2024 TSMC

UN SDGs Action Report

UN SDGs Action Report

Letter from the ESG Committee Chairperson

In today's evolving global landscape, persistent challenges such as the long-term effects of the COVID-19 pandemic, escalating geopolitical tensions, and worsening climate-related disasters have rendered "uncertainty" a defining characteristic of sustainable development. According to the Sustainable Development Solutions Network (SDSN) 2024 Sustainable Development Report, only 16% of the Sustainable Development Goals (SDGs) are currently on track. Nearly half are progressing slowly or moderately, while more than one-third have either stalled or regressed. These alarming trends underscore the urgent need for enhanced dialogue and collaboration among governments, businesses, and civil society to drive meaningful progress toward global stability and shared prosperity.

At TSMC, we believe that establishing long-term objectives aligned with the SDGs is essential to addressing these global challenges. Under the guidance of our ESG Steering Committee and ESG Committee, we have adopted the "collective intelligence" framework introduced by the UNDP Accelerator Labs. Through our long-term commitments to 62 sustainability goals and 22 sustainable actions, we are integrating three key drivers—technology, people, and data—to deliver innovative ESG solutions. By harnessing stakeholder insights and fostering collaborative partnerships, we aim to promote inclusive and measurable progress across the SDGs. Additionally, we are leveraging digital tools and integrated data systems to enhance our information infrastructure, enabling agile, data-driven decision-making to improve the effectiveness of our sustainability initiatives.

TSMC is dedicated to creating a future where technology and sustainability coexist harmoniously. Each year, we evaluate our progress and refine our SDG strategies to ensure they remain practical and forward-looking. In 2024, we joined forces with industry, government, academia, and research institutions to launch the "Eco Plus! Ecological Harmony Program." Inspired by the belief that "We have only one Earth," we are committed to mobilizing collective wisdom and driving innovation forward. By intensifying our efforts and delivering on our initiatives, we strive to accelerate the achievement of the SDGs and contribute to a better, more sustainable world.

Lora Ho

TSMC Senior Vice President and
ESG Committee Chairperson

UN SDGs and Disclosure Trends

The 2024 Sustainable Development Report (SDR) published by the UN Sustainable Development Solutions Network (SDSN) highlights the challenges posed by the ongoing impacts of the COVID-19 pandemic, geopolitical tensions, and climate change. According to the report, only 16% of the Sustainable Development Goals (SDGs) are on track to be achieved by 2030. Meanwhile, more than one-third of the goals have either stalled or regressed, highlighting the urgent need for governments, businesses, and society to quickly realize achievements and work collectively to drive transformative progress worldwide.

As a dedicated global semiconductor foundry, TSMC upholds the SDG principle of "leaving no one behind" and stays attuned to sustainability developments while navigating the complexities of globalization and an evolving international landscape. By doing so, the Company ensures its sustainability objectives effectively address current challenges and empower the implementation of sustainable goals.

TSMC's Commitment to Sustainability

TSMC implements its ESG Policy by embracing the ESG mission of "Acting with Integrity, Strengthening Environmental Protection, and Caring for the Underprivileged." The Company incorporates five ESG directions into its core operations: Driving Green Manufacturing, Building a Responsible Supply Chain, Creating a Diverse and Inclusive Workplace, Developing Talent, and Caring for the Underprivileged. TSMC also adopts the guidelines outlined in "Integrating the Sustainable Development Goals into Corporate Reporting: A Practical Guide," jointly issued by the Global Reporting Initiative (GRI) and the United Nations Global Compact, to identify SDGs relevant to its operations. As a result, TSMC prioritizes nine specific SDGs: 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).

In line with its dedication to corporate citizenship, TSMC collaborates with stakeholders—including employees, shareholders/investors, customers, suppliers/contractors, government/industry associations, and local communities. The Company initiated numerous sustainability initiatives and regularly reports its key achievements and impacts in its UN SDGs Action Report.

Disclosure Framework and Principles

Referring to the ISO/UNDP PAS 53002:2024 framework—jointly issued by the International Organization for Standardization (ISO) and the United Nations Development Programme (UNDP), in 2024, TSMC assessed the alignment of its strategies surrounding material issues and objectives with the SDGs. The framework also facilitated enhanced stakeholder engagement and collaboration, enabling the Company to mitigate risks and establish a resilient model for sustainable operations. TSMC adopted the SDG disclosure trend indicators developed by the organization Support the Goals, systematically presenting the concrete outcomes of its SDG efforts across five key dimensions: Plans, Commitments, Actions, Progress, and Collaboration, thereby enhancing the quality and transparency of its UN SDGs Action Report.

Within the "Initiative and Impact" section, TSMC employs the Impact Measurement and Valuation (IMV) framework to quantify its contributions to and impacts on the environment, society, and economy by taking a monetization approach. The Company also references the Business for Societal Impact (B4SI) framework to evaluate the tangible impact of its sustainability initiatives across three areas: "behavioral or attitudinal change, quality of life or well-being, and skills or job performance." These methodologies ensure that TSMC's actions effectively support the SDGs.

Vision	Uplift Society
Missions	Acting with Integrity; Strengthening Environmental Protection; Caring for the Underprivileged
Roles	An Innovation Pioneer; A Responsible Purchaser; A Practitioner of Green Power; An Admired Employer; Power to Change Society
Stakeholders	Employees; Shareholders/Investors; Customers; Suppliers/Contractors; Government/Industry Associations; Communities
SDGs	3 GOOD HEALTH AND WELL-BEING; 4 QUALITY EDUCATION; 6 CLEAN WATER AND SANITATION; 7 AFFORDABLE AND CLEAN ENERGY; 8 DECENT WORK AND ECONOMIC GROWTH; 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 13 CLIMATE ACTION; 17 PARTNERSHIPS FOR THE GOALS

Five Disclosure Categories

1 Plans	2 Commitments	3 Actions	4 Progress	5 Cooperation
Clearly explain the SDGs supported	Set measurable targets	Proof of actions taken in support of the SDGs	Provide open data to explain the progress of the measurable targets	Encourage stakeholders to support the SDGs

TSMC's Commitment and Progress

TSMC adopts the United Nations Sustainable Development Goals (SDGs) as the foundation for its policies and strategies. Through its ESG Committee, the Company fosters cross-organizational collaboration by convening quarterly meetings with representatives from various departments to review material issues related to business operations and establish long-term target goals for 2030. The ESG Committee is responsible for allocating the relevant budget and dedicating resources to ensure the effective implementation of corresponding actions. TSMC implemented a three-tier performance evaluation system—categorized as red, amber, and green—to regularly monitor progress and outcomes. The Company adjusts the relevance and scopes of its objectives, adding or removing items as needed to maximize its positive impact and generate lasting sustainable value.

In 2024, TSMC committed to 62 long-term goals aligned with the SDGs, including seven newly established objectives. These include requiring Tier 1 suppliers to improve human rights rating on the SAQ, promoting major raw material suppliers to obtain ISO 9001 certification, increasing local sourcing for indirect raw materials by overseas subsidiaries, providing consultation on waste reduction for suppliers, improving the global water positive achievement rate, requiring Tier 1 suppliers to establish phase-out plans for regulated materials, and reduce outsourced waste amount per wafer production in overseas subsidiaries. Compared to 2023, 82% of the goals (45 items) demonstrated ongoing progress and achieved their annual targets, earning a green rating indicative of a positive trend. Conversely, 18% of the goals (10 items) reflected a negative trend. These three goals— employee health and stress management, hours of educational volunteering, and reduce CO_2 emissions from waste treatment—performed below the previous year's levels however still exceeded their respective annual targets and were therefore classified with a yellow rating. Additionally, goals such as unit water consumption, energy efficiency of volume production for each process technology, representation of women in management, and unit greenhouse gas (GHG) emissions did not reach the annual benchmarks; however, their performance improved year-on-year and were also categorized as amber. On the other hand, three goals—investing revenue into R&D expenses, increasing the in-house resource recycling rate, and reducing unit air pollutant emissions— received a red rating, as their performance declined compared to the prior year and fell short of the annual defined targets. Following the evaluation, the ESG Committee has tasked the responsible departments with conducting a comprehensive analysis of the current landscape. This includes identifying the reasons for underperformance, planning resource allocation, and implementing appropriate sustainability actions to ensure future achievement of the defined goals.

TSMC remains dedicated to advancing sustainable development. In addition to optimizing its internal operations, the Company collaborates with value chain partners to drive sustainable transformation. Through close engagement with stakeholders, TSMC continually explores innovative solutions to expand its contributions to society and foster greater positive value. For further details on its sustainability initiatives and outcomes, please refer to the TSMC 2024 Sustainability Report and the TSMC ESG website.

Number of Goals 45 — **82%**

Green Rating

- Performance is superior (equal) to the previous year and meets the annual target.

Number of Goals 7 — **13%**

Amber Rating

- Performance is lower than the previous year but meets the annual target.
- Performance is better than the previous year but falls short of the annual target.

Number of Goals 3 — **5%**

Red Rating

- Performance is lower than the previous year and does not meet the annual target.

Carry Out the UN Sustainable Development Goals

SDGs **9**

Sustainable Actions **22**

2030 Sustainability Goals **62**

SDG 3
Good Health and Well-being

Improve Medical Care to Seniors Living Alone

- Serve seniors living alone 80,000 times every year via the Network of Compassion

Implement Comprehensive Health Management

- Employees with abnormal blood lipids,blood pressure, and blood sugar: ≤ 11%, 13.5%, and 2.5%
- Employees with reported high-stress levels: <9%

SDG 4
Quality Education

Empower Youth and Talent through Education

- Invest NT$80 million or more into quality educational resources
- Cultivate more than 35,000 undergraduate and graduate students globally through university programs that deepen industry-academia collaboration between 2021 and 2030
- Introduces STEM workshop for female high school students with over 3,000 participated

Care for Children in Remote Areas

- 20,000+ hours of educational volunteer every year
- Benefit 50,000+ children in rural areas

SDG 6
Clean Water and Sanitation

Improve Water Efficiency

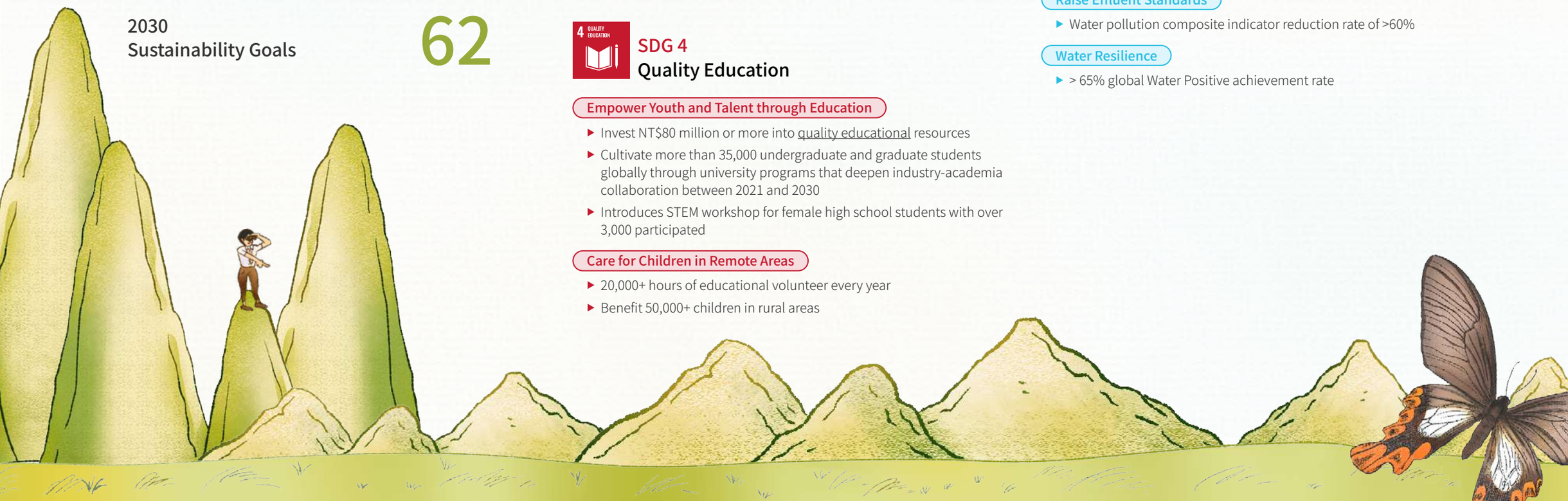
- Reduce unit water consumption by 30%
  (L/12-inch equivalent wafer mask layers)
  (Base year: 2010)
- Provide consultation on water reduction for suppliers and reduce water consumption by a cumulative total of 150 million metric tons
  (Base year: 2020)
- >60% replacement of water resources with reclaimed wate

Raise Effluent Standards

- Water pollution composite indicator reduction rate of >60%

Water Resilience

- > 65% global Water Positive achievement rate



SDG 7
Affordable and Clean Energy

Manufacture with Greater Energy Efficiency

- Double energy efficiency after five years of volume production for each process technology
- Cumulative energy-saving rate reached 18% between 2016 and 2030 through new energy-saving measures

Work with Suppliers Toward Energy Conservation

- Provide consultation on power reduction for suppliers and reduce energy consumption by a total of 1,500 GWh
  (Base year: 2018)

Use Renewable Energy

- 60% of the electricity consumption at all company operational sites comes from renewable energy

SDG 9
Industry, Innovation and Infrastructure

Encourage Innovation

- Maintain TSMC's technology leadership and invest 7~9% of revenue into R&D expenses annually
- Over 100,000 global patent applications
- Over 1,000,000 trade secret registrations
- Provide >1,200 wafer manufacturing and process technologies and >170 advanced packaging technologies in line with the TSMC technology roadmap

SDG 8
Decent Work and Economic Growth

Offer Competitive Compensation

- Maintain position above 75th percentile among industry peers in total compensation

Strengthen Industry Sustainability

- Ensure 100% of Tier 1 suppliers complete the Self-Assessment Questionnaire
- Ensure 100% critical suppliers receive Code of Conduct audits by RBA-certified agencies every year
- Audit a cumulative total of 30 suppliers (≥3 suppliers per year) for due diligence on responsible mineral sourcing
- Ensure 980 sessions of S.H.A.R.P. audits toward critical high-risk suppliers at a pace of 120 sessions a year
- Women in management: ≥18%
- Supplier due diligence on responsible mineral sourcing: 100% of the minerals used are sourced responsibly
- Ensure 100% of Tier 1 suppliers stipulate inclusive workplace related policy or statement
- Achieve an average human rights rating of Grade B on the SAQ for tier 1 suppliers

Promote Workplace Safety

- Disabling Injury Frequency Rate (FR): <0.3
- Disabling Severity Rate (SR): < 3
- Incident Rate per 1,000 Employees: <0.20
- All waste treatment vendors shall acquire ISO 14001 or other international EHS Management certification
- Ensure 100% critical high-risk suppliers complete Safety and Health consultation
- Assist all high-risk contractors to obtain ISO 45001 certification for occupational safety and health management system
- Ensure a cumulative total of 1,500 suppliers participate in the EHS training programs
  (Base year: 2016)

Support Local Suppliers

- Ensure a cumulative total of 145 local raw materials suppliers receive consultation on process advancement and quality improvement
  (Base year: 2016)
- 100% of major raw material suppliers obtain ISO 9001 certification
- Increase global local sourcing: 67.5% for indirect raw materials
- Increase overseas subsidiaries local sourcing: 52.5% for indirect raw materials

SDG 12
Responsible Consumption & Production

Reduce Industrial Waste Output

- Outsourced waste amount per wafer production in Taiwan: ≦ 0.50 (kg/12-inch equivalent wafer mask layer)
- Outsourced waste amount per wafer production in overseas subsidiaries: ≦ 1.10 (kg/12-inch equivalent wafer mask layer)

Carry Out Circular Economy

- 70% In-house recycling rate
- Reduce waste production among local major suppliers by 42% (Base year: 2014)
- 100% Waste recycle rate
- Provide consultation on waste reduction for suppliers and achieve an average waste recycling rate of 86%

Implement Chemicals Management

- Require tier 1 suppliers to establish phase-out plans for regulated materials, with a 100% completion rate
- Develop the capability to analyze 100% of carcinogenic, mutagenic, and reprotoxic (CMR) substances and help suppliers supplying materials with potential risks develop the same capabilities
- Replace 100% of N-methylpyrrolidone (NMP) used in etching processes (Base year: 2016)
- No processes involving perfluoroalkyl substances (PFASs) that have more than four carbons
- 0 case of occupational disorders caused by exposure to chemicals

SDG 13
Climate Action

Implement Chemicals Management

- Reduce the unit air pollutant emissions by 65% (Base year: 2015)
- Reduction rate of volatile organic gases: >99%

Implement Adaptation Strategies to Climate Risks

- Reduce unit GHG emissions by 30% compared to the base year (metric ton of carbon dioxide equivalent ($MTCO_2e$)/12-inch equivalent wafer mask layer) by 30%, and restore GHG emissions to the 2020 level (Base year: 2020)
- Ensure 100% of high energy consumption suppliers receive ISO 14064 Greenhouse Gas Emissions verification
- 0 day of production interruption due to climate disasters
- Reduce CO_2 emissions from waste treatment to 2020 emission levels
- Reduce supplier carbon emissions by 30% (Comparing result from the Business as Usual situation)

Strengthen Supply Chain Climate Resilience

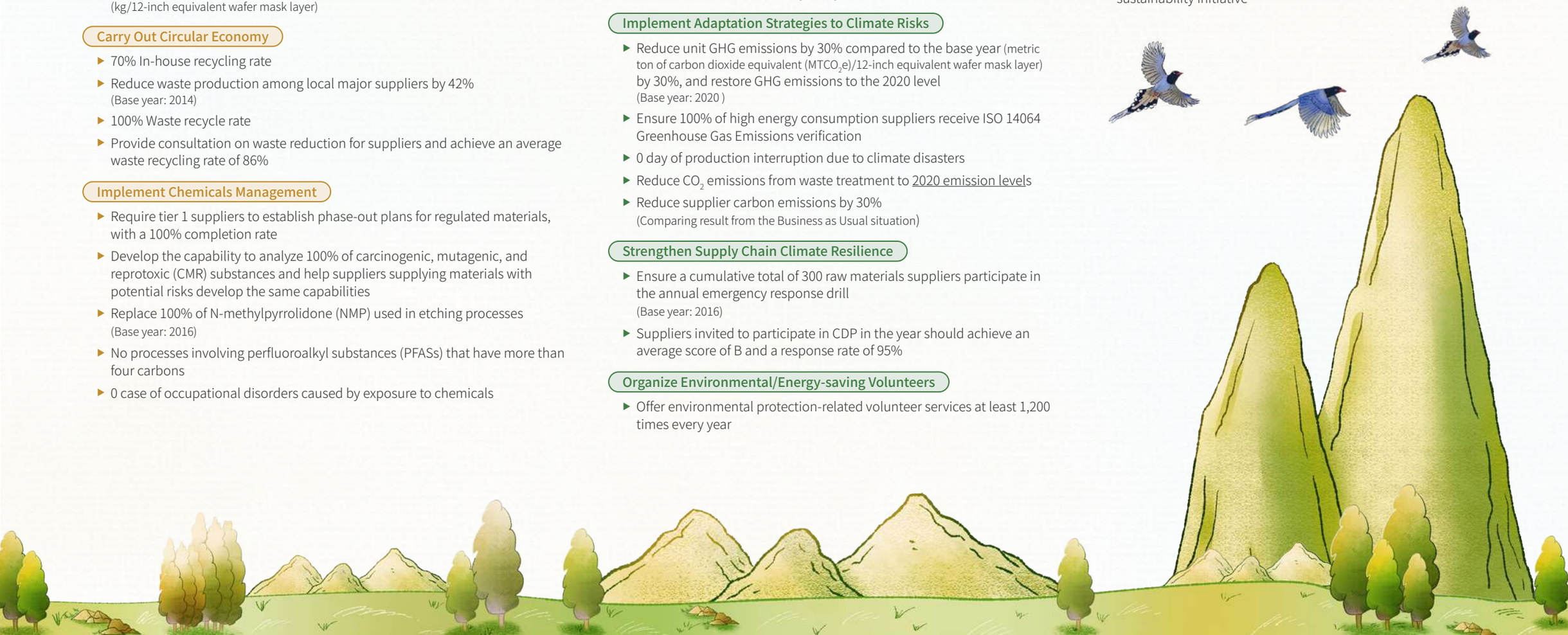
- Ensure a cumulative total of 300 raw materials suppliers participate in the annual emergency response drill (Base year: 2016)
- Suppliers invited to participate in CDP in the year should achieve an average score of B and a response rate of 95%

Organize Environmental/Energy-saving Volunteers

- Offer environmental protection-related volunteer services at least 1,200 times every year

SDG 17
Partnership for The Goals

- TSMC joins hands with stakeholders including employees, shareholders/investors, customers, suppliers/contractors, government/industry associations, and communities through a range of sustainability initiative



SDG 3

Good Health and Well-being

Plans

Ensure healthy lives and promote well-being for all ages to support SDG 3

3.4

By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being

3.d

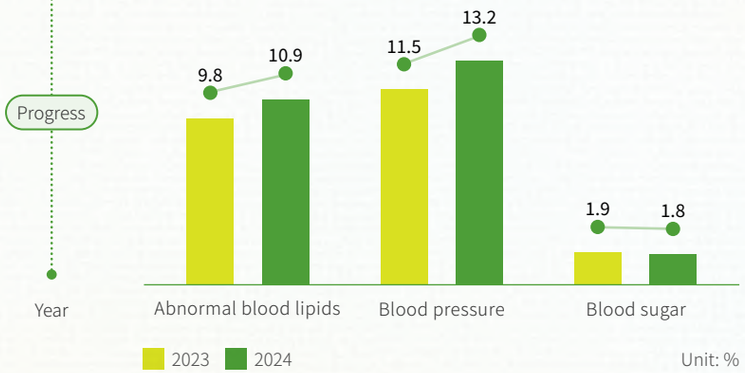
Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

Commitments and Progress

Abnormal blood lipids, blood pressure, and blood sugar

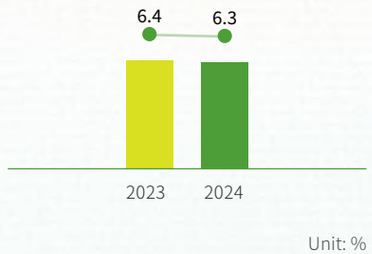
2030 <11% <13.5% <2.5%

Progress



Employees with reported high-stress level

<9%



Actions

- Improve medical care to seniors living alone
- Implement comprehensive health management

Collaborations

- Implement occupational disease prevention and enhance physical and mental balance to help improve employee health and well-being

Caring for Employees' Mental Health with a Three-Stage Preventive and Caring Model

TSMC hosts various topics of educational seminars to help employees strengthen their mental resilience and stress management skills.

TSMC is committed to comprehensive health management and improving quality of care for employees' physical and mental health. In addition to offering employee health check-ups for early disease detection, the Company has also launched a global inclusivity campaign aiming to enhance employees' sense of mental wellness. To support employees' mental health, TSMC employs a "Three-stage Preventive and Care Model," offering tailored support to help them navigate challenges in life and work. Employees took advantage of this initiative more than 1,000 times last year. Additionally, TSMC enhanced its Employee Assistance Program (EAP) by expanding the number of counseling service providers from two to five, while offering greater flexibility in scheduling by adding nighttime and holiday appointments. By broadening the scope of psychological services, the Company aims to improve employees' physical and mental well-being, while creating a supportive and inclusive workplace.

→ Read more

A First: Global Flexible Benefit Plan Includes Pet Care Coverage

TSMC is dedicated to providing competitive compensation, benefits that exceed legal requirements, and a safe, healthy work environment. To further support employees' personal lives and family care, the Company launched the"TSMC Global Flexible Benefit Plan" (tFlex) in 2024, building on its existing benefits system. The tFlex plan is structured into four key categories: medical and insurance, family care, wellness, and development and volunteering. Under this plan, each full-time employee worldwide receives flexible benefit points equivalent to US$250 annually (NT$8,000 for employees in Taiwan). Employees can independently choose and redeem benefits that best align with their lifestyle and needs. As of January 10, 2025, approximately 113,000 tFlex applications were received, totaling around NT$6 billion. More than half of these applications were related to family care, followed by medical and insurance benefits, demonstrating an enhanced employee benefit experience.

TSMC's "Global Flexible Benefit Plan" includes pet care in its benefits offerings for the first time.

→ Read more

First "Environmental Protection, Safety, and Health Month" Attracts Over 3,300 Participants

TSMC launches "environmental protection, safety and health" month to promote the awareness among colleagues with diverse activities.

To drive advancements in environmental, safety, and health (ESH) technical management within the supply chain, TSMC hosted its first ESH technical forum in 2024, focusing on three main themes: safety and health, fire safety and emergency response, and facility and carbon management. The forum featured topics that included heat hazard prevention, lithium battery safety, and carbon capture technology as part of its curriculum. By bringing together experts from industry, government, and academia to share their insights, TSMC aims to enhance suppliers' ESH capabilities and strengthen their ability to prevent and mitigate associated losses. The forum attracted 199 participants from 175 tier one suppliers across various sectors, including gas, chemicals, wafers, components, and parts cleaning.

→ Read more

SDG 4

Quality Education

Plans

Ensure inclusive and equitable quality education and promote lifelong learning opportunities to support SDG 4

4.4

By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

4.7

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

Commitments and Progress

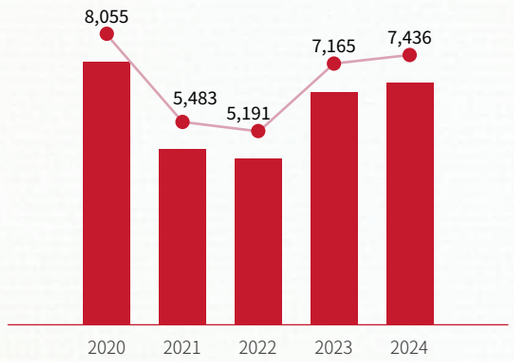
Annual investment in quality education resources

2030

Progress

Year

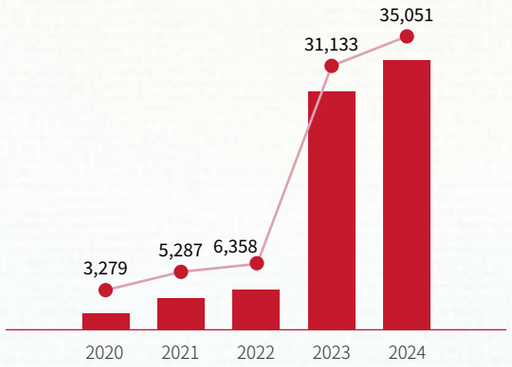
8,000 Million



Unit: NT$/million

Number of children beneficiaries in remote areas

50,000 People



Unit: People

Actions

- Empower youth and talent through education
- Care for children in remote areas

Collaborations

- TSMC work with employees, suppliers, the industry, social welfare groups, schools, and the government to invest in collaboration and initiatives spotlighting quality education

Little Baseball Hero Support Program: Empowering Children to Foster a Future of Inclusivity

TSMC Little Baseball Hero Support Program supports the TABDA in cultivating second talents for young baseball players and plans a photography experience course.

TSMC is dedicated to supporting youth education and talent development. Since 2020, TSMC has partnered with the Taiwan Aboriginal Baseball Development Association (TABDA) and the Taiwan Basegarden Baseball Development Association (TBBDA) to launch the TSMC Little Baseball Hero Support Program. The three-year initiative aims at fostering educational opportunities and skills development for rural children who play baseball, while also enhancing the professional training of coaches. In 2023, TSMC launched an internal monthly donation program to encourage employees to support like programs, enhancing the impact of resource investment. By 2024, the Baseball Friendly Classroom initiative had benefited 1,245 players from 68 schools, providing reading and learning services to 33 schools and donating over 3,600 books. These efforts provide children with the opportunity to transform their lives, promising a hopeful future.

→ Read more

"Internal Trainer Program" Nurtures Outstanding Talent

Talent is TSMC's most valuable asset, and the Company continues to share professional knowledge and experience through its internal trainer system. Each year, TSMC hosts the "TSMC Excellent Trainer Award" to recognize trainers with outstanding teaching performance. In 2024, more than 4,000 internal trainers collectively trained over 460,000 participants. To further enhance teaching effectiveness, TSMC launched the new "Internal Trainer Program," which equips trainers with tools to convey knowledge more effectively, guide participants efficiently, and optimize course content. These efforts aim to improve learning outcomes across the organization. As of 2024, 1,303 participants have joined the training program, becoming key drivers in nurturing talent within the Company.

TSMC hosts the "TSMC Excellent Trainer Award" to recognize the dedication and contributions of internal trainers in talent development.

→ Read more

"DNA Summer Internship Program" Lays the Foundation for Future Talent Competitiveness

The 6th DNA Summer Internship Program introduces Taiwan culture experience activities to promote cross-cultural integration.

TSMC hosts the "DNA Summer Internship Program" to cultivate semiconductor industry talent and attract outstanding students. The program offers diverse learning and growth opportunities for university juniors and above. Entering its sixth year in 2024, the program has recruited 813 interns, setting new records year over year. Over the past six years, 3,100 interns have participated and successfully completed the DNA internship. In line with TSMC's global expansion strategy, the 2024 program introduced two new activities: "Cross-Cultural Exchange Competition" and "Taiwan Cultural Experience." These activities encourage collaboration between domestic and international interns, foster a deeper understanding of TSMC and Taiwanese culture, while promoting inclusion and self-realization.

→ Read more

SDG 6

Clean Water and Sanitation

Plans

Ensure the availability and sustainable management of water and sanitation for all to support SDG 6

6.3

By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

6.4

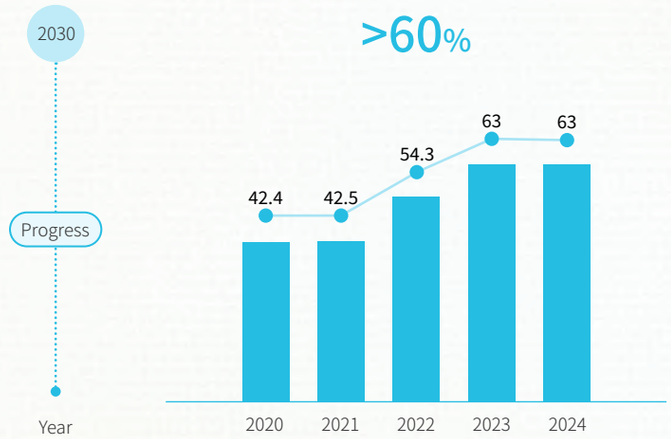
By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

6.5

By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

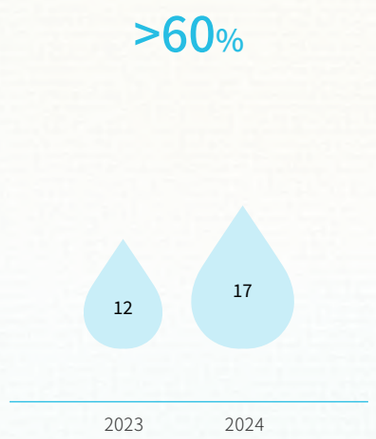
Commitments and Progress

Water pollution composite indicator reduction rate



Unit: %

Replacement of water resources with reclaimed water



Unit: %

Actions

- Improve water efficiency
- Raise effluent standards
- Water resilience

Collaborations

- Participate in global initiatives and collaborate with the government, employees, and suppliers to improve water quality and generate a net positive change in water resources

Introduce Reclaimed Water into Advanced Processes

TSMC introduces reclaimed water into fabs with 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. Following a two-year validation process, in 2024, TSMC successfully introduced reclaimed water into the most advanced semiconductor manufacturing processes. This complex and time-consuming procedure demonstrates TSMC's commitment to quality, 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.

→ Read more

Optimization of NH4-N Wastewater Treatment to Reduce Electrical Conductivity

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.

→ Read more

JASM Water Conservation Engineering, Restored Groundwater of Approximately 5,000,000 m³

Conservation pond of the water conservation engineering at JASM.

The basic concept of Water Positive is to generate a water volume through restoration that is more than water consumed. TSMC actively seeks innovative ways to utilize technology for the restoration of water resources. In Japan's Kumamoto region, known for its plentiful groundwater, TSMC has launched several water conservation engineering initiatives. By installing conservation pods and a rainwater reclamation system, rainwater seeps into the groundwater level for conservation. Meanwhile, in response to the winter fallow of farms, the Company worked with private groups to introduce river water from the midstream of Shirakawa River in Kumamoto into idle farms to restore groundwater. In 2024, TSMC conserved and restored approximately 5,000,000 m3 of groundwater, which is three times the water usage of JASM, implementing the sustainable circulation of water resources.

→ Read more

SDG 7

Affordable and Clean Energy

Plans

Ensure access to affordable, reliable, sustainable and modern energy for all in response to SDG 7

7.3

By 2030, double the global rate of improvement in energy efficiency

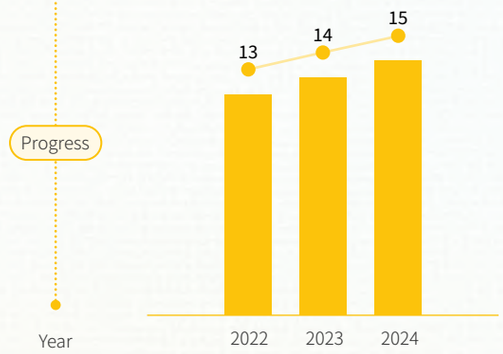
7.a

By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology

Commitments and Progress

Cumulative energy-saving rate from energy-saving measures

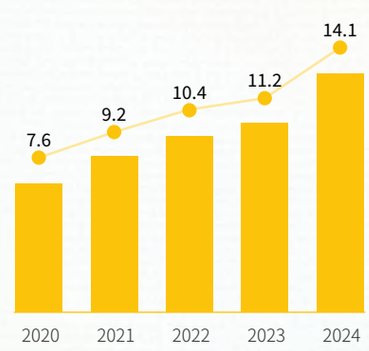
2030 target: 18%



Unit: %

Ratio of renewable energy in production and operation sites

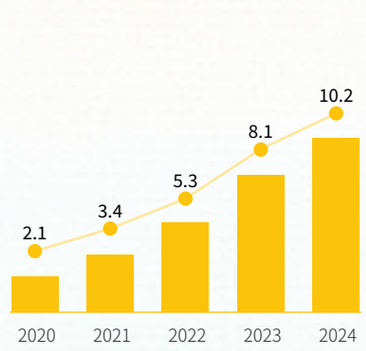
2030 target: 60%



Unit: %

Provide consultation on power reduction for suppliers and reduce energy consumption

2030 target: 1,500GWh



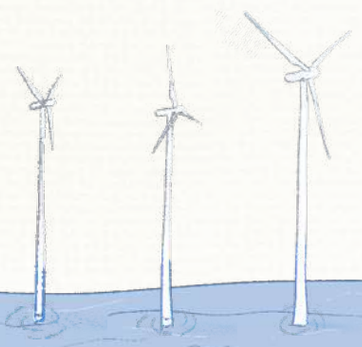
Unit: GWh

Actions

- Manufacture with greater energy efficiency
- Use renewable energy
- Work with suppliers on energy conservation

Collaborations

- Collaborate with suppliers and customers to increase process energy efficiency while also providing energy-efficient, high-performance technologies to help customers achieve product success



Innovating "Real-Time Air Pollution Monitoring System" with One-Minute Rapid Detection

TSMC's real-time air pollution monitoring system enhances detection efficiency.

TSMC upholds its Environmental Policy, striving to achieve zero adverse environmental impact while enhancing air pollution control efficiency in its treatment facilities. Through innovative research, the Company has developed an online real-time air pollution sensing instrument that detects the physical signals of gases using a specialized electrode structure. This system can simultaneously monitor five gases—ammonia, hydrogen fluoride, hydrogen chloride, sulfuric acid, and nitric acid—and significantly reduces data acquisition time from one week to just one minute. The rapid detection capability allows for real-time monitoring and swift responses to abnormal pollution sources. As of 2024, this system has been successfully implemented at Fab 2 & Fab 5, Fab 6, Fab 14, Fab 15A, Fab 18A, Fab 18B and Fab 20, enhancing air pollution prevention and environmental protection.

→ Read more

Introducing High-Efficient Transformers, Saving 85 Million kWh of Electricity

TSMC proactively implements energy-saving measures to strengthen its operational resilience. Collaborating with suppliers, TSMC upgraded the power transformers in its facilities to ensure a stable power supply while enhancing operating efficiency from 98.3% to 99%. As of 2024, TSMC has introduced 2,435 high-efficiency transformers across 12 advanced process fabs and one advanced packaging fab. These upgrades have saved 85 million kWh of electricity and reduced carbon emissions by 40,199 metric tons. Through these efforts, TSMC continues to uphold sustainable values and advance green manufacturing practices.

TSMC collaborates with suppliers to improve operational efficiency of power transformers.

→ Read more

Implementing Dual Initiatives Empowering Suppliers for Sustainable Operations

TSMC assists suppliers in enhancing plant operations and management efficiency.

TSMC is committed to building a resilient supply chain as the cornerstone of its sustainable supply chain management. To ensure suppliers' facilities and production lines meet TSMC's stringent standards while enhancing their self-management and improvement capabilities, TSMC simultaneously launched two key initiatives: the Maintain the Old as the New project and the New Factory Construction Plan. These initiatives focus on three key aspects—Facility Renovation, Maintenance and Repair process, and Equipment Replacement—specifically targeting local suppliers' operational sites. By doing so, TSMC helps suppliers establish robust procedural management mechanisms that enhance their ability to adapt to anomalies. TSMC also guides suppliers in incorporating essential standards and management practices across six key areas—Business Continuity Plan, Production Line, Quality, Environmental Safety and Health, Fire Control, and Green Supply Chain—into their new plant designs. As of 2024, the project has successfully reduced production line anomalies, achieving an 84% reduction, saving 1.155 million kWh of electricity annually, and reducing carbon emissions by 572 metric tons. These efforts promote both facility upgrade and energy efficiency among TSMC's suppliers.

→ Read more

SDG 8

Decent Work and Economic Growth

Plans

Promote inclusive and sustainable economic growth and decent work for all to support SDG 8

8.3

Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services

8.5

By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value

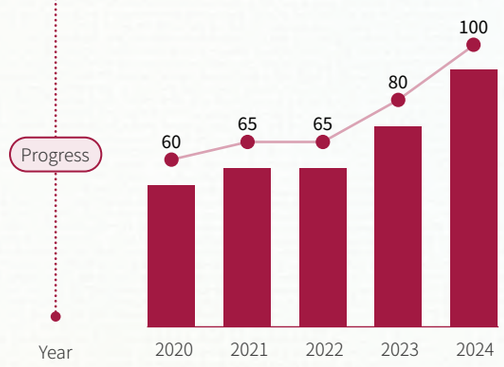
8.8

Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment

Commitments and Progress

ISO 45001 Ensure local raw materials suppliers receive consultation on process advancement and quality improvement

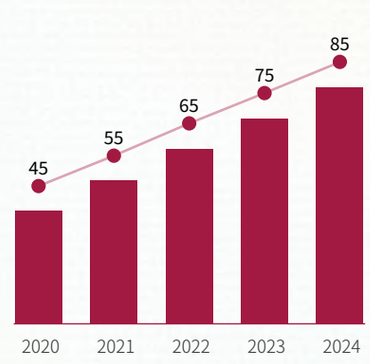
2030: 100%



Unit: %

Ensure local raw materials suppliers receive consultation on process advancement and quality improvement

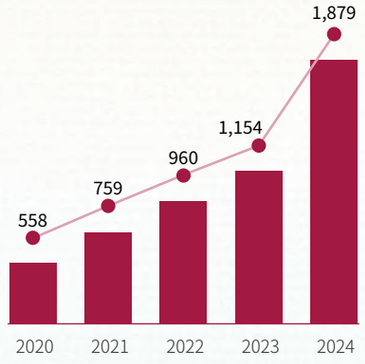
2030: 145



Unit: Cumulative total

Ensure suppliers participate in the EHS training programs

2030: 1,500



Unit: Cumulative total

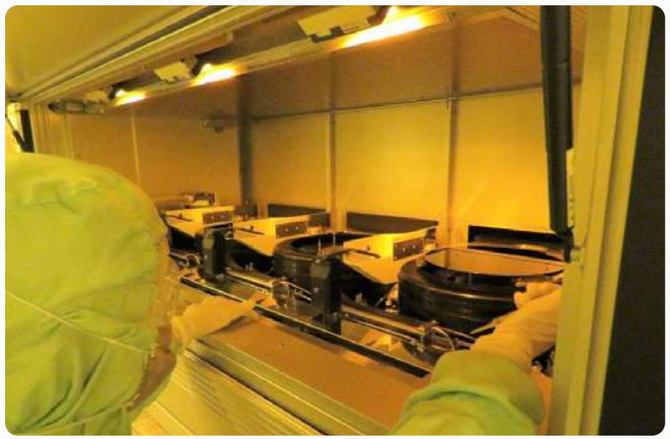
Actions

- Offer competitive compensation
- Strengthen industry sustainability
- Promote workplace safety
- Support local suppliers

Collaborations

- Collaborate with suppliers and contractors to guarantee the human rights of all workers and create a safe and healthy workplace

Introducing Next-Generation Low Temperature Polyimide, Elevating Environmental Sustainability in Materials Innovation



TSMC collaborates with supplier to verify of coating with Next-generation Low Temperature Polyimide formula in lithography process.

Strengthening green chemical management is a key strategy for TSMC to ensure product quality while advancing its sustainability goals. TSMC has eliminated the use of noxious, environmentally hazardous chemicals such as N-Methyl-2-Pyrrolidone (NMP) and Perfluoroalkyl Substances (PFAS) and is further expanding this approach to include production of raw materials within its supply chain. By moving away from NMP and PFAS, TSMC successfully encouraged suppliers to innovate and develop the next generation of Low Temperature Polyimide. This material meets stringent manufacturing process requirements for high hardness, high strength, and chemical resistance. As of 2024, this new-generation material has been integrated into TSMC's 5nm, 3nm, and 2nm advanced processes, with plans for trial production in the second half of 2024, achieving benefits for both environmental sustainability and product quality.

→ Read more

Hosting First "Supply Chain ESH Technical Forum," Ensuring Sustainable Management Remaining Up to Date

In response to climate change and emerging technology trends, and to drive advancements in Environmental, Safety, and Health (ESH) technical management within the supply chain, TSMC held its first ESH Technical Forum in 2024. The forum centered on three main themes: Safety and Health, Fire Safety and Emergency Response, and Facility and Carbon Management. The forum curriculum included topics such as heat hazard prevention, lithium battery safety, and carbon capture technology, providing comprehensive lessons to enhance suppliers' ESH capabilities. By inviting experts from industry, government, and academia to share their experiences, TSMC strengthened suppliers' ability to prevent and mitigate losses effectively. In addition, through the analysis of real-world circular economy cases, TSMC assists suppliers in developing a variety of carbon reduction initiatives, enhancing their green ESH management capabilities. 199 participants from 175 Tier One suppliers attended the forum, making significant progress in sustainable development.

TSMC regularly conducts audits and provides guidance at supplier facilities, and organizes the ESH technical forum to enhance their management capabilities.

→ Read more

Launching the "Supplier Senior Executive Environmental, Health and Safety Improvement Program" Empowering Sustainable Operations

TSMC's expert team conducts on-site reviews at supplier factories to enhance ESH management quality.

Enhancing environmental, safety, and loss prevention capabilities among suppliers is an important aspect of TSMC's sustainable supply chain management. To cultivate a robust EHS culture among small and medium-sized suppliers, TSMC launched the "Supplier Senior Executive Environmental, Safety and Health (ESH) Improvement Program" targeting raw material suppliers whose environmental and safety audit results did not meet the required standards. Through this program, high-ranking executives of these suppliers are coached and trained to deepen their understanding of environmental and safety issues, enabling them to establish proactive safety and health performance management systems. This initiative supports suppliers in implementing effective self-management mechanisms in their factories. As of 2024, nine suppliers' senior executives have completed the training, leading to the establishment of 62 proactive ESH KPIs. This has resulted in an improvement of 16.8% on average in factory audit scores and a 69.2% reduction in significant findings (Priority issues), empowering sustainable operations across TSMC's supply chain.

→ Read more

SDG 9

Industry, Innovation and Infrastructure

Plans

Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation to support SDG 9

9.4

By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

9.b

Support domestic technology development, research, and innovation in developing countries, including byensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

Commitments and Progress

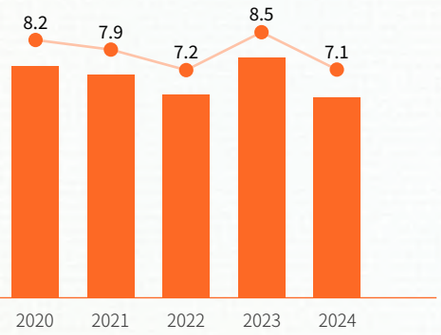
R&D expenses to revenue percentage

2030

Progress

Year

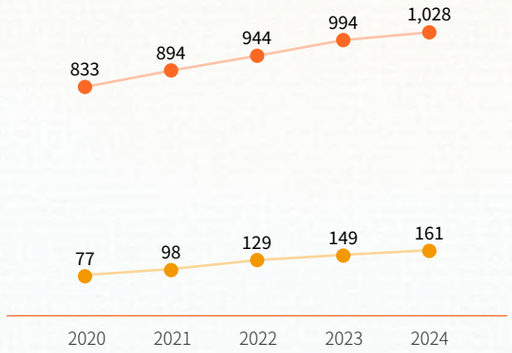
7~9%



Unit: %

Types of Technology for Customers

1,200 Types | 170 Types



Types of wafer manufacturing technology
Types of advanced packaging technology

Unit: Types

Actions

- Encourage innovation

Collaborations

- Form alliances with the industry, universities, and students to increase TSMC's capacity for innovation and skillsets to realize product value

Pioneering the "Trade Secret Sustainable Intelligent Management Center"

Group picture of Trade Secret Intelligent Management Alumni Association's first inaugural meeting.

TSMC is dedicated to strengthening the protection of intellectual property rights. In response to the Company's global expansion and development efforts, TSMC introduced four new systems: the Intelligent Trade Secret Monitoring & Matching System, Trade Secret Registration Innovation Index Analytics System, Trade Secret Registration Intelligent Reminder System, and the Trade Secret Intelligent Management App. By integrating these with seven existing systems, TSMC established the "Trade Secret Sustainable Intelligent Management Center" in 2024. The Center focuses on six main services: Intelligent Registration Integration, Intelligent Misappropriation Prevention & Monitoring, Intelligent Automated Services, Artificial Intelligence Utility, Green Trade Secret, and Charitable Sharing & Public Benefit. The Center made its debut at the first "Trade Secret Intelligent Management Alumni Association" held in September 2024, where 20 companies joined to promote the enhancement of trade secret management practices. This initiative aims to foster a culture of sustainable innovation by encouraging stakeholders to collaboratively advance their trade secret management strategies.

→ Read more

Hosting TSMC's First Supply Chain Security Workshop for Achieving Mutual Success

TSMC is committed to upholding its Information Security Declaration and promoting supply chain information security management. To enhance cybersecurity practices, in 2024, TSMC hosted its first Supply Chain Security Workshop with Strengthening Supply Chain Information Security Management Best Practices as its theme. During the workshop, TSMC shared its experiences in implementing ten key information security control measures and invited experts from the National Security Council and the National Institute of Cyber Security to provide insights into global cybersecurity threat trends and response strategies. Over 800 participants from 486 suppliers attended the workshop. Feedback collected from 457 post-event questionnaires revealed a 98% overall satisfaction rate among suppliers, with 95% acknowledging that the shared experiences contribute to optimizing cybersecurity management and building a more resilient semiconductor supply chain.

TSMC holds its first Supply Chain Security Workshop to enhance supply chain cybersecurity protection.

→ Read more

Industry-leading Technologies Powering AI Innovations at 30th Technology Symposium

Dr. C.C. Wei, TSMC Chairman and CEO, delivers his speech at the TSMC 2024 Technology Symposium.

Semiconductors serve as the cornerstone of technological innovation. As AI applications continue to evolve, TSMC remains committed to investing in the development of cutting-edge semiconductor technologies, enhancing advanced system integration services, and expanding its global manufacturing footprint. Through collaboration with customers, TSMC aims to accelerate product innovation. At its 30th Technology Symposium, TSMC unveiled its latest breakthroughs, including advanced logic, TSMC 3DFabric® silicon stacking and advanced packaging, and specialty technologies, showcasing its silicon leadership in powering the next generation of artificial intelligence (AI) innovations. The event surpassed last year's attendance, attracting more than 8,400 visitors across North America, Europe, Taiwan, China, and Japan.

→ Read more

SDG 12

Responsible Consumption & Production

Plans

Ensure sustainable consumption and production patterns to support SDG 12

12.5

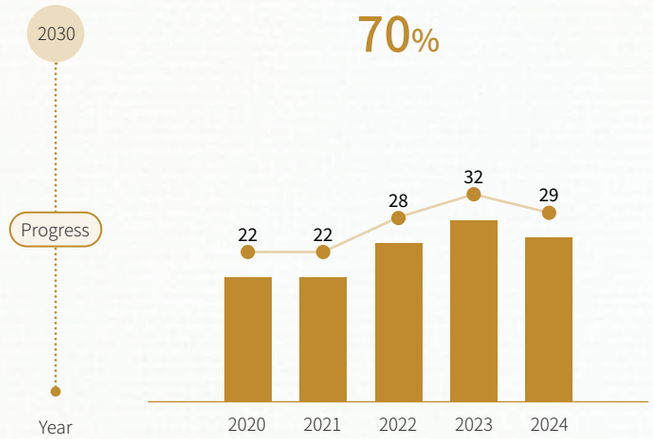
By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

12.7

Promote public procurement practices that are sustainable, in accordance with national policies and priorities

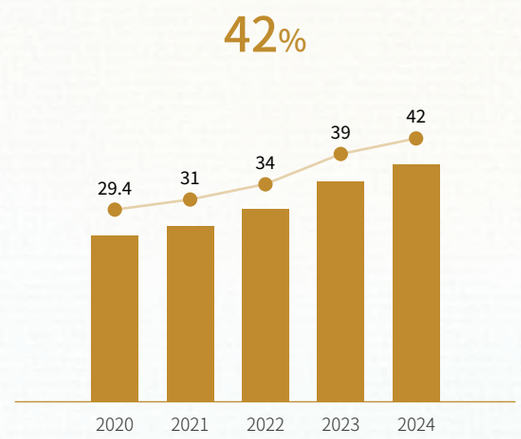
Commitments and Progress

In-house resource recycling rate



Unit: %

Waste production among local major suppliers reduced



Unit: %

Actions

- Reduce industrial waste output
- Carry out circular economy
- Implement chemical management

Collaborations

- Share TSMC's experience with waste disposal firms, suppliers, and the government to foster a circular economy-based production model

Collaborating with Suppliers at Optimizing Hydrogen Production Process

The supplier installs a carbon dioxide recovery and purification system in the hydrogen production plant.

The demand for hydrogen from advanced processes is increasing. TSMC encourages its suppliers to recycle carbon dioxide emitted from the natural gas production process converting it into electronic-grade liquid carbon dioxide for reuse at TSMC. At the same time, TSMC assists suppliers in purchasing carbon-neutral natural gas and has adopted underground pipelines to supply hydrogen directly to the Southern Taiwan Science Park, marking the first successful hydrogen pipeline project for Taiwan Science Parks, and enhancing suppliers' capabilities in low-carbon transformation. As of 2024, over 24,883 metric tons of electronic-grade liquid carbon dioxide have been reused by TSMC, and suppliers have reduced carbon emissions by 34,754 metric tons annually by deploying carbon-neutral natural gas, resulting in a reduction of over 5,563 hydrogen tank truck transportation trips, covering approximately 55,000 kilometers.

→ Read more

Collaborating with the Government to Create the Country's First Chemical Leasing Model

TSMC continues to drive source reduction while enhancing the circular economy to achieve long-term resource sustainability. To maximize resource utilization, TSMC collaborated with Taiwan's Ministry of Environment to create the country's first "chemical leasing" business model, aiming to encourage suppliers to reduce the use of raw materials and increase the recycling rate. The Activated Carbon Regeneration and Recycling project was chosen as the pilot case for a chemical leasing model for implementation in Taiwan. During the one-year demonstration period, the project is expected to extend the service life of 700 metric tons of leased activated carbon and reduce carbon emissions by 4,640 metric tons, with a saving of NT$8.5 million in activated carbon purchase and waste management. It will serve as a reference for Taiwan's Ministry of Environment to further develop the regulatory framework for chemical leasing, progressing toward the goal of resource sustainability.

TSMC collaborates with suppliers to reactivate used activated carbon, becoming the first to adopt a chemical leasing model in Taiwan.

→ Read more

A Milestone in Resource Sustainability: Taichung Zero Waste Manufacturing Center Launches

TSMC holds commercial operation ceremony for Taichung Zero Waste Manufacturing Center, creating a milestone in green innovation technology.

TSMC is dedicated to setting the global standard for environmental sustainability with the goal of achieving "zero waste in resource recycling." The Company established the Taichung Zero Waste Manufacturing Center, the semiconductor industry's leading integrated energy and resource recycling facility, which also serves as TSMC's first circular economy demonstration center. In addition to TSMC's dedicated solvent thermal recovery plant, the Company is collaborating with suppliers to establish three additional facilities: a fluoride recycling plant, a silica recycling plant, and an isopropanol recovery plant, bring the total to four major processing facilities. Since beginning trial operations in 2023, the center has successfully purified and recycled chemicals to meet the standards for recycled products. These chemicals are suitable for use in other industries and are being developed into electronic-grade quality for reuse in semiconductor processes, reducing the need for raw material extraction and expanding sustainable impact.

→ Read more

SDG 13

Climate Action

Plans

Develop comprehensive mitigation and adaptation measures to combat climate change and its impact to support SDG 13

13.1

Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

13.3

Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Commitments and Progress

Actions

- Implement adaptation strategies to climate risks
- Strengthen supply chain climate resilience
- Organize environmental/energy-saving volunteers
- Improve environmental protection

Collaborations

- Share TSMC's experience with waste disposal firms, suppliers, and the government to foster a circular economy-based production model

Introducing Supplier Environmental Information Digital Platform

TSMC builds the Supplier Environmental Information Digital Platform to enhance the environmental management capabilities of the supply chain.

To track and measure suppliers' carbon emissions, TSMC developed a Supplier Environmental Information Digital Platform, an integrated system for supply chain environmental data collection, analysis, and management. By implementing screening criteria, TSMC surveyed 622 supplier factories to identify emission hotspots, key suppliers, and key raw materials. This enables optimized allocation of resources and maximizes effectiveness in carbon reduction efforts. As of 2024, TSMC has completed data collection and analysis for 477 supplier factories and 245 types of raw materials. The platform also covers the information required for ISO 14064-1 greenhouse gas inventory and ISO 14067 carbon footprint verification. After completing online reporting, suppliers can export data for their own verification and audit operations.

→ Read more

Upgrading Air Pollution Control Equipment, Reducing Nitrogen Oxide Emissions by 60%

TSMC is dedicated to developing the best technologies to minimize air pollutant emissions. As part of its nitrogen oxide (NOx) reduction program, TSMC collaborates with suppliers to improve VOC exhaust abatement equipment, achieving a 65% reduction in nitrogen oxide emissions. TSMC has further upgraded its thermal type, burner type, and plasma type local scrubbers by employing methods such as the redox reaction, uniform combustion temperature control, and multi-stage heating to reduce NOx emissions. Test results show a 60% reduction in NOx emissions in a single fab. As of 2024, these NOx reduction methods have been implemented in Fab 12B, 14A, 15A, and 18B, and included as a standardized design in new fabs to enhance air emission treatment capabilities.

TSMC partners with suppliers to improve local scrubbers and reduce NOx emissions.

→ Read more

Carbon Reduction Performance as a Key Supplier Selection Criterion

TSMC incorporates suppliers' carbon reduction performance into its selection criteria, striving to achieve its net-zero emissions commitment.

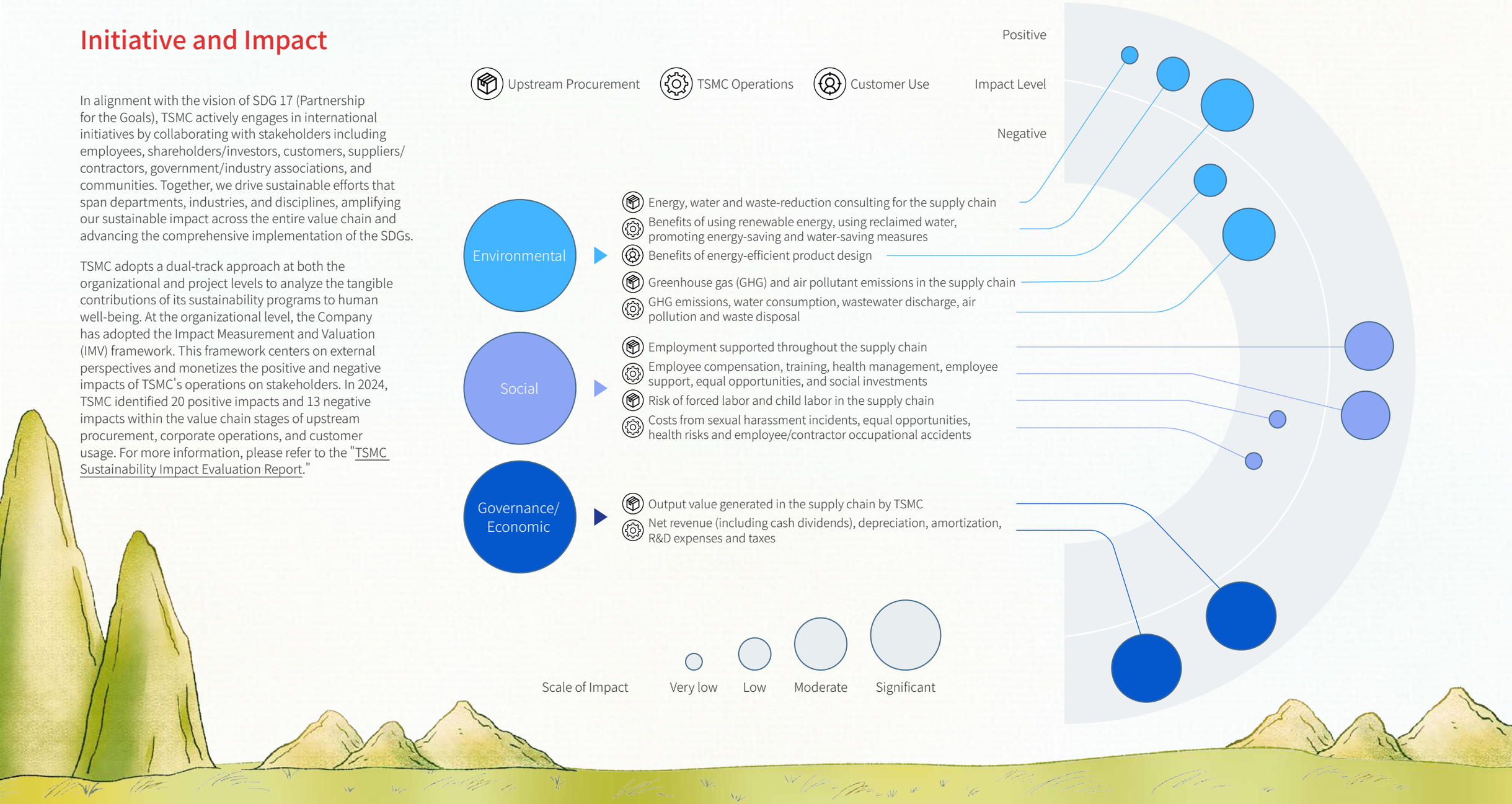
TSMC is committed to achieving net-zero emissions by 2050. In addition to its own climate change management actions, TSMC is developing green and low-carbon supply chains to enhance climate resilience. To accelerate progress in supply chain emission reductions, starting in 2025, TSMC will officially incorporate carbon reduction performance into its supplier selection criteria. Major emission contributors will be required to regularly review their carbon reduction progress and submit new annual and medium-to-long-term plans by designated deadlines each year. This ensures emission reduction results meet expectations and encourages continuous improvement. Additionally, in 2024, TSMC launched a carbon reduction subsidy project, offering NT$84 million in grants to increase suppliers' willingness to invest in energy-saving and carbon-reducing equipment, supporting them in achieving carbon reduction goals.

→ Read more

Initiative and Impact

In alignment with the vision of SDG 17 (Partnership for the Goals), TSMC actively engages in international initiatives by collaborating with stakeholders including employees, shareholders/investors, customers, suppliers/contractors, government/industry associations, and communities. Together, we drive sustainable efforts that span departments, industries, and disciplines, amplifying our sustainable impact across the entire value chain and advancing the comprehensive implementation of the SDGs.

TSMC adopts a dual-track approach at both the organizational and project levels to analyze the tangible contributions of its sustainability programs to human well-being. At the organizational level, the Company has adopted the Impact Measurement and Valuation (IMV) framework. This framework centers on external perspectives and monetizes the positive and negative impacts of TSMC's operations on stakeholders. In 2024, TSMC identified 20 positive impacts and 13 negative impacts within the value chain stages of upstream procurement, corporate operations, and customer usage. For more information, please refer to the "TSMC Sustainability Impact Evaluation Report."



At the project level, in 2024, TSMC applied qualitative, quantitative, and monetization methods to evaluate 24 selected sustainability initiatives. Focusing on three impact categories—behavioral or attitude change; quality of life and well-being; and skills or work performance—the Company completed one qualitative assessment and 16 quantitative analyses. These efforts resulted in over 570,000 employee engagements, reaching 4,345 young learners and involving 1,974 supply-chain partners to advance sustainability awareness and skill development.

TSMC also monetized the impacts of seven of those projects--covering upstream procurement, internal operations, and customer applications–by targeting water resource management and energy-saving and carbon reduction initiatives. These initiatives resulted in the saving and restoring of 24.65 million cubic meters of water, conserving 86.155 million kWh of electricity, and reducing 91,956 metric tons of carbon emissions. In total, these initiatives generated NT$2.1 billion in environmental external benefits.

TSMC remains dedicated to aligning with the SDGs by implementing strategic adjustments and allocating resources to initiatives that create sustainable impact. The Company aims to bolster cross-departmental collaboration and build partnerships throughout the value chain, maximizing positive outcomes and contributing to a more sustainable future.

SDG 3 Good Health and Well-being

Quantitative Indicators

Three-Stage Preventive and Caring Model
- **Five** Counseling Vendors (Psychology/Legal/Finance)

Global Flexible Benefit Plan
- **113,000** Applications

Supply Chain ESH Technical Forum
- **175** Suppliers Participated

SDG 4 Quality Education

Quantitative Indicators

Little Baseball Hero Support Program
- **1,245** Students Benefited

Internal Trainer Program
- **1,303** Attendances
- **460,000** Total Participants

DNA Summer Internship Program
- **813** Interns Recruited (Over the past six years, a total of 3,100 interns have participated)

SDG 6 Clean Water and Sanitation

Quantitative Indicators, Currency Value

JASM Water Conservation Engineering
- **Five Million** Cubic Meters of Groundwater Restored, Generating **NT$300 million** in Water-Saving Benefits

Introduce Reclaimed Water into Advanced Processes
- **19.65 Million** Cubic Meters of Water Saved, Generating **NT$1.1 Billion** in Water-Saving Benefits

Quantitative Indicators

Optimization of NH4-N Wastewater Treatment
- **40%** Decrease Ammonia Nitrogen Wastewater
- **30%** Reduced Chemical Usage

SDG 7 Affordable and Clean Energy

Quantitative Indicators, Currency Value

Introducing High-Efficient Transformers
- 85 Million kWh Electricity Saved
- 40,199 Metric Tons of Carbon Emissions Reduced, Generating NT$310 Million in Carbon Reduction Benefits

Empowering Suppliers for Sustainable Operations
- 572 Metric Tons of Carbon Reduction, Generating NT$4.25 Million in Carbon Reduction Benefits
- 1.155 Million kWh Annually Saved
- Five Suppliers Participated

Quantitative Indicators

Real-Time Air Pollution Monitoring System
- From One Week to One Minute: Accelerating Data Acquisition Time

SDG 8 Decent Work and Economic Growth

Quantitative Indicators

Supply Chain ESH Technical Forum
- 175 Suppliers Participated

Supplier Senior Executive Environmental, Health and Safety Improvement Program
- Nine Suppliers Participated
- 69.2% Reduction in Significant Findings (Priority)

Qualitative Description

Next-Generation Low Temperature Polyimide
- Introduce 5nm, 3nm and 2nm Advanced Processes

SDG 9 Industry, Innovation and Infrastructure

Quantitative Indicators

30th Technology Symposium
- 8,400 Visitors

Trade Secret Sustainable Intelligent Management Center
- 20 Companies Participated

Supply Chain Security Workshop
- 486 Suppliers Attended

SDG 12 Responsible Consumption & Production

Quantitative Indicators, Currency Value

Collaborating with Suppliers at Optimizing Hydrogen Production Process
- 34,754 Metric Tons of Annual Carbon Emissions Reduced, Generating NT$35.34 Million in Carbon Reduction Benefits

Taichung Zero Waste Manufacturing Center Launches
- 40,000 Metric Tons of Carbon Emissions Reduced, Generating NT$300 Million in Carbon Reduction Benefits

The Country's First Chemical Leasing Model
- 4,640 Metric Tons of Carbon Emissions Reduced, Generating NT$34.49 Million in Carbon Reduction Benefits

SDG 13 Climate Action

Quantitative Indicators

Upgrading Air Pollution Control Equipment
- 60% NOx Emissions Reduction

Supplier Environmental Information Digital Platform
- 622 Supplier Survey
- 477 Supplier Analysis

Carbon Reduction Performance as Supplier Selection Criterion
- NT$84 Million in Grants

Qualitative Description: Contributions of sustainability action plans to human well-being.
Quantitative Indicators: Measurable contributions of sustainability action plans to human well-being, expressed in terms of performance metrics.
Currency Value: Monetized impacts of sustainability action plans on human well-being, derived through formula-based calculations.

Quality of Life or Well-being | Skills or Work Performance | Behavioral or Attitude Change

TSMC's "Eco Plus! Ecological Harmony Program" Innovative Ecological Solutions

The growth of businesses is deeply intertwined with natural capital and ecosystem services. TSMC recognizes the environmental impacts stemming from resource consumption, wastewater management, and waste treatment during its operations, as well as the potential risks these activities may pose to both nature and ecosystems.

In pursuit of a balance between technological progress and ecological sustainability, TSMC supports the Kunming-Montreal Global Biodiversity Framework (K-M GBF) and draws inspiration from the collective intelligence model proposed by the United Nations Development Programme Accelerator Labs. In 2024, TSMC introduced the "Eco Plus! Ecological Harmony Program," anchored in three fundamental pillars: Habitat, Species, and Knowledge.

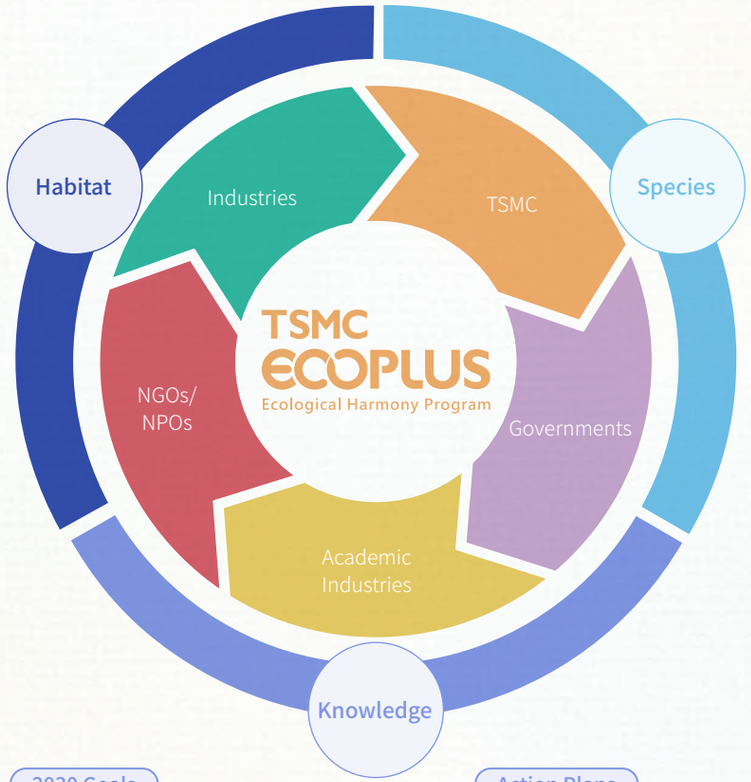
The program focuses on addressing five key challenges in biodiversity conservation: Data Gap, Doing Gap, Diversity Gap, Distance Gap, and Decision-Making Gap. By collaborating with partners across industry, government, academia, and research institutions, TSMC is developing biodiversity conservation projects grounded in data analysis, public engagement, diverse actions, and knowledge sharing. Through these collective efforts, the program aspires to implement practical solutions that enhance the resilience of natural capital, fostering a harmonious coexistence between businesses and the environment.

2030 Goals

- Support 20 hectares of eco-friendly farming, starting with the Central Taiwan Science Park
- Establish one ecological corridor and two Other Effective Conservation Measures (OECMs)
- Establish ten low-elevation mountain protection areas

Action Plans

- Promote Eco-Friendly Farming
- Construct Dadu Mountain Green Belts
- Enhance Corridor Structural Integrity
- Implement Fazi River Stream-Friendly Management



2030 Goals

- Introduce 500 squalidus banarescui into the ecological pool at TSMC Taichung fabs
- Protect 30 Ring-necked Pheasants
- Conservation efforts extend to six endangered species

Action Plans

- Conserve Endangered Species

2030 Goals

- Sponsor 96 ecological potential scholars
- Advance 93 key ecological research projects
- Achieve 90% coverage of bird mapping
- Foster ecological education in 1,200 schools
- Implement strategic empowerment across all educational stages

Action Plans

- Cultivate Biodiversity Talent
- Promote Citizen Scientists

TSMC Eco Plus! Ecological Harmony Program: Bridging Gaps with Collective Intelligence

	Gap Experienced	TSMC Sustainable Actions	Bridge the Gap
Data Gap	Gaps in biodiversity database completeness; insufficient participation from contributors to ecological data	• Promote citizen science through iNaturalist and eBird Taiwan platforms, expanding ecological survey capacity and data validity • Accelerate the development of the Merlin APP for bird sound recognition, advancing visual-to-auditory recognition technology to enhance data efficiency and accuracy • Develop AI-powered species identification systems to optimize recognition efficiency and technologies for mammals, birds, butterflies, amphibians, reptiles, insects, and plants	• Accelerate the development of the Merlin App for bird sound recognition, advancing visual-to-auditory recognition technology to enhance data efficiency and accuracy. • Use AI technology to accelerate data identification and enrich biodiversity databases
Doing Gap	Lack of stakeholder collaboration platforms, hindering interdisciplinary cooperation	• Promote OECMs by engaging local communities in habitat maintenance, management, and environmental education initiatives • Facilitate the integration of resources from industry, government, and academia to prioritize species conservation, restore fragmented habitats, and build fully connected ecological corridors	• Create cross-border cooperation platforms through the "TSMC Eco Plus! Ecological Harmony Program," combining conservation resources from industry, government, academia, and research. Leverage professional expertise and implementation experience to enhance mutual interaction and collaboration, strengthen local community engagement, and foster value co-creation
Diversity Gap	Limited outreach to broader audiences, restricting public understanding of biodiversity importance	• Cultivate ecological ambassadors and volunteers through the iNaturalist "Love Nature" platform and the eBird Taiwan Bird Database • Establish the " TSMC Biodiversity Scholarship and Proposal Grant" to cultivate the next generation of ecological talent and support biodiversity research and conservation projects by non-profits and NGOs • Promote eco-friendly farming by collaborating with local farmers' associations to establish farmer-friendly habitats • Partner with government agencies to conserve resources, sign memorandums of cooperation, and jointly invest in habitat and species conservation	• Leverage collective Intelligence to advance biodiversity initiatives by providing a platform where diverse groups can contribute their unique strengths and actively participate in conservation efforts • Vertically integrate an all-age ecological literacy system, spanning from primary schools to the general public, to deepen research capabilities and foster ecological awareness and capacity building across all education stage
Distance Gap	General public's limited awareness of biodiversity, weakening conservation momentum	• Promote citizen science initiatives to address data gaps and eliminate communication barriers related to biodiversity issues stemming from a lack of scientific foundations • Leverage AI tools to accelerate the development of ecological databases and close knowledge gaps in ecology • Invest in the conservation of species such as squalidus banarescui, ring-necked pheasant, leopard cat, eastern grass owl, yellow pond turtle, and pangolin to enhance public understanding of their surrounding environment and cultivate empathy for ecology and species • Introduce the concept of "ecological first" in Location development, so that economic development and ecology can coexist	• Strengthen the promotion of ecological knowledge and the construction of biodiversity databases to enhance public ecological awareness • Establish biodiversity dialogue channels across diverse sectors, grounded in scientific principles, to deepen mutual trust and cooperation • Promote public awareness of endangered species to strengthen collective efforts toward ecological conservation
Decision-Making Gap	Differing perspectives lead to lack of systematic decision-making foundations in biodiversity promotion	• Strengthen biodiversity database integration to ensure timely and comprehensive ecological data • Sign memorandums of understanding with government agencies to bridge gaps in the implementation of biodiversity-related policies and practices	• Strengthen information and data infrastructure to support informed biodiversity decision-making • Foster public-private collaboration to streamline and accelerate the decision-making process