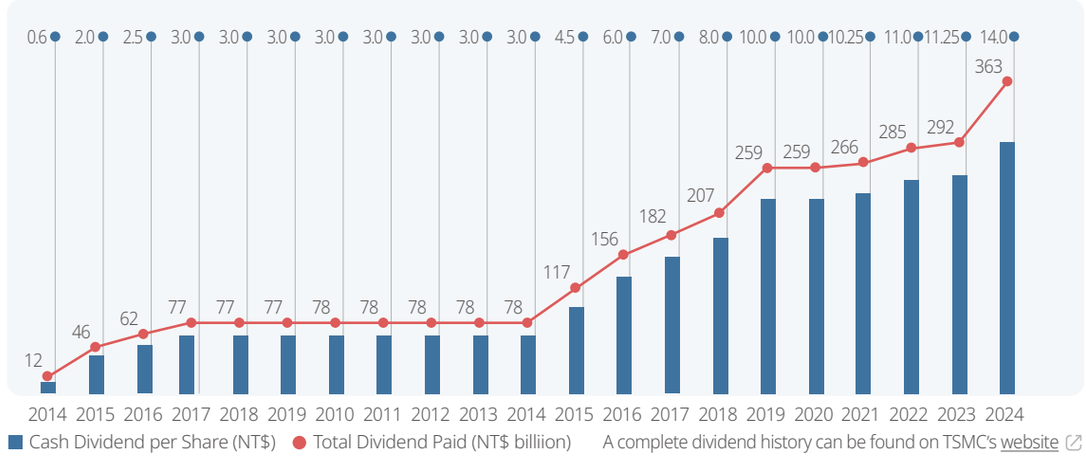



## Market Capitalization

Unit: NT$ trillion




## Cash Dividend




A complete dividend history can be found on TSMC's website

# Tax

TSMC supports the government in formulating laws and regulations that encourage enterprise innovation and foster economic growth. The Chief Financial Officer reviews and approves the Company's tax policy annually, committing to transparency and sustainable development.

## Tax Policy

- Act at all times in compliance with the spirit and the letter of all applicable tax laws and regulations in the jurisdictions in which we operate
- Conduct inter-company transactions on an arm's length basis and in accordance with the internationally accepted transfer pricing guidance published by the OECD
- Be transparent in financial reporting, make disclosures in accordance with applicable regulations and reporting requirements
- Do not use tax havens or tax structures whose sole purpose is tax avoidance
- Do not transfer value created to low-tax jurisdictions
- Develop strong, mutually respectful relationships with tax authorities based on transparency and trust
- Always consider tax as a part of major business decisions
- Analyze the operating environment and assess tax risk through a corporate management mechanism

## Tax Risk Management

TSMC is subject to tax laws and regulations in various jurisdictions in which it operates or conducts business. Any unfavorable changes in tax laws and regulations in these jurisdictions could increase the Company's effective tax rate and have an adverse effect on its operating results. In order to effectively manage tax risks, TSMC follows internal control processes, identifies, assesses, and manages tax risks from regulatory changes and its business transactions, accounts for them appropriately, and implements and monitors controls over them. Tax risk management is embedded within TSMC's enterprise risk management (ERM) framework. Every six months, the risk management division reports to the Audit and Risk Committee on TSMC's key risks and mitigation efforts. For more details on risk management, please refer to the "6.2 Risk Management " section in TSMC's 2024 Annual Report.

## Effective Tax Rate

TSMC's effective tax rate and cash tax rate in 2024 were 16.6% and 13.1%, respectively, both lower than Taiwan R.O.C. statutory tax rate of 20%. It was primarily due to tax credits for investment in forward-looking innovative research and development, as well as for the acquisition of machinery or equipment for advanced manufacturing processes, in accordance with the regulations under the R.O.C. Statute for Industrial Innovation. Over the past two years, TSMC's average effective tax rate and cash tax rate were 15.7% and 14.4%, respectively. These rates were higher than the industry average effective tax rate of 13.96% and the industry average cash tax rate of 13.82%, as reported in the S&P Global 2025 CSA Handbook for the "Semiconductors and Semiconductor Equipment" industry group.

## Tax Governance

The ultimate responsibility for taxation management for TSMC and its subsidiaries rests with the Chief Financial Officer, who delegates day-to-day responsibility to the Controller. A team of qualified and experienced tax professionals supports the Controller to meet TSMC's tax obligations. In addition, TSMC also leverages external tax service providers for complementary expertise.

TSMC's Audit and Risk Committee is delegated by the Board to oversee the quality and integrity of the accounting, auditing, reporting, and financial control practices of the Company through periodic review of certain major matters, including accounting policies and procedures, internal control systems, legal compliance, and corporate risk management, etc. Among these, tax compliance is included as part of the Company's legal compliance.

## Engagement and Management of Tax

TSMC visited tax authorities to proactively exchange views on international tax reform trends and progress, as well as major domestic tax issues, and worked together to establish a sound tax environment.

TSMC participated in conferences held by tax-related organizations to stay abreast of international tax trends and developments, in order to manage tax risks and enhance competitiveness.

**$202.0 Billion**

In 2024, TSMC's total tax payments on a cash basis worldwide were NT$202.0 billion

**>90%**

In 2024, over 90% of TSMC's revenue and profit before tax were generated from its business operations in Taiwan. Meanwhile, over 90% of its income tax payments were also made to the Taiwan R.O.C. government

**1st**

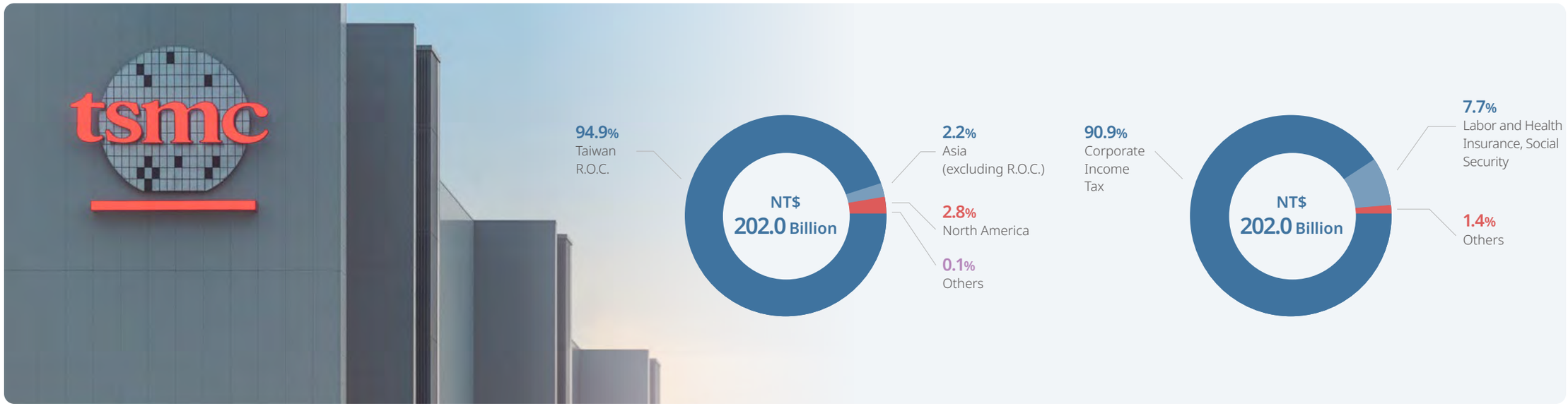
Based on data provided by Taiwan Economic Journal (TEJ) database, TSMC was the largest corporate income tax payer among all public listed companies in Taiwan in 2024

**15.9%**

TSMC's 2024 income tax payment in Taiwan represented 15.9% of total corporate income taxes collected by the R.O.C. government. Note

Note: Source: National Statistics, R.O.C. (Taiwan), Public Finance Statistics Database

## 2024 Tax Breakdown[Note]




### Income Tax Paid - 183.6 Billion (NT$)

- Taiwan R.O.C. 98.7%
- Asia (excluding R.O.C.) 1.0%
- North America 0.3%
- Others 0.0%

### Profit Before Tax - 1,405.8 Billion (NT$)

- Taiwan R.O.C. 95.9%
- Asia (excluding R.O.C.) 2.3%
- North America -0.9%
- Others 2.7%

### Income Tax Accrued - 238.1 Billion (NT$)

- Taiwan R.O.C. 98.9%
- Asia (excluding R.O.C.) 0.8%
- North America 0.3%
- Others 0.0%

Note: TSMC categorizes its profit before tax, income tax accrued, and taxes paid geographically based on the country in which TSMC and subsidiaries are located.

# Information Security

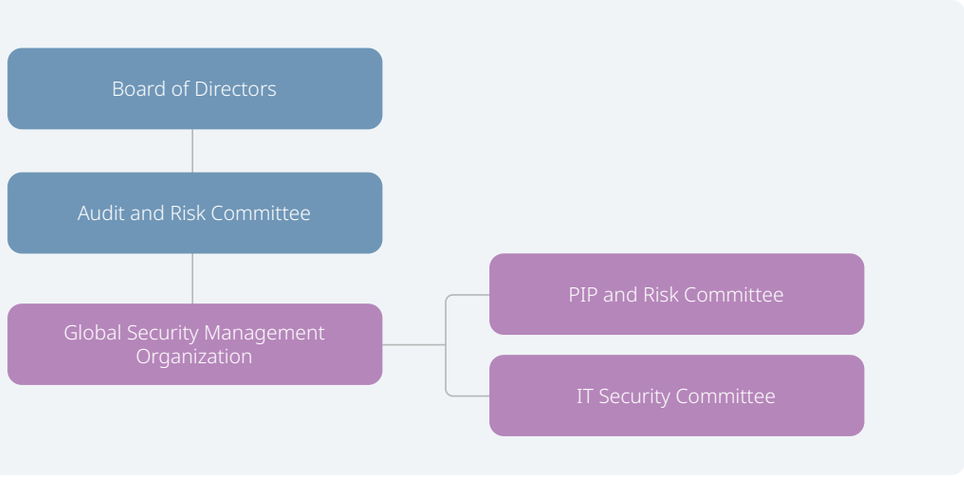
Information security, PIP and physical security represent TSMC's commitment to customers, suppliers, and employees. In response to its global expansion strategy and to enhance security across wafer fabs, offices, data centers, and cloud platforms, TSMC established the GSM organization in 2024. By leveraging AI and IoT technologies, the organization integrates and strengthens information and physical security management at fabs to ensure operational stability and risk response capabilities. Additionally, in 2024, TSMC hosted its first security workshop for suppliers to improve practical implementation. The Company also enhanced collaboration with international organizations/standards and government agencies to broaden supplier impact and extend influence to other industries. Since the inception of the "Information Security Leadership Award" under the TCSA in 2021, TSMC has ranked first in its industry category for four consecutive years, faithfully upholding its commitment in the Information Security Statement .

## Robust Information Security Governance

TSMC's global security management is under the oversight of the Audit and Risk Committee, authorized by the Board of Directors. Sir Peter L. Bonfield, an independent director with cybersecurity expertise, serves as the Chairman. Senior Vice President and Deputy Co-COO Dr. Cliff Hou serves as Chief Information Security Officer (CISO), responsible for the Company's overall information security strategy and resource coordination. To meet the demands of global development, TSMC integrated corporate information and physical security management in 2024 by establishing the Global Security Management Organization, led by Senior Director Dr. James Tu. This organization is responsible for implementing and managing global security operations and reports to the Audit and Risk Committee every six months. The Chairman of the Audit and Risk Committee, in turn, reports the effectiveness of information security supervision and risk control measures to the Board of Directors.

TSMC also established the PIP and Risk Committee and the IT Security Committee. These committees are chaired by the CISO, with VP-level executive members. They meet regularly to review key information security policies and plans, and work closely with the Company's operations, R&D, IT, supporting functions, and overseas offices to strengthen information security protection and management mechanisms.

### TSMC Global Security Management Organization




## Following International Standards for Progressive Information Security Management

TSMC references the U.S. SCF, the National Institute of Standards and Technology's NIST 800-53 and the CSF as well as the U.S. Department of Defense's CMMC to plans its information security development blueprint. This ensures effective control over physical environments, information protection, system operations, and product security. In 2024, TSMC introduced and revised 25 information security regulations. Audits related to information security revealed no significant deficiencies, and there were no major security incidents resulting in breaches, customer information leaks, or fines. Moreover, there were no complaints from third parties or regulatory authorities regarding violations of customer data protection or loss of customer data, leading to legal action against the Company.

TSMC has consistently passed customer and third-party audits of its information security practices while maintaining a high-quality chip manufacturing environment and protecting customer proprietary information. In 2024, TSMC underwent information security related assessments from nine customers, and completed security-related questionnaire assessments from 32 customers. The Company also maintained its ISO 27001 certification for international information security management and ISO 15408 certification for information security product management. That same year, Fab 12A, Fab 12B, Fab 14A, Fab 15A, Fab 15B, and Advanced Backend Fabs 6B and 6C received ISO/IEC 15408 EAL6 certification from the BSI.

## Enhancing Information Security Resilience Across the Industry Chain

TSMC strives to build a more resilient semiconductor cybersecurity supply chain. In 2024, the Company hosted its first Supply Chain Security Workshop, defining and promoting ten key information security control measures while sharing its implementation experiences. Over 800 participants from 486 key suppliers attended. TSMC also continued its partnership with SEMI and TSIA to promote the Specification for Cybersecurity of Fab Equipment (SEMI E187) and the standardization of cybersecurity assessments. Additionally, the Company launched "Dr. James Tu's Semiconductor Cybersecurity Lecture Series" to provide practical solutions and training for small and medium-sized suppliers.

In terms of joint cybersecurity defense, TSMC has joined the FIRST to stay informed of major security incidents and rapidly deploy response mechanisms. In 2024, the Company also actively participated in seminars organized by the AIT and Taiwan's Chief Information Security Officer Alliance to exchange cybersecurity management experience. The Company also signed a memorandum of understanding with the NICS and collaborated closely with the TWCERT/CC to share cybersecurity intelligence and improve information security protection standards.

## Enhancing Global Fab Security with Smart Technologies

TSMC actively applies AI and IoT technologies to enhance security management efficiency across global fabs. In 2024, the Company built a cloud-based intelligent video detection platform with a global deployment architecture, effectively integrating physical security management with advanced monitoring technologies to bolster cross-region emergency response capabilities. At the same time, TSMC launched a smart self-service platform using components certified by GreenCircle and ISO 17065. Through digital transformation, the platform simplifies identity verification, badge applications, and safety management processes for employees and suppliers, reducing 281,277 kg of carbon emissions annually compared to previous practices and achieving both enhanced security management and corporate sustainability.

In response to global expansion in 2024, TSMC launched the "PIP Week" initiative for the first time at its overseas sites, including TSMC (Nanjing), TSMC Arizona, and JASM. The campaign featured poster exhibitions, keynote speeches, and training materials in multiple languages — Chinese, English, and Japanese — to promote PIP as a fundamental mindset and standard in employees' daily work. This marks a step toward the goal of PIP glocalization.

TSMC is committed to enhancing the effectiveness of information and physical security management at its fabs.

## Key Information Security Measures in 2024

### Cybersecurity Control

Protection for external-facing services, multilayered defense, network isolation, vulnerability scanning and patching, email and internet browsing protection, automatic detection of internal network threats, automatic blocking of critical alerts, and others

- Launched a global multilingual interactive online course on anti-phishing protection NEW

### Asset Management and Data Protection

Systematic monitoring and analysis of software and hardware assets, separation of public and private device data, audit trail maintenance, smart endpoint protection systems, secure configuration management of assets, global security settings automation mechanism, and full implementation of document/email confidentiality labeling control, and others

- **>30** Introduced new security configuration items to enhance the security of perimeter firewalls and switches
- Implemented advanced encryption technologies to strengthen protection of customer file transfers

### Access Control

Adherence to the principles of Need-to-Know and information classification, implementation of identity verification and authorization services, remote access control settings, and high-privilege account management

- Established a global virtual office based on ZTNA to enhance network security management NEW
- Implemented access control mechanisms for online meeting participants to protect shared content

### Computer Operation Security

Antivirus and malware detection, server security control, patch management and vulnerability remediation, endpoint deployment of security agent software, smart endpoint protection, and others

- Executed the "Security Certified Data Center" initiative to strengthen data center security NEW
- Launched monthly information security inspection reports for fabs to strengthen semiconductor manufacturing cybersecurity NEW

### Personnel Information Security Management, Training and Promotion

Strengthen the expertise of the information security team, personnel management, education, training, and social engineering drills. Personnel must complete training before entering facilities

- **38 Certifications** The information security team obtained top international information security certifications, totaling over 200 certifications
- **>8,000 New employees** Completed information security education and training courses
- **11** Produced awareness posters
- **2** Issued editions of supplier information security newsletters
- **12** Conducted social engineering and email phishing drills
- **80,921 Employees** Completed the annual online information security refresher course
- **322** Handled employee feedback reports
- **>200 Certifications** The information security team collectively obtained top international information security certifications
- **near 120,000 new vendors** Completed information security education and training courses
- **3** In-house promotional videos
- **>270,000** The total number of recipients for the supplier information security newsletters
- **>300,000 participants** Participated in social engineering and email phishing drills
- **95** Obtained an average score of 95 for employee approval of information protection-related policies
- **0.047%** The proportion of employees disciplined for violations of information security or PIP procedures

Actions in 2024

Note: In 2024, the scope of performance indicators related to PIP includes both Taiwan facilities and all overseas subsidiaries.

## Information Security Assessment and Risk Management

Implement information security risk assessments, automate security testing, monitor key performance indicators, and deepen external experience exchange

- **99** Third-party information security risk assessment score
- **Top 1%** The third-party information security risk assessment scores ranked in the top 1% of the technology industry
- Performed penetration tests and red team-blue team exercises with external expert teams to strengthen cybersecurity resilience

## Personnel and Workplace Security

Deployment of multi-layered, high-spec security monitoring and inspection equipment across fabs. Integrated customer requirements, international standards, and local regulations to enhance security controls from the design stage. Applied AI-based technologies to ensure global risk control and response to external risks. Reinforced the security team by recruiting personnel with military, police, and national security backgrounds to enhance global physical security execution

- Built a cloud-based intelligent video detection platform to strengthen cross-regional emergency response capabilities NEW
- Launched a smart self-service platform to streamline badge application and security management processes NEW
- Formulated response measures at TSMC Arizona for preventing large-scale shooting incidents and to protect employee safety

## Application Security

Conduct application development risk assessment and vulnerability control, implement automated checks into DevSecOps, deployment of automated scanning tools, and open-source software supply chain management

- **3,602 People** Enhanced application security training for development engineers
- **100%** Completion rate of application security training for development engineers
- Implemented access restrictions to DevOps services in office areas to prevent source code leakage

## Cybersecurity Incident Response and Management

Coordinate through a 24-hour CIRC aimed at clarifying the root causes of cybersecurity incidents, executing improvement plans, and conducting practical drills based on incident reporting and management procedures

- **23** Completed cybersecurity incident drills in domestic and overseas facilities
- Continued cyber insurance coverage to reduce risks from cybersecurity incidents

## Supply Chain Security

Strengthen supplier information security management through four key areas: establishment of standards, assessment & collaboration, advocacy, and risk management

- **>800 Suppliers** Completed information security evaluation
- **486 Key suppliers** NEW Participated in the first Supply Chain Security Workshop
- **10** NEW Defined key information security control measures
- **83%** Suppliers' information security achieved an A grade in third-party evaluation
- **98%** Satisfaction rate of the first Supply Chain Security Workshop
- **81%** The proportion of suppliers meeting the requirements of eight or more key information security control measures

Actions in 2024

# Business and Human Rights

TSMC is dedicated to cultivating a workplace that respects human rights and upholds human dignity by adhering to the UDHR and applying the RBA Code of Conduct, the OECD Due Diligence Guidance for Responsible Business Conduct, and the UNGPs adopted by the United Nations Human Rights Council. In managing human rights issues across its own operations, suppliers, contractors, and partners (including customers and communities), the Company strives to prevent and eliminate all forms of modern slavery, including forced labor and human trafficking, in its operations and supply chain. TSMC continuously considers the provision of competitive living wages and incorporates responsible business conduct into its human rights policies and management systems. Through due diligence, the Company establishes preventive and mitigating measures along with appropriate remedy measures, reinforcing and advancing its human rights protection efforts.

## Human Rights Due Diligence

### Establish Policy and Governance

- **Policy/Statement**
  Develop the Human Rights Policy
- **Governance**
  The board of Directors oversees human rights issues
- **Salient Issues**
  Identify 2 additional salient human rights issues.

### Take Investigation and Action

- **Risk Assessment**
  Conduct Workplace Human Rights Climate Survey to employees worldwide
- **Mitigation**
  Prevent and reduce adverse effects
- **Remedy**
  Provide and support appropriate remedies

### Enhance Engagement and Disclosure

- **Monitoring**
  Track the risks and the results of investigation
- **Communication**
  Promote training workshops and online courses.
- **Grievance Channel**
  Provide open and equitable grievance channels

## TSMC's Human Rights Governance Mechanism

The Company designates the Board of Directors as the supreme oversight body for human rights governance. The ESG Committee has established a cross-functional Human Rights Working Group to implement human rights management initiatives. The ESG Committee regularly reports progress to the ESG Steering Committee and submits quarterly updates on human rights actions and outcomes to the Board of Directors and the Nominating, Corporate Governance and Sustainability Committee.

**Board of Directors/Nominating, Corporate Governance, and Sustainability Committee**
The supreme governing body overseeing and committing to human rights issues

**ESG Steering Committee**
Oversees human rights management progress

**ESG Committee**
Establishes and monitors management outcomes

**Human Rights Working Group**
Drives efforts in human rights management

Business Development, Corporate ESH Division, Corporate Information Technology, Corporate Planning Organization, ESG, Finance, Global Sales, Global Security Management, Human Resources, Legal, Materials Management, Operations, Quality & Reliability, and Research & Development

## Salient Human Rights Issues

TSMC identifies salient human rights issues based on six dimensions from the UNDP: Labor Rights, Environmental Rights, Voice & Participation, Gender Equality, Products & Services Liability, and Governance & Security. In line with the European Union's Corporate Sustainability Due Diligence Directive and MVO Nederland CSR Risk Check, the Company conducted its first "Workplace Human Rights Climate Survey" among global employees by considering climate and energy factors, biodiversity, and geographic-specific human rights risks. The survey gathered 64,625 valid responses, with an 82% response rate. The questionnaire covered 40 questions across 11 categories, including: Environmental Rights, Land Use and Property Rights, Forced Labors and Bonded Labors, Health and Safety, Terms of Employment, Wages and Workhours, Harassment, Discrimination, Mental Health, Privacy, and Voice & Participation. TSMC utilizes these survey results and employee feedback as reference for ongoing optimization of human rights management practices. In 2024, the Company offered an online human rights course to further raise awareness of human rights governance and familiarize employees with the link between business conduct and human rights. The Company encourages all employees to integrate human rights values into every decision and action in their daily work, with the training achieving an 89% completion rate. Additionally, the ESG Department organized a human rights workshop for representatives from all organizations in the Human Rights Working Group, bringing together 61 managers and employees across departments. The Company expects these representatives to share the workshop's content — including the scope of business and human rights, its significance, and TSMC's improvement initiatives — in their respective organizations to fully embed human rights values across all levels. For detailed information, please refer to the "2024 TSMC Human Rights Report ."

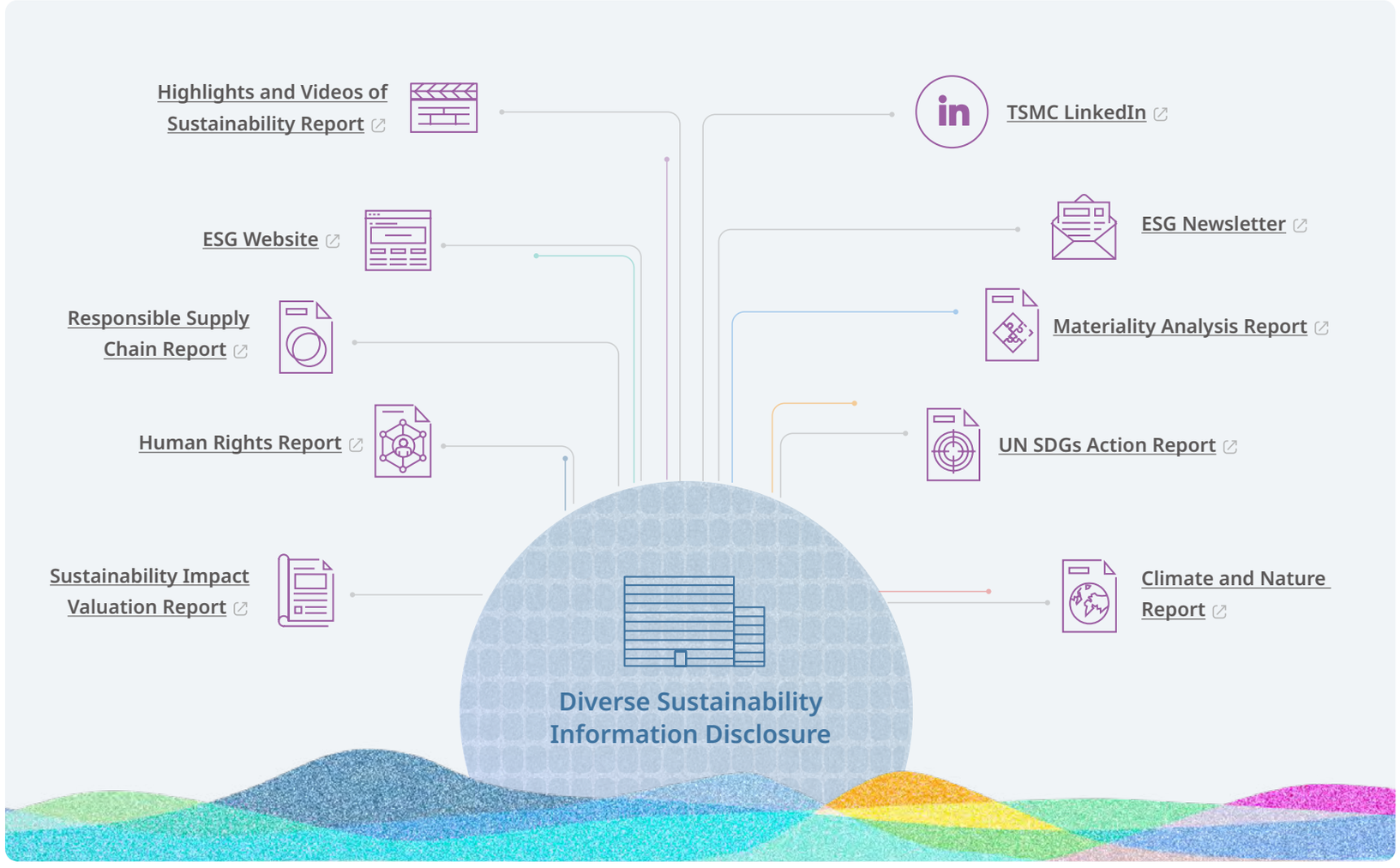
| Dimensions | Salient Human Rights Issues | Indicators | Affected Stakeholders | | | | |
|---|---|---|---|---|---|---|---|
| | | | TSMC Employees | Supplier Employees | Contractor Employees | Customers | Communities |
| Labor Rights | Wages and Working Hours | Overtime work and overtime pay | ✓ | ✓ | ✓ | | |
| | Health and Safety | Worker safety and health | ✓ | ✓ | ✓ | | |
| | Terms of Employment | Extensive use of contractors or outsourced labor | ✓ | ✓ | ✓ | | |
| | Workplace Discrimination | Employee discrimination, workplace diversity, and migrant worker recruitment criteria | ✓ | ✓ | ✓ | | |
| Environmental Rights | Pollution and Chemicals | Impact on water resource of communities, and human health | | | | | ✓ |
| | Climate and Energy NEW | Carbon reduction and climate transition | | ✓ | ✓ | | ✓ |
| | Biodiversity NEW | Impact on ecosystems | | ✓ | ✓ | | ✓ |
| Voice & Participation | Privacy | Improper handling of personal data, employee/worker privacy rights | ✓ | ✓ | ✓ | | |
| Gender Equality | Sexual Harassment | Workplace sexual harassment | ✓ | ✓ | ✓ | | |
| | Gender Discrimination | Health/reproductive risks faced by pregnant or breastfeeding female employees | ✓ | ✓ | ✓ | | |
| Services & Products Liability | Managing Hazardous Substances in Products | Harmful or risky effects on human health from product testing | ✓ | ✓ | ✓ | ✓ | |
| | Customer Proprietary Information and Personal Information Protection | Improper use, access, or processing of confidential customer data and personal information without the customer's consent | | | | ✓ | |
| Governance & Security | Security | Providing safety equipment or facilities for workers in hazardous working conditions | ✓ | ✓ | ✓ | | |

# Appendix

# About This Report

TSMC has published non-financial reports for 26 consecutive years, demonstrating its unwavering commitment to transparency and accountability in sustainability reporting, and ongoing alignment with international sustainability trends, frameworks, and standards. In preparing its sustainability report, the Company adheres to multiple international frameworks including the GRI Standards, TCFD, TNFD,SASB, and IRIS+. In addition, the report references the ESRS, incorporating the Double Materiality principle to address impacts, risks, and opportunities, which serves as TSMC's methodological foundation for materiality analysis .

The Company is also progressively adopting the IFRS Sustainability Disclosure Standards — IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures. TSMC has established a dedicated task force to conduct gap analyses, assess the financial implications of risks and opportunities under S1 and S2, and examine and enhance information disclosures accordingly, as an important tool for managing and communicating ESG. Through materiality analysis, the Company dynamically adjusts its sustainability management direction and openly discloses its implementation strategies, medium and long-term goals, practices, and performance achievement status. It gathers feedback and suggestions from stakeholders through multiple channels, collaborating with employees, shareholders/investors, customers, suppliers/contractors, government/industry associations, and communities to create shared value.



## Reporting Period

The reporting period covers January 1 to December 31, 2024. TSMC plans to publish the report in both Chinese and English on its ESG website in August 2025. The report addresses material issues of concern to stakeholders and presents the Company's specific performance across economic, environmental, social, and governance aspects.

## Reporting Scope

The reporting boundary for the 2024 TSMC sustainability report aligned with the consolidated financial statements, including all TSMC fabs in Taiwan, TSMC headquarters, all wafer fabs, and advanced backend fabs, as well as TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, VisEra, and other subsidiaries . Any variations in the disclosure scope among the mentioned entities will be noted in the corresponding paragraphs.

## Main Changes in 2024 ESG Disclosures

### Materiality Analysis

Explored interrelationships among 14 material issues in 2023 materiality analysis results and adopted the Decision Making and Trial Evaluation Laboratory (DEMATEL) methodology. Identified six key material issues and presented findings with corresponding action plans to the Board of Directors

### Disclosure Scope

Expanded disclosure to include Fab 20 Phase 1, Fab 21 Phase 1, Fab 22 Phase 1, Fab 23 Phase 1, Advanced Backend Fab 6B, and the Zero Waste Manufacturing Center

### Dynamic Updates

Issued 48 ESG sustainability stories throughout the year, providing timely updates on sustainability progress

### Theme Reports

Released the first-ever "Responsible Supply Chain Report ," while continuing to update other theme reports, including the "UN SDGs Action Report ," "Human Rights Report ," "Sustainability Impact Valuation Report ," and the "Climate and Nature Report "

## Report Compiling and Quality Management Process

### Engagement

#### Inclusivity

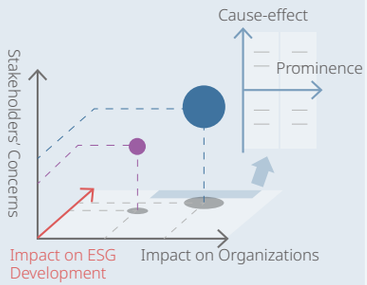
Communicate with stakeholders to collect reasonable expectations

#### Impact

ESG issues with significant impact to TSMC's operation and external sustainability development, and of stakeholders' concern

#### Materiality

Identify and prioritize ESG topics and define TSMC's material issues




#### Responsiveness

Formulate management plan on material issues and transparently disclose the Company's action and progres

### Planning

#### Launch Kick-off Meeting

- Deliver a comprehensive plan
- Define the main theme and content of the Report
- Establish editing and revision guidelines
- Communicate matters requiring collaborations for audit

**ESG Department**

#### Inter-departmental Meetings

- Share new trends and approaches
- Share the annual plan for improvements
- Report case studies
- Plan the ESG Newsletter

**ESG Committee Team Assigned Writer**

### Editing

Compile in compliance with eight reporting principles set forth by the GRI[Note 1], TSMC's 21 quality indicators and the SMART principle

#### Long-term Sustainability Goals

Review the 2030 Sustainability Goals in accordance with the SMART principles

- Specific
- Measurable
- Achievable
- Relevant
- Time-bound

#### Develop the six major quality checklists

Ensure compliance with 21 quality indicators

- Accuracy
- Balance
- Clarity
- Comparability
- Reliability
- Timeliness

#### Establish Internal Control System

Develop the "TSMC Sustainability Information Management Guidelines" to incorporate sustainability information quality management into its internal control system.

### Review

- Confirm sustainable activities and performances by the organization
- Audit information accuracy

**Division-level Managers**

- Verify information and data

**VP-level and Above Executives of TSMC Organizations**

- Preliminary and on-site paper audit by third parties
- Raise improvement items from audit findings

**Independent Verification Organization**

- Review and finalize report

**ESG Committee Chairperson**

- Supervise and guide

**Board of Directors**

### Communication

#### External Communication Channels

- TSMC Website and ESG Website
- TSMC ESG Newsletter
- Email to stakeholders
- TSMC ESG Facebook
- TSMC LinkedIn
- Supply Online 360
- Customer Newsletter
- Government's Public Disclosure Platform

**Sustainability Report**

#### Internal Communication Channels

- EDM to all employees
- myTSMC internal Website
- myESG internal Website
- ESG AWARD Website
- ESG Steering Committee
- ESG Committee
- Inter-departmental communication meetings for ESG

Note 1: Accuracy, balance, clarity, comparability, completeness, sustainability context, timeliness and verifiability
Note 2 :For each certification , please refer to TSMC's ESG website

## Progress on IFRS Sustainability Disclosure Standards S1 and S2 Implementation

In 2024, TSMC launched an implementation roadmap for the IFRS Sustainability Disclosure Standards by establishing a cross-functional task force to enhance collaboration across departments, with the aim of improving the completeness of sustainability disclosures. In accordance with regulations set by Taiwan's governing authorities, the Company regularly reports implementation progress to the Board of Directors. TSMC remains dedicated to transparency by making year-on-year advancements openly available.

**20024**

- Formulate an implementation roadmap for the IFRS Sustainability Disclosure Standards. On the foundation of the ESG Management Platform , establish a cross-functional task force involving ESG, Finance, Risk Management, Legal, Internal Audit, and Corporate Information Technology. Identify key gaps and potential impacts between current sustainability information and IFRS Sustainability Disclosure Standards to guide annual improvements
- Establish an internal control system for sustainability disclosures, clearly list the authorities and responsibilities of managers at all levels
- Align with the boundaries of consolidated financial statements and initiate optimization of sustainability management and information disclosure processes

**2025**

- Identify sustainability-related risks and opportunities in accordance with IFRS Sustainability Disclosure Standard S1 (General Requirements for Disclosure of Sustainability-related Financial Information), and assess material sustainability-related financial information through the sustainability financial impact pathway
- Align with IFRS Sustainability Disclosure Standard S2 (Climate-related Disclosures) by linking TSMC's material climate risks and opportunities with climate-related financial impact analyses , and establish a climate financial impact pathway to quantify financial implications
- Set management metrics and targets for sustainability and climate-related risks and opportunities

**2026**

- Link non-financial and financial information to integrate the reporting process
- Prepare disclosures as per the IFRS Sustainability Disclosure Standards and, for the first time, publish a dedicated sustainability section in the 2026 Annual Report in 2027

## Report Writing Guidelines and Principles

### ESG

**Standards**

- GRI Standards
- ESRS Double Materiality
- TCFD
- TNFD
- SASB Index for the Semiconductor Industry
- AA1000 AccountAbility Principles
- The International Integrated Reporting Framework
- CDP Climate Change/Water Security
- The United Nations Global Compact (UNGC)
- The United Nations SDGs
- WEF IBC Stakeholder Capitalism Metrics
- Impact Reporting and Investment Standards, IRIS+

**Certification Organizations**

- DNV Business Assurance Co. Ltd. certified this Report
- In compliance with the DNV VeriSustain™ Protocol , GRI Standards, and SASB Index

### Financial Information

**Standards**

- IFRSs endorsed by the Financial Supervisory Commission (FSC) with the effective dates
- Regulations Governing the Preparation of Financial Reports by Securities Issuers

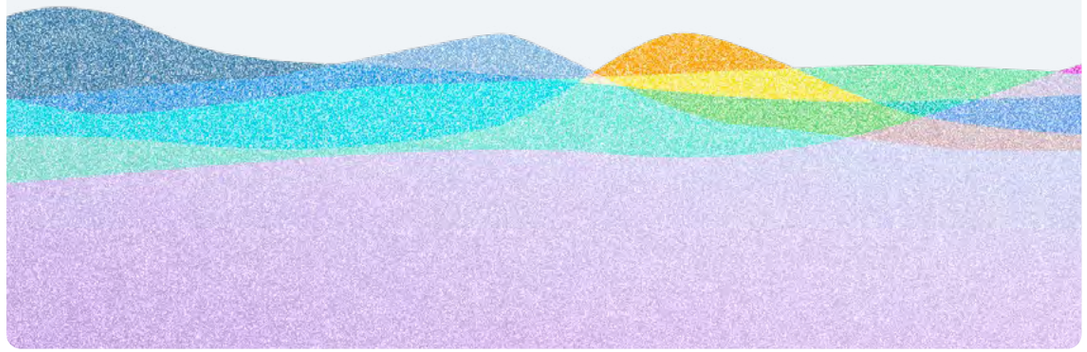
**Certification Organization**

- Deloitte & Touche

### Feedback

If you have any feedback, advice, or suggestion on this report or TSMC's sustainable development, please feel free to contact us. For more information about TSMC's latest sustainability practices, please subscribe to the TSMC ESG Newsletter.

Responsible Unit: ESG Committee
ESG Website: https://esg.tsmc.com/en-US/
Email: ESG@tsmc.com
Phone: +886-3-5636688
Address: 8, Li-Hsin Rd. 6, Hsinchu Science Park, Hsinchu 300-78, Taiwan, R.O.C



# Sustainability Disclosure Framework

TSMC aligns its sustainability reporting framework with standards and guidelines issued by the GRI , AccountAbility , the ISSB , the TNFD , and the World Economic Forum's International Business Council . The Company also incorporates the double materiality principle outlined in the ESRS under the EU CSRD, as proposed by the EFRAG . The Company is progressively adopting ISSB's IFRS Sustainability Disclosure Standards S1 and S2 . Concurrently, TSMC actively participates in international sustainability assessments by ESG rating organizations such as CDP and S&P Global to deepen stakeholder trust, while proactively supporting UN initiatives to advance sustainability management across its business units.


E Environmental S Social G Governance/Economics

# Sustainability Disclosure Indicators of Listed Company - Semiconductor Industry

| No. | Indicators | Indicator Types | Annual Disclosures | Units |
|---|---|---|---|---|
| 1 | Total energy consumption, percentage of purchased electricity, utilization rate(renewable energy) | Quantitative | Please see Sustainability Accounting Standards Board Index TC-SC-130a.1 | Gigajoules (GJ), percentage (%) |
| 2 | Total water withdrawn, total water consumption | Quantitative | Please see Sustainability Accounting Standards Board Index TC-SC-140a.1 | Thousand cubic meters (1000$m^3$) |
| 3 | Total hazardous waste generated and percentage recycled | Quantitative | Please see Sustainability Accounting Standards Board Index TC-SC-150a.1 | Metric tons (t), percentage (%) |
| 4 | Types of, number of employees in and rate of occupational accidents | Quantitative | Please see Occupational Safety and Health | Quantity, percentage (%) |
| 5 | Product Lifecycle Management Disclosure: including weights of scraps and electronic waste and percentage recycled | Quantitative | As a wafer manufacturer, TSMC does not produce end-use products and is not involved in the disposal of products or electronic waste at the end of their useful life, making this indicator inapplicable | Not applicable |
| 6 | Description of the management of risks associated with the use of critical materials | Qualitative | Please see Sustainability Accounting Standards Board Index TC-SC-440a.1 | Not applicable |
| 7 | Total amount of monetary losses as a result of legal proceedings associated with anti-competitive behavior regulations | Quantitative | Please see Sustainability Accounting Standards Board Index TC-SC-520a.1 | New Taiwan Dollars |
| 8 | Production by product category | Quantitative | Please see Page 11of the Annual Report | Varies by product category |

# Climate-related Information of Listed Companies

| | Item | Execution Status |
|---|---|---|
| 1 | Description on the Board and Management's oversight and governance on climate-related risks and opportunities | See TSMC Climate and Nature Management Framework — Governance |
| 2 | Description on how the identified climate risks and opportunities impact the company's business, strategies, and finance (short, mid, long-term) | See TSMC Climate and Nature Management Framework — Strategies , Opportunities and Response Strategies for Climate/Nature Risks – Transition Risks, Opportunities and Response Strategies for Climate/Nature Risks – Physical Risks |
| 3 | Description on the impact extreme climate events and transitional actions have on finance | See TSMC Climate and Nature Management Framework — Strategies |
| 4 | Description on how the climate risk identification, assessment, and management process is integrated in the overall risk management system | See TSMC Climate and Nature Management Framework — Risk Management |
| 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 | See TSMC Climate and Nature Management Framework — Strategies |
| 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 | See TSMC Climate and Nature Management Framework — Metrics and Targets |
| 7 | Should the internal carbon pricing is used as the planning tool, the pricing mechanism should be explained | See TSMC Carbon Pricing Mechanism |
| 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 | See TSMC Climate and Nature Management Framework — Metrics and Targets |
| 9 | Carbon inventory and assurance efforts | See chart on the next page |

| Year | Area | Scope 1 | | Scope 2 | | Assurance Institutes | Assurance Efforts |
|---|---|---|---|---|---|---|---|
| | | Total Emissions (metric tons $CO_2e$) | Emission Intensity (metric tons $CO_2e$/thousand) | Total Emissions (metric tons $CO_2e$) | Emission Intensity (metric tons $CO_2e$/thousand) | | |
| 2024 | The Parent Company | 1,581,312 | 0.0006 | 10,926,644 | 0.0038 | DNV | Reasonable level |
| | VisEra | 5,043 | 0.0005 | 30,753 | 0.0031 | DNV | Reasonable level |
| | TSMC (China) | 118,141 | 0.0046 | 0 | 0 | DNV | Reasonable level |
| | TSMC (Nanging) | 53,216 | 0.0008 | 0 | 0 | DNV | Reasonable level |
| | TSMC Washington, LLC | 53,723 | 0.0090 | 0 | 0 | AWN | Reasonable level |
| | JASM | 14,241 | 0.1314 | 0 | 0 | DNV | Reasonable level |
| | TSMC Japan 3DIC R&D Center | 196 | 0.0002 | 0 | 0 | DNV | Reasonable level |
| 2023 | The Parent Company | 1,307,966 | 0.0006 | 10,150,252 | 0.0047 | DNV | Reasonable level |
| | VisEra | 4,399 | 0.0006 | 37,135 | 0.0051 | DNV | Reasonable level |
| | TSMC (China) | 161,698 | 0.0063 | 0 | 0 | DNV | Reasonable level |
| | TSMC (Nanging) | 45,118 | 0.0007 | 0 | 0 | DNV | Reasonable level |
| | TSMC Washington, LLC | 76,851 | 0.0093 | 0 | 0 | AWN | Limited level |

Note 1: Greenhouse gases include $CO_2$, $CH_4$, $N_2$, HFCs, PFCs, $SF_6$, and $NF_3$.

Note 2: Scope 1 (direct emissions) are emissions based on the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gases Inventories directly owned or controlled by the Company, and the calculation uses the Global Warming Potential (GWP) from IPCC's Fifth Assessment Report; Scope 2 (indirect emissions) are indirect GHG emissions from purchased electricity, heat, and steam.

Note 3: New additions to the 2024 emissions boundary include Fab 20 Phase 1, Advanced Backend Fab 6 Phase 2, Taichung Zero Waste Manufacturing Center, TSMC Japan 3DIC R&D Center.

# Participation in Industry Associations and Non-Profit Organizations Note 1

Adhering to its core values and business philosophy, TSMC works with partners and stakeholders to meet our commitments to the environment, society, and governance to drive positive change. In accordance with TSMC's "Public Policy Engagement Guidance ," TSMC actively participates in a variety of trade organizations, industry associations, and public policy related non-profit organizations to promote industry dialogue and development, as well as track key issues such as technology innovation, corporate governance, environmental sustainability, supply chain management and social inclusion[Note 2]. In 2024, TSMC participated in domestic and international 82 industry associations and non-profit organizations, with expenditures of over NT$64.62 million[Note 3]. Total expenditures in the past five years (2020~2024) were approximately: NT$274.22 million[Note 4, 5].

The issues covered by the industry associations and non-profit organizations in which TSMC participates are as follows:

## Industry Dialogue and Development

TSMC strives for the common good of the semiconductor industry. By actively participating in industry associations, the Company forges consensus, facilitates collaboration, defines standards, develops talents, and makes policy suggestions to the government in topics including land, water, electricity, talent, intellectual property protection, resilient societies and other areas related to the competitiveness of the industry. Industry associations that TSMC participates in to steer industry development include:

- Taiwan Semiconductor Industry Association (TSIA)
- Semiconductor Industry Association (SIA)
- SEMI
- Global Semiconductor Alliance (GSA)
- The Allied Association for Science Park Industries
- Chinese National Association of Industry and Commerce, Taiwan (CNAIC)
- Taiwan Electrical and Electronics Manufacturers' Association (TEEMA)
- Monte Jade Science & Technology Association of Taiwan
- The Center for Asia-Pacific Resilience and Innovation (CAPRI)
- Information Technology Industry Council (ITI)
- National Committee on United States-China Relations
- Greater Phoenix Chamber of Commerce

TSMC Senior Vice President and Deputy Co-COO Cliff Hou serves as Chairman of TSIA since 2023. Executive Vice President and Co-Chief Operating Officer Y.P. Chin currently serves as chairperson of TSIA's Energy Committee, Vice President Dr. Y.L. Wang currently serves as chairperson of TSIA's Industry and University Committee, Director Han-Wen Fung currently serves as chairperson of TSIA's Environment Safety and Health Committee, and Director Dr. Percy Chang currently serves as chairperson of TSIA's JSTC Committee, and Director T.C. Morris Cheng currently serves as vice chairperson and convener of the IC manufacturing group of the Industry Policy Committee. Vice President Dr. Douglas Yu currently serves as co-chair of SEMI Taiwan's Packaging & Testing Committee, Director Dr. John Lin currently serves as chairperson of SEMI Taiwan's IC Committee, Director Dr. Shih-Fen Huang currently serves as chairperson of SEMI Taiwan's MEMS & Sensors Committee, Director M.D. Chen currently serves as chairperson of SEMI Taiwan's Materials Committee, Deputy Director Dr. Scott Yu currently serves as co-chair of SEMI Taiwan's Smart Manufacturing Committee, and Director Dr. James Tu currently serves as chairperson of SEMI Taiwan's Cyber Security Committee. Senior Vice President Rick Cassidy currently serves on the board of GSA, and Senior Vice President Lora Ho serves as director of GSA Women's Leadership Council. Executive Vice President and Co-Chief Operating Officer Y.P. Chin currently serves as executive director of The Allied Association for Science Park Industries, and Senior Vice President Lora Ho serves as controller of The Allied Association for Science Park Industries. Former Chairman Dr. Mark Liu serves as director of CNAIC. Former Senior Vice President J.K. Lin currently serves as director of TEEMA. Senior Vice President and General Counsel Sylvia Fang currently serves on the board of CAPRI. Senior Vice President Peter Cleveland currently serves on the board of ITI.

Note 1: The definition of non-profit organizations here does not include TSMC Charity Foundation and TSMC Education and Culture Foundation. For details of both foundations, please see pages 208 to 232 of this report.

Note 2: By law, TSMC is not permitted to make political donations as the Company is majority owned by foreign shareholders. TSMC has always followed this legal requirement and maintained political neutrality but respects and encourages employees to fulfill their civic duty.

Note 3: The five largest membership fees paid or donations made by TSMC in 2024, in descending order, are:

1) Information Technology Industry Council (ITIC)/NT$12,851,600
The United States is one of TSMC's primary markets. TSMC participates in the ITIC in the U.S. to join other global technology companies to discuss policy trends and industry standards related to technology industry development, and to communicate with the U.S. and global governments on the importance of technology to the global economy.

2) Taiwan Semiconductor Industry Association (TSIA)/ NT$7,817,998
TSMC participates in the TSIA to support Taiwan's semiconductor industry, develop consensus on the development of the industry through the association's activities and promote healthy growth for the sector through cooperation amid competition.

3) Semiconductor Industry Association (SIA)/ NT$6,607,250
TSMC participates in the SIA to join other industry members to collectively communicate with the U.S. government and highlight the importance of the semiconductor industry to U.S. economic development, national security, and global competitiveness.

4) SEMI/ NT$3,049,470
TSMC participates in the SEMI, which serves the manufacturing supply chain for the micro- and nano-electronics and green energy industries, including semiconductors, optoelectronics semiconductor, flat panel display (FPD), micro-electromechanical systems (MEMS) and sensors, printed and flexible electronics, photovoltaics (PV), wind energy, smart storage, green finance and hydrogen fuel cell (HFC).

5) Allied Association for Science Park Industries/ NT$1,980,000
TSMC participates in the Allied Association for Science Park Industries, which serves as a conduit between government and business for promulgation of policies and communication of views. It serves the common interests of companies in Taiwan's science parks and facilitates cooperation for the stable development of science park businesses.

Note 4: TSMC's expenditures of membership and donation for industry associations and nonprofit organizations between 2020 and 2024 were NT$40,197,059, NT$44,367,769, NT$70,943,042, NT$54,089,183, and 64,621,556 respectively.

Note 5: In addition to the expenditures disclosed in Note 4, TSMC's government relations expenses in 2024 amounted to NT$55,941,665 with the primary expense being employee payroll. TSMC did not make any political donations in the reporting period. In the past five years (from 2019 to 2023), TSMC did not make any political donations or other spendings related to ballot measures or referendums.

## Technology Innovation

Technology innovation is the key to driving progress in the industry, economy and society forward. TSMC not only cares for and invests in technology innovation and participates in the definition of technical standards, but also calls on the government and private sector to protect the results of innovation together so that it can gain appropriate economic value and encourage further innovation, creating a fair competitive environment. TSMC participates in industry associations related to technology innovation including:

- Epoch Foundation
- K.T. Li Foundation for Development of Science and Technology
- Taiwan Association for Trade Secrets Protection (TTSP)
- Information Technology and Innovation Foundation (ITIF)
- Global Women's Innovation Network
- Peripheral Component Interconnect Special Interest Group (PCI SIG)
- Alliance for Telecommunications Industry Solutions
- JEDEC Solid State Technology Association (JEDEC)

TSMC Senior Vice President and Deputy Co-COO Dr. Cliff Hou succeeded former Chairman Dr. Mark Liu as a board director of Epoch Foundation since December 2024. Former Chairman Dr. Mark Liu currently serves on the board of K.T. Li Foundation for Development of Science and Technology. TSMC Senior Vice President and General Counsel Sylvia Fang jointly founded TTSP in 2015 and served as its chairperson for the first two terms to help promote legal reform of Taiwan's trade secret laws and regulations. Currently she is an executive director of the TTSP. Associate General Counsel Dr. F.Y. Shieh currently serves as chairman of TTSP.

## Corporate Governance

TSMC actively carries out corporate sustainable development, and is committed to advocate and act upon the principles of operational transparency to protect shareholder rights. Based on a strong foundation of corporate governance, TSMC believes in leading with integrity and adopts ethics, regulatory compliance, and risk management mechanisms into daily business operations. TSMC participates in industry associations in the area of corporate governance including:

- Asia Business Council
- Asian Corporate Governance Association (ACGA)
- Chinese Professional Management Association
- Association of Certified Fraud Examiners, Taiwan Chapter
- Forum of Incident Response and Security Teams (FIRST)
- The Risk Management Society (RIMS)

## Environmental Sustainability

Responding to climate change and mitigating climate impact to protect our shared global environment, TSMC promotes and preserves local biodiversity, integrates green management into daily operations. It continuously improves energy management, water stewardship, circular resources, and air pollution control through introducing innovative green technologies. The Company's goal is to become a global standard for eco-friendly corporations. TSMC also leverages its social influence, actively participates in climate-related initiatives, and joins hands with all sectors of society to adopt a climate position aligned with the Paris Agreement. TSMC participates in industry associations and non-profit organizations in the area of environmental sustainability including:

- RE100
- SEMI Semiconductor Climate Consortium)
- Science and Technology in Society forum (STS forum)
- Taiwan Institute for Sustainable Energy (TAISE)
- Taiwan Net Zero Emissions Association (TNZEA)
- Taiwan Climate Partnership (TCP)
- CommonWealth Sustainability Council
- Business Council for Sustainable Development of Taiwan (BCSD Taiwan)

TSMC was the first semiconductor company to join the RE100, and also the founding member of TNZEA, TCP, CommonWealth Sustainability Council, and SEMI Semiconductor Climate Consortium. Director Han-Wen Fung currently serves as vice chairman of TNZEA. Senior Vice President Lora Ho currently serves as director at TCP.

## Supply Chain Management/ Social Inclusion

Creating an inclusive corporate culture is an important issue for TSMC's operation and development. In accordance with the "Human Rights Policy" and "Global Inclusive Workplace Statement", TSMC leads by example and conducts regular self-assessments. TSMC also requires all suppliers to follow the "Supplier Code of Conduct" as well as the local laws and regulations to create a respectful working environment and contribute to social inclusion. TSMC participates in industry associations related to social inclusion including:

- RBA
- RMI
- Disability:IN
- Junyi Academy

Senior Vice President Lora Ho currently serves as director at Junyi Academy.

# ESG Performance Summary [Note 1]

| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| **Operations and Governance** | | | | |
| **Corporate Governance** | Size of the Board (HC) | 10 | 10 | 10 |
| | Number/Percentage of Non-executive Directors on the Board (HC/%) | 3 / 30% | 3 / 30% | 2 / 20% |
| | Number/Percentage of Independent Directors (HC/%) | 6 / 60% | 6 / 60% | 7 / 70% |
| | Number/Percentage of Executive Directors on the Board (HC/%) | 1 / 10% | 1 / 10% | 1 / 10% |
| | Number/Percentage of Women on the Board (HC/%) | 1 / 10% | 1 / 10% | 2 / 20% |
| | Number of Board Meetings/Board Meeting Attendance (%) | 5 / 100% | 5 / 94% | 6 / 97.02% |
| | Number of Audit and Risk Committee (ARC) Meetings/ARC Meeting Attendance (%) | 5 / 93% | 5 / 97% | 6 / 100% |
| | Number of Compensation and People Development Committee (CPDC) Meetings/CPDC Meeting Attendance (%) | 5 / 97% | 4 / 100% | 5 / 100% |
| | Number of Nominating, Corporate Governance and Sustainability Committee (NCGS) Meetings/NCGS Meeting Attendance (%) | - | 5/97% | 4 / 97.5% |
| | Executive Compensation Linked to ESG Performance (Y/N) | Y | Y | Y |
| **Financial Performance** | Revenue (NT$ billion) | 2,264 | 2,162 | 2,894 |
| | Net income (NT$ billion) | 1,017 | 838 | 1,173 |
| | Income tax expense (NT$ billion) | 127 | 141 | 233 |
| | Cash dividend (NT$ billion) | 285 | 292 | 363 |
| | R&D expenditures (NT$ billion) | 163 | 182 | 204 |
| | Capital expenditures (NT$ billion) | 1,083 | 950 | 956 |

Note 1: Figures from all Taiwan fabs and subsidiaries of TSMC. If the scope of reporting is different from the above statement, a note will be added to explain any differences in this paragraph.

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| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| **An Innovation Pioneer** | | | | |
| **Innovation Management** | R&D expenses to revenue (%) | 7.2% | 8.5% | 7.1% |
| | Global patents granted[Note 2] | 57,401 | 63,571 | 70,833 |
| | Registered trade secrets | 240,000 | 341,657 | 475,462 |
| | Cultivate undergraduate and graduate students globally through diverse industry-academia collaboration between 2021 and 2024 | - | 12,677 | >18,000 |
| | Participants of STEM workshops for female high school students | - | - | >4,000 |
| **Product Quality** | Number of CIT projects | - | - | 3,118 |
| | Value generated from improvement projects (NT$ billion) | 130 | 140 | 150 |
| | Involve outstanding projects in Taiwan Continuous Improvement Awards (TCIA) | 10 | 9 | 9 |
| | Encourage major local raw materials suppliers advanced to the finals of TCIA (%) | 17% | 14% | 18% |
| | Encourage wafer manufacturing raw materials suppliers to participate in TCIA (%) | 74% | 74% | 71% |
| | Encourage advanced packaging raw materials suppliers to participate in TCIA (%) | 60% | 60% | 80% |
| | Number of new innovative testing methods for product quality and reliability | 272 | 283 | 292 |
| | Percentage of major raw material suppliers that obtain ISO 9001 certification (%) | - | - | 100 |
| | Develop the capability to analyze 100% of CMR substances in materials with potential risks, and assist suppliers of such materials in developing the same capability (%) | 100% | 100% | 100% |
| | NMP replacement rate for etching processes (%) (Base year: 2016)[Note 3] | 97.2% | 98.6% / 71% | 100% |
| | Ensure that manufacturing processes are free from PFASs with more than 4 carbon atoms | Photoresist substitutes that do not contain PFHxA-related substances failed to pass production line testing; to select new substitute materials | Replace 14% of photoresists containing PFHxA related substances in VisEra | Replace 64% of photoresists containing PFHxA related substances in VisEra |
| | Complete quality and reliability certification during the design stage for advanced processes, specialty processes, and wafer-level packaging processes in compliance with the TSMC technological roadmap | Completed | Completed | Completed |
| | Cases of product recall by customers due to safety concerns | - | 0 | 0 |

Note 2: Since this 2024 Sustainability Report, the TSMC patent portfolio covers TSMC Washington, LLC, and Visera.
Note 3: NMP replacement rates in 2022 represent Taiwan fabs of TSMC only. The NMP replacement rates of Taiwan and overseas fabs in 2023, including TSMC Washington, LLC, TSMC(China), and TSMC(Nanjing), are 98.6% and 71%, respectively. The NMP replacement rates of overseas subsidiaries in 2024 is 100%.

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| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Customer Relations | Customer trust and satisfaction (%) | 92% | 94% | 96% |
| | Reduce cases of engineering quality problem to % of the level in 2019 for every one million 12-inch wafers shipped (%) | 36% | 25% | 26% |
| | Provided wafer manufacturing and process technologies in line with the TSMC technology roadmap | 944 | 994 | 1,028 |
| | Provided wafer packaging technologies in line with the TSMC technology roadmap | 129 | 149 | 161 |
| | Passed customer product information security audits with no major flaws | No major flaws | No major flaws | No major flaws |
| **A Responsible Purchaser** | | | | |
| Sustainable Supply Chain | Tier 1 suppliers' human rights rating and average score on the SAQ | - | - | C / 77 |
| | Tier 1 suppliers' completion rate of the Sustainability Management SAQ (%) | 100% | 100% | 100% |
| | Significant suppliers' completion rate for receiving third-party audits (by RBA-certified auditing institutions) every year(%) | 100% | 100% | 100% |
| | Total number of critical high-risk significant suppliers that have received audits for the S.H.A.R.P. Program | 100 | 148 | 150 |
| | Raw materials suppliers invited to observe the annual emergency response drill (Base year: 2016) | 161 | 190 | 212 |
| | Total number of suppliers that participated in the ESH training program (Base year: 2016) | 960 | 1,154 | 1,879 |
| | High-risk significant suppliers that received safety and health support (%) | 100% | 100% | 100% |
| | Increase Taiwan local sourcing of indirect raw materials (%) | 62.1% | 64.8% | 65% |
| | Increase overseas subsidiaries sourcing of indirect raw materials (%) | - | - | 33.1% |
| | Increase Taiwan local sourcing of parts and components (%) | 43% | 37% | 46% |
| | Diversify facilities and assess new suppliers in compliance with the multi-source program (Base year: 2018) | 135 | 145 | 155 |
| | Cumulative total of local raw materials suppliers receiving consultation on process advancement and quality improvement (Base year: 2016) | 65 | 75 | 85 |
| | Requires suppliers to conduct due diligence for responsible mining; % of legally compliant mines | 100% | 100% | 100% |
| | Audit at least three suppliers for due diligence in responsible mining each year | 5 | 3 | 3 |
| | Total number of suppliers audited for due diligence in responsible mining | 8 | 11 | 14 |
| | Supplier carbon emissions reduce rate (Comparing result from the BAU situation) | - | 2% | 4% |

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| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Sustainable Supply Chain | Score and reponse rate of suppliers invited to participate in the CDP (Carbon Disclosure Project) in the year | C / 81% | B- / 98% | B- / 100% |
| | High-energy-consumption suppliers that have received ISO14064 certification for GHG emissions (%) (Base year: 2021) | 65% | 84% | 90% |
| | Total energy conserved by helping suppliers (GWh) (Base year: 2018) | 5.3 | 8.1 | 10.26 |
| | Total water conserved by helping suppliers (metric tons) (Base year: 2020) | 29,080,000 | 42,580,000 | 54,860,000 |
| | Waste reduction in major local waste-generating suppliers (%) (Base year: 2014) | 34% | 39% | 42% |
| | Average waste recycling rate by helping suppliers (%) | - | - | 80% |
| **Practitioner of Green Power** | | | | |
| Climate and Energy | Greenhouse gas emission (metric ton-$CO_2$ equivalent) (Scope 1 and Scope 2 market-based) | 11,558,554 | 11,783,418 | 12,783,269 |
| | Scope 1 (metric ton-$CO_2$ equivalent) Note 4 | 2,018,789 | 1,596,031 | 1,825,872 |
| | Taiwan sites/Subsidiaries Note 5 | 1,669,770 / 349,019 | 1,307,966 / 288,065 | 1,581,312 / 244,560 |
| | Scope 2 (metric ton-$CO_2$ equivalent) (market-based) | 9,539,765 | 10,187,387 | 10,957,397 |
| | Taiwan sites/Subsidiaries Note 5 | 9,510,082 / 29,683 | 10,150,252 / 37,135 | 10,926,644 / 30,753 |
| | Scope 2 (metric ton-$CO_2$ equivalent) (location-based) | 10,887,145 | 11,466,118 | 12,674,921 |
| | Scope 3 (metric ton - $CO_2$ equivalent) Note 6 | 7,429,158 | 7,616,655 | 8,223,173 |
| | Carbon offset (metric ton - $CO_2$ equivalent) | 616,271 | 616,880 | 626,516 |
| | Fluorinated greenhouse gas emission (metric ton - $CO_2$ equivalent) | 1,102,353 | 959,642 | 1,097,070 |
| | Reduction rate of GHG emissions per unit product compared to the base year (metric ton - $CO_2$ equivalent - 12-inch equivalent wafer mask layer) (%) | 6% | -31% | -19% |
| | Energy consumption (GWh) (including electricity, natural gas and diesel) | 22,423 | 24,775 | 27,477 |

Note 4: To ensure consistent data in GHG inventory and reduction goals after 2020, inventory data for Scope 1 complies with the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gases Inventories starting from 2020. The base year also changes from 2010 to 2020.

Note 5: Subsidarie environmental figures includes TSMC Washington, LLC, TSMC(China), TSMC(Nanjing), VisEra, TSMC Arizona, JASM, and TSMC Japan 3DIC R&D Center.

Note 6: Figures includes TSMC fabs in Taiwan, TSMC Washington, LLC, TSMC (China), TSMC (Nanjing), and VisEra.

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| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Climate and Energy | Direct energy consumption (GWh) (including natural gas and diesel) | 1,336 | 1,553 | 1,920 |
| | Taiwan sites/Subsidiaries[Note 5] | 1,187 / 150 | 1,389 / 165 | 1,708 / 212 |
| | Indirect energy consumption (GWh) (non-renewable energy) | 18,895 | 20,630 | 21,944 |
| | Taiwan sites/Subsidiaries[Note 5] | 18,837 / 58 | 20,541 / 89 | 21,912 / 62 |
| | Indirect energy consumption (GWh) (renewable energy) | 2,191 | 2,592 | 3,612 |
| | Taiwan sites/Subsidiaries[Note 5] | 940 / 1,251 | 1,085 / 1,507 | 1,417 / 2,195 |
| | Renewable energy used at all TSMC fab operation sites (%) | 10.4% | 11.2% | 14.1% |
| | Renewable energy used at overseas subsidiaries (%) | 100% | 100% | 100% |
| | Total energy conserved from new energy saving measures since 2016 (GWh/y) | 31 | 39 | 47 |
| | Cumulative energy-saving rate from 2016 to 2030 through new energy-saving measures (%) | 13% | 14% | 15% |
| | Energy efficiency after volume production - 5nm technology | 0.6 (3rd year) | 0.0 (4th year) | 0.6 (5th year) |
| | Days of production interrupted due to climate disasters | 0 | 0 | 0 |
| Water Stewardship | Water withdrawal (million metric tons) | 105.0 | 113.6 | 128.8 |
| | Taiwan sites – surface water | 96.8 | 92.5 | 94.6 |
| | Taiwan sites – reclaimed water | 0.4 | 12.6 | 19.6 |
| | Subsidiaries[Note 5] –surface water | 7.8 | 8.5 | 13.5 |
| | Subsidiaries[Note 5] –groundwater | - | - | 1.0 |
| | Process water recycling rate (%) | 85.7% | 90.3% | 88.1% |
| | Reclaimed water substitution rate (%) | - | 12% | 17% |
| | Total water saving (million metric tons) | 215.7 | 286.4 | 284.6 |

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| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Water Stewardship | Ultra-pure water usage (million metric tons) | 132.1 | 130.9 | 139.61 |
| | Tetramethylammonium hydroxide (TMAH)[Note 7] | 3.8 | 2.5 | 2.1 |
| | Copper ion ($Cu^{2+}$) [Note 7] | 0.06 | 0.07 | 0.08 |
| | Reduction % in unit water consumption (liter/12-inch equivalent wafer mask layer) (Base year: 2010) | 2.6% | -25.2% | -14.3% |
| | Water pollution composite indicator reduction rate (%)[Note 7] | 54.3% | 63.4% | 63% |
| Circular Resources | Outsourced unit waste disposal per wafer in Taiwan (kg/12-inch equivalent wafer mask layer) | 0.99 | 1.16 | 1.15 |
| | Outsourced unit waste disposal per wafer in overseas subsidiaries (kg/12-inch equivalent wafer mask layer) | 0.79 | 0.99 | 1.38 |
| | Reduce the $CO_2$ emissions from waste treatment to the same as 2020 emission levels (53,178 metric tons) | Reused instead of incinerating 125 metric tons of organic sludge and reduced carbon emissions by 92 metric tons | Promote three projects to reuse instead of incinerate and reduce carbon emissions by 694 metric tons | Promote three projects to reuse instead of incinerate and reduce carbon emissions by 483 metric tons |
| | Waste recycling rate (%) | 96% | 96% | 97% |
| | Taiwan sites/Subsidiaries[Note 8] | 96% / 92% | 97% / 93% | 97% / 92% |
| | Waste generated (metric tons) | 744,019 | 656,841 | 789,208 |
| | Outsourced General waste generated | 342,804 | 285,605 | 344,056 |
| | Taiwan sites/Subsidiaries[Note 8] | 331,499 / 11,305 | 272,923 / 12,682 | 317,769 / 26,287 |
| | Outsourced Hazardous Waste generated | 401,215 | 371,236 | 445,152 |
| | Taiwan sites/Subsidiaries[Note 8] | 373,419 / 27,796 | 338,840 / 32,396 | 399,363 / 45,789 |
| | Develop multiple types of electronic-grade chemicals for resource recycling within TSMC - % of resource recycling within facilities | 28% | 32% | 29% |
| | Waste treatment vendors that have obtained ISO14001 or other international EHS Management certifications (%) | 84% | 87% | 89% |
| | Waste treatment vendors establishing a smart system for tracking waste (%) | 9% | 29% | 44% |
| | Waste treatment vendors graded as Excellent and Good (%) | 80% | 86% | 88% |

Note 7: Figures from all Taiwan Fabs of TSMC
Note 8: Figures includes TSMC Washington, LLC, TSMC (China), TSMC (Nanjing), VisEra, TSMC Arizona, and JASM.

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| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Air Pollution Control | NOx emissions (metric tons) | 159.87 | 185.42 | 274.88 |
| | SOx emissions (metric tons) | 37.78 | 40.7 | 48.67 |
| | VOC emissions (metric tons) | 112.9 | 94.4 | 136.7 |
| | Reduction in air pollutant emissions per unit of production (%) | 59% | 50% | 47% |
| | Reduction rate of volatile organic gases (%) | 98.9% | 99% | 99% |
| | Number of unusual events reported in air pollution prevention equipment | 0 | 0 | 0 |
| | ISO 14001 certified sites number | 27 | 27 | 29 |
| | ISO 14001 certified sites percentage (%) | 100% | 100% | 100% |
| **An Admired Employer** | | | | |
| Inclusive Workplace | Rank for the Inclusive Workplace determined by comparing results from the Engagement Survey against the WTW Global High Performance Norm | - | Missed top 50% | - |
| | Global Full-time Employees (people) | 73,090 | 76,478 | 83,825 |
| | Females in all employees (%) | 34.4% | 34.2% | 33.7% |
| | Females in management (%) | 13.3% | 14.1% | 14.6% |
| | Females in junior management (%) | 13.6% | 14.3% | 15.0% |
| | Females in top management (%) | 6.1% | 5.9% | 11.4% |
| | Females in newly hired technicial professionals (%) | 23.7% | 28.4% | 28.7% |
| Talent Attraction and Retention | Goals for Core Values Survey to reinforce core values: Employee satisfied with the implementation of Integrity(%) [Note 9] | - | - | 93% |
| | Employee satisfied with the implementation of Commitment(%) | - | - | 92% |
| | Employee satisfied with the implementation of Innovation(%) | - | - | 92% |
| | Employee satisfied with the implementation of Customer Trust(%) | - | - | 97% |
| | Goals for the issue of sustainably engaged from the Engagement Survey in comparison to the WTW Global High Performance Norm | - | Missed top 75% | - |

Note 9: The percentage represents the proportion of respondents who selected "Tend to Agree" or "Agree" relative to the total number of respondents.

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| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Talent Attraction and Retention | Total compensation amongst industry peers | Top 25% | Top 25% | Top 25% |
| | Turnover rate (%) | 6.7% | 3.7% | 3.5% |
| | New hire (< 1 year) turnover rate (%) Note 10 | 15% | 8.9% | 8.9% |
| | Voluntary turnover rate (%) | 6.5% | 3.5% | 3.4% |
| Talent Development | Management positions filled through internal promotions (%) | 88.6% | 88.2% | 88.7% |
| | Vacancies filled through internal transfers (%) | 57.6% | 63.8% | 58.1% |
| | Reviewed the talent pipeline for fab directors/directors(%) | 69% | 96.3% | 97.6% |
| | Annual average of learning hours in employees | 69.5 | 85.4 | 100.5 |
| | Employee training hours | 5,077,993 | 6,533,076 | 8,426,074 |
| Occupational Safety and Health | Incident rate per 1,000 employees | 0.145 | 0.156 | 0.133 |
| | Injury frequency rate Note 11 | 0.27 | 0.35 | 0.26 |
| | Injury severity rate Note 12 | 3 | 4 | 3 |
| | Occupational fatalities - employees | 0 | 0 | 0 |
| | Occupational fatalities - contractors | 0 | 1 | 1 |
| | Cases of occupational disorders caused by exposure to chemicals | 0 | 0 | 0 |
| | Employees with abnormal blood lipids/ blood pressure/ blood sugar (%) | 9.2% / 10.8% / 1.8% | 9.8% / 11.5% / 1.9% | 10.9% / 13.2% / 1.8% |
| | Employees with reported high stress levels (%) | 8.1% | 6.4% | 6.3% |
| | Contractors that have obtained ISO 45001 certification for occupational safety and health management system with help from TSMC (%) | 65% | 80% | 100% |
| | Absentee rate Note 13 | 0.57% | 0.88% | 0.84% |

Note 10: Since 2021, the statistic of new hire (< 1 year) turnover rate included VisEra.

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Note 11: Safety –Injury Frequency Rate=Injury Number x 1,000,000/Total hours worked
According to the Occupational Safety and Health Act, Disabling Injury Frequency Rate are defined as any diseases, injuries, disabilities, or deaths of workers caused by buildings, machinery, equipment, raw materials, materials, chemicals, gases, vapors, dusts, etc., at the place of duty, or as a result of work activities, or due to other occupational causes. Other unrelated injuries in the workplace such as falling in the cafeteria or parking lot due to various reasons are not considered as work injuries. Target has been amended according to new definition. Please refere to Statistical Analysis of Disabling Injuries for detailed information.

Note 12: Safety –Injury Severity Rate=Lost Work Days x 1,000,000/Total hours worked
According to the Occupational Safety and Health Act, Disabling Injury Frequency Rate (FR)/Disabling Severity Rate (SR) are defined as any diseases, injuries, disabilities, or deaths of workers caused by buildings, machinery, equipment, raw materials, materials, chemicals, gases, vapors, dusts, etc., at the place of duty, or as a result of work activities, or due to other occupatio al causes. Other unrelated injuries in the workplace such as falling in the cafeteria or parking lot due to various reasons are not considered as work injuries. Target has been amended according to new definition. Please refer to Statistical Analysis of Disabling Injuries for detailed information.

Note 13: Absentee rate (%) = (Total hours of absence during the year / Total hours worked during the year) x 100%. Employee absences include occupational injury leave, sick leave (including menstrual leave and maternity leave for pregnancy protection). The calculation scope encompasses all employees at Taiwan sites, with a coverage rate of 100%. In 2021, the absentee rate was 0.50%.

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| Issues | Key Indicators | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| **Power to Change Society** | | | | |
| **Social Impact**[Note 14] | TSMC Volunteers accumulated/volunteer hours accumulated | 11,378 / 31,760 | 14,736 / 51,038 | 17,501 / 91,787 |
| | Beneficiaries of Social Engagement Programs | 2,291,030 | 1,031,433 | 1,391,674 |
| | social engagement activities invesetments (NT$ billion) | 1.263 | 1.454 | 2.441 |
| | Cumulative amount of Matching Donations (NT$ million) [Note 15] | - | 2.97 | 10.69 |
| | Charity partners | 130 | 690 | 192 |
| | Charity programs | 171 | 216 | 217 |
| | Total participants in youth competitions | 2,388 | 8,033 | 6,823 |
| | Promotional activities/participants on semiconductor sciences | 18 / 1,275 | 25 / 1,561 | 69 / 3,132 |
| | Invest resources in cultivating young generation/Invest resources and cooperate with educational organizations (NT$ billion) | 4,284 / 1,787 | 4,257 / 2,908 | 4,284 / 3,152 |
| | Participants for Chinese in-person opera activities | - | 5,160 | 14,551 |
| | Beneficiaries for arts and cultural events | 26,821 | 66,348 | 64,159 |
| | Sponsor outstanding local artists or groups | 12 | 13 | 20 |
| | Educational volunteer service hours | 2,060 | 30,268 | 27,990 |
| | Annual donations to underprivileged people (NT$ million)[Note 16] | 15.29 | 18.46 | 17.80 |
| | Children in remote areas that have benefited from TSMC programs | 6,358 | 31,133 | 35,051 |
| | Number of elder served via the Network of Compassion[Note 17] | 16,471 | 112,260 | 186,210 |
| | Meals delivered by Network of Compassion | 355,692 | 336,277 | 292,325 |
| | Annual beneficiaries of the Cherish Food Program | 48,143 | 44,344 | 46,916 |
| | Volunteer service from environmental protection volunteers | 499 | 1,105 | 1,128 |
| | Install solar panels for social welfare institutions/year | 7 | 7 | 13 |
| | Replace LED light tubes for elementary schools/year | 246 | 240 | 363 |

Note 14: Figures in Social Impact includes Taiwan Fabs of TSMC, TSMC(China), and TSMC(Nanjing).

Note 15: The match donation program was conducted starting from the third quarter of 2023. The donation amount is calculated based solely on the volunteer hours recorded during the months when the program is in effect. The actual hours of service received by the service units (excluding volunteer empowerment, transportation, etc.) will be recognized, and for every hour recorded, NT$300/US$10 will be donated.

Note 16: Resource contributions include both monetary donations and in-kind materials, the calculation has been adjusted to reflect the donation value in terms of New Taiwan Dollar (NTD).

Note 17: The target description was revised to reflect the inclusion of elderly individuals living alone as well as those in long-term care institutions.

# Glossary

## A

| | |
|---|---|
| **ACEEE** | American Council for an Energy Efficient Economy |
| **ACGIH** | American Conference of Governmental Industrial Hygienists |
| **ACSS** | Annual Customer Satisfaction Survey |
| **ADFP** | Academic Design Foster Package |
| **AED** | Automated External Defibrillator |
| **AIT** | American Institute in Taiwan |
| **AP** | Application Processors |
| **AR** | Augmented Reality |
| **AWS** | Alliance for Water Stewardship |

## B

| | |
|---|---|
| **B4SI** | Business for Societal Impact |
| **BAU** | Business As Usual |
| **BCD** | Bipolar-CMOS-DMOS |
| **BCP** | Business Continuity Plan |
| **BKM** | Best Known Method |
| **BSI** | Germany Federal Office for Information Security |

## C

| | |
|---|---|
| **CAGR** | Compound Annual Growth Rate |
| **CBAM** | Carbon Border Adjustment Mechanism |
| **CIRC** | Cybersecuriy Incident. Response Center |
| **CIS** | CMOS Image Sensor |
| **CIT** | Continuous Improvement Team |
| **CLC** | Climate Leadership Coalition |
| **CLSM** | Controlled Low Strength Material |
| **CMMC** | Cybersecurity Maturity Model Certification |
| **CMR** | Carcinogenic, Mutagenic and Toxic for Reproduction |
| **COUPE™** | Compact Universal Photonic Engine |
| **CoW** | Chip on Wafer |
| **CPU** | Central Processing Unit |
| **CSDDD** | Corporate Sustainability Due Diligence Directive |
| **CSF** | Cybersecurity Framework |
| **CSFT** | Customer Secure File Transfer |
| **CSRD** | Corporate Sustainability Reporting Directive |

## D

| | |
|---|---|
| **DCA** | Design Center Alliance |
| **DEMATEL** | Decision Making and Trial Evaluation Laboratory |
| **DJSI** | Dow Jones Sustainability Index |
| **DOE** | Design of Expereience |
| **DPPM** | Defect Parts Per Million |
| **DTC** | Deep Trench Capacitor |
| **DTCO** | Design Technology Co -Optimization |

## E

| | |
|---|---|
| **EC** | Energy Collaborative |
| **EDA** | Electronic Design Automation |
| **EFRAG** | European Financial Reporting Advisory Group |
| **EUV** | Extreme Ultraviolet |
| **E-HEMT** | Enhanced High Electron Mobility Transistor |
| **EP&L** | Environmental Profit & Loss |
| **ERM** | Enterprise Risk Management |
| **ESMC** | European Semiconductor Manufacturing Company |
| **ESRS** | European Sustainability Reporting Standards |

## F

| | |
|---|---|
| **FFU** | Fan Filter Unit |
| **FinFET** | Fin Field-Effect Transistor |
| **FIRST** | Forum of Incident Response and Security Teams |
| **FMEA** | Failure Mode and Effects Analysis |
| **FPGA** | Field Programmable Gate Array |
| **FR** | Frequency Rate |
| **FSC®** | Forest Stewardship Council |
| **FTP** | File Transfer Protocol |

## G

| | |
|---|---|
| **GAC** | Granular Activated Carvon |
| **GDS** | Graphic Data System |
| **GeSI** | Global e-Sustainability Initiative |
| **GIIN** | Global Impact Investing Network |
| **GPS** | Global Positioning System |
| **GPT** | Generative Pre-trained Transformers |
| **GPU** | Graphics Processor Unit |
| **GRI** | Global Reporting Initiative |
| **GSA** | Global Semiconductor Alliance |
| **GSM** | Global Security Management |
| **GVA** | Gross Value Added |
| **GWP** | Global Warming Potential |

## H

| | |
|---|---|
| **HBM** | High Bandwidth Memory |
| **HFCs** | Hydrofluorocarbons |

## I

| | |
|---|---|
| **IEEE** | Institute of Electrical and Electronics Engineers |
| **IEEE JSSC** | IEEE Journal of Solid-State Circuits |
| **IFRS** | International Financial Reporting Standards |
| **IFVI** | International Foundation for Valuing Impacts |
| **IMEC** | Interuniversity Microelectronics Centre |
| **IMP** | Impact Management Project |
| **InFO-M-PoP** | Integrated Fan-Out Multi-chips with Package-on-Package |
| **IP** | Intellectual Property |
| **IPA** | Isopropanol Alcohol |
| **IRIS** | Impact Reporting and Investment Standards |
| **IRIS+** | Impact Reporting and Investment Standards+ |
| **ISO** | International Organization for Standardization |
| **ISSB** | International Sustainability Standards Board |
| **ISSCC** | International Solid-State Circuits Conference |
| **ISTI** | Industry, Science and Technology International Strategy Center |
| **IWA** | Impact-Weighted Accounts |

## J

| | |
|---|---|
| **JEDEC** | Joint Electron Device Engineering Council |
| **JSTC** | Joint Steering Committee |

## L

| | |
|---|---|
| **LLM** | Large Language Model |
| **LOFIC** | Lateral Overflow Integration Capacitor |
| **LSI** | Local Silicon Interconnect |

## M

| | |
|---|---|
| **MCU** | Microcontroller Unit |
| **MD** | Membrane Distillation |

## N

| | |
|---|---|
| **NICS** | National Institute of Cyber Security |
| **NIST** | National Institute of Standards and Technology |
| **NMP** | N-methylpyrrolidone |
| **NPU** | Network Processing Unit |

## O

| | |
|---|---|
| **OECD** | Organization for Economic Cooperation and Development |
| **OECM** | Other Effective Conservation Measures |
| **OIP** | Open Innovation Platform® |

## P

| | |
|---|---|
| **PDCA** | Plan–Do–Check–Act |
| **PDK** | Process Design Kit |
| **PEMFC** | Proton Exchange Membrane Fuel Cell |
| **PFA** | Physical Failure Analysis |
| **PFASs** | Perfluoroalkyl Substances |
| **PFCs** | Perfluorinated Compound |
| **PFHxA** | Perfluorohexanoic acid |
| **PFOA** | Perfluorooctanoic acid |
| **PFOS** | Perfluorooctanesulfonic acid |
| **PIP** | Proprietary Information Protection |

## R

| | |
|---|---|
| **RBA** | Responsible Business Alliance |
| **REACH** | Registration, Evaluation, Authorization, and Restriction of Chemicals |
| **RECs** | Renewable Energy Certificates |
| **RFID** | Radio Frequency Identification |
| **RMI** | Responsible Minerals Initiative |
| **RO** | Reverse Osmosis |
| **RoHS** | Restriction of Hazardous Substances |

## S

| | |
|---|---|
| **SAQ** | Self-Assessment Questionnaire |
| **SASB** | Sustainability Accounting Standards Board |
| **SBTi** | Science Based Targets Initiative |
| **SCC** | Semiconductor Climate Consortium |
| **SCF** | Security Control Framework |
| **SDGs** | Sustainable Development Goals |
| **SEC** | U.S. Securities & Exchange Commission |
| **SEMI** | Semiconductor Equipment and Materials International |
| **SEMI S2** | SEMI S2 - Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment |
| **SIP** | System in a Package |
| **SoC** | System on a Chip |
| **SPC** | Statistical Process Control |
| **SPI** | Safety Performance Index |
| **SR** | Severity Rate |
| **SRC** | Semiconductor Research Corporation |
| **STCO** | System Technology Co-Optimization |
| **STIPT** | Semiconductor Talent Incubation Program Taiwan |
| **SVHC** | Substances of Very High Conern |
| **SWE** | Society of Women Engineering |

## T

| | |
|---|---|
| **TCFD** | Recommendations of the Task Force on Climate-related Financial Disclosures |
| **TCSA** | Taiwan Corporate Sustainability Awards |
| **TDDB** | Time Dependent Dielectric Breakdown |
| **TEJ** | Taiwan Economic Journal |
| **TEM** | Transmission Electron Microscope |
| **TIPS** | Taiwan Intellectual Property Management System |
| **TLVs** | Threshold Limit Values |
| **TMAH** | Tetramethyl Ammonium Hydroxide |
| **TNFD** | Taskforce on Nature-related Financial Disclosures |
| **TOSHMS** | Taiwan occupational safety and health management System |
| **TSIA** | Taiwan Semiconductor Industry Association |
| **TSR** | Total Shareholder Return |

## U

| | |
|---|---|
| **UCIe** | Universal Chiplet Interconnect Express |
| **UDHR** | Universal Declaration of Human Rights |
| **UNDP** | United Nations Development Programme |
| **UNGPs** | United Nations Guiding Principles on Business and Human Rights |
| **UWB** | Ultra-wideband |

## V

| | |
|---|---|
| **VAP** | Validated Assessment Program |
| **VBA** | Value Balancing Alliance |
| **VCA** | Value Chain Alliance |
| **VLSI** | Very-Large-Scale IC |
| **VR** | Virtual Reality |

## W

| | |
|---|---|
| **WBA** | World Benchmarking Alliance |
| **WEF** | World Economic Forum |
| **WiST** | The Society of Women in Science and Technology |
| **WLAN** | Wireless Local Area Networks |
| **WRI** | World Resources Institute |

## Z

| | |
|---|---|
| **ZTNA** | Zero Trust Network Access |

# Independent Third Party Assurance Statement

WHEN TRUST MATTERS



## Independent Limited Assurance Statement

Taiwan Semiconductor Manufacturing Company Ltd. ("TSMC" or 'the Company') commissioned DNV Business Assurance Co. Ltd. ("DNV") to undertake independent assurance of the 2024 Sustainability Report (the "Report") for the year ended 31 December 2024.

**Our Conclusion:** On the basis of the work undertaken, nothing came to our attention to suggest that the Report does not properly describe TSMC's adherence to the Principles described below. In our opinion, the Report provides sufficient information for readers to understand the Company's management approach to its most material issues and impacts.

### Scope and approach

Our assurance engagement was carried out during October 2024 to April 2025. We performed our work using DNV's assurance methodology VeriSustain™, which is based on our professional experience, international assurance best practice including International Standard on Assurance Engagements 3000 (ISAE 3000) and the Global Reporting Initiative (GRI) Sustainability Reporting Standards.

The Report is prepared in accordance with the reporting principles and requirements of the Global Reporting Initiative (GRI) Standards 2021. The Report also incorporated the relative sustainability reporting guidelines, such as Sustainability Accounting Standards Board (SASB) Semiconductors Sustainability Accounting Standard and Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

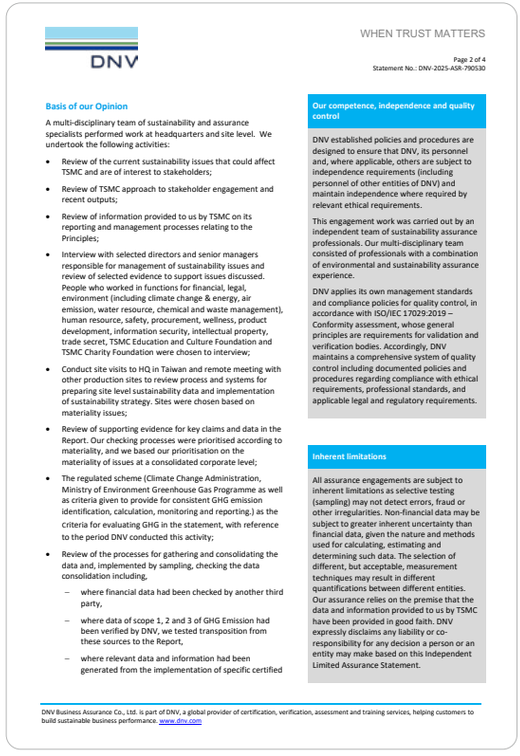
We evaluated the Report using the reliability principle together with TSMC data protocols for how the data are measured, recorded and reported. The reported data in scope was against TSMC's significant Environmental, Social and Governance (ESG) issues and the 2030 sustainability commitment and the topics set forth in the GRI standards.

We understand that the reported financial data and information are based on data from TSMC's Annual Report and Accounts, which are subject to a separate independent audit process. The review of financial data taken from the Annual Report and Accounts is not within the scope of our work.

GHG verification is excluded from the scope of work, since as GHG assurance had been done under the jurisdiction of an official mechanism governed by the Authority. In this assurance, DNV did not go through it again but only refer the statement of the verification (C736454-2024-AG-TWN-DNV, 13 May 2025 ), actually it released by DNV as an approved verification body, of that official mechanism.

We planned and performed our work to obtain the evidence we considered necessary to provide a basis for our assurance opinion. We are providing a 'moderate / limited level' of assurance. The procedures performed in a limited assurance engagement vary in nature and timing from, and are less detailed than, those undertaken during a reasonable assurance engagement, so the level of assurance obtained is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. We planned and performed our work to obtain the evidence we considered sufficient to provide a basis for our conclusion, so that the risk of this conclusion being in error is reduced, but not reduced completely.





WHEN TRUST MATTERS



### Basis of our Opinion

A multi-disciplinary team of sustainability and assurance specialists performed work at headquarters and site level. We undertook the following activities:

- Review of the current sustainability issues that could affect TSMC and are of interest to stakeholders;
- Review of TSMC approach to stakeholder engagement and recent outputs;
- Review of information provided to us by TSMC on its reporting and management processes relating to the Principles;
- Interview with selected directors and senior managers responsible for management of sustainability issues and review of selected evidence to support issues discussed. People who worked in functions for financial, legal, environment (including climate change & energy, air emission, water resource, chemical and waste management), human resource, safety, procurement, wellness, product development, information security, intellectual property, trade secret, TSMC Education and Culture Foundation and TSMC Charity Foundation were chosen to interview;
- Conduct site visits to HQ in Taiwan and remote meeting with other production sites to review process and systems for preparing site level sustainability data and implementation of sustainability strategy. Sites were chosen based on materiality issues;
- Review of supporting evidence for key claims and data in the Report. Our checking processes were prioritised according to materiality, and we based our prioritisation on the materiality of issues at a consolidated corporate level;
- The regulated scheme (Climate Change Administration, Ministry of Environment Greenhouse Gas Programme as well as criteria given to provide for consistent GHG emission identification, calculation, monitoring and reporting.) as the criteria for evaluating GHG in the statement, with reference to the period DNV conducted this activity;
- Review of the processes for gathering and consolidating the data and, implemented by sampling, checking the data consolidation including,
  - where financial data had been checked by another third party,
  - where data of scope 1, 2 and 3 of GHG Emission had been verified by DNV, we tested transposition from these sources to the Report,
  - where relevant data and information had been generated from the implementation of specific certified

### Our competence, independence and quality control

DNV established policies and procedures are designed to ensure that DNV, its personnel and, where applicable, others are subject to independence requirements (including personnel of other entities of DNV) and maintain independence where required by relevant ethical requirements.

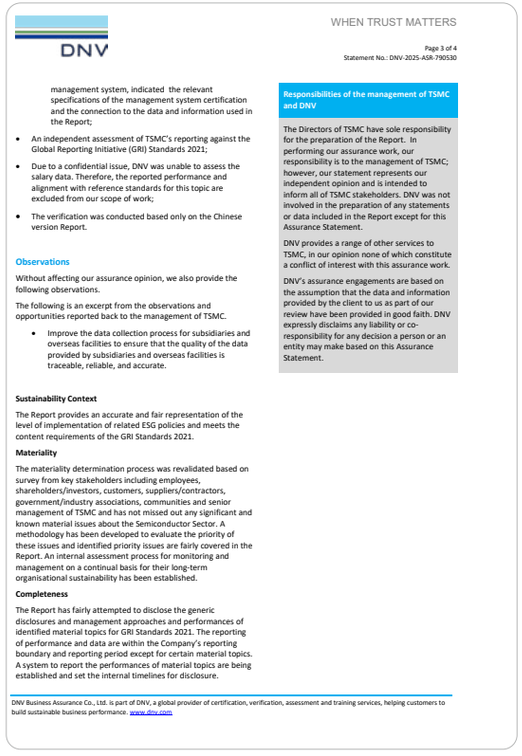
This engagement work was carried out by an independent team of sustainability assurance professionals. Our multi-disciplinary team consisted of professionals with a combination of environmental and sustainability assurance experience.

DNV applies its own management standards and compliance policies for quality control, in accordance with ISO/IEC 17029:2019 – Conformity assessment, whose general principles are requirements for validation and verification bodies. Accordingly, DNV maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

### Inherent limitations

All assurance engagements are subject to inherent limitations as selective testing (sampling) may not detect errors, fraud or other irregularities. Non-financial data may be subject to greater inherent uncertainty than financial data, given the nature and methods used for calculating, estimating and determining such data. The selection of different, but acceptable, measurement techniques may result in different quantifications between different entities. Our assurance relies on the premise that the data and information provided to us by TSMC have been provided in good faith. DNV expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Independent Limited Assurance Statement.





WHEN TRUST MATTERS



management system, indicated the relevant specifications of the management system certification and the connection to the data and information used in the Report;

- An independent assessment of TSMC's reporting against the Global Reporting Initiative (GRI) Standards 2021;
- Due to a confidential issue, DNV was unable to assess the salary data. Therefore, the reported performance and alignment with reference standards for this topic are excluded from our scope of work;
- The verification was conducted based only on the Chinese version Report.

### Observations

Without affecting our assurance opinion, we also provide the following observations.

The following is an excerpt from the observations and opportunities reported back to the management of TSMC.

- Improve the data collection process for subsidiaries and overseas facilities to ensure that the quality of the data provided by subsidiaries and overseas facilities is traceable, reliable, and accurate.

**Sustainability Context**

The Report provides an accurate and fair representation of the level of implementation of related ESG policies and meets the content requirements of the GRI Standards 2021.

**Materiality**

The materiality determination process was revalidated based on survey from key stakeholders including employees, shareholders/investors, customers, suppliers/contractors, government/industry associations, communities and senior management of TSMC and has not missed out any significant and known material issues about the Semiconductor Sector. A methodology has been developed to evaluate the priority of these issues and identified priority issues are fairly covered in the Report. An internal assessment process for monitoring and management on a continual basis for their long-term organisational sustainability has been established.

**Completeness**

The Report has fairly attempted to disclose the generic disclosures and management approaches and performances of identified material topics for GRI Standards 2021. The reporting of performance and data are within the Company's reporting boundary and reporting period except for certain material topics. A system to report the performances of material topics are being established and set the internal timelines for disclosure.

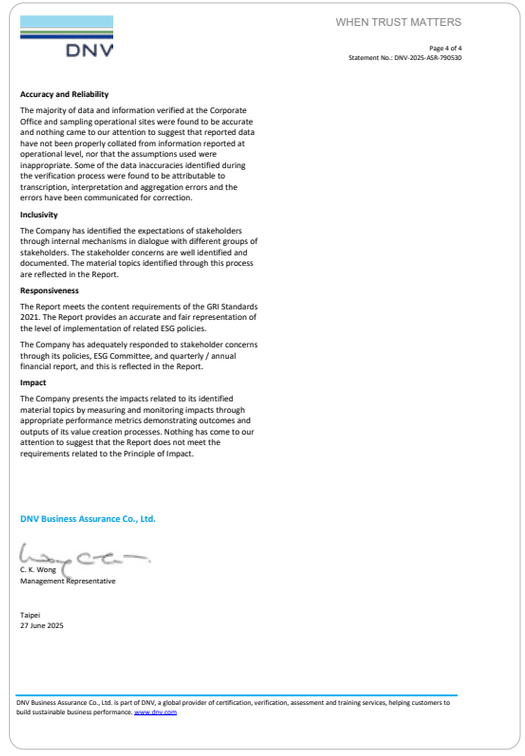
### Responsibilities of the management of TSMC and DNV

The Directors of TSMC have sole responsibility for the preparation of the Report. In performing our assurance work, our responsibility is to the management of TSMC; however, our statement represents our independent opinion and is intended to inform all of TSMC stakeholders. DNV was not involved in the preparation of any statements or data included in the Report except for this Assurance Statement.

DNV provides a range of other services to TSMC, in our opinion none of which constitute a conflict of interest with this assurance work.

DNV's assurance engagements are based on the assumption that the data and information provided by the client to us as part of our review have been provided in good faith. DNV expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Assurance Statement.





WHEN TRUST MATTERS



**Accuracy and Reliability**

The majority of data and information verified at the Corporate Office and sampling operational sites were found to be accurate and nothing came to our attention to suggest that reported data have not been properly collated from information reported at operational level, nor that the assumptions used were inappropriate. Some of the data inaccuracies identified during the verification process were found to be attributable to transcription, interpretation and aggregation errors and the errors have been communicated for correction.

**Inclusivity**

The Company has identified the expectations of stakeholders through internal mechanisms in dialogue with different groups of stakeholders. The stakeholder concerns are well identified and documented. The material topics identified through this process are reflected in the Report.

**Responsiveness**

The Report meets the content requirements of the GRI Standards 2021. The Report provides an accurate and fair representation of the level of implementation of related ESG policies.

The Company has adequately responded to stakeholder concerns through its policies, ESG Committee, and quarterly / annual financial report, and this is reflected in the Report.

**Impact**

The Company presents the impacts related to its identified material topics by measuring and monitoring impacts through appropriate performance metrics demonstrating outcomes and outputs of its value creation processes. Nothing has come to our attention to suggest that the Report does not meet the requirements related to the Principle of Impact.

**DNV Business Assurance Co., Ltd.**

C. K. Wong
Management Representative

Taipei
27 June 2025

# Contact Information

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