

TSMC 2016 Corporate Social Responsibility Report



A Better Future Together

Corporate social responsibility is part of TSMC's DNA.

Dr. Morris Chang proposed an innovative business model in 1985, and used it to found the world's first pure-play semiconductor foundry - TSMC - in 1987.

Guided by Dr. Morris Chang's "TSMC Business Philosophy", Corporate Social Responsibility (CSR) has long been an internalized principle for every TSMC employee.

TSMC has always played a key role in providing innovative solutions to the semiconductor industry, which enables new technologies that help overcome the challenges we face.

Beginning with our fundamental core value of integrity, we view employees as our most precious asset, build the strongest innovation team in the semiconductor industry with our customers and suppliers, and dedicate resources to ensuring environmental sustainability and providing abundant returns to shareholders, investors and the society to create sustainable value to our stakeholders.

Semiconductors are everywhere in human life.

Let's build a better future together.

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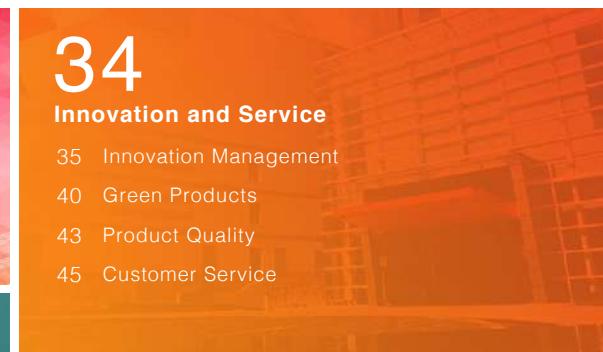
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Letter from the CSR Committee Chairperson

Innovation • Sustainability • Rise Up and Act!

TSMC is built on the cornerstone of responsible management, and it is our abiding promise. Based on our core values of integrity, commitment, innovation, and customer trust, we hold ourselves to the highest standards of corporate governance. TSMC believes employees are its most important asset, and works actively to build a collaborative team with shared vision and values. We provide customers with the most advanced and comprehensive process technologies through unceasing innovation, build green factories and green supply chains friendly to the environment, and take concrete action to give back to society.

This year is the 30th anniversary of TSMC's founding. In 1987, TSMC pioneered a revolutionary new business model that gave rise to two all-new industries: dedicated IC foundry and fabless IC design. At its third decade, TSMC is now the leader in dedicated IC foundry. Over the years we have innovated with our customers, driven continued progress in global technology, brought about the proliferation of a convenient digital lifestyle, and enabled many wonderful changes in modern society. This has also been our unchanging vision since Chairman Dr. Morris Chang first founded TSMC.

TSMC continues to strengthen its commitment to sustainable operations so that this endeavor can continue to endure. It has molded a unique corporate culture and principles, embodied in each TSMC employee's dedication to diligence in every task.

Five Focal Points for Action on Sustainability

In 2016, TSMC focused on the five dimensions of "innovation and service", "responsible supply chain", "green manufacturing", "inclusive workplace", and "social participation". Based on the material issues we have identified, we have laid out a set of strategies and long-term goals in this report as our "TSMC 2020 Vision". Beginning with our core business, we aim to respond to the United Nations Sustainable Development Goals by continuing to make efforts in the economic, environmental, and social dimensions of our business, and make a contribution towards resolving environmental and social issues.

In 2016, TSMC achieved the following sustainability goals:

Innovation and Service

TSMC has long been the trusted technology and capacity provider to the global semiconductor industry, and a leader in providing new generations of technology. We help customers quickly enter volume production with our outstanding front- and back-end integration capabilities and provide them with competitive advantage in power, performance, and area. In 2016, we led the industry in launching 10nm process technology, and completed IP design and began silicon validation for our 7nm technology. We were also the first in world to bring 16nm Integrated Fan-Out Package-on-Package (InFO PoP) technology to volume production, reducing device footprint and lowering thermal resistance.

Responsible Supply Chain

TSMC views the sustainable development of its supply chain as a key part of its corporate social responsibility. We have established a "TSMC Supplier Code of Conduct" based on the "Electronic Industry Citizenship Coalition (EICC) Code of Conduct" and assembled a supplier counselling team which ensures supplier compliance through numerous channels, including evaluation, audit, training, and the annual Supply Chain Management Forum. In 2016, not only did all new suppliers sign the "TSMC Supplier Code of Conduct", TSMC also successfully guided 11 domestic suppliers to optimize their processes and improve yield. Compared with 2014, domestic suppliers accounting for 80% of total waste production reduced unit

waste output by 18.8%, and suppliers that originally did not meet TSMC's environment, safety, and health standards improved their performance by 18%. We hope to leverage our influence to strengthen the capabilities of domestic suppliers to meet international sustainability standards.

Green Manufacturing

TSMC has continued to enhance its green manufacturing to meet the operational challenges that global warming may bring by making progress through innovation. Our wafer capacity has doubled in the past 10 years while processes continue to grow more complex, but through our efforts, unit wafer average power consumption has decreased 6.4%, process water consumption has decreased 31.7%, and greenhouse gas (GHG) and PFC emissions have respectively decreased 46.5% and 85.1% over that time.

In 2016, we not only met environmental targets for water and power conservation, GHG emissions, waste recycling, and others, we also developed 61 new power conservation methods and 16 water conservation projects, effectively reducing power consumption by 91 GWh and water consumption by as much as 1.41 million metric tons, comprehensively improving our power and resource efficiency. We also purchased 200 GWh of green power, directly supporting renewable energy to become Taiwan's largest buyer of green power for two consecutive years. Although TSMC has been the leading company in terms of waste recycling rate for many years, we continue to challenge ourselves; in addition to strict waste

classification at the source, we have introduced circular economy management methods to independently develop waste recycling technology. In 2016, TSMC was the first semiconductor company to perform internal recycling of waste sulfuric acid and waste copper sulfate, enabling them to become reusable resources and lowering reliance on outsourcing. Total benefits from waste recycling for the full year exceeded NT\$920 million.

Inclusive Workplace

TSMC employs people based on their talents, without regard to their nationality. We offer good terms of compensation above the industry average, leave and benefits that meet employees' needs, a variety of training courses, and do our utmost to create a safe and healthy work environment. In 2016, we recruited 3,477 new employees around the world in a fair, open, and just fashion. We also issued the "TSMC Human Rights Policy" based on international standards, further implementing the "EICC Code of Conduct" to support employees' physical and mental health as well as work/life balance as they grow with the Company.

Social Participation

TSMC aims to be proactive in corporate social responsibility. Through the TSMC Education and Culture Foundation, TSMC Volunteer Program, and TSMC i-Charity Platform, we effectively combine the Company's resources with employees' actions to lay out a public service network for TSMC's social participation. In addition to caring for

education of the underprivileged, building education platforms, and promoting arts and culture, we encourage employees to participate in public service in reading, guiding, ecology and conservation, and caring for the underprivileged and elderly. In 2016, volunteers served 16,570 times, covering 18 cities and counties, for a total of 93,623 hours. TSMC and its employees contributed or invested more than NT\$93 million to public service in 2016, supporting 422 schools and non-profit organizations to benefit a total of 212,671 people.

Our Responsibility to Prosper Together

TSMC strives to be a good corporate citizen, and is the only semiconductor company in the world to be selected

as component of the DJSI World Index for 16 consecutive years. In 2016, TSMC was also selected as a major component of the FTSE4Good Emerging Index and the MSCI Global Sustainability Indexes, and recognized as one of the leaders in climate disclosure by the CDP. We understand that with these international honors comes greater and heavier responsibility, because TSMC's prosperity is supported by society and the industry ecosystem. With our ultimate goal of "uplifting society" in mind, we will continue to strengthen our capabilities in sustainability, create value for stakeholders, the environment, and society, and do our utmost to realize a prosperous future for everyone.

Lora Ho
Senior Vice President and Corporate Social Responsibility Committee Chairperson



Awards and Recognitions

Organizations	Awards
R.O.C. Presidential Office	<ul style="list-style-type: none">• R.O.C. Presidential Innovation Award
Taiwan Stock Exchange	<ul style="list-style-type: none">• Ranked in top 5% in Corporate Governance Evaluation of Listed Companies
Taiwan Institute of Sustainable Energy	<ul style="list-style-type: none">• Taiwan Corporate Sustainability Awards - No.1 for Domestic Corporates
Cheers Magazine	<ul style="list-style-type: none">• Most Admired Company for the New Generation
Newsweek	<ul style="list-style-type: none">• Selected as Newsweek Green Rankings Top Green Companies in the World
Asiamoney	<ul style="list-style-type: none">• Best Managed Company - Large Cap in Taiwan
FinanceAsia	<ul style="list-style-type: none">• 20th Anniversary Platinum Awards: Best Company – in Taiwan
IR Magazine	<ul style="list-style-type: none">• Global Top 50 Gold Rank No.1• Global Top IRO• Best in Sector: Technology - Greater Asia
CDP	<ul style="list-style-type: none">• Best CEO (Technology/Semiconductor) 1st Place – All Asia• Best CFO (Technology/Semiconductor) 1st Place – All Asia• Best Investor Relations (Technology/Semiconductor) 1st Place – All Asia• Best Investor Relations Professional (Technology/Semiconductor) 1st Place – All Asia• Best Analyst Days (Technology/Semiconductor) 1st Place – All Asia
Institutional Investor Magazine	
FORTUNE THE WORLD'S MOST ADMINED COMPANIES	
ROBECOSAM Sustainability Award Gold Class 2017	
MSCI 2017 Constituent MSCI Global Sustainability Indexes	
FTSE4Good	
BARRON'S	
MEMBER OF Dow Jones Sustainability Indices In Collaboration with RobecoSAM	
RobecoSAM Sustainability Award - Gold Class	
Selected as MSCI Global Sustainability Indexes component	
Selected as FTSE4Good Emerging Index component	
Selected as Top 100 World's Most Admired Companies	
Selected as one of The World's Most Admired Companies	
Most Admired Company in Taiwan for the 21 st consecutive year - CommonWealth Magazine	
Selected as one of the most sustainable corporations	
Global Top Corporate Governance	
Climate Change Scoring Level: Leadership	

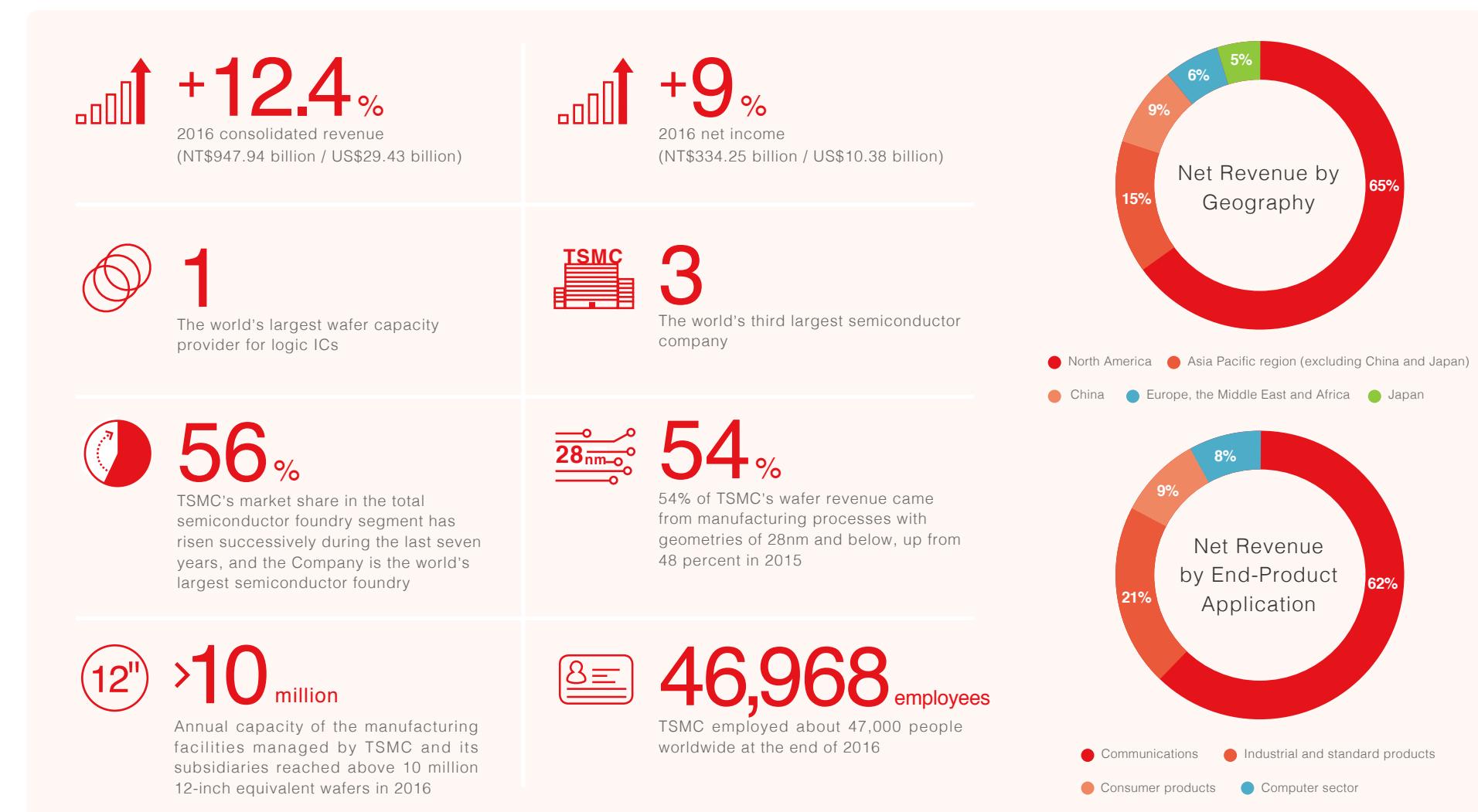
For more details of 2016 CSR awards and recognitions, please refer to TSMC's [2016 Annual Report](#).

About TSMC

Established in 1987 and headquartered in Hsinchu Science Park, Taiwan, TSMC is the World's first and largest dedicated semiconductor foundry.

Based on its three defining competitive strengths of Technology Leadership, Manufacturing Excellence, and Customer Trust, TSMC does not design, manufacture or market semiconductor products under its own brand name, ensuring that it does not compete directly with its customers. TSMC is the worldwide semiconductor foundry leader for both advanced and specialty process technologies. In 2016, TSMC maintained its leading position in the total foundry segment of the global semiconductor industry, with an estimated market share of 56%, despite intense competition from both established players and relatively new entrants to the business. At the same time, we deployed 249 process technologies, and manufactured 9,275 products for 449 customers. Such strong diversification helps smooth fluctuations in market demand, which, in turn, leads to higher levels of capacity utilization and profitability. TSMC revenue grew double-digit in 2016, outpacing a relatively flat global semiconductor industry. We also achieved our highest gross and operating margin in the last twenty years, and earned a premium to the overall semiconductor industry's growth.

TSMC operates wafer fabs, subsidiaries, and engineering service offices in Taiwan, North America, Europe, Japan, China and South Korea. In March 2016, we established TSMC Nanjing Company Limited, and the facility is scheduled to commence production of 16nm process technology in 2018.



Sustainable Management

TSMC values the rights of its stakeholders, and integrates the efforts of each functional organization through the CSR Committee led by the CFO. These functions are responsible for issues of interest to shareholders, employees, customers, suppliers, governments, society, and other stakeholders, and set working plans and budgets to systematically and effectively fulfill the Company's CSR vision and missions.

“ As the world's largest dedicated IC foundry, TSMC is keenly aware that as a company grows bigger, it also exerts a greater influence on industry and society. We place great importance upon integrity, respect the rule of law, and hope that the way we do business serves as a benchmark for sustainability and a positive force in society.

Morris Chang
Chairman

“ Sustainability is a culture and a set of values. I would like to deepen our culture of "rise up and act" in the Corporate Social Responsibility Committee and enable colleagues across organizations to gather together, pool their ideas through their respective professional knowledge, and break out of existing constraints to solve problems and create new ways of doing things. I believe that combining everyone's strengths can bring positive changes to society.

Lora Ho
Corporate Social Responsibility
Committee Chairperson





Corporate Social Responsibility Policy

Since its establishment, TSMC has not only strived for the highest achievements in its core business of dedicated IC foundry services but has also actively developed positive relationships with all stakeholders including employees, shareholders, customers, suppliers, and society to fulfill its responsibility as a corporate citizen and pursue a sustainable future.

● Vision

- To Uplift Society

● Mission

- Integrity
- Strengthening Environmental Protection
- Caring for the Disadvantaged

● Guiding Principles

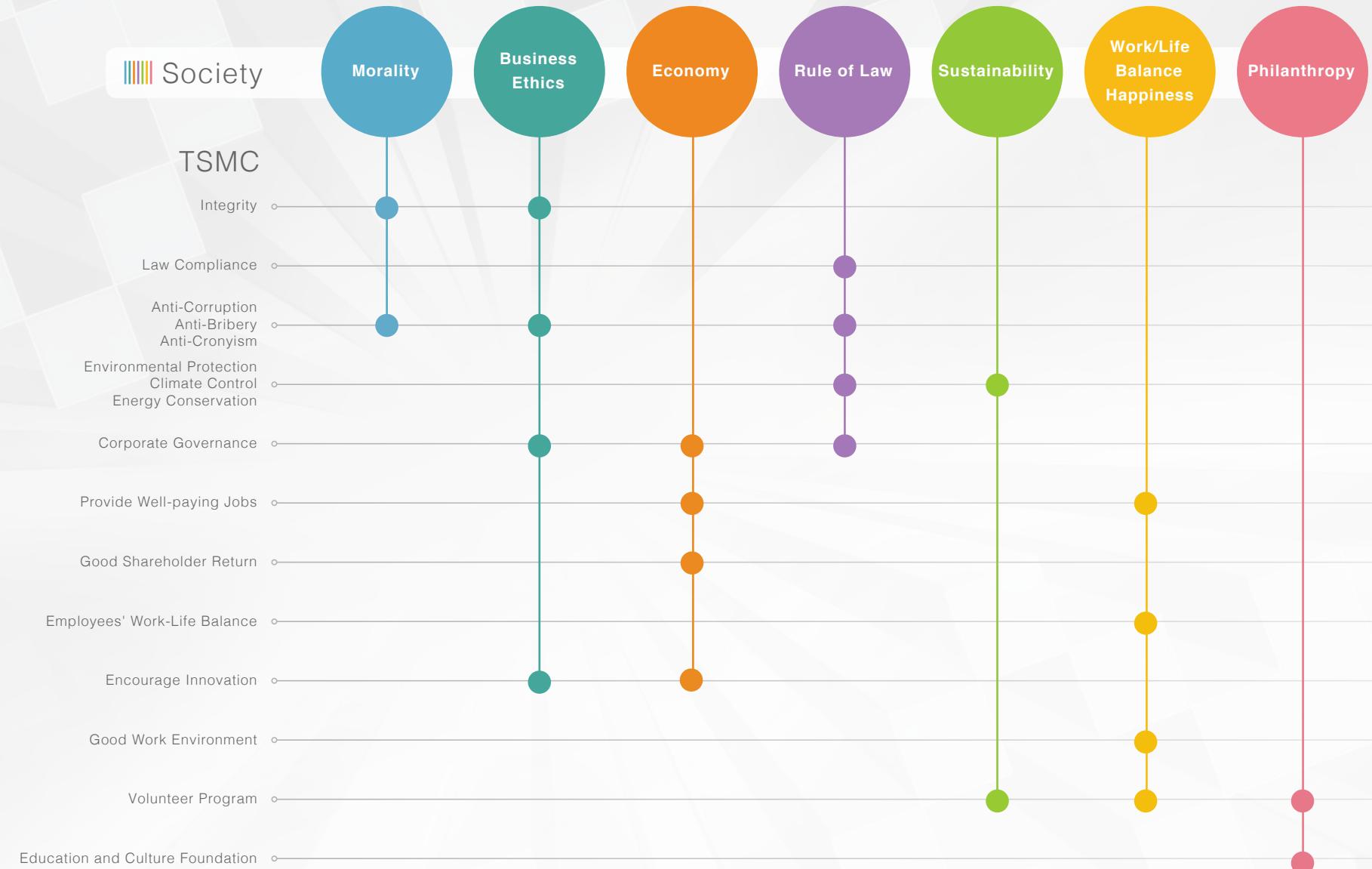
- Acting with Integrity: TSMC believes in acting ethically, following the law, and balancing the interests of all stakeholders. The Company endeavors to use the experience of developing a sustainable business to drive the industry and supply chain into a positive cycle and to act together with them as an uplifting force in society.
- Strengthening Environmental Protection: TSMC strives to achieve environmental sustainability and continues to promote green fabs, green manufacturing, and green supply chains. The Company seeks the most efficient use of energy and resources and is committed to reducing waste and preventing pollution. TSMC is eager to share its environmental experience and expertise and aims to collaborate with government, academia, and all of society to address the challenges of climate change.
- Caring for the Disadvantaged: TSMC believes in equality, justice, and a safe and prosperous society. The Company combines its resources with employee volunteer service to commit money, material and labor to the two main areas of "education" and "living." TSMC hopes to provide underprivileged students in rural regions with diverse learning opportunities and to offer disadvantaged groups necessary aid and emergency relief for the common good of society.

Morris Chang
Chairman

Corporate Social Responsibility Matrix

"TSMC Corporate Social Responsibility Policy" is the top guiding principle for our sustainable development. The "CSR Matrix" set by Chairman Dr. Morris Chang clearly defines the scope of TSMC's corporate social responsibility. The horizontal axis shows the seven areas where TSMC aims to set an example: morality, business ethics, economy, rule of law, sustainability, work/life balance and happiness, and philanthropy. On the vertical axis are actions that TSMC has taken to fulfill its responsibilities.

TSMC believes "right people with shared vision" are essential for a company to last. Under this corporate culture, each TSMC employee is steadfast in carrying out their responsibilities. TSMC employees are the most solid support to TSMC's sustainable development as they help TSMC to excel in economic, environmental and social dimensions under the CSR matrix criteria through hard work and focus on their duties.



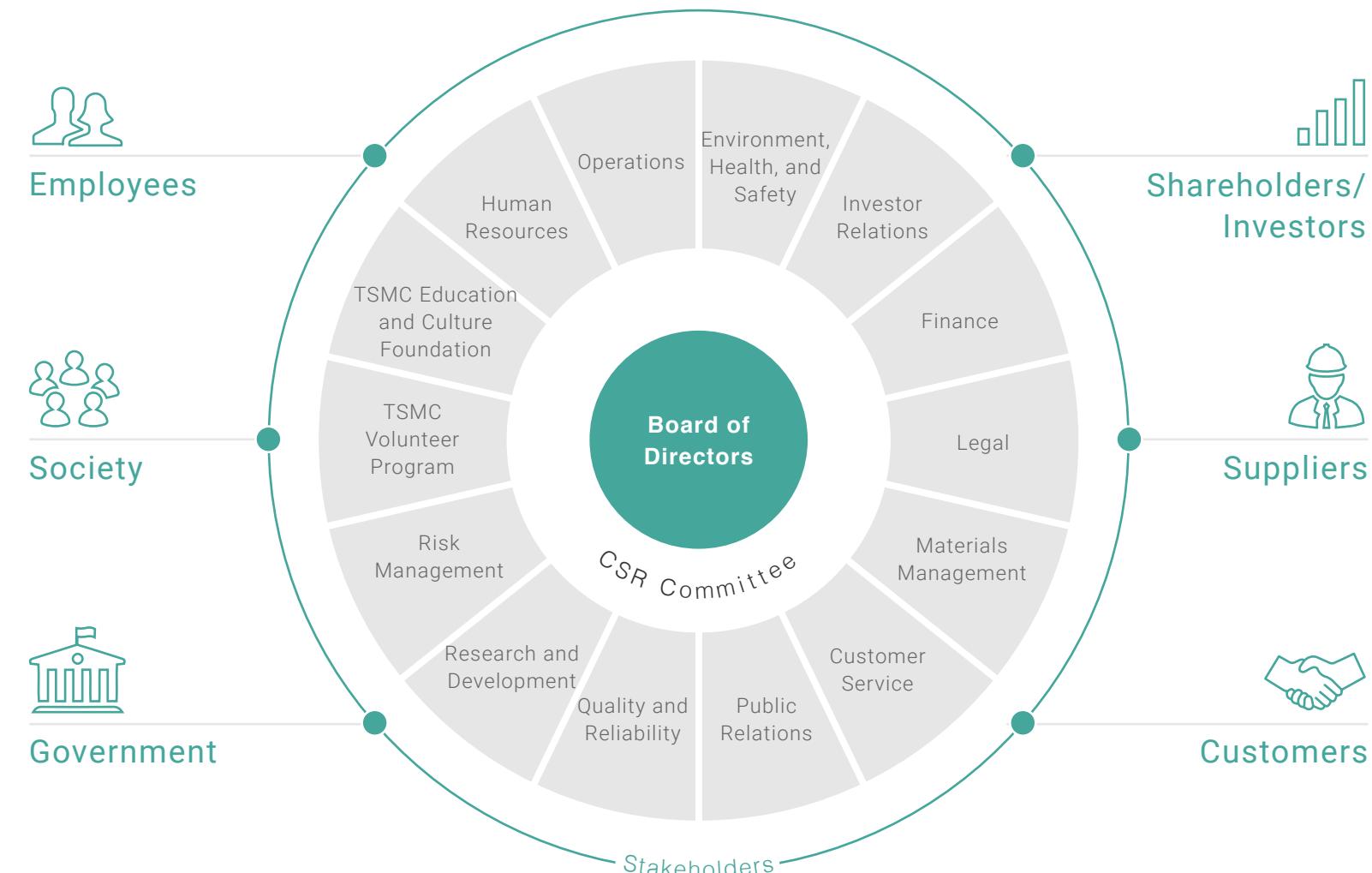
Corporate Social Responsibility Committee

The Corporate Social Responsibility Committee is the highest-level corporate social responsibility organization within TSMC. The Chairman appointed the CFO to be the committee chairperson, and has incorporated corporate social responsibility into the board's formal agenda. As a decision-making center and cross-departmental communication platform for TSMC's corporate social responsibility, committee representatives are nominated by each functional organization with a quota of one to three. All economic, environmental and social issues and their corresponding representatives related to corporate social responsibility are clearly defined by the committee.

The Chairperson of the Corporate Social Responsibility Committee reports annually to the Board of Directors on implementation results for the year and the work plan for the following year. The 2016 Chairperson's report to the Board of Directors focused on TSMC and its supply chain's implementation of EICC regulations, green manufacturing performance, education projects for disadvantaged students and volunteer service. In the 2017 CSR Annual Work Plan, we continue to improve green manufacturing capabilities and expand support for disadvantaged education, and we also focus on how to improve corporate social responsibility report disclosure quality.

Adhering to the vision and mission of the "TSMC Corporate Social Responsibility Policy", the Chairperson leads the committee members to focus on the three major categories of corporate social responsibility issues: economic, environmental and social aspects, and evaluate the risks and opportunities of sustainability issues related to employees, shareholders/investors, customers, suppliers, government, society, and other stakeholders to determine the response strategies and action plans. In addition, we will conduct cross-departmental communication, coordination, and resource integration based on the issue's type and nature, monitor the progress and effectiveness of CSR projects, convey the guiding principles of corporate social responsibility policy promptly and effectively to all departments, and systematically implement them in TSMC's daily operations.

TSMC CSR Management System

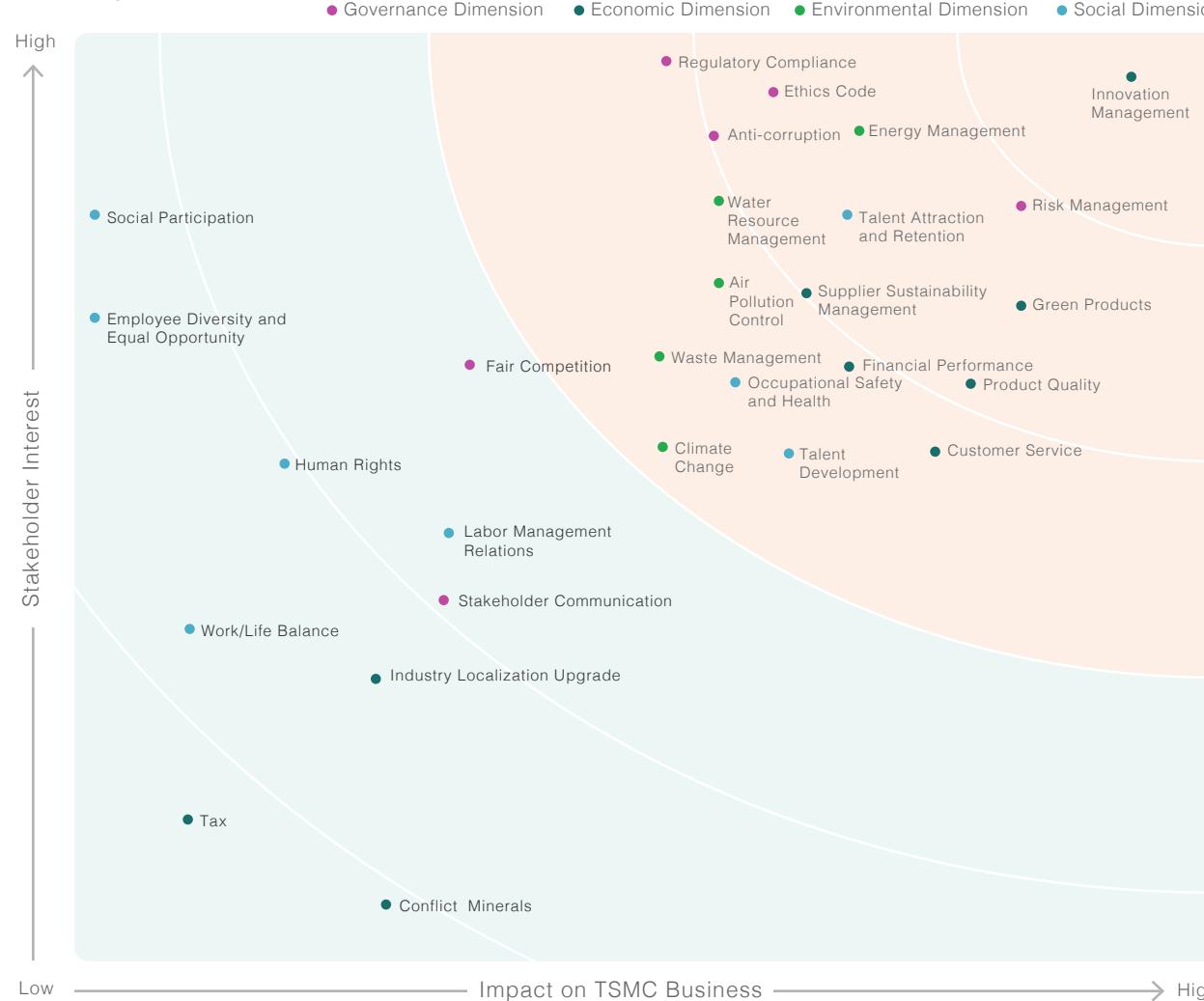


Materiality Analysis and Stakeholder Communication

In order to understand the level of stakeholder interest in sustainability issues and track the progress of corporate sustainability, material issues related to the economic, environmental and social dimensions are identified annually through materiality analysis. In doing so, TSMC systematically launched a model of materiality analysis in line with the GRI G4 guidelines and AA 1000 stakeholder engagement standards (SES) with the aim of gaining a clear understanding of stakeholders' concerns. In addition, the impact of sustainability issues on TSMC operations is evaluated for goal setting in sustainable management.

Based on the results of materiality analysis and 18 material issues, TSMC identified six core competencies in implementing corporate sustainability: customer relationship management, human resource management, supply chain management, innovation management, environmental management and ethics management. These six core competencies are present in all stages of the TSMC value chain, and play a significant role in economic, environmental and social value creation as well as stakeholder benefit.

Identification		Prioritization		Validation		
Step 1 Stakeholder Identification	Step 2 Sustainability Issue Collection	Step 3 Stakeholder Interest Level	Step 4 Impact on Business	Step 5 Determination of Material Issues	Step 6 Disclosure and Boundaries	Step 7 Review of Disclosure Content
6 Major Categories of Stakeholders	28 Sustainability Issues	982 Questionnaires	54 Colleagues	18 Material Issues	4 Value Chain Stages	21 Aspects
<ul style="list-style-type: none"> TSMC defines stakeholders as: internal and external groups or individuals who have an impact on or are affected by TSMC. By following this principle, employees, shareholders/investors, customers, suppliers/contractors, governments and society (communities, academic institutions, media, NGOs/NPOs) were identified as TSMC's major stakeholders. 	<ul style="list-style-type: none"> Over 80 sustainability issues were derived from international sustainability standards and regulations (GRI G4, ISO26000, EICC), sustainable investing (DJSI, CDP, MSCI ESG Index), internal development goals and visions, and feedback from all stakeholders. Based on the aforementioned listed issues, 28 sustainability issues had been identified to TSMC. 	<ul style="list-style-type: none"> To effectively gauge stakeholder interest in sustainability issues, TSMC identified key respondents within six major categories of stakeholders in terms of relationship with the Company, level of influence, and expectations of the engagement. In total, 982 web-based, electronic and paper questionnaires were collected. 	<ul style="list-style-type: none"> In order to measure the impact of sustainability issues on TSMC operations and business, six criteria of impact on R&D, costs, revenues, customer satisfaction, brand and risks were identified. A total of 54 managers in the TSMC CSR committee participated in determining the impact of each issue on TSMC operations. 	<ul style="list-style-type: none"> TSMC's materiality matrix was determined using the results from steps 3 and 4. Results of the analysis were reviewed by the CSR committee and senior management, after which short-, medium- and long-term goals were set for the 18 material issues identified. 	<ul style="list-style-type: none"> Based on the TSMC value chain – procurement, wafer fabrication, packaging/testing, customer usage – and 18 relevant topics, disclosure boundaries were defined in order to understand the upstream and downstream impact of sustainability topics. 	<ul style="list-style-type: none"> With the 18 material issues, 21 corresponding aspects in the GRI G4 guideline were identified for collecting sustainability information and data. Other information on potential CSR issues deemed relevant by TSMC was also disclosed publicly. The completeness of the information and data above, along with improvements in sustainable management, was verified by the CSR committee.

Materiality Matrix**Material Issues in the TSMC Value Chain**

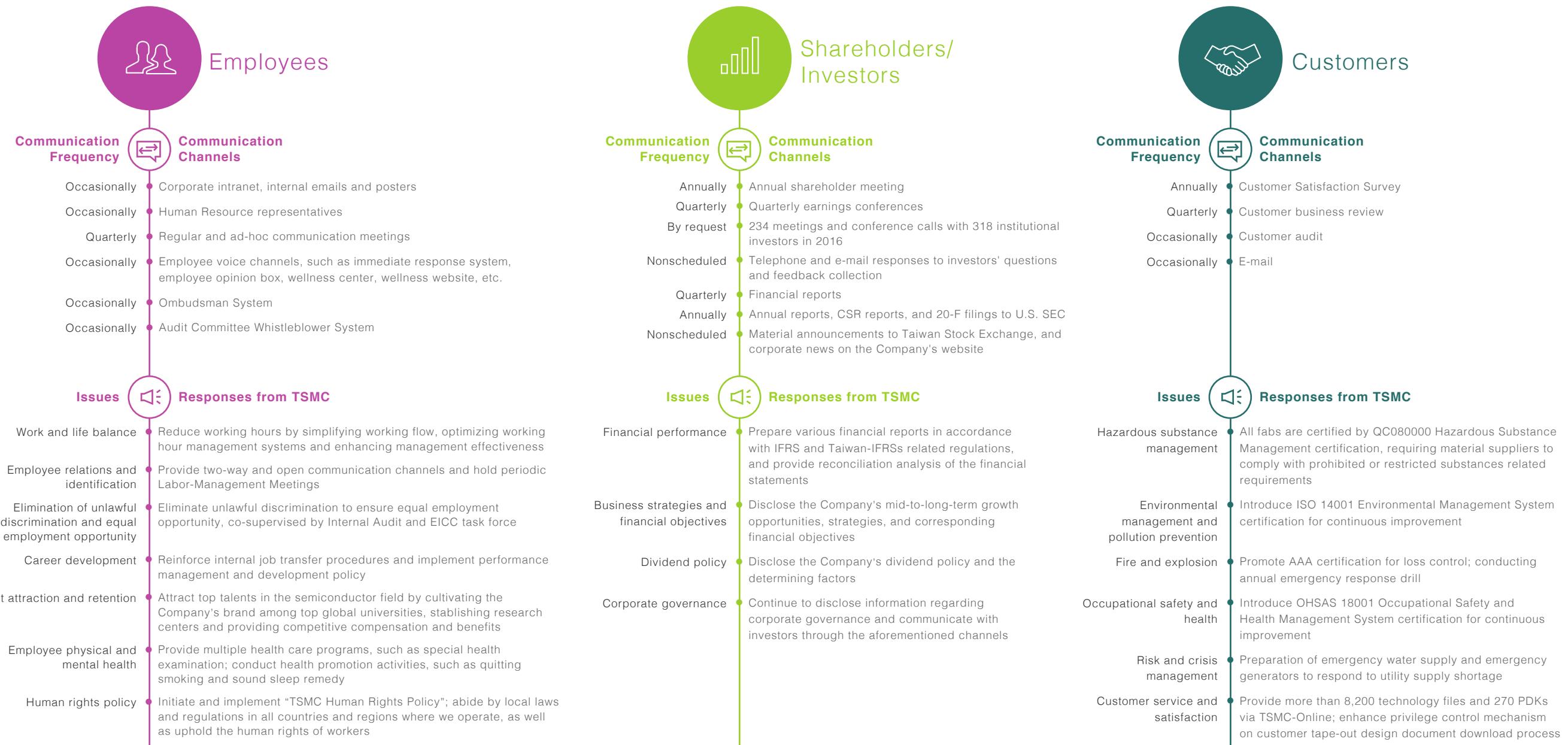
Material Issues	GRI G4 Aspects	Upstream ^{Note1}		TSMC Operations ^{Note2}		Downstream ^{Note3}	
		Procurement	Wafer Manufacturing	Packaging/Testing	Customer Usage		
Governance Dimension	Risk management	Economic performance, general standard disclosure	✓	✓	✓		
	Ethics code	Anti-corruption	✓	✓	✓		
	Anti-corruption	Anti-corruption	✓	✓	✓		
	Regulatory compliance	Compliance for environment, society, and products	✓	✓	✓		
Economic Dimension	Innovation management	Economic performance	✓	✓			
	Supplier sustainability management	Indirect economic impacts, procurement practices, supplier environmental assessment, supplier assessment for labor practices, supplier human rights assessment, supplier assessment for impacts on society	✓				
	Green products	Products and services	✓	✓	✓	✓	
	Product quality	Products and services, product and service labeling	✓	✓	✓	✓	
Environmental Dimension	Financial performance	Economic performance	✓	✓	✓		
	Customer service	Economic performance, product and service labeling	✓	✓	✓	✓	
	Energy management	Energy	✓	✓	✓	✓	
	Climate change	Emissions	✓	✓	✓	✓	
Social Dimension	Water resource management	Water, effluents and waste	✓	✓			
	Air pollution control	Emissions	✓	✓			
	Waste management	Effluents and waste	✓	✓			
	Occupational safety and health	Occupational health and safety	✓	✓			
Social Participation	Talent attraction and retention	Employment, diversity and equal opportunity	✓	✓			
	Talent development	Training and education	✓	✓			

Note 1: Upstream Boundaries: materials, equipment and related services procured by TSMC
Note 2: Operation Boundaries: wafer fabrication and packaging/testing provided by TSMC

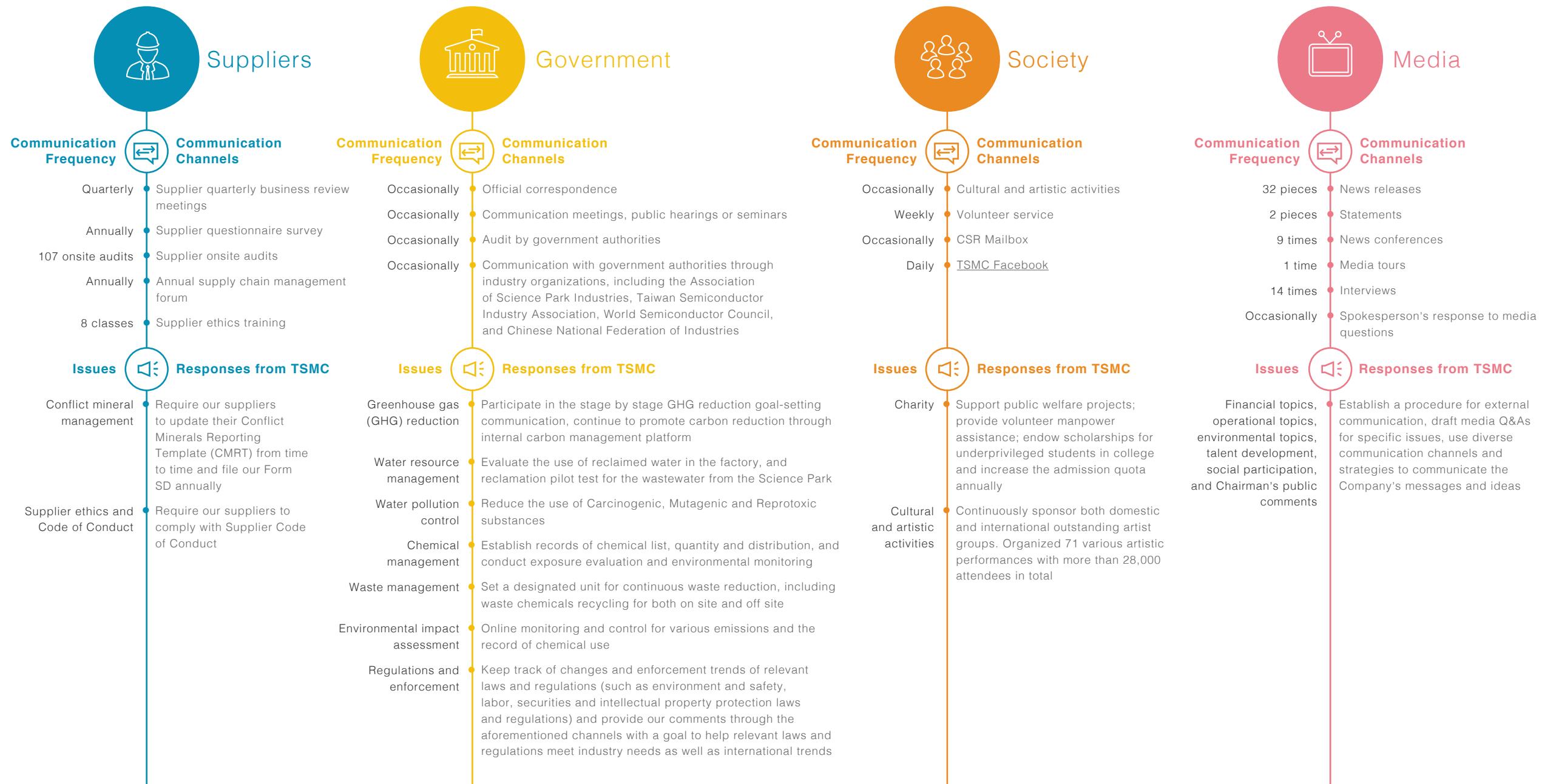
Note 3: Downstream Boundaries: end products destined for customers provided by TSMC
Note 4: ✓ : Material issue and disclosure in this report

2016 Stakeholder Communication

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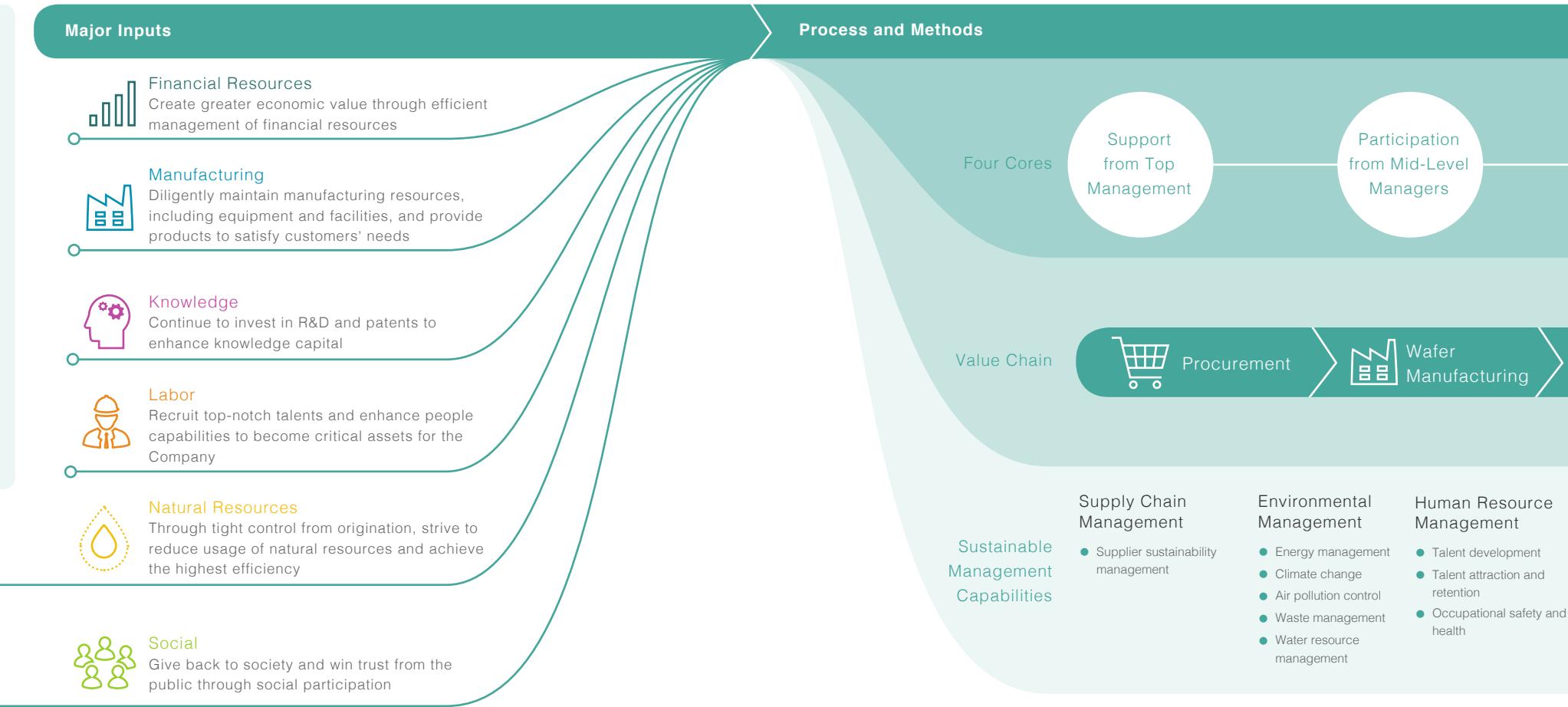
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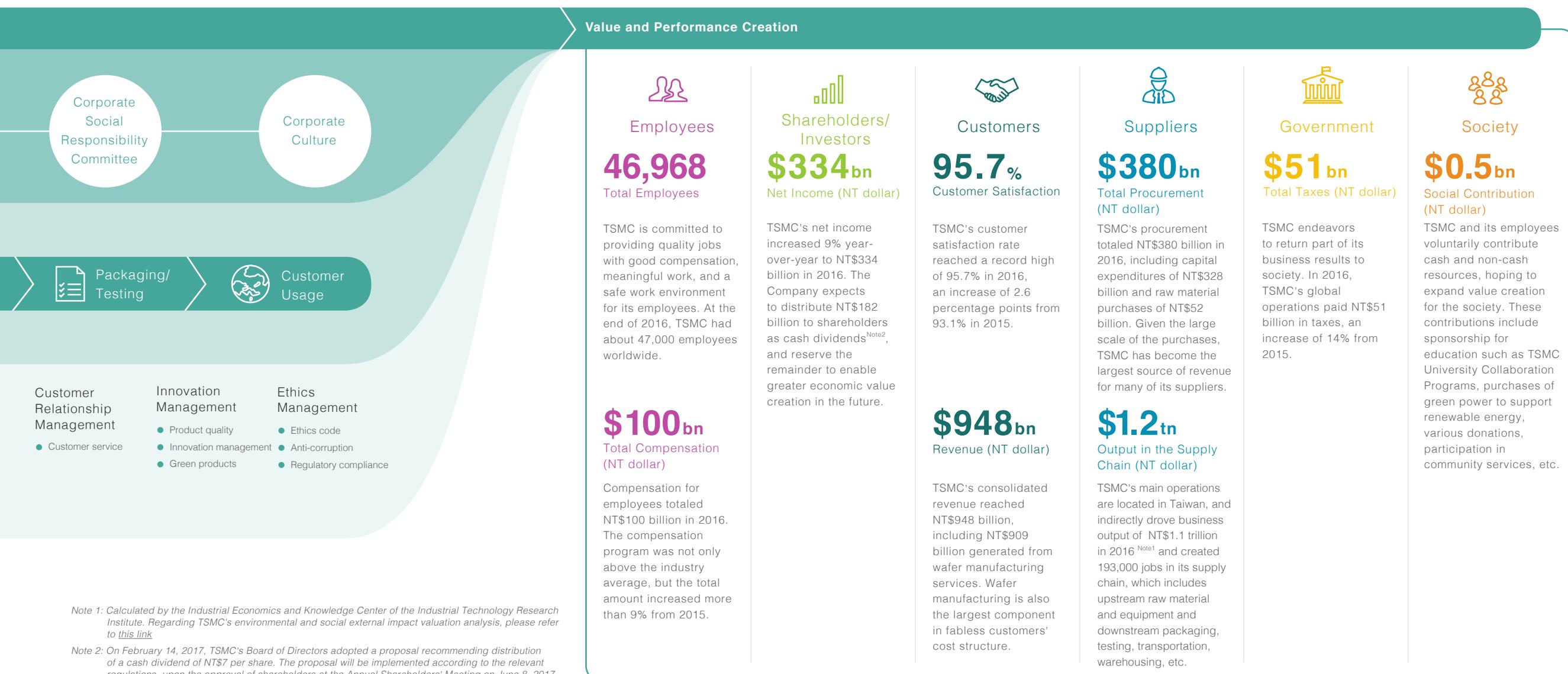
Sustainable Value Creation

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In order to continuously create value for various stakeholders, TSMC applies the Sustainable Value Creation model to its operations. From its six major inputs, such as financial and manufacturing resources, the Company creates corresponding value or performance for its various stakeholders. TSMC's Sustainable Value Creation model is centered around the Company's value chain and business model, and is built on four cores: support from top management, participation from mid-level managers, management of the Corporate Social Responsibility Committee, and corporate culture. In turn, these four cores drive TSMC's six sustainable management capabilities of supply chain management, environmental management, human resource management, customer relationship management, innovation management, and ethics management, to serve as the foundation of improving sustainability performance.



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Responding to the United Nations Sustainable Development Goals

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In 2015, the United Nations (UN) launched 17 Sustainable Development Goals (SDGs), encompassing the economic, environmental, and social dimensions, which are the shared visions of all humanity and an opportunity for corporations to pursue sustainable development. As an important member of global semiconductor industry, TSMC shares the fate of humankind and carries inescapable responsibility for challenges we face. In 2016, we comprehensively examined the relationship between SDGs and TSMC's operations, and discovered that 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) and SDG 13 (Climate Action) are our primary and applicable directions.

To make practical contributions towards the seven SDGs mentioned above and understand their impacts on our operations, TSMC began by reviewing internal practices. The TSMC CSR Committee then integrated multifunctional resources, disclosed our visions for 2020, established measurable and time-based goals, applied SDGs to our organizational culture and daily operations, took corresponding sustainable management actions, and demonstrated our long-term commitments to SDGs. TSMC collaborates with stakeholders including employees, customers, suppliers/contractors and society to welcome the sustainable future with dignified human rights, thriving environment and prosperous society. At the moment, TSMC's efforts with the SDGs are still a work in progress. Our next step will focus on learning the SDG Compass, outlining how to gradually set up an overall structure, embedding SDGs in our corporate decisions, and taking steps towards the sustainable future with shared values.



Quality Education



Mission

TSMC believes the diversity and equality of education plays a key role in enhancing the quality of the entire education system. From elementary school to graduate school, TSMC promotes different types of education, including the aesthetics, sciences and humanities. We have combined the resources of the TSMC Volunteer Program to accompany and guide rural children to read, hoping to eliminate the urban-rural education gap and advance towards a harmonious and equal society.



Sustainable Management Action

- Sponsor Junyi Academy
- Provide scholarships for underprivileged students
- Sponsor Hope Reading program
- TSMC Aesthetic/Science Tour programs
- Reading volunteer program



TSMC Vision 2020

- Continuously cooperate with internal and external institutions to promote education for the underprivileged; invest not less than NT\$10 million per year
- Offer sponsorships for National Tsing Hua University's "Rising Sun Project" and National Central University's "Sunflower Project"
- Donate 100 good books to 200 high schools and primary schools in remote townships of Taiwan
- Hold "TSMC Aesthetic Tour" and "TSMC Science Tour" every year
- Over 30,000 times participation of volunteer activities yearly



Clean Water and Sanitation



Mission

Water is a key resource for semiconductor manufacturing and a dire challenge for survival under extreme climate conditions.



Sustainable Management Action

- Use each drop of process water 3.5 times
- Recycling rate exceeds regulatory requirements
- Establish water recycling facilities



TSMC Vision 2020

- Reduce water consumption per wafer (liter/8-inch wafer equivalent-mask layer) to 30% below the year 2010 level
- Accumulate 12.77 million metric tons in water conserved through new conservation measures by 2025
- Maintain average process water recovery rates above science park administration standards (85%)
- Build effluent reclaim systems to increase water recycling



Affordable and Clean Energy



Mission

TSMC takes the initiative to improve process and products, reducing energy consumption and converting energy usage, while actively purchasing renewable energy for a new generation of affordable energy.



Sustainable Management Action

- Improve energy efficiency
- Buy renewable energy



TSMC Vision 2020

- Reduce unit wafer power usage (kWh/8-inch wafer equivalent-mask layer) to 12% below the year 2010 level
- Accumulate 2,800 GWh in total power conserved from 2016 to 2025

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Decent Work and Economic Growth



Mission

For TSMC, providing competitive compensation and a safe workplace is not only a key factor for retaining talents but also a main factor of job creation.

TSMC provides overall compensation above industry standards, pursues non-discriminatory working conditions through the EICC, and builds a safe employment environment for employees and contractors.



Sustainable Management Action

- Provide competitive pay and benefits
- No child labor
- Disability frequency and severity rates significantly below industry average



TSMC Vision 2020

- In Taiwan, the annual compensation of a newly-graduated engineer with a Master's degree is equivalent to 33 months' salary, outperforming our industry peers
- Consult international standards to promulgate "TSMC Human Rights Policy" and abolish child labor
- Both the disabling frequency rate (lower than 0.37) and disabling severity rate (lower than 4.55) are below the respective averages of Taiwan's semiconductor and electronic parts and components manufacturing industries



Industry, Innovation and Infrastructure



Mission

Innovation is the key for the technology industry to overcome the challenges of global sustainable development. TSMC invests considerable resources each year in technology innovation, not only to strengthen its competitive advantages, but also to bring a higher quality of life to humanity. At the same time, TSMC is establishing innovation-based sustainable competitiveness by combining technological innovation with environmental sustainability, improving energy efficiency and reducing resource consumption.



Sustainable Management Action

- Leading the industry to introduce next-generation technology
- Annual increase in R&D personnel and spending



TSMC Vision 2020

- Volume production of 5nm technology
- Total R&D budget accounts for approximately 8% of total revenue



Responsible Consumption and Production



Mission

As a global leader in sustainable manufacturing, TSMC has introduced the concept of cleaner production and product life cycles, which emphasizes the reduction of resources through proper source management and process control to enable circular economy-based resource recycling. TSMC takes the initiative to monitor wastewater and exhaust gas emission and to actively reduce the use of hazardous substances to achieve the vision of sustainable factories.



Sustainable Management Action

- Waste management
- Air pollution control
- Wastewater treatment
- Hazardous substances management



TSMC Vision 2020

- Waste recycling rate is higher than 95%; waste landfill rate is lower than 1%
- Unit waste output is less than 0.32 kg/8-inch wafer-layer
- Volatile organic gas reduction rate is higher than 90%
- Through 25 different types of chemical waste treatment systems (36 types for new fabs), chemical wastes are transported to our contractors to produce more than 30 types of recycled products that will be circulated for use in other industries



Climate Action



Mission

Climate change is a key sustainable development issue for all humankind. TSMC is actively improving energy efficiency, purchasing renewable energy, promoting climate change mitigation and working with supply chain partners on energy conservation and carbon reduction.



Sustainable Management Action

- Improve energy efficiency
- Reduce greenhouse gas emissions



TSMC Vision 2020

- Reduce unit wafer GHG emission (metric ton - CO₂ equivalent / 8-inch equivalent wafer-layer) to 18% below the year 2010 level
- Reduce unit wafer PFC emission (metric ton - CO₂ equivalent / 8-inch equivalent wafer-layer) to 60% below the year 2010 level
- Reduce total PFC emission (metric ton - CO₂ equivalent) to 20% below the year 2010 level
- Reduce unit wafer power usage (kWh/8-inch wafer equivalent - mask layer) to 12% below the year 2010 level
- Accumulate 2,800 GWh in total power conserved from 2016 to 2025

Governance and Business

A world-class business leader must be held to world-class ethics standards. This is the spirit of TSMC, and its key to success. To achieve high ethical standards, TSMC values corporate governance and acts upon operational transparency. We continuously create added value for the Company based on our core values and sound internal management. TSMC is committed to the welfare of its stakeholders. We believe an impartial and independent Board of Directors and a clearly defined management team can balance the benefits of employees, shareholders/investors, customers, suppliers, and society.

“
TSMC commits to growing our business in a sustainable manner and has built a solid framework of corporate governance. We are attentive to risks associated with our operation, and have adopted a robust risk management program. TSMC has set “Integrity” as one of its most important core values, and proactively communicates with employees through multiple channels to reinforce our culture of ethics and compliance. We further extend this core value to our suppliers to ensure that “Integrity” is a common ethical standard of our supply chain.

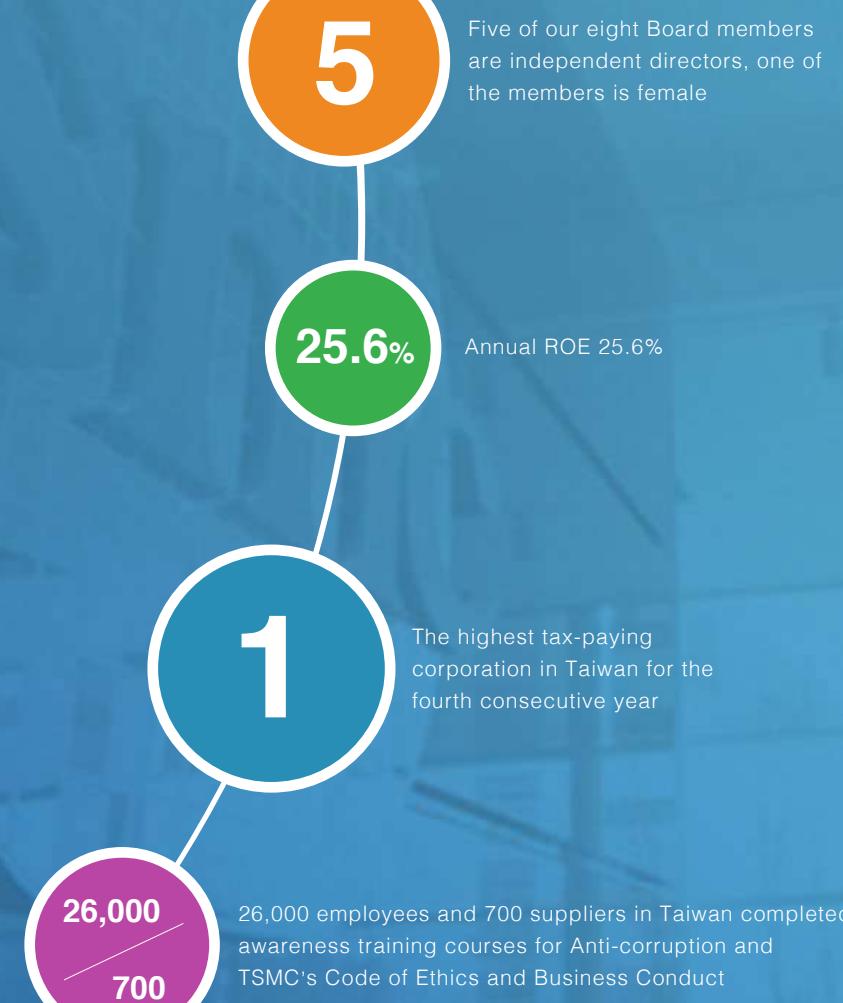
Sylvia Fang
Vice President and General Counsel

“
TSMC has been consistently one of the top five holdings in Overlook Investment's portfolio for 17 years. The performance of our investment in TSMC has been nothing less than spectacular; compounding at 13.62% per year. Over the last nine or ten years I have described TSMC to Overlook's investors as the “finest public company in Asia” and you have never let me down. Indeed, our long-term relationship with TSMC certainly ranks as one of Overlook's proudest achievements during our 25-year history.

Richard H. Lawrence, Jr.
Executive Chairman, Overlook Investments

“
TSMC has developed and regularly updates a comprehensive enterprise risk management and business continuity program to protect all stakeholders' interests. Chubb believes that with its capabilities in business continuity and crisis response, TSMC will always be a trustworthy business partner to its insurers and all stakeholders.

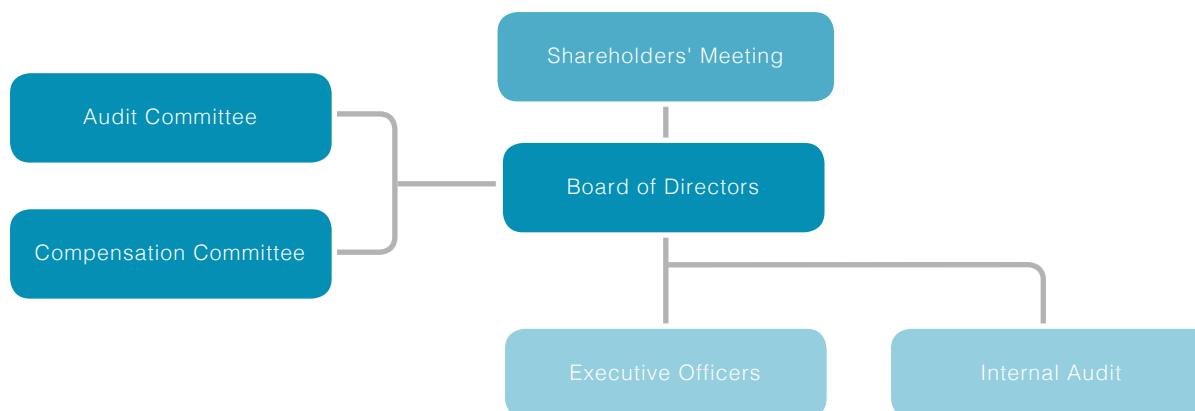
Edward Tseng
Country President, Taiwan Chubb



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, the TSMC Board delegates various responsibilities and authority to two Board Committees, Audit Committee and Compensation Committee. Each Committee has a written charter approved by the Board. Each Committee's chairperson regularly reports to the Board on the activities and actions of the relevant committee. The Audit Committee and Compensation Committee consist solely of independent directors.

Governance Structure



Board of Directors

Board Structure

As the highest governance body, TSMC's Board of Directors consists of eight distinguished members with a great breadth of experience as world-class business leaders or professionals. Five of the eight members are independent directors, and one of the members of the Board Directors is female. The number of Independent Directors is more than 50% of the total number of Directors.

We do have one major shareholder on our Board, i.e. the National Development Fund, Executive Yuan, R.O.C., which is also one of our largest shareholders. It has served as our director since our founding. As a corporate entity, the National

Development Fund, Executive Yuan, R.O.C. is required to appoint a representative to act on its behalf. The Chairman and Vice Chairman of the Board of Directors are not executive officers of the Company. The Board approved the appointment of two members of our senior management team to jointly serve as the President and Co-Chief Executive Officer of TSMC. These two Co-CEOs report to and perform such duties as designated by the Chairman of the Board.

Board Responsibilities

Under the leadership of Chairman Dr. Morris Chang, TSMC's Board of Directors takes a serious and forthright approach to its duties and is a dedicated, competent and independent Board.

In the spirit of Chairman Chang's approach to corporate governance, a board of directors' primary duty is to supervise. The Board should supervise the Company's: compliance with relevant laws and regulations, financial transparency, timely disclosure of material information, and maintenance of the highest integrity within the Company. TSMC's Board of Directors strives to perform these responsibilities through the Audit Committee and the Compensation Committee, the hiring of a financial expert for the Audit Committee, and coordination with the Internal Audit department.

The second duty of the Board of Directors is to evaluate the management's performance and to appoint and dismiss officers of the Company when necessary. TSMC's

management has maintained a healthy and functional communication with the Board of Directors, has been devoted in executing guidance of the Board, and is dedicated in running the business operations, all to achieve the best interests for TSMC shareholders.

The third duty of the Board of Directors is to resolve the important, concrete matters, such as capital appropriations, investment activities, dividends, etc.

The fourth duty of the Board of Directors is to provide guidance to the management team of the Company. Quarterly, TSMC's management reports to the Board on a variety of subjects. The management also reviews the Company's business strategies with the Board and updates TSMC's Board on the progress of those strategies, obtaining Board guidance as appropriate.

Audit Committee Responsibilities

The Audit Committee assists the Board in fulfilling its oversight of the quality and integrity of the accounting, auditing, reporting, and financial control practices of the Company. Under R.O.C. law, the membership of the Audit Committee shall consist of all independent Directors. TSMC's Audit Committee satisfies this statutory requirement. The Committee also engaged a financial expert consultant in accordance with the rules of the U.S. Securities and Exchange Commission^{Note}. The Audit Committee annually conducts self-evaluation to assess the Committee's performance and identify areas for further attention.

Compensation Committee Responsibilities

The Compensation Committee assists the Board in discharging its responsibilities related to TSMC's compensation and benefits policies, plans and programs, and in the evaluation and compensation of TSMC's directors of the Board and executives.

The Compensation Committee is comprised of all five independent directors. The Chairman of the Board, Dr. Morris Chang, is invited by the Committee to attend all meetings and is excused from the Committee's discussion of his own compensation.

Selection and Election of Directors

We envision the membership of its esteemed Board of Directors to be composed of highly ethical professionals with the necessary knowledge, experience and understanding from diverse backgrounds. We envision our Board to be composed of as many independent directors as possible, and the independence of each independent director candidate is also considered and assessed under relevant laws.

Directors shall be elected pursuant to the candidates nomination system as specified in Article 192-1 of the R.O.C. "Company Law". The tenure of office for Directors shall be three years. Under R.O.C. law, 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.

There are no limits on the number of terms that a director may serve. We believe the Company benefits from the contributions of directors who have over their years of dedicated service acquired unique insights into the operations and financial developments of the Company. The Company reviews the appropriateness of each director's continued service to ensure there are new viewpoints available to the Board.

Transition of Responsibilities

In November 2013, following nomination by Chairman Dr. Morris Chang and approval by the Board of Directors, Dr. Mark Liu and Dr. C.C. Wei assumed duties as Presidents and Co-Chief Executive Officers of TSMC, reporting directly to the Chairman. Demonstrating TSMC's steady and deliberate transition of responsibilities, the Board of Directors approved in April 2017 the nomination of Dr. Liu and Dr. Wei to serve as members of the Board, and they will stand for election to the Board at the TSMC Annual Shareholders' Meeting to be held in June 2017.

For more details of [corporate governance and directors'](#) and [executive officers' compensation](#), please refer to TSMC's [2016 Annual Report](#).

Material Issue

Ethics and Regulatory Compliance

Our Strategies

- Reinforce continuously TSMC employees' and suppliers' ethics and compliance awareness through periodic training and communication
- Track, identify and implement regulatory requirements in a systematic manner to ensure compliance with laws

TSMC 2020 Vision

2020 Goals

- The completion rate for employee annual training reaches 95% every year
- No material violation (where the fine exceeds NT\$1 million) of laws and regulations

2016 Targets

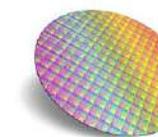
- To reach 95% of completion rate for employee annual training
- To reach 95% of participation rate for communicating with key suppliers in person
- No material violation (where the fine exceeds NT\$1 million) of laws and regulations

2016 Achievements

- | | |
|---|------------|
|  Completion Rate | 96% |
|  Participation Rate | 96% |
|  No material violation | |

2017 Targets

- | | |
|--|------------|
| Completion Rate | 95% |
| Participation Rate | 95% |
| No material violation (where the fine exceeds NT\$1 million) of laws and regulations | |



 Achieved  Surpassed

Code of Conduct and Anti-corruption

Compliance Program

To fulfill our core value of "Integrity", TSMC strictly implements six elements to systematically adhere to the Code and prevent corruption.



In 2016, we provided employees with training regarding the Code and anti-corruption. With a completion rate over 96%, approximately 26,000 employees received this training; to further strengthen the awareness of the employees in the identified organizations (such as operations, R&D, and procurement), approximately 3,000 employees in these organizations also received the face-to-face training.

TSMC not only emphasizes employee self-discipline, it also takes concrete actions to motivate our suppliers to comply with the Code and our suppliers therefore bear an important role in TSMC's implementation of the Code. In 2016, we provided 8 live seminars to over 700 suppliers in Taiwan for a participation rate of 96%, successfully enhancing their awareness of the Code and our reporting channels. In addition to receiving numerous suppliers' positive feedback on the ethics training, we also noticed more whistleblowers reporting potential Code violations through our reporting channels and taking a more proactive role in our investigations.

Also in 2016, TSMC formed an Ethics Committee chaired by our vice president overseeing the Ombudsman System and comprised of the vice presidents of Legal and Human Resource functions and other executives. The Committee supervises investigations of potential ethics violations cases and determines disciplinary action and punishment to be imposed. The Committee also has the authority to oversee the promotion of the Code and our core value of "Integrity".

Whistleblowing

Because of the open reporting channels, TSMC receives reports about various issues from time to time from employees and external parties. Below is a summary of the number of reported incidents over the past three years. No incident related to finance or accounting matters was reported in 2016. However, with respect to the trend of general reporting, we noticed an increase of reports we received via our reporting channels for two consecutive years since 2014. As mentioned above, we also believe our vendors/vendors have been more forthright during recent

fraud investigations. We attribute the increase in the report numbers and the positive attitude of the fraud reporters to our enhanced ethics awareness promotion activities targeting our employees and suppliers in 2015 and 2016.

We do not tolerate any violation of the Code and treat every received case and possible violation incident seriously. Any violator of the Code (or relevant regulations) will be severely disciplined to the full extent of our policies and the law, under the supervision of the Ethics Committee, up to

and including immediate dismissal, termination of business relationship, and judicial prosecution as appropriate on a case by case basis. Taking a Code violation investigation in 2016 as an example, we initiated an investigation as soon as we received the report. After confirming that the involved employee was receiving an inappropriate monthly NT\$10,000 consulting fee from a supplier, we terminated the employment relationship immediately due to the serious nature of the violation of the Code. The case was later reported by the news media in 2017.

Regulatory Compliance

As an international company, TSMC operates in multiple regions and is required to comply with the law requirements in multiple countries. Therefore, to manage our regulatory compliance program in an efficient manner, we established the Code as the heart of the program and implement the program through conducting risk assessments and considering our stakeholders' focused areas to identify the most important regulatory compliance topics.

TSMC has promulgated policies, guidelines and procedures in different compliance areas, including (but not limited to):

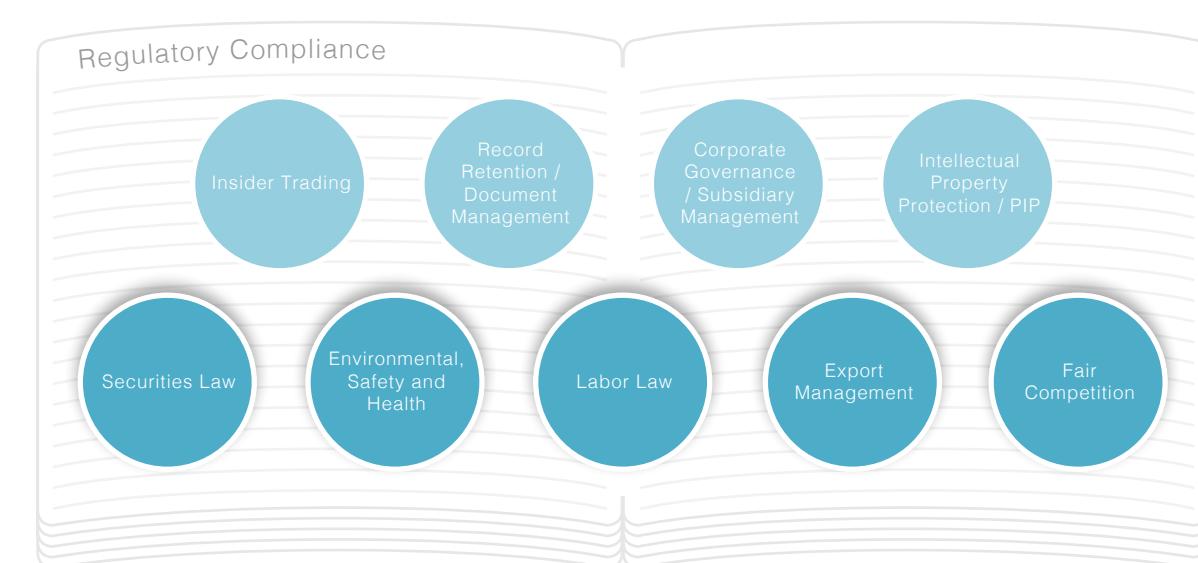
Summary of 2014 ~ 2016 Reported Incidents

Category	FY 2014	FY 2015	FY 2016
Incidents Reported to the Ombudsman System	39	60	80 ^{Note1}
Incidents Reported to the Audit Committee Whistleblower System	-	-	1
Incidents Reported to the Irregular Business Conduct Reporting	22	16	35 ^{Note2}
Total incidents reported	61	76	116
Total incidents investigated as founded	-	-	2 ^{Note3}
Sexual Harassment Investigation Committee	4	7	5
Total incidents investigated as founded	4	7	5

Note 1: Among the 80 cases, no incidents related to ethics matters

Note 2: Among the 35 cases, 15 cases related to ethics matters

Note 3: Two employees involved in these two cases separately were discharged after TSMC's investigation confirmed their violation of the Code. TSMC also pressed criminal charge against one of the employees, and the case is currently under investigation by the authority



Focus of our 2016 Regulatory Compliance Program

Export Management

Major policy

TSMC Export Management Policy and Export Control Management Guidelines

Control mechanism

- TSMC's Export Management System (EMS) was established to ensure compliance with all applicable regulations covering the export of items that are classified as Strategic High-Tech Commodities. TSMC's EMS was certified by the Bureau of Foreign Trade, the Taiwan export control authority, as a qualified ICP (Internal Compliance Program) exporter.

To help build a more secure global supply chain, TSMC shared our experience on EMS implementation with third parties in the Workshop on Strategic Trade Controls in the Asia-Pacific, held by CSIS (Center of Strategic & International Studies) in 2016.

Fair Competition

Major policy

TSMC Antitrust Compliance Guidelines

Control mechanism

- We required relevant personnel to receive compliance training.
- We continuously reviewed the business models and behaviors of the company to ensure their compliance with antitrust laws.

We requested suppliers to sign an updated version of Letter of Assurance (the "LoA") in which suppliers must promise not to engage in unfair competition. In 2017, we will encourage more suppliers to sign the LoA and target to have 80% of current suppliers and 100% of our new suppliers sign the LoA.

Environmental, Safety and Health

A two-pronged approach to ensure compliance

- Our Environmental, Safety and Health ("ESH") Division tracked changes and updates of relevant laws and regulations and notified relevant departments through Total ESH Management, an internal electronic platform (the "TEM"), to take corresponding actions. These departments used the TEM to document timely completion of necessary action items. Each individual fab's ESH Section conducted internal compliance audits of the fab's daily operation, while the corporate ESH Division conducted its annual audits of every fab on ESH compliance to identify potential risks of violation of laws or internal rules.
- In parallel, our Legal Organization also kept track of changes and updates of relevant laws and regulations and notified ESH Division, as well as providing legal advice, to take corresponding actions.

We communicated with Taiwan authorities, providing our suggestions at early stages of legislation to help set reasonable standards for enforcement of relevant prospective laws and regulations.

Securities Law

A two-pronged approach to ensure compliance

Since TSMC is listed on the TWSE and NYSE, TSMC must comply with the securities laws of both Taiwan and the U.S.

- Our Finance Organization kept track of changes and updates of relevant laws and regulations and notified the relevant departments to take corresponding actions.
- In parallel, our Legal Organization also kept track of changes and updates of relevant laws and regulations and notified relevant departments, as well as providing legal advice, to take corresponding actions.

We communicated with Taiwan authorities, providing our suggestions with regard to legislation to help relevant prospective laws and regulations meet industry needs as well as international trends.

Labor Law

A two-pronged approach to ensure compliance

- Our Human Resources Organization ("HR") kept track of changes and updates of relevant laws and regulations and notified the relevant departments to take corresponding actions.

- In parallel, our Legal Organization also kept track of changes and updates of relevant laws and regulations and notified HR, as well as providing legal advice, to take corresponding actions.

2016 Regulatory Compliance Training and Promotion



Live Seminars

Ethics Code

- To Do & Not to Do (0.5 hour)
- Audience: TSMC employees (including TSMC subsidiaries)
- Pre-departure Training for Overseas Assignees (1 hour)
- Audience: Overseas assignees
- Making TSMC's Ethical Standards Your Behavioral Standards (1 hour)
- Audience: TSMC suppliers in Taiwan

Export Control

- Export Management Compliance (1 hour)
- Audience: Import & Export team and HR

Environment, Safety and Health

- Waste Management Cases Sharing (1 hour)
- Audience: Corporate-ESH and Waste Resource Management



eLearning Courses^{Note}

Ethics Code and Regulatory Compliance

- Annual Promotion
- Topics:
 - » Anti-corruption
 - » Avoidance of Conflicts of interest and Declaration
 - » Reporting channels and whistleblower rights
 - » Export Control
 - » Insider Trading
 - » Personal data protection (Privacy)

Ethics Code

- To Do & Not to Do

Sexual Harassment

- Annual Promotion

Proprietary Information Protection (PIP)

- Annual Promotion



Poster Awareness Promotion

Ethics Code and Regulatory Compliance

- Annual Promotion

Ethics Code

- Did You Blow the Whistle? Report a Violation You are Protected

Export Control

- Be a Hero
- Start by Knowing the Product and Where It's Going

Insider Trading

- Buying TSMC Customer or Vendor Stock May Also Buy You Trouble

Personal Data Protection (privacy)

- Am I Violating Personal Data Protection Rules?
- Go to the Privacy FAQ and Find out!

Records Retention and Disposal

- Annual Promotion

WorldECR

**Export Controls
Compliance
Team of the Year
Rest of the World 2016**

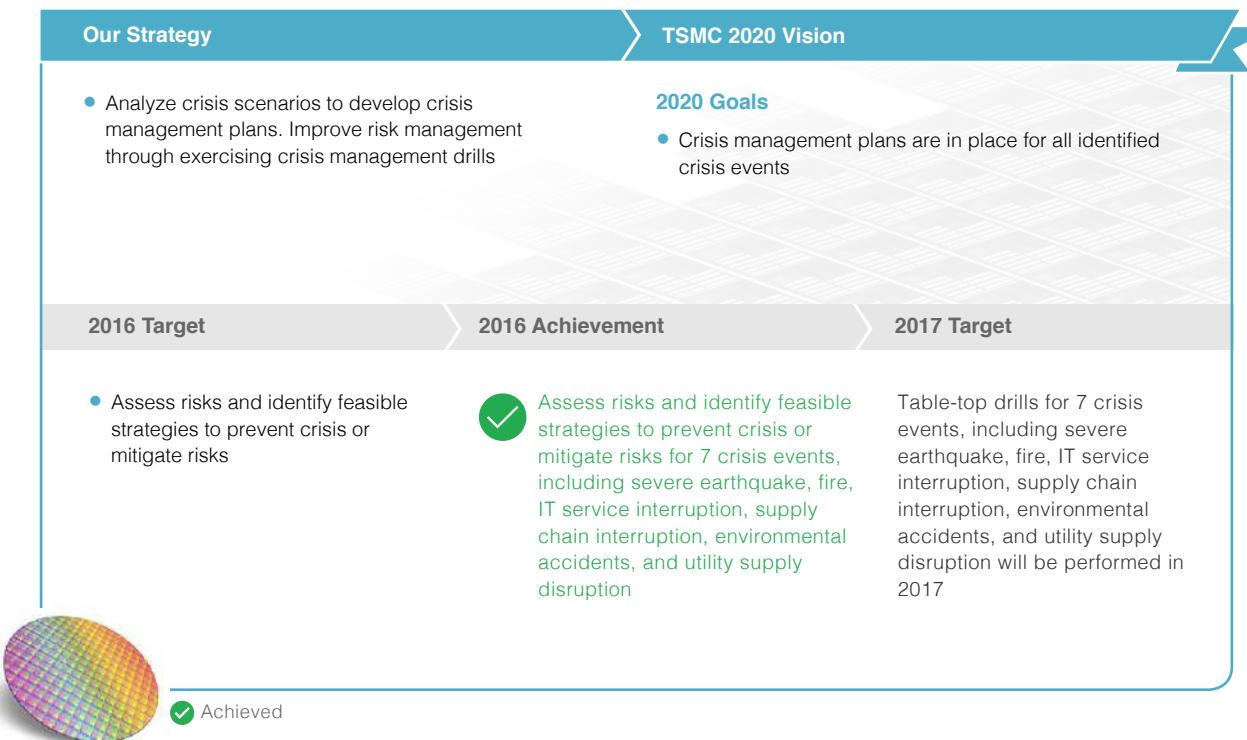
TSMC

In 2016 TSMC was recognized by World Export Control Review (World ECR), a well-known professional journal in U.K., as the best Export Controls Compliance team of the year for the Rest of the World. TSMC is the first company in high tech industry outside USA and Europe, as well as the first company in Taiwan, to win the trophy.

Note: The feedback we receive from trainees on compliance eLearning has been very positive, rating above 90%

Material Issue

Risk Management

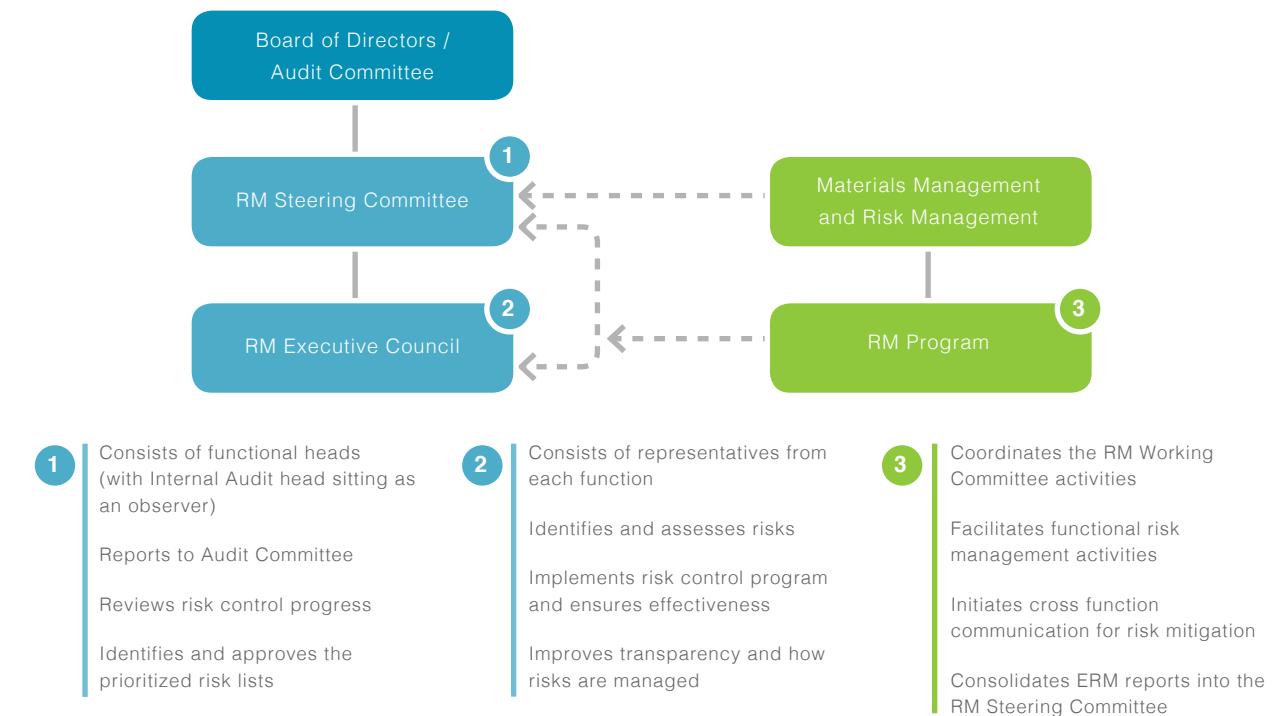


In an ever-changing risk environment, establishing integrated enterprise risk management and crisis management capabilities are the fundamentals for business maintaining its sustainability and competition. TSMC operates an Enterprise Risk Management (ERM) program based on both its corporate vision and its long-term sustainability, as well as on its responsibility to both industry and society. ERM seeks to provide the appropriate management of risks

by TSMC on behalf of all stakeholders. A Risk Map that considers likelihood and impact severity is applied for identifying and prioritizing corporate risks. Various risk treatment strategies are also adopted in response to identified corporate risks. TSMC's risk management assessed risks from strategic, operational, financial and hazardous events perspectives.

Risk Management Organization

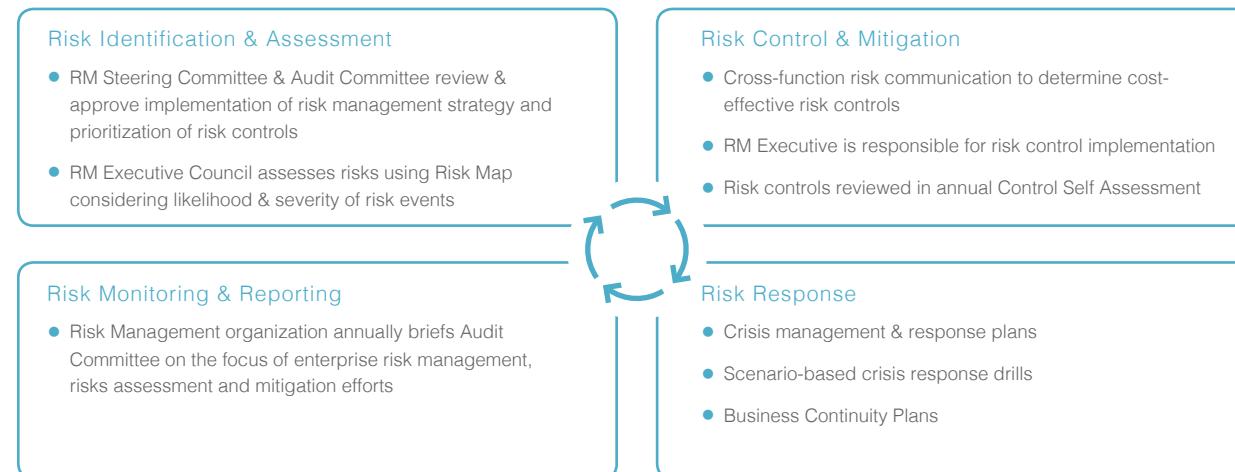
TSMC's Risk Management organization annually briefs the Audit Committee on the focus of enterprise risk management, risk assessment and mitigation efforts. Our Audit Committee's Chairperson also briefs the Board on such discussion and actions.



Scope of Risk Management

Strategic Perspective	Operational Perspective	Financial Perspective	Hazardous Events
<ul style="list-style-type: none"> Regulatory change & compliance Government policies Changes in technology & industry Technology development & competition Demand & capacity expansion 	<ul style="list-style-type: none"> Sales & purchase concentration Intellectual property rights Recruiting qualified personnel Corporate image 	<ul style="list-style-type: none"> Interest rate, foreign exchange, inflation & deflation External financing High-risk/high-leveraged investment, financial derivative transactions Strategic investments 	<ul style="list-style-type: none"> Earthquake & natural hazards Fire or chemical spill Climate change

Enterprise Risk Management Framework



Focus & Achievements of Enterprise Risk Management in 2016

TSMC believes being crisis prepared is a responsibility for a sustainable business. Therefore, TSMC continuously improves our risk management implementation. Regarding impact resulting from the earthquake on Feb 6, 2016, TSMC reviewed the earthquake resilience from both technical and management perspectives. Improvements in anti-seismic capability of production tools and facilities were conducted with support from seismic experts. An internal forum on earthquake preparedness and response enhancement was held on Dec 8, 2016. At the forum, 180 staff members participated in a cross-function discussion focusing on enhancing anti-seismic capability. A total of eight new Standard Operation Procedures (SOPs) were issued and 20 existing anti-seismic related SOPs were revised. To mitigate the impacts of crisis events, including severe earthquake, fire, IT service interruption, supply chain interruption, environmental accidents, and utility supply disruption, a central crisis response procedure has been set. The central crisis command center would be chaired by a Co-CEO for more efficient cross-fab coordination and mutual support. To increase risk awareness in TSMC, three cross function crisis management trainings involving 80 staff members were conducted in 2016. To improve quality of enterprise risk monitoring and reporting, functions' risk identification, risk assessment, and risk controls have been registered in the GRC (Governance, Risk & Compliance) system for tracking.

Focus & Achievements of Enterprise Risk Management in 2017

To continue driving functions to achieve the goal of crisis management following 2015, a crisis response drill involving 80 staff members was held on Feb 17, 2017. For crisis events, including severe earthquake, fire, IT service interruption, supply chain interruption, environmental accidents, and utility supply disruption, table-top drills will be performed in 2017 to examine the crisis response plan's feasibility. To ensure effective risk controls, 54 internal controls related to enterprise risk management were identified and will be reviewed in an annual Control Self Assessment conducted by Internal Audit.

Case Study



Earthquake Continuity Plans Surpassing Legal Requirements

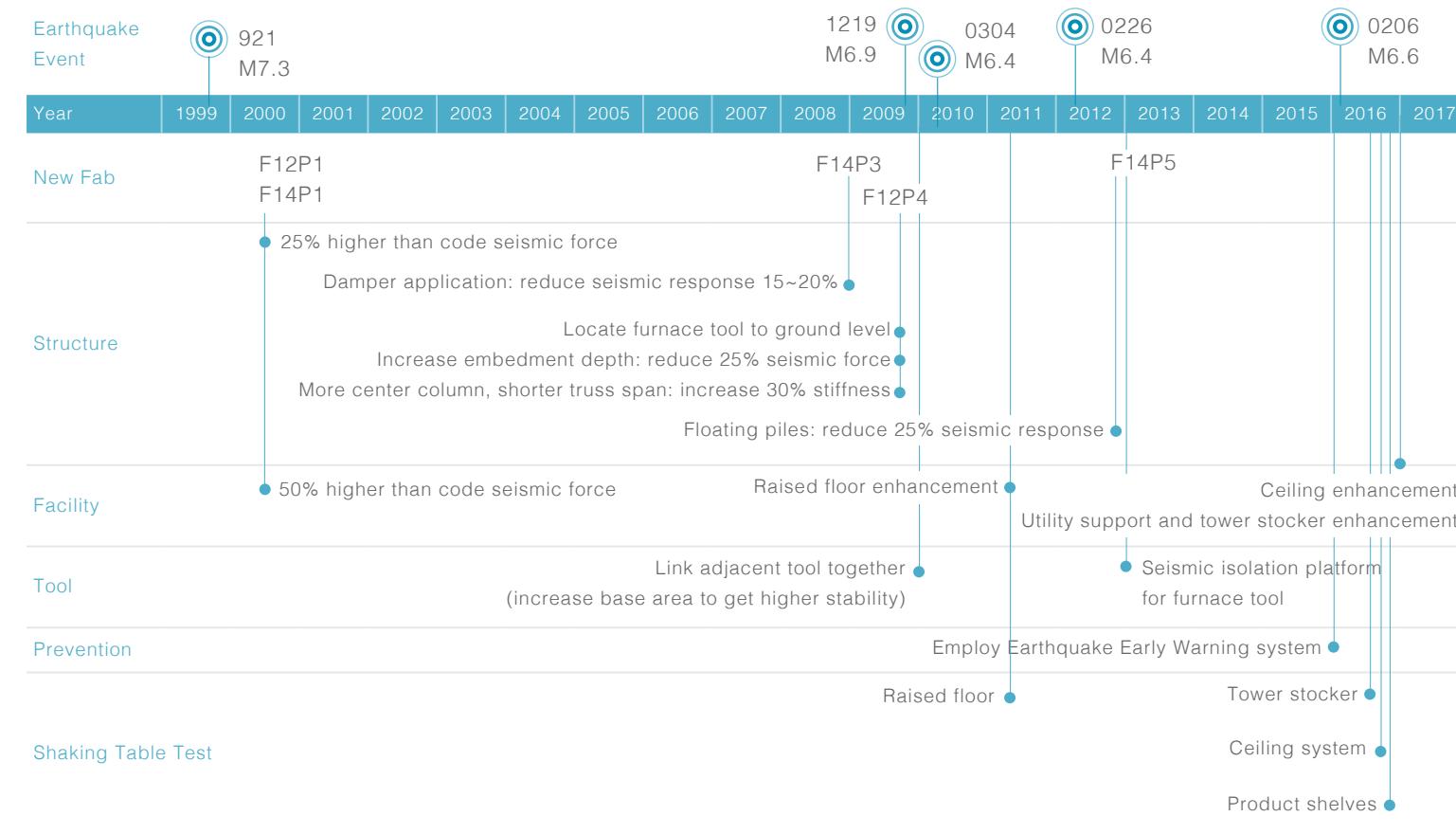
Following the September 21, 1999, Chi-Chi earthquake in Taiwan, TSMC has laid down a series of earthquake protection management plans surpassing legal requirements. The company has conducted a comprehensive investigation on all buildings and facilities, set up dampers to improve building structures, and adopted new anti-seismic technologies and methodologies to assess and control the risks.

TSMC's strategy is to simultaneously enhance the seismic resistance of facilities along with emergency response skills. On February 6, 2016, another earthquake struck southern Taiwan, in Mei-Nong District of Kaohsiung. It was the most powerful earthquake experienced by TSMC Fab 6 and Fab 14 in Tainan Science Park. With the above anti-seismic methodologies, TSMC's Fabs were safe from structural damage, chemical leakage, process tools misalignment, fire and casualty.

Pioneering Anti-seismic Methodologies

Year	Methods
2000	The seismic coefficient was improved beyond legal requirements by as much as 25% for main structure of new buildings, 50% for nonstructural components. New seismic anchorage was installed onto equipment and facilities.
2008	The greatest potential earthquake hazard analysis of each site, evaluation of anti-seismic ability of hardware facilities. Dampers were installed along with new Fab; seismic response was reduced by 15 - 20%.
2012	Floating piles were installed in new Fabs of Tainan Science Park, which decreased seismic amplitude by 25% in the Fabs. Evaluation of raised floor shaking table test and improvement of process tool anchorage.
2013	Installation of seismic isolation platform onto furnace tool.
2015	Establishment of Earthquake Early Warning System
2016	Additional stoppers were installed for tower stocker to prevent sliding and ceiling bracings added to strengthen ceiling.

TSMC Anti-seismic Methodologies Timeline



Following Mei-Nong Earthquake, in addition to comprehensive investigations toward damaged equipment, a post-earthquake improvement program was implemented immediately in the company, to reinforce building and facility seismic durability.

Continue on next page

Continued from previous page

Post-earthquake Enhancement Actions



Actions

External Experts Consultation	Inviting earthquake engineering experts from Taiwan, the U.S. and Japan to the three-day "Earthquake Hazard Reduction Workshop" in TSMC
Improvement of Building Seismic Coefficient	TSMC improved seismic resistance of all the Fab's, the seismic coefficient was enhanced and surpassed government regulation by 1.25 times for main structure and 1.5 times for Nonstructural components.
Seismic-resistance Assessment of Existing Buildings	Conducting a comprehensive investigation of existing buildings with the latest Pushover method of external experts to reinforce building structures according to standards surpassing government regulations. The construction started in 2017.
Reinforcement of Seismic Resistance Ability for Facility Systems	Enhancing anti-seismic ability of hardware facilities, such as wafer storage tanks, clean room ceilings, walls, tanks and chemical lorry.
Cooperation with National Center for Research on Earthquake Engineering (NCREE) on Shaking Table Tests	Site inspections and seismic resistance verification: <ul style="list-style-type: none"> ● Wafer storage tanks: setting up stopper ● Ceilings: improving bracings ● Product shelves: anchoring onto floors or walls
Renewal of Earthquake Management Regulations	Review and renew four internal regulations on earthquake protection and define the responsibilities. Seismic operating procedures were established and all items were verified with drill practices. The improvement approaches and post-earthquake response procedures were included into official management regulations of the company. The assessment was performed based on the OHSAS 18001 system.
Holding Earthquake Protection Workshops	The 180 earthquake protection guards were fully trained with seismic knowledge and practices to ensure their ability to perform their duties. A cross-Fabs audit will be carried out in 2017 to examine the implementation of seismic resistance plans.
The guiding principles of TSMC earthquake management policy are "Zero casualty, short operation recovery time and least impact on customers". Cross-Fabs post-earthquake emergency response procedures and business continuity plans were established according to these guiding principles. Constantly and systematically, TSMC minimizes damage caused by earthquakes and enhances anti-seismic ability.	

Proprietary Information Protection

TSMC understands Proprietary Information Protection is the key to maintaining TSMC's current and future competitive advantages. Therefore TSMC not only established its Proprietary Information Protection policy and related regulations to control and manage TSMC trade secrets, but also implemented the management mechanism of PDCA (Plan-Do-Check-Act) to enhance the capability of Proprietary Information Protection and employees' awareness to ensure the best interests of the company, shareholders, employees, customers and suppliers.

Plan

Establish guidelines, management procedures and regulations

Do

Enforce Proprietary Information Protection controls
Conduct awareness training and promotions

Check

Perform regular audits and handle violations

Act

Improve defects to strengthen the capability of Proprietary Information Protection

In addition, TSMC adopted special security management in IC manufacturing processes to not only comply with customers' security requests but also passed relevant security audits and certifications. For example, F14A obtained ISO 15408 site security certification in 2016 to provide more secure protection of IC manufacturing process on security products such as chips on identity certification, as well as debit card and credit card for customers. Moreover, TSMC passed all security audits in 2016 from customers to further enhance the trust and partnership between TSMC and customers.

2016 Proprietary Information Protection Enforcement Result

1,000

Invited over 1,000 suppliers to six PIP promotion and communication sessions

100%

All newcomers completed Proprietary Information Protection training courses

9

Newly created or revised nine Proprietary Information Protection regulations to ensure more robust Proprietary Information Protection.

2 million
headcounts

Conduct PIP audits over two million headcounts monthly

- PIP prohibited item inspection
- Physical access compliance check
- Confidential information handling
- Email handling

45,000

Over 45,000 employees completed Y2016 Proprietary Information Protection annual refresh e-learning course.
Course content:

- PIP policy and regulations
- PIP prohibited item rule communication
- Physical security and badge regulations
- Tips for confidential information transmission and sharing
- How to correctly operate computer devices and access networks
- PIP violation case studies and reminders
- Reinforce PIP promotion and communication
- Enhance outgoing email and document printing management
- Review users' access privilege to information

1%

Employee PIP violation rate: 1%
Main Cause: individual negligence or failure to comply with PIP procedures.
Corrective actions:

Material Issue

Financial Performance



TSMC believes that good financial performance is key to corporate sustainability and creating greater economic value for our stakeholders, including shareholders, employees, customers, suppliers, government, community, and others. Financial performance is particularly important to shareholders, as it often plays a decisive role in Company's investment value.

As financial performance is mainly determined by revenue growth and consistent improvement in profitability, TSMC continued to invest in process technologies and capacity, maintain trusting relationships with customers, and pursue growth in revenue and market segment share, while maintaining or improving profitability and investment returns. Committed to increase shareholder value, TSMC has set clear strategic financial objectives. These strategic financial objectives include: (1) average ROE across cycle greater or equal to 20%; (2) net income compounded annual growth rate from 2015 to 2020 between 5% and 10%.

Financial Performance



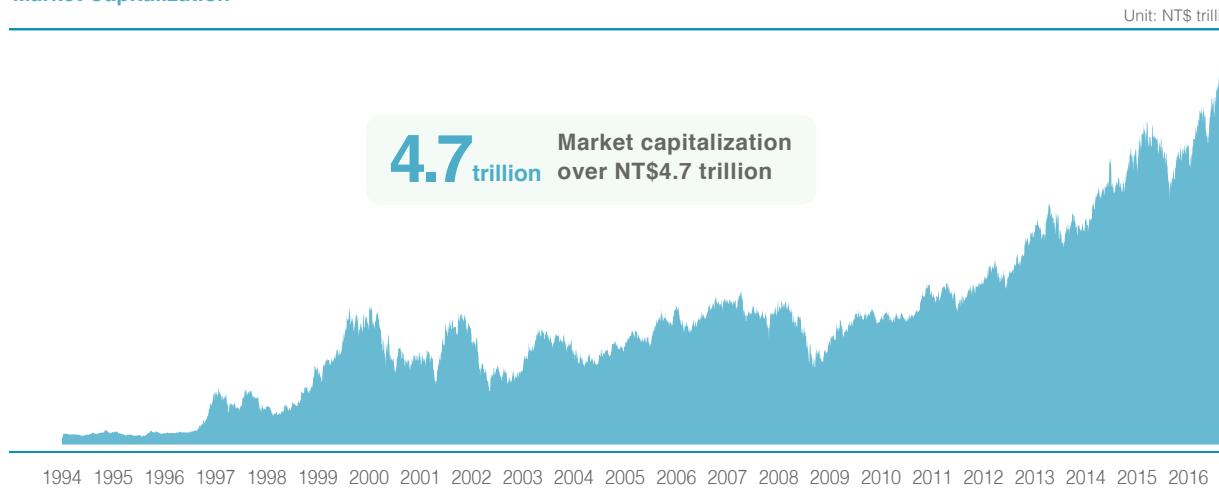
These financial objectives can help investors better understand TSMC's long-term investment value, while its financial track record gives investors high confidence in TSMC's capability to achieve these financial objectives. For example, during the past 10 years, TSMC's averaged ROE was 24% and CAGR for operating income was 11%, both of which met our long-term financial objectives.

Applying long-term financial objectives to the year of 2016, TSMC had targeted (1) ROE to be greater or equal to 20%; (2) net income growth rate to be between 5% and 10%. As 2016 concluded, TSMC delivered 12% growth in revenue,

9% growth in net income, and 26% in ROE; both of the annual targets were met in 2016.

Supported by solid financial performance, TSMC's stock performance including cash dividends increased 32% during 2016, marking 8 consecutive years of annual growth. Since the Company went public in 1994, TSMC has been profitable every year and TSMC's market capitalization has grown steadily. As of December 31, 2016, TSMC's market capitalization reached above NT\$4.7 trillion or US\$146 billion.

Market Capitalization

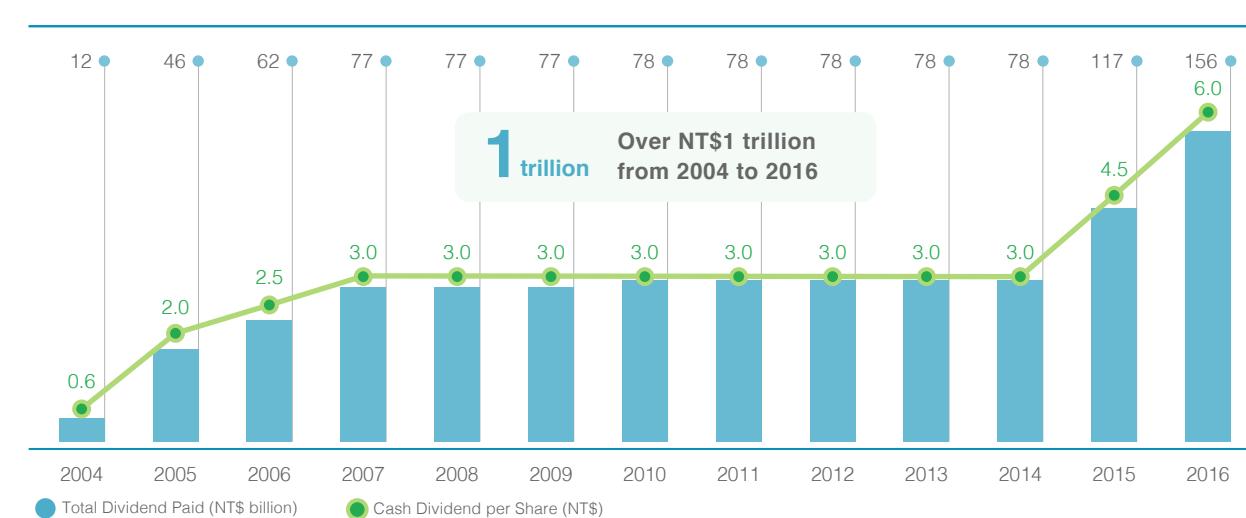


Dividend Policy

TSMC's solid financial performance enables the Company to distribute profits to shareholders in the form of dividends. TSMC commits to its dividend policy that TSMC will maintain a stable and sustainable dividend policy, and will consider raising dividend per share when the free cash flow is sufficient to cover the previous level of dividend payment and any debt repayment. Starting from 2004, TSMC has distributed cash dividends to our shareholders each year. As free cash flow significantly improved in 2015 and 2016,

TSMC increased cash dividend per share paid in 2016 by another 33% to NT\$6 per share. From 2004 to 2016, TSMC has paid out more than NT\$1 trillion, or US\$32 billion, in cash dividends. On February 14, 2017, TSMC's Board of Directors adopted a proposal recommending distribution of a cash dividend of NT\$7 per share. The proposal will be implemented according to the relevant regulations, upon the approval of shareholders at the Annual Shareholders' Meeting on June 8, 2017.

Cash Dividend



Credit Rating

Since becoming a publicly listed company in 1994, TSMC has consistently delivered value to shareholders through cash dividends and share price appreciation, maintaining a strong balance sheet, and keeping one of the highest credit ratings among global semiconductor companies and Taiwan companies (Standard & Poor's (S&P) Ratings: A+; Moody's Ratings: A1; Taiwan Ratings: twAAA).

A+

Standard & Poor's (S&P) Ratings

A1

Moody's Ratings

twAAA

Taiwan Ratings

Tax Policy

TSMC supports tax policies and incentives that encourage innovation and foster economic growth. We aim for our tax approach to be transparent and sustainable in the long

term, and commit to the following:

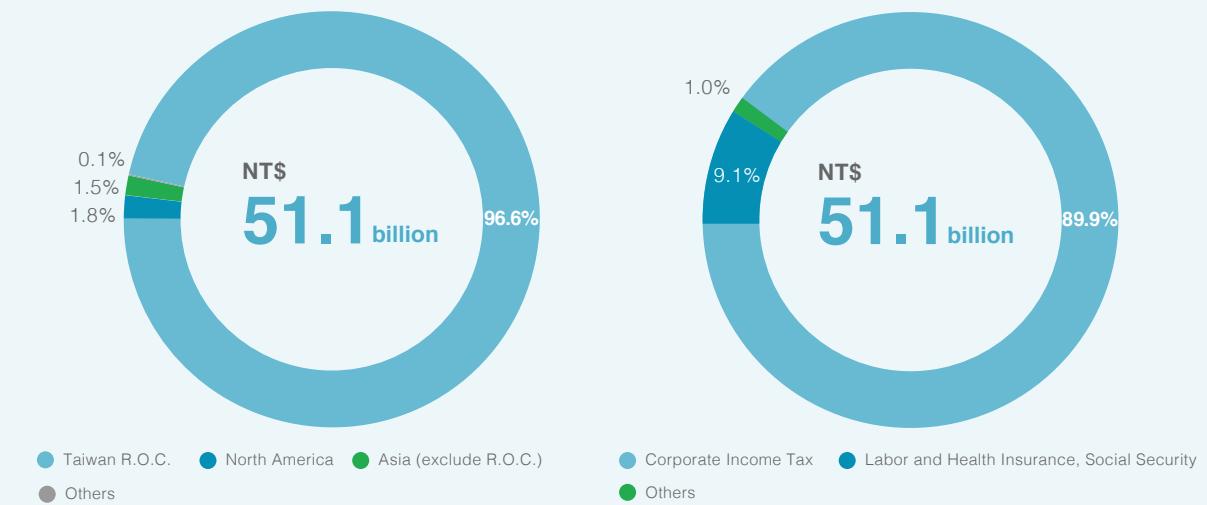
1. Act at all times in accordance with all applicable laws and regulations.
2. Be transparent in financial reporting. Disclosures are made in accordance with applicable regulations and reporting requirements.
3. Do not undertake transactions whose sole purpose is for tax avoidance.
4. Develop strong, mutually respectful relationships with tax authorities based on transparency and trust.
5. Always consider tax as part of major business decisions.
6. Analyze the operating environment and assess tax risk through corporate management mechanism.

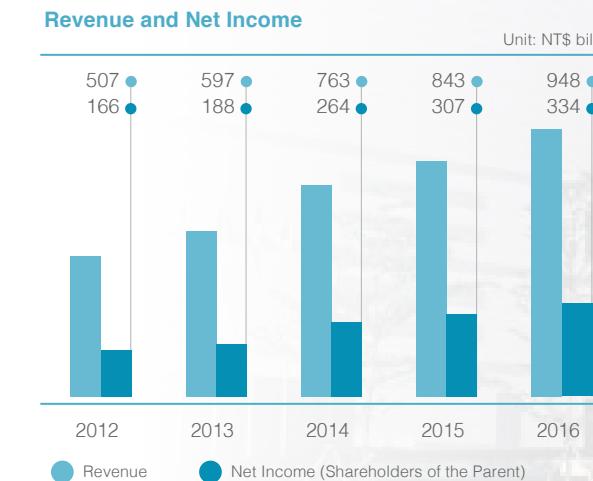
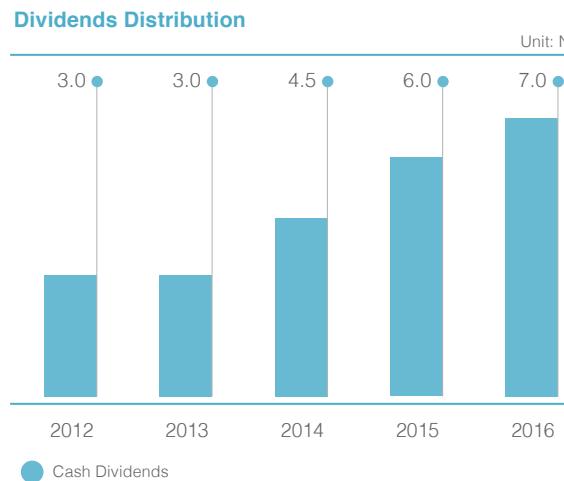
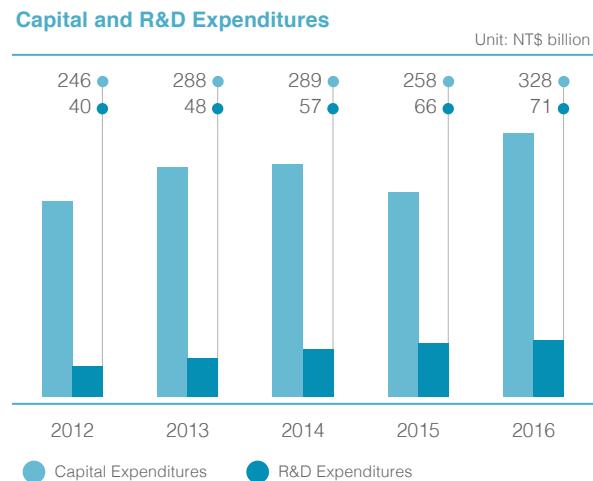
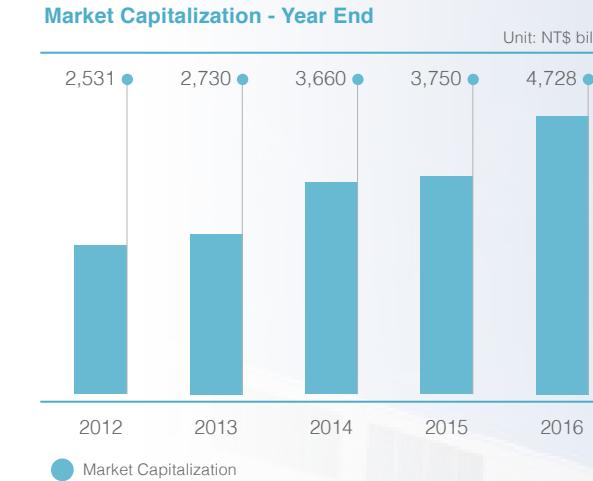
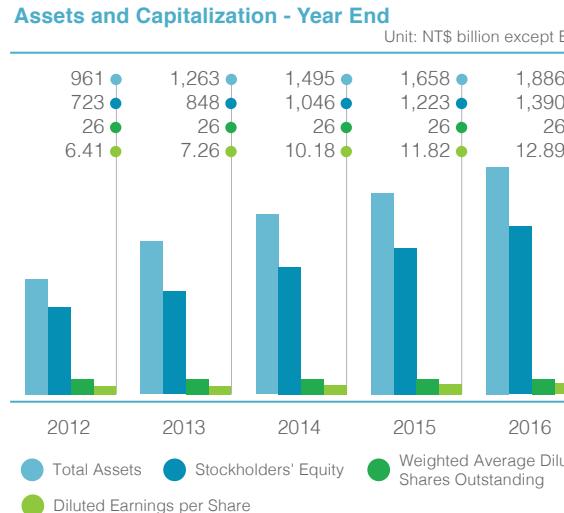
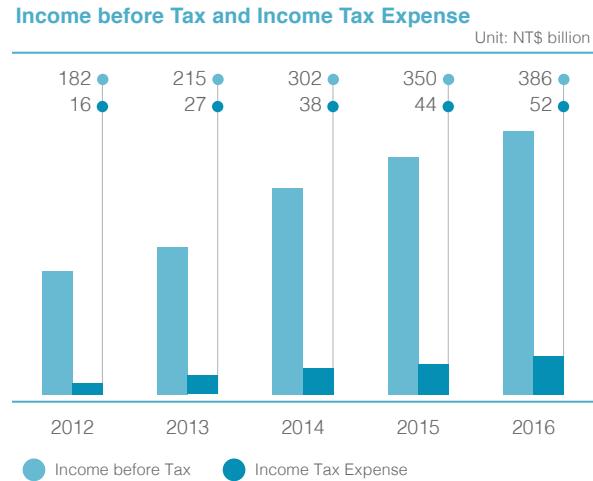
TSMC payments to governments are primarily for corporate income tax. In 2016, TSMC's total tax payments on cash basis worldwide were NT\$51.1 billion. Over 90% of TSMC's revenue and operating profit are generated from our business operations in Taiwan. Meanwhile, over 90% of our tax payments were also made to the Taiwan R.O.C. government. TSMC was the largest corporate income taxpayer in Taiwan in 2016, with the tax amount representing 8.8% of total corporate income taxes collected by Taiwan R.O.C. government.

In accordance with applicable regulations, TSMC was eligible for tax incentives such as tax exemption and investment tax credits in 2016 as follows:

Law/Statute	Item	Amount (NT\$ billion)
Article 9 of the Statute for Upgrading Industries	5-year tax exemption	19.6
Article 10 of the Statute for Industrial Innovation	R&D expenditures tax credits	4.9

2016 Taxes Paid Breakdown





Note 1: 2013 Taiwan-IFRSs version was adopted by the Company starting 2015 and 2014 financial performance was adjusted for the impact of newly effected GAAP

Note 2: The charts were prepared based on the audited financial statements, except market capitalization

Innovation and Service

From an innovative business model to continuous breakthroughs in technology, innovation has always been the basis of TSMC's growth, and quality is the principle of our work and service. We not only seek unceasing innovation in technology, our attitude of pursuing excellence and continuous improvement drives innovations in every part of our business to provide outstanding semiconductor foundry services to customers around the world to ensure customer satisfaction. We have always regarded our customers' competitiveness as TSMC's competitiveness, and are committed to being the long-term partner that they rely upon for success.

“ Innovation is the wellspring of TSMC's growth, and is a part of all aspects of our business, from strategic planning, marketing and management, to technology and manufacturing. At TSMC, innovation means more than new ideas, it means putting ideas into practice.

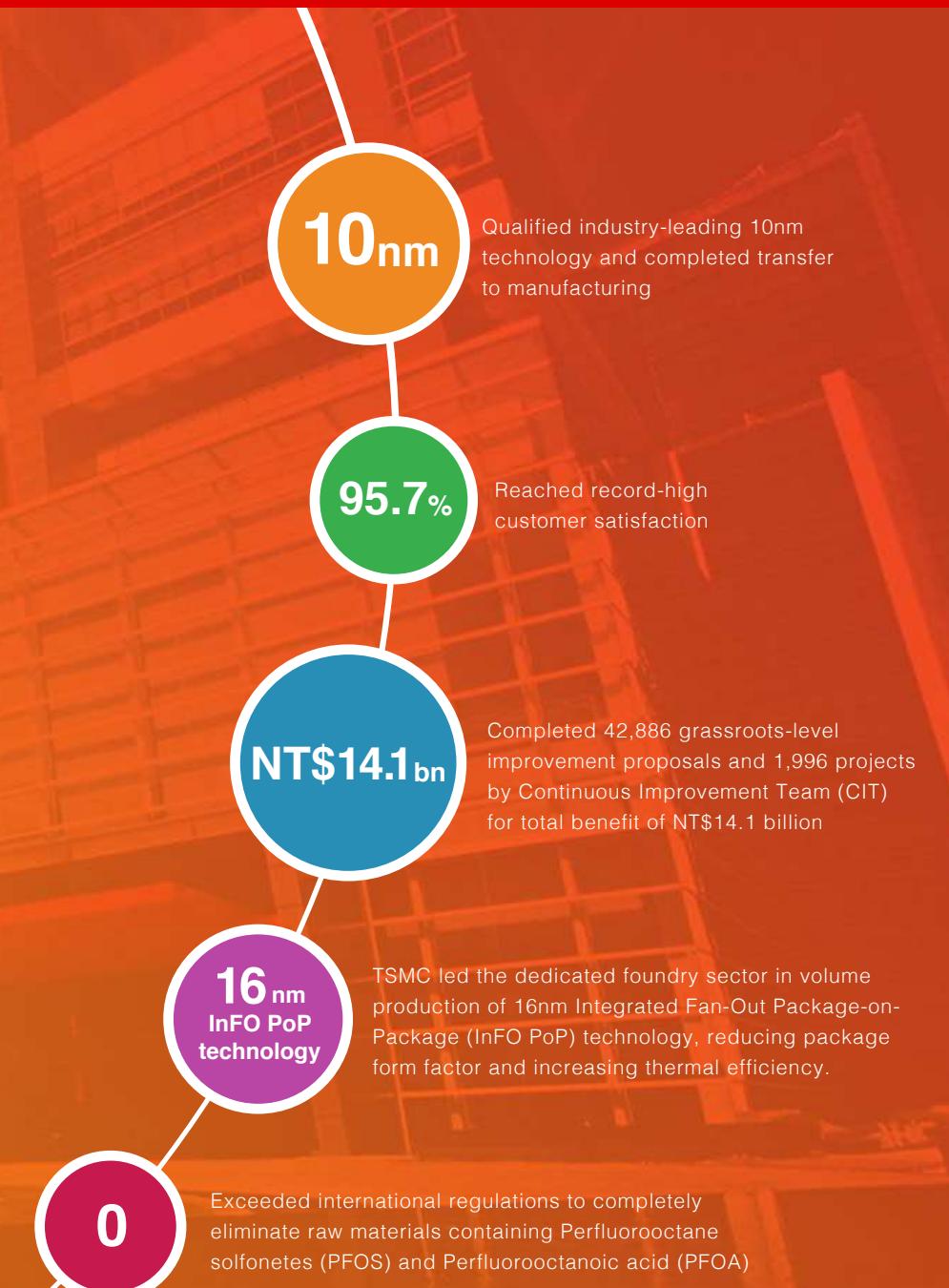
Morris Chang
Chairman

“ TSMC is the best in the industry on quality, delivery and yield.

Mark Smrtic
Vice President of
Front End Foundry Operations, ADI

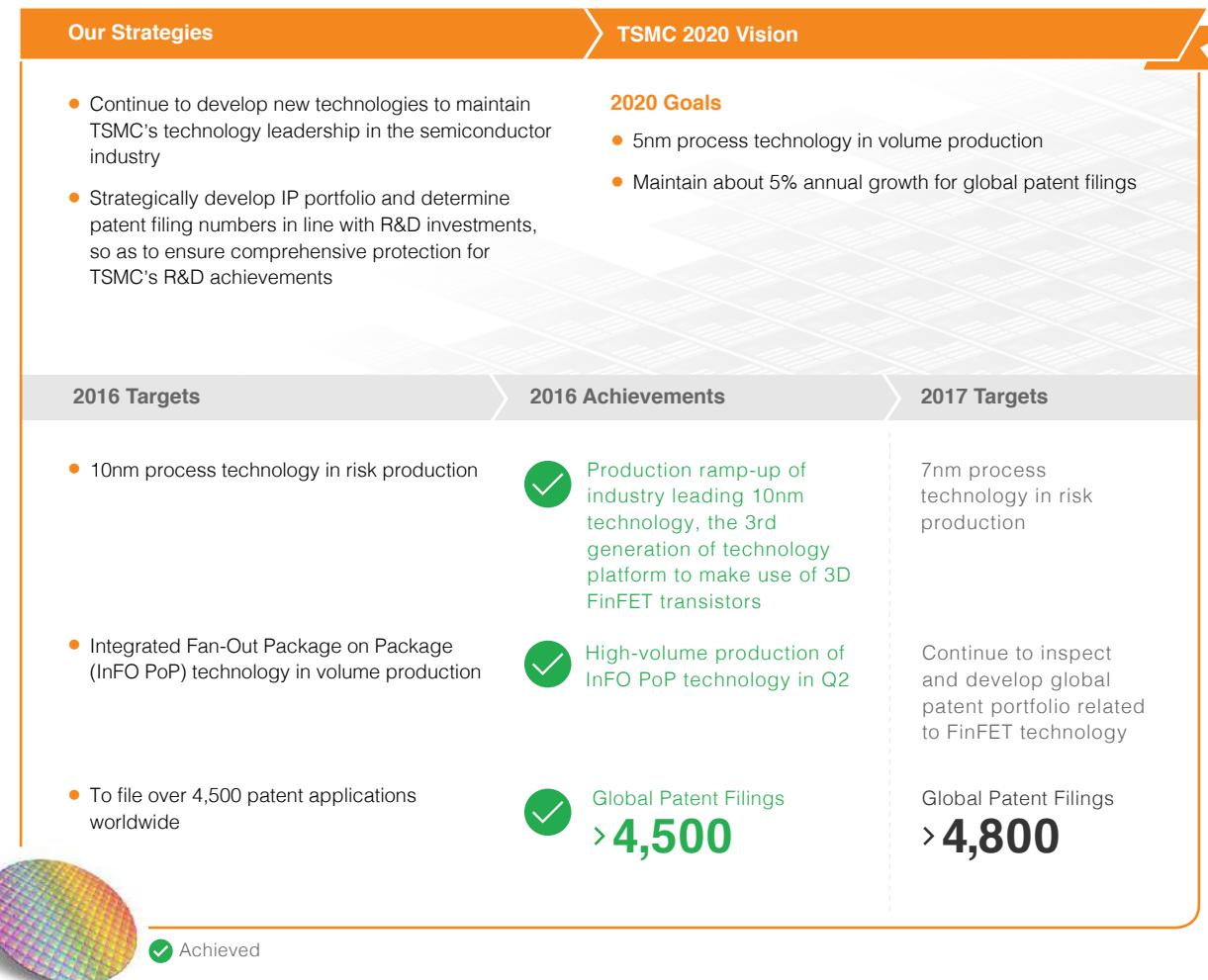
“ I believe TSMC is the most trusted provider.

Mitsugu Naito
Corporate Senior Vice President,
SOCIONEXT



Material Issue

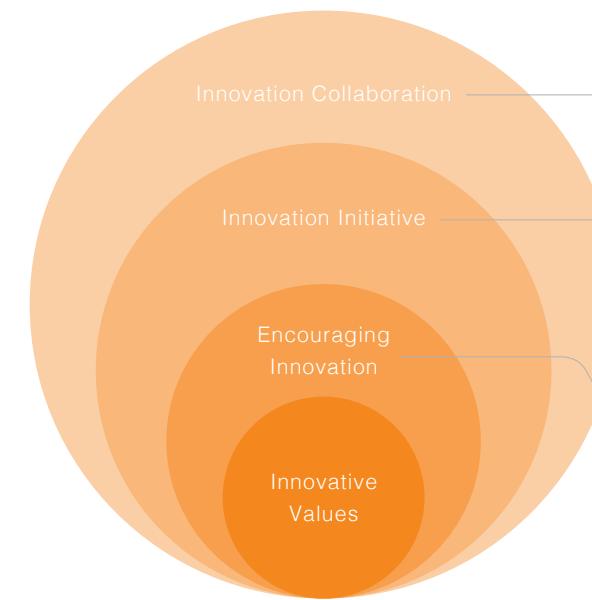
Innovation Management



Innovative Management Framework

In an innovative business model, Dr. Morris Chang founded the world's first dedicated IC foundry, which significantly reduces the barriers to entry into the semiconductor industry and contributes to the growth and prosperity of the global fabless IC design industry. Since its establishment, and based on its innovative values, TSMC actively builds an innovative culture and creates an innovative working environment. TSMC also encourages its employees to practice in the work of a wide range of innovation, in response to the ever-changing characteristics of the semiconductor industry.

In addition to building an internal innovation sharing mechanism and continuously strengthening the organization's innovative vitality, TSMC also assists customers, industry and academics in cross-domain innovation, including product innovations in collaboration with customers, innovations in cooperation with academic institutes, and green innovations with suppliers.

**TSMC University Collaboration Programs**

- TSMC University Research Centers Program
- TSMC University Shuttle Program

Open Innovation Platform®**Green Innovation Cases**

- [Ammonia nitrogen wastewater reclamation system / waste sulfuric acid on-site regeneration and reuse system](#)
- [Copper extraction from waste copper sulfate: In-house copper extraction system](#)
- [Industry's First Uninterruptible Power Supply Energy Saving Mode](#)

Intelligent Precision Manufacturing**Intellectual Property****Technology Leadership**

Annual Idea Forum competition incl. Operations, R&D, Corporate Planning Organization & Finance, Suggestions from grassroots, Continual Improvement Team (CIT), and Total Quality Excellence and Innovation Conference.

Technology Leadership

In 2016, TSMC continued to invest in research and development, with total R&D expenditures amounting to US\$ 2,211 million, up about 7% from the previous year, accounting for 8% of the total revenue. The staff of the R&D organization increased to 5,423, up about 5.8%, a level that equals or exceeds the R&D investment of many other leading high-tech companies.

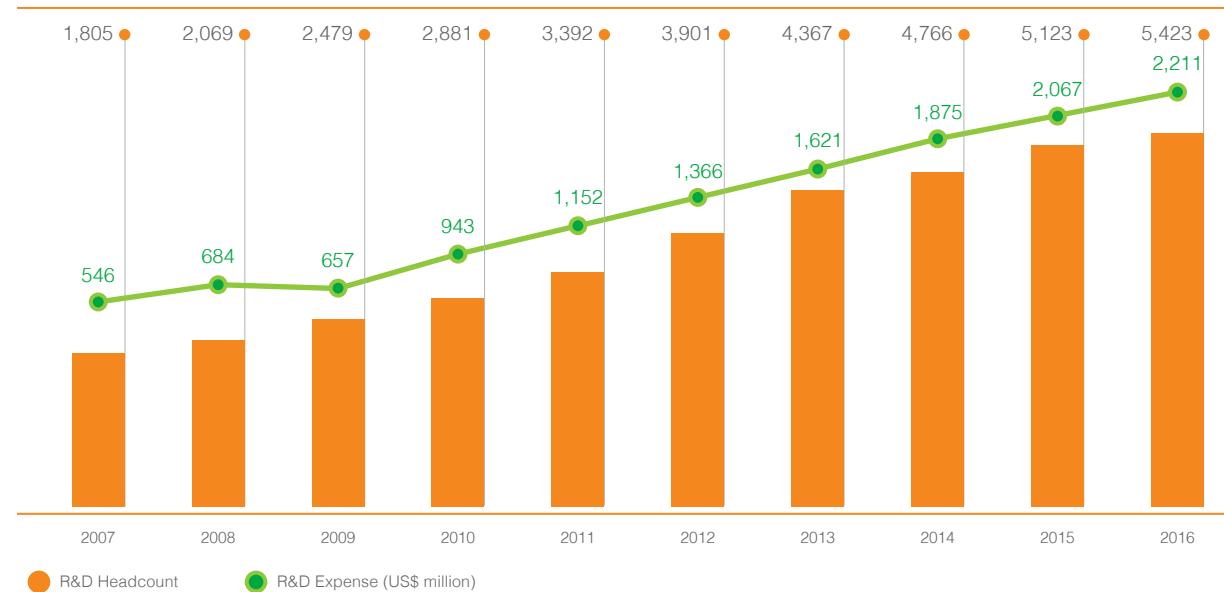
TSMC recognizes that the technology challenge of continuing to extend Moore's Law is becoming increasingly complex and difficult. The efforts of the R&D organization are focused on enabling the Company to continuously offer its customers first-to-market, leading-edge technologies and design solutions that contribute to their product success in today's competitive market environment. In 2016, TSMC completed

the transfer to manufacturing of the industry-leading 10nm technology, the 3rd generation of technology platform to make use of 3D FinFET transistors, and continued to fuel the pipeline of technological innovation needed to maintain industry leadership. TSMC's 7nm technology development is on track to meet the goal of production start-up in 2017. TSMC 5nm technology is now in the full development stage,

and definition and intensive early development efforts have been started for nodes beyond 5nm.

In addition to CMOS logic, TSMC conducts R&D on a wide range of other semiconductor technologies that provide the functionality customers require for mobile SoC and other applications.

TSMC is Committed to Investment in Technology Advancement



Specialty Technology/Integrated Interconnect & Packaging

3D IC

- The world's first high-volume production of Integrated Fan-Out Package on Package (InFO PoP) for mobile application processor packaging.
- Successful qualification of InFO PoP Gen-2 advanced packaging technology for mobile applications.
- InFO wafer-level fine-pitch fan-out technology for die-partition and high-speed applications.

Power IC/BCD Technology

- 0.18µm second generation BCD (Bipolar-CMOS-DMOS) technology resulting in the world's highest performance quick charger and wireless charger.

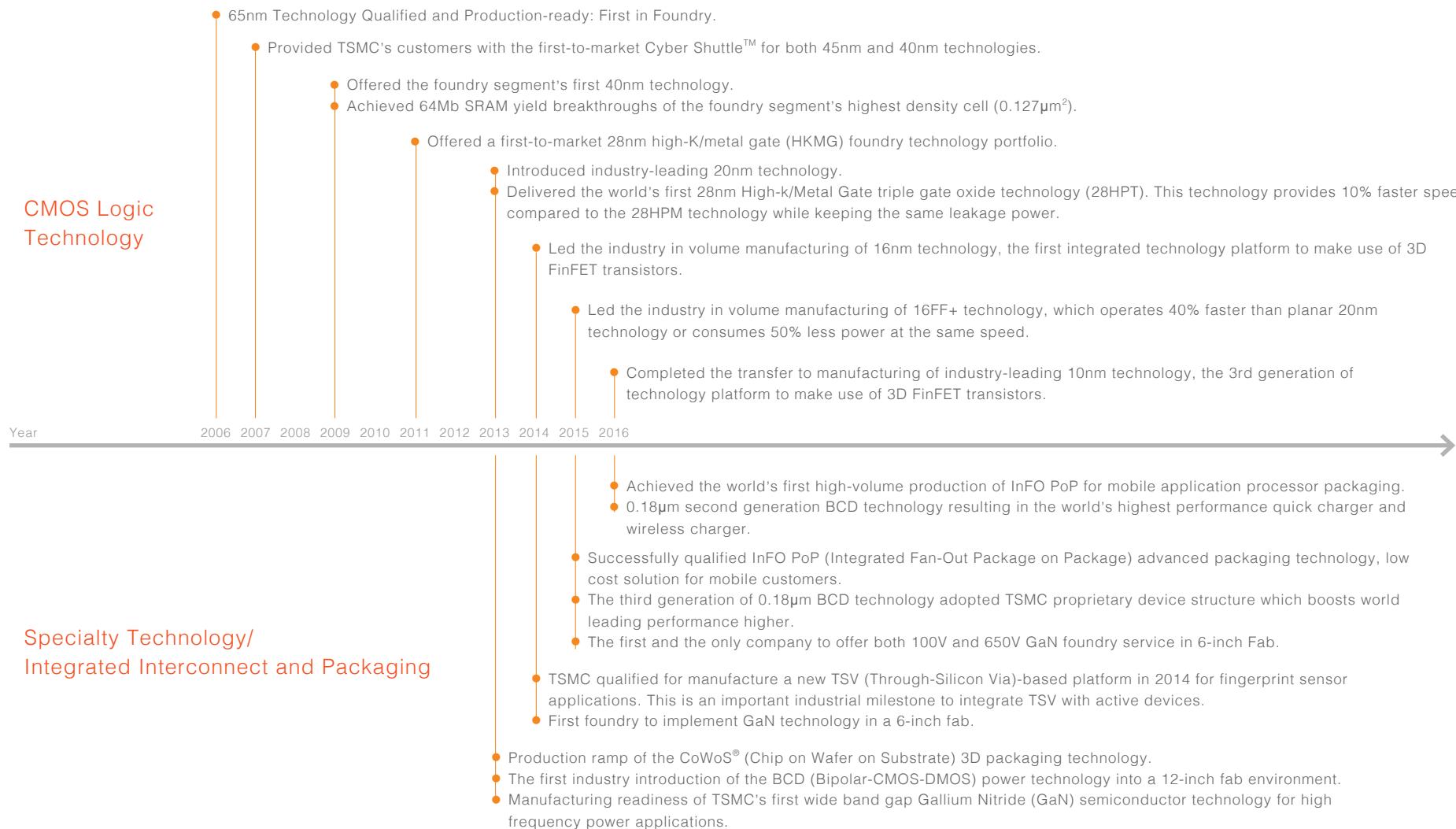
Embedded Flash Technology

- Successful production launch of e-Flash 65nm/55nm node, NOR-based cell technologies, including 1-T cell and split-gate cell.
- Completion of qualification of the 40nm node, split-gate cell technology for consumer electronics applications such as IoT and smartcards

GaN Technology

- Completed development and manufacturing qualification of 650V D-MISFET, 100V E-HEMT, and RF 30V D-MISFET GaN devices.

Leading Technology and Innovations in IC Foundry Service



Intellectual Property

A strong portfolio of intellectual property rights strengthens TSMC's technology leadership and protects our advanced and leading-edge technologies. We continue to implement a unified strategic plan for TSMC's intellectual capital management. Strategic considerations and close alignment with business objectives drive the timely creation, management and use of our intellectual property.

In 2016, TSMC received a total of 2,294 U.S. patents, a 30% increase from the previous year, and thus reached a historical-high ranking of #9 in terms of U.S. patent grants. Additionally, TSMC received over 1,200 issued patents in Taiwan and the PRC, a 59% increase from the previous year, as well as patents in other various countries. As of 2016, TSMC's patent portfolio has reached over 35,000 patents worldwide (including patent applications in queue). Resources for constructing TSMC's patent portfolio are maximized by utilizing effective management to proactively control patent procurement/maintenance costs.

Year	Ranking of US Patent Grants <small>Note1</small>	Ranking of Taiwan Patent Grants <small>Note2</small>
2016	↑ #9	↑ #3
2015	↑ #13	↑ #5
2014	↑ #23	↑ #13
2013	↑ #35	↑ #21
2012	↑ #48	↑ #35

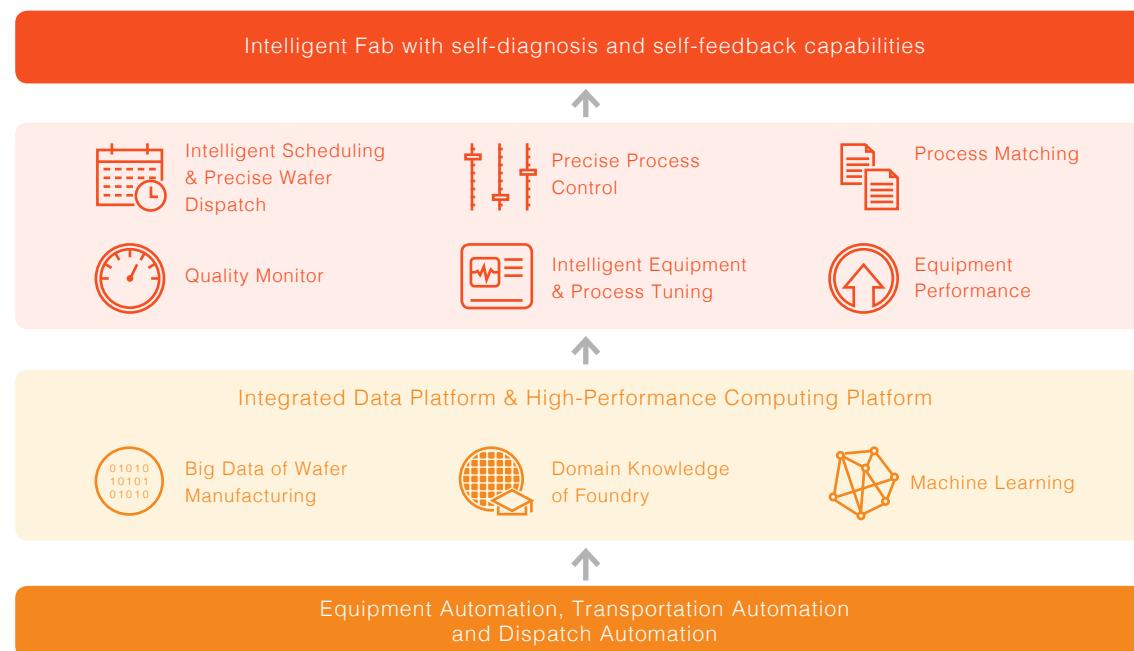
Note1: IFICLAIMS issued Top 50 US Patent Assignees

Note2: TIPO released Top 100 Native Corporate Patent Applicants for Patent Grants

Intelligent Precision Manufacturing

TSMC is committed to manufacturing excellence and leads the industry in equipment automation, transportation automation and dispatch automation, successfully establishing the world's first automated 12-inch GIGAFAB® facility. To enhance its existing automation infrastructure, TSMC is also enhancing its big data and machine learning capabilities. Through integrated data and high-performance computing platforms, these capabilities are applied to Intelligent Scheduling and Precise Wafer Dispatch, Precise Process Control, Process Matching, Quality Monitor, Intelligent Equipment & Process Tuning,

and Equipment Performance Improvement, and more. We call this "Intelligent Precision Manufacturing", and it transforms our facilities into intelligent fabs capable of self-diagnosis and self-feedback. At the same time, TSMC also adopts innovative process transfer methods to ensure consistent performance across fabs and achieve process optimization, shortening the yield learning curve and production time to provide customers with the best product yield and performance through continuous calibration and simultaneous learning across sites. More recently, TSMC has also utilized cloud computing technology and data classification mechanism for proprietary information



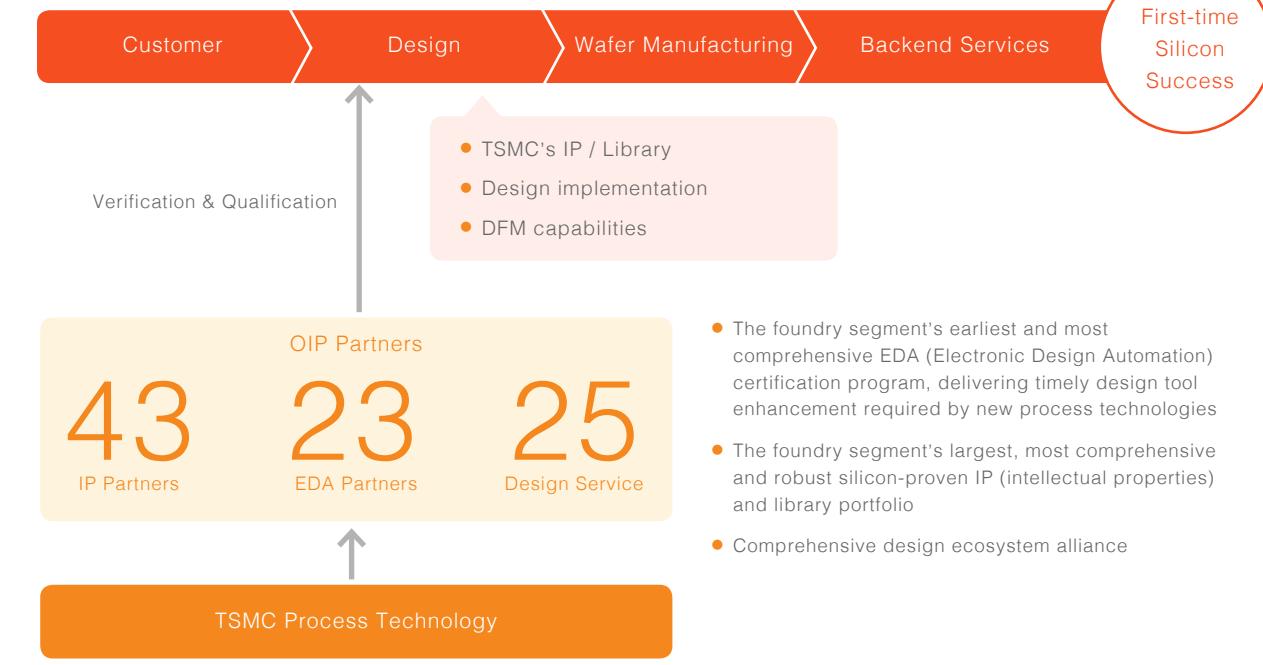
protection to both preserve core technology and raise operational efficiency, achieving manufacturing excellence by managing global fabs from one site.

Open Innovation Platform® (OIP)

TSMC does not compete with its customers, but rather acts as a partner to help them make innovation come true. The TSMC Open Innovation Platform® (OIP) initiative is a comprehensive design technology infrastructure that encompasses all critical IC implementation areas to reduce design barriers and improve first-time silicon success. OIP

continued to expand in 2016 with more than 12,000 items contained in our libraries and silicon IP portfolio. More than 8,200 technology files and over 270 process design kits were available to customers via TSMC-Online, which saw more than 100,000 customer downloads in 2016. In September 2016, TSMC hosted an OIP ecosystem forum at the San Jose Convention Center in California, and another in October in Beijing, with keynote addresses from OIP ecosystem partners as well as TSMC executives. The forum talked about the technology development of latest generation technology and demonstrated the value of collaboration through OIP to nurture innovation.

Open Innovation Platform Diagram



TSMC University Collaboration Programs

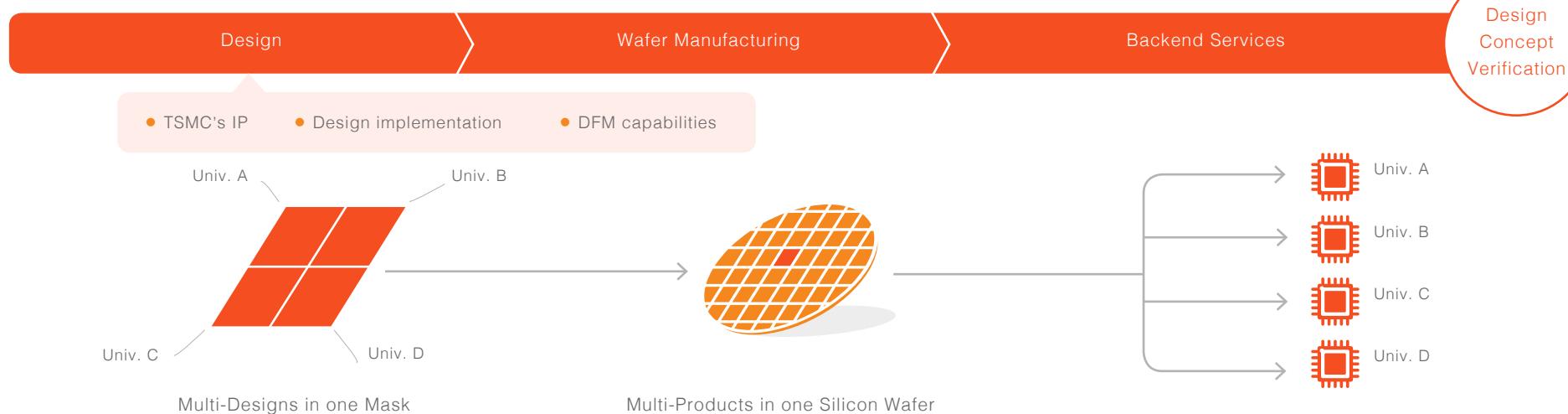
TSMC University Research Centers Program

TSMC has significantly expanded its interaction with universities in Taiwan with the establishment of four research centers located at the nation's most prestigious universities. Beginning in 2013, four research centers have been established at National Chiao Tung University, National Taiwan University, National Cheng Kung University and National Tsing Hua University, with a total of 1,637 students joining the centers since establishment. Over the past four years, TSMC has invested more than NT\$200 million in research funding, representing an increase of 7.5% in CAGR. These cooperative projects are not only to cultivate more highly qualified talents suitable for the

future of the semiconductor industry, but also to inspire university professors to initiate new research programs. In 2016, 908 high-caliber students conducted semiconductor research programs across Electronics, Physics, Materials Engineering, Chemistry, Chemical Engineering and Mechanical Engineering disciplines.

In addition, TSMC works with the world's top universities such as Stanford, Massachusetts Institute of Technology, and University of California at Berkeley to conduct strategic research programs, focusing on subversive innovative transistors, wire technology, mask technology, simulation and special process technology research.

Diagram of University Shuttle Program



TSMC University Shuttle Program

The TSMC University Shuttle Program was established to provide professors at leading research universities worldwide with access to the advanced silicon process technologies needed to research and develop innovative circuit design concepts, and is one of the world's most important research and development platforms in the semiconductor industry. This program links motivated professors and graduate students of 14 universities worldwide with enthusiastic managers at TSMC. It aims to promote excellence in the development of advanced silicon design technologies, and the nurturing of new generations of engineering talent in the semiconductor field.

Case Study



Elite Seeds Camp

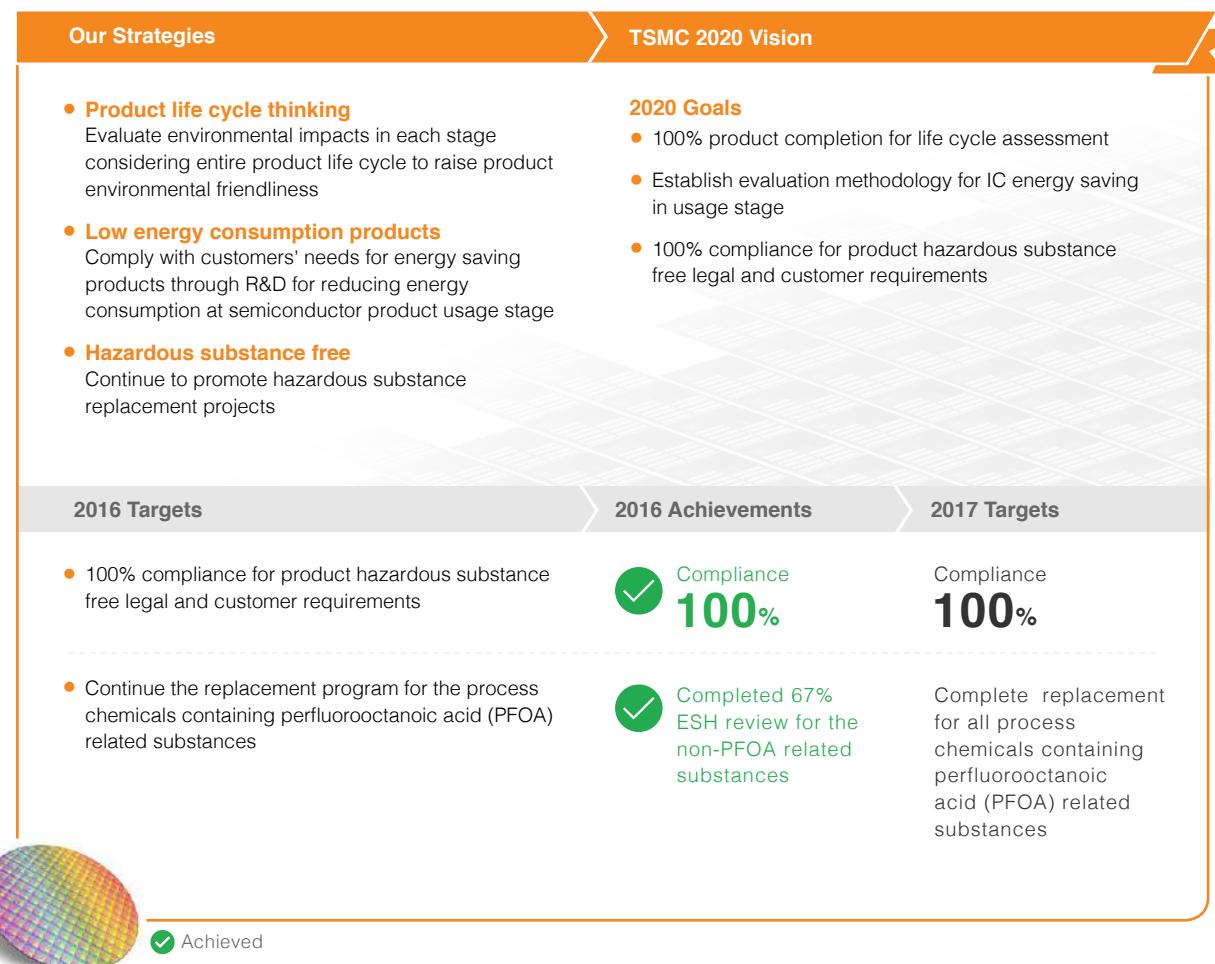
In order to encourage top students to conduct research on the field of nanoelectronics at the university level, TSMC has invited around 60 outstanding college students to participate in the elite seeds camp through the centers. Arranging university professors and industry lecturers to introduce the semiconductor, including semiconductor history, electronic applications in daily life, and future technology development, students can have a better understanding of semiconductors. By interacting with university professors and visiting TSMC, we inspire students' interest in semiconductor research. From a survey of the 2015/2016 elite seeds camp, we found that this camp improved the student's understanding of semiconductor significantly.

Effectiveness Analysis of Elite Seeds Camp

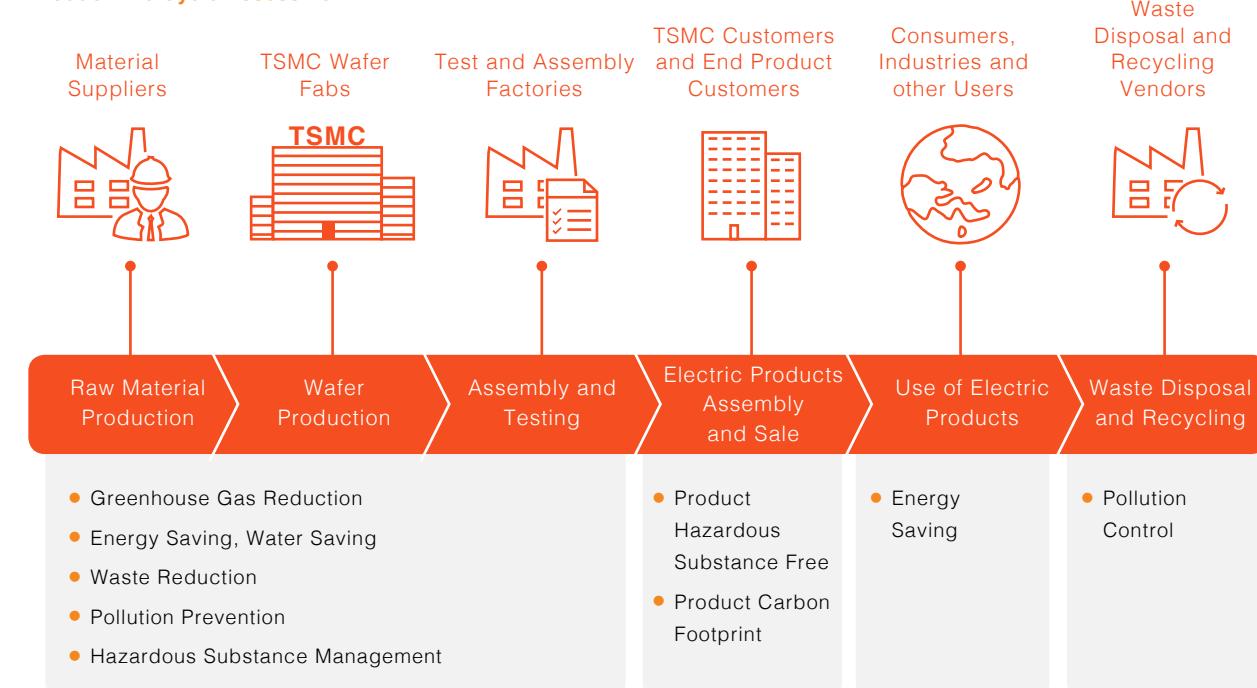


Material Issue

Green Products

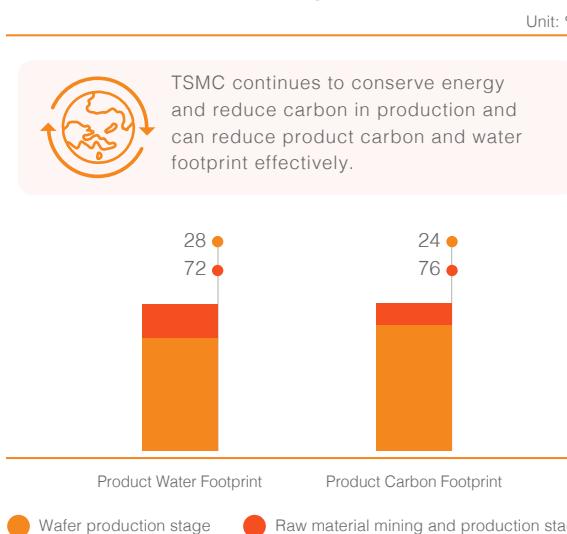


TSMC considers, clarifies and compares environmental impacts of each stage based on product life cycle, including product design, raw material mining, production and transportation, product manufacturing and transportation, usage, and waste disposal. Therefore, we require good hazardous substance management, pollution prevention, energy saving, water saving, waste reduction and other clean production measures in our own factories. We also require and assist suppliers to do so, and even ask suppliers to have their suppliers do so and establish a semiconductor green supply chain together.

Product Life Cycle Assessment

TSMC continues to encourage and assist suppliers to set up greenhouse gas (GHG) and water inventory procedures. We collaborated with upstream and downstream partners to complete 12-inch wafer and packaged integrated circuit product carbon footprints, which passed third-party certification based on the British PAS2050 product carbon footprint standard. In 2012, TSMC also completed a product water footprint third party certification. In 2015, we continued to promote and establish product carbon footprints and water footprints, and completed product carbon footprint and water footprint for all fabs in 2015 and received ISO 14067 and ISO 14046 third party certifications respectively. We not only can provide related information to customers but also continue to promote carbon reduction and water saving in the supply chain and TSMC from a life cycle point of view.

Wafer Carbon and Water Footprint

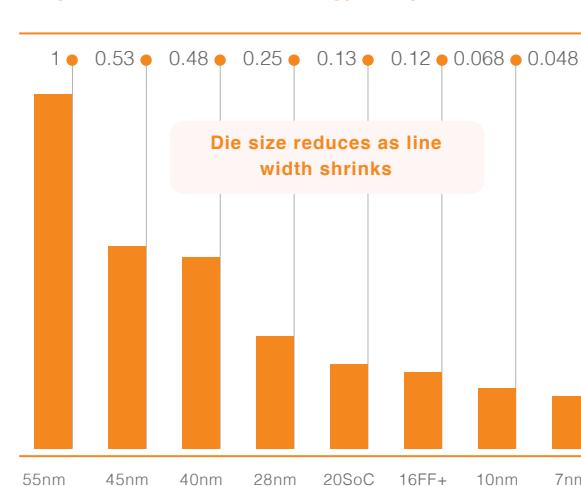


According to TSMC wafer product carbon footprint and water footprint inventory results, the wafer manufacturing stage accounts for 76% of the carbon footprint and 72% of the water footprint respectively. TSMC continues to improve carbon reduction, water saving and waste reduction so as to reduce product carbon footprint and water footprint. TSMC also asks aggressively for carbon reduction and water saving from upstream raw material suppliers although their carbon and water footprint are relatively low. For more TSMC supply chain environmental measures, please refer to "Sustainable Supply Chain Management" in this report.

More Advanced and More Energy-efficient Electronic Products

In each new technology generation for IC manufacturing,

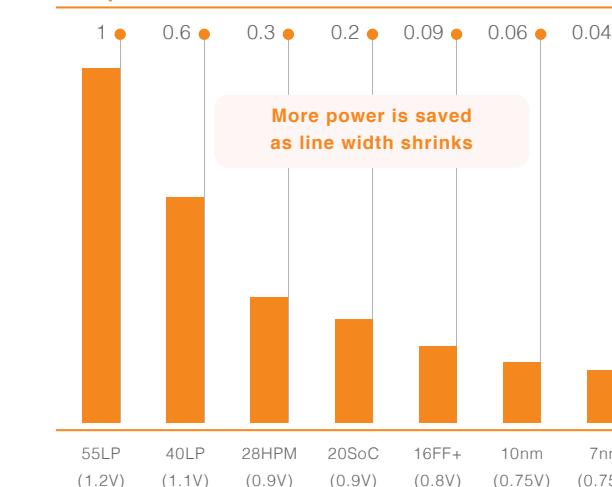
Chip Die Size Cross-Technology Comparison



circuitry line widths shrink, making IC chip smaller and reducing product power consumption.

TSMC is consistently first among dedicated foundries to provide next-generation, leading-edge technologies. The Company also provides comprehensive specialty technologies and excellent frontend and backend integration capabilities. These help customers produce more advanced, energy-saving and environmentally friendly products to minimize environmental impact of technology progress. Through TSMC's manufacturing technologies, customers' designs are realized and their products are used in a broad variety of applications covering various segments of the computer, communications, consumer, industrial and other electronics markets. These chips make significant contributions to the progress of modern society.

Chip Total Power Consumption Cross-Technology Comparison



30% About 30% total power consumption reduction

40% About 40% chip size shrink

TSMC led the dedicated foundry by manufacturing high-performance customer products with its 10nm FinFET technology.

50% About 50% operating power reduction

TSMC led the dedicated foundry by starting volume production of 16nm FinFET Compact ultra-low-power technology.

10% About 10% thinner chip package

10% About 10% thermal efficiency increase

TSMC led the dedicated foundry by starting volume production of Integrated Fan-Out PoP technology for 16nm logic chips, reducing device package form factor and increasing device thermal efficiency.

More Powerful and Smarter

Demonstrated the world's first and smallest CMOS-MEMS motion sensor SoC.

Realized the world's highest performance quick charger and wireless charger

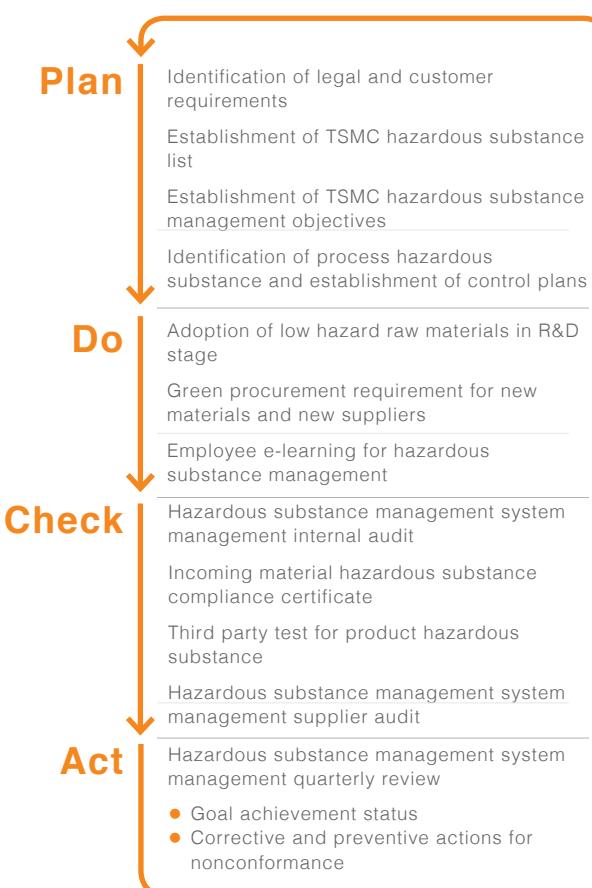
Launched 0.18μm second-generation BCD technolog.



Hazardous Substance Management

TSMC's principles to highly hazardous materials are (1) avoid use if possible (2) use less if possible. By practicing QC 080000 to establish its internal hazardous substance management system, TSMC ensures that finished wafer and assembly products comply with international regulations and customer requirements for hazardous substance management. In addition, we also conduct green procurement procedures to evaluate all new suppliers and new materials carefully at the R&D stage so as to ensure prohibited substances are not used in process and compliance with international regulations.

Product Hazardous Substance Management



Green Procurement for Hazardous Substances

Prohibited or Restricted Substances



25 categories of prohibited or restricted substances including legal, customer requirements and TSMC voluntary.

Prohibit or restrict containing in process raw materials or products.

Controlled Substances



Carcinogenic, mutagenic or toxic for reproduction (CMR) substances.

"Not use" as the principle, but to be used following environmental, safety and health requirements and approval of R&D, Operation Vice Presidents and Corporate ESH unit if no available alternatives.

Reportable Substances



Required to report by regulations.

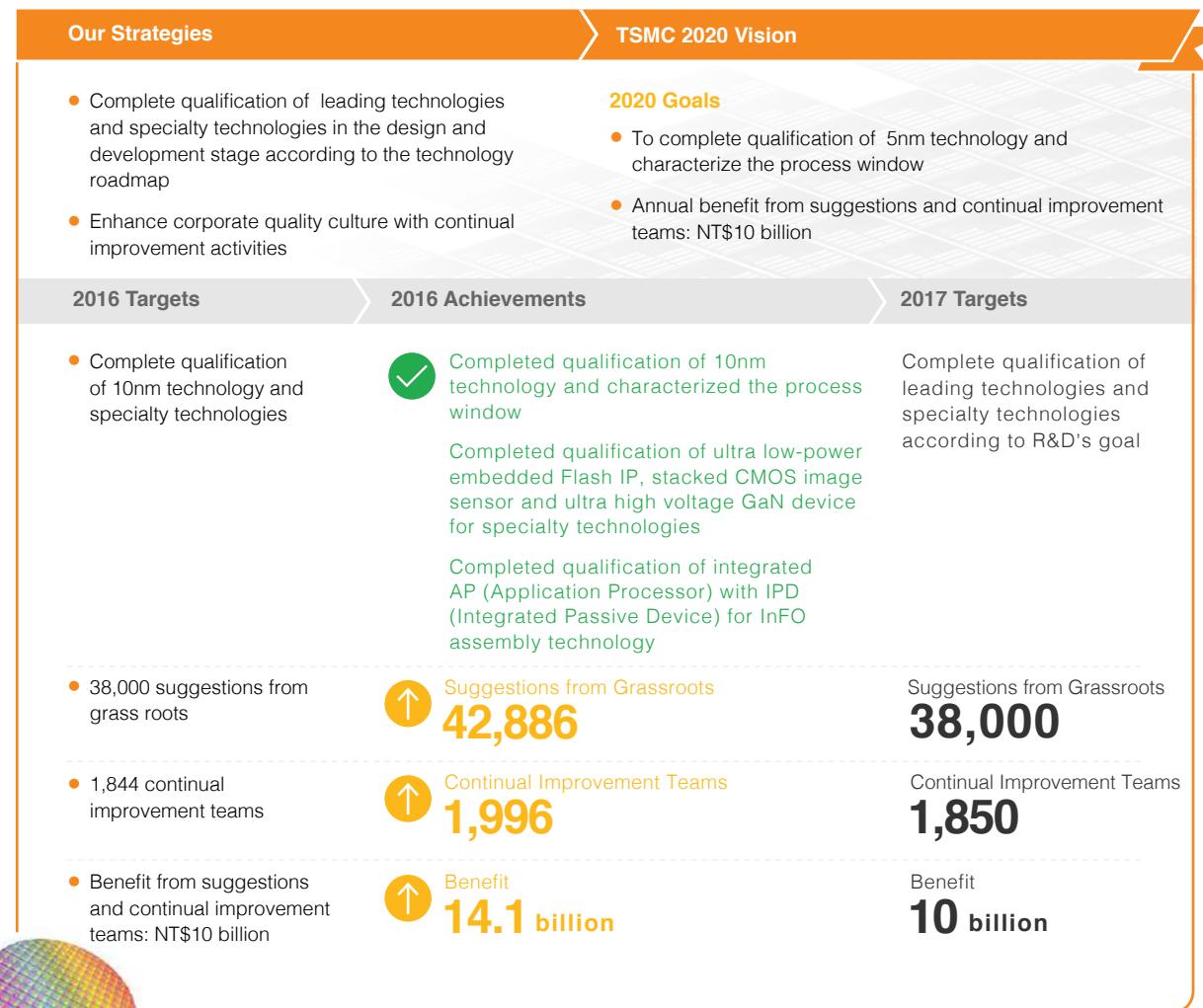
Use after conforming related information.

TSMC Product Hazardous Substance Management is Compliant with or Surpassed International Regulations

International Regulations / Customer Requirements	Summaries of Requirements and Limits	Description of Legal Compliance
European Union Restriction of Hazardous Substance (EU RoHS)	Limit of product composition includes Lead, Cadmium, Mercury, Hexavalent Chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), Diisobutyl phthalate (DIBP). Please refer to the EU website for more details.	Comply with international regulations: <ul style="list-style-type: none"> TSMC provides lead free bumps to customers. A few customers still need trace lead contained bump which is exempted by EU RoHS. Other EU RoHS restricted substances are not used in TSMC process.
Product Halogen Free Requirements	Bromine 900 ppm Chlorine 900 ppm Bromine + Chlorine 1,500 ppm	<ul style="list-style-type: none"> All TSMC products are compliant.
Perfluorooctanesulfonic Acid (PFOS), Perfluorooctanoic Acid (PFOA) Restriction in Process	PFOS 1,000 ppm PFOA 1,000 ppm	<ul style="list-style-type: none"> TSMC has totally phased out using PFOS and PFOA, and all products also do not contain these two substances.
EU Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) (REACH) Annex XVII	Please refer to EU website for regulative substances and applicable objects.	<ul style="list-style-type: none"> All TSMC products are compliant.
EU REACH Substances of Very High Concern (SVHC)	Please refer to EU website for regulative substances.	<ul style="list-style-type: none"> All TSMC products are compliant.
EU Waste Electrical and Electronic Equipment (WEEE) Directive	Please refer to EU website for electrical and electronic final products waste recycling rate and related requirements.	<ul style="list-style-type: none"> TSMC's products are not final products and this law is not directly applicable.

Material Issue

Product Quality



TSMC aims to provide customers with the highest-quality wafers and best services for their products. With collaboration among Quality and Reliability (Q&R) and other organizations, TSMC strives to achieve "quality on demand" to fulfill customers' needs for time-to-market delivery, reliable quality, and market competitiveness over a broad range of products. In 2016, the focuses of product quality and reliability were to complete qualification of leading technologies and specialty technologies and to establish related capabilities for failure analyses, chemical and material analyses. Please refer to [TSMC's 2016 AnnualReport](#) for details.

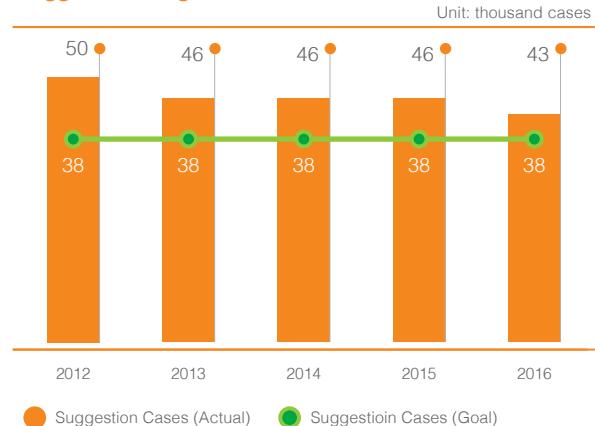
To ensure product quality and reliability and prevent massive recalls after volume production, Q&R works with R&D in the process technology design and development stage to complete qualification of the leading technology and specialty technologies according to the AEC-Q100 requirement, which is the Integrated Circuits reliability standard for automotive electronic devices. We also establish related capabilities for failure analyses, chemical and material analyses. With these efforts, TSMC did not have any massive product recalls in 2016.

Corporate Quality Culture Enhancement

In TSMC, quality is the basis for work and service provision. All employees are dedicated to build quality into all aspects of our business.

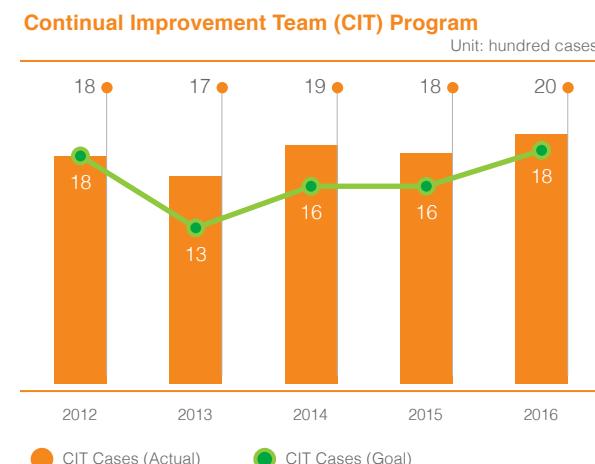
To enhance corporate quality culture with continual improvements on product quality, production efficiency and cost reduction, TSMC fully promoted the "Suggestion" in basic level and the activities of "Continual Improvement Team (CIT)". TSMC also held a corporate-level "Total Quality Excellence and Innovation conference". With the public rewards and praises, we expect to provide a cross-department communication and study platform with continual improvement cases sharing. It aims to enhance employees' problem solving and innovation capabilities for achieving the win-win goal of TSMC's competitiveness and customer satisfaction.

Suggestion Program

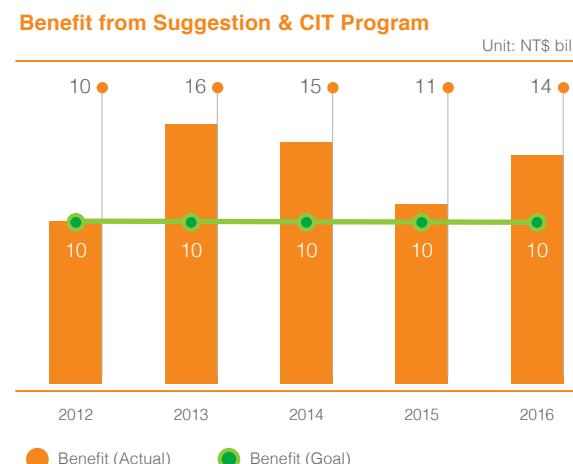
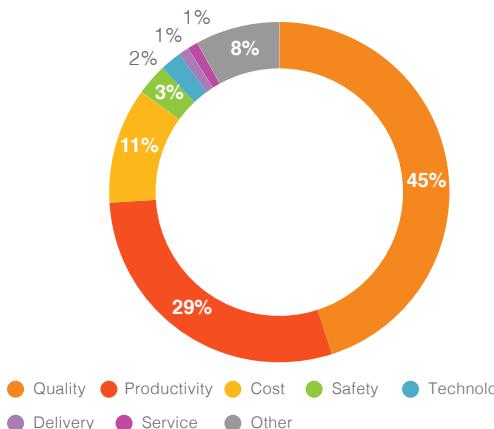


In 2016, there were 42,886 suggestions issued at the grass roots level, and a total of 1996 continual improvement team activities were registered and implemented. The benefits from these improvement cases were NT\$14.1 billion. Among them, 45% of continual improvement team activities focused on product quality enhancement.

In addition to internal cross-department communication and study, TSMC also participates in the National Quality Control Circle competition to share and learn the continual improvement methods in a cross-industry communication and study platform. With the participation, employees will break existing thinking to solve the challenges from work with innovation. In 2016, TSMC secured four gold and two silver medals in the National Quality Control Circle competition.



2016 Continual Improvement Team Program



Note: TSMC has been promoting continual improvement programs for over 20 years. In 2013, the benefit goal for improvement cases was set to emphasize the importance of cases' quality for corporate quality culture enhancement.

Examples for Process Quality Improvement Cases In 2016

Process Quality Improvement Cases	Benefit
To Improve the Thin Film Resistance in PVD (Physical Vapor Deposition) Process	16x Enhanced 16x device stability
To Improve the Ion Implantation Process	60% Enhanced product yield 60%
To Improve CMOS Image Sensor Product Structure and Process	13.5% Enhanced product yield 13.5%
To Improve the Chamber Sidewall Falling Particles in Furnace Process	4% Enhanced product yield 4%
To Improve the Equipment Component and Slurry in CMP (Chemical Mechanical Planarization) Process	1.7% Enhanced product yield 1.7%
To Improve the Methods in Lithography and Etching Processes	97% Reduced the reliability defects 97%

2016 National Quality Control Circle Competition

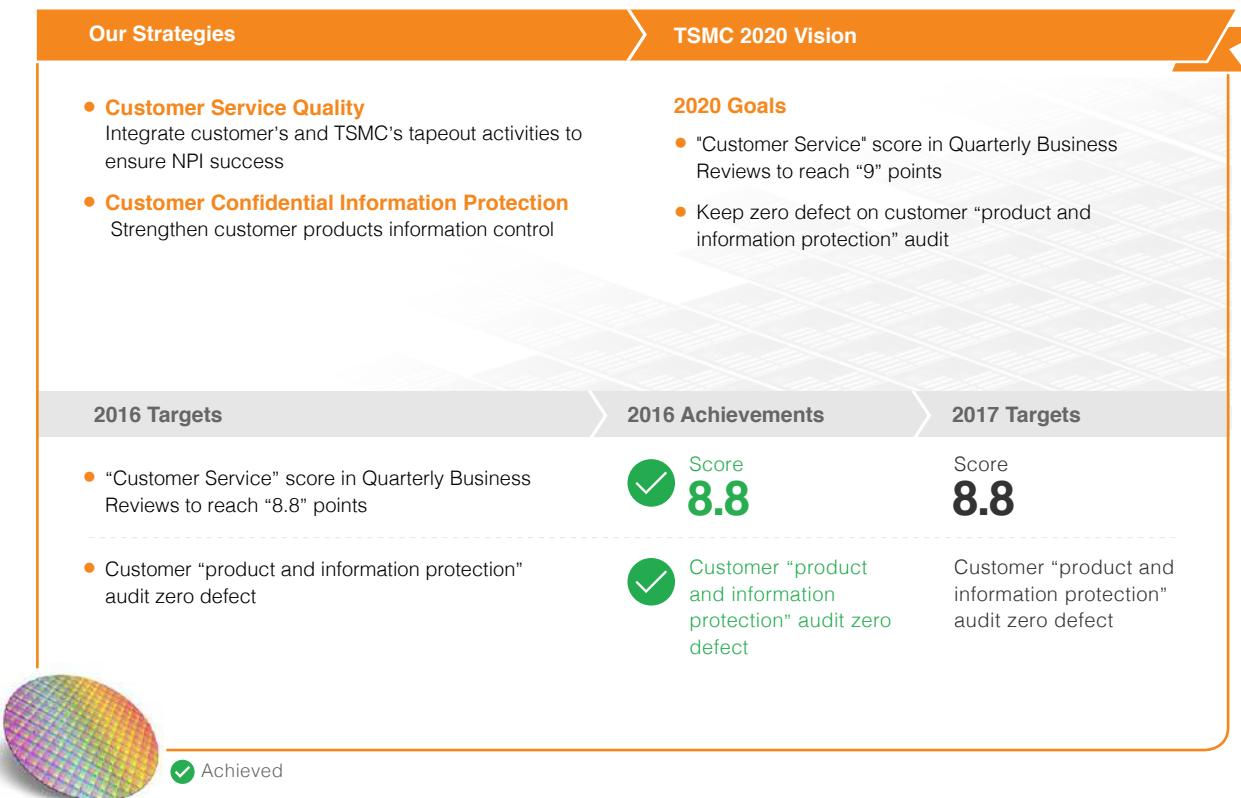
Cases in National Quality Control Circle Competition	Result
To Improve Fab 3 Chiller System for Energy Saving	Gold Medals
To Improve the Plating's Quality, Capacity and Cost in Copper Process	Gold Medals
To Improve High Voltage Product Yield	Gold Medals
To Improve the Quality of Back-illuminated CMOS Sensor	Gold Medals
To Improve the Productivity for Wafer Inspection	Silver Medals
To Improve 28 nm Production Cycle Time	Silver Medals



2016 National Quality Control Circle Competition

Material Issue

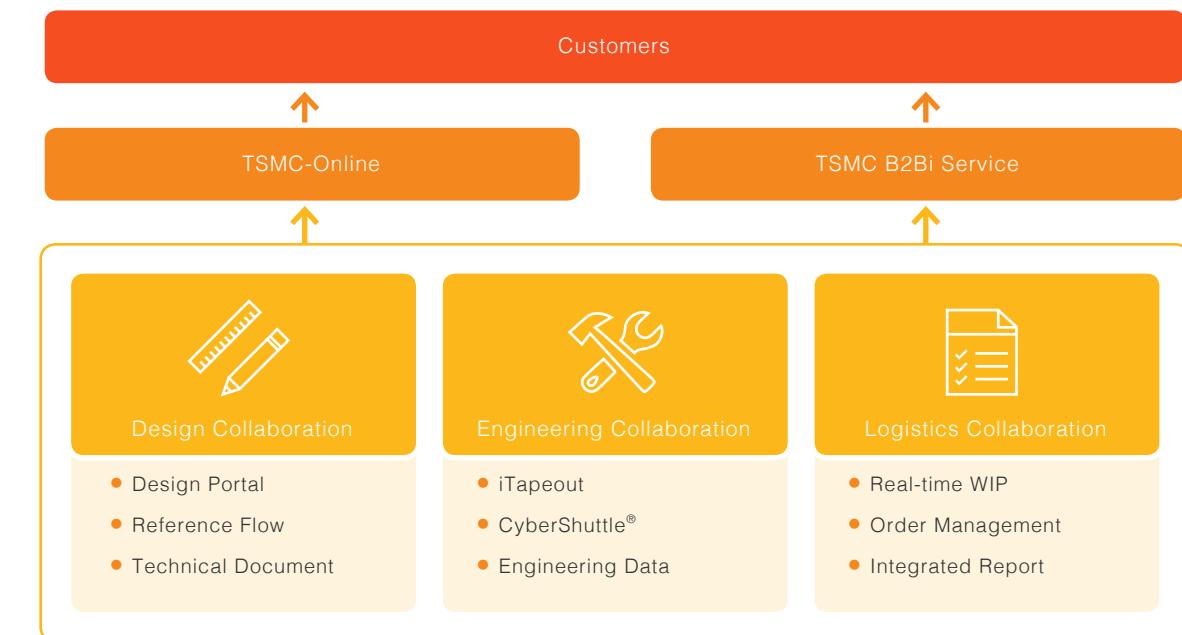
Customer Service



To provide the best service to customers, TSMC has a dedicated customer service team as the main contact window for coordination and facilitation. TSMC strives to provide world-class design support, mask making, wafer manufacturing, and backend services. TSMC also protects customers' confidential information with the highest standard. These are aimed at achieving an optimum experience for customers and gain customer trust.

Customer Service Quality

To facilitate customer interaction and information access on a real-time basis, TSMC-Online offers a suite of web-based applications that provide an active role in design, engineering, and logistics collaborations. Customers have 24/7 access to critical information and customized reports. Design Collaboration focuses on content availability and accessibility, with close attention to complete, accurate, and current information at each level of the design life cycle. Engineering Collaboration includes online access to engineering lots, wafer yields, wafer acceptance test (WAT) analysis, and quality reliability data. Logistics Collaboration provides access to data on any given order status in wafer fabrication, backend process, and shipping. In 2016, more than 400,000 people browsed TSMC-Online. TSMC provided more than 8,200 technology files and 270 PDKs, and more than 100,000 customers downloaded these files via TSMC-Online.



Customer Confidential Information Protection

Customer trust has always been one of TSMC's core values and that is also one of the major reasons that customers are willing to rely on TSMC for their wafer manufacturing.

TSMC is committed to customer proprietary information protection in order to protect customers' interests.

TSMC formulated its "Proprietary Information Protection" (PIP) Policy, which defines the confidential information management procedures and handling guidelines to reinforce every TSMC employee's awareness and capability of proprietary information classification and handling. In addition, the Customer Service Division conducts "control and self-assessment" on PIP control points annually. In

2016, TSMC enhanced privilege control mechanisms on the customer tape-out design document download process to significantly strengthen the protection of customer design information. For example, we built a privilege application and approval system to standardize the approval process, and set up time-limitation auto control mechanism to ensure privilege validation.

In 2016, TSMC passed all customer audits on product and information protection. We aim to pass all customer product and information protection audit every year and continuously strengthen customer trust to TSMC.

Customer Satisfaction

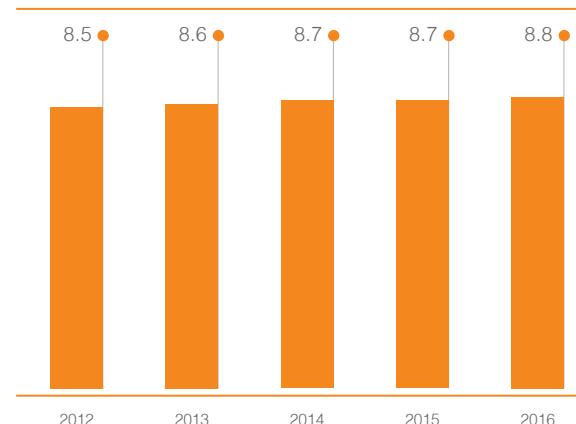
TSMC believes that continuous innovation, high quality product and superior customer service are critical to enhancing customer satisfaction, which can retain existing

customers, attract new customers, strengthen customer relationships, and lead to higher levels of retention and expansion.

To assess customer satisfaction and ensure that our customer needs are appropriately understood, TSMC conducts the Annual Customer Satisfaction Survey (ACSS) with most active customers, either by web survey or interviews through an independent consultancy.

Complementary to the survey, Quarterly Business Reviews (QBRs) are also conducted by the customer service team so that customers can give feedback to TSMC on a regular basis. Through surveys, feedback reviews and intensive interaction with customers, TSMC is able to maintain close contact for better service and collaboration.

Quarterly Business Review Customer Service Score

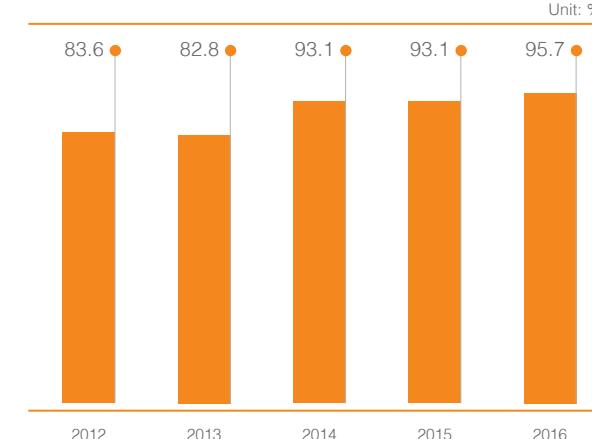


Customer feedback is routinely reviewed and considered by executives and then developed into appropriate improvement plans, all-in-all becoming an integral part of the management process with a complete closed loop. TSMC use customer survey data as a base to identify future focus areas for customer relationship development.

With superior service quality and confidential information protection, the average score of customer service in 2016 Quarterly Business Reviews was 8.8 and met the annual goal of 8.8 or higher.

With its competitiveness in "technology leadership" and "manufacturing excellence", TSMC manufactured 9,275 different products for 449 customers, using 249 distinct technologies to deliver 9.6 million 12-inch equivalent wafers

Annual Customer Satisfaction



with 9.6% year-over-year increase in 2016. With all TSMC employees' contribution, Annual Customer Satisfaction was higher than 95% in 2016. In the global integrated semiconductor industry, TSMC will keep playing its role of the trusted technology and capacity provider and an important partner to customer success.



Customer recognition of TSMC's excellence in customer service

TSMC Delivers Unrivalled Manufacturing Service

2016 total wafer shipments increased 9.6 percent from 2015 to reach 9.6 million 12-inch equivalent.

- Technologies **249**
- Customers **449**
- Products **9,275**



Fab 2

- 33
- 81
- 1,228

Responsible Supply Chain

Today's consumers not only expect better performance and lower price with each generation of new electronics products, they rightfully expect to enjoy this product without damaging the sustainability of our natural environment. Responding to their demand for sustainable products, TSMC drives the industry and supply chain into a positive cycle and works with its upstream and downstream partners to build a green supply chain, building a sustainable future for the next generation.

“TSMC's growth comes from the support of our supplier partners. We will need to collaborate even more closely to overcome the challenges of scaling and green manufacturing, and win together.

Steve Tso
Senior Vice President and Chief
Information Officer

“As one of TSMC's supply chain partners focused on sustainability, we formulated a new post etch residue remover which reduces the required number of post-cleaning steps and cuts energy use during the manufacturing process. By working closely together with TSMC, we helped to further reduce their products' environmental footprints.

Edward Shober
Senior Vice President of Global Materials
Segment, Versum Materials



Suppliers are the most important partners to make TSMC innovations possible. By strengthening our Grand Alliance, TSMC will overcome challenges together with our supplier partners and continue to push Moore's Law forward and grow sustainably. As the largest foundry services provider, TSMC is committed to continuing to upgrade its entire supply chain management performance above international standards to create a win-win situation with supplier partners, and become a sustainable force to uplift society.

Directions of Responsible Supply Chain

As an industry leader, TSMC is concerned about the economic, environmental, and social aspects of the development of its supply chain. TSMC Chairman Dr. Morris Chang announced the "[TSMC Environmental Policy](#)" and "[TSMC Safety and Health Policy](#)" in March 2016, declaring TSMC's vision, strategy and guiding principles in these two areas. Based upon the EICC

Code [Code of Conduct](#), TSMC has established its own Supplier Code of Conduct and requires all suppliers to sign a compliance agreement and agree to be bound by the Code before they do business with TSMC. The Code is reviewed at least once every two years. TSMC completed the 4th revision in February 2016 to include hazardous gases and chemicals in its consideration of occupational safety.

TSMC published its [Supplier Code of Conduct](#) on the TSMC Supply Online portal such that suppliers can readily access it and understand TSMC's sustainability requirements.

Main Topics

In 2016, as to supply chain management, TSMC focused on the topics of "Supplier Sustainability Management" and "Industry Localization Upgrade", and also addressed shareholder concerns through full disclosure in Supplier Waste Management and Conflict Minerals.



Main Topics	Sub-topic	Environmental				Social				Economic				
		Green Manufacturing	Pollution Prevention	Hazardous Substance Management	Risk of Climate Change	Occupational Safety and Hygiene	Labor Policies	Ethics Code	Fire Protection Management	Conflict Minerals	Quality and Process Enhancement	Industry Localization Upgrade	Business Continuity Plan	Supply Chain Capacity and Inventory Management
Supplier Sustainability Management	Supplier Assessment	✓	✓	✓	✓	✓	✓	✓		✓				
	Supplier Audit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Supplier Training	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Supply Chain Management Forum and Awards	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Supplier Waste Reduction	✓	✓	✓										
	Conflict Minerals									✓				
Industry Localization Upgrade	Key Material													
	Supplier Capability Improvement	✓	✓	✓	✓	✓			✓		✓	✓	✓	✓
	Continue Driving Local Supply Chain Upgrade	✓									✓	✓	✓	✓

Material Issue

Supplier Sustainability Management

Our Strategy	TSMC 2020 Vision	
2016 Targets	2016 Achievements	2017 Targets
<ul style="list-style-type: none"> With green manufacturing as our objective, TSMC utilizes its influence to lead suppliers to save energy, cut carbon emissions, reduce waste and set up waste management system to upgrade the entire supply chain's management performance to international standards 	<p>2020 Goals</p> <ul style="list-style-type: none"> Maintain 100% fulfillment rate of EICC requirements with respect to member supply chain assessment/audit/management 95% of all suppliers are to sign the Supplier Code of Conduct To enhance the ESH audit score of local suppliers by 160 ^{Note} Sustain 100% sourcing from CFSP compliant smelters Reduce unit waste production of major local waste-producing suppliers by 24% against the 2014 baseline Opt for surface freight in place of air freight to cut 20% carbon footprint for equipment suppliers located in Asia <p>2025 Goals</p> <ul style="list-style-type: none"> Newly developed equipment to conserve power by 30% 	<p>Attained Fulfillment Rate 100%</p> <p>Current Suppliers 65% New Suppliers 100%</p> <p>Materials Source from CFSP Compliant Smelters 100%</p> <p>ESH Audit Score Reached 148</p> <p>Reduced Waste 18.8%</p> <p>Formed Task Force 100%</p> <p>Maintain Fulfillment Rate 100%</p> <p>Current Suppliers 80% New Suppliers 100%</p> <p>Source from CFSP Compliant Smelters 100%</p> <p>ESH Audit Score Reached 150</p> <p>Reduce Waste 20%</p> <p>Complete Feasibility Assessment 20 tool types</p>
<ul style="list-style-type: none"> Attain 100% fulfillment rate of EICC requirements with respect to member supply chain assessment/audit/management Require current and new suppliers to comply with TSMC's ethical standards by signing and updated version of Letter of Assurance Source from CFSP compliant smelters Improve the ESH audit score of local suppliers higher than 146 Reduce unit waste production of major local waste-producing suppliers by 16.2% (against 2014 baseline) Deliver 2025 power-efficient equipment development plan 		

 Achieved

 Surpassed

Note: Audit full score is 200.

Supply Chain Management Measures

Through collaboration with suppliers, TSMC set up a project to bring sustainability into daily supply chain management by means of supplier selection, audit, performance measurement, training and the annual supply chain management forum. In addition, TSMC has regularly held a supply chain risk management meeting every week and works with Fabs, Nano-Materials Centers, quality management and related business units to identify and manage the associated risks such as insufficient capacity, quality issues or supply chain disruptions. Supply chain management results are reported to the vice presidents of material management, quality management and operations every two months.



Supplier Assessment

All suppliers must be qualified and follow the supplier's code of conduct

- Process related raw material supplier: obtaining ISO9001 certification (Quality Management Systems Standards) is mandatory
- Facility suppliers and subcontractors: obtaining OHSAS18001 certification (Occupational Health and Safety Assessment Series) is mandatory
- Local manufacturer: obtaining a valid factory registration certificate issued by the local government and ISO14001 certification (Environmental Management Standards)



Supplier Audits

- TSMC has set up an audit team and a tutoring team to trace the progress of deficiency improvements. These teams work with suppliers to improve quality and technology, enhance the process and production yield, elevate ESH performance as well as implement automation for capacity expansion. TSMC also requires suppliers' commitment for waste reduction.



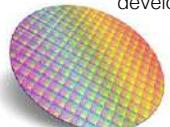
Supplier Training

- TSMC hosts periodic training and workshops. Through different forms of guidance and communication, the performance of environmental and safety and health is expected to be enhanced and aligned with international norms effectively. The course includes workplace hygiene, employee health, fire prevention and maintenance, carbon emission investigation, climate change, regulatory risk, business ethics and conflict minerals.



Supplier Forum and Awards

- In addition to conveying the sustainability concepts and objectives of TSMC, TSMC also recognizes the outstanding performance and significant contribution with awards in four areas: excellent quality, cost effectiveness, ensuring supply, and sustainability. These are awarded at the annual supplier forum.



Supplier Assessment

There are over 1,500 suppliers from different professional domains doing business with TSMC. To accelerate their alignment with international standards, TSMC made use of the EICC protocol to establish a systematic risk assessment process. In 2016, TSMC requested all its 25 major suppliers associated with the top 80% in spending to complete the SAQ (Self-Assessment Questionnaire) evaluation at both corporate and facility levels, and the results showed that 96% of them were considered as low risk. The only medium-risk major supplier, based in Taiwan, was included in the 2016 audit plan.

SAQ Results of Major Suppliers

Group	Total Assessed in 2016	Main Locations	Assessment Method	Assessment Results	Total Audits
Major Suppliers Top 80% spending	Headquarters • 25 suppliers	Japan, USA, and Western Europe	SAQ score	96% of major suppliers assessed and considered as low risk	1
	Supplying facilities • 83 supplying facilities worldwide			Supplying facilities • 82 considered low risk • 1 medium risk	1
Secondary Suppliers Remaining 20% spending	207 suppliers	China, Malaysia, and Taiwan ^{Note}	Based on supplier risk assessment considerations	51% needed to be audited	106

Note: Due to weaker labor rights and longer working hours, suppliers operating in China, Malaysia and Taiwan are classified as at-risk

Supplier Risk Assessment Flow



Supplier Audits

To ensure that suppliers fully comply with TSMC's Supplier Code of Conduct and take responsibility for their supply chains, every year TSMC takes SAQ scores of major suppliers as well as other risk assessment factors into consideration to determine the auditees. In 2016, TSMC personnel audited 102 suppliers located in Taiwan, whereas suppliers in China and Malaysia were requested to conduct VAP (Validated Audit Process) audits by engaging certified third-party auditors who are familiar with local laws. Altogether, 107 audits were conducted in 2016, markedly higher than the 60 in the preceding year.

Every on-site audit in Taiwan was led by a Supply Chain member and supported by associates from Legal, ESH, and Waste Management divisions who were experts in their

respective fields. During each audit, plant inspections, document reviews, and interviews with management and employees were carried out for issue identification and rectification.

Number of Supplier Sustainability Audits



Supplier Audit Results

Item	Taiwan	China	Malaysia
Audit Type	Non-VAP audits (performed by TSMC)	VAP audits (outsourced)	VAP audits (outsourced)
Audit Count	102	3	2
Audit Score ^{Note}	148	71	76
Average Non-compliances	6	22	28
Common Non-compliances	<ul style="list-style-type: none"> ● Working hours ● Employment fees ● Labor health regulations ● Fire protection ● Climate change response ● Earthquake protection 	<ul style="list-style-type: none"> ● Working hours ● Wages and benefits ● Occupational safety ● Hazardous Substance Management 	<ul style="list-style-type: none"> ● Working hours ● Occupational safety ● Industrial hygiene

Note: Full score is 200

Supplier Training

TSMC requires suppliers to strictly comply with the local ESH regulations of their factories to reduce the risk of raw material supply disruption, improve the safety and health level of the supplier's working environment and mitigate the impact of climate change. According to the audit results, there is room for improvement in suppliers' performance in environmental protection, safety, and health. All of the audit faults are closely tracked through

TSMC Supply Online. At the same time, training courses and counseling were held to improve suppliers' ability. In 2016, TSMC organized 12 supplier training courses covering the fields of safety and hygiene, employee health, fire protection maintenance, carbon inventory, climate change, regulatory risk, and ethics, which were attended by more than 1,000 suppliers' representatives.

In addition to organizing training courses to enhance supplier capabilities, TSMC directly communicated with the top managers of the suppliers when serious audit faults were unearthed since 2016. In addition to an explanation of the root cause, we also asked for a comprehensive improvement plan. Through this two-way approach, the suppliers' average auditing score was 148, and the ESH audit score of substandard local suppliers increased by 18%.

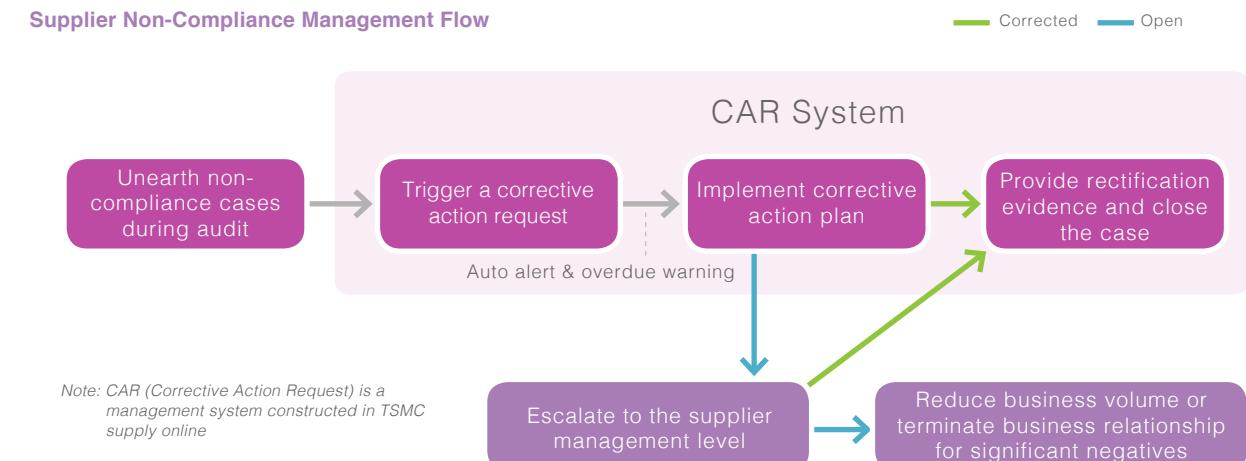
158

For repeat auditees in 2016, their average improved to 158 from 144 in the previous year

148

In 2016, the ESH audit score of local suppliers improved from 146 to 148 and substandard local suppliers' score increased by 18%

Note: Full score is 200

Supplier Non-Compliance Management Flow

Note: CAR (Corrective Action Request) is a management system constructed in TSMC supply online



TSMC managers communicated face-to-face with suppliers



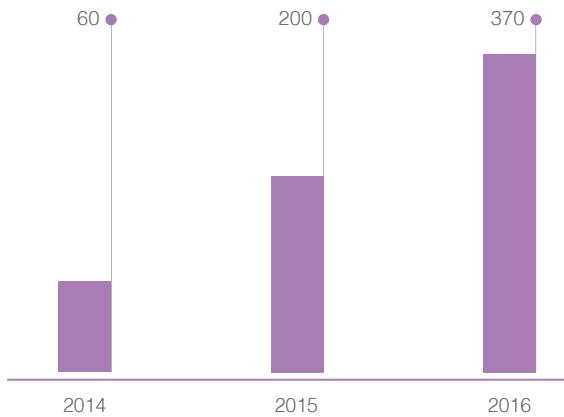
Suppliers visited TSMC to observe fire emergency response

2016 Supplier Training

Training	Number of Times	Training Topics	Number of Attendees
Training Course	● Safety & Hygiene, Labor Health, Fire Protection Maintenance, Carbon Inventory, Mitigation for Climate Change Regulatory Risk, BCP	2	180
	● Ethics	8	719
On-site Observation and Learning	● Examination of emergency response devices and observation of accident emergency response practices	1	32
ESH Forum	● Experience sharing of suppliers with excellent ESH performance ● Face-to-face communication between TSMC Procurement and ESH directors and suppliers on ESH forum	1	160

Number of Environmental Safety and Health Training for Suppliers

Unit: No. of people

**Unqualified Ratio of Supplier Environmental Safety and Health Audit**

Unit: %

**Supplier Forum and Awards**

Every quarter, TSMC measures supplier performance for quality, cost, delivery and sustainability of silicon wafers, reclaimed wafers, gas, chemicals, quartz components, and masks, covering more than 90% of our annual raw material spending. Based on that, we determine our procurement strategy and candidates for yearly supplier awards accordingly.

TSMC held its [17th annual Supply Chain Management forum](#) on February 23th, 2017 to show appreciation for the support and contributions of its suppliers. Keeping with the forum's theme of "Collaborate and Win Together", the event gathered over 600 suppliers from around the world in the fields of equipment, materials, packaging, testing,

facilities, IT systems and services, and environmental and waste management services.

TSMC President & Co-CEO, Dr. Mark Liu, announced a new vision of green energy, and called for equipment suppliers' collaboration with TSMC to achieve the goal of 30% power conservation for new tools in 2025. At the same time, he also encouraged suppliers to improve process, optimize material consumption and improve waste recycling rate. In 2016, TSMC successfully brought 10nm technology into volume production and paved much of the way for risk production qualification of 7nm technology. In order to highlight the part played by suppliers in these and other successes, TSMC recognized 11 outstanding equipment and materials suppliers with its Excellent Performance Award.

Supplier Waste Reduction

TSMC believes that the best waste reduction approach is to reduce its generation at the source and make use of circular economies to manage it as a resource. As such, TSMC encourages local material suppliers to initiate waste reduction programs, and in 2015 requested them to disclose their waste output to identify the 10 collaborating partners (accounting for 80% of output) on the effort. For 2016, these suppliers collectively reduced their unit waste output by 18.8% (against the 2014 baseline), translating to 17,000 metric tons in cumulative weight since the program started. At the same time, TSMC also plans to receive equipment from suppliers located in Asia by surface freight rather than air freight, thereby reducing carbon footprint 20% by 2020.



TSMC President and Co-CEO, Dr. Mark Liu, gave the keynote speech at TSMC's 17th Annual Supply Chain Management Forum

Supplier Waste Reduction Programs and Results^{Note}

Product Category	Supplier	Main Waste	Improvement Means	Reduction (%)	Cumulative Reduction (Metric Tons)
 OSAT	Supplier 1	Over 70% was developer waste mixed with organic solvent waste	1. Control of water content in sludge 2. Diversion of low-concentration rinsing solution to waste water treatment plant 3. NMP recycle	31%	4,960
	Supplier 2	Over 90% was solvent waste, trash, and inorganic sludge	1. Piping segregation 2. Efficiency improvement of organic waste water treatment	20%	674
	Supplier 3	Ammonium chloride, waste solutions (IPA, OK-73)	1. Lowering of acid flushing frequency 2. Self-treatment of liquid waste 3. Piping segregation to reduce the volume of highly-diluted solution being treated as chemical waste	9%	428
 Wafer	Supplier 4	Over 80% was inorganic sludge, sludge mixture, and non-hazardous sludge	Reutilization of cutting oil to improve the recycling rate of oil and grain	14%	3,549
	Supplier 5	Over 70% was non-hazardous sludge	Installation of load cell on new slurry tool, and usage optimization of oil and powder	16%	1,820
	Supplier 6	Over 90% was non-hazardous and inorganic sludge	Recycling of cutting oil	19%	582
 Chemical/Photoresist	Supplier 7	Over 60% was fluoride liquid waste (discounting acetic acid)	Reduction of average HF usage for tankers	33%	2,360
	Supplier 8	Over 90% was inorganic sludge, activated charcoal	1. Use of ozone machine to lower chemical mixture and sludge production 2. Improvement of bio function to reduce mixing load to reduce sludge production 3. Process improvement of high-waste-output products	4%	420
 Gas	Supplier 9	Nearly 90% was liquid waste (with flash point < 60°C) and chemical drums	1. Process enhancement to reduce usage of materials 2. Reduction of liquid waste usage in laboratory	26%	219
	Supplier 10	Nearly 90% was organic and CaF ₂ sludge	Dehydration	21%	2,196

Note: Only main reduction programs disclosed

Conflict Minerals

TSMC supports the “responsible sourcing” practice advocated by the Electronic Industry Citizenship Coalition (EICC) and the Global e-Sustainability Initiative (GeSI), and adopts their jointly developed Conflict-Free Smelter Program (CFSP) to require and help our suppliers to source conflict-free minerals. Meanwhile, we have implemented a series of compliance safeguards in accordance with industry leading practices such as establishing the due diligence framework in the OECD's Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High Risk Areas.

Actions and Achievements on Conflict Minerals

Actions Taken in 2016

- TSMC joined Conflict Free Sourcing Initiative, CFSI
- TSMC required our suppliers to update their Conflict Minerals Reporting Template (CMRT) from time to time
- Potential new suppliers were required to pass an assessment for verification of their compliance with TSMC's conflict minerals policy before formally becoming TSMC's eligible suppliers
- TSMC required our suppliers to assure us in writing that they would only source from CFSP compliant smelters

Achievements of 2016

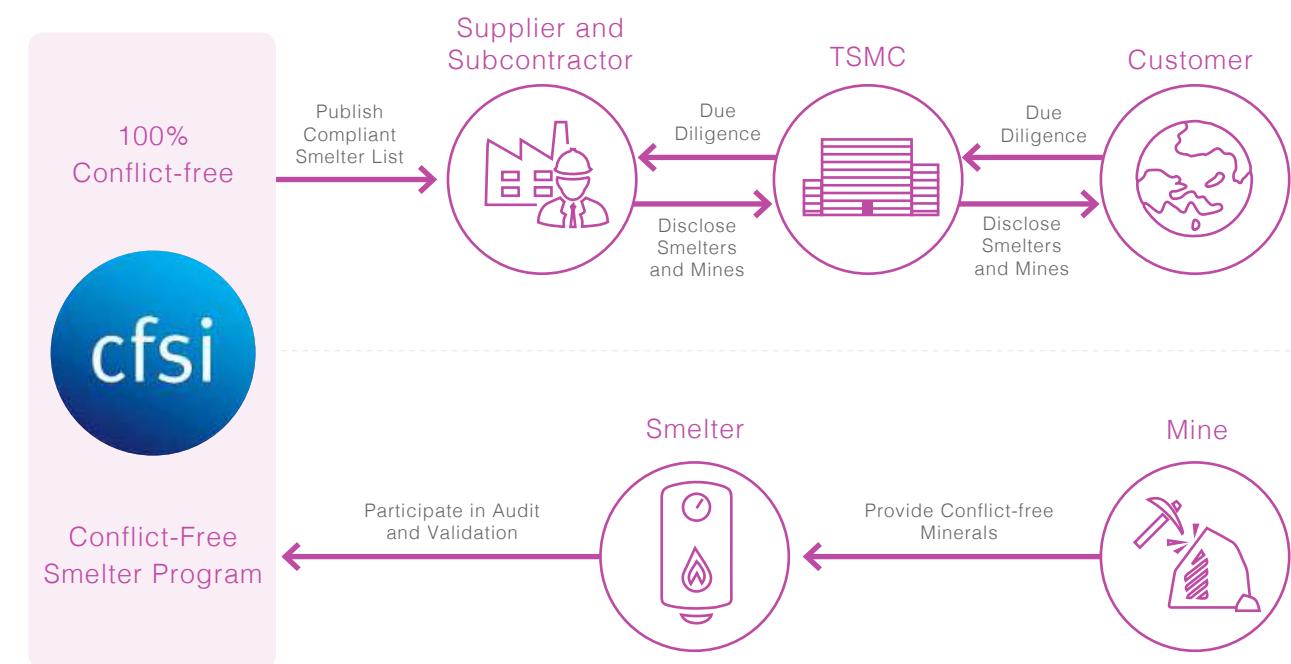
100%

Conflict-free Sourcing

100%

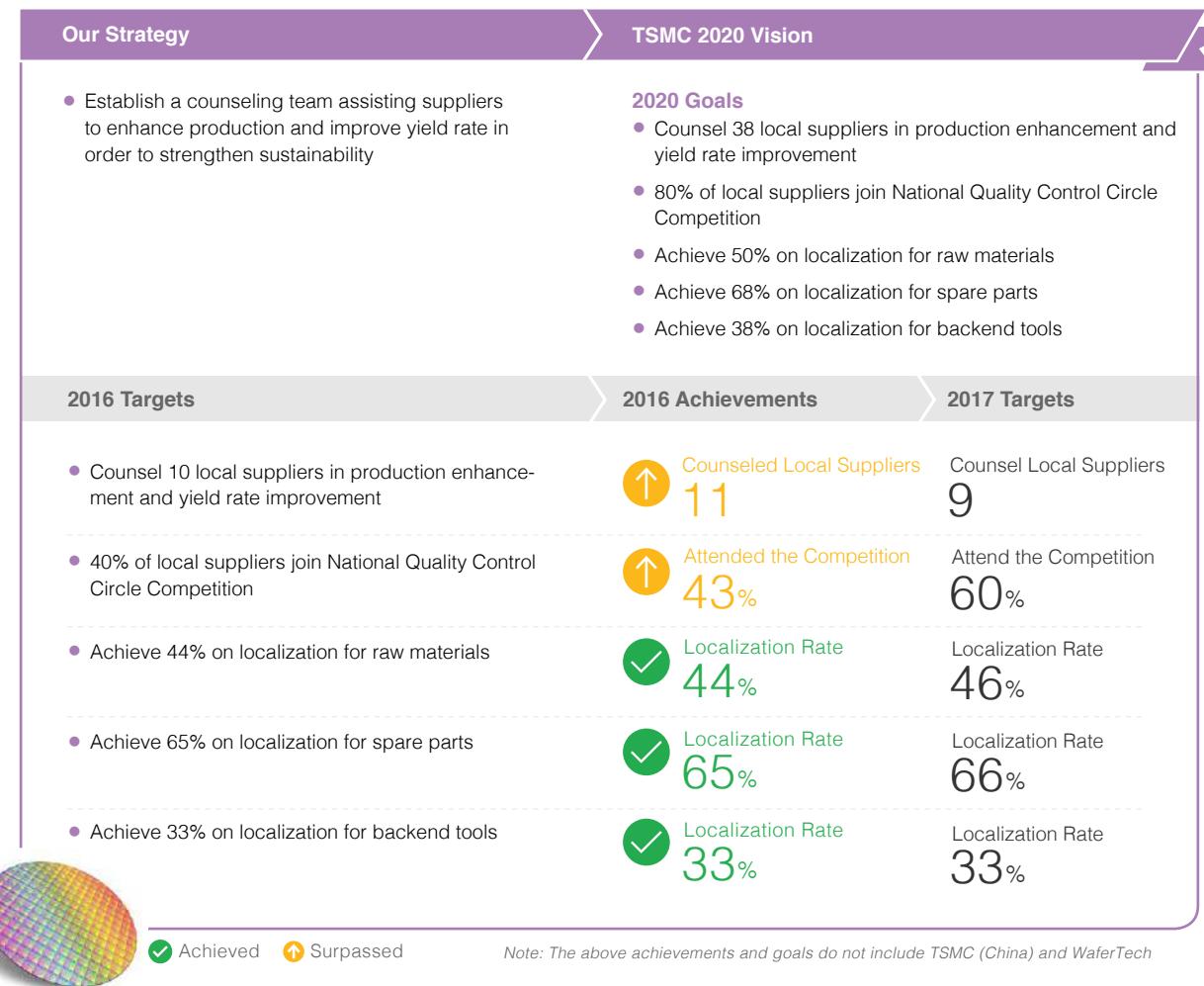
Compliant with Customers' Audit Requirements on
Conflict-free Sourcing

Conflict-Free Sourcing Management Framework



Material Issue

Industry Localization Upgrade

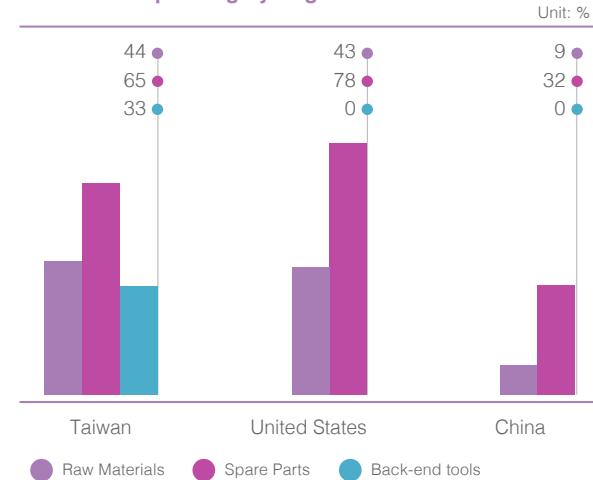


TSMC procurement categories are broadly divided into six categories: equipment, spare parts, raw materials, factory, facility and commodity. In Taiwan, procurement in each plant is unified by headquarters. TSMC (China), WaferTech and other subsidiaries have independent procurement organizations.

In order to strengthen cooperation with suppliers, TSMC has been promoting the localization of procurement for many years. In addition to increasing flexibility, shortening the development of new products and reducing unnecessary costs to ensure the quality of service to customers, localization can also reduce supply chain carbon emissions, promote green industry development and create local employment opportunities. This is also why many suppliers have come to Taiwan to invest in production in response to TSMC's call since 2004.

TSMC's current main production base is in Taiwan and we view enhancing the sustainability of the local semiconductor industry an important part of corporate social responsibility. We actively counsel key raw material suppliers to upgrade their technology and quality, thereby increasing the amount of local procurement. As an extension of TSMC's global supply chain, TSMC (China) will actively promote localization in the future and help local suppliers enhance their capacity in a win-win situation.

2016 Local Spending by Region



Note1: Localized procurement means the supplier is required to be engaged in manufacturing and processing

Note2: In Taiwan: The Central Procurement of TSMC includes plants in Hsinchu, Taichung and Tainan

Note3: In the United States: WaferTech

Note4: In China: TSMC (China)

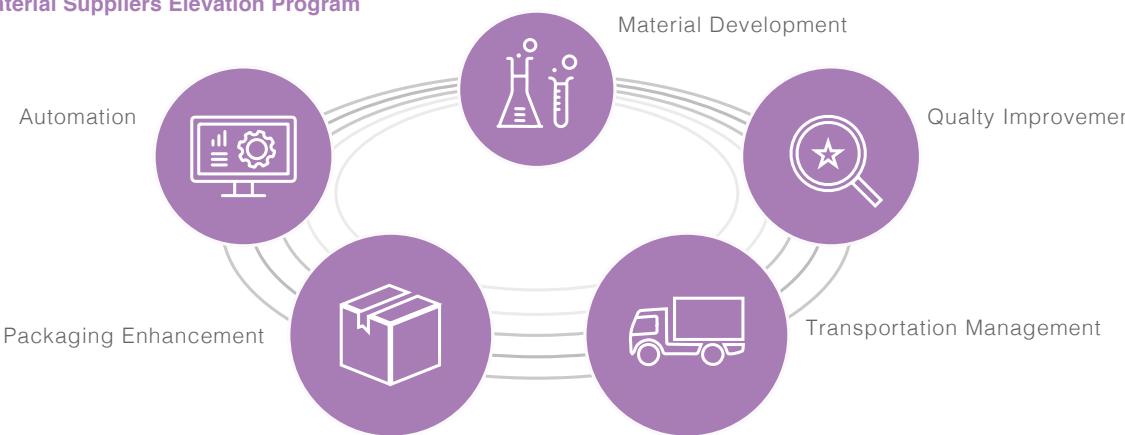
Note5: Neither TSMC (China) nor WaferTech has demand for back-end tools

Key Material Supplier Capability Improvement

During the process of innovation, TSMC cannot challenge and break through Moore's Law without its suppliers' support. To make its 10nm process ramp up smoothly, TSMC has encouraged our suppliers to join the "Raw Material Suppliers Capability Upgrade" improvement plan since 2015. Hundreds of field experts from the Material Management Division, Nano-Materials Center Department, Incoming Materials Quality & Reliability Department, Corporate ESH Division, Legal, and Waste Management teams worked hand in hand with our local suppliers to develop advanced node materials, improve quality and technology, enhance the process and yield, upgrade packaging and implement automation for capacity expansion.

The "Raw Material Suppliers Capability Upgrade" team has continuously revealed issues from its on-site audits and periodic quality reviews, and targeted 38 key raw material suppliers for the improvement program. During 2016, we successfully cooperated with 11 local suppliers, and will continue to devote resources to improve supplier quality and process capability. The project's aim is to complete the rest of the 27 suppliers before 2020.

Raw Material Suppliers Elevation Program



In addition to supplier counseling, TSMC has revised the weighting of "continuous improvement" in its supplier appraisal procedure, and encouraged suppliers to join the National Quality Control Circle Competition held by the Industrial Development Bureau of Ministry of Economic Affairs for elevation of quality culture and capability. In 2016, 43% of our local suppliers joined the competition to reach the highest join ratio ever, and collectively won 2 silver prizes and 4 bronze prizes. TSMC will continue to encourage our suppliers to join the competition and we target raising the participation ratio to 60% by 2017, and 80% by 2020.

Supplier Improvement Results

	Issue Description	Methods	Achievements
Material Development	<p>Supplier-1 New materials development for high-end products</p> <p>Supplier-2 Jointly develop new materials with raw material suppliers</p> <p>Supplier-3 </p>		Developed new materials for high-end products and fulfilled the capacity requirements
Quality Improvement	<p>Supplier-4 High impurities in raw material may result in process defects</p> <p>Supplier-5 Poor yield leads to insufficient supply</p>	<p>Control critical manufacturing recipe</p> <p>Improve tank cleanliness</p>	<p>Impurities reduced by 50%</p> <p>Purity improved by 60% so that safety inventory was built</p>
Transportation Management	<p>Supplier-6 Raw materials contamination during transportation may result in goods return</p> <p>Supplier-7 Surge demand for raw materials during ramping in new plant</p>	<p>Improve the quality of lorry and implement real-time monitoring</p> <p>Replace tank by lorry for transportation</p>	<p>Zero lorry return rate</p> <p>Capacity increased by 15 times</p>
Packaging Enhancement	<p>Supplier-8 Contamination of raw materials leads to process defects</p> <p>Supplier-9 Blemished cylinder caused by process defects</p> <p>Supplier-10 High cylinder return rate</p>	<p>Implement pre-check process for packaging</p> <p>Duplicate TSMC's experience and establish a risk-free production line</p> <p>One-stop inspection from supplier to TSMC</p>	<p>Zero pollution and zero defect for packaging materials</p> <p>Zero blemished cylinder</p> <p>Zero cylinder return rate</p>
Automation	Supplier-11 Lack of production capacity and loose production line management	Optimize management processes by system automation	Capacity increased by 10 times

Continue Driving Local Supply Chain Upgrade

As of the end of the 2016, foreign equipment suppliers, raw materials suppliers, and key parts suppliers have invested to build 68 facilities in Taiwan, including 43 manufacturing facilities, 13 R&D centers, and 12 training centers. It is estimated that the number of suppliers that will invest to build factories and establish R&D centers in the coming two years will increase by eight.

TSMC believes that the only way to drive the continuous growth of the local purchasing is to upgrade the capability of suppliers. In 2016, through the local supplier counseling and continuous improvement program, the proportion of locally procured raw materials increased from 42% in 2015 to 46% in 2016, and is expected to reach 50% in 2020. The

spare parts localization ratio is expected to increase from 65% in 2016 to 68% in 2020. Back-end equipment local purchasing ratio is expected to increase from 33% in 2016 to 38% in 2020.

Benefits from Localization

Benefit	Description
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Reduce the Carbon Footprint

Through localized production, we reduce transportation costs and carbon dioxide emissions. In 2016, raw materials acquisition localization has reduced carbon dioxide emissions by 3,560 metric tons.

3,560 metric tons

Reduced carbon dioxide emissions by 3,560 metric tons

\$1.5 bn

TSMC localized purchase value increased to NT\$1.5 billion from 2004 to 2016.

3,000 jobs

Created more than 3,000 local jobs from 2004 to 2016



Ensure Technology Leadership

In addition to reducing the cost of localization and shortening the development time of advanced processes, the investment in R&D resources also promotes the upgrading of Taiwan's semiconductor industry. In recent years, suppliers have set up R&D centers and training centers in Taiwan to increase the number of quality jobs.



Creating Local Employment Opportunities

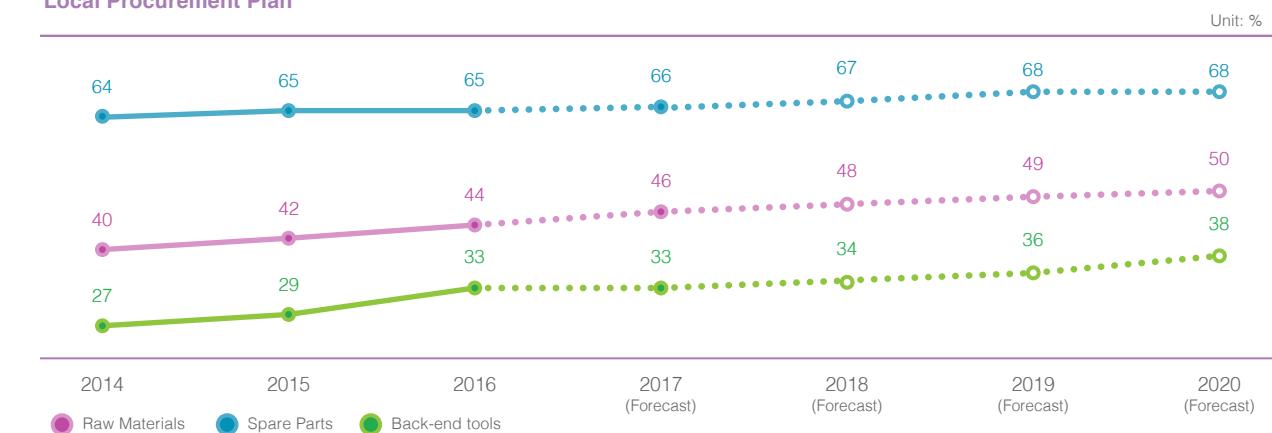
Based on total purchase value of raw materials in 2016, TSMC localized purchase value increased to NT \$ 1.5 billion and created more than 3,000 local jobs from 2004 to 2016.

Historical Numbers of Localized Critical Foreign Suppliers



Note: TSMC foreign equipment, raw material and spare parts critical suppliers

Local Procurement Plan



Note: TSMC Taiwan including business in Hsinchu, Taichung and Tainan

Green Manufacturing

TSMC is steadfast in its commitment to sustainability, and strives to be a world-class company in environmental protection. As a leader in green manufacturing, TSMC stays abreast of global trends in environmental protection, energy conservation, and climate change, and assimilates green management and development strategies into business. In addition to taking the lead in adopting environmentally friendly measures and continuously improving energy management and pollution prevention, the Company is eager to share its environmental know-how and experience. TSMC looks forward to a sustainable future where enterprise is in harmony with the environment.

“ TSMC cares about climate change, and is committed to green manufacturing to pursue the most efficient use of our energy and water resources. In recent years, we have also begun to engage in waste reduction and waste resource management. We encourage employees to innovate all the time and find ways to improve sustainable performance and keep building up our world-class green power.

J. K. Wang
Vice President of Operations

“ TSMC has a lengthy track record of aggressively reducing greenhouse gases and recycling wastewater, surpassing legal requirements for environmental protection. It creates sustainable value by generating enterprise growth while also prospering with the environment, and is a world-class benchmark company that the people of Taiwan can be proud of. I look forward to TSMC's continued influence on the industry and supply chain to improve their environmental performance.

Young Ku, Chair Professor
Department of Chemical Engineering,
National Taiwan University of Science and Technology



Material Issue

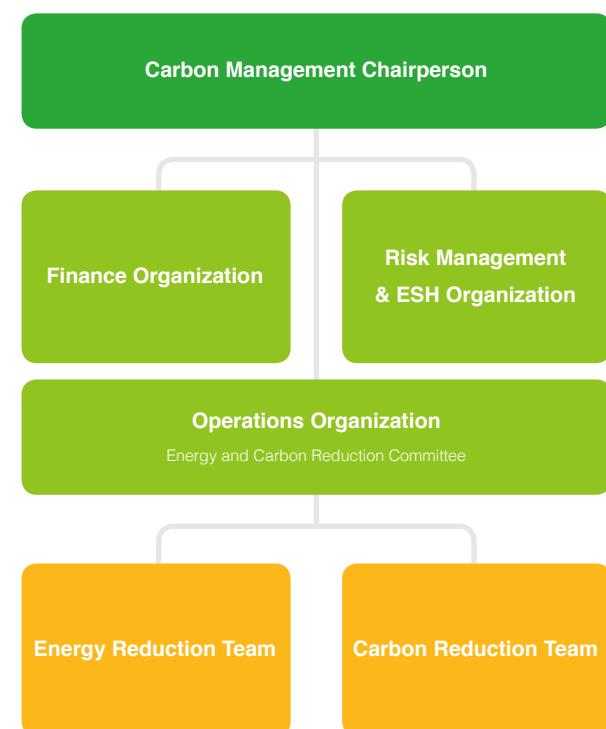
Climate Change and Energy Management



Climate change impacts global ecosystems and human lifestyles. Countries are now more determined to respond to climate change as an urgent task for all mankind since the Paris Climate Agreement became effective in November, 2016. The "TSMC CSR Policy" and "TSMC Environmental Policy" approved by the Chairman Morris Chang declare that responding to climate change is one of our most important responsibilities and strategies. We employ risk matrix to evaluate in three dimensions the regulation, climate disaster and action impact, which helps to identify TSMC's risks and opportunities from global climate change. We continuously monitor global climate change, international and governmental response trends, with regular reviews by the CSR chairperson, and reports are made to the Audit Committee of the TSMC Board of Directors.

semiconductor industry in Shanghai. This China experience will be an important reference for TSMC's carbon cap and trade strategy. TSMC currently uses the highest penalty of the R.O.C. Greenhouse Gas Reduction and Management Act as an internal carbon price as a reference for evaluating the feasibility of energy and carbon reduction plans.

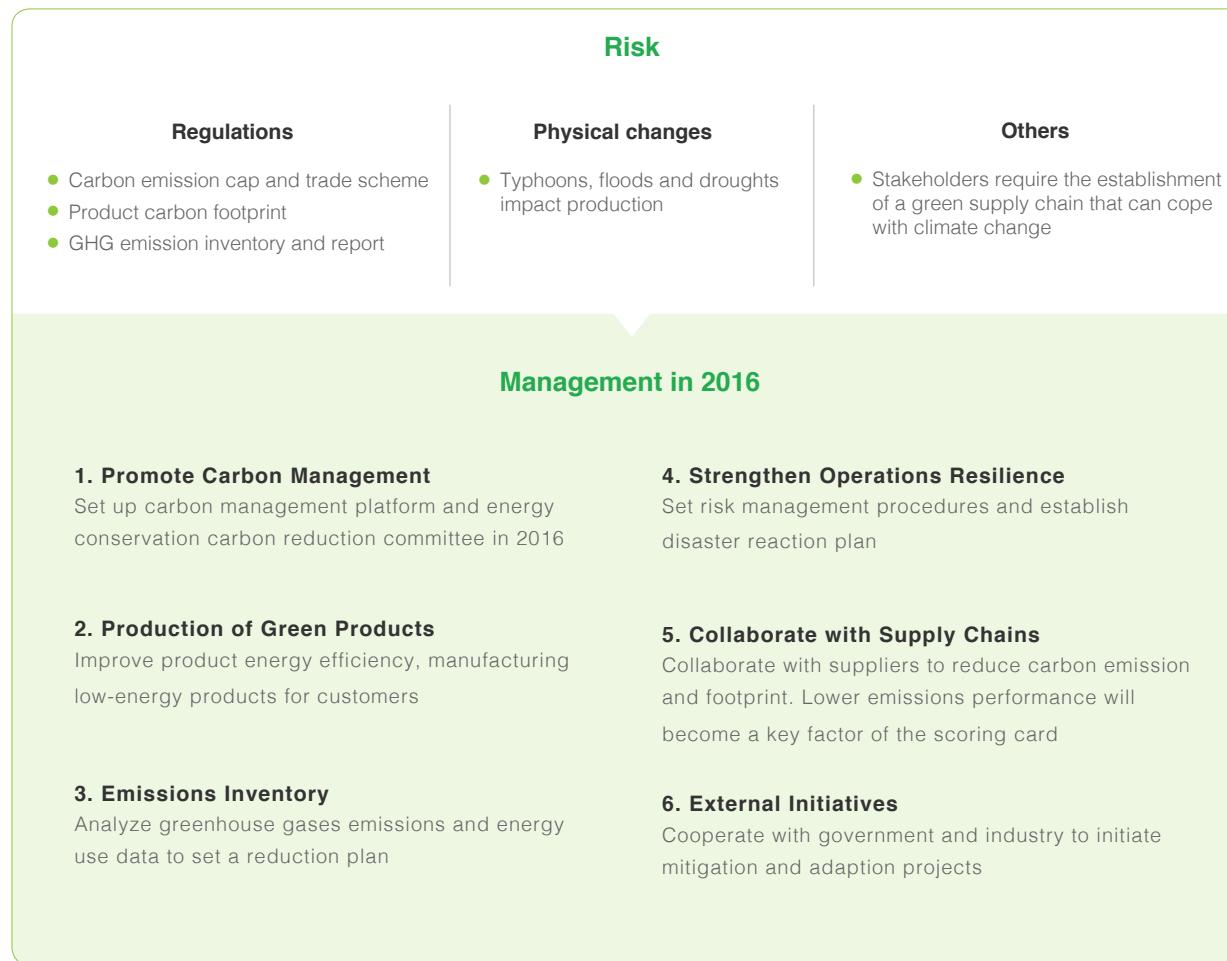
Carbon Management Platform



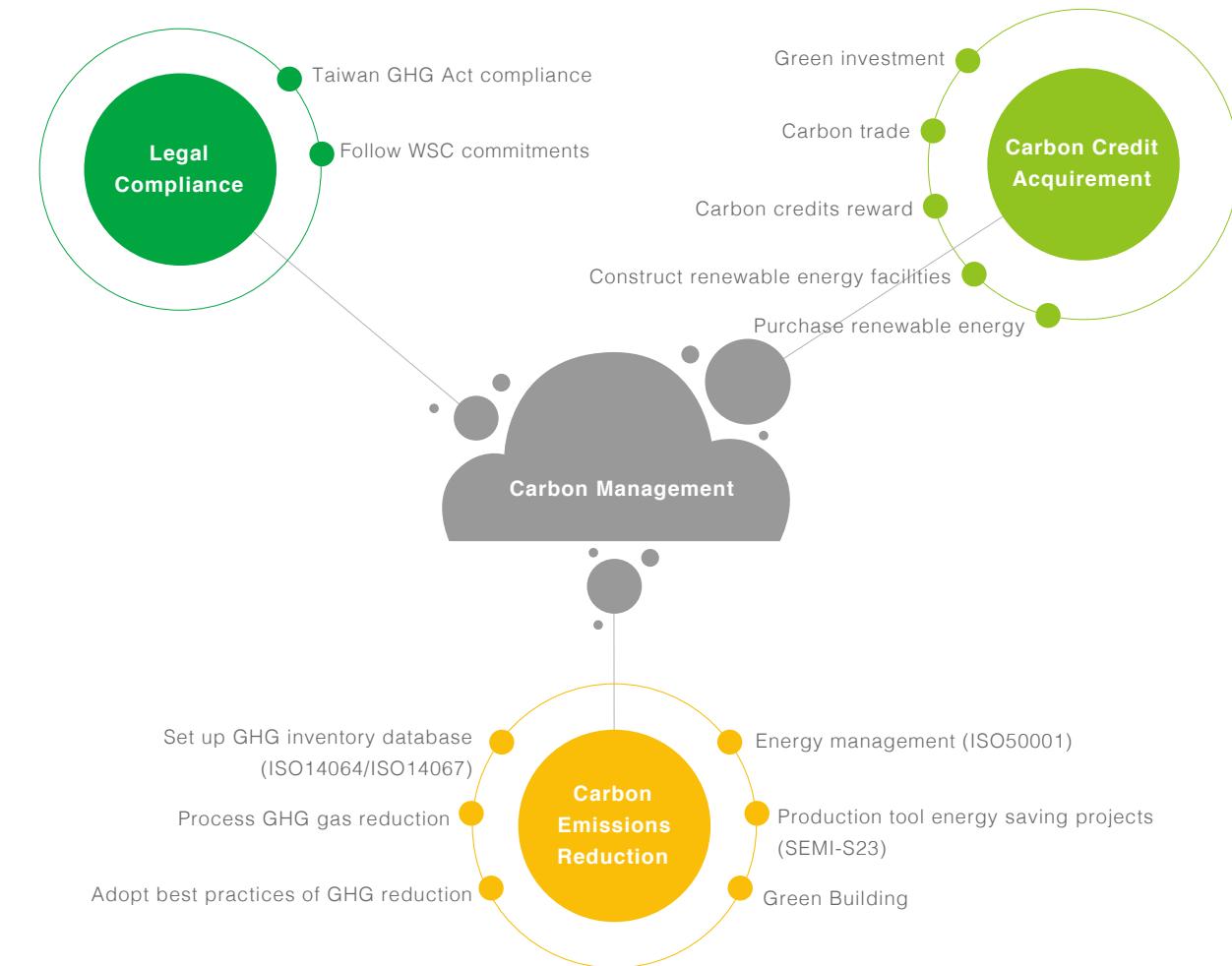
Initiating Carbon Management Platform

In order to cope with the global climate change and the R.O.C. "Greenhouse Gas Reduction and Management Act" promulgated in 2015, TSMC initiated a cross-function platform for corporate carbon management in February 2016. The three focuses of this platform are legal compliance, carbon emission reduction, and carbon credit acquisition. In addition to participating in official regulatory consultation and communications meetings, TSMC also sets medium- and long-term reduction targets through the "Energy and Carbon Reduction Committee" led by VPs of Operations, which are carried out by energy and carbon reduction teams of individual fabs as the company continues to strengthen climate mitigation and adaption. In 2016, TSMC China became the first fab to face external carbon cost due to a cap and trade scheme applied to

Risk Assessment and Climate Change Response



Carbon Management



Climate Change Mitigation

Greenhouse Gas Emission Inventory

In 2005, TSMC established GHG emissions inventory procedures for all fabs, including oversea fabs. Each fab is required to complete scope 1 and scope 2 GHG emissions inventory for the previous year and receive official ISO 14064-1 certification issued by an external verification party.

In 2016, due to the expansion of new production capacity, the total amount of greenhouse gas emissions from TSMC increased 11% from 2015 to 7.42 million metric tons of carbon dioxide equivalent, of which scope 1 direct emissions accounted for about 30%, and scope 2 indirect

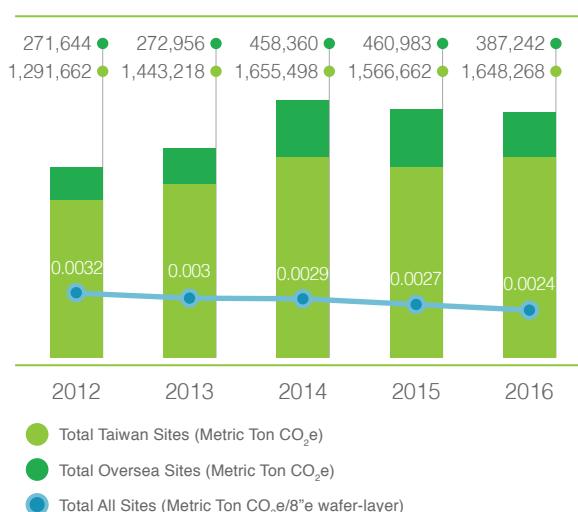
emissions accounted for 70%. With the full implementation of carbon reduction projects in existing fabs and best energy-saving design adoption in new fabs, the greenhouse gas emissions per unit product was 10% below 2010's level in 2016, achieving our reduction target.

TSMC is not only devoted to reducing our own manufacturing emissions but have also focused on the emissions from supply chains. We required and assisted our suppliers to establish capability to monitor greenhouse gas inventory levels and estimate product carbon footprint. All these upstream and downstream emissions are monitored in our scope 3 emission data and are also indexed to track and reduce our suppliers' carbon emissions.

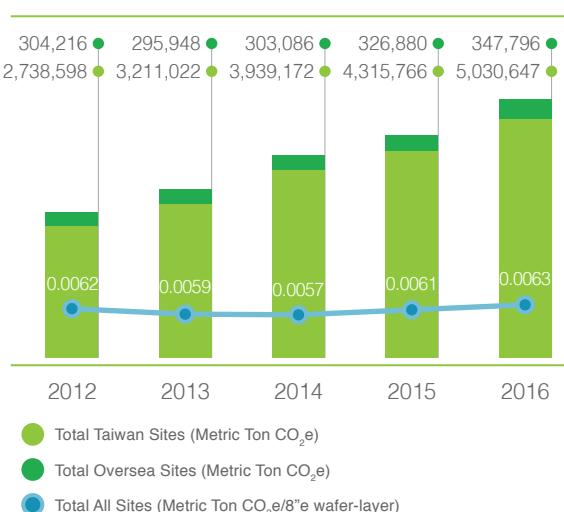
Greenhouse Gas Inventory Scope Definition



Scope 1 GHG Emissions



Scope 2 GHG Emissions



Scope 1 Emission

Direct Emission from Manufacturing

Process gases (PFCs, HFCs, N₂O, CH₄ and CO₂)

Fuel combustion such as natural gas, gasoline and diesel

Fugitive emissions from septic tanks and firefighting equipment

Scope 2 Emission

Indirect Emission from Purchasing Energy

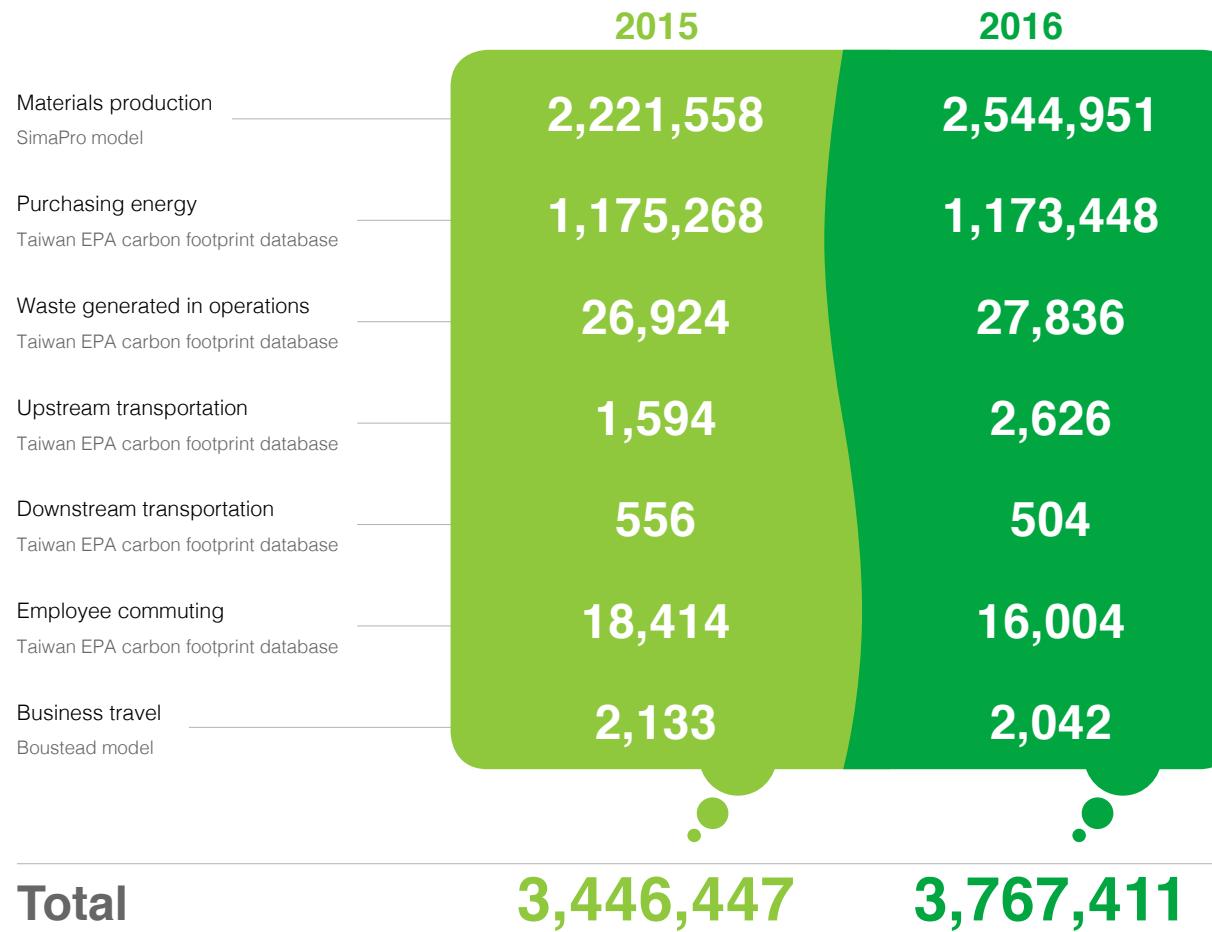
Purchasing electricity

Scope 3 Emission

Other Indirect Emission

- Employee commuting
- Business travel
- Products and materials shipping
- Materials and capital goods production
- Waste generated in operations
- Fuel-and-energy-related activities (not included in Scope 1 or 2)

Scope 3 Greenhouse Gas Emission



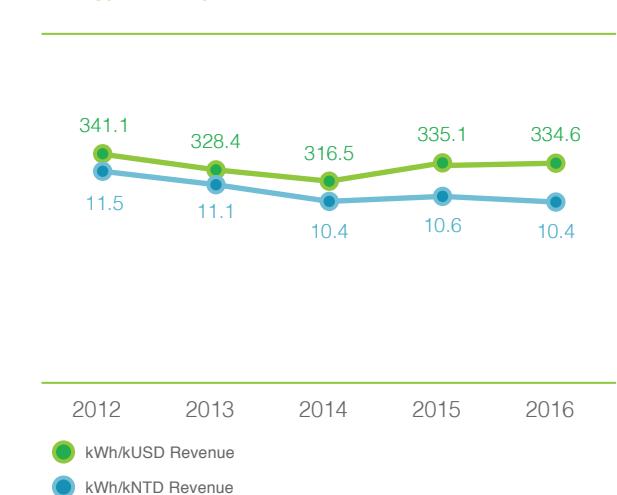
Energy Use Status

According to the results of TSMC's energy inventory, the company's primary source of energy is electric power, followed by natural gas and small amounts of diesel fuels. TSMC's total energy consumption in 2016 was 9,848 GWh. The majority is electricity usage, which is about 95% of total energy consumption. Second is natural gas, which is about 4.9% of total energy consumption. Diesel consumption is less than 0.05% of total energy consumption. TSMC's energy consumption per thousands of NT\$ revenue was 10.4 kWh in 2016, down about 1.9% from 10.6 kWh in 2015.

Energy Consumption



Energy Intensity



Note 1: The statistical data for annual energy consumption includes all fabs in Taiwan, as well as all overseas fabs, packing and testing facilities, bumping, EBO, R&D, and energy consumed by non-production activities

Note 2: The conversion unit is 1 cubic meter of natural gas = 10.4 kWh

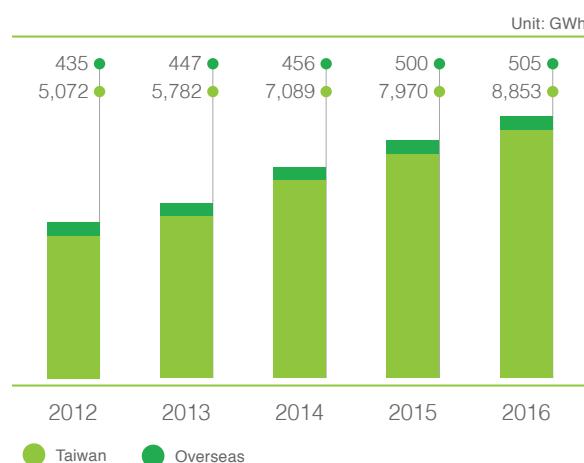
Note 3: TSMC's annual diesel consumption is less than five ten thousandths, not shown on the chart

Note 1: The statistical data for energy intensity includes all fabs in Taiwan, as well as all overseas fabs, packing and testing facilities, bumping, EBO, R&D, and energy consumed by non-production activities

Note 2: US\$1 = NT\$32.2

TSMC's electric power is mainly consumed in manufacturing by process equipment and facility systems. We use ISO 50001 and cross-fab energy efficiency comparisons to find the best mode of operation and make company-wide adjustments to seek maximum efficiency from each kWh consumed. TSMC's unit power consumption was 9.7 kWh/8"e wafer - layer in 2016, 8.5% lower than 10.6 kWh/8"e wafer - layer in 2010. Natural gas is mainly used for boilers, Volatile Organic Compounds (VOC) treatment systems and burn-type Point-of-Use Waste Gas Treatment systems to reduce direct fluoride gas emission and greenhouse gas emission. In 2016, TSMC consumed 0.055 cubic meters of natural gas per 8-inch wafer per mask layer. Diesel is primarily used in emergency power generators and fire pumps, which are only engaged during power supply disruptions, scheduled maintenance and emergencies. Diesel is not a direct energy source for production and we used approximately 442 kiloliters in 2016.

Power Consumption



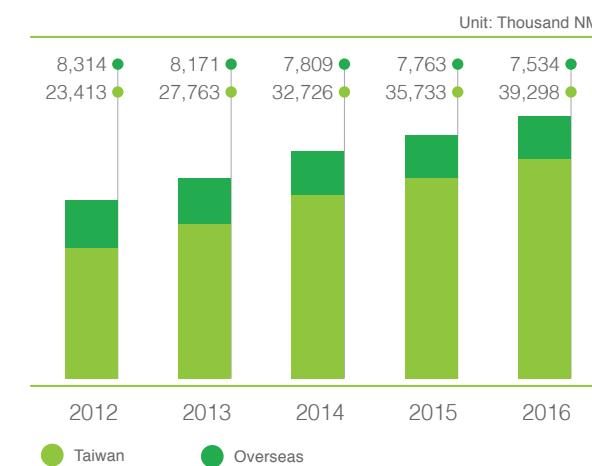
Unit Power Consumption and Goal Completion



Note : The statistical data for annual power consumption includes all fabs in Taiwan, as well as all overseas fabs, packing and testing facilities, bumping, EBO, R&D, and power consumed by non-production activities

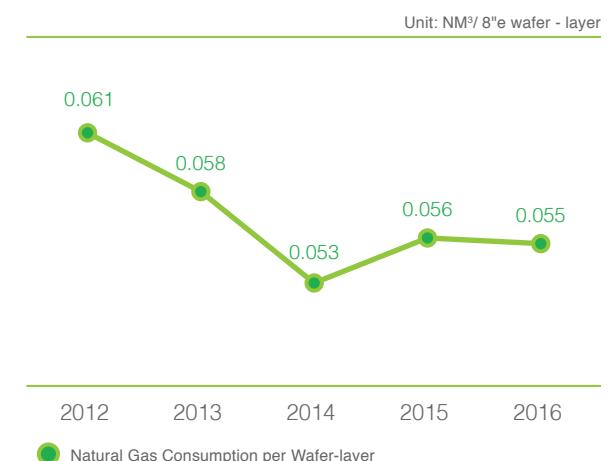
Note : The statistical data for unit power consumption density is for the power usage of wafer fabs in Taiwan and overseas

Natural Gas Consumption



Note : The statistical data for natural gas consumption includes all fabs in Taiwan, as well as all overseas fabs, packaging and testing facilities, bumping, EBO, R&D, and natural gas consumed by non-production activities

Unit Natural Gas Consumption



Note : The statistical data for unit natural gas consumption density includes all fabs in Taiwan, as well as all overseas fabs, packaging and testing facilities, bumping, EBO, R&D, and natural gas consumed by non-production activities

Renewable Energy

TSMC responds to the government's policy to support renewable energy development by taking practical action as buying green power. TSMC purchased 100 GWh of green power in 2015 and 200 GWh of green power in 2016, accounting for 74% of total green energy sold, becoming Taiwan's largest buyer of green power for two years. TSMC Fab have also installed solar panel to generate renewable energy used in our facilities. As of 2016, our total solar panel capacity is 1,313 kW and new Fabs will expand the capacity to 480 kW solar installations in 2017. As our actions to encourage the local production of renewable energy, TSMC will not only install solar panel in Fabs in the future, but also actively assess other opportunities to increase the use of renewable energy to reduce greenhouse gas emission and product carbon footprint of our clients/TSMC.

Greenhouse Gas Emissions Reduction

Reducing greenhouse gas emissions is the first and most effective way to mitigate climate change. According to the results of TSMC's greenhouse gas inventory, electricity consumption accounts for 70% of the Company's total greenhouse gas emissions and direct emissions of fluorinated greenhouse gases (including PFC / NF₃ / SF₆ / HFC) and nitrous oxide (N₂O) are 30% of total emissions. The TSMC Energy Saving and Carbon Reduction Committee has therefore established teams for direct emissions reduction as well as energy conservation for process tools and plant facilities, leading all Fabs in continuous improvement in carbon reduction. All continuous

improvement experience is applied as the best available technology and becomes guidelines for new Fabs to follow in order to reach our energy saving and fluorinated gas reduction target. In 2016, TSMC's production was more than six times higher than that of 2000 but the total amount of fluorinated greenhouse gases was 28% lower and unit product emissions decreased by 94%.

Reducing Direct Emissions from Process Gases

Fluorinated compounds are the major sources of greenhouse gas direct emissions from semiconductor manufacturing processes, exceeding 80% of the direct

emissions. TSMC's three main action plans for reducing direct emissions are to optimize process gas consumption, to replace existing gases with low global warming potential gases, and to install local abatement equipment. TSMC actively participated in Taiwan Semiconductor Industry Association (TSIA) and World Semiconductor Council (WSC) initiatives to work with domestic and international peer companies to develop best practices for fluorinated gas abatement. All new production lines in TSMC, including the U.S. subsidiary Wafer Tech and TSMC China, must conduct the best practices by fully adopting the high performance abatement equipment (local scrubbers) in all

fluorinated compound-related processes. To mitigate the risk of local scrubber failure, each local scrubber is set up with a backup unit. Abatement equipment must also be included with any new purchases of related process tools in existing Fabs. In 2016, the total emissions and unit product emissions of fluorinated compounds were significantly lower than those of the previous year. Unit product emissions were 50% below the base year 2010, exceeding the WSC's global voluntary PFC reduction goal for 2020, and met the reduction target for 2017.

PFC Reduction Targets

2010 WSC's 2010 PFC Global Voluntary Reduction Goal

Reduce PFC emission to 90% of the average emissions level of 1997~1999.



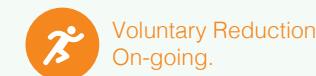
2020 WSC's 2020 PFC Global Voluntary Reduction Goal

Reduce unit product PFC emissions by 30% below year 2010 level, in line with WSC reduction goal.

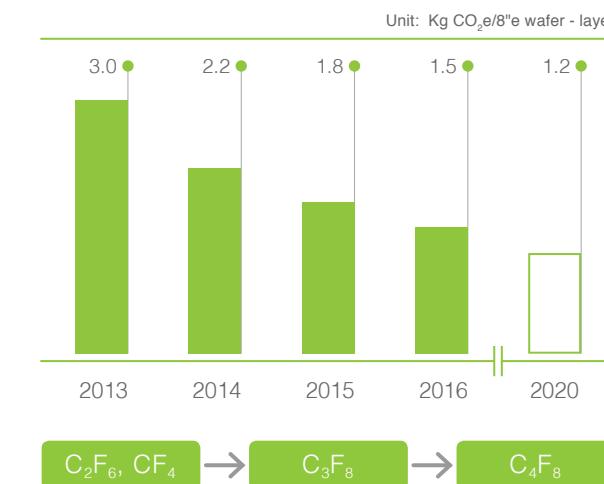


TSMC Target

Reduce unit product PFC emissions by 60% below year 2010 level, exceeding the WSC reduction as a leading benchmark.



PFC Emissions



Future Approaches

Details

All new fabs must install high performance abatement equipment (local scrubber) and back-up units in all fluorinated compound-related processes.

New tools installed in existing fabs must include high performance abatement equipment (local scrubbers) in all fluorinated compound-related process and continue replacing existing low DRE (Destruction or Removal Efficiency) local scrubbers.

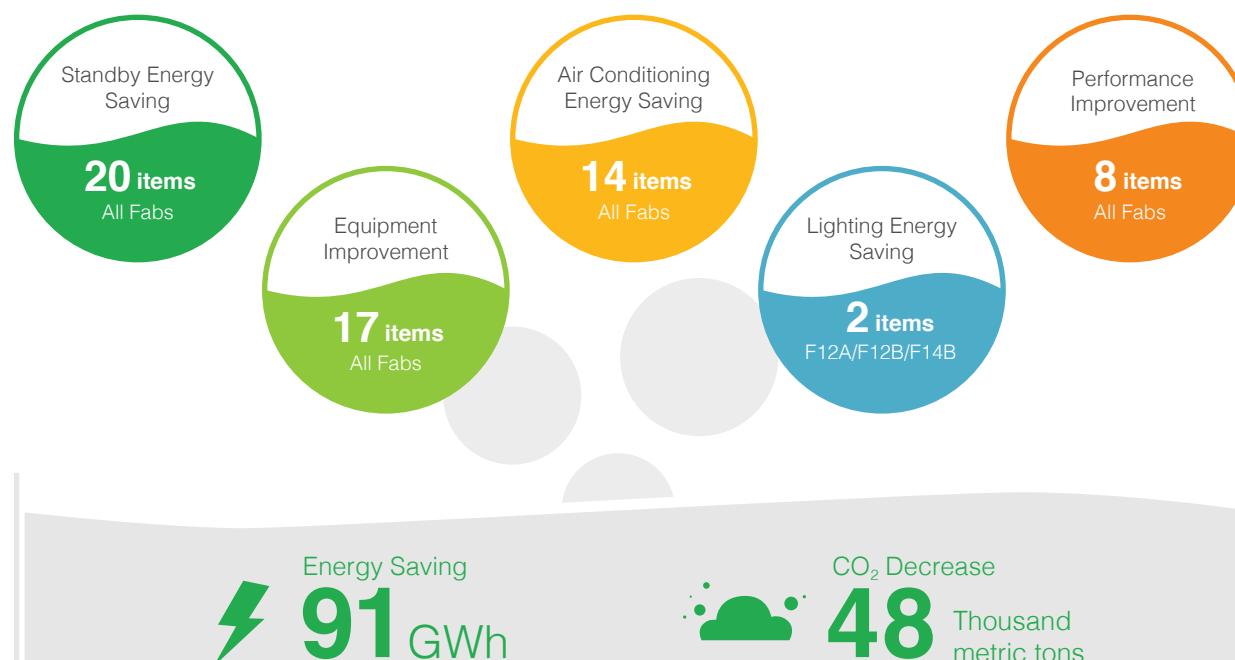
Adopt high N₂O reduction efficiency and low air pollution local scrubbers.

Continue studying the low GWP replacement solutions.

Improving Energy Efficiency and Reducing Indirect Emission

TSMC's electric power is mainly consumed by the facility and equipment departments, which were the main promoters of energy-saving measures in 2016. Through ISO50001 management practices, the facility department has established intelligent management systems to control power use and reduce standby power consumption. The process equipment department focuses on replacing inefficient components and optimizing equipment energy consumption. TSMC's annual energy-saving plan included 61 measures across five categories, reducing consumption by 91GWh, eliminating 48,000 metric tons of carbon dioxide emission and saving NT\$230 million in electricity costs. In addition, reducing carbon emissions also saved NT\$72 million in potential external carbon costs. TSMC unit power consumption decreased to 9.7 kWh/8"e wafer - layer in 2016, down 2% from 9.9 kWh/8"e wafer - layer in 2015 and down 8.5% compared with 10.6 kWh/8"e wafer - layer in 2010, reaching our 2016 energy-saving goal.

2016 Energy Saving & CO₂ Reduction



Energy Utilization Optimization

Category	Method	Energy Saving Approach	Energy Saving (GWh)	Carbon Equivalent (Metric ton CO ₂ e)	Cost Saving (M NTD)	External Cost of Carbon Emissions (M NTD)
Standby energy savings		Uninterruptible power supply (UPS) efficiency improvement (6 items)	14.4	7,603	36	11.4
		Optimize energy saving for Point-of-Use waste gas treatment system (2 items)	11.9	6,283	29.8	9.4
		CDA operational strategy optimization (2 items)	7.9	4,171	19.8	6.3
		Pump design capacity optimization (2 items)	0.5	264	1.3	0.4
Facility		Others (8 items)	10.7	5,650	26.8	8.5
		Make-up air unit (MAU) Intelligent operation control(8 items)	11	5,808	27.5	8.7
		Replace old low-efficiency old units with improved high-efficiency units (3 items)	3	1,584	7.5	2.4
		Optimize chiller system outlet temperature according to external temperature (1 items)	0.3	158	0.8	0.2
Air conditioning energy saving		Others (2 items)	3.5	1,848	8.8	2.8
		Intelligent lighting (2 items)	2.6	1,373	6.5	2.1
		CDA dryer heat dissipation adjustment (1 items)	0.5	264	1.3	0.4
		Heating jacket smart energy control (1 items)	0.3	158	0.8	0.2
Performance improvement		Others (6 items)	0.7	370	1.8	0.6
		Using high efficiency vacuum pump (4 items)	15.9	8,395	39.8	12.6
		Reduce the usage of cooling water (4 items)	1.9	1,003	4.8	1.5
		Reduce the usage of gas box exhaust (1 item)	1.8	950	4.5	1.4
Production Tool		Using high efficiency chiller (1 item)	0.7	370	1.8	0.6
		Turn off heater and hot DI water system when not necessary for process (6 items)	2.3	1,214	5.8	1.8
		Remove tool inner UPS, replaced by central system supply (1 item)	1	528	2.5	0.8
	Total		91	47,995	227	72

Note: Carbon equivalent coefficient factor= 0.528 kg/ kWh, 1 kWh =NT\$2.5, according to the Greenhouse Gas Reduction and Management Act, the maximum penalty per metric ton of carbon is a NT\$1,500 fine



Production tool-equipment improvement: using high efficiency vacuum pump

Major Energy Saving Projects in 2017

TSMC is committed to power conservation and has set a 10-year long-term goal of saving 2800 GWh. In 2017, TSMC's energy saving target is 280 GWh, of which facility systems account for 48% and process equipment for 52%. Energy saving for facility systems will be carried out in four directions: standby energy saving, air conditioning, lighting and performance improvement. Process equipment will focus on introduction of high efficiency components, optimization of water, electricity and gas in process tools, turning off modules that do not need to be used, and energy-saving tool designs and modifications. Facility power conservation includes improving air conditioning energy consumption such as energy saving from large MAU humidification and washing systems as well as optimization of non-cleanroom temperature adjustment. Process tool power conservation is through optimization of tool settings to enhance the energy efficiency of electricity, water and exhaust. Moreover, energy-saving motors, energy-saving cooler controls, waste heat recovery in place of heaters and other measures will be also adopted by new Fabs.

Case Study

Industry's First Uninterruptible Power Supply Energy Saving Mode

All facility systems and process equipment are equipped with uninterrupted power systems to manage fluctuations in power. However, in order to protect against power dips, UPS systems must be charged 24 hours a day through the rectifier to store energy, and then through the inverter to supply power. This causes additional energy consumption 5% above normal operations. To reduce energy consumption, TSMC collaborated with UPS suppliers to develop a UPS energy saving mode to provide more energy saving measures for the industry and increase energy efficiency.

Power Dip Analysis and Firmware Improvement

TSMC and vendors analyzed UPS records for all power dips from 2015 to 2016, reviewed the relationship between

parameter sensitivity and power dip protection actions one by one, and consulted power experts on internal firmware logic to optimize UPS and find a safe energy-saving mode.

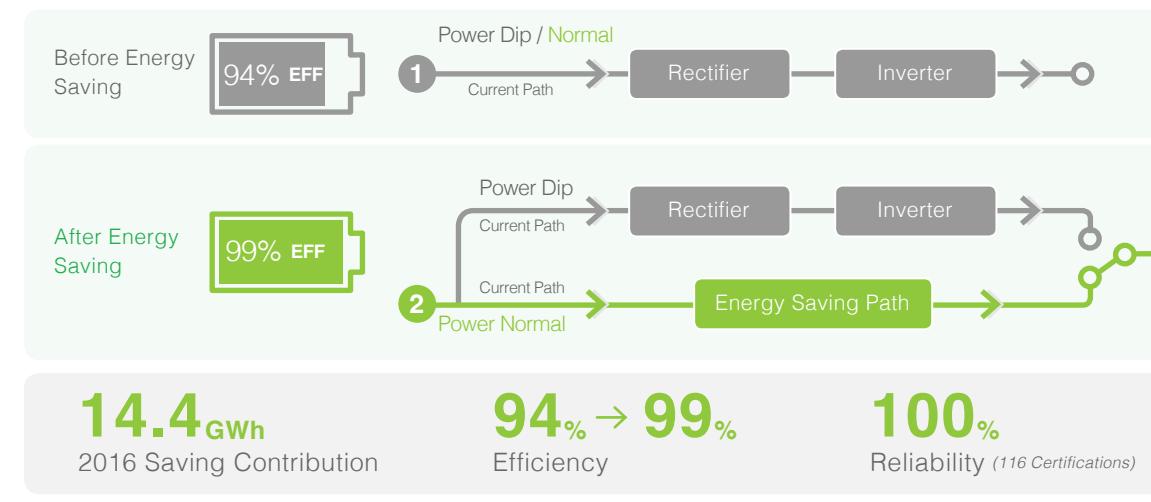
Precise Verification, Reliability 100%

If facility operates abnormally, fabs will suffer significant operational loss. Therefore before the full implementation of new energy saving project, we introduce a 116-items verification through a third-party of international verification authority (Underwriters Laboratories Inc.). It ensures that when power supply is abnormal, the action logic of new energy saving mode conforms to the international semiconductor industry voltage transient strain ability specification (IEEE SEMI F47). Additional load tightening

tests are also applied. The new energy saving project is fully implemented only after three times of 100% power dips reliability confirmation.

Improving Efficiency, Creating a Win-win Situation

Under the newly-designed UPS energy-saving mode, power is normally supplied via an energy saving path (as shown below), and the UPS can instantly switch to voltage compensation to protect production tools when voltage is abnormal. The UPS not only reduces energy consumption by 5% but also increases efficiency from 94% to 99%. In 2016, this energy saving measure was introduced to advanced technology production successfully which saved 14.4 GWh, accounting for 16% of the company's annual energy savings. It is a major breakthrough in factory power conservation.



Climate Change Adaption

TSMC assesses the risk of climate change every year. We not only aggressively conduct mitigating projects, but also adopt plans for enhancing operating resilience to reduce impact from climate disasters. Climate change mitigation cannot immediately prevent impact from climate change disasters, and therefore climate change adaption is required for direct and urgent control of operations risk. Mitigation and adaption in parallel is the mainstream practice on climate change. Currently, TSMC has identified the key climate disasters risk such as a high temperature, heavy rain, droughts and windstorms, and established emergency reaction plans for power rationing, flooding, water shortage and windstorm damage.



Power Rationing on High Temperature Days

- Green building design
- Establish an emergency response plan: purchase emergency generators (342 units), to provide an additional 20% to 50% power supply capacity



Floods

- Conduct flood potential analysis, check and improve public facilities and major suppliers' emergency response
- Install floodgates for exiting building openings in the higher risk areas
- Raise foundation height of new plants by 2 meters to reduce flooding risk
- Execution of water-saving measures and improvement in process water recycling rate
- Support Government's policy of promoting reclaimed water, and committing to using reclaimed water of "Yongkang Water Recycling Center"
- Initiated "effluent reclaim pilot run system" at F14P5 located in Tainan. Recycled effluent water quality met the required standards for semiconductor industry
- Track public water supply status, establish emergency response measures. Each factory is equipped with enough water for two days, and water tankers and backup water supplies are on standby for emergencies



Droughts



Windstorm Damages

- Improve cooling tower and other outdoor facilities structure against windstorm damage



Case Study

TSMC Certified Green Building Area and Green Factory Certifications are No.1 in Taiwan

TSMC continues to build environmentally-friendly fabs to reduce energy and water consumption. Since 2006, all new manufacturing facilities and offices in TSMC have been designed, built and certified according to the U.S. Green Building Council's "Leadership in Energy and Environment Design" (LEED) rating system, and Taiwan's "Ecology, Energy Saving, Waste Reduction, and Health" (EEWH) rating system. For existing buildings and offices, TSMC also uses its experience in green building guidelines to raise energy efficiency and to reduce impact on the environment. As of 2016, TSMC owns the most LEED certifications among the semiconductor companies of the world, has the largest green building area and number of green factories in Taiwan.



GIGAFAB® 15 Green Building



U.S. Green Building Council LEED

100%

All 300mm fabs are LEED-certified, 3 Platinum and 18 Gold certifications



Taiwan EEWH

15

All 300mm fabs earned EEWH Diamond certification

42.8%

TSMC's LEED-certified area (2,487,074m²) out of the total certified area in Taiwan

3

One new Platinum and two new Gold certifications in 2016

5

Five new Diamond certifications in 2016



Green Factory

7

Seven 300mm fabs gained Green Factory certification

1st

The largest number of Green Factories in Taiwan

1

One new Green Factory in 2016

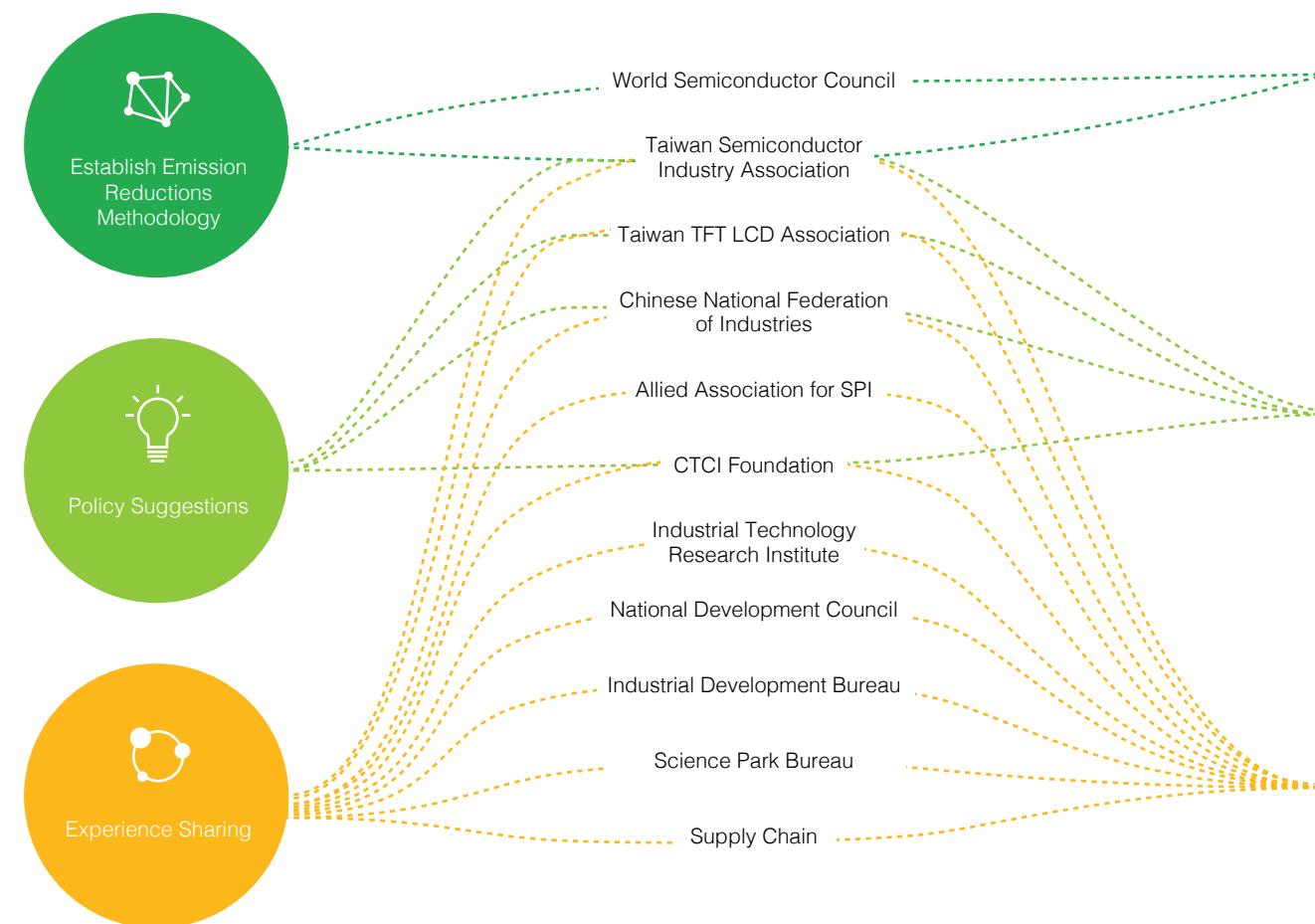
Leading Industry to Mitigate and Adapt to Climate Change

No company can neglect the impact of global climate change. TSMC is willing to share its environmental protection knowledge and experience with industry and the entire society. We also gained the support of the Science Park Industrial Association, Science Park Administration, National Science Council, Water Resources Agency, Taipower, and Taiwan Water Corporation to adopt TSMC's best practices into the industry standard. TSMC believes that only the collaboration between government, industry and academia can face the severe challenges of climate change.



Introduction of wastewater treatment to the EPA Minister and media

Collaborating with Government, Industry and Academia to Build Sustainability for the Next Generation



Assist TSIA to develop "Best Practice Guidance for PFC Emission Reduction" adopted by WSC in 2012 and revised in 2016

Collaborate with TSIA members to apply for EPA greenhouse reduction methodology – "Fluorinated gas and N₂O emission reduction from installation of an abatement system in a semiconductor manufacturing facility"

Participate in National Energy Conference and National Water Forum

Represent Chinese National Federation of Industries to give suggestions to government

Represent Taiwan Semiconductor Industry Association to collaborate with Industrial Development Bureau & National Federation of Industries on industrial responses on greenhouse gas regulation compliance.

Participate in Taiwan Semiconductor Industry Association energy committee to communicate with government and private sector on water and energy related issues

Join in the CTCI Foundation panel discussion with industry members and government to discuss the material issues such as Taiwan's energy policy and GHG reduction scheme.

Share environmental protection and carbon reduction experience in official forums.

Participate in industrial panel discussions to share energy and water saving experience.

Join research institution symposiums on issues of climate change challenges, energy policy and other related issues

Invite university and government agencies to share green manufacturing experience

Organize training courses for supply chain and industry peers

Material Issue

Water Resource Management



The risk of water shortage and flooding has increased in recent years due to global climate change. The stable supply of water resources has become an important issue in the world. TSMC believes water resources management plays an important role in climate change and natural disaster adaptation. The Company has developed five core actions in line with our strategy to reach our goals. The first four actions rely on TSMC's internal execution; the fifth requires external collaboration.

Five Actions of Water Resource Management

Water Source Management

Continue water conservation measures, track water supply status and prepare for droughts and related actions, lay the foundation for water conservation and process water recycling through enhancement of the wastewater classification system.

Water Recycling

Raise the recycling rate and reduce environmental impact through advanced wastewater treatment techniques.

Optimization of Wastewater Resource Utilization

Convert materials in wastewater into reusable resources, optimizing resource utilization.

Developing Water Resource Diversity

Recycle wastewater effluent and cooperate with the government to execute reclaimed water project.

External Cooperation

Communicate and cooperate with industry, government, and academia and share water resource management experience to deal with the challenges of water shortages.

Core Action I: Water Source Management

TSMC's Water Sources

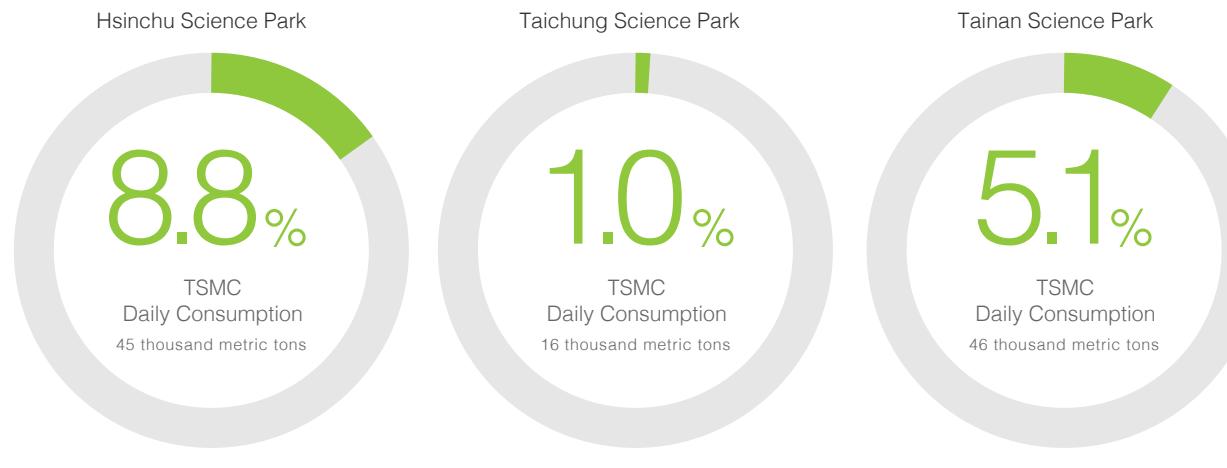
TSMC employs three sources of water including municipal water, air conditioning condensation water and rain water. Municipal water is used in production and domestic water. Air conditioning condensation water is also applied in production and sometimes used for landscaping irrigation. Rain water is used for irrigation. We continuously monitor water supply status and quality through the water storage capacity of reservoirs and water consumption of each factory. We also set our response by dynamically evaluating the water supply situation through our water

resource reporting system, which is updated twice a day. We also forecast long-term water consumption trends to reduce the impact on water supply.

Process Wastewater Discharge Management

The most important aspect of water conservation is source management. TSMC classifies process wastewater into 36 types according to their composition and concentration of specific compounds. Furthermore, we design different recycling systems based on the characteristics of the water quality to treat different wastewater. In principle, high-concentration waste liquids are reused, and low-concentration liquids are treated as recycled water.

Water Usage Ratio of TSMC in Three Science Parks

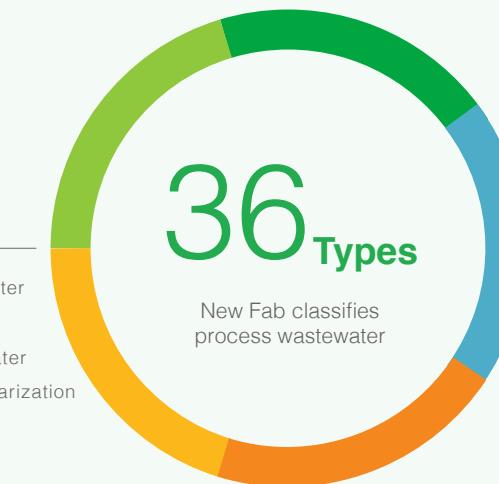


Daily supply: 510 thousand metric tons

Reservoirs:
- Baoshan Reservoir
- Baoshan Second Reservoir

Note: Daily supply of reservoirs was based on Water Resource Agency data. Reservoirs for Taichung Science Park also supply Taichung and Miaoli area.

Classifications of Process Wastewater in New Factories



- Low Concentration
- Acid and Caustic Wastewater
 - Organic Wastewater
 - Hydrofluoric Acid Wastewater
 - Chemical Mechanical Planarization Wastewater

- Acid and Caustic Wastewater
- Deionized water reclaim
 - Acid wastewater drain
 - Acid wastewater reclaim
 - Deionized water reclaim with ozone
 - Acid wastewater drain with ozone
 - Caustic wastewater drain
 - Caustic wastewater drain with ozone
 - Tetramethylammonium Hydroxide

- Hydrofluoric Acid Wastewater
- Hydrofluoric acid dilute
 - Hydrofluoric acid concentrate
 - Hydrofluoric acid concentrate with ozone
 - Local Scrubber drain

- Chemical Mechanical Planarization Wastewater
- Chemical mechanical Planarization
 - Chemical mechanical Planarization with copper
 - Electroplating

- High Concentration Wastewater
- Total 19 types of high concentration wastewater

Core Action II: Water Recycling

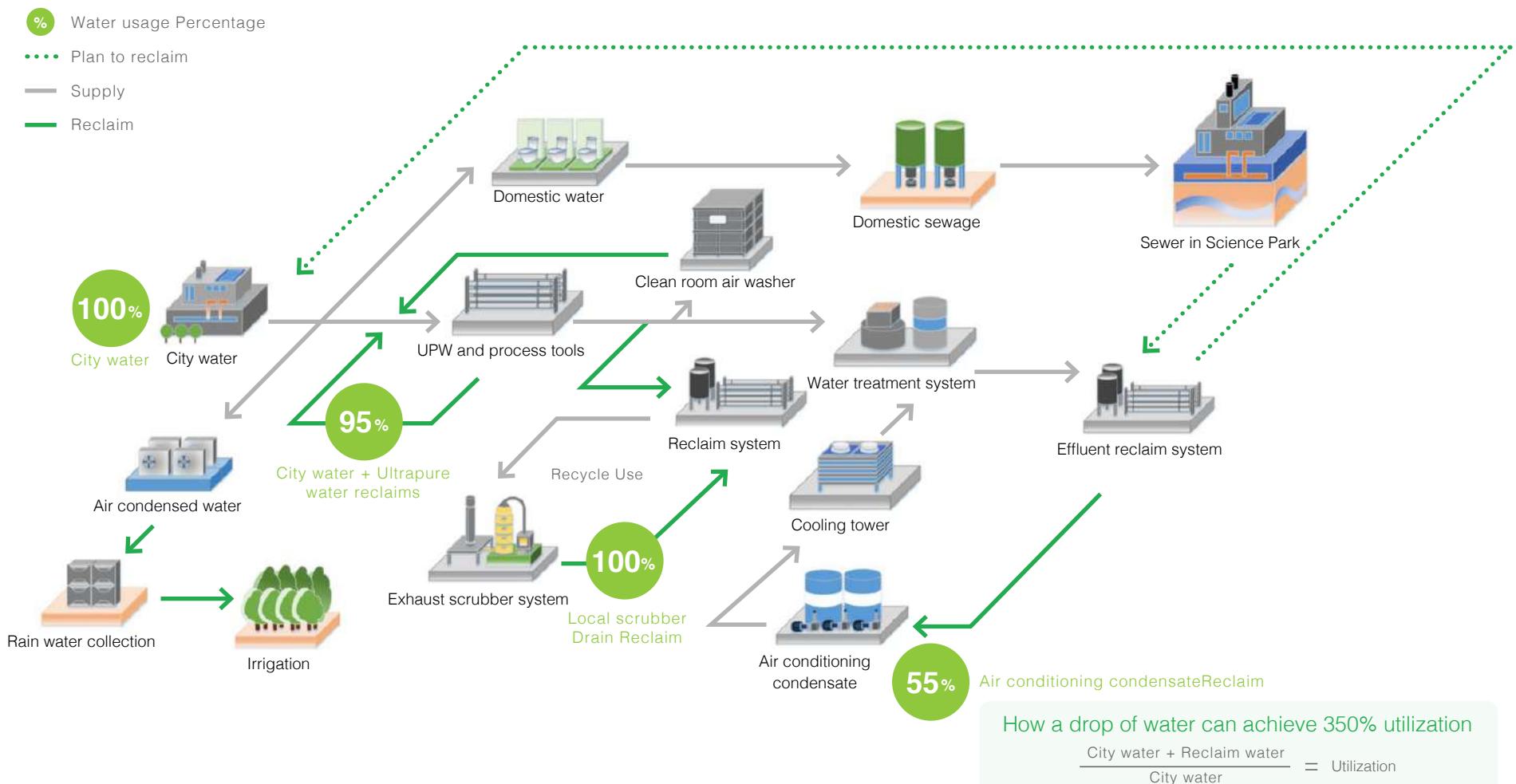
To improve the efficiency of water usage, TSMC categorizes process wastewater according to the cleanliness of discharge. The cleanest water can be reused in production. Water that is less clean can be used in cooling tower systems following treatment. Finally, unrecyclable wastewater is treated at an on-site wastewater treatment plant before discharge. Reusable water is recycled and regenerated in TSMC by means of the design of classified process water drains and the establishment of various water recycling systems.

In addition to all daily water recycling, TSMC continues to strive for effective usage of each water drop to 3.5 times, which is 350% of usage rate.

New Water Conservation Methods in 2016

In addition to existing water conservation measures, TSMC strives to find ways to use recycled water and reduce consumption. We take a holistic view of the water usage of all fabs to evaluate and implement opportunities, design new methodologies to achieve our dual goals of reducing consumption and discharge. Our goal for 2016 was to save 1.23 million metric tons of water through new conservation methods. Through 16 new measures carried out across four areas, we conserved 1.41 million metric tons of water, and saved approximately NT\$18.07 million in water utility costs in 2016.

The Journey of Water in TSMC



New Water Conservation Methods and Achievements in 2016

Major Water Conservation
Achievements in 2016

NT\$ 18.07 million

1,410,000 metric tons

Practical saving methods	Quantity saved (metric ton)	Cost saved (thousand NTD)
Reduce cooling tower and sand filter backwash water	37,987	\$ 473
Use reclaimed water to clean filter	22,125	\$ 282
Reduce rinse water in TMAH system	11,030	\$ 141
Office cleaning water saving	7,300	\$ 94
Increase Facility Water Reclamation		
Construct hydrofluoric acid dilute reclaim system	306,610	\$ 3,925
Reclaimed UPW resin regenerated water	219,944	\$ 2,804
Reclaimed air condensed water	171,256	\$ 2,192
Reclaimed caustic wastewater	240,980	\$ 3,084
Improve Water Production Rate		
Increase reclaimed water RO production	57,165	\$ 730
Reduce water circulation in system	40,231	\$ 512
Adjust RO rejection rate	12,800	\$ 164
Reduce Water Discharge Loss		
Reduce ACF backwash water	96,809	\$ 1,239
Recycle chemical dump drain	73,018	\$ 935
Expand ACF backwash period	71,240	\$ 912
Adjust nonproduction reclaimed water adjustment	45,760	\$ 585

Note: Cost saving was calculated by NT\$12.82/metric ton

Water Recycling and Usage Efficiency

The average process recovery rate was 87.4% in 2016, which was higher than the standard set by the science park administration (85%). Some 92.89 million metric tons of water was recycled through existing methods, and an additional 1.41 million metric tons was recycled through 16 new water conservation methods in 2016. That brings the total for 2016 to 94.3 million metric tons, about three times large as Baoshan Reservoir II.

With continuous water-saving activities, TSMC's water use per 8-inch wafer equivalent per mask layer has decreased 23.8%, from 62.6 liters in the base year of 2010 to 47.7 liters in 2016, successfully reaching our goal of 18%. However, compared to 44.6 liters in 2015, the reason that unit water consumption increased in 2016 was a higher proportion of advanced technology production with higher cleanliness demands required by shrinking geometries. TSMC nonetheless continues to strive to improve process water recovery rates and the quantity of reclaimed water.

Water Recycling and Usage Efficiency



Note 1: Total recycle water quantity includes process and scrubbers recycling
Note 2: Total recycled water quantity is about 2.5 times city water consumption in TSMC

City Water Consumption and Water Consumption per Wafer-Layer



Note 1: TSMC annual water consumption statistic is based on monthly utility bill from Taiwan Water Corporation. The statistical data for water consumption includes all fabs in Taiwan, as well as all overseas fabs, packaging and testing facilities, bumping, EBO, R&D, and water consumed by non-production activities

Note 2: The statistical data for unit water consumption density is for the water usage of wafer fabs in Taiwan and overseas

Water Conservation Effectiveness (2012-2016)

	2012	2013	2014	2015	2016
Average Process Water Recycling (%) ^{Note 1}	86.5	86.9	87.6	87.3	87.4
Total Water Saved (million M ³)	53.4	66.9	81.0	85.6	94.3 ^{Note 4}
Water Saved, Measured by the Full Capacity of Baoshan Reservoir II ^{Note 2}	1.7	2.1	2.6	2.7	3.0
Water Saved, Measured by Standard Swimming Pools ^{Note 3}	21,348	26,744	32,396	34,252	37,732
Number of Times of Each Drop Water Usage	3.1	3.2	3.3	3.5	3.5

Note 1: Average process water recycling rate is defined by the Science Park Administration

Note 2: A standard 50x25x2m swimming pool contains up to 2,500 cubic meter of water

Note 3: Baoshan Reservoir II is the major reservoir serving Hsinchu Science Park and the full capacity is 31.47 million metric tons

Note 4: Total recycled water quantity is 94.3 million metric tons in 2016 (92.89 million metric tons from existing measures and 1.41 million metric tons from new methods)

Core Action III: Optimization of Wastewater Resource Utilization

Wastewater Classification and Reclamation

In order to optimize water treatment capability, TSMC classifies wastewater according to strict rules. Generally, wastewater in TSMC can be classified into 25 types, or as much as 36 types for new factories. Proper water treatment processes can be mapped out according to the characteristics of the classified wastewater. On the whole, process wastewater can be divided into hydrofluoric acid wastewater, acid, caustic and organic wastewater, chemical mechanical planarization wastewater and high concentration wastewater. All wastewater is strictly managed and classified at tool side. With classification of pipelines, every type of wastewater can be delivered to a specific water treatment system and bring the reusable resource into reclamation. The detailed classifications are as shown below:

Wastewater Classification and Reclamation Process



Classification



Hydrofluoric Acid Drain

- HFD: Hydrofluoric acid drain (2 types)
- HFD(O₃): Hydrofluoric acid drain with O₃
- Local Scrubber drain



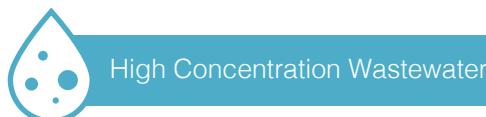
Acid, Caustic and Organic Wastewater

- DIR: Deionized water Reclaim
- DIR(O₃): Deionized water Reclaim with O₃
- AWD: Acid wastewater drain (2 types)
- AWD(O₃): Acid wastewater drain with O₃
- CWD: Caustic wastewater drain
- CWD(O₃): Caustic wastewater drain with O₃
- TMAH drain
- Advance organic reclaim (2 types)



Chemical Mechanical Planarization

- ECP: Electroplating
- CMP: Chemical mechanical planarization
- CuCMP: Chemical mechanical planarization with copper

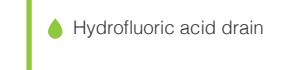


High Concentration Wastewater

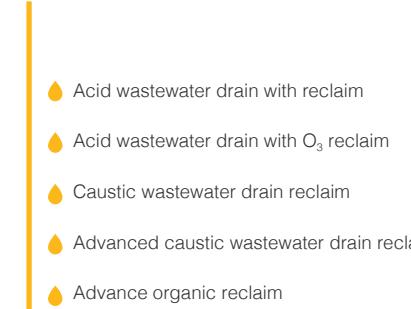
- Waste-H₂SO₄
- Waste-CuSO₄
- ... 19 types in total



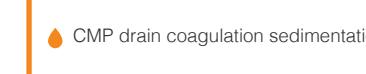
Reclaim System



- Hydrofluoric acid drain
- Local Scrubber drain reclaim



- Acid wastewater drain with reclaim
- Acid wastewater drain with O₃ reclaim
- Caustic wastewater drain reclaim
- Advanced caustic wastewater drain reclaim
- Advance organic reclaim



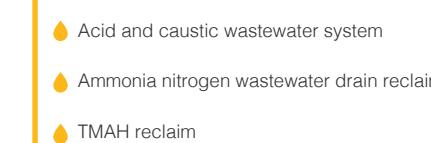
- CMP drain coagulation sedimentation
- Advanced CuCMP drain reclaim



Wastewater Treatment



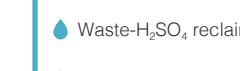
- Hydrofluoric chemical treatment



- Acid and caustic wastewater system
- Ammonia nitrogen wastewater drain reclaim
- TMAH reclaim



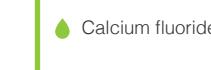
- CMP drain coagulation disposal
- CuCMP drain coagulation disposal



- Waste-H₂SO₄ reclaim
- Electroplating with Cu



Product



- Calcium fluoride



- Fluorite
- Ammonium sulfate
- Ammonia
- Plaster
- TMAH

Note 1: TMAH is the abbreviation of Tetramethyl Ammonium Hydroxide

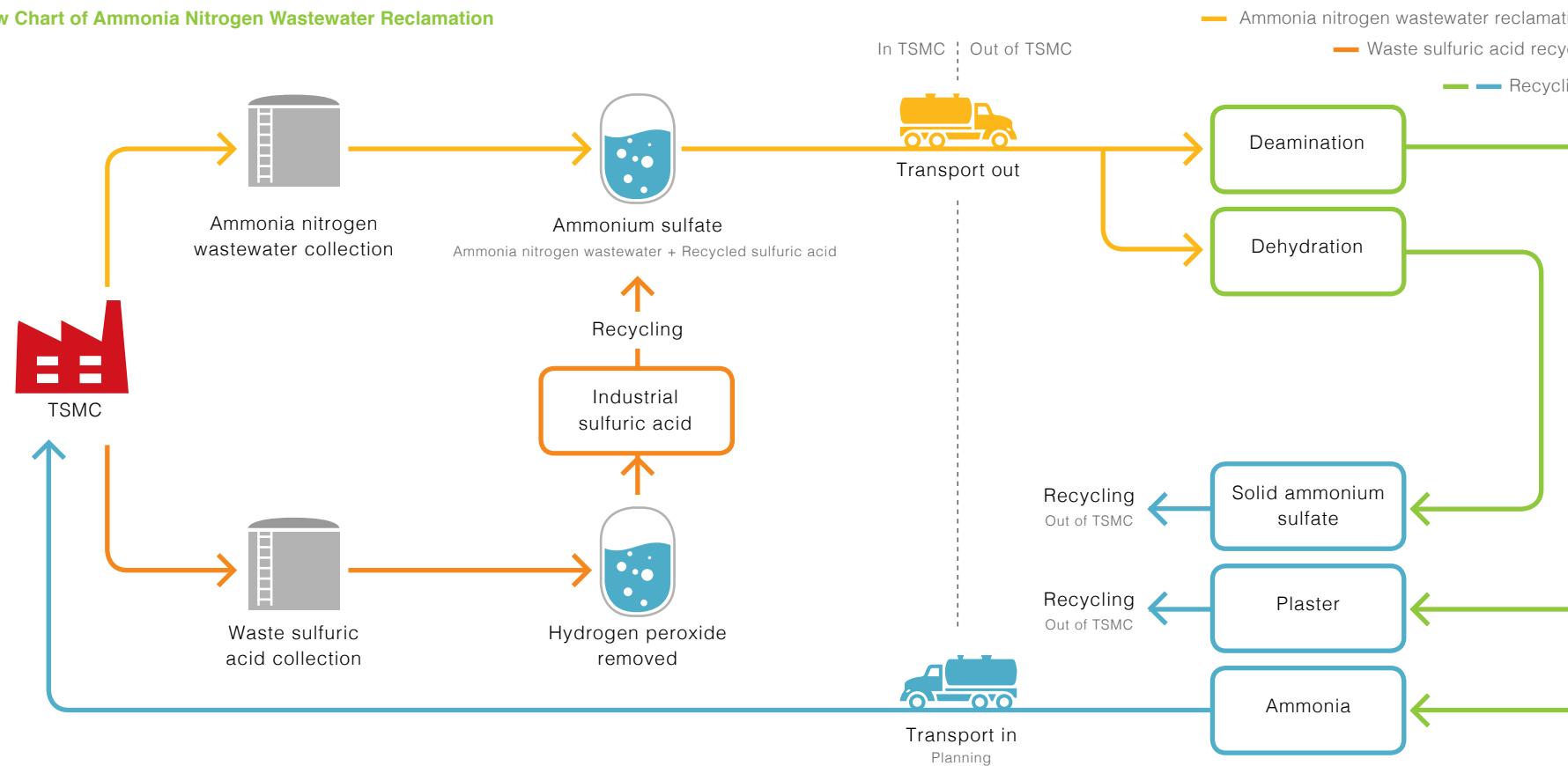
Note 2: Among reclamation products, sulfuric acid is reused in TSMC and others are provided for related industries

Note 3: There are 36 types of wastewater for new factories. New added types are deionized water with ozone and 10 other high concentration waste liquids

Semiconductor Industry's First Ammonia Nitrogen Wastewater Reclamation System

In addition to technology innovation, TSMC also actively engages in environmental innovation. In 2016, TSMC and vendors introduced the first resource reclamation system for ammonia nitrogen wastewater in Taiwan. Waste sulfuric acid discharged by the production line is treated with hydrochloric acid to remove hydrogen peroxide to reach industrial quality. It is then delivered to facility systems to react with ammonia nitrogen wastewater which can produce ammonium sulfate. Next, it is transferred to vendors who convert ammonium sulfate into valuable materials including solid ammonium sulfate, ammonia and plaster. This technique has helped TSMC reduce its waste sulfuric acid discharge quantity and saved 46,889 metric tons in sulfuric acid purchases while also reducing ammonia concentration in wastewater. In 2016, the ammonia nitrogen concentration in wastewater was less than 50 ppm at our Hsinchu and Taichung sites(some fabs achieved to less than 30 ppm), and Tainan site was less than 80 ppm, which successfully met the science park's effluent standard. By continuous enhancement of the system, TSMC aims to reduce the ammonia nitrogen concentration to 60 ppm at Tainan site, 20 ppm for new fabs at Taichung site. This ammonia wastewater reclamation technique can not only reduce sulfuric acid purchase but also reduce ammonia in wastewater and produce valuable products, achieving simultaneous benefits and realize the circular economy.

Flow Chart of Ammonia Nitrogen Wastewater Reclamation



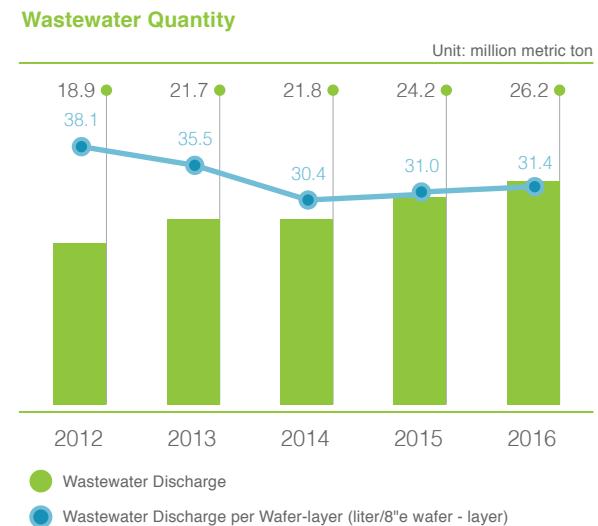
Wastewater Discharge Quantity

Wastewater discharge quantity is closely correlated to municipal water consumption. In 2016, the increasing proportion of advanced process products, which require higher cleanliness standards due to smaller geometries, caused a slight increase in unit water consumption. The wastewater discharge per 8-inch wafer equivalent per mask layer also increased slightly from 31 to 31.4 liters.

Core Action IV: Developing Water Resource Diversity

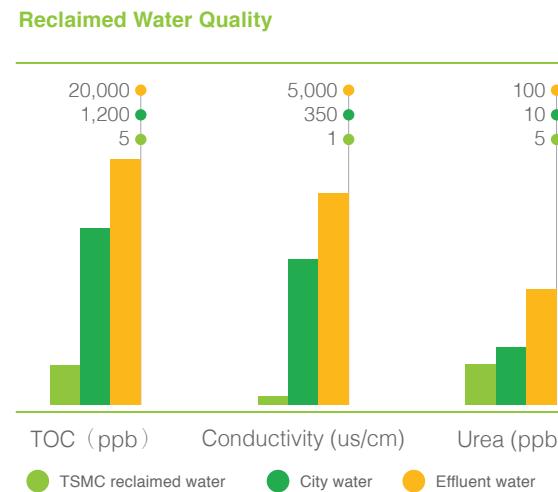
TSMC's water requirements grow as our semiconductor process technology advances. In addition to reducing water consumption in manufacturing process and increasing water recycling, TSMC also cooperates with the Water Resources Agency on policies encouraging industrial use of reclaimed water. Once the Yongkang Water Resource Recycling Center begins formal operations, TSMC will immediately adopt it for use. By continuous development of advanced oxidation techniques, wastewater after treatment

can replace city water and be used in process tools. We has also built an effluent reclaim pilot run system in Tainan plant (F14P5), the current water reproduction rate is 50%, daily production capacity is 24 metric tons; TOCs, urea, conductivity and other major water quality related factors are effectively reduced. The quality of recycled effluent water meets the required standards for use in wafer manufacturing.



Note 1: TSMC statistical data for wastewater discharge includes all fabs in Taiwan, as well as all overseas fabs, packaging and testing facilities, bumping, EBO, R&D and wastewater consumed by non-production activities

Note 2: Unit wastewater discharge density is for the wastewater discharge of wafer fabs in Taiwan and overseas



Note: Lower value means better water quality

Core Action V: External Cooperation

At the end of 2015, TSMC began coordinating with the Taiwan Semiconductor Industry Association, Water Resources Agency and Taiwan Water Corporation to jointly establish a "Water Resources Diversification Management and Cooperation Platform". The purpose is to exchange opinions among water users, central authorities and water supply companies on issues related to water resources

regulations such as long-term water supply, diversification of water resources, emergency response to flood/drought and others. Two meetings were held in June and December 2015 to discuss reclaimed water, water shortage response, water dispatching and other issues. We hopes to cooperate more closely to ensure water supply and demand balance over the long-term.



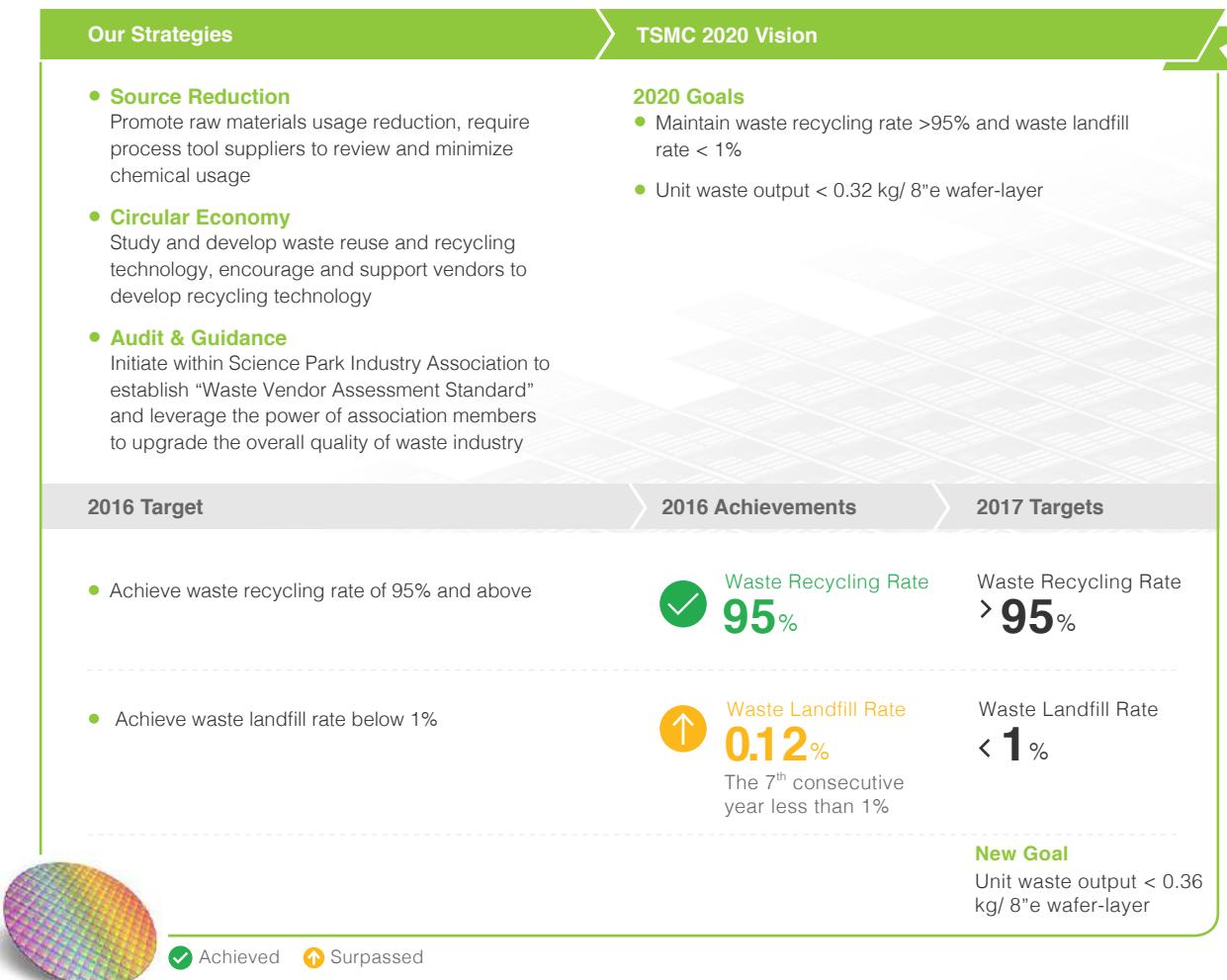
Wastewater Effluent Recycling Pilot Plant



Water Tank Area of Wastewater Effluent Recycling Pilot Plant

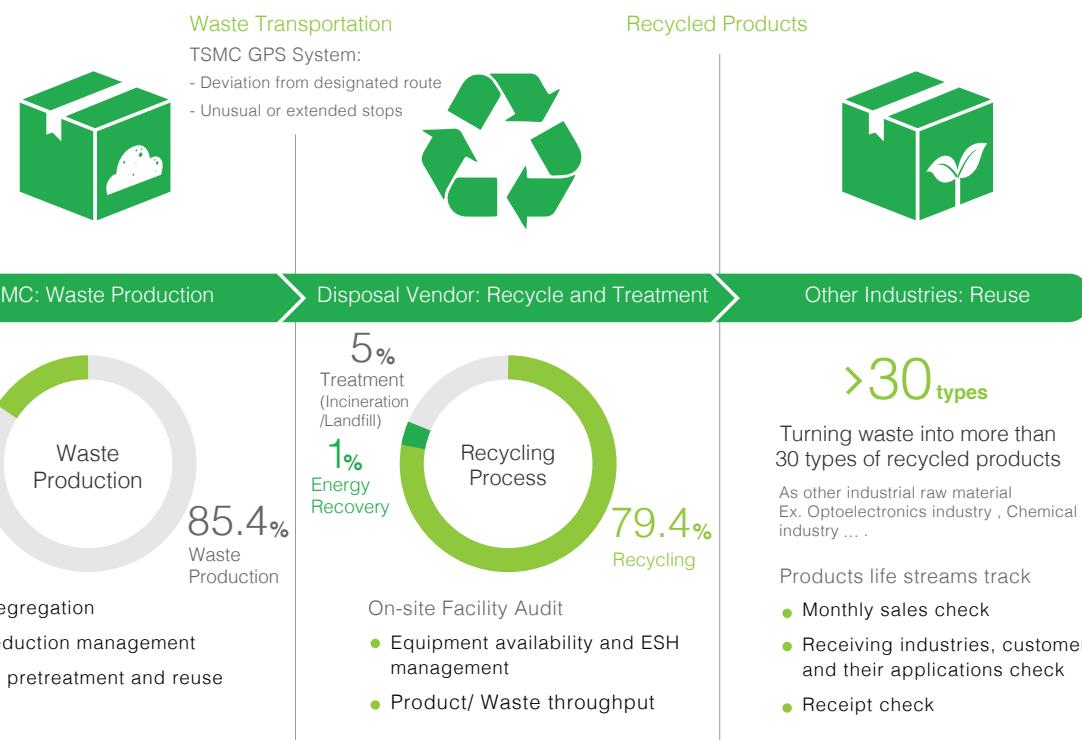
Material Issue

Waste Management



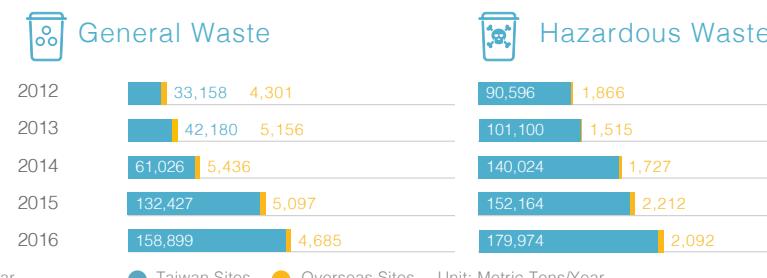
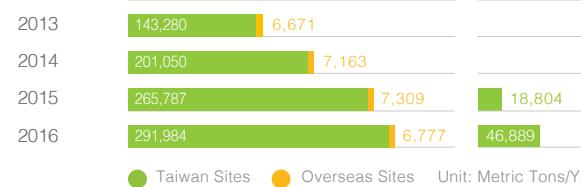
TSMC understands the importance of waste resource management in green manufacturing and our supply chain. We manage waste as a resource, categorize and collect waste at the source, raise waste recyclability, and also collaborate with waste treatment and recycling facilities to search for or develop possible recycling measures to reduce the amount of waste sent to incinerators and landfills. TSMC also adopts proactive actions to strengthen vendor auditing effectiveness to ensure legal and proper recycling and treatment of wastes.

Life Cycle Management of Waste



TSMC actively collaborates with process tool suppliers to reduce chemical usage and waste. In order to sustainably use our resources, the first priority of our waste management is source reduction; the second is waste reuse on-site and material recycling, followed by energy recovery, and finally disposal through incineration and landfill. In TSMC, the usage of all chemicals is reviewed and differentiated for its ultimate treatment after use. Through 25 different types of wastewater classification system (or as much as 36 types for new factories), TSMC can reuse and recycling chemical wastes, which are then transported to our contractors to produce more than 30 types of recycled products that will be circulated in use in other industries. In addition, in order to ensure proper recycling and treatment of our waste, we have established strict vendor control procedures and regular on-the-spot audit are required to properly track the flow of recycled product downstream.

Waste Quantity and Treatment Status Statistic



Note 1: Total waste = Outsourcing disposal waste + In-house recycling waste = General waste + Hazardous waste

Note 2: Hazardous wastes are defined by local governments

95% Recycled Waste (321,935 Metric Tons)

14.6% - TSMC in-house reuse and recycling

79.4% - Outsource material recycling

1.0% - Outsource energy recycle (Alternative fuel)

5% Non-recycled Waste (16,938 Metric Tons)

4.8% - Incineration/Treatment

0.12% - Landfill



● Taiwan Sites ● Overseas Sites Unit: %

● Taiwan Sites ● Overseas Sites Unit: %

Waste Reduction and Resource Management

Due to the Taiwan EPA's expanded NH₃-N standards for wastewater influent in 2014 and tighter limits in 2015 as well as the continued increase in TSMC's advanced technology capacity and increased demand for raw materials usage, TSMC forecasts that without adopting proactive waste reduction activities, the amount of waste outsourced per 8"e wafer-layer would have increased to 0.49kg in 2016 from 0.25kg in 2012, and forecasts a potential increase to 0.67kg in 2020.

Therefore, in 2015, TSMC formed a cross-organization "waste management task force" led by a TSMC Vice

President to promote "raw material source reduction" and "in-house waste reuse and recycling" and conduct company-wide usage and waste reduction projects. In 2016, TSMC invested in waste regeneration equipment and collaborated with suppliers to optimize processes to minimize raw material use and improve equipment with monthly tracking of execution progress. The amount of waste outsourced for processing per 8"e wafer-layer has been reduced to 0.35kg from the 0.49kg forecast. In 2017, our company-wide usage and waste reduction projects have been expanded to reduce the unit waste output to 0.32kg in 2020.

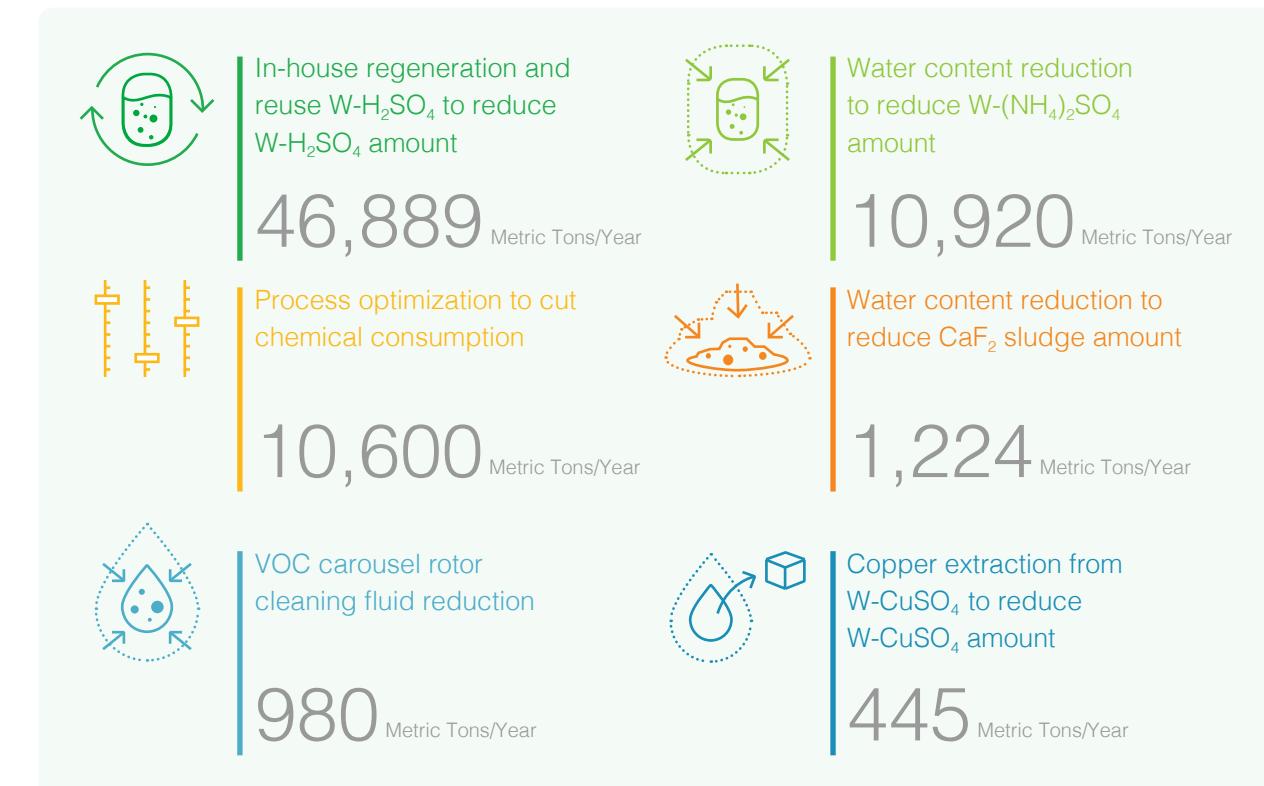
Unit Waste Output Trendchart



Note 1: Unit waste output has continued to rise due to 1. the increased complexity of TSMC manufacturing processes and 2. to comply with new regulation of wastewater standards, TSMC transform NH₃-N into waste ammonia sulfate

Note 2: TSMC adopted proactive waste reduction activities since 2015, therefore our waste output forecast is based on 2014 unit

2016 Key Projects on Waste Reduction



Waste Reduction Project

NT\$503,442,900

Cost saving for waste treatment from chemical waste reduction of H₂SO₄, H₂O₂, (NH₄)OH, CuSO₄, Photoresist, Solvent, Developer

Income from Waste Recycling

NT\$420,011,100

Recycling of used chemicals, wafers, targets, batteries, lamps, packaging materials, paper cardboard, metals, plastics, and other wastes

Case Study

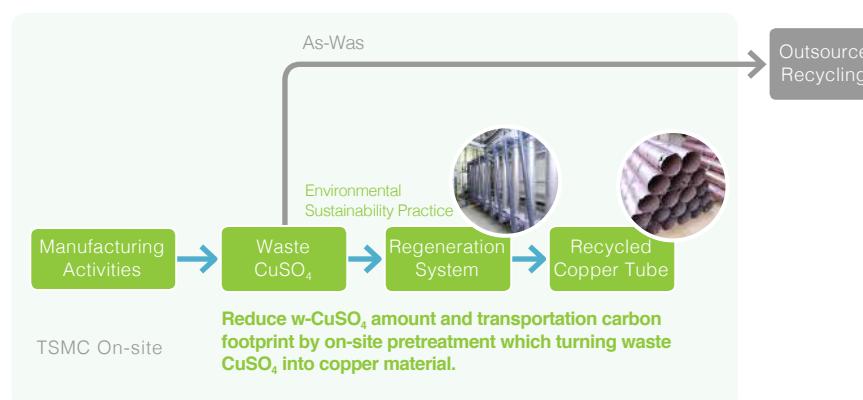


2016 Key Projects on Waste Reduction

TSMC was first in the semiconductor industry to adopt two waste resource regeneration technologies

1. Copper Extraction from Waste Copper Sulfate

In 2016, TSMC cooperated with vendors to develop and implement in-house copper extraction equipment to produce copper tube 9.7 metric tons from copper sulfate. This system avoids sending 445 metric tons waste copper sulfate out for external treatment, saving NT\$2.2 million.

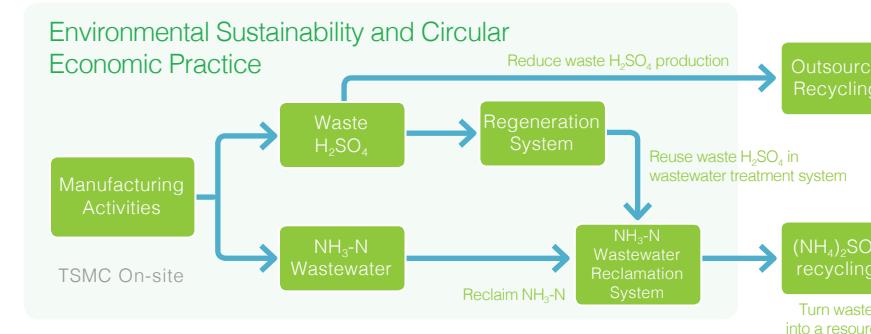


321,935 Metric Tons

TSMC recycled 321,935 metric tons of waste in 2016, which is a gain of more than NT\$420 million through meticulous waste classification.

2. Waste Sulfuric Acid On-site Regeneration and Reuse

In 2015, TSMC has successfully implemented the first regeneration system for regenerating waste sulfuric acid. This recycled acid is used on-site to react with ammonia wastewater to produce reusable ammonium sulfate. This system avoids the discharge of ammonia wastewater into public wastewater treatment plants and reduces waste sulfuric acid outsourced for treatment. In 2016, a waste sulfuric acid regeneration system was set up at all fabs, and 46,889 metric tons waste sulfuric acid were reused on-site for a cost saving effect of NT\$150 million.



Conversion of TSMC Waste into Useful Recycled Products

TSMC Waste	Recycled Products
(NH ₄) ₂ SO ₄	Industrial grade ammonia sulfate, Ammonia, Plaster
H ₂ SO ₄	Industrial grade sulfuric acid, Oleum, Sulfates (Wastewater treatment agent)
CuSO ₄	Copper tube/plate, Copper sulfide
H ₃ PO ₄	Industrial grade H ₃ PO ₄ , Phosphate (Wastewater biogicide nutrients)
HF	Industrial grade HF, Artificial fluorite
Organic Solvent	Industrial grade organic solvent
Developer	Display industry developer
Stripper	Alternative fuel
CaF ₂ Sludge	Cement additive, Artificial fluorite
Chemical Drum	Recycled plastic pellets
Resin	Recycled resin
Activated Carbon	Recycled activated carbon
Lubricating Oil	Lubricating oil
Quartz Glass	Optical materials, Concrete additives
Wood Pallets	Alternative fuel
Lamp	Raw materials of mercury, metal, glass
Lead Acid Battery	Raw lead and recycled plastic pellets
Mixed Hardware	Raw metal material
Recycling Category	Raw materials of paper, plastic, glass, metal

Waste Cleanup and Waste Vendor Management

TSMC carefully selects waste disposal and recycling vendors through a team composed of related departments including corporate ESH division, procurement division, and waste management section. TSMC's team visits and examines potential waste vendor according to our "New Waste Vendor Selection Procedure". For existing vendors, TSMC performs annual assessments and audits of site operations, and communicate our suggestions. TSMC encourages improvement for vendors lagging behind the average and continues to reinforce their performance by working with them to implement improvements when necessary.



Waste management education and training course for waste vendor

To ensure proper treatment of our waste, regular on-site audit and recycled product sales data are checked and reviewed with data obtained from Taiwan's EPA to ensure recycled products flow downstream properly. In 2016, TSMC terminated transactions with five disposal vendors whom were scored as inadequate without improvement actions and introduced five new partners through a rigorous vendor selection process. In 2016, all vendors were encouraged to acquire ISO14001 certification, upgrade equipment, and strengthen management of product flow downstream. The percentage of good and excellent vendors improved to 59% from 22% in 2015.



On-site audit with Science Park Administration for waste recycling technical evaluation

In 2016, TSMC focused on upgrading the overall quality of the waste recycling and treatment industry by initiating and implementing the "Waste Vendor Assessment Standard" with the members of Science Park Industry Association. TSMC believes that integrating the power of industry association members to implement a "Waste Tracking and Management System" for all members will help sustainable development in Taiwan.



Regular waste vendor on-site audit

Case Study



TSMC's "GPS Satellite Fleet"

In order to monitor waste disposal activities, TSMC also adopts proactive actions to strengthen vendor auditing effectiveness. All waste transportation vendors are requested to join the TSMC's "GPS Satellite Fleet" so that cleanup transportation routes and abnormal stays for all trucks can be traced. In addition, all waste recycling and treatment vendors install CCTV in operation sites for the purpose of review and auditing in tracing waste receiving and handling status. In addition, TSMC has strengthened tracking the flow of recycled product to ensure the appropriate reuse of the product. All these actions are to ensure legal and proper recycling and treatment of wastes.

In 2016, all waste transportation vendors joined TSMC's "GPS Satellite Fleet" system. This system has provided 100% system auditing instead of an individual unscheduled truck-following audit for selected vendors.

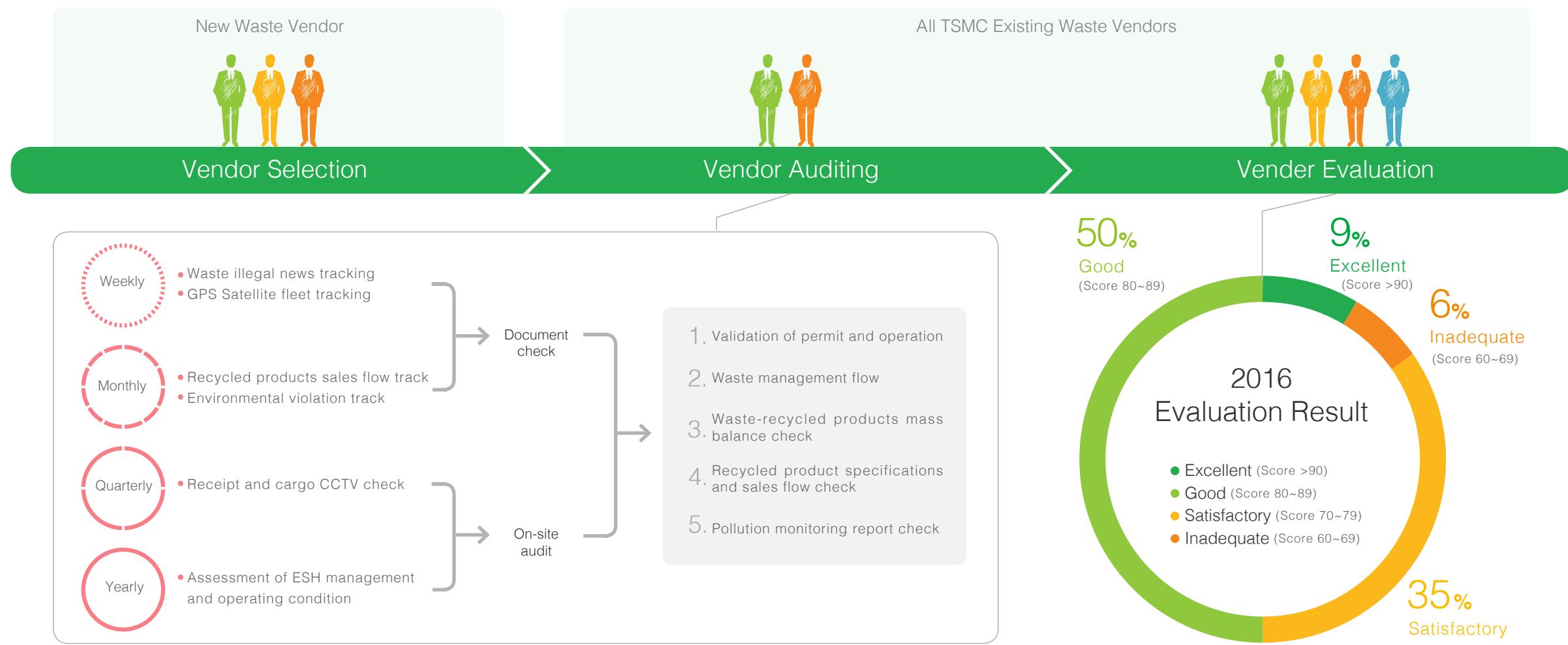
Process Flow in Waste Vendor Management

Corporate ESH Division

Procurement Division

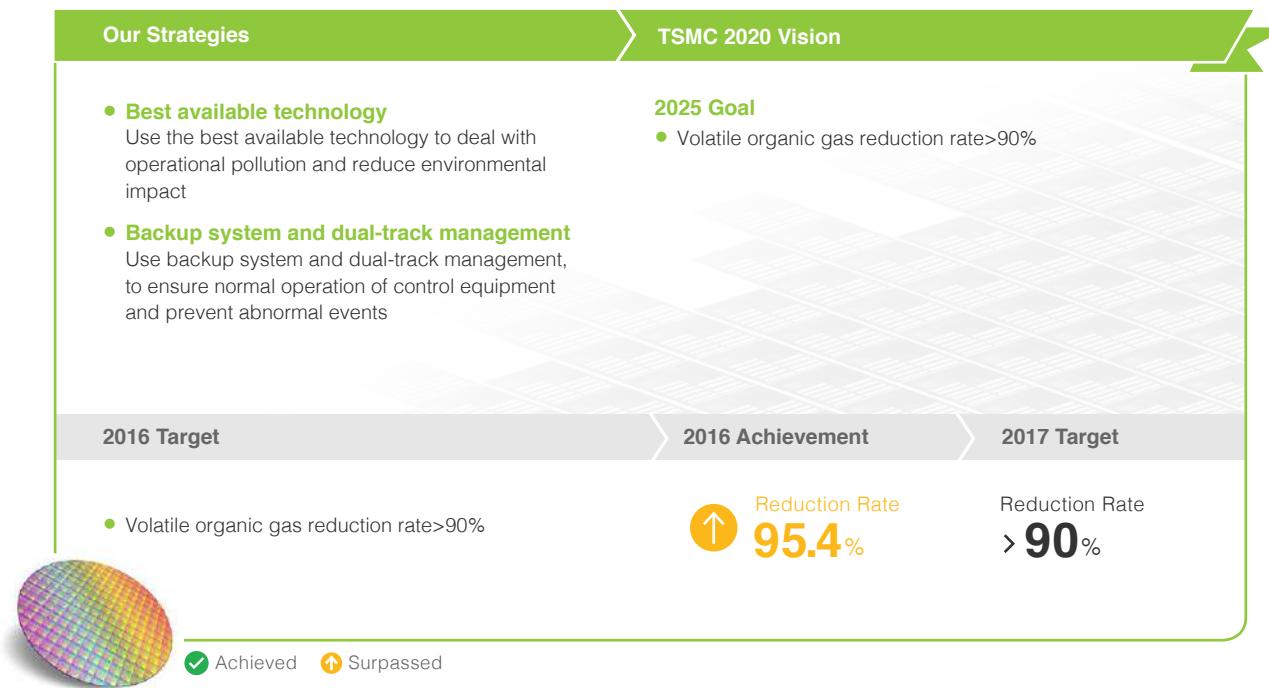
Waste Management Section

Legal Division



Material Issue

Air Pollution Control



TSMC's air pollution control design adopts a "source classification and multi-stage processing" approach by using the best available technology through high-performance equipment to ensure that pollutants discharged into the atmosphere can meet or exceed government regulations. In addition to setting up central pollution control facilities according to national regulations, TSMC also adds high-efficiency local pollution control facilities for different process gases to enhance the efficiency of air emissions. First, exhaust gas from the tools is treated by the local pollution facilities (Local Scrubbers) at the first stage for source processing, reduction rate is over 95%, and then the gas is sent to the pollution control facilities (Central Scrubbers) for the second stage of terminal processing. After two-stage treatment, the total reduction rate can reach as high as 99% or more.

Air Pollution Control Process

1. Initial Treatment

Local scrubber



Dry process tools



Wet process tools



Facility chemical storage tank



Organic process tools



Local scrubbers

2. Terminal Treatment

Central scrubber

Acid & alkaline gases



Two-stage wet scrubber



Exhaust



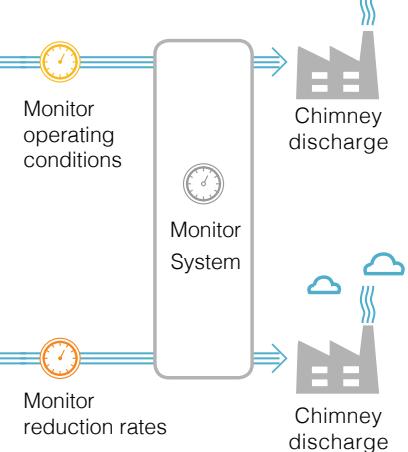
Organic gas



Zeolite concentration rotor and burning

3. Monitoring Management

Dual-track emissions monitoring



1st Stage: Front-end Treatment - Local Scrubbers

TSMC uses seven types of local scrubber for different process gases, including thermal type, burning type, plasma type, washing and dosing type, adsorption type, condensation type, and washing type.

2nd Stage: Terminal Treatment - Central Scrubbers

After first stage treatment, the exhaust gas containing low concentrations of inorganic acid and alkaline components is sent to the two-stage washing tower for acid-base neutralization. Gases containing volatile organic components are sent to the zeolite concentration rotor to be concentrated, burned, and then discharged into the atmosphere. The average removal rate of volatile organic waste gas is 95.4%, which is far superior to the removal efficiency required by regulations of 90%.

TSMC's new factories fully adopt a two-stage washing tower system for inorganic acid and alkaline gas. Compared with the one-stage washing tower system, the two-stages tower's filling layer thickness is doubled and specific surface area is increased by 1.4 times in order to extend the exhaust gas retention time in the control equipment. After full contact between exhaust gas and detergent liquid, the pollutants removal rate is 10% higher than traditional treatment.

Local Scrubber Classification

Plasma + Wet PFCs
●



Burning + Wet PFCs
●



Thermal + Wet Flammable and acid, alkaline gases
●



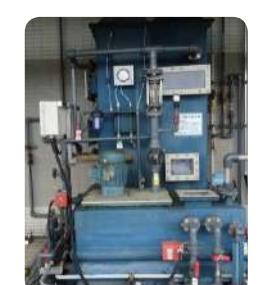
Adsorption Special gases
●



Washing + Dosing Acid & alkaline gases
●



Condensation High boiling point organic gases
●

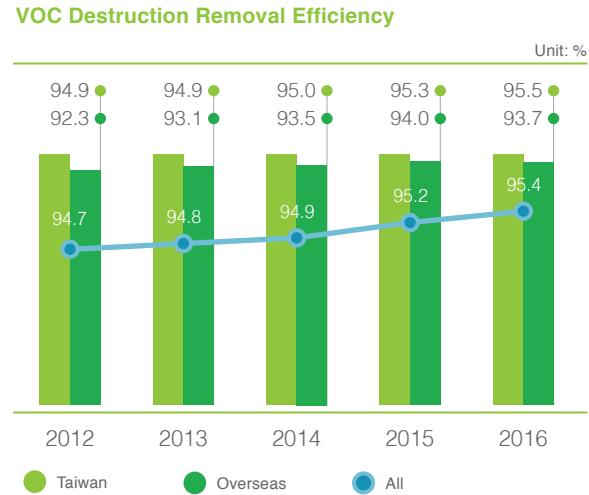


Washing + Dosing Acid & alkaline gases
●

● Dry process ● Wet process ● Organic process ● Facility chemical storage tank

Air Pollution Control Measures Exceed Regulatory Requirements

Gas Classification	Regulatory Standards	TSMC Practices
Acid Exhaust System (SEX)	<ul style="list-style-type: none"> The pH value of the wash tank should be > 7. The wetting factor should be $> 0.1 \text{ m}^2 / \text{hr}$. The retention time of the packing section should be $> 0.5 \text{ seconds}$ and the specific surface area of the packing should be $> 90 \text{ m}^2 / \text{m}^3$. 	<ul style="list-style-type: none"> The pH value of the wash tank is set at 8~11. The wetting factor is $> 0.155 \text{ m}^2 / \text{hr}$. The retention time of the packing section is $> 0.73 \text{ seconds}$ and the specific surface area of the packing is $> 128 \text{ m}^2 / \text{m}^3$.
Alkaline Exhaust System (AEX)	<ul style="list-style-type: none"> The pH value of the wash tank should be < 7. The wetting factor should be $> 0.1 \text{ m}^2 / \text{hr}$. The retention time of the packing section should be $> 0.5 \text{ seconds}$ and the specific surface area of the packing should be $> 90 \text{ m}^2 / \text{m}^3$. 	<ul style="list-style-type: none"> The pH value of the wash tank is set at 2~6. The wetting factor is $> 0.155 \text{ m}^2 / \text{hr}$. The retention time of the packing section is $> 0.73 \text{ seconds}$ and the specific surface area of the packing is $> 128 \text{ m}^2 / \text{m}^3$.
Volatile Organic Exhaust System (VEX)	<ul style="list-style-type: none"> Emission reduction rate of central scrubber should be over 90%. 	<ul style="list-style-type: none"> Emission reduction rate of central scrubber is over 95%.



TSMC's Two-Stage Washing Tower

3rd stage: Monitoring Management - Dual-track Emission Monitoring

TSMC's air pollution control capability complies with Taiwan's "Air Pollution Control and Emission Standards for Semiconductor Manufacturing" and the "Air Pollutants Emission Standards for Fixed Pollutants", and overseas factories also meet local regulatory standards. To ensure stable 24-hour and 365-day operation of pollution control equipment, all equipment is provided with at least one set of backup system (N + 1 design). In addition, TSMC has also established automatic monitoring systems to grasp the effectiveness of the exhaust gas treatment at all times. Relevant information is provided to the facility monitor control system room and the industrial safety emergency response center at the same time, so gas emissions are tracked under a dual-track independent monitoring system, ensuring that chimney exhaust gas is in compliance with specifications. Under the control of early warning systems and immediate response, there were no unusual events that required TSMC to inform relevant authorities in 2016.

Besides close monitoring in the factory, TSMC also entrusts certified laboratories for detection, and reports test results to the competent authorities. The test results include non-methane hydrocarbons (NMHC), acid and alkaline gases including sulfuric acid (H_2SO_4), hydrochloric acid (HCl), nitric acid (HNO₃), hydrofluoric acid (HF), phosphoric acid (H_3PO_4), chlorine (Cl₂) and ammonia (NH₃), nitrogen oxides (NO_x) and sulfur oxides (SO_x). TSMC's test results over the years show that air pollutant emissions are all lower than the emission standards set by the Science Park Administration and the local Environmental Protection Bureau.



Zeolite Concentration Rotor and Burning



Facility Monitor Control Center



Reduction Rate Monitor System



Industrial Safety Emergency Response Center

Inclusive Workplace

Employees are TSMC's most important asset, and the goal for the Company's human resources policies and practices is to enhance our Company and employees' overall productivity and effectiveness, and to enable employees' continuous contribution and growth. In order to attract and retain talent, TSMC is committed to providing quality jobs with good compensation, meaningful work, and a working environment supported by a healthy management system. This enables the Company to recruit and retain the best talents suitable for its positions. For talent development, the Company continuously unlocks employees' potential through collaboration between employees and managers, enabling employees to keep their capabilities at the leading edge, and grow together with the Company. In Human Rights protection, TSMC adheres to its core values to protect employees' human rights by complying with international standards and principles. In establishing a working environment, TSMC deeply instills a people-oriented safety culture and promotes employee health awareness to reduce safety and health risks.

“ Employees are the most important asset of TSMC, and also the key to sustaining our competitive advantage. The Human Resource Organization's key mission is to create an energized organization and inclusive workplace, and to enable employees' continuous contribution and growth in the Company.

Connie Ma
Vice President of Human Resources

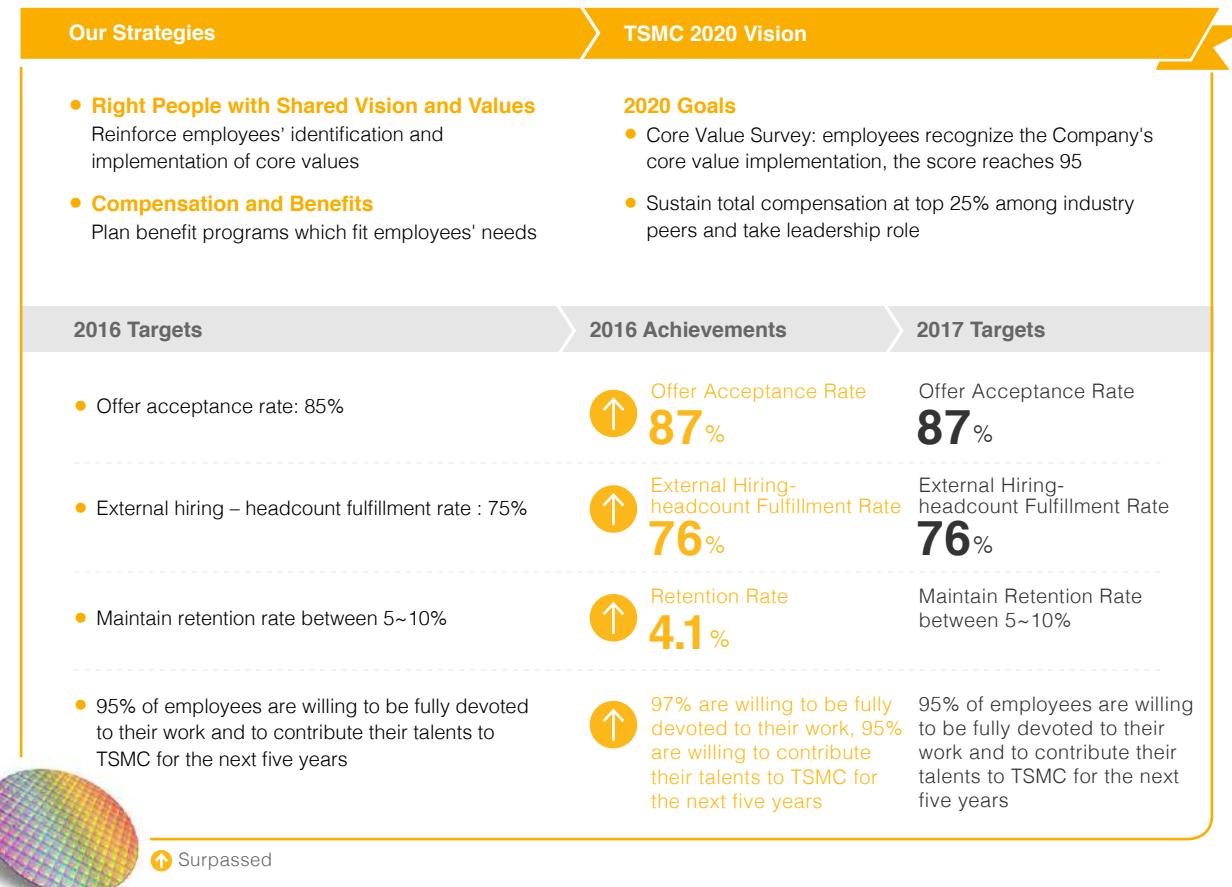
“ TSMC provides customized courses to develop employees' capabilities for a wide variety of positions and job functions. From my experiences working and cooperating with over one hundred companies, TSMC is among the most dedicated to investing in employee training and people development.

Ling-Lan Huang
External Learning and Development Trainer



Material Issue

Talent Attraction and Retention



Employment and Diversity

Workforce Structure

At the end of 2016, TSMC had 46,968 employees, including 29,562 managers, professionals, assistants, and 17,406 technicians. Among all employees, 44.8% hold Ph.D. or Master's degree, and 68.9% are between the age of 21 to 40, which helps to equip TSMC with the capabilities of innovation, research and development to adopt to the changing and competitive environment.

In terms of geographic distribution, over 90% of employees are located in Taiwan. We have overseas subsidiaries in China, North America, Europe, Japan, and Korea. In addition, the diversity of employees is important to TSMC. We not only conduct volume hiring in Taiwan but also actively recruit talent from around the world.

In terms of educational background, over 80% of our managers and professionals hold Master's degree or above. In a knowledge intensive field such as the semiconductor industry, the innovation of our employees contributes greatly to our leading position.

To attract, retain and develop the right people with shared vision and values is always the focus of TSMC in recruiting, staffing, compensation, performance management, and training and development policies, without regard to

gender, religion, races, nationality, or political affiliation. By "right people," we mean all employees who share our vision and values. "People with shared vision" means people aimed in the same direction as us, while "people with shared values" means people who do things based on the same principles as TSMC. Through a variety of human resources practices, our employees can bring all their potential into full play in the right position, which contributes to a win-win situation for both our company and employees.



Workforce Structure

Categories	Groups	Male		Female		Subtotal and Percentage by Groups	
		Number	Percentage of Group	Number	Percentage of Group	Number	Percentage of Group
Employee Category	Managers	4,335	88.31%	574	11.69%	4,909	10.45%
	Professionals	17,144	82.75%	3,575	17.25%	20,719	44.11%
	Assistant Engineer/Clerical	3,155	80.20%	779	19.80%	3,934	8.38%
	Technician	3,504	20.13%	13,902	79.87%	17,406	37.06%
Location	Taiwan	25,566	60.13%	16,954	39.87%	42,520	90.53%
	Asia	1,516	52.17%	1,390	47.83%	2,906	6.19%
	North America	1,019	68.53%	468	31.47%	1,487	3.17%
	Europe	37	67.27%	18	32.73%	55	0.12%
Age	18~20	17	34.69%	32	65.31%	49	0.10%
	21~30	8,331	61.06%	5,313	38.94%	13,644	29.05%
	31~40	13,952	59.50%	9,497	40.50%	23,449	49.93%
	41~50	4,820	58.70%	3,391	41.30%	8,211	17.48%
	51~60	927	62.01%	568	37.99%	1495	3.18%
	60+	91	75.83%	29	24.17%	120	0.26%
Education	Ph.D.	1,930	91.38%	182	8.62%	2,112	4.50%
	Master's	15,566	82.22%	3,366	17.78%	18,932	40.31%
	Bachelor's	7,639	60.93%	4,898	39.07%	12,537	26.69%
	Other Higher Education	1,566	28.63%	3,904	71.37%	5,470	11.65%
Employment Type	High School	1,437	18.15%	6,480	81.85%	7,917	16.86%
	Regular	28,133	59.91%	18,829	40.09%	46,962	99.99%
	Temp	5	83.33%	1	16.67%	6	0.01%
	Subtotal by Genders	28,138	59.91%	18,830	40.09%	--	
Total							46,968

Female Workers

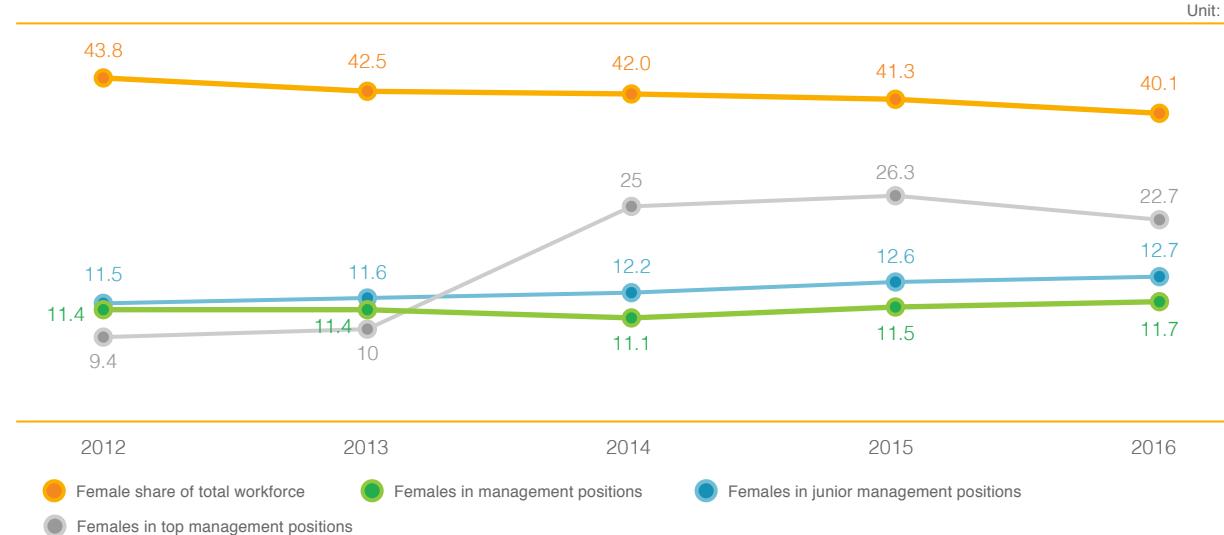
Based on the semiconductor industry characteristics and social culture in Taiwan, there are more male managers and professionals in the Company. In terms of technician group, the female workers' ratio is nearly 80%.

The ratio of total annual compensation between female and male employees in each region is listed in the table below. The compensation is based on one self's job responsibilities and performance, without regard to gender.

Ratio of Total Annual Compensation Between Female and Male Employees in Each Region

Region	Position	Female	Male
Taiwan	Manager	1	1.14
	Professional	1	1.00
	Assistant Engineer/Clerical	1	0.89
	Technician	1	0.83
China	Manager	1	1.00
	Professional	1	0.89
	Assistant Engineer/Clerical	1	0.81
	Technician	1	0.89
Japan	Manager	1	1.74
	Professional	1	1.29
North America	Manager	1	1.24
Europe	Manager	1	0.49
	Professional	1	0.93

Ratio of Female Workers in TSMC



Campus recruitment representatives visited the Company

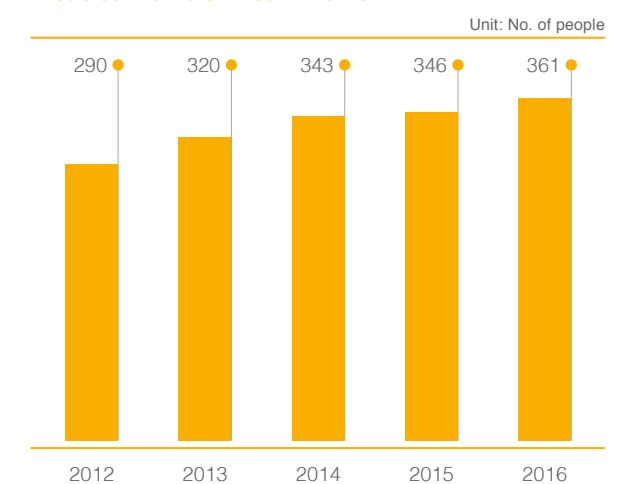


Campus recruitment representatives visited TSMC Museum of Innovation

Endeavor to Hire Disabled Workers

TSMC endeavors to hire disabled workers, and also proactively collaborated with 39 universities to create more diversified and high-quality job opportunities for disabled persons in 2016. In addition to existing job positions, we continue to integrate external resources to develop suitable jobs for disabled persons, including serving as Recruitment Service Representatives. In 2016, the number of disabled employees we hired has complied with government regulations.

Disabled Workers Hired in TSMC



Talent Recruitment

Right People with Shared Vision and Values

"Right People with Shared Vision and Values" is always the Company's foundation in recruiting talent. In recent years, along with the transformation of technology and the rise of new generations of talent, TSMC realized that only by proactively recruiting and retaining talent can we generate the momentum of R&D and manufacturing, which supports TSMC to sustain our long term competitive advantage even as competition and challenges become globalized.

TSMC recruits right people with shared vision and values through outstanding business performance, highly public recognition and active approaches such as summer

internships, university programs such as Joint Development Programs, and Research and Development Substitute Services. In 2016, TSMC recruited 3,477 new employees, which fulfilled the talent demand and boosted the momentum of the organization's growth.

Summer Internship

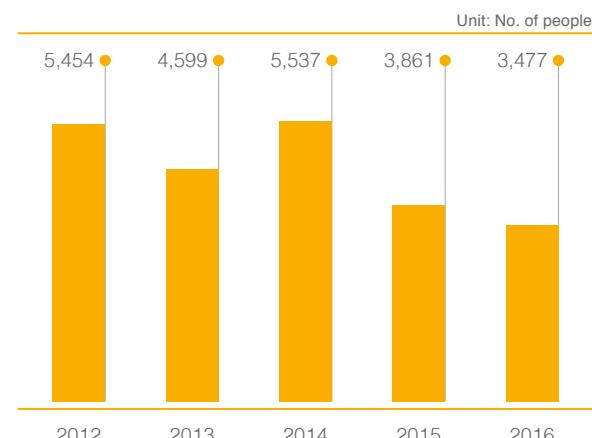
TSMC offers an internship program every year and managers regard this program as a channel to attract excellent talent. In 2016, the promotion channels for intern recruitment were the encouragement from professors, promotion from campus department offices, internal referrals, as well as public social networks (Facebook fan

page: "Join TSMC, Create Miracle Together") and face-to-face interaction with students during campus recruitment. The Company also encouraged students from research centers at National Taiwan University, National Chiao Tung University, National Tsing Hua University, and National Cheng Kung University to participate in summer internship programs to get involved in actual semiconductor R&D and manufacturing.

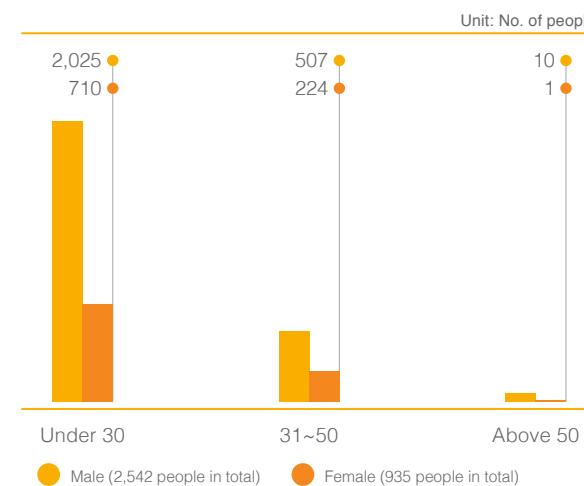
At the end of the internship program, we conducted a post-survey where 98% of interns agreed "the internship experience at TSMC can help their future career", and the overall rating for the internship program is 92 out of 100. In

addition, out of 240 interns in 2016, 51% received TSMC's advanced offer through managers' evaluation. Summer internship supports the Company to engage with talents in the early stage, and also provides students opportunities with exposure to industry practices, to experience the working life in TSMC, and benefits fresh graduates by offering a seamless on boarding process and shortening the assimilation into the industry.

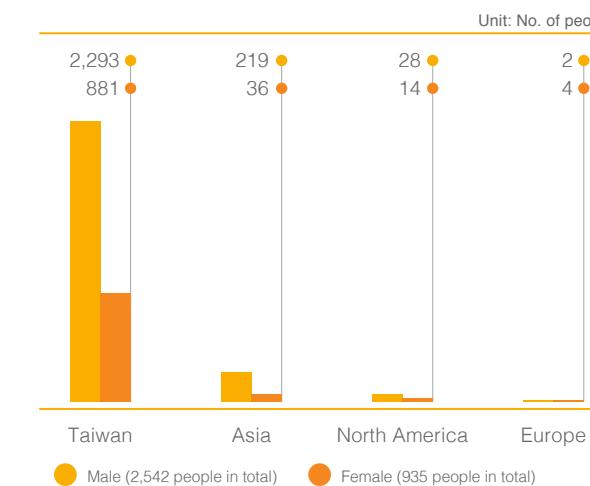
2012-2016 New Hire Employees



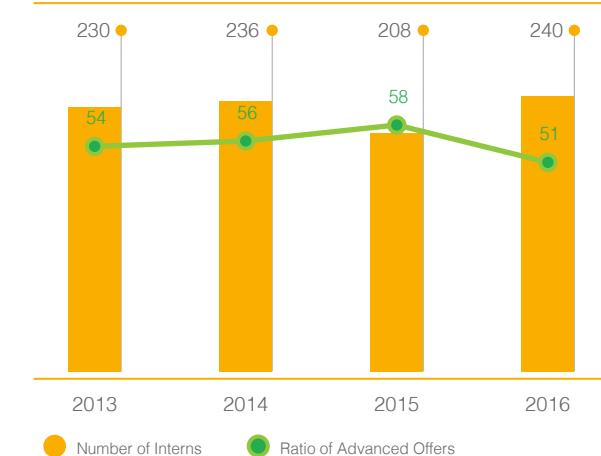
Distribution of New Hires by Age in 2016



Distribution of New Hires by Location in 2016



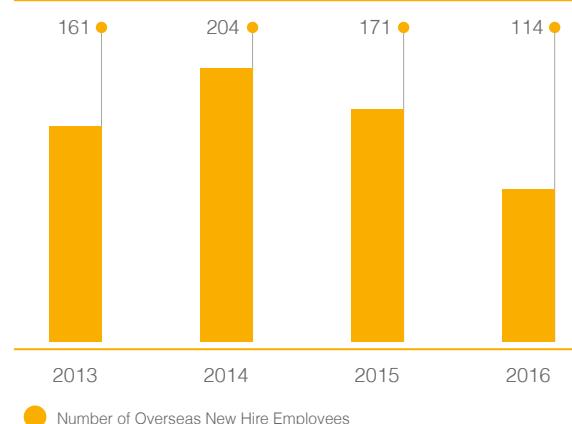
2013-2016 Number of Interns and Ratio of Advanced Offers



Overseas Talent Recruitment

Around 90% of employees are based in Taiwan, therefore the majority recruitment activities occurred domestically. However, in order to sustain the diversity and recruit technology and management talent in the fields of special technology, TSMC continuously cultivates overseas talent and hold joint development programs with MIT, Stanford University and University of California, Berkeley for years. In 2016, Purdue University was newly added into the Joint Development Program (JDP). TSMC gradually expanded the amount of JDP universities and gives priority to Electronic Engineering related programs in order to engage and target students who can join TSMC upon graduation.

2013-2016 Number of Overseas New Hires



TSMC's recruiting department visits top universities and cities in the United States to recruit semiconductor related talent in the first and second half of each year. In the 2nd half of 2016, the search regions for semiconductor talent expanded to Europe (UK, Germany, Belgium and Netherland), Canada and Japan. Moreover, TSMC participated in the Indian Institutes of Technology campus recruitment at the end of every year. In 2016, TSMC recruited 114 overseas talents.

Innovative Communication for Young Generation and Retention

More than 60% of employees are under the age of 35 in Taiwan. In order to retain talent proactively, TSMC has integrated communication channels and facilitates the communication to fit the younger generation needs. In 2016, in order to communicate the modification of Taiwan's Labor Law's and Code of Conducts (CoC), the Company designed short animations as one of its communication tools. It leverages trendy tones and day-to-day examples, which resonates with the younger generations and deepens impressions of regulations. The CoC animation video was viewed over 10 thousand times in 2 weeks, and has also been promoted in each level's communication meetings. Positive feedback was received with comments such as "the communication tool is effective, it brought a lot of feedback." The creative communication will be implemented in the future continuously to polish TSMC's core values, to shape the Company's culture and reinforce

mutual commitment among the Company and employees.

Furthermore, the Company's efforts on retention are reflected in 2016 Core Value Survey, which is a general census to all employees. 40,119 questionnaires were collected with 91% response rate. Excluding invalid questionnaires with incomplete and duplicate responses, the effective sample rate is 87%. Compared with previous Core Value Survey, the score of "Integrity," "Commitment," "Innovation" and "Customer Trust" have all improved; especially for "Customer Trust" which received the highest rating.

Generally, employees agree with the implementation of TSMC core values. According to the survey, 97% employees agreed that they are willing to devote fully to their work to make TSMC an even more successful company; while 95% of them concurred with the statement that they are willing to contribute their talents to TSMC and grow together with the Company for the next five years. The survey result will be used as an important reference for reinforcing Company's culture, as well as enhancing Company's management. The survey results also showed positive outcomes of the Company's current policies and programs.



Recruiting Seminar and Talent Engagement in Purdue University



Animations for Code of Conduct Promotion

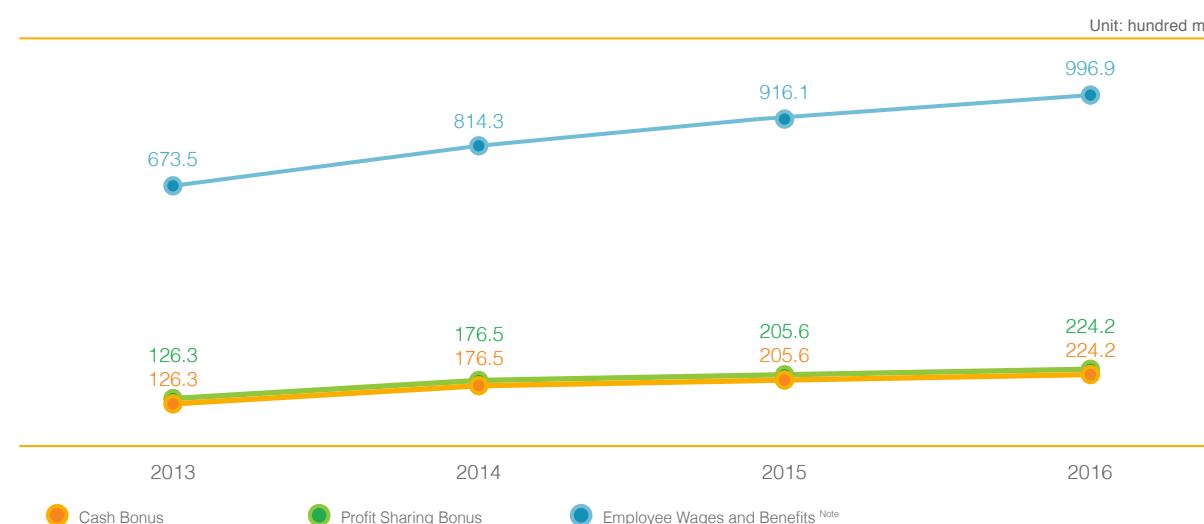
Compensation and Benefits

Competitive Compensation Program

TSMC provides competitive compensation packages for attracting and retaining the best talent, and for rewarding employee's performance and encouraging their long-term contribution. Our total compensation includes base salary, allowance, employees' cash bonus and profit sharing bonus, which is based on individual expertise, job responsibility, performance, commitment, and the Company's operational achievement.

TSMC achieved record-high operational performance and profit in 2016. The total amount of employees' cash bonus and profit sharing bonus in 2016 is expected to exceed NT\$44 billion. The total compensation of a newly-graduated engineer with a Master's degree in Taiwan would be equal to 33 months' salary, including 12 months' base salary, 2 months' year-end bonus and around 19 months' employees' cash bonus and profit sharing bonus, outperforming our industry peers.

2013-2016 Employees' Compensation and Benefits



Note: Employee wages and benefits mainly are salary, allowance, cash bonus, profit sharing bonus, pension expenses and benefit programs.

2016 Salary Increase and Bonus

Salary Increase

- In order to maintain the competitiveness of the Company's total compensation, we appropriately adjust employees' salaries annually, taking the results of global salary surveys, market salary scales, and economic indices into consideration.
- In April 2016, TSMC completed salary increases for employees in Taiwan and overseas subsidiaries.

Take Taiwan for example, the salary increase rate for employees is around

3-5%

Bonus

- Cash bonus and profit sharing for our employees are reviewed by the Board of Directors' Compensation Committee and are linked to our financial, operational performance and future growth.
- In 2016, the Board of Directors approved distribution of employees' cash bonus and profit sharing bonus totaling approximately NT\$44,836,678 thousand. The cash bonus of NT\$22,418,339 thousand distributed following each quarter of 2016 to balance our employees' cash flow and provide timely reward.
- The profit sharing bonus of NT\$22,418,339 thousand to be distributed in July 2017 to encourage our employees' continuous contribution.

Cash Bonus

NT\$22,418,339 thousand

Profit Sharing Bonus

NT\$22,418,339 thousand

Benefits Program Exceeds Statutes

Beyond statutory benefit requirements, TSMC offers additional benefit programs which fit employees' needs, such as holidays, insurance plan, pension plan, financial assistance for employees who encounter difficult circumstances, subsidies for marriage, childbirth, and funerals, or discounts provided by designated vendors.

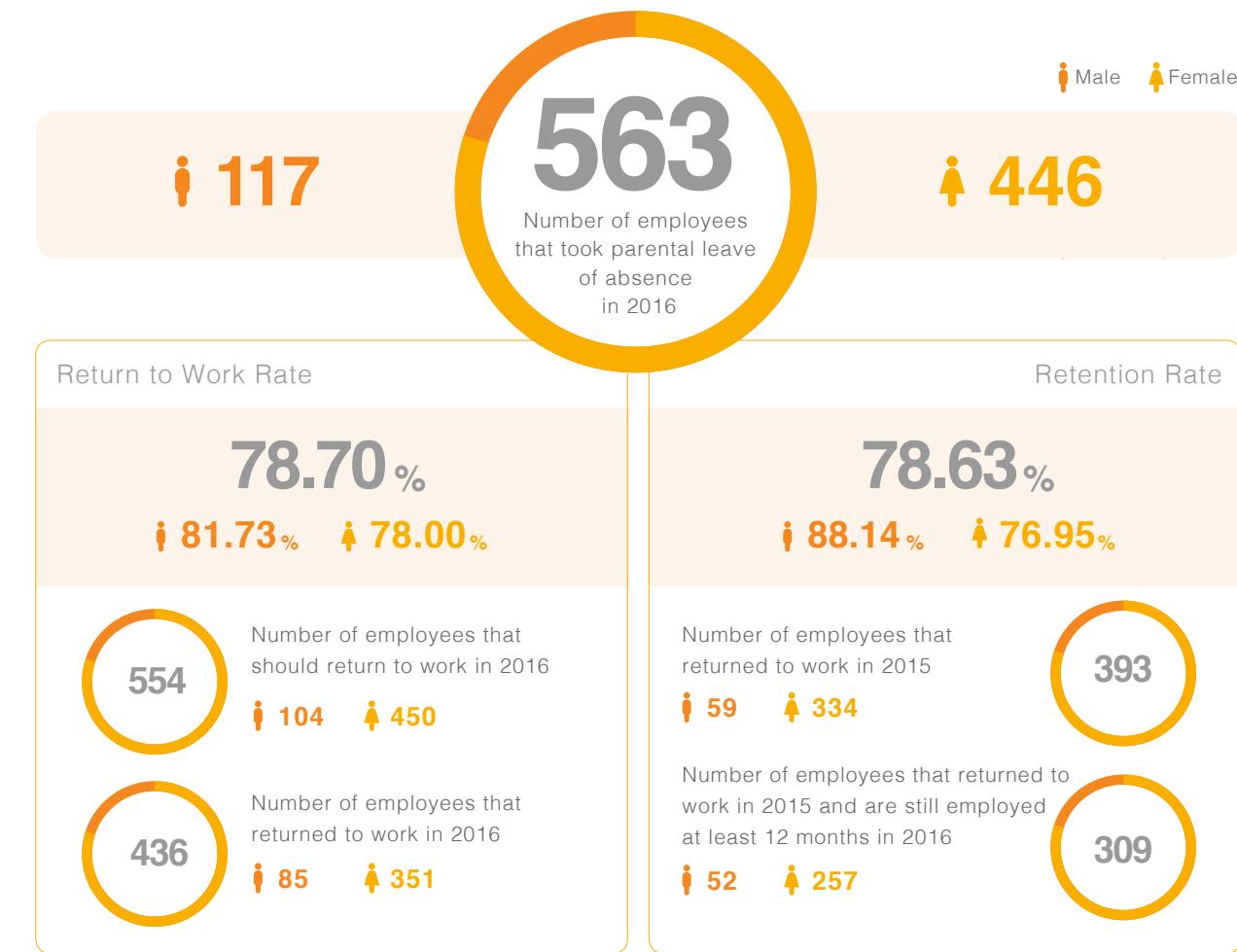
In addition, in order to take care of both personal and family needs, employees can apply for leaves of absence for reasons such as childcare, military service, and medical treatment for serious illness or injury. They can also apply to return to our company before the end date of his or her leave of absence. In 2016, there were 563 employees who took

parental leave of absence. 436 employees returned to work in 2016, and the return-to-work rate was 78.70%. Among 393 employees who returned to work in 2015, 309 employees are still employed in 2016, and the retention rate was 78.63%. In addition to the practice in Taiwan, as a global company, we provide employees of overseas subsidiaries with a competitive localized salary plan in accordance with local regulations, industry practices and labor market status. At the same time, we design bonus programs as part of our compensation package based on the operational performance of our Company and each overseas subsidiary to encourage overseas employees' continuous contribution to the future growth of our company.

Benefit Practices which Exceed the Statutory Requirement

Item	Labor Law	Practices which Exceeds the Statutory Requirement
Holiday	<ul style="list-style-type: none"> 12 national holidays per year 	<ul style="list-style-type: none"> TSMC holidays include 12 national holidays in accordance with the Labor Standards Act and 7 additional memorial days.
Sick Leave	<ul style="list-style-type: none"> 30 days of half-paid sick leave per year 	<ul style="list-style-type: none"> 120 hours fully-paid and 120 hours half-paid sick leave per year
Personal-affairs Leave	<ul style="list-style-type: none"> 14 days of personal-affairs leave per year 	<ul style="list-style-type: none"> In addition to personal-affairs leave, granted based on the Labor Standards Acts, employees are entitled to 90 days of special personal leave with approval by authorized supervisors if they must attend to important personal affairs.
Insurance Plan	<ul style="list-style-type: none"> Employee shall be insured by Labor and National Health Insurance eligible for their statutory benefits from the first day they come on board. 	<ul style="list-style-type: none"> In addition to the Labor Insurance and National Health Insurance, we provide comprehensive group insurance plans to employees without charge. Coverage includes life insurance, accident insurance, hospital insurance, cancer insurance, and business travel insurance. Besides, employees also have the flexibility to participate in self-pay insurance plans for their family with lower prices. The coverage will be extended without charge to employees in leave of absence for the purpose identified by labor law.

2016 Number of Employees Who Took Parental Leave of Absence, Return to Work Rate and Retention Rate



Stable Pension Plan

The Company's employee pension plan is set in accordance with the Taiwan Labor Standards Act and Labor Pension Act. With our company's sound financial system, we ensure employees a solid contribution and regular pension payments. TSMC's overseas subsidiaries also make monthly contributions at certain percentages of the basic salary of their employees. In addition to statutory contributions, we also invite professional accountants and consultants to conduct precise calculations of our company's pension fund, so as to assure sufficient funding for employee pension payments in the future.

2016 Pension Plan and Pension Allocation**Practice****Pension Contribution under Labor Standards Act**

- TSMC provides a defined benefits plan based on an employee's length of service and average monthly salary for the six-month period prior to retirement under the Labor Standards Act. TSMC contribute an amount equal to 2% of salaries paid each month to their respective pension funds, which are administered by the Labor Pension Fund Supervisory Committee (the Committee) and deposited in the Committee's name in the Bank of Taiwan.

Pension Contribution under Labor Pension Act

- TSMC provides a defined contribution plan under the Labor Pension Act (the "Act"). Pursuant to the Act, TSMC makes monthly contributions equal to 6% of each employee's monthly salary to employees' pension accounts.

Pension Asset as of year 2016

- The fair value of plan assets was NT\$3,929,072 thousand as of December 31, 2016. Accordingly, TSMC recognized expenses of NT\$272,141 thousand for the years ended December 31, 2016. Insufficient funding was included in the balance sheet under accrued pension cost and amounted to NT\$8,551,408 thousand as of December 31, 2016.

- Accordingly, TSMC recognized expenses of NT\$2,164,900 thousand for the years ended December 31, 2016.

Encourage Employees' Outstanding Performance

To encourage employees' continuous development, TSMC recognizes employees' performance through performance management, development system, and promotion system. For technical talents development, TSMC provides a dual-ladder system as an appropriate evaluation and recognition approach. For entry level employees, TSMC holds Excellent Labor Awards annually and invites awardees' family to join the ceremony and banquet. In order to appreciate senior employees' commitment and contribution to the Company, TSMC also provides service award and retirement acknowledgment.

Apart from corporate-wide awards, TSMC strives to recommend employees to participate in external awards. In 2016, TSMC employees continued to be recognized through national awards and competitions such as Outstanding Young Engineer Award, National Manager Excellence Award and National Industrial Innovation Award.

Employee Turnover Rate

Compared with the external environment, TSMC provides better jobs, with competitive compensation, meaningful work and safe work environment to retain talents effectively. In 2016, the turnover rate for all employees was 4.1%,

which is stable and gradually decreasing compared with the previous years.

In order to sustain talent mobility, we assume a turnover rate between 5~10% is acceptable. Even though the turnover rate in 2016 was lower than the assumption before, the Company hired 3,477 employees in 2016 and the new comer ratio reached 7.4% due to the Company's growth. In addition, the Company accelerated talent mobility through the transparency of internal job opportunities to encourage employees to take initiative in arranging and planning their career path.

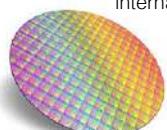
2012-2016 TSMC's Turnover Rate

Unit: %



Material Issue

Talent Development



✓ Achieved ↑ Surpassed

For sustainable talent development, TSMC sets directions for employees' Learning Development and People Development.

In order to adapt to the changing environment and organizational growth needs, TSMC accelerates organizational and employee growth with four learning and development focuses: company cultural transition, organizational and personnel management, capability development, and learning systems and resources.

In terms of people development, the Company focuses on three directions to develop employees: dual ladder system, people mobility, and promotion criteria of potential, to create a continuous development environment for employees by generating managers and employees' collaboration.

Direction of Talent Development

Company Cultural Transition

Enhances all employees' identification and implementation of corporate core values, and not lose the focus because of company expansion.

Dual Ladder System

In order to provide employees an appropriate development environment, TSMC builds a diverse and comprehensive development structure and reinforces Human Resources policy and procedures

Organizational and Personnel Management

TSMC strengthens the management capability at various levels of management, to reinforce employees' engagement and commitment toward the Company.

Capability Development

To cope with the difficulty of external hiring, TSMC will strengthen employees' training and development and maintain high-quality talent capabilities.

People Mobility

TSMC make internal job opportunities transparent and respects employees' transfer decisions. Employees can plan and arrange their own career, which accelerate internal talent mobility simultaneously.

Learning Systems and Resources

TSMC provide a variety of learning channels and methods to encourage employees to be self-directed learners. TSMC will also strengthen the learning management system and the implementation of knowledge sharing and transition.

Promotion Criteria

Identify 'Potential' as critical promotion criteria.

Learning and Development Directions

People Development Directions

Learning and Development

Employee's learning and development is an integral and critical factor for the growth of a company, and it should be "goal-oriented, planned and disciplined". TSMC is committed to cultivating a continuous and diverse learning environment, and established "TSMC Employee Training and Education Procedure" to ensure that Company's and individuals' development objectives can be achieved through the integration of internal and external training resources.

2016 Key Focus of Learning and Development

New Manager Capability Enhancement

In response to rapid growth of organizations and the increase of new managers in recent years, management capabilities need to be enhanced fast for building organizational capacity effectively

- To enhance management capacity and organizational effectiveness, TSMC provide training programs for new managers and first line managers in 2016. The average training effectiveness score (trainees' evaluation score for their ROI) reached 95 points.
- Core value survey in 2016 showed that one of the "Commitment" items -"All levels of the company managers support my work and life balance" score higher than previous survey, which implies the management training program showed results gradually.

Organization and Talent Development

Timely resolution of organizational issues and improve work efficiency

- To help organizations and employees to solve issues, TSMC provide 4 talent development programs for different fabs, 9 customized courses or workshops for capability development, and 3 team experiential learning sessions.
- The average customized trainings and workshops effectiveness score reached 90 points, and received positive feedback. For example, Internal Audit director specially wrote an appreciation email after the workshop, saying that it is effective workshop with to-the-point tips, easy-to-follow practice, and real-time in-class exercise.

New Site Training

Support organizations and personnel to successfully achieve task in the new sites by implementing Nanjing and Longtan site training

- Nanjing Site: TSMC provides orientation, cross-culture training and core value training for Taiwan assignees and overseas hires. 100% of target trainees completed the training, and the average training effectiveness score reached 95 points. In order to equip new comers and employees who transferred to Nanjing with required skills, 96.6% of them passed the online certification in the domain of equipment, module and system.
- Longtan Site: TSMC provides local orientation for new comers in Longtan. 100% of target trainees completed the training and the average training effectiveness score reached 95 points. Supported Longtan site to begin mass production on schedule.

In 2016, TSMC provided 623,711 hours of training and the number of attendees totaled 450,756. On average, each employee attended over 13 hours of training and TSMC spent NT\$75,401,157 on the learning and development for employees.

TSMC provides individual development plan (IDP) for employees. In order to encourage employees to choose suitable learning resources and methods according to individual needs, TSMC reduced classroom course hours of Personal Effectiveness Training Program and New

Managers Program in 2016. As a result, the number of the course attendees, training hours and internal instructors' course delivery showed a downward trend; on the other hand, average training hours for direct labor grew stably due to a higher proportion of compulsory technical courses and certification. As the quality of the course improved year by year, trainees' average evaluation score (include course content, instructor, administration and effectiveness) increased to 94 points in 2016.



Organizational Development Activity: Work Together to Build a Bridge

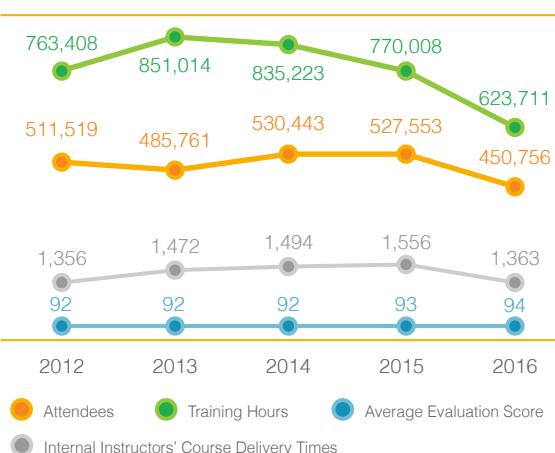


First Line Manager Training



New Comer Training in Nanjing site: Culture Assimilation Workshop

2012~2016 Training Index



Note: The data scope of attendees and training hours includes Taiwan, China and North America. Due to the difference of training system, the data of average evaluation score and internal instructors' course delivery does not include North America.

2012-2016 Average Training Hours

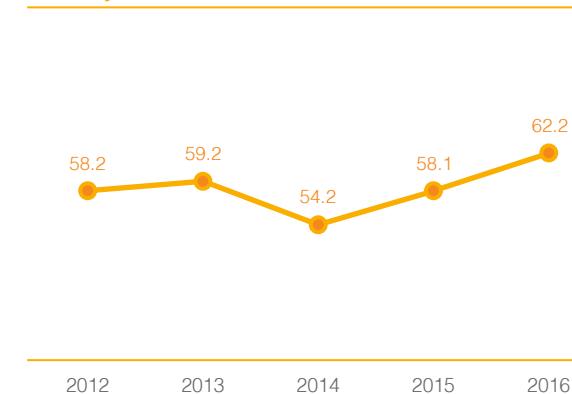


People Development

TSMC provides employees a diverse and comprehensive people development structure. We continue to strengthen the development system of 'dual ladder'. Our employees can, based on their own characteristics and expertise, develop in managerial or technical/professional areas. We also make internal job opportunities transparent and respect employee's willingness to encourage our employees to take initiative to plan and arrange their own career path. The percentage of open positions filled by internal candidates was increased from 58.1% to 62.2% in 2016. In promotion, TSMC considers 'potential' as the most important factor, in addition to seniority and past performance.

2012-2016 Percentage of Open Positions Filled by Internal Candidates

Unit: %



2016 Key Focus of People Development



Dual Ladder System

Build a diverse and comprehensive people development structure and reinforce policy and procedures related to Human Resources to provide our employees an appropriate development environment

- Clearly define the difference of managerial and technical/professional manager, and apply the definition to performance appraisal and development process.
- Provide differentiated training program for managerial and technical/professional managers.
- Revise TSMC Academy Procedure, including loosening qualification in job grade of nomination in accordance with employees' ability, increasing the level of executive council and adding the procedure of job grade promotion.
 - » When the Company has business requirements, employees should respect the Company's business needs and job arrangement.
 - » The Company respects individual-initiated transfers under the condition of not impacting business operations.



People Mobility

Respect employee transfer decisions in principle. Encourage employees to take initiative to plan and arrange their own career path, which accelerates internal talent mobility simultaneously.



Promotion Criteria - Potential

Emphasize the importance of employee's potential in promotion system to enhance the quality of decision-making for promotion.

- Consolidate the definition of 'potential', identify the assessment approach and set it as a promotion criteria.
- Establish a guidebook for promotion process and assist managers to evaluate employees' potential for promotion.

Material Issue

Human Rights



Human Rights Policy

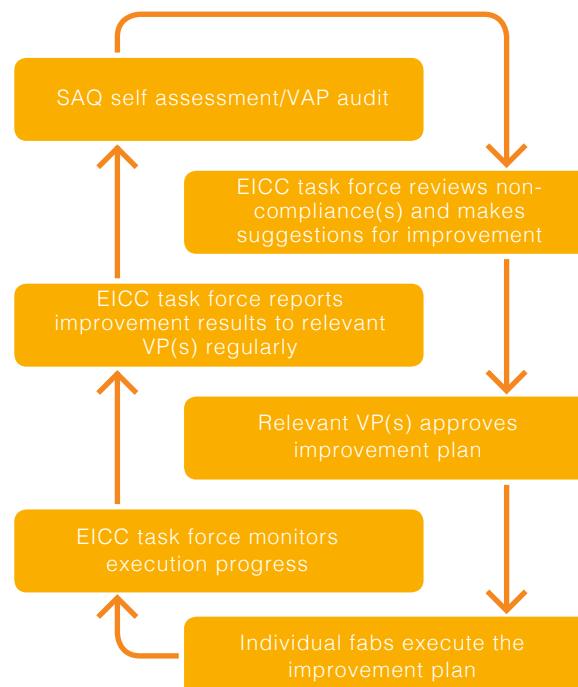
TSMC's Human Resources are guided by the Company's core value - Integrity, Commitment, Innovation and Customer Trust. Refer to "A Guide for Business – How to Develop a Human Rights Policy" by UN Global Compact, and complied with "The International Bill of Human Rights", "The International Labour Organization's (ILO) Declaration on Fundamental Principles and Rights at Work"; and "The United Nations Global Compact", the Company promulgated "Human Rights Policy" to ensure our employees' human rights. Also, our guiding principles of the Human Rights Policy align with the Electronic Industry Citizenship Coalition (EICC) Code of Conduct.

Human Rights Evaluation

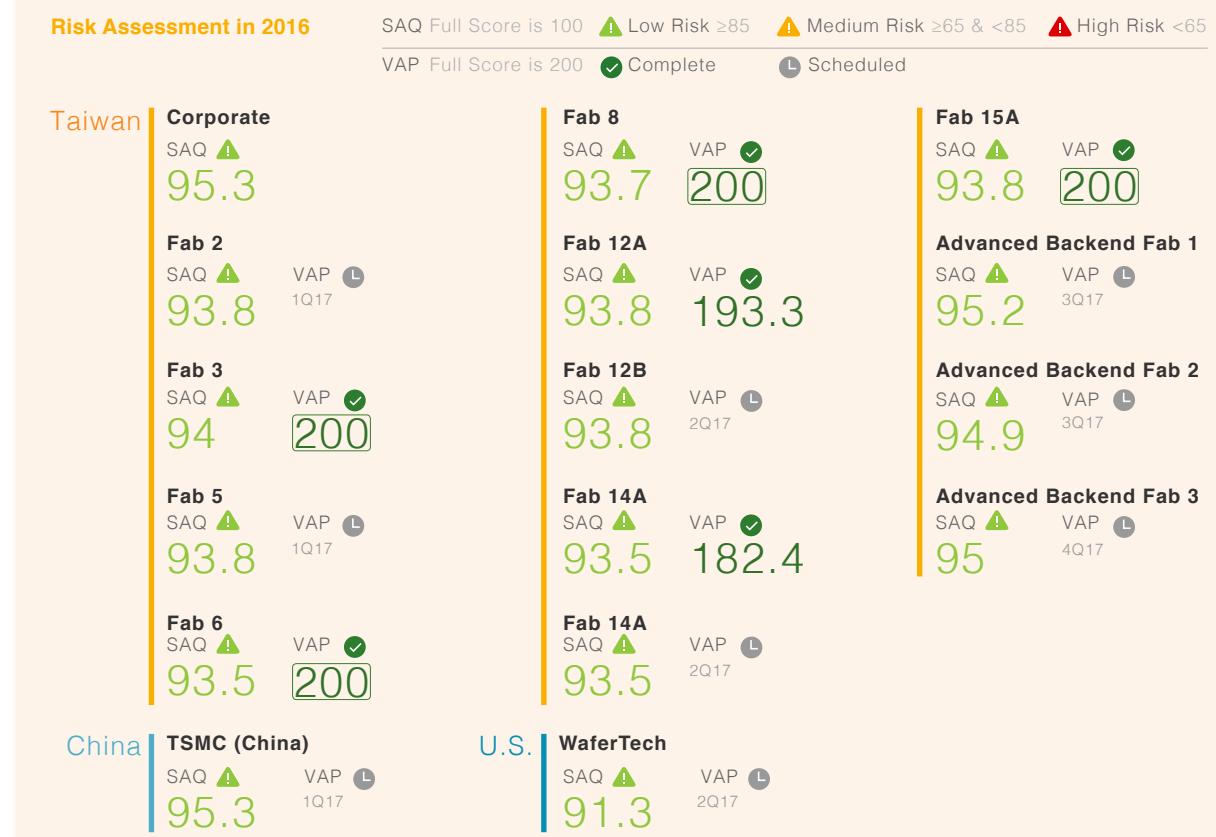
As the world's largest dedicated semiconductor foundry, TSMC is committed to ensuring that working conditions in its facilities are safe, that workers are treated with respect and dignity, and that business operations are environmentally responsible and conducted ethically. In reflection of this commitment, TSMC in December 2014 became a member of the

Electronic Industry Citizenship Coalition (EICC), and went through a meticulous due diligence process to make sure that its own code of conduct is consistent with and no less stringent than the EICC Code of Conduct. A number of internal policies and procedures applicable to all facilities worldwide had to be changed to make this possible. For example, forbidding the use of forced labor and child labor is now explicitly spelled out in the staffing policy, even though TSMC has never engaged in such employment practice. In the employee grievance procedure, anonymity can now be guaranteed to ensure employees are able to raise any concerns without fear of retaliation.

Continuous Improvement Process of Labor Conditions



Every year, TSMC makes use of a standardized risk assessment template called the Self-Assessment Questionnaire (SAQ) developed by the EICC to identify the highest social, environmental and ethical risks in its operations. In addition to that, TSMC has put together a plan to execute VAP (Validated Audit Process) audits for all its facilities over a two year period starting 2016. The VAP is the EICC standard for effective, shareable audits carried out by independent, third-party auditors specially trained in social and environmental auditing and the VAP audit protocol. The audit reports, once available, are published transparently through the electronic EICC-ON platform such that TSMC's customers can easily access them. As promised in this report last year, TSMC completed the VAP audits of 6 facilities in 2016; the remaining 9 facilities will complete the audits in 2017.



Human Rights Risk Reduction Measures

For the reporting year of 2016, TSMC completed the assessment at the corporate level and at the facility level for all its manufacturing plants around the globe. On the whole, TSMC's conditions can be classified as low risk. That said, TSMC remains committed to continuous improvement in pursuit of better alignment with the EICC spirit. For instance, to strike a better work-life balance for employees, TSMC overhauled the night shift scheduling system for engineers in 2016 and made it possible for them to get enough rest time without compromising their incomes. In the same year, TSMC also formally established its Human Rights Policy.

It is worth mentioning that the execution of VAP audits is not a mandatory EICC membership requirement in the absence of any high-risk facility. Yet TSMC is still committed to executing VAP audits for all its facilities, and through the proactive move TSMC aspires to make material changes for quality working environment. At the same time, TSMC hopes to correct the stereotypical impression many international communities have on factories in Taiwan and reverse the stigma.

In human rights protection related training, TSMC's practices are listed as below:

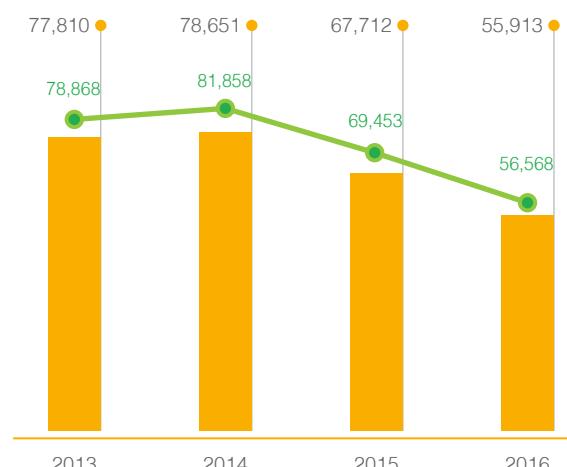
1. Provide regulatory compliance information in new employee orientation, with contents including forced labor prohibition, child labor prohibition, anti-discrimination, anti-sexual harassment, working hours management, human treatment and a healthy and safe environment
2. Provide sexual harassment e-learning, with contents including: the major concept and prevention of sexual

harassment, and practical approaches to deal with sexual harassment

- Provide comprehensive occupational safety trainings, which include: fire training, emergency response training, first-aid training, general environment, safety and health training, occupational safety and health training for new and promoted managers

In the past two years, TSMC reviewed all sexual harassment e-learning and occupational safety series training, integrated the similar course content and reduced course hours for better training effectiveness. Therefore, the total number of training attendees and training hours has decreased.

2013-2016 Number of attendees and training hours of human rights protection related training



- Number of attendees of human right protection related training
- Training hours of human right protection related training

Internal Communication Channels for Employees

TSMC strives to create harmonious employee relations, values two-way communication and fosters open communication channels for management levels, subordinates and peers. This enables effective communication between the Company and employees and also creates a high-involvement working environment.

TSMC Internal Communication Structure



Employees are also highly engaged and willing to make commitments to TSMC. In addition, TSMC abides by regulations to hold Labor-Management Meeting periodically, summarizes and publishes business updates, labor conditions, and employee welfare activities for employees.

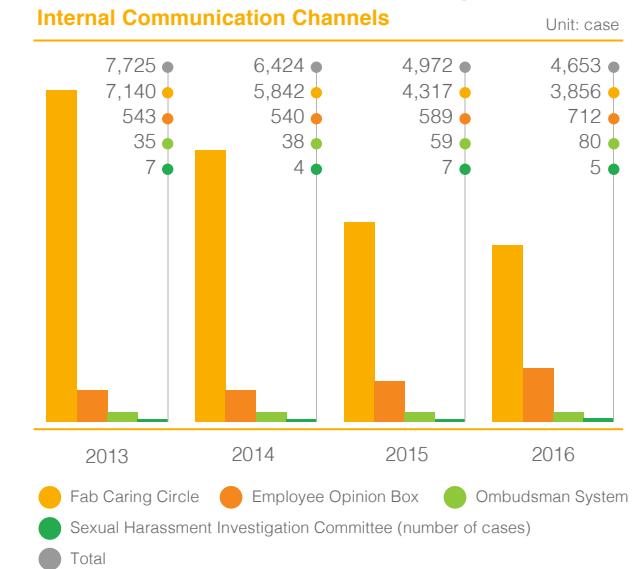
In 2016, there were 4,653 cases being raised through internal communication channels in Taiwan, including

5 sexual harassment cases from sexual harassment investigation committee, 80 cases via ombudsman system, 712 cases via employee opinion box, and 3,856 cases via fab caring circle.

Among these channels, employee opinion box has a quick satisfaction survey mechanism, and 85% of users are satisfied with the results of case handling.

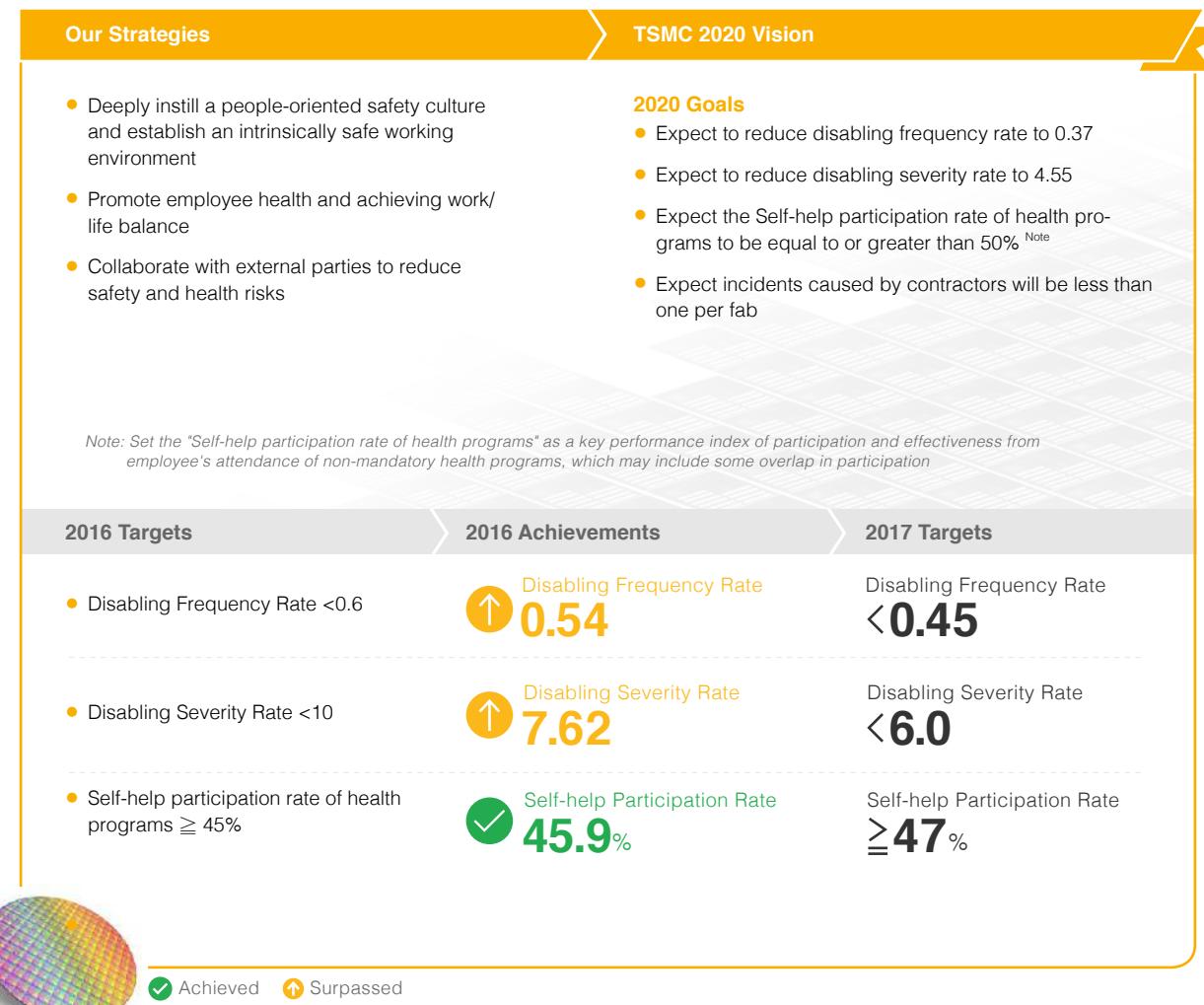
The relationship between our management level and employees has been harmonious over the years due to our transparent and effective communication channels; TSMC respect the right to form a labor union of employees, but no employees have pursued it so far, underlying the achievement of the Company's dedication. In 2016, there have been no losses resulting from labor disputes.

2013-2016 Number of Cases raised through Internal Communication Channels



Material Issue

Occupational Safety and Health



TSMC stays abreast of global safety and health topics, meets or surpasses international safety and health regulations and standards and adopts rigorous safety and health control measures. TSMC focuses on enhancing every employees' and contractors' awareness and sense of accountability for safety and health, proactively establishing a safe and healthy working environment, preventing occupational injuries and diseases, and promoting employee and contractor safety and mental health and collaborating together to pursue a sustainable future.

Executive Organization



Structure of Safety and Hygiene

TSMC's safety and hygiene structure includes nine major items such as safety and health policy, hazard identification, emergency response, personnel management, tool safety management, chemical management, infectious diseases prevention, employee physical & mental protection and physical hazard prevention. TSMC formulated 59 standard management procedures for the above-mentioned nine items, announced these on TSMC's internal website and reviewed and modified these procedures yearly to let all employees to be able to find and follow these standards publicly. The benefit of establishing standardized procedures is not only to achieve the goal of building the best workplace, but also to align the staffs' awareness, shorten the learning curve and reduce the error generated. The standard procedure became an important basis for establishing the best health working environment.



Achievements in 2016

- Complete 1,938 safety and health management programs
- Complete 2,796 safety management changes. Zero related incidents
- Establish and consolidate investigation technique of incidents
- Enhance the ability of 2,565 contractors' safety technician
- Zero incidents which were caused by tool installations
- Build up exposure model. Zero chemical exposure and occupational disease incidents
- Trace infectious disease status from Centers for Disease Control, R.O.C.)
- Details listed in the section for [comprehensive health management](#)
- TSMC is the first Taiwan company to build ergo risk assessment e-system

Safety Performance Index

With TSMC's rapid expansion, to ensure we follow the 59 safety and health standardized procedures, we built up one quantifiable SPI (Safety Performance Index) system to monitor safety and health executing stats at all sites quantitatively. SPI classifications include active and passive indexes. Starting in 2016, TSMC added contractor management as one of its SPI assessment factors, and expects to work enthusiastically together with contractors to establish a safe and health working environment. In addition, employee health promotion items were also added into SPI assessment as a bonus consideration.

Safety performance indicators adopted a management mechanism that uses blue, green yellow and red four-level lights. In the event that one site's light is yellow, it indicates that the site has one incident. ISEP will immediately investigate the root cause and then fan out the improving actions to other sites at same time to prevent similar incidents from occurring. In 2016, overall lights appearances are no red lights, 91.1% are blue lights, 4.8% are green lights and 4.2% are yellow lights. Comparing the overall light status in 2016 with Y2015 (92.5% are blue lights, 4.1% are green lights and 3.4% are yellow lights), the yellow light appearance rate increased 0.8% because we added the contractor management assessing items to enhance the contractor management performance. (For details please refer to the section of [contractor management consolidation](#))

Sample of Four-Level Lights

SPI	Performance	Color
$\text{SPI} \geq 95$	Excellent	●
$85 \leq \text{SPI} < 95$	Good	●
$70 \leq \text{SPI} < 85$	Warning	●
$\text{SPI} < 70$	Alarm	●

Active Items

- Numbers of safety management of change
- Numbers of safety and health executing program
- Numbers of safety and health licenses
- Numbers of safety and health promotion activity

Passive Items

- Numbers of incident
- Numbers of proactive audit defects
- Completed rate of regulation identification
- Internal and external defect rates of safety and health
- Contractor management
(Include the numbers of inspection audit defect, proactive audit defect, notify abnormal case to site ISEP proactively, proactive improvement)

New Plus Item

- Participating rate of health promotion activities
(Encourage employees to participate in activities like lose weight, quit smoking, etc.)

Disabling Injury Statistics

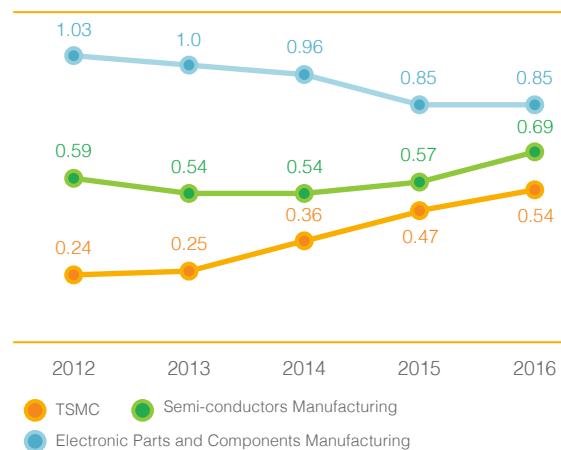
TSMC uses the Disabling Frequency Rate (FR), Disabling Severity Rate (SR) and Absentee Rate (AR) defined by Taiwan's MOL (Ministry of Labor) and Global Reporting Initiative G4 to evaluate the effectiveness of the company's occupational health and safety programs (the statistics did not include traffic accidents outside the factory).

There were 43 cases of disabling injuries among TSMC Taiwan employees in 2016. The FR and SR of TSMC's fabs in Taiwan were 0.54 (male: 0.39, female: 0.77) and 7.62 (male: 5.74, female: 10.55) respectively in 2016. TSMC's FR and SR are both lower than the averages of Taiwan's electronic parts and components manufacturing industry and semiconductor manufacturing industry. There were no occupational diseases and fatalities; the most common type of disabling injury was slipping (34.9%) followed by collision (23.3%) and sports injury & sprain (14.0%).

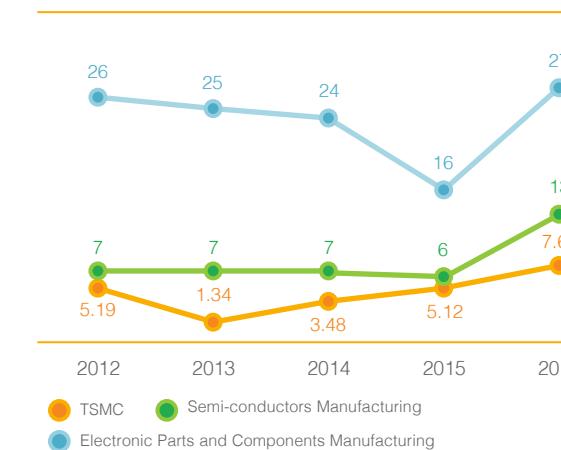
In the final injury analysis data between 2012 and 2016, the main root causes of an upwards trend in FR and SR were slipping from employee improper actions and most accidents were caused by slipping and falling while walking up or down stairs. The improvement actions included hardware inspections and improvements of accident scene, and safety announcements of slipping and falling prevention such as refrain from running and please hold the handrail while walking up or down stairs.

TSMC Taiwan Disabling Injury Data

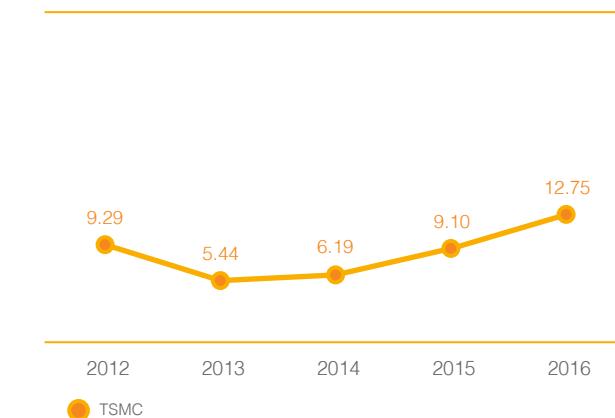
Disabling Frequency Rate



Disabling Severity Rate

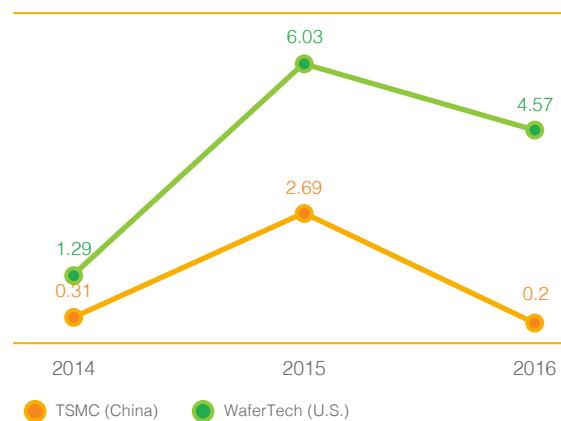


Absentee Rate

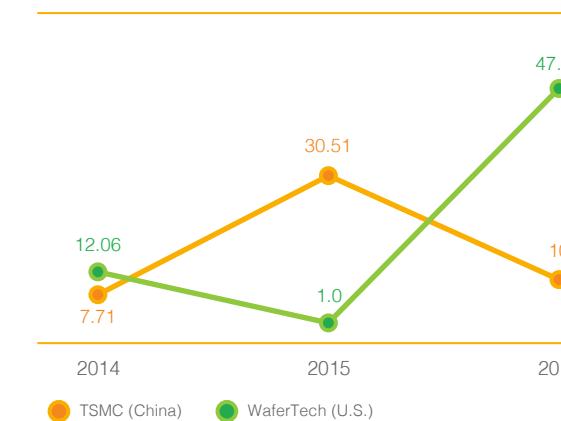


TSMC Overseas Disabling Injury Data

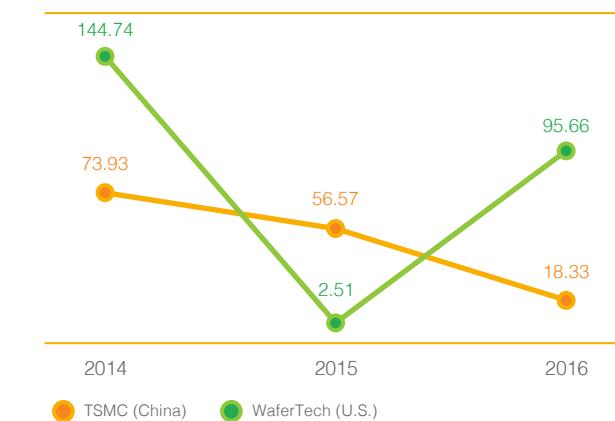
Disabling Frequency Rate



Disabling Severity Rate

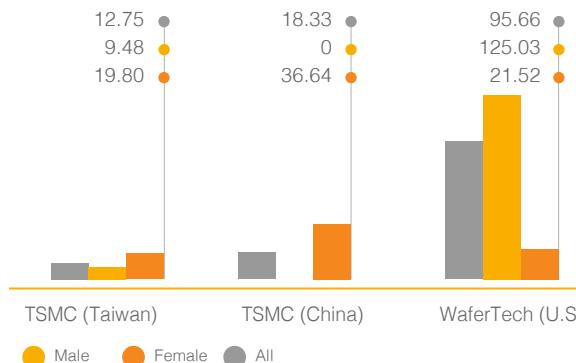


Absentee Rate



TSMC (China) had only one disabling injury case in 2016. Then FR, SR and absent rate are lower 99%, 67% and 67% than 2015. WaferTech (US) only had one disabling case in 2016 and the FR is 24% lower than 2015. But the root cause of a trend up in SR and absent rate is one male sprained his ankle while walking, and resulted in 85 days of disabling damage.

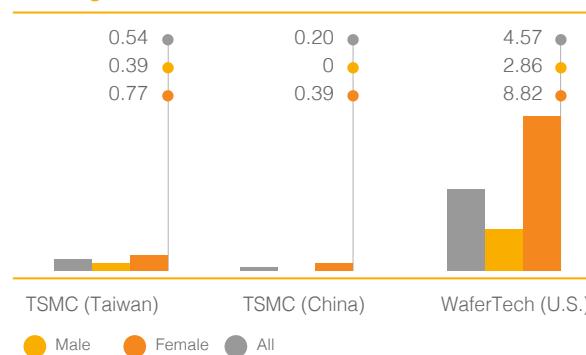
Absent Rate (AR) of TSMC fabs by Gender and Region in 2016



Note1: Statistic data of FR and SR are on the base of occupation disaster declaration, and this data did not include contractors.)

Note2: Disabling Frequency Rate is the total number of disabling injuries per every one million hours worked)

Disabling Frequency Rate (FR) of TSMC fabs by Gender and Region in 2016



Disabling Severity Rate (SR) of TSMC fabs by Gender and Region in 2016



Note3: Disabling Severity Rate is total lost days per every one million hours worked)

Note4: Absent rate is total absent days per every 0.2 million working days.)

Note5: Data of EE and semiconductor manufacturing industry are from "The platform of OSHA Performance")

Incidents Analysis

According to the analysis of incidents^{Note6} from 2012 to 2016, the four main classifications of incidents included gas leak alarm, fire alarm, people injury and chemical leak. In 2016, the gas leak alarm occurred more frequently. Besides that, the main root causes of a trend up in incidents are rapid fab expansion, senior engineer transfers to new fabs while new and junior engineers joined and the maturity of existing fabs dropped off, and incoming contractors increasing for new Fab.

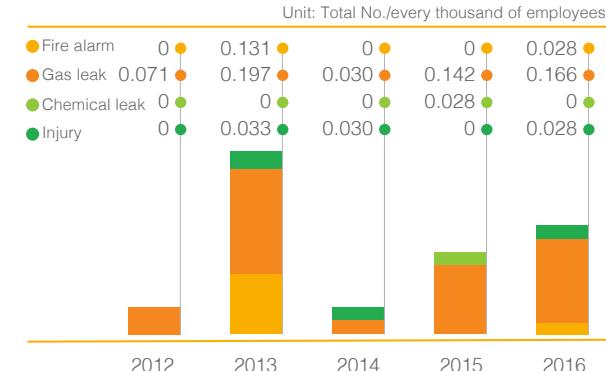
After analyzing the root causes of incidents, the safety and health management's focus in 2016 were as follows:

- Strengthen operation procedures
- Working environment should suit intrinsic safety designs
- Enhancing contractor management

Incident Improvement

In the past, all sites at TSMC used different incident investigation procedures to find out the root cause. From 2016, the division of C-EH and CQRD collaborated to use a quality analysis instrument, 3L5W (Three-Legged Five Whys) to standardize the incident investigation procedure and asked event site to use the instrument to find out the real root cause like intrinsic design, management structure, operation steps, and etc. to improve and reduce the incidents from re-occurring again at other sites and to achieve the purpose of establishing a more safe and health working environment.

Incidents Classification



Note6: Incident definition referred to TSMC emergency response procedure and it means the incidents may have caused or has caused employees or contractors injuries, working environment damage or loss, or property loss. The classification of incidents includes fire alarm, gas leak, explosion, environmental protection, occupational injury, chemicals and others which were defined as high risk cases.

Structure of 3 Legged 5 Why

Specific Leg



Detection Leg



Systemic Leg





Incidents of Gas Leak

Strengthen operation procedures



Joint Operation
Two people working together



Standardize LeakTest
Define the standardize leak test requirements by tools or process types



Define Personal Protection Equipment
Define the personal protection equipment by different chemicals' characteristic



Optimized Procedure
Optimize, standardize and follow these procedures to prevent from miss operation



Incidents of Falling From High Working Environment

Strengthen operation procedures,
Working environment should suit intrinsic safety designs



Strengthen Safety Facilities at Working Environment
Set up safety ropes, and specific pathway at fractional remainder



Safety Inspection at Working Environment
Improve the illumination and safe check at open working area



Simulation Operation
Hold contractors' training course and teach them to use safe belt and select anti-falling facilitate correctly



Enhance Audit and Standardize Procedures
Igorously
Define the standardize procedure and ask workers to follow seriously to prevent from mis-operation



Incidents of Fire or Gas Leak in Factory

Enhancing contractor management



Upgrade Professional Ability
Enhance the ability of 2,565 contractors' safety technicians. All safety technicians should get the certification.



Correct Attitude
Enhance proactive audit, safety technicians should provide daily audit records including good finding & defects



Improve Discipline
Site ISEP & contractors co-check and audit.
Standardized the audit method



E-system for Tracing Contractors in/out Factory
Statistical analysis of the number of contractors' work of the whole company to monitor contractors' work status



Contractor Performance Evaluation
Unified performance evaluation indicators and weight rate. Link contractors' performance to the procurement contract. Give high priority to good contractors



High Risk Work Contractors Certification
Set up training and certification seed trainer and locations

Enhancing Contractor Managements

In 2016, as some contractors did not follow TSMC's safety procedures, which led to incidents of fire or gas leak alarm. TSMC conveyed one taskforce to focus on certifying contractors' safety and health technicians, build up an e-system to control contractors coming in or out of fabs, and to craft certification training materials and examination questions to strengthen the professional ability of safety technicians and enhance the workers' ability of high risk work control.

Contractors are TSMC's important partners and a key part of strengthening the working environment. In 2016, TSMC expanded new fabs and the number of incoming contractors grew rapidly. For example, in 2016 Fab F15B's total accumulated incoming contractors was 870 thousand man-times, and the incoming contractors daily total will be up to 6,500 in one day and higher than existing one of 4,000 in one day. In mid-2016, TSMC added contractor management into SPI assessing items including the numbers of inspection audit defect, proactive audit defect, proactive notification of abnormal case to site ISEP, and proactive improvement. The contractor management enhancement taskforce was divided into three stages for numerous contractors. Three-stage improvements are as follow. At stage 1 (period is 2016.07~2016.12), we define the improving actions and add contractor management into SPI. At stage 2 (period is 2017.01~2017.06), we will monitor the improvement status. At stage 3 (period is 2017.07~2017.12), we will check and review the improvement status. The detailed performance will be presented in our 2017 CSR report.

Case Study



Strengthen Chemical Management

The new generation of process technology requires the use of a variety of chemicals. TSMC continuously looks to optimize the process to reduce the use of hazardous chemicals, using the priority and principles of "no use" and "use less". But if the chemicals are needed, the chemical supply system should meet intrinsic safe designs to prevent workers' chemical exposure risk and TSMC will choose the best available control technology to prevent any environmental pollutant. In 2016, the three major chemicals management strengthening items are listed below.

1.

Enhancement of the intrinsic safe design for high hazardous chemical supplying system

To reduce fire risk for using high hazardous chemical

2.

Evaluation of hazardous chemicals exposure risk

Reduce use of high health risk chemicals and set up TSMC's chemical selectivity principals

3.

Control high health risk chemical

Install detector or simulation to assess the chemical exposure risk

1. Enhance the Intrinsic Safety Design for High Hazardous Chemicals Supplied System

In 2016, re-check hazardous chemical supplied system and enhance the intrinsic safe design to reduce fire risk. Assigned specific person to operate hazardous chemical supplied system, and ensure these kind of tools are intrinsically equipped with safe designs such as double safety interlock to prevent chemical leakage, and one of these interlock is linked to earthquake's signal to stop the supplied system immediately when an earthquake occurs.



Permit Control

Inhibited to disconnect supplied lines without getting permit



Receive the Signal From Earthquake

If tool got the 5 and above magnitude earthquake signal, hazardous chemical will stop immediately



Add Anti-Temper Design

Outlet of tool equipped with anti-temper design to to reduce fire risk



Assign Specific Person

Specific person to re-train regularly



Upgrade the Intrinsic Safe Design

- If the waste gas abating system was failed, this tool would stop operations immediately
- Add double safety interlock to monitor hazardous chemical

2. Evaluation of Hazardous Chemicals Exposure Risk

TSMC evaluated potential hazardous chemicals' exposure risk through measurement and simulation to prevent occupational disease. In 2016, all sites completed 8,000 evaluation items of hazardous chemicals to clarify exposure risks and the results showed that no exposure risk in working areas, and all hazardous chemicals were confined into tools or gas lines and we have clear operation and maintenance procedures to reduce exposure risk effectively.



Hazard Identification

Build up chemical list



Measurable Type: Detect or Monitor

On the basic of chemical characteristic, the measurable chemicals should control by routine working environment sampling or equip with detectors



Non-Measurable Type: Exposure Simulation

On the basic of chemical characteristic, the non-measurable chemicals should consider the hazard level, exposure time & frequency and emission quantity



Work Out a Control Plan

Inspect, measure, and monitor chemicals by yearly for confirming no exposure risks

Continue on next page

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3. Controlling and Management of High Health Risk Chemicals

TSMC's chemical selectivity priority is to prefer non-high health risk chemicals for developing new technology. From 2016, if a new technology still has to use high health risk chemicals for essential process developing, R&D users should get the approval agreement by related vice presidents on behalf of R&D, ESH and operation department. The basic chemical selection principle for new technology development is to reduce the use of high health risk chemicals. In 2016, TSMC introduce 268 new chemicals which are all low health risk.

3 Steps to illustrate the management of chemicals as follows: 1. Review of the hazard and exposure risks of new chemicals before introductions at the R&D stage. 2. Risk control in the workplace. 3. Evaluation of the risk toward surroundings.



Review before Introduction

Avoid adoption of hazardous chemicals

Avoid adopt of hazardous chemicals, if the hazardous chemical is essential to the manufacturing process.

Approved by senior supervisor

R&D

Risk Control in the Workplace

If unavoidable, not more than necessary

Manufacturing stage

Risk control in the workplace

Chemical reduction

Evaluation of the Risk Toward Surroundings

Adopt the Best available control technology

Process waste

Best available control technology

Low environmental health risk

Case Study

Ergo Risk Prevention

TSMC kept three prevention actions including hardware control, on-job observation, and health examination questionnaire to reduce ergo risk. In 2016, TSMC changed the auxiliary standard to improve the handling load. In the past, if the operator handled an object which weighed more than 40 kg, he/she should use the auxiliary, but now the weight specification is changed to 30 kg. All sites surveyed similar handling jobs which was weighting more than 30 kg and found a total of 41 items of handling jobs that met the new specification and finally we add 8 new auxiliary designs now.



Before



After



Hardware control

Equipment should meet SEMI Ergo safety design requirement, SEMI-S8



On-job observation

According to on-job observation, we can find the improving opportunity



Health examination questionnaire

Analysis health examination questionnaire per three years. Employees who felt musculoskeletal pain and left work for more than four days should evaluate to improve their job

Training

To comply with safety and health regulations, to meet the requirements of emergency response, and to enhance employees and contractors' awareness on safety and health rules, TSMC continued to invest in resources to provide associated training to both employees and contractors.

Training Courses for Employees

Employee	Emergency Response Team	Professional Staff
	Equipment, Facility Personnel <ul style="list-style-type: none"> ● General Safety and Health Training for new comers ● Annual Evacuation Drills, Fire-fighting Training ● Annual Department/Division Safety and Health Training, Monthly Safety and Health Promotion 	Regulatory Items <ul style="list-style-type: none"> ● Personal Protective Equipment Training for new comers ● Emergency Response Training ● IC Commander Training ● First-aid Personnel Training ● Quarterly Emergency Response Drill
		<ul style="list-style-type: none"> ● Training for supervisors of organic solvent, specific chemical substance, dust, confined space operations ● Training for operator of scissor lift and boiler ● Training for operators of radioactive material or equipment capable of producing ionizing radiation ● Training for fire fighting management personnel and the public security inspect person of hazardous materials

Training Courses for Contractors

General Contractor	Stationed Contractors who should Join to Emergency Response	High Risk Work Contractor
<ul style="list-style-type: none"> ● General Safety and Health Training for new contractors ● General Safety and Health Training ● Annual Evacuation Drills, Fire-fighting Training ● Daily Safety and Health Promotion in Toolbox meeting 	<ul style="list-style-type: none"> ● Personal Protective Equipment Training ● Annual Evacuation Drills, Fire-fighting Trining ● If it's necessary to assist in emergency response, Emergency Response Training is a must ● Quarterly Emergency Response Drill 	<ul style="list-style-type: none"> ● High Risk Work Training in class ● Hight Risk Work Training in field (Operation in field)

Employee and Contractor Safety and Health Related Training

Identity	Training Course	Persons in 2014	Persons in 2015	Persons in 2016	Regulatory Item	Items that more than Regulator One
On-duty  Employees	New Hired	General Safety and Health Training	4,841	3,430	3,361	✓
		Safety and Health Training for New Promoted Manager	347	310	197	✓
		Monthly Safety and Health Promotion	64,500	60,243	40,319	✓
		Annual Department/Division Safety and Health Training	12,231	12,651	9,086	✓
		Annual Fire-Fighting Training	18,582	18,529	14,130	✓
		Annual Evacuation Drill	23,825	22,916	25,624	✓
		Emergency Response Training	3,429	3,861	8,631	✓
		IC Commander Training	2,036	2,378	2,683	✓
		First-aid Personnel Training	4,453	4,461	4,478	✓
		External Fire-fighting Training	509	296	1,031	✓
Emergency response team members  Contractors		Quarterly Emergency Response Drill	7,932	8,202	9,230	✓
		Annual Emergency Response Drill	846	820	1,628	✓
	New	General Safety and Health Training	13,288	16,242	21,370	✓
		Personal protective Equipment Training for contractors whom located at TSMC and have chemical exposure risk	1,528	1,998	2,608	✓
		Annual Emergency Response Drill for contractors whom located at TSMC and have chemical exposure risk	213	124	205	✓

Comprehensive Health Management

TSMC Wellness Centers at each fab are staffed by professional doctors and nurses providing 24-hour first-aid and a broad spectrum of wellness services, which includes special protection, health care services, health promotion, and employee assistance program, to prevent occupational injuries and diseases as well as promoting employee's physical and mental health.

Special Protection

Taiwan and Shanghai sites conducted special health examinations for special task employees annually.

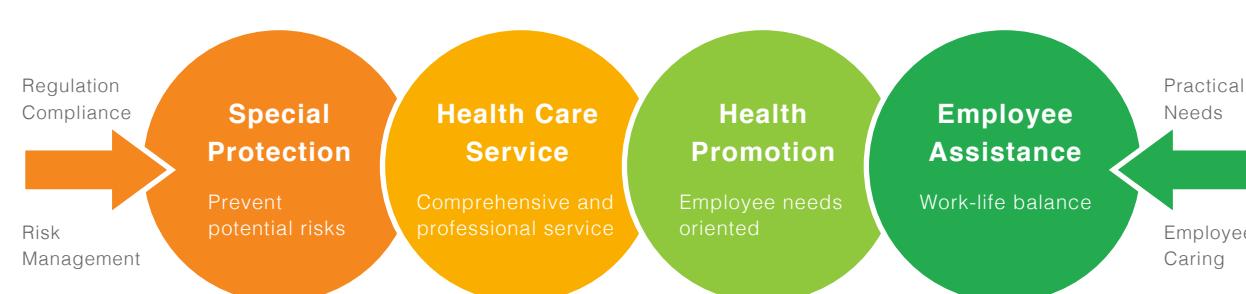
which included noise, ionizing radiation, lead, N-Dimethylformamide, N-hexane, Arsenic, manganese and related compound, dust particles, chromate and salts, nickel and related compound, mercury and inorganic compounds, and indium identified by site ISEP. The completion rate was 100% in 2016. Workers with abnormal results of special health examination and second degree risk ranking and above were put under a set of management measures accordingly. The management measures included through assessment of health examination results and job monitoring by occupational doctors, moreover, providing health instruction and assistance of fitness for work.

According to Taiwan government regulation, Taiwan site conducted two prevention and management programs regarding work-induced cerebral and cardiovascular disease and maternal health, which included individual risk assessment and follow ups to proactively protect employee's health.

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Total 4,981 attendances received special protection management, and there were no work-related disease in 2016.

Special Protection Programs



Special Health Exam. and Management



Special task workers

- Follow the government regulation to conduct special health examination of pre-job, special task changed, and on-job employees.
- The completion rate must be 100%.

Work-induced Cerebral and Cardiovascular Disease Prevention and Management



The middle and high risk groups

- Annually identified employees in the risk groups of work-induced cerebral and cardiovascular diseases by analyzing Framingham risk scores from 2015 annual health exam results, working hours, and workload.
- Smoking over 3 years was counted as an additional factor for risk assessment in 2016.

Maternal Health Protection and Management



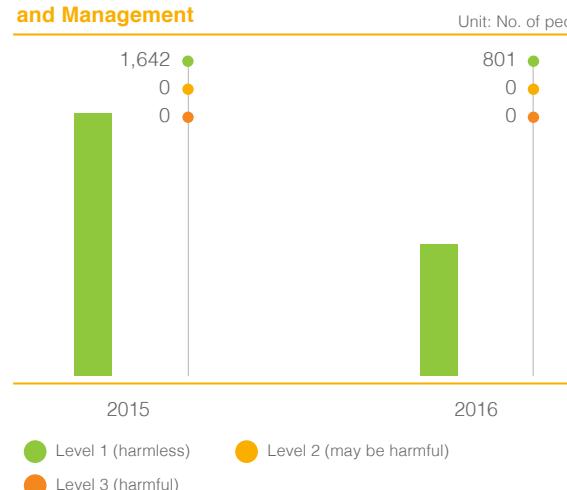
Female workers who is in pregnant or postpartum within one year

- HR provides name list of leave for routine prenatal visit.
- Attractions: special gift and parking spaces for pregnant employees.

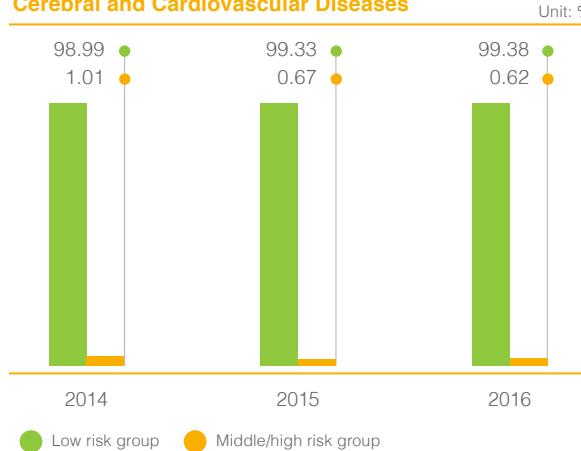
Visits of Special Health Examination



Person-Times of Maternal Health Protection and Management



Percentage of Different Risk Group of Work-Induced Cerebral and Cardiovascular Diseases



Note: 0.62% of 34,204 employees were identified to be in the middle/high risk group in 2016.



Promotion for maternal health assessment and protection

Health Care Service

Taiwan and Shanghai sites provide annual health examinations where the frequency and number of tests are above regulatory requirements. After the examination, health administrators proactively provide health instructions and follow up for abnormality group by cooperating with on-site medical and dental clinics to taking good care of our employees.

We also regularly provides on-site cancer screening activities for early detection and treatment to lower impact from illness, as well as conducting communicable disease management to prevent group infection.

Health Care Service Programs

Abnormality of Health Examination



General task employees

- Providing annual health examination which the frequency and number of tests are above regulatory requirements.

Cancer Screening



All employees

- Stool test for colorectal cancer, pap smear for cervical cancer, and breast ultrasound for breast cancer.

Clinic Service



Employees and their family members, vendors, and visitors

- On-site medical and dental clinic, as well as ultrasound checkups of thyroid, abdomen, and heart.

Communicable Disease Prevention and Management



Employees and their family members, vendors, and visitors

- Control manners for reported communicable disease

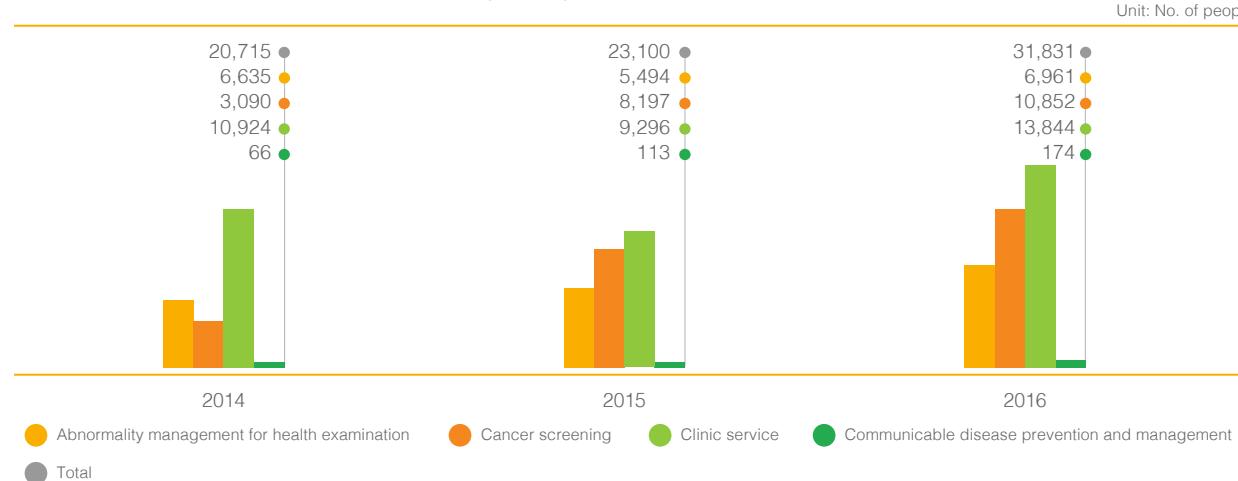
37,306 attendances

There were 37,306 attendances in 2016

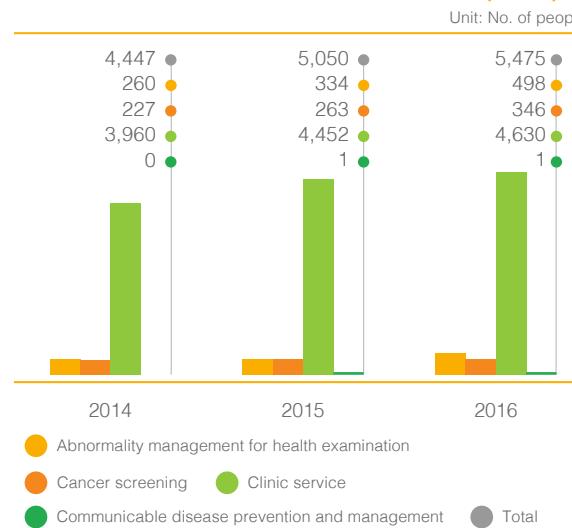
32 %

Cancer screening participation rate increased 32% then last year

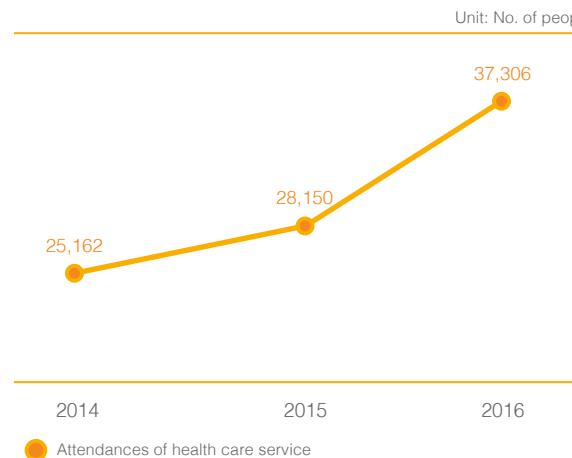
Attendances of Health Care Service in TSMC (Taiwan)



Attendances of Health Care Service in TSMC (China)



Total Attendances of Health Care Service in TSMC



Health Promotion

Taiwan site conducted a series of activities such as “Infuse Lohas into Your Life”, chiropractor service, and health lectures to promote employee's well-being after the analysis of annual health examination showed that the key health problems in 2016 were excess weight, smoking, and sleep disorder.

Exercise is a positive factor that benefits our health, and Taiwan site conducted multiple casual and formal exercise programs at the on-site fitness centers and a sport center to cultivate employees's habitual and regular exercise. There were 7,171 employees (113,830

attendances) who used the fitness facilities or participated in exercise programs. Moreover, a total of 6,850 employees have attended activities hosted by our 80 clubs to balance work and life.

126,989 attendances

Participants of weight control saw improvement in BMI, Liver function index, and high blood lipid then others.

Health Promotion Programs

Infuse Lohas into Your Life



Employees who were suffered sleep disorder, smoking, and BMI > 24

- A series of activities: Weight control, Combat smoking, and sleep soundly

Chiropractor Service



All employees

- Taiwan site: additional charge for on-site chiropractor service
- Shanghai site: provide free massage program to direct labors

Health Lecture



Book by department secretary

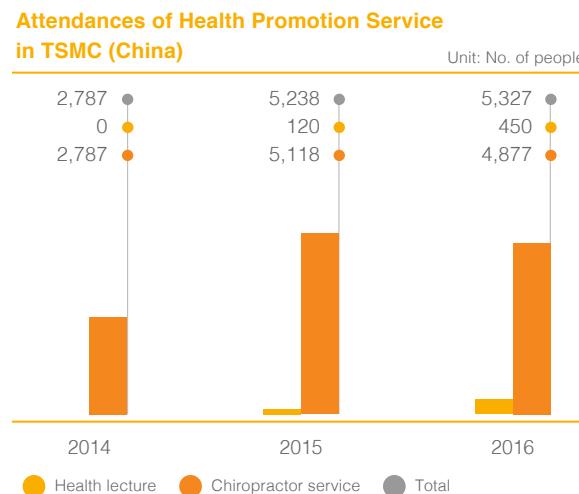
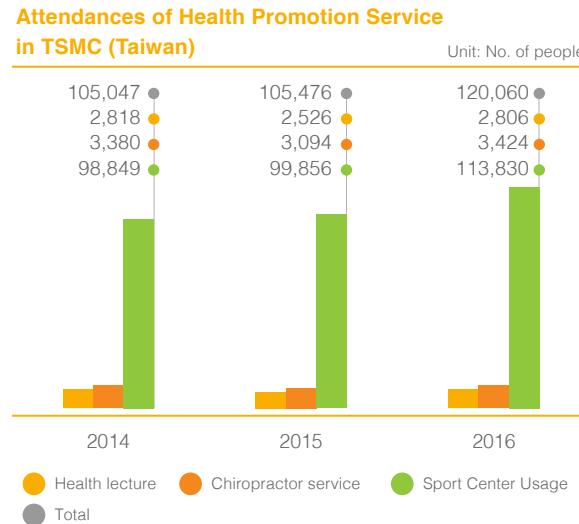
- Topics included stress adjustment, communication, chronic diseases, etc.

Sport Center



Employees and their family members

- Providing energy lessons such as flywheel, boxing, pilates, yoga, and swimming, etc. at fitness center and swimming pool.



Infuse Lohas into Your Life

In 2012, Taiwan site integrated internal and external resources, led by our executive managers to launch the activity of "Declaration of Healthy Life" and 1st "Infuse Lohas into Your Life" campaigns to encourage our employees to conduct a healthier lifestyle with "Eat smart", "Exercise happily", and "Daily weight".



Lecture of mindfulness

Employee Assistance

Taiwan and Shanghai sites have cooperated with professional institutes for a long time, and we work together to promote and provide professional consultations on issues of family, relationship, marriage, legal and financial matters. The usage trend for these services in recent years indicates that we have created an atmosphere where our employees are willing to ask for help when they need it, and care for the people around them.

Employee Assistance Programs

External Counselling and Consultation Service



All employees

- On-site counselling and consultation provided by external professional institutes can be book through telephone or internet.

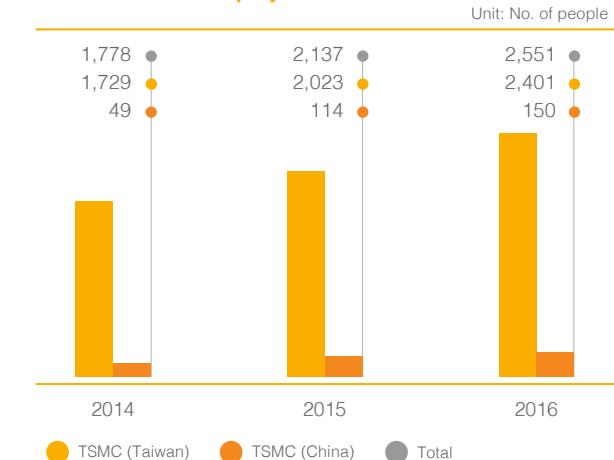
Internal Counselling and Consultation Service



Moderate to severe stress group

- We have collected employees stress perception via a questionnaire in our annual health examination since 2012. After analysis, we identify moderate and severe groups to arrange interviews with a counseling psychologist or refer them to other institutions by individual.

Attendances of Employee Assistance



2,551 attendances

2,551 attendances of counselling and consultation service

Social Participation

Taiwan Semiconductor Manufacturing Company (TSMC) has been established in Taiwan for 30 years, and we have thrived with support from all of society. What we have taken from society, we give back to society. With our core principles of fairness, justice and living and working in harmony, TSMC has been contributing for many years to neglected corners of society and areas lacking resources, combining the TSMC Culture and Education Foundation, TSMC Volunteer Program and TSMC i-Charity into a charity network for social care and steering TSMC's resources toward the public as a force to uplift society.

“
Education is the foundation of a country and culture is the soul of society. TSMC values education and culture, and uses a variety of educational programs and exquisite artistic performances by the TSMC Foundation to fill gaps in regular education and uplift the spirit of society. TSMC hopes this current can make our society a more beautiful place.

F.C. Tseng
Chairman, TSMC Foundation

“
Book-reading volunteers, called "Red Angels" by the children, lead students to experience a diverse learning experience and work to mend the culture gap between city and country. They try so hard to open children's eyes to learning. I am grateful and so touched by the faith in the hearts of TSMC volunteers.

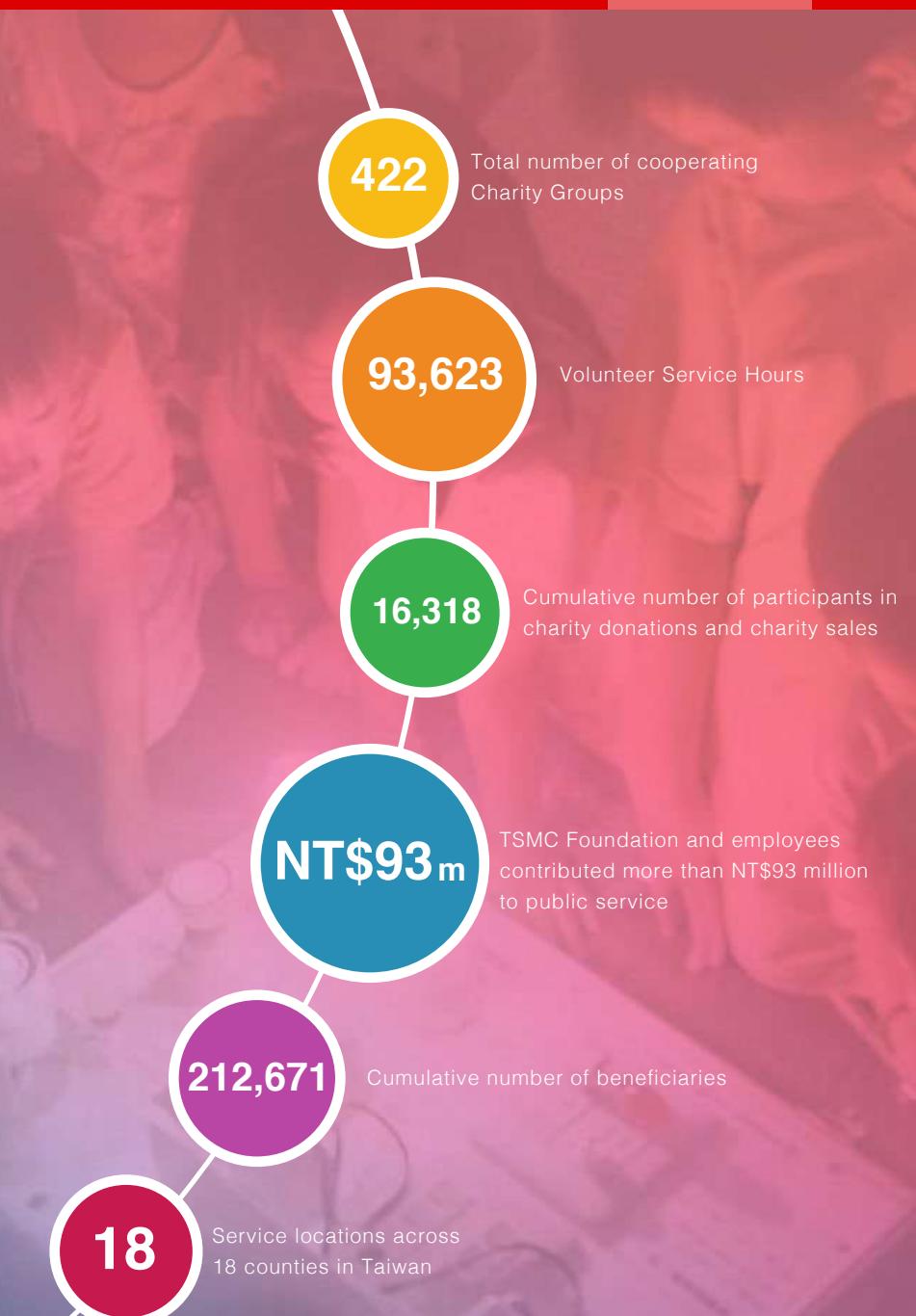
Hsiao-Chiuan Chang
President,
Tainan Song-Lin elementary school

“
TSMC employees work very hard, and they also have lots of love in their hearts. We try to use their love, knowledge and experience to help society through our volunteer program.

Sophie Chang
President, TSMC Volunteer Program

“
Every time I serve, and see the carefree smiles on the faces of the people we accompany, I discover how our little efforts really can make a change.

David Lu
Fab 15 Volunteer



TSMC's mission is to uplift society. We have not only strived to thrive in our core business of dedicated IC foundry services, but have also built a socially-caring network through TSMC Culture and Education Foundation, TSMC Volunteer Program and TSMC i-Charity Platform. By combining the Company's resources with employee volunteer service to commit money, material, and labor to a diverse range of in-depth charity work in the areas of education for underprivileged students, caring for the disadvantaged, cultivation of youth, arts and culture, ecology and energy conservation, we bring transformation to our local communities.

TSMC believes that to achieve sustainability, we must contribute to common good. With the social vision of equality and justice, we act as a good corporate citizen and have enduring efforts geared towards bridging the rural-urban gap in resources. We encourage our employees to make social justice part of the DNA of our very ethos. Social participation in charity and local communities has driven us to be an ever-growing force in pursuit of a promising future.



Spreading the Seeds of the Fine Arts and Coloring the Beautiful Society



Happy Volunteer,
Do good with wisdom

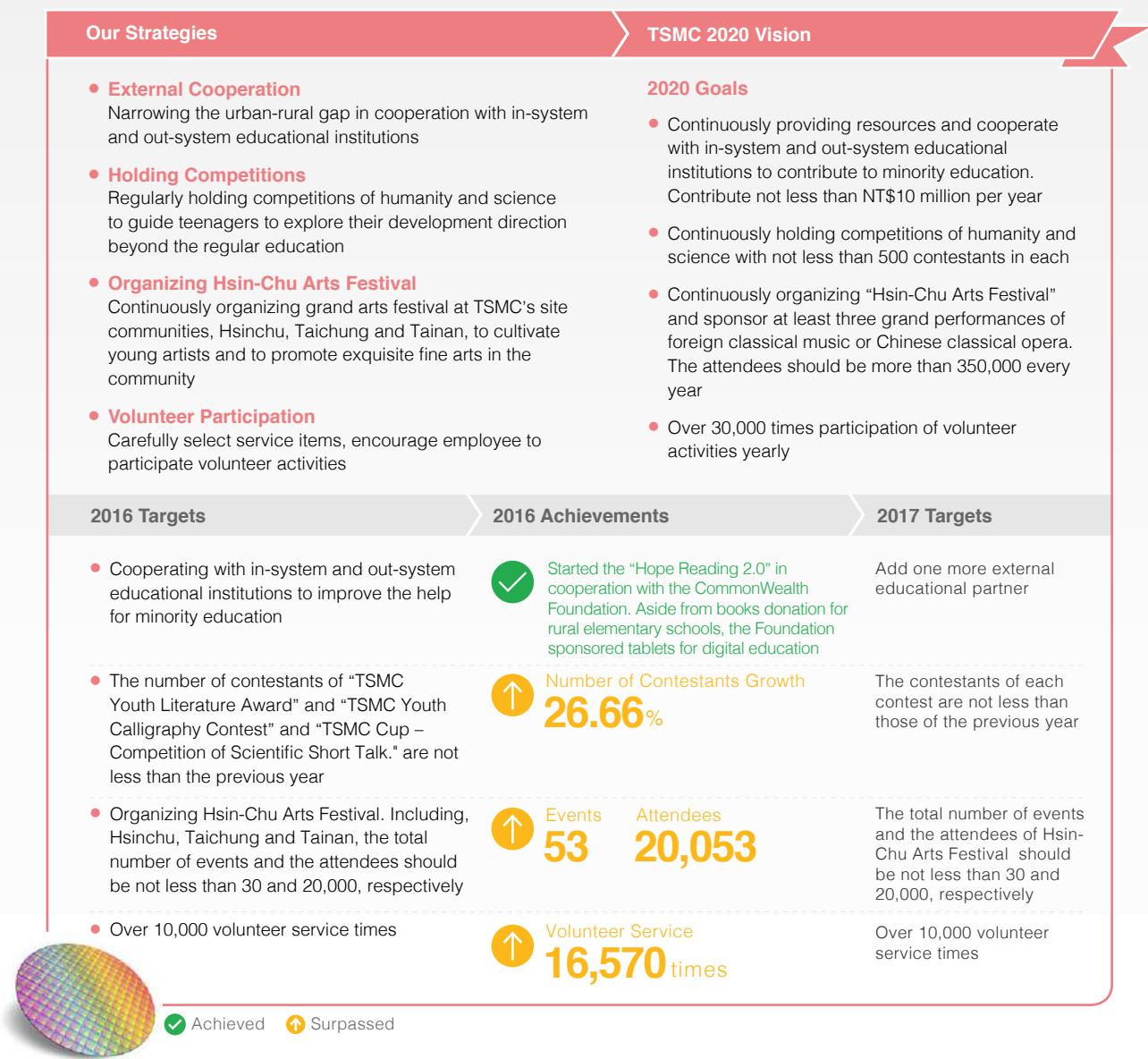


To make good things happen with love

Focus on Minority Education,
Building Educational Platforms,
Promoting the Arts and Culture

Six major corporation
volunteer programs

To integrate employee donations and
volunteer service resources to help social
vulnerable groups and eliminate the gap
between urban and rural areas



The Chronicle of TSMC's Charity

1997~2016

- Commitment to Education
- Promotion of Art and Culture
- Communities Building
- Employee Volunteer Program



Sponsorship of U-Theatre Taiwan Tour Project

- Sponsorship for the restoration of the former American embassy to rebirth in the form of SPOT Film House



Establishment of TSMC Volunteer Program



Sponsorship of Berliner Philharmoniker's Debut in Taiwan

- Sponsorship for National Chin-hua University to establish the first college of technology management, and the research center "TSMC Building"



Renovation of the exhibit "the World of the Integrated Circuit" of the National Museum of Natural Science, renamed the exhibit "the World of the Semiconductor"



Sponsorship of the establishment of "Children Art Education Center" of Taipei Fine Arts Museum

- Launch of the Project "TSMC Dream Builders of Youth"



Sponsorship of the pressure garments for victims of Taiwan Water Park Dust Explosion



Books Reading Volunteer Program

- Sponsorship of Royal Concertgebouw Orchestra's Debut in Taiwan



Sponsorship of the Wu Ta-Yu Science Camp

- Community Volunteer Program



Launch of TSMC Youth Calligraphy and Seal-carving Competition — More than 5,981 participants since it started



Launch of TSMC Literature Award for Novelettes

Sponsorship of the Royal Concertgebouw Orchestra second visit to Taiwan



Set up TSMC-I Charity Platform



- Sponsorship of the Exhibition "Cultural Relics from the Tang dynasty"



Sponsorship of Literature Salon at Taipei Story House

- Endowment of International Exchange Student Scholarship of National Chin-hua University



- Sponsorship of the British Museum—The Body Beautiful in Ancient Greece
- Sponsorship of Berliner Philharmoniker's second visit to Taiwan



Sponsorship of Royal Concertgebouw Orchestra second visit to Taiwan



- Sponsorship of the project "the Protection of the Historical Sites" of the Culture Affairs Bureau in Hsinchu City



- Volunteer Docent Program
- Endowment of Morris Chang Chair Professorship at National Chin-hua University
- Launch of the Project "Reading Hope" with the CommonWealth Education Foundation



Launch of the TSMC Youth Literature Award — More than 6,551 works were submitted

- Sponsorship of the exhibition of "the British Museum—The Body Beautiful in Ancient Greece"
- Sponsorship of the Opera "Madama Butterfly", produced by National Symphony Orchestra



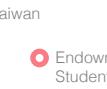
- Sponsorship of the reconstruction of Kao-hsiung Gas Explosion
- Sponsorship of the reorganization of Junyi Academy



- Sponsorship of the project "The Training of Home Care Services" of The Red Cross Society of Taiwan



Launch of the TSMC Youth Literature Award — More than 6,551 works were submitted



Sponsorship of the TV Program "the Journey through the Palace Museum" of the Taiwan Public Television Channel

- Sponsorship of the Energy Saving Volunteer Program
- Sponsorship of the Madame Curie Chemistry Camp



- Sponsorship of the Competition of Scientific Short Talk



- Sponsorship of the Hope Reading 2.0 with the CommonWealth Foundation



- Sponsorship of the restoration of Dr. Sun Yat-sen's Residence



- Sponsorship of the Hope Reading 2.0 with the CommonWealth Foundation



- Sponsorship of "Raising Sun" Scholarships of National Tsing Hua University and "Sunflower" Scholarship of National Central University



- Sponsorship of the establishment of the Foundation of the Museum of Contemporary Art at Taipei



Launch of the TSMC Athletistic Tour for taking the elementary school students from the remote townships to visit museums — Have invited 69,885 children from more than 500 rural primary schools



- Endowment of the TSMC Scholarships for underprivileged students of National Taiwan University, National Chin-hua University, National Chiao-tung University, National Central University and National Cheng-kung University



Sponsorship of the Wu Chien-Shiung Science Camp

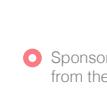
- Sponsorship of the research building "Tzi-Shueh Hall" of the Chemistry Department in National Taiwan University
- Fab/Division Volunteer Program



- Ecology Volunteer Program



- Donation of the Museum "The World of the Integrated Circuits" to National Museum of Natural Science



- Sponsorship of the establishment of the Foundation of the Museum of Contemporary Art at Taipei

(Year)

1997

1998

1999

2000

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

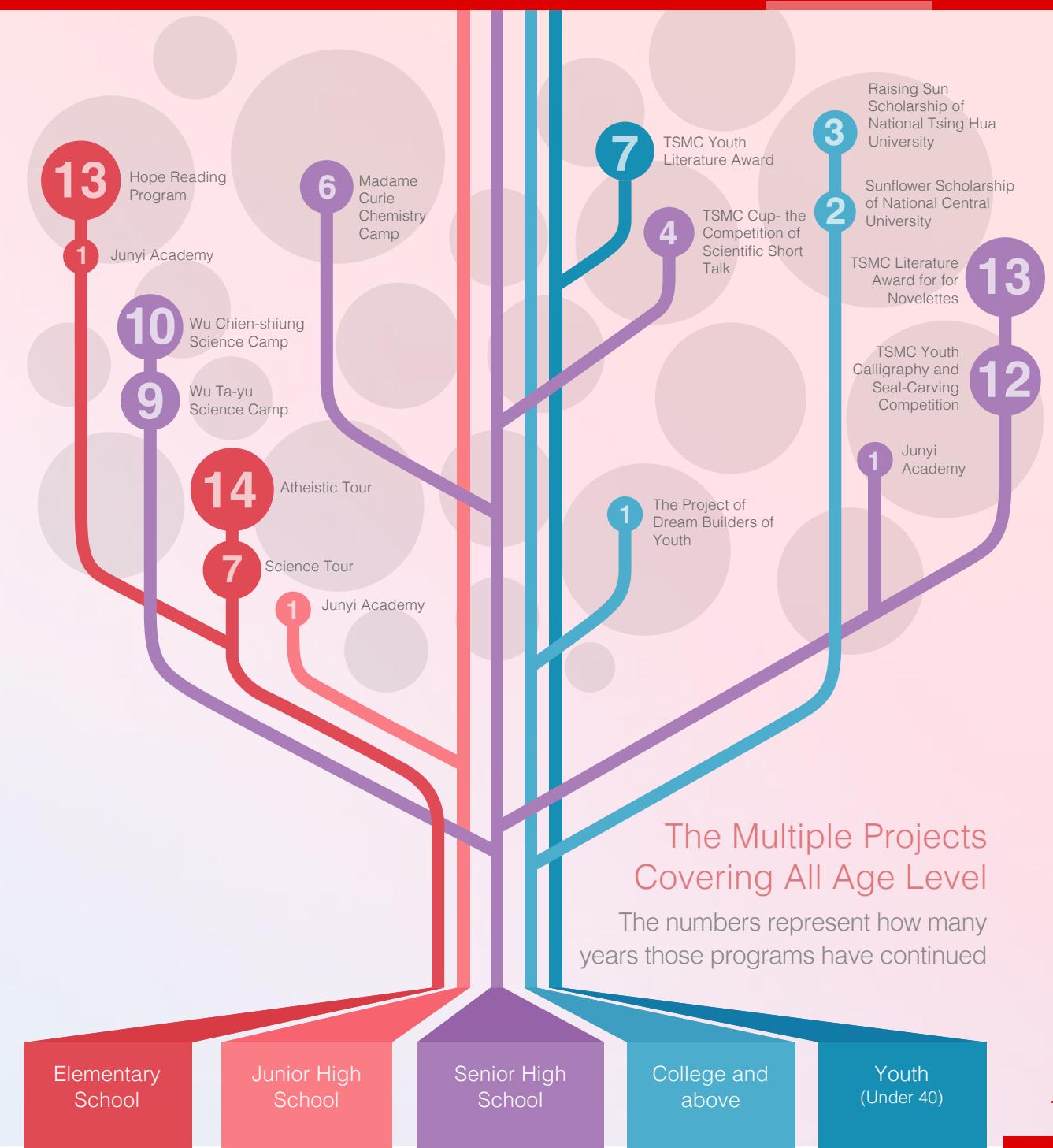
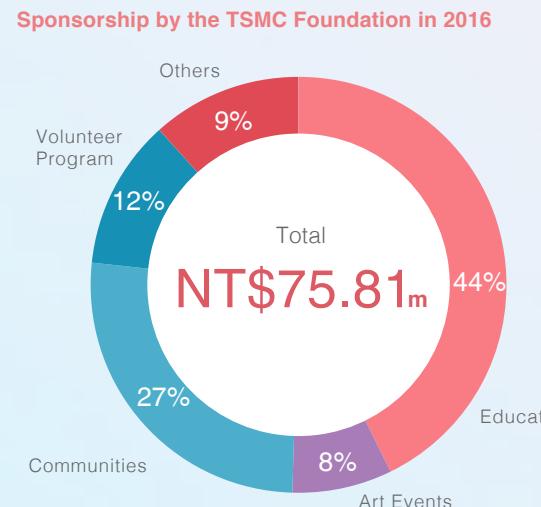
2016

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TSMC Education and Culture Foundation

The TSMC Education and Culture Foundation, led by TSMC Vice Chairman F.C. Tseng who serves as the TSMC Foundation's chairman, was established in 1998 to make CSR contributions. The TSMC Foundation fulfills its long-term commitment to education and culture through four main focal points: Commitment to Education, Promotion of Art and Culture, Communities Building, and Employee Volunteer Program. In 2016, the TSMC Foundation contributed over NT\$75.81 million to various projects in minority education, humanity education, arts promotion, productions of broadcasting and internet programs and regular literature lecture.

The TSMC Foundation established a website www.tsmc-foundation.org to offer the public online lectures, activity information, and details of the Foundation's projects.



The 2016 Full Record of TSMC Foundation Activities

- Commitment to Education for the Underprivileged
- Building Education Platform
- Promoting Arts and Culture



85
Supporting Schools
of Remote Townships

20,000
Donating Books

3,000,000
Total Grand Prize for the
Dream Builders of Youth (NT\$)

71
Sponsorship of Art
Performances

27,849
Audience Attending
the Performances

Commitment to Education for the Underprivileged

Corporate Contributions to Bridge the Urban-Rural Gap

The TSMC Foundation has cared about the educational gap, caused by the rapid social change, between rural and urban areas. This year, the Foundation strengthened collaboration with the CommonWealth Foundation, the Junyi Academy and the Boyo Foundation to infuse the resources to narrow the gap. The Foundation continued to hold the Aesthetic Tour and the Science Tour to take the pupils from remote townships to museums and science educational centers to bring them the wider vision in art and science. In addition, the Foundation sponsored the Raising Sun Scholarship of Tsing Hua University and the Sunflower Scholarship of Central University, providing 19 underprivileged students with NT\$1.62 million to help them to focus on their studies in college.

Hope Reading 2.0

Reading is key to learning knowledge. The TSMC Foundation takes the cultivation of reading ability into very serious consideration. In 2004, the TSMC Foundation began supporting "Hope Reading" of the CommonWealth Foundation, which each year donates 100 good books to 200 high schools and primary schools in Taiwan's remote townships. Over the past 13 years, more than 732,000 children have been helped with more than 210,000 books.

To respond to the needs of the digital era, the TSMC Foundation further sponsored "Hope Reading 2.0," in 2016.

In addition to book donation, the program selects six merit schools and five benchmark schools, and provides each class two tablets and each student in third to sixth grades with one tablet, respectively, with a total of 265 tablets in all. With the help of other education partners, the TSMC Foundation will also implement e-learning systems to build up the reading and e-learning culture with the aid of distance courses and online community reading platforms.

Junyi Academy

The "Junyi Academy" is an open platform, which is expected to bring educational opportunities to each corner of the society through the cloud platform. So far there are over 8,000 teaching videos and over 2,000 interactive practices in Math, Science, Language and Society covering basic courses from primary school to college. The services are available mainly at Yilan County, Hualien County, Yunlin County, New Taipei City and Toayuan City, for up to 35,000 users every week.

Since 2016, the TSMC foundation has sponsored the "Junyi Academy" in expectation of providing rural students affordable and customized qualified digital learning tools. The Junyi Academy can not only ease the burden of teachers, reduce the cost of studying and provide various courses, but also enhance the ability of digital applications.

Aesthetic and Science Tour

The TSMC Foundation emphasizes aesthetics and science education. "TSMC Aesthetic Tour" and "TSMC Science Tour," launched in 2003 and 2010, respectively, take children from remote townships throughout the country to visit the National Palace Museum, the Taipei Fine Arts Museum and the science museums in northern, central and

southern Taiwan. In 2016, a total of 1,410 students took part in the Aesthetic Tour and 1,831 students took part in the Science Tour. All the educators and students were from 17 counties, including Hualien, Taidong, Nantou, Pingdong and Penghu island.



Flip the Disadvantaged:
The Press Conference of Launching
the Plan "Hope Reading 2.0"



Flip the Disadvantaged:
Junyi Academy



Flip the Disadvantaged:
The Aesthetic Tour

Building Educational Platforms

Fostering Multi-Competence Talents and Helping Youth Reach Their Dreams

To encourage those in the younger generation to chase their dreams, the TSMC Foundation launched the first "TSMC Dream Builders of Youth Project" in 2016. Eight teams were awarded prizes totaling NT\$3 million to chase their dreams. In addition, the Foundation continued to hold the literature award, the calligraphy and seal-carving competition and the science short talk competition to build multiple stages for our young generation.

TSMC Dream Builders of Youth

In 2016, the TSMC Foundation launched the "TSMC Dream Builders of Youth" project. A total of 166 teams composed of 500 college students from Taoyuan, Hsinchu and Miaoli, applied for the project. After elimination stages, eight teams were awarded prizes totaling NT\$3 million. The winning projects including agricultural recreation,

environmental sustainability, humanities promotion and technology from multiple kinds of field to demonstrate their creativity and potential.

TSMC Youth Calligraphy and Seal-carving Competition

To encourage the youth to pursue the art of calligraphy, the Foundation holds the TSMC Youth Calligraphy and Seal-carving Competition, including the groups of regular script and cursive script for the senior-high-school students, and the group of seal-carving for the youth under age 40. The first prize for the winner of each group is NT\$100,000, which is the grandest prize among the competitions of the same level in Taiwan. In 2016, the 9th TSMC Youth Calligraphy and Seal-carving Competition attracted 366 attendees in total. Collaborating with the National Palace

Museum, the TSMC Foundation set the competition's theme as "Child, No Fear", the graphics of the words are the Chinese ancient inscriptions from the Mao-kung Ting from the important collection of the National Palace Museum, to encourage the young generation to be brave to face and overcome the difficulties. There were also three workshops, respectively, held in the National Palace Museum, the Taichung Municipal Cingshuei Senior High School and the Kaohsiung Municipal Kaohsiung Industrial High School, attracting 450 educators and students.

TSMC Youth Literature Award

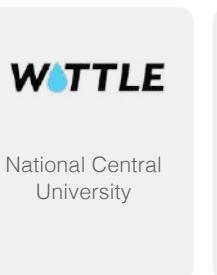
To encourage the young generation to develop proficiency in literature, since 2003 the TSMC Foundation has held the "TSMC Youth Literature Award", which is the most important literature award for senior high school students. The

winning works were not only printed in the United Daily but collected to be published every year. In 2016, in addition to novel and poetry, prose was included as another category for literary creation, the Literature Award also held the seminar "How to write a prose for a senior-high-school student?", inviting the famous writers' experience of literacy creation for the encouragement. This year, there were a record 628 works submitted, including 146 works of prose, 240 works of poetry and 242 works of novel.

TSMC Cup – Competition of Scientific Short Talk

Unlike ordinary science fairs or paper contests, the TSMC Cup-Competition of Scientific Short Talk is a completion of Sci-Talks. The competitors have to read a wide variety of scientific materials, write popular scientific articles, give scientific speeches and answer the questions from their opponents to improve the students' science presentation skills. In 2016, echoing the United Nations' theme of "International Year of Pulses," the competition focused on pulses and invited 223 teams composed of senior high school students to read well-respected books, write essays and deliver short scientific talks on the subjects of science, nutrition, environment and agriculture in the preliminary and semi-final workshops and the contest. The ultimate goal is to cultivate in-depth knowledge and mastering presentation skills.

The Winners of 2016 TSMC Dream Builders of Youth



Promoting Arts and Culture

Spreading the Seeds of Fine Arts and Humanities for Community Development

The TSMC Education and Culture Foundation is devoted to the promotion of arts and culture to lift the spiritual life of the people and society. Over the years, the Foundation has sponsored and organized multiple humanity activities, including exquisite performances, broadcasting and internet programs, and regular literature lectures to infuse the art resources to the society and enrich the people's mind and spirit.

TSMC Hsin-Chu Arts Festival

The TSMC Foundation has long played the role of "fine arts planter", spreading the seeds of fine arts in the society. In addition to actively supporting prominent international and Taiwanese artistic performances, the TSMC Foundation has continued to organize the "TSMC Hsin-Chu Arts Festival" at TSMC's site communities - Hsinchu, Taichung and Tainan - to present a broad spectrum of performances to encourage the community's interest in the arts. In 2016, in commemoration of 400th anniversary of the death of William Shakespeare, the festival invited Contemporary Legend Theatre, Corny Chicken Theatre and Prof. I-Fan Ho of National Hsinchu University of Education to perform novel musical, children's concert and drama lectures for community residents to better understand Shakespeare's literature. The festival also invited young violinist Richard Lin to perform three concerts in northern, central and southern Taiwan, to promote prominent Taiwanese artists. Furthermore, the TSMC Foundation hosted the first "In Spring Chanting Poetry Festival" and invited communities and schools from Taoyuan, Hsinchu and Miaoli to chant poetry and enjoy the beauty of literature. The "2016 TSMC Hsin-Chu Arts Festival" arranged 53 fine arts activities, attracting over 20,000 attendees. Since 2003 the Festival has organized over 620 performances, attracting 310,000 attendances in total.

Sponsorship on the National Production of the Opera "Othello"

The TSMC Foundation also supports various Taiwanese art groups with actual deed. In 2016, the TSMC Foundation sponsored the opera concert of Verdi's "Othello," a semi-stage opera concert with sound effects and projected animations made by National Symphony Orchestra. It was jointly developed with Mary Birnbaum, an opera and theater director of the Juilliard School in U.S. "Othello" attracted more than 3,500 fans to enjoy the music and was very well reputed.



Hsin-chu Arts Festival :
The Theatrical Demonstration of "A Midsummer Night's Dream"

The Chinese Classic Broadcasting Program "Analects in Hsin's View"

The TSMC Foundation has a long-term commitment to promote Chinese Traditional Classics. Since 2008, the TSMC Foundation has invited Professor Yih-Yun Hsin to lecture the traditional Chinese philosophy and wisdom through the broadcast program on the IC Radio Broadcasting Station. Following the first part of Analects, Chung-tzu and Mo-tzu, since 2015 the Professor has started to lecture the second part of Analects, which will be finished in the middle of 2017.



Hsin-chu Arts Festival:
Richard Lin Violin Recital

Hsin-chu Arts Festival:
The Music Fantasy of Penguin Shakespeare

Feedback from Program Participants



"I've made my mind to do this project, for I hoped I could better understand my father through this documentary of native species of Phalaenopsis Aphrodite on Orchid Island and I might know why he had been loving the orchid. Now I understood his love to the orchid and land."

Thanks to this project held by TSMC foundation. The end of the project does not mean the end of the dream, but one another beginning!"

ZOU Jia-Jing, a member of "Orchid's", the winner of 2016 TSMC Dream Builders of Youth

"Due to my family's difficult financial situation, I occasionally had enough food, not even say to enter the good school for better education. And therefore, I almost had to be enforced to choose to service in the army. Thank for the Raising Sun Scholarship, I could learn in such great college and learn what I want to learn without caring the economic situation."

Mr. Chou, studying in College of Engineering in NTHU, student of 2016 Rising Sun Plan,

TSMC i-Charity Platform

Founded in 2014, the " TSMC i-Charity Platform" is the interaction mechanism of TSMC employees. With the support of TSMC's Social Responsibility Committee, we have integrated caring projects of the TSMC Volunteer Program and the TSMC Education and Culture Foundation. Meanwhile, employees could propose caring projects, share good things and good ideas to do good on the platform. In addition, in order to provide a more convenient route, the platform's donation mechanism is linked to the Company's payroll system so that employees can contribute to specific projects or choose their "volunteer service" approaches.

The Operations of TSMC i-Charity Platform

	2014	2015	2016
Caring Projects	3	6	10
Number of Participants	9,000	9,600	6,826
Donation Amount	NT\$18 million	NT\$18 million	NT\$12 million

2016 TSMC i Charity Platform Project Overview



Delivering Good with Love; Gathering Power of Good and Sharing Hope

TSMC volunteer members dig caring cases from the front line service and seek support from employees in the company to raise donation projects on the "TSMC i-Charity Platform."

6,826 employees

In 2016, a total of 6,826 employees donated NT\$12.2 million.

5,546 people

In 2016, the employees donation support 10 projects and help 5,546 people.

TSMC Volunteer Program

The TSMC Education and Culture Foundation established the "TSMC Volunteer Program" in 2004. Under the leadership of Ms. Sophie Chang (Su-feng Chang), the program persists in the objective of "long-term commitment to chosen service themes," and encourages our employees to participate in volunteer activities with joy and wisdom. Through volunteer activities, we hope to lead the way for our employees to strike a fulfilling balance between their work and life.

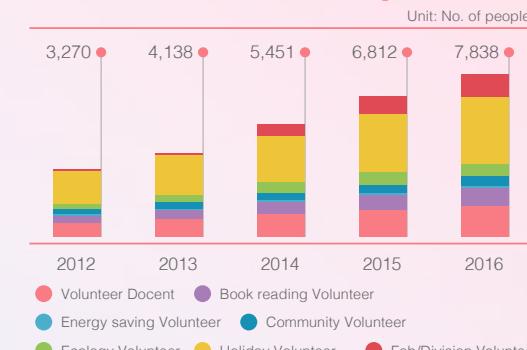
The TSMC Volunteer Program coordinates many forms of volunteer services. Employees of the Company and our affiliated companies, as well as their family members, are invited to participate in related activities under the Program. There have been six volunteer programs so far, and we make a long-term commitment for the land of Taiwan.



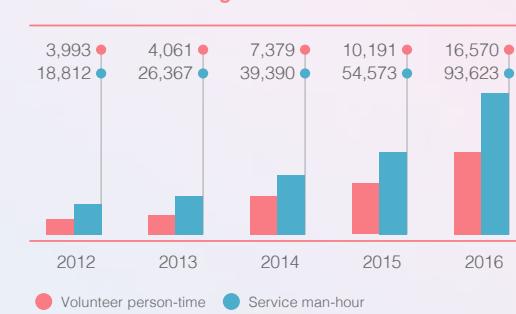
Accumulation of TSMC Volunteer Head Count



Accumulation of each Volunteer Program



TSMC Volunteer Program Outcome



TSMC Museum of Innovation



Innovation often originates as a single idea; yet it has the potential to unimaginably transform the lives of billions of people around the globe!

Welcome to the TSMC Museum of Innovation. Here, we explore how TSMC and its innovative business model changed the global integrated circuit (IC) industry and continue to unleash tidal waves of innovation in chip designed product applications. These innovations propel advances in ICs and their pervasiveness in our modern world while making lives more connected, more convenient, smarter and more fulfilling! Here we also learn how TSMC contributes to global IC innovation and to Taiwan's economy.

Website: www.tsmcmoi.com

Tel: +886-3-5636968



Volunteer Service

Long-term Commitment to Chosen Service Themes

In 2016, TSMC's Volunteer Program aimed for three major themes for social participation: Emphasizing on Environmental Protection, Caring for the Underprivileged Living, and Caring for the Underprivileged Education.

Emphasizing on Environment Protection Regularly Ecology Docent Service

TSMC Green Park Tour Guide

TSMC is devoted to the protection of our environment. We reserve land for ecological projects at every new fab. Currently, we have three major green parks: Hsinchu Fab12B, Taichung Fab15, and Tainan Fab14C., serving as Ecological conservation bases for remote elementary schools. In 2016, a total of 24 elementary schools, 1,002 students from the education priority areas in Hsinchu, Taichung, and Tainan came to explore the TSMC Ecology Park.

Tainan Jacana Ecology Park

Since 2012, TSMC has extended the scope of environmental protection to the Tainan Jacana Ecology Park. In addition to inviting employees and their families as a tour guide on the weekend, we also called for employees to go to the Jacana ecology park together in the annual production season to pick up, buy, and sell water chestnut in the Tainan Site, and to support daily operation in the Jacana ecology education park, and make an effort for the local endangered jacana. According to the national jacana winter amount survey, the number of jacana was at a record-high level of 1,152 in Guanti area on Dec. 4, 2016, compared with 549 in 2012, showing that jacana conservation was successful.

Action for Environment Education

Responding to "2016 Earth Day"

A total of 235 Ecology Volunteers and employees' families of the Taichung Site joined hands with 23 children from the Xi Wei Elementary School to plant 150 seedlings in the Taichung City Park, putting the seeds of guarding the land in the children's heart.

"Eagles want to fly" Education Promotion

Ecology Volunteers of the Tainan site helped promote the documentary film "Eagle wants to fly". They brought the

Words from Volunteers

“Being a volunteer for 11 years, my life has been a full of happiness and growth.

I still remember the first time when I walked into the pine forest elementary school to read stories for the fifth grade children; the first time when I hosted my first tour to people I first met in the Taichung Museum of Science; the first time when I celebrated Father's Day with elderly veterans after my father passed away; the first time when I closely observed water pheasant and migratory birds ...

I understand that it was a beautiful moment for every volunteer attendance, so that happiness, love, respect and a sense of accomplishment enrich my own life.”

Book Reading, Community , and Ecology Volunteer from Tainan site Sui Mei Hsu

film to remote elementary schools in Tainan (Guang Jung, Song Lin, Shu Lin, Yu Jin, and Nan Si Elementary School), and arranged researchers, production team to exchange opinions. They put the concepts of environmental awareness and friendly environment into the hearts of 1,010 students.

Jinshan Elementary School Ecology Graduation Trip

For four consecutive years, TSMC has cooperated with the Jinshan elementary school in the Hsinchu County to prepare a "Jinshan passing love and grateful trip," which is full with environmental sustainability concept for graduates. Children

set off from school, along the Roman road to the Mautu Discover Forest, travelling a total of about eight kilometers. Teachers arranged activities including Solar Docent, caring elderly, cleaning houses and knowing new good food. TSMC's volunteers raised 12 new cameras to children, helping to open the children's vision and re-understand their growing home.



Jacana Protection: Photo taken in Tainan's Jacana Ecology Park



Responding to the "2016 Earth Day": Ecology Volunteer of Taichung Site



Chin Shan Elementary School graduation trip with love

Caring for the Underprivileged Education

TSMC is the biggest beneficiary of education. Base on the value of taking from the society and using it to the society, we selected the theme of education, putting long-term and stable investment in human and resources to turn on a light for the disadvantaged students and give them more learning opportunities.

Chinese & English Book Reading

The TSMC book reading volunteer program is made up of employees and their families. In alliance with the Common Wealth Group, volunteers read books sponsored by the Hope Reading Program to students of elementary schools and encourage them to make the most of the learning resources available. TSMC's book reading volunteers provided service at eight rural elementary schools in Hsinchu, Taichung, and Tainan in 2016.

Mathematics Counseling

Two hours a week, TSMC volunteers combined with employees engineering background and used the "Junyi Academy", an online teaching platform, to counsel Ho-Xin elementary school students by one-on-one coaching system with online teaching short films and interactive exercises. They put 381 volunteer attendees into 58 after-school counseling classes in 2016. They accompanied 35 students to complete 762 hours of practice exercises to help the students regain their confidence of learning mathematics.

"Looking at the World with Eyes" Photography Course

Since the beginning of March in 2014, TSMC started the

public service platform -- "Children's another eyes," a campus photography deep plowing plan. TSMC is the nation's first private enterprise to respond to this project. Our volunteers in Taichung go up to the mountains once a month to conduct photography courses for 57 children at the Jian Shi Xiang Shi Lei, and Yufeng elementary schools in the Hsinchu County. In 2016, through 688 hours of practice in the classroom and outdoor, the students learnt the basis of shooting, multimedia and power director photo editing to make photography a child's fishing rod, taking aesthetics with them.

Science Experiment

In the promotion of natural science, TSMC has led the poor rural children to carry out scientific experiments, and held a scientific experience day. In 2016, a total of 23 experiments



English Book Reading Volunteer

were designed to accompany 25 students at the Meihua elementary school in Jianshi town of the Hsinchu County, and 46 children in the Gao Shu Town of Pingtung County. Within 1,868 hours of playing with science and learning to understand the physical and chemical principles, the students simultaneously are trained to have independent thinking and practical ability to experience the ubiquitous science in the life.

Caring for the Underprivileged Living

TSMC takes the initiative to reflect the local needs and care for the disadvantaged life. Based on the first line of physical practice, TSMC volunteers carry out a common spirit of crossing a river in the same boat.



"Another Eye of Children" Photography Volunteer program in the school

Appreciation from Children



“ Thank you for coming every Friday to teach us Mathematic. In the beginning, I really don't like math, but after your teaching, I love math gradually.”

Hsinchu Hoshin Elementary School / Hui Min Pan
PD / Mathematic Volunteer

“ Uncles and aunties from TSMC: Thanks for your teaching and caring for the whole semester.
Thank you very much! ”

Hsinchu County Yuandong Elementary School / Shin En
Legal / English Book Reading Volunteer



Repair Service

Taiwan's operation bases are in Longtan, Hsinchu, Taichung and Tainan, and the implementation of caring for the minority is an important part of the practice of corporate citizenship. In 2016, a total of 5,886 TSMC employees raised NT\$ 10.1 million to help repair six family houses in Taoyuang, a gymnasium in the Yuentung junior high school of Hsinchu County, classroom in the Hsinshen elementary school of Tainan City, internship factory of the National Taitung Specialized School, Little Sun School of Xiulin Town in the Hualien County, Hsinchu County Zhubei City Elderly Relief Center, and a farm of the Taitung Catholic Church Hospital. The Taitung project was completed in March 2017, while the other projects were completed in 2016.



"Hope & New Born" Assist work action

Life Assistance

TSMC hopes to provide the necessary assistance to the disadvantaged groups, and play a common spirit of crossing a river in the same boat. In 2016, employees initiated many life-assistance programs, including helping elderly farmers in Hsinchu, launching a fishing rod plan to support Miaoli holy family to fight for rights for work and learning, accompanying children from the Hsinchu Benevolent House and St. Francis Jr. School to cultivate their ability to make a living, combining with department outing to launch one-day brook, coastal and mountain cleanup activities, and incorporating with nine major festivals to launch charity group purchasing. In 2016, we helped more than 137 institutions throughout 18 counties and cities in Taiwan.



To improve lighting @ Zhubei Caring Center

St-Francis Xavier home of girls: 4 parts of Career Path finding

Case Study

Air Quality Improvement Actions

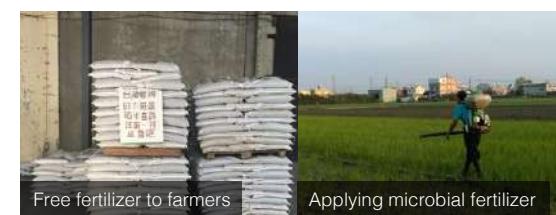
Providing free microbial fertilizer to farmers to reduce straw burning

There are two harvests a year in Taiwan. In order to sow as soon as possible, some farmers will burn straw after first harvest.

TSMC is committed to improving the air quality in central Taiwan. Since 2015, in order to reduce PM2.5 caused by straw burning, we have cooperated with farmers in the Taichung city to use microbial fertilizers (organic fertilizer containing Bacillus subtilis) to speed up straw decay, and increase organic matter in paddy fields.

The project began with the establishment of 40 hectare (ha) exemplary paddy fields at the Wuri district and free provision of the microbial fertilizer. Because of the good trial result, the project has been expanded to another 13 administrative areas and 2,246 hectare (ha) paddy field. The implemented area, 3,275 hectare (ha) in total, is 50 times larger than the initial area. The PM10 is effectively reduced by 10.32 metric tons, PM2.5 reduced by 10.25 metric tons. The impact is significant to reduce air pollutants.

For enhancing efficacy, TSMC visits farmers during the harvest period, estimates required quantity of microbial fertilizer and evaluates farmers' feedback. We look forward to enlarging continuously the implemented areas to reduce the local air pollutions.



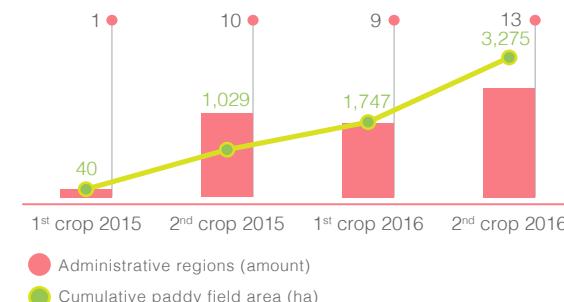
Free fertilizer to farmers

Applying microbial fertilizer



Following up on results

Promotion Results of Microbial Fertilizer



Note: After first harvest, some farmers use regrowth without resow, therefore microbial fertilizer usage is unnecessary.

Public Welfare Participation of TSMC Volunteers – Four Seasons sonata of Love

12 months a year, 52 weeks, TSMC volunteers provide services every week.
We can see the power of doing good from employees.

- Caring for the Underprivileged living
- Caring for the Underprivileged education

- Emphasizing on Environment Protection
- Volunteer Docent



Public Welfare Activity Participation Units

Volunteer Docent
Book Reading Volunteer
Ecology Volunteer
Energy Saving Volunteer

Community Volunteer
Hualien/Taitung Volunteer
PD
200mm TB

300mm TB
300mm FD
Q&R
BTSD

MTC
Fab 2/5
Fab 3
Fab 6

Fab 8
Fab 12A
Fab 12B
Fab 14

Fab 15
Legal
HR



Appendix

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[Certification / Verification](#)

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About This Report

TSMC believes a company's corporate social responsibility is to uplift society. In addition to actively strengthening competitiveness in its core business of dedicated IC foundry, TSMC also continuously takes action in the economic, environmental, and social dimensions of corporate responsibility. By publishing its corporate social responsibility report, TSMC transparently discloses the company's financial and nonfinancial performance and attends to the rights of our all stakeholders including employees, shareholders/investors, customers, suppliers, and society to serve as a positive force in society.

Report Structure

TSMC took the initiative to publish an "Environment, Safety & Health Report" in 2000, and has been publishing a non-financial report for 18 consecutive years since then.

Since 2007 we have annually published our CSR report according to globally widely-adopted guidelines set by the Global Reporting Initiative and established a corporate responsibility website to disclose our continuing efforts in sustainable goals and achievements from the economic, environmental and social dimensions. This CSR disclosure

serves as a tool not only to manage our sustainability in daily operations but also to demonstrate the values and performance we bring to the society and help stakeholders understand how TSMC fulfills its corporate social responsibilities.

The 2016 report is based on the Global Reporting Initiative (GRI) G4 framework and AA 1000 Accountability Principle. This report is published in June, 2017 in both English and Chinese and is available on TSMC's corporate website (www.tsmc.com).

Report Scope Note 1

Our 2016 CSR Report demonstrates our performance in the full 2016 calendar year for the most relevant CSR topics to our stakeholders and our business. It mainly covers the topics identified with "materiality", while we also report on some special economic, environmental, and social topics. There is no significant change from previous reporting periods in the scope and boundaries.

Report Boundary

Regarding the report boundaries, this report contains CSR-related data and activities of all TSMC fabs located in Taiwan, our overseas subsidiaries including TSMC China, WaferTech in the United States, and other subsidiaries' information with materiality Note 2 & 3. The financial statements adopt Taiwan-IFRSs 2013 version and the Guidelines Governing the Preparation of Financial Reports by Securities Issuers and financial figures in this report are based on consolidated financial information and are in NT dollars unless otherwise specified. Environmental performance is expressed in commonly accepted benchmarks.

Report Quality

CSR Committee members act as an interdepartmental editorial team for the CSR Report and provide goals, performance indexes/guidelines, achievements in 2016, and future focuses of TSMC's CSR initiatives. The CSR Report Team is in charge of overall planning, data compilation, data layout, editing, and prepares a draft report for approval by the Chairperson of the CSR Committee.

Report Assurance

For internal assurance, the information and data of this report is initially reviewed and verified by the relevant managers or vice presidents of each organization and is ultimately approved by the CFO, who also serves as the CSR Committee Chairperson. For external verification, DNV GL Business Assurance reviewed this report against the DNV GL VeriSustain Protocol and the GRI G4 guideline. It also verified that this report is in accordance with the comprehensive option of the G4 guidelines. Financial data and Greenhouse Gases (GHG) emission/reduction data are based on a verified financial report and GHG Inventory report. DNV GL's Report Assurance Statement can be found in the annex of this report.

Note 1: Please refer to "Materiality Analysis and Stakeholder Communication" for our identification of materiality and our boundary of each material topic

Note 2: The chapter "Green Manufacturing" encompasses all TSMC fabs located in Taiwan, and our overseas subsidiaries including TSMC China and WaferTech in the United States

Note 3: Should the disclosure of the data collection be excluded here, it is be further explained in each chapter

Certification / Verification



Environmental Management System

Scope: All TSMC fabs



Energy Management System

Scope: TSMC Fab 12, 14, 15



Greenhouse Gas Inventory

Scope: All TSMC fabs



Occupational Safety & Health Management System

Scope: All TSMC fabs



Taiwan Occupational Safety & Health Management System

Scope: All TSMC fabs in Taiwan



Product Carbon Footprint

Scope: All TSMC fabs in Taiwan
(Advanced Backend Fab 3 excluded)



Product Water Footprint

Scope: All TSMC fabs in Taiwan
(Advanced Backend Fab 3 excluded)



Hazardous Substance Management System

Scope: All TSMC fabs



ISO 9001 Quality Management System

Scope: All TSMC fabs



ISO/TS 16949 Automotive Quality Management System

Scope: All TSMC fabs (Advanced Backend Fab 3 excluded)



Green Factory

Scope: TSMC Fab 12, 14, 15, total 7 factories



US LEED Green Building

Scope: TSMC Fab 12, 14, 15 factory and office, total 21 buildings



Taiwan EEWH Green Building

Scope: TSMC Fab 12, 14, 15 factory and office, total 15 buildings



Taiwan Intelligent Building

Scope: TSMC Fab 12, 14, 15 office, total 3 buildings



ISO/IEC 27001: 2013 Information Security Management

Scope: IP merge, mask data preparation, mask making, 300mm wafer production (Tainan), warehousing and associated supporting information and IT processing activities



ISO/IEC 15408 Common Criteria for Information Technology Security Evaluation

Scope: Fab 14A (mask and wafer manufacturing, test service), Fab 2/5 (mask data preparation)



United Nations Global Compact Comparison Table

10 Principles	Report Contents or Explanation	Page
Human Rights		
Principle 1 Businesses should support and respect the protection of internationally proclaimed human rights	Refer to "A Guide for Business – How to Develop a Human Rights Policy" by UN Global Compact, and complied with "The International Bill of Human Rights", "The International Labour Organization's (ILO) Declaration on Fundamental Principles and Rights at Work"; and "The United Nations Global Compact", TSMC promulgated "Human Rights Policy" to ensure our employees' human rights. Also, our guiding principles of the Human Rights Policy align with the Electronic Industry Citizenship Coalition (EICC) Code of Conduct. Please refer to "Inclusive Workplace - Human Rights" in this report for more details	99
Principle 2 Make sure that they are not complicit in human rights abuses	TSMC supports the "responsible sourcing" practice advocated by the Electronic Industry Citizenship Coalition (EICC) and the Global e-Sustainability Initiative (GeSI), and has become a member of EICC. Please refer to "Responsible Supply Chain - Supplier Sustainability Management" in this report for more details	50
Labor		
Principle 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining	TSMC respect the right to form a labor union of employees. Please refer to "Inclusive Workplace - Human Rights" in this report for more details	99
Principle 4 The elimination of all forms of forced and compulsory labor	"Eliminate forced labor" is one of guiding principles of "TSMC Human Rights Policy". Please refer to " TSMC Human Rights Policy " for more details	
Principle 5 The effective abolition of child labor	"Abolish child labor" is one of guiding principles of "TSMC Human Rights Policy". Please refer to " TSMC Human Rights Policy " for more details	
Principle 6 The elimination of discrimination in respect of employment and occupation	"Eliminate unlawful discrimination to ensure equal employment opportunity" is one of guiding principles of "TSMC Human Rights Policy". Please refer to " TSMC Human Rights Policy " for more details	
Environment		(continues on next page)



10 Principles	Report Contents or Explanation	Page
Principle 7 Businesses should support a precautionary approach to environmental challenges	"Continue promoting green fab, green manufacturing, green supply chain and managing environmental risks" is one of TSMC environmental protection strategies. Please refer to " TSMC Environmental Policy " and "Green Manufacturing" in this report	59
Principle 8 Undertake initiatives to promote greater environmental responsibility	"Collaborating with external parties to reduce environmental impact" is one of TSMC environmental protection strategies. Please refer to " TSMC Environmental Policy " and "Green Manufacturing" in this report	59
Principle 9 Encourage the development and diffusion of environmentally friendly technologies	"Adopting environmentally-friendly actions, enhancing performance of energy and resource consumption, waste management and pollution control, and building up a green supply chain for the semiconductor industry with suppliers and customers through audit and cooperation" is one of TSMC environmental protection strategies. Please refer to " TSMC Environmental Policy ", "Green Manufacturing" and "Innovation and Service - Green Products" in this report	40 59
Anti-Corruption		
Principle 10 Businesses should work against corruption in all its forms, including extortion and bribery	Code of Conduct and Anti-corruption Please refer to 2016 TSMC Annual Report : - 3.5 Code of Ethics and Business Conduct - 5.5.5 Employee Engagement-Employee Communication	22



CSR Performance Summary

Key Indicators		2012	2013	2014	2015	2016
Economic	Revenue (NT\$ billion)	507	597	763	843	948
	Net Income (NT\$ billion)	166	188	264	307	334
	Income Tax Expense (NT\$ billion)	16	27	38	44	52
	R&D Expenditures (NT\$ billion)	40	48	57	66	71
	Capital Expenditures (NT\$ billion)	246	288	289	258	328
Environmental	Greenhouse Gas Emission (Metric Ton - CO ₂ equivalent/8-inch equivalent wafer-layer) (Scope 1 and Scope 2)	0.0094	0.0089	0.0086	0.0088	0.0087
	Greenhouse Gas Emission (Metric Ton - CO ₂ equivalent) (Scope 1 and Scope 2)	4,606,119	5,222,778	6,356,130	6,670,291	7,413,953
	Scope 1	1,563,306	1,716,174	2,113,858	2,027,645	2,035,510
	Taiwan Sites	1,291,662	1,443,218	1,655,498	1,566,662	1,648,268
	Overseas Sites	271,644	272,956	458,360	460,983	387,242
	Scope 2	3,042,814	3,506,970	4,242,258	4,642,646	5,378,443
	Taiwan Sites	2,738,598	3,211,022	3,939,172	4,315,766	5,030,647
	Overseas Sites	304,216	295,948	303,086	326,880	347,796
	Scope 3	-	-	-	3,446,447	3,767,411
	Energy Consumption (GWh) (Including electricity, nature gas and diesel)	5,839	6,604	7,968	8,915	9,848
	Direct Energy Consumption (GWh) (Including electricity, nature gas and diesel)	332	375	423	455	489
	Indirect Energy Consumption (GWh) (Electricity)	5,507	6,229	7,545	8,460	9,358
	Water Consumption (Million Metric Tons)	29.2	33.2	38.2	37.5	42.0
	Taiwan Sites	25.8	29.7	34.9	34.0	38.6
	Overseas Sites	3.4	3.5	3.3	3.5	3.4
	Process Water Recycling Rate (%) (Taiwan Sites)	86.5	86.9	87.6	87.3	87.4
	Total Water Saving (Million Metric Tons) (Taiwan Sites)	53.4	66.9	81.0	85.6	94.3

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Key Indicators		2012	2013	2014	2015	2016
Environmental	Waste Generated (Metric Tons)	129,921	149,951	208,211	291,900	345,650
	General Waste Generated (Metric Tons)	37,459	47,336	66,462	137,524	163,584
	Taiwan Sites	33,158	42,180	61,026	132,427	158,899
	Overseas Sites	4,301	5,156	5,436	5,097	4,685
	Hazardous Waste Generated (Metric Tons)	92,462	102,615	141,749	154,376	182,066
	Taiwan Sites	90,596	101,100	140,024	152,164	179,974
	Overseas Sites	1,866	1,515	1,727	2,212	2,092
	Waste Recycling Rate (%)	90.89	91.36	92.59	94.67	94.69
	Taiwan Sites	91.83	92.19	93.06	95.08	95.00
	Overseas Sites	79	78.74	79.25	78.94	78.96
Social	Numbers of Employee	37,149	40,483	43,591	45,272	46,968
	Employee Training Hours	779,442	889,184	884,174	780,546	623,711
	Safety - Injury Frequency Rate (Taiwan Sites)	0.24	0.25	0.36	0.47	0.54
	Safety - Injury Severity Rate (Taiwan Sites)	5.19	1.34	3.48	5.12	7.62
	Cash Donation (NT\$ million)	76.4	95.2	99	64.8	89.1

Note 1: Safety - Injury Frequency Rate=Injury NumberX1,000,000 /Total hours worked

Note 2: Safety - Injury Severity Rate= Lost Work DaysX1,000,000/Total hours worked

Note 3: Cash donation is the amount of cash donations by TSMC; other non-cash donations by TSMC and cash donations by of TSMC employees are not included.



GRI G4 Index Comparison Table

Index	Description	Report Contents or Explanation	Page
STRATEGY AND ANALYSIS			
G4-1	Provide a statement from the most senior decision-maker of the organization (such as CEO, chair, or equivalent senior position) about the relevance of sustainability to the organization and the organization's strategy for addressing sustainability	<ul style="list-style-type: none">● TSMC CSR Policy● Letter from the CSR Committee Chairperson	8 3
G4-2	Provide a description of key impacts, risks, and opportunities	<ul style="list-style-type: none">● Letter from the CSR Committee Chairperson	3
ORGANIZATIONAL PROFILE			
G4-3	Report the name of the organization	<ul style="list-style-type: none">● About TSMC	6
G4-4	Report the primary brands, products, and services	<ul style="list-style-type: none">● About TSMC	6
G4-5	Report the location of the organization's headquarters	<ul style="list-style-type: none">● About TSMC	6
G4-6	Report the number of countries where the organization operates, and names of countries where either the organization has significant operations or that are specifically relevant to the sustainability topics covered in the report	<ul style="list-style-type: none">● About TSMC	6
G4-7	Report the nature of ownership and legal form	About TSMC; Please refer to 2016 TSMC Annual Report (II): Financial Statements	6
G4-8	Report the markets served (including geographic breakdown, sectors served, and types of customers and beneficiaries)	About TSMC; Please refer to 2016 TSMC Annual Report	6
G4-9	Report the scale of the organization	<ul style="list-style-type: none">● Workforce Structure <p>Please refer to 2016 TSMC Annual Report</p>	88
G4-10	Report the total number of employees by various categories	<ul style="list-style-type: none">● Workforce Structure● Right People with Shared Vision and Values	88 91

(continues on next page)



Index	Description	Report Contents or Explanation	Page
G4-11	Report the percentage of total employees covered by collective bargaining agreements	No employees in covered by collective bargaining agreements	
G4-12	Describe the organization's supply chain	● Responsible Supply Chain	48
G4-13	Report any significant changes during the reporting period regarding the organization's size, structure, ownership, or its supply chain	The capacity in 2016 increased 10% from 2015	
G4-14	Report whether and how the precautionary approach or principle is addressed by the organization	● Risk Management; or 2016 Form 20-F : Item 3. Key Information — Risk Factors	26
G4-15	List externally developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes or which it endorses	● TSMC adopts the EICC Code of Conduct ● TSMC supports the "responsible sourcing" practice advocated by the Electronic Industry Citizenship Coalition (EICC) and the Global e-Sustainability Initiative (GeSI)	99
G4-16	List memberships of associations (such as industry associations) and national or international advocacy organizations	In addition to pursuing our own business sustainability, TSMC participates in or supports a variety of trade and industry associations as well as public-policy related nonprofit entities to facilitate exchange with other companies and industries and to address key public policy issues. In 2016, the total spending for membership dues and monetary contributions is NT\$36,296,334 (which is about 0.00383% of our revenue in the same year). Here is a non-exhaustive list of these associations and entities: <ul style="list-style-type: none">- Asian Corporate Governance Association- Electronic Industry Citizenship Coalition- Semiconductor Industry Association- Taiwan Semiconductor Industry Association- The Third Wednesday Club- Chinese National Association of Industry and Commerce, Taiwan- The Allied Association for Science Park Industries- Taiwan Association for Trade Secrets Protection- Cross-Strait CEO Summit- Business Council for Sustainable Development of Taiwan- Taiwan Carbon Capture Storage and Utilization Association- Academia-Industry Consortium for Southern Taiwan Science Park- Taiwan IC Industry and Academia Research Alliance- Taipei Forum Foundation- Taiwan Institute for Sustainable Energy- Epoch Foundation- Institute for Information Industry	

(continues on next page)



Index	Description	Report Contents or Explanation	Page
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES			
G4-17	List all entities included in the organization's consolidated financial statements or equivalent documents	• Materiality Analysis and Stakeholder Communication	11
G4-18	Explain the process for defining the report content and the Aspect Boundaries. Explain how the organization has implemented the Reporting Principles for Defining Report Content	• Materiality Analysis and Stakeholder Communication	11
G4-19	List all the material Aspects identified in the process for defining report content	• Materiality Analysis and Stakeholder Communication	11
G4-20	For each material Aspect, report the Aspect Boundary within the organization, report any specific limitation regarding the Aspect Boundary within the organization	• Materiality Analysis and Stakeholder Communication	11
G4-21	For each material Aspect, report the Aspect Boundary outside the organization, report any specific limitation regarding the Aspect Boundary outside the organization	• Materiality Analysis and Stakeholder Communication	11
G4-22	Report the effect of any restatements of information provided in previous reports, and the reasons for such restatements	There are no restatements of information.	
G4-23	Report significant changes from previous reporting periods in the Scope and Aspect Boundaries	No significant changes	
STAKEHOLDER ENGAGEMENT			
G4-24	Provide a list of stakeholder groups engaged by the organization	• Materiality Analysis and Stakeholder Communication	11
G4-25	Report the basis for identification and selection of stakeholders with whom to engage	• Materiality Analysis and Stakeholder Communication	11
G4-26	Report the organization's approach to stakeholder engagement, including frequency of engagement by type and by stakeholder group, and an indication of whether any of the engagement was undertaken specifically as part of the report preparation process	• Materiality Analysis and Stakeholder Communication	11
G4-27	Report key topics and concerns that have been raised through stakeholder engagement, and how the organization has responded to those key topics and concerns, including through its reporting. Report the stakeholder groups that raised each of the key topics and concerns	• Materiality Analysis and Stakeholder Communication	11

(continues on next page)



Index	Description	Report Contents or Explanation	Page
REPORT PROFILE			
G4-28	Reporting period (such as fiscal or calendar year) for information provided	• About This Report	129
G4-29	Date of most recent previous report (if any)	• About This Report	129
G4-30	Reporting cycle (such as annual, biennial)	• About This Report	129
G4-31	Provide the contact point for questions regarding the report or its contents	• About This Report	129
G4-32	Report the 'in accordance' option the organization has chosen, the GRI Content Index for the chosen option, the reference to the External Assurance Report, if the report has been externally assured	• About This Report: Report Assurance	129
G4-33	Report the organization's policy and current practice with regard to seeking external assurance for the report	• About This Report: Report Assurance	129
GOVERNANCE			
G4-34	Report the governance structure of the organization, including committees of the highest governance body. Identify any committees responsible for decision-making on economic, environmental and social impacts	• Governance Structure • CSR Committee	20 10
G4-35	Report the process for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees	• Governance Structure • Board of Directors/Board Responsibilities • CSR Committee	20 20 10
G4-36	Report whether the organization has appointed an executive-level position or positions with responsibility for economic, environmental and social topics, and whether post holders report directly to the highest governance body	• Governance Structure • Board of Directors/Board Responsibilities • CSR Committee	20 20 10
G4-37	Report processes for consultation between stakeholders and the highest governance body on economic, environmental and social topics. If consultation is delegated, describe to whom and any feedback processes to the highest governance body	• Materiality Analysis and Stakeholder Communication	11

(continues on next page)



Index	Description	Report Contents or Explanation	Page
G4-38	Report the composition of the highest governance body and its committees	<ul style="list-style-type: none">• Board of Directors/Board Responsibilities <p>TSMC's Board of Directors consists of distinguished members with a great breadth of experience as world-class business leaders or professionals. All of them have management experience and competency in economic, environmental and social topics</p>	20
G4-39	Report whether the Chair of the highest governance body is also an executive officer (and, if so, his or her function within the organization's management and the reasons for this arrangement)	No, the Chair of the highest governance body is not an executive officer	
G4-40	Report the nomination and selection processes for the highest governance body and its committees, and the criteria used for nominating and selecting highest governance body members	<ul style="list-style-type: none">• Board of Directors/Selection and Election of Directors <p>TSMC's Board of Directors consists of distinguished members with a great breadth of experience as world-class business leaders or professionals. All of them have management experience and competency in economic, environmental and social topics</p>	21
G4-41	Report processes for the highest governance body to ensure conflicts of interest are avoided and managed. Report whether conflicts of interest are disclosed to stakeholders	<p>The avoidance of conflicts of interests is governed by several corporate processes. First, any director or executive officer who, for him/herself or on behalf of another, wishes to engage in any business activity that overlaps with TSMC's business must obtain the prior approval of our shareholders' meeting or Board of Directors respectively in accordance with relevant laws. Second, each board member and executive officer must complete an annual declaration on related party transactions which is reviewed by our Audit Committee. Third, we are subject to strenuous reporting requirements on reporting any related party transactions under both R.O.C. and U.S. security rules</p> <p>Please refer to 2016 TSMC Annual Report:</p> <ul style="list-style-type: none">2.4.1 Information Regarding Board Members4.1.4 Major Shareholders4.1.8 Related Party Relationship among Our 10 Largest Shareholders5.3.4 Raw Materials and Supply Chain Management-Suppliers Accounted for at Least 10% of Annual Consolidated Net Procurement5.4 Customer Trust-Customers that Accounted for at Least 10% of Annual Consolidated Net Revenue8.1 Subsidiaries <p>Please refer to Consolidated Financial Statements for 2016:</p> <ul style="list-style-type: none">Note 44: Additional DisclosuresNote 44: Additional Disclosures - Table 6 Total purchases from or sales to related parties of at least NT\$100 million or 20% of the paid-in capital)	

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Index	Description	Report Contents or Explanation	Page
G4-42	Report the highest governance body's and senior executives' roles in the development, approval, and updating of the organization's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental and social impacts	<ul style="list-style-type: none">● Board of Directors/Board Responsibilities● Corporate Social Responsibility Policy● CSR Matrix <p>Board of Directors annually reviews CSR report which includes economic, environmental and social topics, in addition, they also review the annual plan and the donations of the TSMC Education and Culture Foundation</p> <p>TSMC's Board of Directors consists of distinguished members with a great breadth of experience as world-class business leaders or professionals. All of them have management experience and competency in economic, environmental and social topics</p> <p>The "Corporate Social Responsibility Policy" and "CSR Matrix" set by Chairman Dr. Morris Chang clearly defines the scope of TSMC's corporate social responsibility</p>	20 8 9
G4-43	Report the measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics	<p>Please refer to 2016 TSMC Annual Report:</p> <p>3. Corporate Governance "Continuing Education/Training of Directors" and "Continuing Education/Training of Management" in 2016</p> <p>Through quarterly management report and annually CSR report to develop and enhance the Board of Directors' collective knowledge of economic, environmental and social topics</p>	
G4-44	Report the processes for evaluation of the highest governance body's performance with respect to governance of economic, environmental and social topics. Report whether such evaluation is independent or not, and its frequency. Report whether such evaluation is a self-assessment. Report actions taken in response to evaluation of the highest governance body's performance with respect to governance of economic, environmental and social topics, including, as a minimum, changes in membership and organizational practice	<p>Please refer to 2016 TSMC Annual Report:</p> <p>3.4 Taiwan Corporate Governance Implementation as Required by Taiwan Financial Supervisory Commission</p>	
G4-45	Report the highest governance body's role in the identification and management of economic, environmental and social impacts, risks, and opportunities. Include the highest governance body's role in the implementation of due diligence processes. Report whether stakeholder consultation is used to support the highest governance body's identification and management of economic, environmental and social impacts, risks, and opportunities	<ul style="list-style-type: none">● Board of Directors● Risk Management <p>Please refer to 2016 TSMC Annual Report:</p> <p>3.4 Taiwan Corporate Governance Implementation as Required by Taiwan Financial Supervisory Commission</p> <p>6.3 Risk Management</p>	20 26
G4-46	Report the highest governance body's role in reviewing the effectiveness of the organization's risk management processes for economic, environmental and social topics	<ul style="list-style-type: none">● Board of Directors● Risk Management <p>Please refer to 2016 TSMC Annual Report:</p> <p>6.3 Risk Management</p>	20 26

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Index	Description	Report Contents or Explanation	Page
G4-47	Report the frequency of the highest governance body's review of economic, environmental and social impacts, risks, and opportunities	<ul style="list-style-type: none">● Board of Directors● Risk Management <p>Please refer to 2016 TSMC Annual Report: 3. Corporate Governance</p>	20 26
G4-48	Report the highest committee or position that formally reviews and approves the organization's sustainability report and ensures that all material aspects are covered	This report is reviewed and approved by the Company's functional heads and Chairperson of the Corporate Social Responsibility Committee (Chief Financial Officer)	
G4-49	Report the process for communicating critical concerns to the highest governance body	<ul style="list-style-type: none">● CSR Committee	10
G4-50	Report the nature and total number of critical concerns that were communicated to the highest governance body and the mechanism(s) used to address and resolve them	In 2016, our CSR committee reported CSR related topics to the BOD, including EICC-related activities, green manufacturing, charity activities, and 2017 CSR focuses. We review and manage the progress of related programs periodically through our CSR committee quarterly meeting	
G4-51	Report the remuneration policies for the highest governance body and senior executives. Report how performance criteria in the remuneration policy relate to the highest governance body's and senior executives' economic, environmental and social objectives	<p>Please refer to 2016 TSMC Annual Report:</p> <ul style="list-style-type: none">2.4.2 Remuneration Paid to Directors2.5.2 Compensation Paid to President & Co-CEO and Vice Presidents2.5.3 Employees' Profit Sharing Bonus Paid to Management Team5.5.4 Compensation	
G4-52	Report the process for determining remuneration. Report whether remuneration consultants are involved in determining remuneration and whether they are independent of management. Report any other relationships which the remuneration consultants have with the organization	<p>Please refer to 2016 TSMC Annual Report:</p> <ul style="list-style-type: none">3.2.2 Compensation Committee3.2.3 Director and Committees Members' Attendance	
G4-53	Report how stakeholders' views are sought and taken into account regarding remuneration, including the results of votes on remuneration policies and proposals, if applicable	<p>Please refer to 2016 TSMC Annual Report:</p> <ul style="list-style-type: none">3.2.2 Compensation Committee	
G4-54	Report the ratio of the annual total compensation for the organization's highest-paid individual in each country of significant operations to the median annual total compensation for all employees (excluding the highest-paid individual) in the same country	We do not publicly disclose this confidential information	
G4-55	Report the ratio of percentage increase in annual total compensation for the organization's highest-paid individual in each country of significant operations to the median percentage increase in annual total compensation for all employees (excluding the highest-paid individual) in the same country	We do not publicly disclose this confidential information	

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Index	Description	Report Contents or Explanation	Page
ETHICS AND INTEGRITY			
G4-56	Describe the organization's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics	<ul style="list-style-type: none">● Code of Conduct and Anti-corruption	22
G4-57	Report the internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organizational integrity, such as helplines or advice lines	<ul style="list-style-type: none">● Code of Conduct and Anti-corruption <p>Please refer to 2016 TSMC Annual Report: 3.5 Code of Ethics and Business Conduct 5.5.5 Employee Engagement - Employee Communication</p>	22
G4-58	Report the internal and external mechanisms for reporting concerns about unethical or unlawful behavior, and matters related to organizational integrity, such as escalation through line management, whistleblowing mechanisms or hotlines	<ul style="list-style-type: none">● Code of Conduct and Anti-corruption <p>Please refer to 2016 TSMC Annual Report: 3.5 Code of Ethics and Business Conduct 5.5.5 Employee Engagement - Employee Communication</p>	22
CATEGORY: ECONOMIC			
ASPECT: ECONOMIC PERFORMANCE			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Financial Performance	30
G4-EC1	Direct economic value generated and distributed	<ul style="list-style-type: none">● Financial Performance	30
G4-EC2	Financial implications and other risks and opportunities for the organization's activities due to climate change	<ul style="list-style-type: none">● Risk Management● Climate Change and Energy Management	26 60
G4-EC3	Coverage of the organization's defined benefit plan obligations	<ul style="list-style-type: none">● Inclusive Workplace - Compensation and Benefit	93
G4-EC4	Financial assistance received from government	<ul style="list-style-type: none">● Financial Performance	30

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Index	Description	Report Contents or Explanation	Page
ASPECT: INDIRECT ECONOMIC IMPACTS			
G4-EC7	Development and impact of infrastructure investments and services supported	• Social Participation	114
G4-EC8	Significant indirect economic impacts, including the extent of impacts	Please refer to 2016 TSMC Annual Report : 6.3.3 Operational Risks (Risks Associated with Purchase Concentration); • Social Participation	114
ASPECT: PROCUREMENT PRACTICES			
G4-EC9	Proportion of spending on local suppliers at significant locations of operation	• Responsible Supply Chain	48
CATEGORY: ENVIRONMENTAL			
G4-DMA	Generic Disclosures on Management Approach	• Green Manufacturing	59
ASPECT: ENERGY			
G4-DMA	Generic Disclosures on Management Approach	• Green Manufacturing • Climate Change and Energy Management	59 60
G4-EN3	Energy consumption within the organization	• Climate Change Mitigation: Energy Consumption	63
G4-EN4	Energy consumption outside of the organization	• Climate Change Mitigation: Greenhouse Gas Emission Inventory - TSMC Scope 3 GHG emissions	63
G4-EN5	Energy intensity	• Climate Change Mitigation: Energy Consumption	63
G4-EN6	Reduction of energy consumption	• Climate Change Mitigation: Greenhouse Gas Emissions Reduction: Improving Energy Efficiency and Reducing Indirect Emission	66
G4-EN7	Reductions in energy requirements of products and services	• Green Products	40

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Index	Description	Report Contents or Explanation	Page
ASPECT: WATER			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Green Manufacturing● Water Resource Management	59 70
G4-EN8	Total water withdrawal by source	<ul style="list-style-type: none">● Water Resource Management: Water Source Management	71
G4-EN9	Water sources significantly affected by withdrawal of water	Our operations are compliant with the Environmental Impact Assessment requirements of the Science Parks. There are no significant effects to water sources by withdrawal of water	
G4-EN10	Percentage and total volume of water recycled and reused	<ul style="list-style-type: none">● Water Resource Management: Water Recycling	72
ASPECT: EMISSIONS			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Green Manufacturing● Climate Change and Energy Management	59 60
G4-EN15	Direct greenhouse gas (GHG) emissions (Scope 1)	<ul style="list-style-type: none">● Climate Change Mitigation: Greenhouse Gas Emission Inventory	62
G4-EN16	Energy indirect greenhouse gas (GHG) emissions (Scope 2)	<ul style="list-style-type: none">● Climate Change Mitigation: Greenhouse Gas Emission Inventory	62
G4-EN17	Other indirect greenhouse gas (GHG) emissions (Scope 3)	<ul style="list-style-type: none">● Climate Change Mitigation: Greenhouse Gas Emission Inventory	62
G4-EN18	Greenhouse gas (GHG) emissions intensity	<ul style="list-style-type: none">● Climate Change Mitigation: Greenhouse Gas Emission Inventory	62
G4-EN19	Reduction of greenhouse gas (GHG) emissions	<ul style="list-style-type: none">● Climate Change Mitigation: Greenhouse Gas Emissions Reduction	65
G4-EN20	Emissions of ozone-depleting substances (ODS)	TSMC doesn't use Montreal Protocol Class I & II ODS	

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Index	Description	Report Contents or Explanation	Page
G4-EN21	NO _x , SO _x , and other significant air emissions	<ul style="list-style-type: none">● Air Pollution Control Air emissions in 2016, VOC: 162.24 metric tons, NO _x : 53.86 metric tons, SO _x : 29.3 metric tons	84
ASPECT: EFFLUENTS AND WASTE			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Green Manufacturing● Water Resource Management	59 70
G4-EN22	Total water discharge by quality and destination	<ul style="list-style-type: none">● Green Manufacturing● Water Resource Management	59 70
G4-EN23	Total weight of waste by type and disposal method	<ul style="list-style-type: none">● Green Manufacturing● Water Resource Management	59 70
G4-EN24	Total number and volume of significant spills	There were no significant spills in all TSMC fabs in 2016	
G4-EN25	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally	There were no imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII in 2016	
G4-EN26	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff	TSMC's treated wastewater is discharged to the Science Park wastewater treatment plant, and there is no significant environmental impact	
ASPECT: PRODUCTS AND SERVICES			
G4-EN27	Extent of impact mitigation of environmental impacts of products and services	<ul style="list-style-type: none">● Green Products	40
G4-EN28	Percentage of products sold and their packaging materials that are reclaimed by category	TSMC uses recyclable plastic and paper as packing materials for shipping products. TSMC recycles wafer product packing materials including paper box, cushion and wafer box from products shipped to customers and testing and assembly facilities for reuse after cleaning. Packing materials from raw wafers are also reused in product shipping. These measures have reduced both packing material consumption and waste generation. In 2016, we recycled about 92,607 sets of 12-inch waferbox (FOSB) from customers and assembly subcontractors, which is about 24% of our 12-wafer shipping quantity, increased 2% compared to 2015	

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Index	Description	Report Contents or Explanation	Page
ASPECT: COMPLIANCE			
G4-DMA	Generic Disclosures on Management Approach	• Governance and Business	19
G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	• Please refer to G4-SO8 in this table	150
ASPECT: OVERALL			
G4-EN31	Total environmental protection expenditures and investments by type	Please refer to "Environmental Accounting" in 2016 TSMC Annual Report page 124-125 for environmental cost and benefit	
ASPECT: SUPPLIER ENVIRONMENTAL ASSESSMENT			
G4-DMA	Generic Disclosures on Management Approach	• Responsible Supply Chain	48
G4-EN32	Percentage of new suppliers that were screened using environmental criteria	All suppliers are required to sign an agreement and agree to be bound by TSMC's Supplier Code of Conduct before they can do business with TSMC	
G4-EN33	Significant actual and potential negative environmental impacts in the supply chain and actions taken	• Supplier Sustainability Management	50
CATEGORY: SOCIAL			
SUB-CATEGORY: LABOR PRACTICES AND DECENT WORK			
ASPECT: EMPLOYMENT			
G4-DMA	Generic Disclosures on Management Approach	• Talent Recruitment	91
G4-LA1	Total number and rates of new employee hires and employee turnover by age group, gender and region	• Right People with Shared Vision and Values • Employee Turnover Rate	91 95

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Index	Description	Report Contents or Explanation	Page
G4-LA2	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	<ul style="list-style-type: none">Compensation and Benefit	93
G4-LA3	Return to work and retention rates after parental leave, by gender	<ul style="list-style-type: none">Benefits Program Exceeds Statutes	94
ASPECT: LABOR/MANAGEMENT RELATIONS			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">Internal Communication Channels for Employees	101
G4-LA4	Minimum notice periods regarding operational changes, including whether these are specified in collective agreements	TSMC does not have collective agreements.	
ASPECT: OCCUPATIONAL HEALTH AND SAFETY			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">Occupational Safety and Health	102
G4-LA5	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs	<p>Percentage of total workforce represented in our Safety and Health Committee</p> <ul style="list-style-type: none">- Taiwan Fab: 54%- TSMC China: 4%- WaferTech: 91%	
G4-LA6	Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender	<ul style="list-style-type: none">Occupational Safety and Health: Disabling Injuries Statistics	104
G4-LA7	Workers with high incidence or high risk of diseases related to their occupation	<p>TSMC's critical health risk operations include operations involving noise, ion-radiation, lead, dimethylformamide, n-hexane, arsenic, manganese and its compounds, dust, chromic acid and its salts, nickel and its compounds, mercury and its inorganic compounds. Fab ISEPs report workers engaged in related operations for special annual health exams and categorized health management if necessary</p> <p>For high risk groups, such as those at risk for work-induced cerebral and cardiovascular diseases, ergonomic hazards, and maternal health, TSMC institutes hierarchical management measures in order to minimize or eliminate the risks.</p>	
G4-LA8	Health and safety topics covered in formal agreements with trade unions	TSMC does not have health and safety topics covered in formal agreements with trade unions	

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Index	Description	Report Contents or Explanation	Page
ASPECT: TRAINING AND EDUCATION			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Talent Development● Learning and Development● People Development	96 97 98
G4-LA9	Average hours of training per year per employee by gender, and by employee category	<ul style="list-style-type: none">● Learning and Development	97
G4-LA10	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	<ul style="list-style-type: none">● Learning and Development● People Development <p>The Company provides programs for upgrading employees skills and facilitating continued employability. There is no related transition assistant programs for career endings resulting from retirement or termination of employment</p>	97 98
G4-LA11	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	<ul style="list-style-type: none">● Learning and Development● People Development <p>The identification of this indicator is "Percentage of employees receiving regular performance and career development reviews, by gender and by employee category. TSMC's implementation rate of Performance Management and Development is 100%, therefore the Company discloses further training and development indicators to respond to the purpose of this indicator (i.e. training hours in each category - manager/indirect labor/direct labor, development effectiveness and internal job opening fulfilled by employees)</p>	97 98
ASPECT: SUPPLIER ASSESSMENT FOR LABOR PRACTICES			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Responsible Supply Chain	48
G4-LA14	Percentage of new suppliers that were screened using labor practices criteria	<ul style="list-style-type: none">● Responsible Supply Chain <p>All suppliers are required to sign an agreement and agree to be bound by TSMC's Supplier Code of Conduct before they can do business with TSMC</p>	48
G4-LA15	Significant actual and potential negative impacts for labor practices in the supply chain and actions taken	<ul style="list-style-type: none">● Responsible Supply Chain <p>TSMC follows through defined risk assessment, audit, and gap closure process</p>	48

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Index	Description	Report Contents or Explanation	Page
ASPECT: SUPPLIER HUMAN RIGHTS ASSESSMENT			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Responsible Supply Chain	48
G4-HR10	Percentage of new suppliers that were screened using human rights criteria	<ul style="list-style-type: none">● Responsible Supply Chain <p>All suppliers are required to sign an agreement and agree to be bound by TSMC's Supplier Code of Conduct before they could do business with TSMC</p>	48
G4-HR11	Significant actual and potential negative human rights impacts in the supply chain and actions taken	<ul style="list-style-type: none">● Responsible Supply Chain <p>TSMC follows through defined risk assessment, audit, and gap closure process</p>	48
ASPECT: ANTI-CORRUPTION			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Code of Conduct and Anti-corruption	22
G4-SO3	Total number and percentage of operations assessed for risks related to corruption and the significant risks identified	<p>TSMC assesses anti-corruption risk based on function rather than geographical region. Our assessment approach includes the following:</p> <ol style="list-style-type: none">1. A task force, including the Legal, Internal Audit, and Procurement departments, is organized to engage an independent third party to perform an anonymous annual supplier survey in the third quarter each year to assess the ethical climate corporation-wide2. Internal Audit department interviews top management in the fourth quarter each year to collect/assess potential risks, including anti-corruption risks3. All divisions perform a Control Self Assessment (CSA) annually to assess risks and the effectiveness of controls, including awareness of and compliance with the business code of conduct4. The TSMC external and internal websites provide links to an ombudsman system to investigate reported cases related to irregularities or corruption <p>Based on 2016's supplier survey, interviews with top management, CSA Reports received from each division and a review of the complaints received through the ombudsman system and the results of investigations conducted accordingly, the corruption risk is appropriately controlled and no significant corruption risk was identified</p> <p>Please refer to 2016 TSMC Annual Report:</p> <ul style="list-style-type: none">3.5 Code of Ethics and Business Conduct3.6 Regulatory Compliance	22

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Index	Description	Report Contents or Explanation	Page
G4-SO4	Communication and training on anti-corruption policies and procedures	<ul style="list-style-type: none">● Code of Conduct and Anti-corruption● 2016 Regulatory Compliance Training and Promotion <p>Please refer to 2016 TSMC Annual Report:</p> <p>3.5 Code of Ethics and Business Conduct 3.6 Regulatory Compliance</p>	22 25
G4-SO5	Confirmed incidents of corruption and actions taken	<ul style="list-style-type: none">● Whistleblowing <p>Please refer to 2016 TSMC Annual Report:</p> <p>3.5 Code of Ethics and Business Conduct</p>	23
ASPECT: PUBLIC POLICY			
G4-SO6	Total value of political contributions by country and recipient/beneficiary	TSMC is prohibited under Taiwan law from making political contributions as the majority of our investors are foreign investors, and TSMC has fully complied with this law. TSMC has consistently remained politically neutral, but encourages all of its employees to fulfill their duties as citizens	
ASPECT: ANTI-COMPETITIVE BEHAVIOR			
G4-SO7	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	The Company had no legal actions pending or completed during the reporting period regarding anti-competitive behavior and violations of anti-trust and monopoly legislation	
ASPECT: COMPLIANCE			
G4-DMA	Generic Disclosures on Management Approach	<ul style="list-style-type: none">● Regulatory Compliance	23
G4-SO8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	In 2016 and as of the Date of the 2016 Annual Report, the Company complied with the Taiwan Company Law, Securities Trading Act and relevant labor laws and regulations. The competent authorities levied fines totaling NT\$166,000 for three violations of environmental and safety laws: (1) After the magnitude 6.4 earthquake which struck southern Taiwan on February 6, 2016, one of our employees was injured during the assessment of the damage caused. The Company has further strengthened relevant safety measures, and revised the internal rule to enhance environmental checks conducted after earthquakes; (2) Our vendors did not take effective measures to suppress dust at our construction site. The vendors have taken corrective action measures and increased relevant supervisory and execution professionals per our request. We also increased our own supervision over this site; (3) The Company did not appropriately report the non-production of a specific type of non-hazardous waste. We submitted our report immediately upon notification from the competent authority and enhanced the inspection process for future reporting	

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Index	Description	Report Contents or Explanation	Page
ASPECT: SUPPLIER ASSESSMENT FOR IMPACTS ON SOCIETY			
G4-DMA	Generic Disclosures on Management Approach	• Responsible Supply Chain	48
G4-SO9	Percentage of new suppliers that were screened using criteria for impacts on society	• Responsible Supply Chain All suppliers are required to sign an agreement and agree to be bound by TSMC's Supplier Code of Conduct before they can do business with TSMC	48
G4-SO10	Significant actual and potential negative impacts on society in the supply chain and actions taken	• Responsible Supply Chain TSMC follows through defined risk assessment, audit, and gap closure process	48
ASPECT: PRODUCT AND SERVICE LABELING			
G4-PR3	Type of product and service information required by the organization's procedures for product and service information and labeling, and percentage of significant product and service categories subject to such information requirements	TSMC provides customers product composition information upon requests	
G4-PR4	Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes	The Company had no incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes	
G4-PR5	Results of surveys measuring customer satisfaction	• Customer Service	45
ASPECT: COMPLIANCE			
G4-DMA	Generic Disclosures on Management Approach	• Regulatory Compliance	23
G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	We don't have any significant fines for non-compliance with laws and regulations concerning the provision and use of products and services in 2016	

Assurance Statement

DNV-GL

Independent assurance statement

Scope and approach

Taiwan Semiconductor Manufacturing Company Ltd. ('TSMC' or 'the Company') commissioned DNV GL Business Assurance Co. Ltd. ('DNV GL') to undertake independent assurance of the 2016 Corporate Social Responsibility Report (the 'Report') for the year ended 31 December 2016.

We performed our work using DNV GL'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 Guidelines.

We evaluated the performance data using the reliability principle together with TSMC data protocols for how the data are measured, recorded and reported. The performance data in scope was against TSMC's significant CSR issues and the 2025 sustainability commitment and the core indicators set forth in the GRI G4.

Note: exceptions / exclusions from scope: financial information from annual report

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.

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 level' of assurance.

Responsibilities of the Directors of TSMC and of the assurance providers

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 GL was not involved in the preparation of any statements or data included in the Report except for this Assurance Statement.

DNV GL provides a range of other services to TSMC, none of which constitute a conflict of interest with this assurance work.

DNV GL'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 GL expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Assurance Statement.

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;

¹ The VeriSustain protocol is available on dnvgl.com

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This Assurance Statement is based on the information made available to us and the assumptions conditions detailed above. Hence, DNV GL cannot guarantee the accuracy or correctness of the information. DNV GL cannot be held liable by any party relying or acting upon this Assurance Statement.
立恩威國際檢驗股份有限公司,新北市 220 板橋區文化路二段 293 號 29 樓

DNV-GL

- Review of information provided to us by TSMC on its reporting and management processes relating to the Principles;
- Interviews 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 air emission, water resource, chemical and waste management), human resource, safety, procurement, wellness, and product development were chosen to interview;
- Site visits to HQ and 3 production sites in Taiwan to review process and systems for preparing site level sustainability data and implementation of sustainability strategy. Sites chosen were 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;
- Review of the processes for gathering and consolidating the specified performance data and, for a sample, checking the data consolidation. Where financial data had been checked by another third party, and, where data of scope 1 and 2 of Green House Gases Emission has been verified by another third party, we tested transposition from these sources to the report; Where relevant data and information has been generated from a certified management system note which data and management system certification and that this was considered;
- An independent assessment of TSMC's reporting against the Global Reporting Initiative (GRI) G4 Guidelines;
- There was a confidential issue that we cannot assess the salary data; there were many assumptions in the calculation of scope 3 of Green House Gases Emission that we cannot verify the reliability of data. The verification was conducted based only on the Chinese version Report.

Opinion

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. In terms of reliability of the performance data, nothing came to our attention to suggest that these data have not been properly collated from information reported at operational level, nor that the assumptions used were inappropriate.

Observations

Without affecting our assurance opinion we also provide the following observations.

TSMC 2016 Corporate Social Responsibility Report provides an accurate and fair representation of the level of implementation of related Corporate Social Responsibility (CSR) policies, and meets the content requirements of the GRI G4. Based on GRI G4, the reported information generally meets the disclosure requirement for 'in accordance— Comprehensive' covering Generic Disclosures on Management Approach (DMA) and Performance Indicators for identified material aspects.

TSMC has developed its own data management system for capturing and reporting its CSR performance. In accordance with Moderate level assurance requirements, we conclude that no systematic errors were detected which causes us to believe that the specified CSR data and information presented in the Report is not reliable. The following is an excerpt from the observations and opportunities reported back to the management of TSMC.

- The management approach can be improved involving with social aspects. It is suggested to establish specific objectives/ targets for continuous performance improvement.
- Improving the accuracy and reliability by implementing internal verification during the internal audit in accordance with certified management system.
- Improving the data gathering process to cover all impact boundaries of significant aspects.

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DNV-GL

Materiality

The materiality determination process was revaluated based on survey from key stakeholders including employees, customers, suppliers, NGOs, governments, shareholders, investors, regulatory bodies, local 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 General and Specific Standard disclosures including the disclosure on management approach and performance indicators for identified material aspects for GRI G4 'In accordance – Comprehensive'. The reporting of performance and data are within the Company's reporting boundary and reporting period except for certain material aspects. A system to report the performance indicators are being established and set the internal time lines for disclosure.

Accuracy and Reliability

The majority of data and information verified at the Corporate Office and 3 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. Hence in accordance with DNV GL VeriSustain Protocol requirements for a moderate level assurance engagement, we conclude that the specified sustainability data and information presented in the Report is generally acceptable.

Induslity

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 significant CSR issues identified through this process are reflected in the Report.

Responsiveness

The Company has adequately responded to stakeholder concerns through its policies, CSR Committee, and management systems, and this is reflected in the Report.

Neutrality

The disclosures related to sustainability issues and performances are reported in a neutral tone, in terms of content and presentation, however Report could further bring out responses related to the challenges faced during the reporting period at various geographical locations of operations in terms of disclosure of all identified material aspects, sustainability goals and targets etc.

For and on behalf of DNV GL Business Assurance Co. Ltd.

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Lead Verifier
DNV GL – Business Assurance
Statement Number: 00002-2017-ACSR-TWN

Lin, Chun Nan
Reviewer
DNV GL – Business Assurance

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