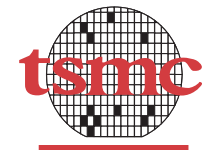




2011 TSMC  
Corporate  
Social  
Responsibility  
Report



# Table of Contents

## Overview----2

### 1. Letter from the Chairman and CEO----3

### 2. Company Profile----5

2.1 An Introduction to TSMC----5

2.2 Market Overview----6

2.3 Business Overview----6

2.4 Business Development----7

2.5 Intellectual Property----8

2.6 Trade Secret Protection----8

2.7 Membership in Industry Associations----8

2.8 Investor Engagement----8

2.9 Awards and Recognitions Received in the Reporting Period----11

2.10 Financial Highlights----11

### 3. Stakeholder Engagement----13

### 4. Corporate Governance----17

4.1 Governance Structure----17

4.2 Board of Directors----17

4.3 Audit Committee----18

4.4 Compensation Committee----18

4.5 Political Contributions----19

4.6 Code of Ethics and Business Conduct----19

4.7 Regulatory Compliance----20

4.8 Risk Management----21

### 5. A Great Place to Work----22

5.1 Right People with Shared Vision and Values----23

5.2 Work-Life Balance----28

5.3 Engaged People----30

5.4 Employees' Physical and Mental Well-being----32

5.5 Safety and Health----33

### 6. Customer Service and Supplier Management----40

6.1 Customer Service and Satisfaction----40

6.2 Supplier Management----41

### 7. TSMC Social Participation----47

7.1 TSMC Education and Culture Foundation----48

7.2 TSMC Volunteer Program----52

7.3 Alishan County Reconstruction Plan----55

7.4 Other Social Participation----59

### 8. Environmental Protection----61

8.1 Climate Change----63

8.2 Water Resource Management----68

8.3 Green Product----70

8.4 Pollution Prevention----72

8.5 Environmental Management System----77

8.6 Green Promotion Activities – Acting as A Positive Influence----79

### Appendix----83

TSMC CSR Performance Summary----84

Independent Assurance Opinion Statement----86

GRI G3.1 Index----89

ISO 26000 Index----98

United Nations Global Compact Comparison Table----100

Contact Information----101

# Overview

As a good corporate citizen, TSMC is fully committed to its corporate social responsibilities. We believe a company's corporate social responsibility is to uplift society, and also believe that strong employee and supplier relations, corporate governance, business ethics, social contribution, and environmental protection are the cornerstones of TSMC's sustainable growth.

In 2011, TSMC was again selected as a component of the Dow Jones Sustainability Index (DJSI) for the 11<sup>th</sup> consecutive year, which testifies to TSMC's global reputation in sustainability and investment value over the long run.

In our 2011 Corporate Social Responsibility (CSR) Report, we would like to share with you our continuing efforts in sustainable development along the economic, environmental and social dimensions.

## Report Scope and Profile

This report contains CSR-related data and activities of all TSMC fabs located in Taiwan, as well as our overseas subsidiaries such as TSMC China and WaferTech in the United States. Financial figures in this report are expressed in NT dollars unless otherwise specified. Environmental performance is expressed in commonly accepted benchmarks. This report outlines our performance in the full 2011 calendar year for the most relevant CSR issues to our stakeholders and our business.

We publish this report annually, and the previous report was published in June 2011. This report is compiled based on the Global Reporting Initiative (GRI) G3.1 framework; a table is attached in appendix for the readers' reference. In addition, we refer to ISO 26000 Guidance on Social Responsibility and United Nations Global Compact, and also provide a table in Appendix. This report is published in both English and Chinese and is available on TSMC's corporate website.

## Report Assurance

The British Standards Institution (BSI) reviewed this report against the AccountAbility AA1000 Assurance Standard and the GRI G3.1 guideline on materiality, inclusivity and responsiveness, and verified this report complies with GRI Application Level A+. BSI's Report Assurance Statement can be found at the end of this report.

# 1. Letter from the Chairman and CEO

TSMC believes there are many dimensions to corporate social responsibility. We both practice and push ourselves to improve our performance in the seven dimensions of “morals, business ethics, economy, rule of law, work/life balance, caring for the earth and the next generation, and philanthropy” in order to carry out the responsibilities that a good corporate citizen should bear. By doing our part in these seven dimensions, we can act as a stabilizing force in society, and inspire others to follow, and make society better.

We firmly believe that a corporation’s social responsibility is to act as an uplifting force in society to realize our vision of a society that works together towards sustainable development, equality and justice, and a harmonious environment to live and work. Our ten principles of corporate social responsibility are our criteria for continuing to bring positive change to society.

1. We insist on honesty and integrity. We are honest to our shareholders, employees, and to the public alike.
2. We respect the rule of law and always obey the law.
3. We oppose corruption and reject cronyism. We do not bribe, and do not curry favor with the government or any government official.
4. We practice good corporate governance, and balance the interests of shareholders, employees, and all stakeholders in the company.

5. We do not engage in politics.
6. We provide good job opportunities with a safe, comfortable, and intellectually challenging environment to give our employees both physical comfort and mental stimulation.
7. We contribute our part to controlling global climate change and place great importance on protecting the environment.
8. We emphasize and reward innovation, and manage the risks that innovation may bring.
9. We actively invest in green businesses such as solid state lighting and solar power to contribute to environmental protection and conservation.
10. We provide long-term care to communities and continue to support educational and cultural activities.

In the area of morals, TSMC insists on integrity, opposes corruption, and does not seek favor with government officials. In terms of business ethics, besides the principles above, TSMC maintains good corporate governance, transparent operations, meets commitments to all stakeholders, and encourages innovation to drive progress and prosperity in industry.



Along the economic dimension, TSMC's good corporate governance, outstanding operations, and promotion of innovation allows us to offer good job opportunities and an excellent return to shareholders, creating added value for society. In terms of rule of law, we do more than obey the law and oppose corruption; we hold ourselves to the highest standards of morality and business ethics.

In work/life balance, TSMC offers its employees good compensation and a high-quality work environment, and at the same time pays close attention to our employees' work/life balance. We advocate eliminating unnecessary meetings, improving work flows, raising efficiency, and ask managers to lead by example to reduce working hours and to give employees a balanced and healthy work environment.

We care for the earth and the next generation by providing a healthy living environment. Industry has an especially strong responsibility to protect the environment and care for the earth's resources, and TSMC is no exception. TSMC's new factories and office buildings all meet green building standards and use environmentally friendly equipment, and office areas also make use of many energy-saving measures.

While caring for the earth and the next generation, TSMC also does its part in corporate philanthropy. Our employees formed the TSMC Volunteer Society out of their own initiative to engage with society, including acting as docents at the National Museum of Natural Science, reading to schoolchildren, and acting as energy-saving volunteers to share their power conservation know-how with schools. Besides helping society, these volunteer activities

also bring happiness and balance to our employees. In addition, the company also established the TSMC Education and Culture Foundation to actively engage in social welfare, encourage scholarship, and support community and cultural activities.

TSMC will continue to redouble its efforts in the dimensions above to act as a positive force in society. While creating value for all our stakeholders, we hold firm to our commitments in environmental sustainability, and aspire to act as a benchmark for others. Through the hard work of all our employees at TSMC, we have won acclaim for our corporate governance, operations, investor relations, employee benefits, environmental protection, and other fields. Looking ahead, TSMC will persist in strengthening our performance and commitment in our principles to benefit all our stakeholders and build a better future for our society.

#### Corporate Social Responsibility: Uplift Society

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



*Morris Chang*  
Morris Chang,  
Chairman and CEO

# 2. Company Profile

## 2.1 An Introduction to TSMC

Founded on February 21, 1987 and headquartered in Hsinchu, Taiwan, TSMC pioneered the semiconductor foundry business model of focusing solely on manufacturing customers' semiconductor designs. Therefore, TSMC does not design, manufacture, or market semiconductor products under its own brand name, ensuring that TSMC does not compete directly with its customers.

With a diverse global customer base, TSMC-manufactured microchips are used in a broad variety of applications that cover various segments of the computer, communications, consumer, and other electronics markets.

Total capacity of the manufacturing facilities managed by TSMC, including subsidiaries and joint ventures, equated to 13.22 million 8-inch equivalent wafers in 2011. In Taiwan, TSMC operates three advanced 12-inch wafer fabs, four 8-inch wafer fabs, and one 6-inch wafer fab. TSMC also manages two 8-inch fabs at wholly owned subsidiaries: WaferTech in the United States and TSMC China Company Limited. In addition, TSMC obtains 8-inch wafer capacity from other companies in which the Company has an equity interest.

TSMC provides customer service through its account management and engineering services offices in North America, Europe, Japan, China, South Korea, and India. The Company employed more than 33,000 people worldwide as of the end of 2011.

TSMC continued to lead the foundry segment of the semiconductor industry in both advanced and "More-than-Moore" process technologies. Already the first foundry to provide 65nm and 40nm production capacity, TSMC in 2011 also reached volume production of 28nm featuring 28HP & 28HPM for high performance and 28LP & 28HPL for low power. In addition to general-purpose logic process technology, TSMC supports the wide-ranging needs of its customers with embedded non-volatile memory, embedded DRAM, Mixed Signal/RF, high voltage, CMOS image sensor, color filter, MEMS, silicon germanium technologies and automotive service packages.

In August 2011, TSMC transferred its Solar and Solid State Lighting businesses to its two new subsidiaries, "TSMC Solar Ltd." and "TSMC Solid State Lighting Ltd.", respectively.

The Company is listed on the Taiwan Stock Exchange (TWSE) under ticker number 2330, and its American Depositary Shares trade on the New York Stock Exchange (NYSE) under the symbol "TSM".



## 2.2 Market Overview

We estimate that the world-wide semiconductor market reached US\$300 billion of revenue in 2011, a 0.4% increase compared to 2010. Total foundry, a manufacturing sub-segment of the semiconductor industry, generated total revenues of US\$30 billion in 2011, or 5% YoY growth. In 2011, the largest geographic market (based on the location of customers' corporate headquarters) for foundry services was North America, accounting for 61% of overall foundry revenue. The second largest geographic market was Asia Pacific (excluding Japan), which accounted for 28% of foundry revenue. European-based customers accounted for 8%, and orders from companies based in Japan contributed 3%.

After 45% growth in 2010, foundry segment growth slowed down significantly to only 4% in 2011 compared to 2010. Sluggish end-demand and cautious inventory management caused by the softening global macro economy, as well as supply-chain disruption following the Japan earthquake and flooding in Thailand were among the factors that contributed to weak semiconductor growth, hence impacting the foundry segment.

We forecast total foundry sales to grow at 9% YoY in 2012. Longer term, supported by increasing semiconductor content in electronics devices, continuing market share gain of fabless semiconductor companies and increasing IDM outsourcing, foundry sales are expected to display a 9% compound annual growth rate (CAGR) from 2011 through 2016, higher than the 4% CAGR for the total semiconductor industry.

## 2.3 Business Overview

In 2011, TSMC maintained its leading position in the foundry segment of the global semiconductor industry, with an estimated market segment share of 48%. TSMC achieved this result amid intense competition from both established players and relatively new entrants to the business.

Leadership in advanced process technologies is a key factor in TSMC's strong market position. In 2011, 73% of TSMC's wafer revenue came from manufacturing processes with geometries of 0.13 $\mu$ m and below. By August 2011, TSMC shipped its millionth 45/40nm 12-inch wafer. TSMC also piloted the leading-edge 28nm process with its foundry customers. As of fourth quarter 2011, 59% of TSMC's wafer revenue came from 65nm processes and below.

With TSMC's focus on customer trust, the Company continuously strengthened its Open Innovation Platform<sup>®</sup> (OIP) in 2011 with additional innovative services. During the 2011 TSMC Technology Symposium and the 2011 Design Automation Conference (DAC) of the IEEE/ACM, the Company revealed TSMC Reference Flow 12.0, the 3<sup>rd</sup> revision of its radio frequency (RF) reference design kit, and the 2<sup>nd</sup> revision of its Analog Mixed-Signal Reference Flow, highlighting the success of design enablement through OIP. A two-day OIP Ecosystem Forum was held in October 2011 in San Jose, California, which was well attended by both customers and ecosystem partners to demonstrate the value of collaboration through OIP to foster innovations. Furthermore, the OIP business model was recognized by the Taiwan Government in its 1<sup>st</sup> National Industrial/Enterprise Innovations Award in December 2011, underscoring OIP's benefits to the semiconductor industry.

TSMC continued to advance its semiconductor roadmap in 2011. Examples of technologies the Company either developed or rolled out include:

- 20nm technology is under development to provide the best speed/power value for both performance-driven products like CPU (Central Processing Unit), GPU (Graphics Processing Unit), APU (Accelerated Processing Unit), FPGA (Field-Programmable Gate Array) and mobile computing applications including smartphones, tablets and high-end SoC (System-on-a-Chip).
- 28nm High Performance (28HP) technology for performance-driven markets like CPU, GPU, APU, FPGA & high-speed networking applications.
- 28nm High Performance Mobile computing (28HPM) technology for tablets, smartphones, and high-end SoC applications.
- 28nm Low Power (28LP & 28HPL) and RF (28HPL-RF) technology for mainstream smartphones, application processors, tablets, home entertainment and digital consumer applications.
- 40nm general purpose technology for performance-driven markets like CPU, GPU, FPGA, HDD (Hard Disk Drive), game console & Gigabit Ethernet applications.
- 40nm low power and RF technology for cellular baseband, application processor, DTV (Digital Television), STB (Set-Top-Box), game and wireless connectivity applications.
- 40nm and 65nm embedded Flash (eFlash) for non-volatile memory technologies under joint development for high-end automotive applications.
- 55nm low-power RF technology for WLAN (Wireless Local Area Network), cellular baseband, DTV, STB, Bluetooth, PMP (Personal Media Player), MID (Mobile Internet Devices) and other handheld applications.

- 55nm & 65nm technology for WLAN, cellular baseband, DTV, STB, Bluetooth, Blue-Ray DVD Player and HDD applications.
- 55nm and 85nm low power technology for flash controller application.
- 80nm high voltage process for fully integrated HD720 display drivers which could achieve "RETINA" display quality in smartphones.
- 90nm eFlash technology qualified and in production for ASIC and microcontroller applications.
- 0.18 $\mu$ m Extreme Low Leakage (eLL, reduced 98% leakage current from 0.18 $\mu$ m generic technology) eFlash technology qualified for extremely power sensitive applications.
- 0.18 $\mu$ m and 0.25 $\mu$ m qualified OTP (One-Time Programmable) solution for automotive applications.
- 0.18 $\mu$ m and 0.25 $\mu$ m high-precision analog process fully released for performance-driven mixed-signal applications.
- new generation 0.18 $\mu$ m BCD for digital power management is now in Beta site release stage that offers worldwide competitive Rds(on) performance to optimize IC cost structure.

In addition, TSMC further strengthened its comprehensive development of specialty technologies in 2011, including Backside Illumination CMOS image sensor (BSI CIS), 90/55nm embedded flash, 0.5 $\mu$ m ultra high voltage power IC and 0.13 $\mu$ m analog technologies. In 2011, TSMC offered a motion sensor 3D MEMS (Micro Electro Mechanical Systems) platform with 30 $\mu$ m thick MEMS structure and wafer level bonding for hermetic seal of MEMS device to first wave fabless customers. These first wave customers have adapted the platform structure with a separate ASIC driver chip for accelerometer application. TSMC will offer a fully-integrated CMOS 3D MEMS platform with design rules

in first quarter 2012 as a general offering. These specialty technologies are key differentiators from our competitors and provide customers more value added.

## 2.4 Business Development

### Position

As the leader in the semiconductor foundry segment, TSMC commanded a 48% share of this segment in 2011, with total consolidated revenue of US\$14.5 billion. In terms of geographic distribution of net sales, 69% came from companies headquartered in North America; 14% from the Asia Pacific region, excluding China and Japan; 9% from Europe, and 4% from China and 4% from Japan. By end product application, 22% of TSMC's wafer revenue came from the computer sector, 49% from communications, 10% from consumer products, and 19% from other categories, such as industrial products.

### Differentiation

TSMC's leadership position is based on a trinity of key differentiating strengths: technology leadership, manufacturing excellence, and customer trust. As a technology leader, TSMC has consistently been first among pure-play foundries in developing the next generation of leading-edge technologies. As a manufacturing leader, TSMC is renowned for its yield management, and offers best-in-class designer/developer support services to expedite time-to-market and time-to-volume. And, as to in customer trust, TSMC works closely with its customers on end-to-end collaboration to optimize design and manufacturing efficiencies. TSMC continually builds on this trinity of strengths to provide the best overall value to its customers.

### Strategy

TSMC is confident that its differentiating strengths will enable it to leverage the attractive growth opportunities in the foundry sector going forward. TSMC works constantly to ensure that these strengths are maintained and improved. For example, TSMC is intensively working on the leading-edge 28nm and 20nm processes to maintain its technology leadership position. Numerous efforts are also underway to ensure manufacturing excellence, such as continuing enhancement of Design-For-Manufacturing (DFM) support services to increase yield and efficiency. TSMC also expanded its Open Innovation Platform™ initiative, a set of ecosystem interfaces and collaborative components initiated and supported by TSMC that efficiently empowers innovation throughout the supply chain to enhance timely innovation. TSMC conducted customer reviews and surveys throughout 2011 to better understand customer needs and wants, and accordingly may adjust its offerings in response, thereby strengthening its relationship with customers. (For more details, please refer to 6.1 Customer Service and Satisfaction)

To address the dual challenges of falling wafer prices and fiercer competition from other semiconductor manufacturing companies, TSMC continually strengthens its core competitiveness, and properly deploys its short-term and long-term technology and business development plans in order to enhance its Return on Investment (ROI) and growth objectives.

- Short-term semiconductor business development plan
  - 1) Substantially ramp up the business in response to customer requirements and sustain our leadership position in the semiconductor industry, especially our leadership in market share of advanced semiconductor technologies with further investment on capacity.



- 2) Maintain market segment share of mainstream technology by expanding business into new technology applications and new customer and market segments through deployment of core logic technologies.
- 3) Grow business with Integrated Device Manufacturers (IDMs) by establishing a closer relationship on technology development.

- Long-term semiconductor business development plan

- 1) Continue developing leading edge technologies.
- 2) Broaden "More-than-Moore" business contributions by further developing derivative technologies.
- 3) Further expand TSMC's business and service infrastructure into emerging and developing markets.

## 2.5 Intellectual Property

A strong portfolio of intellectual property rights strengthens TSMC's technology leadership and protects our advanced and leading edge technologies. In 2011, TSMC received 440 U.S. patents, 146 Taiwanese patents, 180 PRC patents, and other patents issued in various other countries. TSMC's patent portfolio is now approximately 15,000 patents worldwide. We continue to implement a unified model for TSMC's intellectual capital management. Strategic considerations and close alignment with the business objectives drive the timely creation, management and use of our intellectual property.

At TSMC, we have built a process to extract value from our intellectual property by aligning our intellectual property strategy with our R&D, business objectives, marketing, and corporate

development strategies. Intellectual property rights protect our freedom to operate, enhance our competitive position, and give us leverage to participate in many profit-generating activities.

We have worked continuously to improve the quality of our intellectual property portfolio and to reduce the costs of maintaining it. We plan to continue investing in our intellectual property portfolio and intellectual property management system to ensure that we protect our technology leadership and receive maximum business value from our intellectual property rights.

## 2.6 Trade Secret Protection

To protect the TSMC's competitive edges and invaluable intellectual property, the Company is dedicated to Proprietary Information Protection (PIP) (e.g. protection of the trade secrets of TSMC, our customers, etc) to preserve the interests of the Company, customers, employees and shareholders. We established TSMC Proprietary Information Protection Policy, in which the management procedures and guidelines are well-defined.

Trainings and promotions are rolled out for every employee in TSMC. The Company reinforces the employees' awareness and capability for proprietary information classification and handling process. Regular audits are conducted as well as an annual PIP refresher training was rolled out for all TSMC employees in 2011. In addition, if violations of PIP policies occur, warnings or punishments will be delivered depending upon its severity. Legal action will also be undertaken in certain situations.

TSMC regards vendors as the Company's important partners, and thus provides security training and management to help them fit in with the Company's security culture. For each individual vendor, he/she must take PIP and work safety training, sign a nondisclosure agreement, and pass a work safety exam before receiving working badge. For the vendors' company, TSMC hosts a security symposium every quarter. During the gathering, vendor companies not only share successful experiences, but also review improvement plans. The symposium successfully helps vendors follow TSMC regulations.

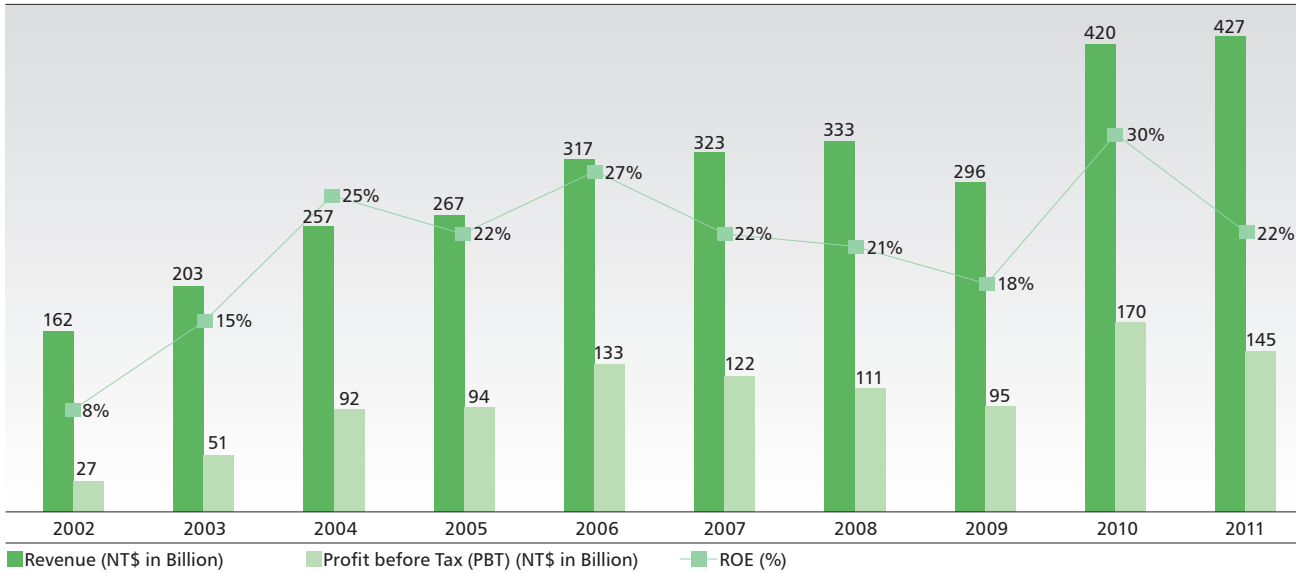
## 2.7 Membership in Industry Associations

As a semiconductor industry leader, TSMC actively participates in trade and industry associations. TSMC executives have been nominated to and hold senior positions in associations including the Taiwan Semiconductor Industry Association, the Association of Industries in Science Parks, the Chinese National Association of Industry and Commerce, the Taiwan Electrical and Electronic Manufacturers' Association, the Mount Jade Science and Technology Association of Taiwan, the Taiwan Business Council for Sustainable Development, and the Taiwan SOC Consortium and the Licensing Executives Society of Taiwan, holding positions such as Chairman or Executive Board Director. In addition, many TSMC employees also contribute to the semiconductor industry and professional associations by serving in industry associations as committee chairman or vice chairman in various committees.

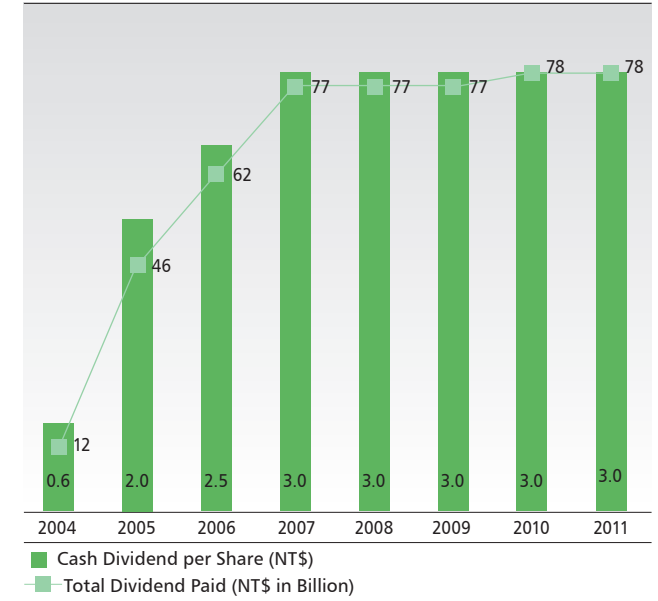
## 2.8 Investor Engagement

TSMC's business strategies and financial policies aim to uphold and increase shareholder value. We align ourselves with international standards that demonstrate our position and

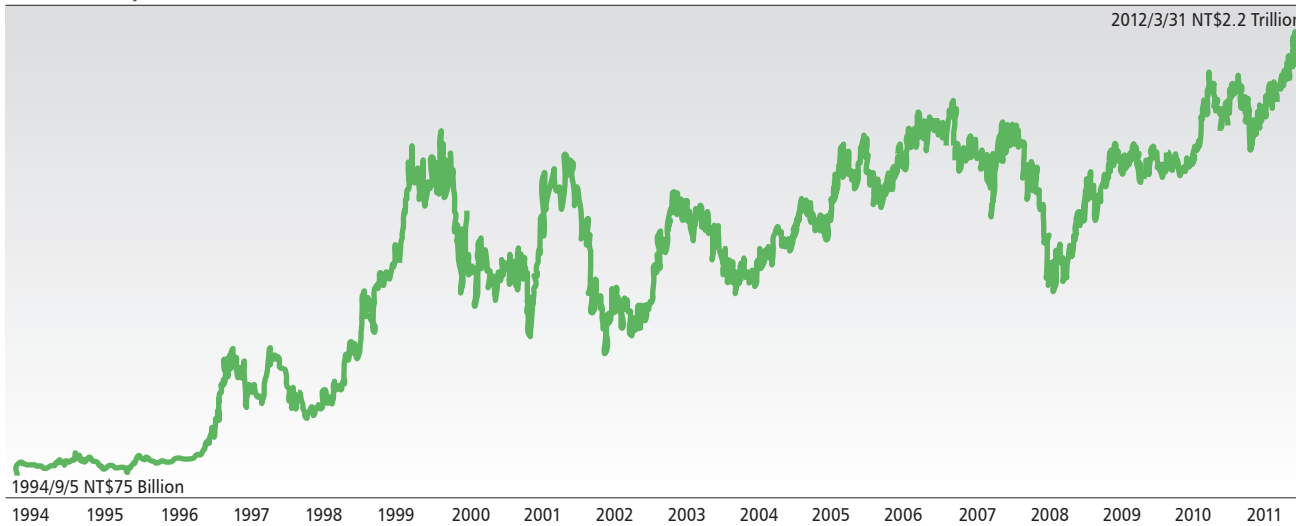
**TSMC Financial Performance – 10 Year Averaged ROE=21%; PBT CAGR=20%**



**Cash Dividend – Over NT\$500 Billion from 2004 to 2011**



**Market Capitalization – Over NT\$2 Trillion**



reputation as a sustainability champion, and have been included as a component of Dow Jones Sustainability Index (DJSI) for 11 consecutive years since 2001. In 2010, TSMC was named the DJSI Sector Leader among global semiconductor companies.

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 technology companies. In our core semiconductor business, we invest in opportunities that will expand our leadership in technology and capacity. In 2011, in addition to a record R&D budget, TSMC spent an unprecedented US\$7.3 billion on capital expenditures to meet the capacity needs of our customers. Moreover, we actively pursue new revenue opportunities in solid state lighting

and thin film solar photovoltaic technology, which leverage our technological strengths and engineering capabilities. We believe these investments will fuel TSMC's future growth and maximize our shareholder value.

In order to serve investors and the investment community, TSMC has established a highly effective communication system to disseminate information. Each quarter, our CEO and CFO jointly hold a face-to-face investor conference, followed by an audio conference call, to report and discuss company performance with investors worldwide. Replays of these conferences are then made available on the company website for investors' reference. Our Investor Relations team holds hundreds of investor and analyst meetings and conference calls annually, and actively participates in broker-sponsored investor conferences and non-deal roadshows, extending our reach in Asia, Europe and North America. In 2011, more than 260 such meetings and conference calls were held with investors worldwide. All these efforts are focused on serving worldwide investors with accurate, timely, and transparent information and financial data regarding TSMC business strategy, operations and performance. In addition, E-mail updates covering all business activities and key events are regularly sent to thousands of members of the investment community. Information regarding TSMC's business fundamentals and important filings with regulatory authorities are posted on TSMC's corporate website in a timely manner.

In order to increase shareholders' value, TSMC has set clear strategic financial objectives. These strategic financial objectives include: (1) average return on equity (ROE) across cycle greater or equal to 20%; (2) 10% profit before tax (PBT) compounded annual growth rate (CAGR) for the next five years. These financial

objectives can help investors better understand TSMC's long-term investment value, while our financial track record also gives investors higher confidence in TSMC's capability to achieve these financial objectives. For example, during the past 10 years, TSMC's averaged ROE was 21% and CAGR for profit before tax was 20%, both of which met our long-term financial objectives. Supported by solid financial performances, TSMC's share performance including cash dividends increased 11% during 2011, and significantly outperformed the Taiwan Stock Exchange Capitalization Weighted Stock Index (TAIEX) performance of -21% over the same period. Since the Company went IPO in 1994, TSMC's market capitalization has grown steadily. As of March 31, 2012, TSMC's market capitalization reached above NT\$2 trillion, or US\$70 billion.

Starting from 2004, TSMC has distributed cash dividends each year to our shareholders. From 2004 to 2011, TSMC has already paid out more than NT\$500 billion, or US\$16 billion, in cash dividends. Moreover, TSMC commits to our shareholders that our dividend policy is one that will maintain or steadily increase dividend per share (DPS) every year.

Investors surveyed annually by media have recognized the transparency of TSMC's disclosure policies, corporate governance commitment, and equitable treatment of shareholders. Furthermore, in 2011, TSMC was voted Best Investor Relations Company in Asia according to Institutional Investor survey and received Grand Prix for Best Overall Investor Relations in Greater China by *IR Magazine*. Total awards and recognitions received by TSMC in 2011 include:

### ***Institutional Investor***

- Best IR Company in Asia (Buy side voted / Technology Sector)
- Best IR Company in Asia (Sell side voted / Technology Sector)
- Best CEO in Asia (Buy side voted / Technology Sector)
- Best CEO in Asia (Sell side voted / Technology Sector)
- Best CFO in Asia (Buy side voted / Technology Sector)
- Best IR Professional in Asia (Buy side voted / Technology Sector)

### ***IR Magazine***

- Grand prix for best overall investor relations - Large cap in Greater China
- Best investor relations by sector - Technology & telecoms in Greater China
- Best overall investor relations by a Taiwanese company
- Best investment meetings in Taiwan
- Best reporting by a Taiwanese company
- Best investor relations by a CFO in Taiwan
- Best investor relations professional in Taiwan

### ***IR Global Rankings***

- Best Corporate Governance in Asia Pacific
- Best Corporate Governance in Greater China
- Best Overall Investor Relations in Taiwan
- Best Investor Relations by a CEO in Taiwan
- Best Investor Relations by a CFO in Taiwan
- Best Investor Relations Officer in Taiwan

### ***Corporate Governance Asia***

- Best CEO in Asia
- Best CFO in Asia
- Best Investor Relations by a Taiwan company
- Best Investor Relations Professional

## 2.9 Awards and Recognitions Received in the Reporting Period

TSMC actively participated in various CSR-related awards to share experience and gain external feedback. Through this participation, we gain a better understanding of external concerns and are able to review internal performance for continuous improvement. TSMC has been honored with many awards over the years, and our awards and recognitions received in 2011 are as follows:

### Corporate Social Responsibility

- Chosen for membership in the Dow Jones Sustainability World Index for an eleventh consecutive year.
- Awarded "Most Admired Company in Taiwan" by *CommonWealth Magazine* for the 15<sup>th</sup> consecutive year.
- Awarded "Excellence in Corporate Social Responsibility, First Prize" by *CommonWealth Magazine*.
- Recognized by the Taiwan Institute of Sustainable Energy (TAISE) with the "Gold Award for Taiwan Corporate Sustainability Reports" for a third consecutive year. TAISE is the first organization to initiate a Corporate Sustainability Report competition in Taiwan.
- Recognized by the Taiwan Institute of Sustainable Energy with their first "Outstanding CSR Website Award". TSMC was the sole winner of this award.
- Recognized by the Taiwan Stock Exchange with its Outstanding Disclosure Award for Listed Companies' Corporate Sustainability Reports.

### Environmental Protection

- Chairman Dr. Morris Chang received the Akira Inoue Award from Semiconductor Equipment & Materials International (SEMI) for contributions to environment, health and safety

management in the semiconductor industry. The Award recognizes individuals in industry and academia who have made significant contributions to EHS by exercising leadership or demonstrating innovation in the development of processes, products or materials that reduce EHS impacts.

- Received the Ministry of Economic Affairs (MOEA) Bureau of Foreign Trade's first "Taiwan Green Classic Award" in the categories of "Green Classic Product" and "Green Classic Service".
- Fab 12 Phases 4 and 5 were recognized by the Environmental Protection Administration with "The Annual Enterprise Environmental Protection Award".
- Fab 12 Phase 3 was recognized by the Ministry of Economic Affairs with the "Water Conservation Award".
- Fabs 3, 5, and Fab 12 Phases 1, 2, and 3 were recognized by the Hsinchu Science Park Administration with the "Low Carbon Enterprise Award".
- Fab 3 was recognized by the Hsinchu Science Park Administration with the "Water Conservation Award".
- Fab 12 Phases 4 and 5 were recognized by the Ministry of Economic Affairs with the "Energy Conservation Award".
- Fabs 2, 5, 3, 6, and 8 were recognized by the Environmental Protection Administration with the "Energy Conservation and Carbon Reduction Action Mark".
- The Fab 12 Phase 4 Office Building was recognized by Ministry of the Interior with the "Outstanding Green Building Honor Award".

### Safety and Health

- Fab 3 and Fab 12 Phases 4 and 5 were recognized by the Hsinchu Science Park Administration with the "Excellence in Labor Safety and Hygiene Award".

- TSMC's Tainan site was recognized by the Executive Yuan Department of Health with the "Outstanding Healthy Workplace Award".
- TSMC's Tainan site was recognized by the Tainan City Government with the "Excellence in Workplace Wellness Promotion Award".

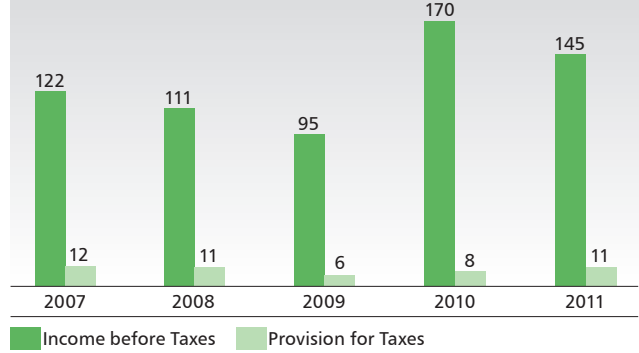
## 2.10 Financial Highlights

For 2010 earning distribution, TSMC paid dividends of NT\$3.0 in cash per common share in 2011.

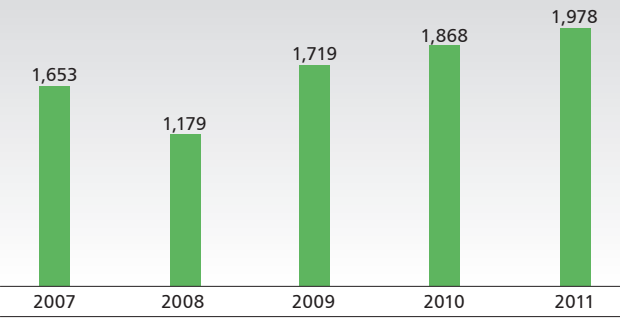
Based on increases on previous expansion, the purchase of production equipment and research and development expenditures, TSMC is entitled to tax incentives, such as tax exemption and investment tax credits in 2011 as follows:

Law/Statute	Item	(In Thousands of NT\$)
Article 9 of the Statute for Upgrading Industries	5-year tax exemption	13,832,239
Article 6 of the Statute for Upgrading Industries	Purchase of machinery and equipment	2,058,572
Article 6 of the Statute for Upgrading Industries	R&D and personnel training expenditures	1,827,002
Article 10 of the Statute for Industrial Innovation	R&D expenditures	2,432,641

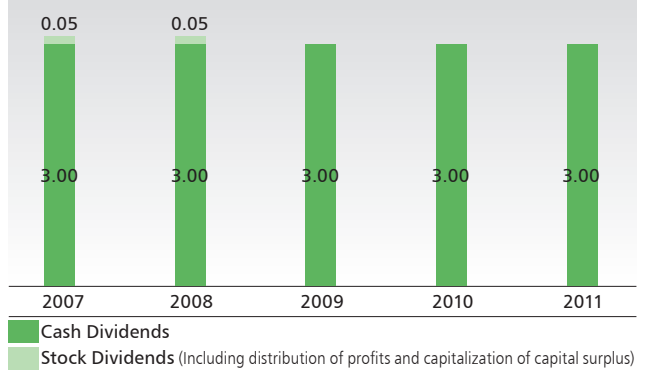
**Income before Taxes and Provision for Taxes** Unit: in NT\$ billion



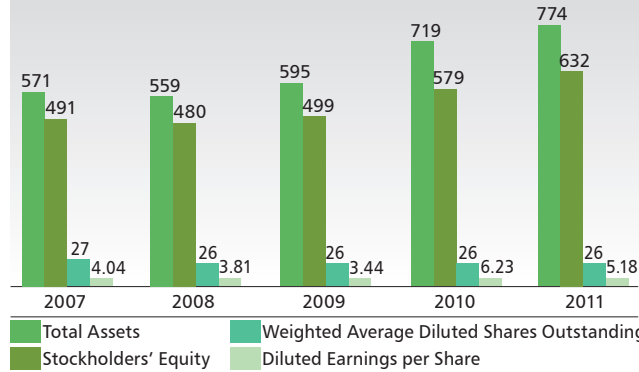
**Market Capitalization — Year End** Unit: NT\$ in billion



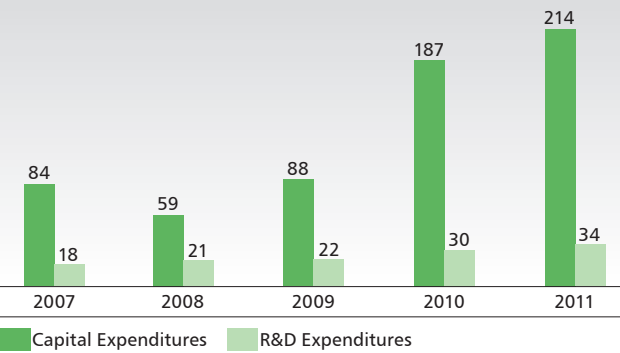
**Dividends Distribution** Unit: NT\$ in billion



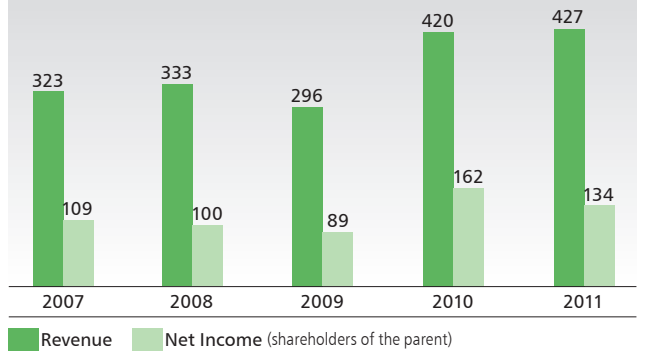
**Assets and Capitalization — Year End** Unit: NT\$ in billion



**Capital and R&D Expenditures** Unit: NT\$ in billion



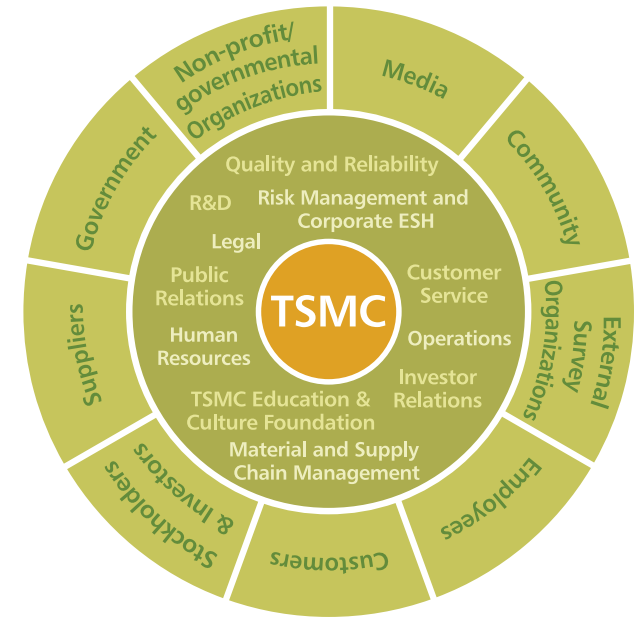
**Revenue and Net Income** Unit: NT\$ in billion



# 3. Stakeholder Engagement

TSMC pursues sustainable operations and establishes multiple transparent and effective communication channels with stakeholders. These channels help TSMC understand their needs and expectations, which serve as important references for our CSR policy and plans. TSMC stakeholders include employees, customers, suppliers, stockholders and investors, non-profit/governmental organizations, communities, government, external survey organizations, and media. TSMC formed a CSR taskforce led by Volunteer Association President Ms. Sophie Chang and Senior Vice President Lora Ho. TSMC's CSR taskforce includes Customer Service, Human Resources, Investor Relations, Legal, Material and Supply Chain Management, Operations, Public Relations, Quality and Reliability, R&D, Risk Management and Corporate ESH, and the independent TSMC Education & Culture Foundation for a total 24 representatives participating in our CSR quarterly meeting. These units compile stakeholders' concerns through various channels, communicate with them, and ensure implementation of appropriate initiatives and programs responsive to those interests and concerns.

TSMC and Stakeholders

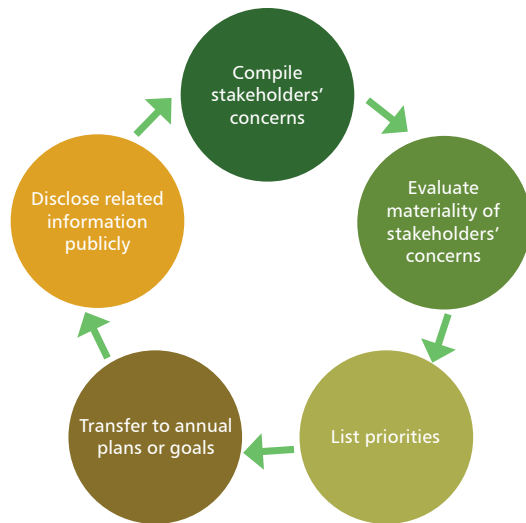


### Stakeholders' Concerns Management Procedure

TSMC applies a "Plan-Do-Check-Act" model to improve social responsibility performance through continuous communication with stakeholders and invites them to participate in many of our activities. Our goals for managing stakeholder concerns are as follows:

- Fully understand stakeholders' concerns and continue to improve CSR-related performance.
- Obtain stakeholders' trust and respect for TSMC.
- Disclose TSMC's efforts and performance to maintain and enhance TSMC's reputation.

### TSMC Identification Procedure for Stakeholders' Concerns



### Topics of Concern for TSMC Stakeholders and Communication Channels

Stakeholder	Communication Channels	Topics of Concern	2011 TSMC's Approaches and Achievements (Please Refer to Related Contents in This Report for Details)
Employees	<ul style="list-style-type: none"> <li>• Announcements</li> <li>• Human resource representatives</li> <li>• Regular / Ad-hoc communication meetings</li> <li>• Employee suggestion channels, such as immediate response system/HR employee suggestion box/wellness center/wellness website</li> </ul>	<ul style="list-style-type: none"> <li>• Labor relations</li> <li>• Employee recognition</li> <li>• Salary and benefits</li> <li>• Occupational health and safety</li> </ul>	<ul style="list-style-type: none"> <li>• 5. A Great Place to Work (page 22)</li> </ul>
Customers	<ul style="list-style-type: none"> <li>• Annual customer satisfaction survey</li> <li>• Customer quarterly business review meeting</li> <li>• Customer audits</li> </ul>	<ul style="list-style-type: none"> <li>• Green product</li> <li>• Conflict mineral free survey</li> <li>• Proprietary information protection</li> </ul>	<ul style="list-style-type: none"> <li>• 8.3 Green Product (page 70)</li> <li>• 8.6 Green Promotion Activities – Acting as A Positive Influence (page 79)</li> </ul>
Suppliers	<ul style="list-style-type: none"> <li>• Supplier quarterly business review meeting</li> <li>• Supplier questionnaire survey</li> <li>• Supplier on-site audit</li> <li>• Annual supply chain management forum</li> </ul>	<ul style="list-style-type: none"> <li>• Supply chain management</li> <li>• Environmental Safety &amp; Health (ESH) management</li> <li>• Legal compliance</li> </ul>	<ul style="list-style-type: none"> <li>• 6.2.2 Establishing A Sustainable Supply Chain (page 42)</li> </ul>
Stockholders & Investors	<ul style="list-style-type: none"> <li>• Annual Shareholder Meeting</li> <li>• Quarterly Institutional Investors' Conference</li> <li>• Quarterly Operation Conference</li> </ul>	<ul style="list-style-type: none"> <li>• Financial information</li> <li>• Operational status</li> <li>• Investment plan</li> <li>• Proprietary information protection</li> </ul>	<ul style="list-style-type: none"> <li>• 2.6 Trade Secret Protection (page 8)</li> <li>• 2.8 Investor Engagement (page 8)</li> </ul>
Government	<ul style="list-style-type: none"> <li>• Official documents</li> <li>• Communication meetings or public hearings on regulations</li> <li>• Communication with government authorities through industry organizations, including the Association of Science Park Industries, Taiwan Semiconductor Industry Association, World Semiconductor Council, and Chinese National Federation of Industries</li> </ul>	<ul style="list-style-type: none"> <li>• Greenhouse gas reduction</li> <li>• Water resource management</li> <li>• Green product</li> <li>• Energy and water saving</li> </ul>	<ul style="list-style-type: none"> <li>• 8.1 Climate Change (page 63)</li> <li>• 8.2 Water Resource Management (page 68)</li> <li>• 8.3 Green Product (page 70)</li> <li>• 8.1.2.4 Energy Conservation Measures (page 65)</li> </ul>
Community	<ul style="list-style-type: none"> <li>• Volunteer activities</li> <li>• TSMC Education &amp; Culture Foundation</li> <li>• Corporate website/email</li> </ul>	<ul style="list-style-type: none"> <li>• Volunteer services</li> </ul>	<ul style="list-style-type: none"> <li>• 7. TSMC Social Participation (page 47)</li> </ul>
Non-profit / governmental Organizations	<ul style="list-style-type: none"> <li>• Volunteer activities</li> <li>• Government-sponsored conferences</li> </ul>	<ul style="list-style-type: none"> <li>• Philanthropic activities</li> <li>• Global climate change</li> </ul>	<ul style="list-style-type: none"> <li>• 7. TSMC Social Participation (page 47)</li> <li>• 8.1 Climate Change (page 63)</li> </ul>
External survey organizations	<ul style="list-style-type: none"> <li>• Questionnaire surveys</li> <li>• Corporate website and email</li> <li>• Awards and competitions</li> </ul>	<ul style="list-style-type: none"> <li>• Global climate change</li> <li>• Water resource management</li> <li>• Ecological preservation</li> </ul>	<ul style="list-style-type: none"> <li>• 8.1 Climate Change (page 63)</li> <li>• 8.2 Water Resource Management (page 68)</li> <li>• 8.4 Pollution Prevention (page 72)</li> </ul>
Media	<ul style="list-style-type: none"> <li>• Press conferences</li> <li>• Interviews</li> <li>• Press releases</li> </ul>	<ul style="list-style-type: none"> <li>• Economic status and operational growth</li> <li>• New fab planning and expansion</li> <li>• Employee recruitment</li> </ul>	<ul style="list-style-type: none"> <li>• 1. Letter from the Chairman and CEO (page 3)</li> <li>• 2. Company Profile (page 5)</li> <li>• 5. A Great Place to Work (page 22)</li> </ul>

TSMC compiles stakeholders' concerns through multiple channels established by CSR-related units, then prioritizes concerns according to their impact on the company. Stakeholders' concerns are divided into significant, medium and general topics to be included in daily work or annual plans of related units, or become cross-function projects for sustainable development.

TSMC also contacts stakeholders actively to understand their expectations and to let them know our efforts and performance. In addition, all external stakeholders can contact responsible people through the TSMC website [http://www.tsmc.com/english/contact\\_us.htm](http://www.tsmc.com/english/contact_us.htm), or submit questions or recommendations to our CSR taskforce through our CSR mailbox ([csr@tsmc.com](mailto:csr@tsmc.com)).

TSMC believes that maintaining good communication with stakeholders can not only help us understand our economic, social and environmental challenges, but also creates value for our company and society, allows the company to continue sustainable growth.

### Stakeholder Materiality Analysis





## Extending Beyond Our Company To Build A Better Society: Examples of TSMC Collaboration with Stakeholders

### TSMC and stakeholders collaborate to complete Taiwan's First "Semiconductor Supply Chain Carbon Footprint Program"

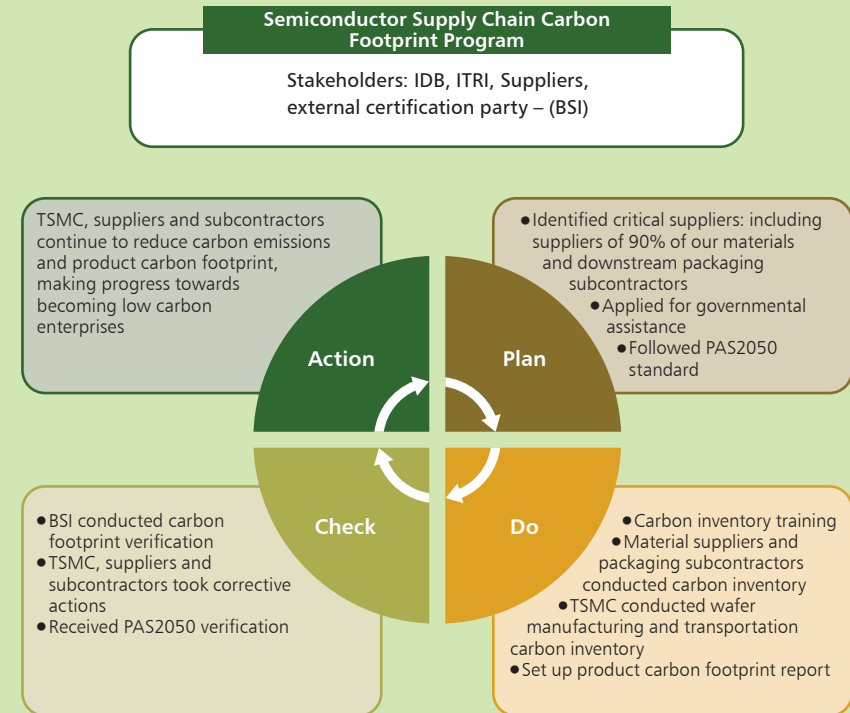
As the challenge of global climate change grows more severe, environmental protection has become an increasingly important business trend and corporate responsibility. Governments and enterprises around the world have acknowledged that climate change is a grave future challenge that will impact peoples' livelihood, and have begun to engage in energy saving and carbon reduction. TSMC was a pioneer in setting up a carbon inventory system in 2002, and led 20 suppliers to complete a "Supply Chain Carbon Inventory Assistance Plan" in 2009 in accordance with our commitment for establishing a green supply chain.

#### From Carbon Inventory to Carbon Footprint

TSMC led 15 supplier partners in jointly completing a "Semiconductor Supply Chain Carbon Footprint Program" with assistance from the Taiwan Ministry of Economic Affairs' Industrial Development Bureau (IDB) and the Industrial Technology Research Institute (ITRI) to implement Wafer and Integrated Circuit (IC) product carbon footprint verification in 2010.

TSMC followed the PAS2050 standard and assisted suppliers to establish competence in carbon inventory and carbon emissions calculation through a series of training courses. We selected 12-inch wafer and IC package products and calculated carbon emissions from materials mining, material manufacturing, material transportation, wafer manufacturing, wafer transportation and IC packaging, and then converted this data into a carbon footprint. In February 2011, our 12-inch wafer and IC packaging products were verified by an external certification organization – the British Standards Institution (BSI) – according to the PAS2050 standard.

TSMC continues to collaborate with ITRI to complete product carbon footprints for our 6 and 8-inch wafers, and we expect to complete carbon footprints for all of our products in 2012. To carry out our green mission, TSMC will continue to keep abreast of new trends in global environmental protection, collaborate with stakeholders to share energy saving and carbon reduction experience, and join hands to do our part for climate change mitigation.



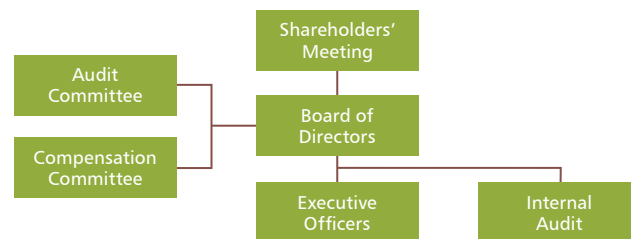
# 4. Corporate Governance

TSMC advocates and acts upon the principles of operational transparency and respect for shareholder rights. We believe that the basis for successful corporate governance is a sound and effective Board of Directors. In line with this principle, TSMC's Board of Directors established an Audit Committee in 2002 and a Compensation Committee in 2003.

TSMC has established the "Rules and Procedures of Board of Directors Meetings", "Audit Committee Charter", and "Compensation Committee Charter" to govern the operation and process of the Board of Directors, Audit Committee and Compensation Committee.

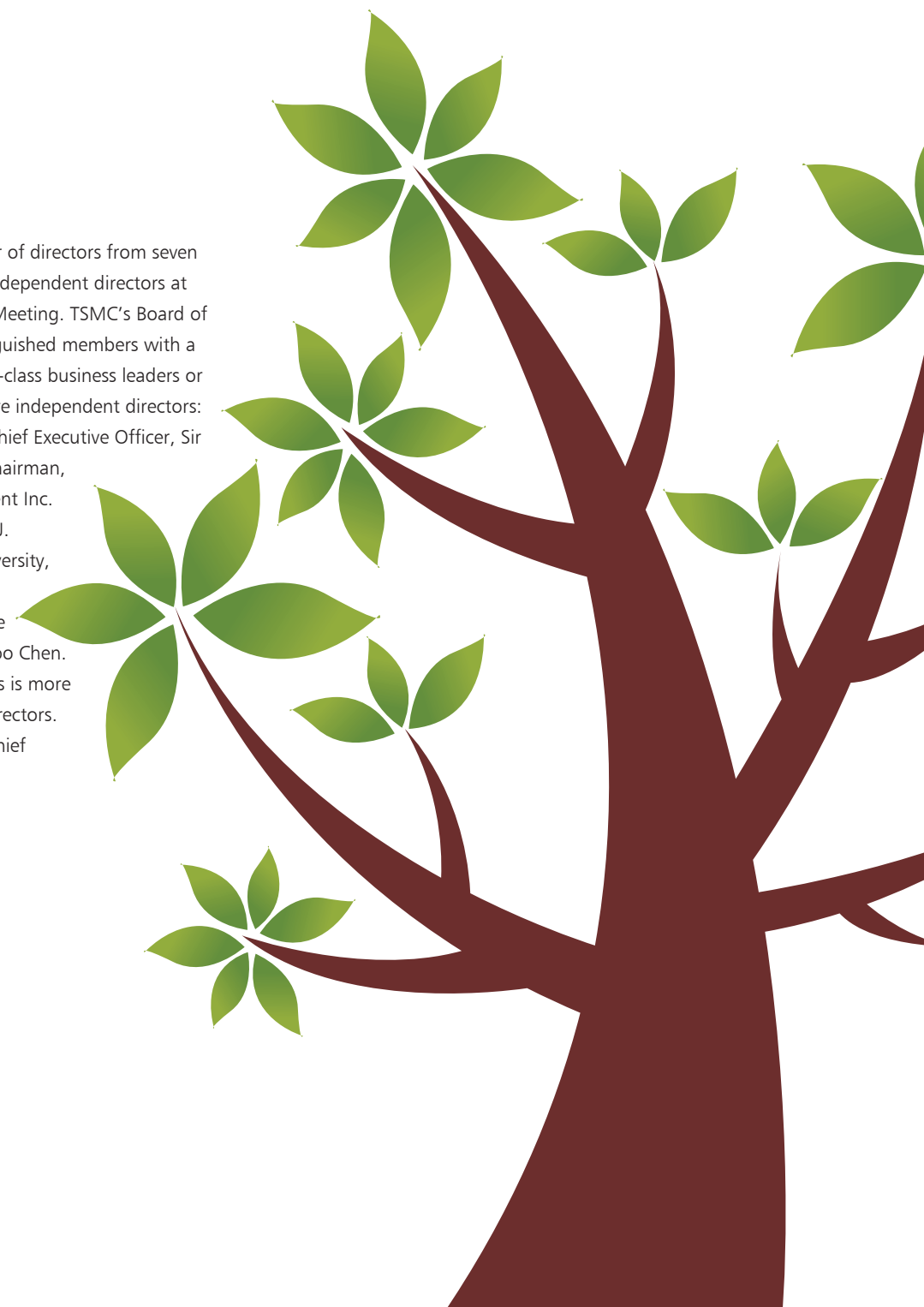
## 4.1 Governance Structure

TSMC's governance structure is as follows:



## 4.2 Board of Directors

In 2011, TSMC increased the number of directors from seven to nine and elected two additional independent directors at TSMC's 2011 Annual Shareholders' Meeting. TSMC's Board of Directors now consists of nine distinguished members with a great breadth of experience as world-class business leaders or scholars. Five of the nine members are independent directors: former British Telecommunications Chief Executive Officer, Sir Peter Bonfield; former Acer Group Chairman, Mr. Stan Shih; former Texas Instrument Inc. Chairman of the Board, Mr. Thomas J. Engibous; Professor of Princeton University, Gregory C. Chow; and an advisor to the Taiwan Executive Yuan and the Taipei City Government, Ms. Kok-Choo Chen. The number of Independent Directors is more than 50% of the total numbers of Directors. Chairman Morris Chang is also the Chief Executive Office of the Company.



Under the leadership of Chairman 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 maintaining of highest integrity within the Company. TSMC's Board of Directors strives to perform through the Audit Committee and the Compensation Committee, the hiring of a financial expert for the Audit Committee, coordination with the Internal Audit department, and through the ombudsman reporting system.

The second duty of the Board of Directors is to provide guidance to the management team of the Company. Quarterly, TSMC's management reports to the TSMC Board on a variety of subjects which include the management of economic, environmental, and social performance, including relevant risks and opportunities, and adherence or compliance with internationally agreed standards, codes of conduct, and principles. The management also reviews the Company's business strategies with the Board. Furthermore, the management often reviews with and updates TSMC's Board on the progress of the strategies, obtaining Board guidance as appropriate.

The third duty of the Board of Directors is to evaluate the management's performance and to dismiss officers of the Company when necessary. TSMC's management has maintained a healthy and functional communication with TSMC Board of Directors, has been devoted in executing guidance of TSMC Board of Directors, and is dedicated in running the business operations, all to achieve the best interests for TSMC shareholders.

The Board meets at least once every quarter. The Chairman convened four regular meetings and two special meetings in 2011.

### **4.3 Audit Committee**

The Audit Committee assists the Board in carrying out its financial oversight responsibilities and other duties as set forth in the Company Act, the Securities and Exchange Act, and other applicable laws and regulations. Matters required to be reviewed by the Audit Committee include the Company's: financial reports; auditing and accounting policies and procedures; internal control systems; potential conflicts of interests; material asset or derivatives transactions; offering or issuance of any equity-type securities; hiring or dismissal of an attesting CPA or the compensation given thereto; and appointment or discharge of financial, accounting, or internal auditing officers. Furthermore, the Risk Management Division also reports to the Audit Committee on enterprise risk management activities on a regular basis.

TSMC's Audit Committee is empowered by its Charter to conduct any study or investigation it deems appropriate to fulfill its responsibilities. It has direct access to TSMC's internal auditors, the Company's independent auditors, and all employees of the Company. The Committee is authorized to retain and oversee special legal, accounting, or other consultants as it deems appropriate to fulfill its mandate, and meets at least once every quarter.

The Audit Committee consists of five independent directors and a financial expert consultant. Sir Peter Bonfield was Chairman of the Audit Committee, and convened four regular meetings in 2011. In addition to these meetings, the Audit Committee members and consultant participated in five telephone

conferences to discuss the Company's Annual Report to be filed with the Taiwan and U.S. authorities and investor conference materials with management.

### **4.4 Compensation Committee**

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 Committee meets at least once every quarter.

The Compensation Committee consists of all five independent directors; the Chairman of the Board, Dr. Morris Chang, shall be invited by the Committee to attend all meeting and is excused from the Committee's discussion of his own compensation. Mr. Stan Shih was Chairman of the Compensation Committee, and convened four regular meetings in 2011.

The compensation for directors are determined in accordance with the procedures set forth in TSMC's Articles of Incorporation. The Articles of Incorporation also provides that the compensation to directors shall be no more than 0.3% of earnings available for distribution. Directors who also serve as executive officers of the Company are not entitled to receive director compensation. The distribution of compensation to directors shall be made in accordance with TSMC's "Rules for Distribution of Compensation to Directors".

The compensation and profit sharing paid to executives are also reviewed by the Compensation Committee individually based on their job responsibility, contribution, and projected future risks facing the Company before the compensation and profit sharing proposals are submitted to the Board of Directors for approval.

## **4.5 Political Contributions**

TSMC has consistently remained politically neutral, but encourages employees to fulfill their duties as citizens and actively participate in politics and vote for the candidates the employees believe to be the best public servants. TSMC executives have also expressed concerns from time to time and have made public comments on certain matters affecting industry, the economy and our employees livelihood. In the past, TSMC made legally proper political donations to local political parties between 2000 and 2004 to support the development of democracy in Taiwan. Due to a recent Taiwan legislation, TSMC is now prevented from making political contributions because it is over 50 percent owned by foreign investors. TSMC has fully complied with this newly enacted law.

## **4.6 Code of Ethics and Business Conduct**

### **4.6.1 Ethics Values**

Integrity is the most important core value of TSMC's culture. TSMC is committed to act ethically in all aspects of our business; constantly and vigilantly promoting integrity, honesty, fairness, accuracy, and transparency in all that we say and do.

TSMC's Code of Ethics and Business Conduct (the "Code") applies to TSMC and its subsidiaries, and this Code requires that each employee bears a heavy personal responsibility to preserve and to protect TSMC's ethical values and reputation and to comply with various applicable laws and regulations.

In so doing, each of us: must not advance our personal interests at the expense of, or in conflict with the Company; must refrain from corruption, unfair competition, fraud, waste and abuse; must not undertake any practices detrimental to TSMC, the environment and to society; must abide by both the spirit and letter of all applicable laws, rules and regulations; and must avoid any efforts improperly to influence the decisions of anyone, including government officials, agencies, and courts, as well as our customers, suppliers, and vendors.

In order to continue to build an environment of innovation, technology leadership, and sustainable profitable growth, the Code requires that we must promote business relationships founded upon an unwavering respect for the intellectual property rights, proprietary information and trade secrets of TSMC, our customers, and others; and the proper use of the Company's assets, not for personal use, but for achieving TSMC's vision for many years to come.

All employees, officers and Board members must wholeheartedly embrace and practice the Code. TSMC's management must set the best example of integrity and ethical conduct. TSMC's officers, especially our CEO, CFO, and General Counsel, with oversight from our Board, are responsible for the full,

fair, accurate, timely, and understandable financial accounting and financial disclosure in reports/documents filed by the Company with securities authorities and in all TSMC public communications/disclosures.

### **4.6.2 Code Administration and Disciplinary Action**

All employees, officers and managers must comply with the Code and the other policies and procedures. TSMC expects our customers, suppliers, vendors, advisors and others with which we come into contact to understand and respect the Company's ethics standards and culture.

As part of our ethics compliance program, all employees must disclose any matters that may or have the appearance of undermining the Code, such as conflict of interest. Key employees and senior officers must periodically declare their compliance status with the Code. To encourage an open culture of ethics compliance, we also have implemented several related policies that allow employees or any whistleblowers with relevant evidence to report any financial, legal, or ethical irregularities through the "Complaint Policy and Procedures for Certain Accounting and Legal Matters" or "Procedures for Ombudsman System". When an employee finds or suspects a breach of this Code, he/she should report it immediately to any of the following persons: their supervisor; the Function Head of Human Resources; the Company's Ombudsman; or to the Chairman of the Company's Audit Committee, depending on the nature of the suspected breach.

In order to promote a culture of awareness, we have made available through easy access all of our various policies on our intranet and require all employees to be trained on our core values and compliance regime. Our compliance program includes regular live seminars and online training on the requirements to prevent bribery and protect our intellectual property and other topics on ethics are also available for all employees. Our intranet website posts numerous guidelines and informative articles on ethics and honorable business conduct. We also require our stakeholders such as our suppliers, vendors and other partners to accept and abide by the same high ethical standard to which we hold all of our officers and employee. For example, we require all of our suppliers, vendors and partners to declare in writing that they will not engage in any fraud or provide unethical conduct when dealing with us or our officers and employees. We have established an online "hotline" that any relevant person may use to report any ethical irregularities to be investigated personally by designated senior management of TSMC.

The internal auditors of TSMC regularly audit the compliance by the Company, our vendors, suppliers, and customers, of relevant rules and regulations.

TSMC Internal Audit assist the Board of Directors and Management in inspecting and reviewing whether the TSMC's internal control system is adequate in design and effective in operation to ensure:

- Financial, managerial, and operating information is accurate, reliable, and timely.
- Legislative or regulatory issues impacting the organization are recognized and addressed properly.

- Employee's actions are in compliance with policies, standards, procedures, and applicable laws and regulations.
- Resources are acquired economically, used efficiently, and adequately protected.

To achieve the above objectives, Internal Audit submit the annual audit plan incorporating the regulatory compliance audit projects to the Board of Directors for approval. Subsequent to the audit, Internal Audit report the audit findings along with issue follow-up to the Board and Management on a regular basis.

We have a "zero tolerance" rule for any violation of any ethics rule. Simply put, any officer or employee regardless of their seniority will be severely punished (including immediate dismissal) and prosecuted to the full extent of our policies and the law, for any violation of our ethical standards. For example, the Company prosecuted two legal actions against former employees for misappropriation of the Company's intellectual property and bribery in 2011. Additionally, TSMC terminated 9 employees during 2011 for PIP and other ethics Rules.

#### **4.7 Regulatory Compliance**

TSMC's management team closely monitors both domestic and foreign government policies and regulatory developments that could have a material impact on TSMC's business and financial operations, and have established related risk management procedures. In addition to TSMC's Code of Ethics and Business Conduct, TSMC has established other policies, guidelines and procedures concerning compliance with laws and regulations in many other areas, including: anti-Bribery/corruption, anti-Harassment/discrimination, antitrust (unfair competition),

environment, export control, financial reporting/internal controls, insider trading, intellectual property, proprietary information protection ("PIP"), privacy and so forth. With respect to "PIP", it is one of the key 6 strategies of TSMC as announced in June 2010.

TSMC also executes compliance programs on a variety of compliance areas, all of which are well defined and communicated throughout the Company. Highlights of our compliance educational program include the following:

- A wide range of on-line learning programs is designed to provide employees with an understanding of the law and key compliance issues. Topics available via on-line learning including competition law (antitrust), environmental protection, insider trading, export control management, PIP and more.
- Live seminars are offered for topics related to antitrust, anti-harassment, financial reporting, etc. They are mandatory to senior managers and employees with job functions that are heavily focused on one of these compliance areas.
- Members of our legal team regularly attend outside training in Taiwan and abroad to receive legal updates and new development in compliance.
- Invite legal professionals and industry experts to lecture on new area of knowledge and latest developments on industry-specific compliance matters.
- To enhance compliance and risk management to subsidiaries, we regularly hold compliance meetings with them to ensure all of our subsidiaries are aligned with the compliance standards at TSMC headquarters.

To increase awareness of all employees in relation to the various compliance topics, we also regularly publish legal articles on our dedicated legal website. The articles are specially designed in the format of short stories and guidelines to effectively educate employees with an overview and general concepts of the various compliance areas. The initiatives taken to promote the publishing of each article including poster campaign, advertising on TSMC's internal website and by sending email notifications.

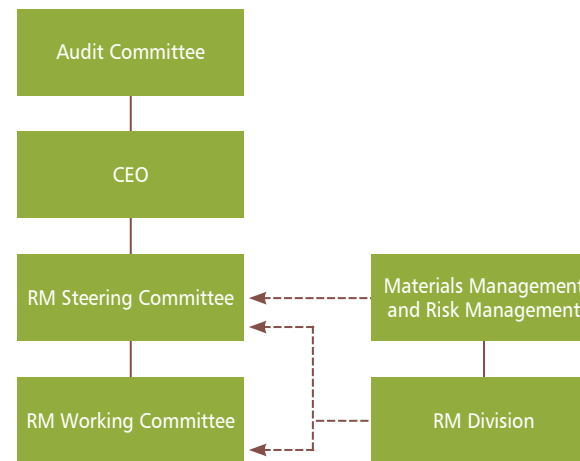
In 2011, TSMC has not been subject to any significant monetary fines and/or nonmonetary sanctions for noncompliance with any statutory laws and regulations, other than minor administrative fines (around US\$400) for incomplete record-keepings in connection with personnel management. After communicating with the authorities, TSMC has been completing relevant remedial measures.

#### 4.8 Risk Management

TSMC and its subsidiaries are committed to proactively and cost-effectively integrating and managing strategic, operational, financial and hazardous risks together with potential consequences to operations and revenue. TSMC established its Enterprise Risk Management (ERM) program based on both its corporate vision and its long-term sustainability and responsibility to both industry and society. ERM seeks to provide for the appropriate management of risks by TSMC on behalf of all stakeholders. Risk map considering likelihood and impact severity is applied for identifying and prioritizing corporate risks.

To reduce TSMC's supply chain risks, a cross-function taskforce comprised of members from fab operations, material management, risk management and quality system management worked with TSMC's primary suppliers to develop business continuity plans, and effectively manage the risks faced by our suppliers. As a result of those efforts, the March 11 earthquake in Japan did not cause any interruptions in TSMC's supply lines. As TSMC expanded capacity in 2011, risk treatment practices and green factory projects were initiated and implemented, beginning in the design phase for all new fabs.

Risk Management organization chart illustrated as follow:



- **RM Steering Committee:**

- Reports to Audit Committee;
- Is composed of functional heads;
- Reviews risk control progress; and
- Identifies and approves the prioritized risk lists.

- **RM Working Committee:**

- Is composed of representatives from each function;
- Aligns functional ERM activities; and
- Follows up the risk control action plan.

- **RM Division:**

- Coordinates the RM Working Committee activities;
- Facilitates functional risk management activities; and
- Consolidates ERM reports into the RM Steering Committee.

## 5. A Great Place to Work

TSMC has set many key semiconductor industry milestones since its establishment in 1987. We contribute toward a better life for all of society in collaboration with our partners. We are able to reach these achievements because of our competitive advantages of technology leadership, manufacturing excellence, and customer trust, which spring from the Company's clear vision, strong core values, effective strategies and powerful execution. The lynchpin of our success is our ability to continuously attract and develop talent who recognize our vision and values, and work together for our sustainable growth. TSMC truly believes that talent is our most important asset.

Our core values are integrity, commitment, innovation and customer trust, and our principles for human resources originate from these core values. For example,

- The first thing we consider when hiring is the person's character and capabilities because integrity is our basic belief.
- We are devoted to providing career opportunities that offer above-average compensation because we are highly committed to our employees. At the same time, we hope our employees will commit themselves to the Company as well and do their best to contribute to the Company.
- We encourage our employees to make valuable innovations because innovation is the wellspring of the Company's growth.

Based on these principles, all our human resources policies and practices have only one goal: to enhance the Company's overall productivity and effectiveness. Therefore, our employees can not only perform their job excellently but also balance their work and life, enjoying a fulfilling lifestyle.

In 2011, TSMC was awarded by Taiwan's most prestigious *CommonWealth Magazine* "Most Admired Company in Taiwan" for a 15<sup>th</sup> consecutive year and "Corporate Citizenship Award", recognizing our achievement on corporate governance,



TSMC won the Executive Yuan Council of Labor Affairs' first "Outstanding Employee Assistance Program" award.

commitment, and employees' development. Furthermore, we also won the Executive Yuan Council of Labor Affairs' first "Outstanding Employee Assistance Program" award, affirming the Company's continuous efforts in creating a friendly workplace.

## 5.1 Right People with Shared Vision and Values

To attract, retain and develop the right people has always been the focus of our efforts on recruiting, staffing, compensation, performance management, and training and development. By right people, we mean people who share the same vision and values with the Company. "People with shared vision" means people aimed in the same direction, while "people with shared values" means people who do things based on the same guidelines. Through various 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 TSMC and our employees.

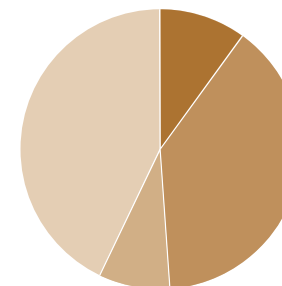
### 5.1.1 Stable and Healthy Workforce

At the end of 2011, TSMC and its overseas subsidiaries had 33,669 employees (over 35,000 employees if consolidating TSMC and its non-wholly owned subsidiaries), including 3,374 managers and 13,111 professionals, 2,745 assistants, and 14,439 technicians.

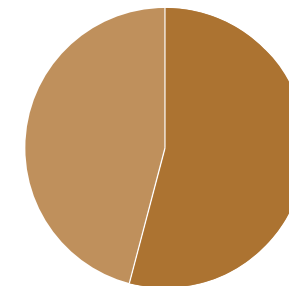
TSMC Workforce Structure

Categories	Groups	Male	Female
Employee Category	Managers	2,988	386
	Professionals	10,740	2,371
	Assistant Engineer/Clerical	2,122	623
	Technician	2,374	12,065
Location	Taiwan	16,399	13,682
	Asia*	867	1,335
	North America	927	412
	Europe	31	16
Age	16~20	69	654
	21~30	7,467	6,543
	31~40	7,867	6,645
	41~50	2,422	1,416
	51~60	364	169
	60+	35	18
Employment Type	Regular	18,193	15,225
	Temp	31	220
Avg. Service Yrs		5.3	7.2
Subtotal by Gender		18,224	15,445
Total		33,669	

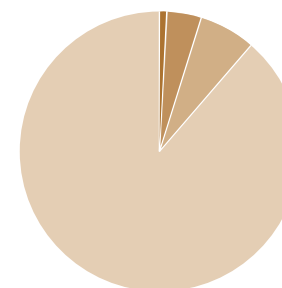
\*Asia region includes China, Japan and Korea.



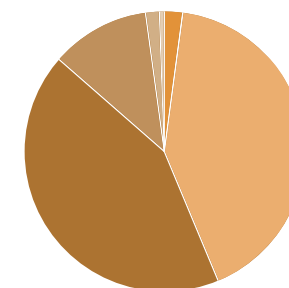
**Employee by Job**  
 ■ Managers (10.0%)  
 ■ Professionals (38.9%)  
 ■ Assistant Eng./Clerical (8.2%)  
 ■ Technician (42.9%)



**Employee by Gender**  
 ■ Male (54.1%)  
 ■ Female (45.9%)



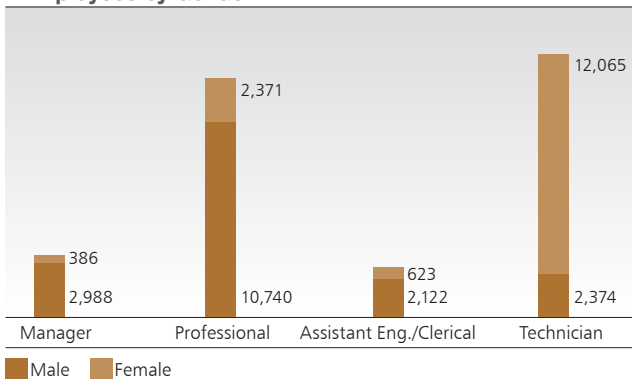
**Employee by Geography**  
 ■ Europe (0.1%)  
 ■ North America (4.0%)  
 ■ Asia Region\* (6.5%)  
 ■ Taiwan (89.3%)  
 \*Asia region includes China, Japan and Korea



**Employee by Age**  
 ■ 16<=20 (2.1%)  
 ■ 21~30 (41.6%)  
 ■ 31~40 (43.1%)  
 ■ 41~50 (11.4%)  
 ■ 51~60 (1.6%)  
 ■ 60+ (0.2%)

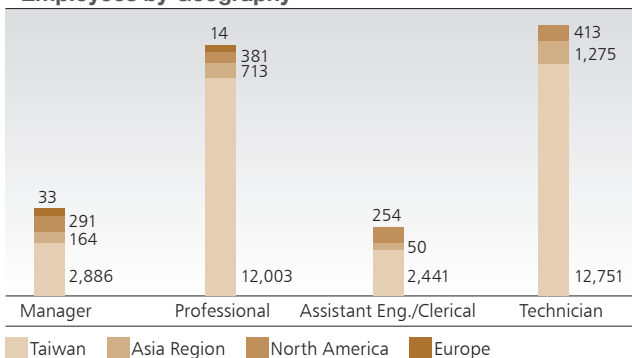


### Employees by Gender



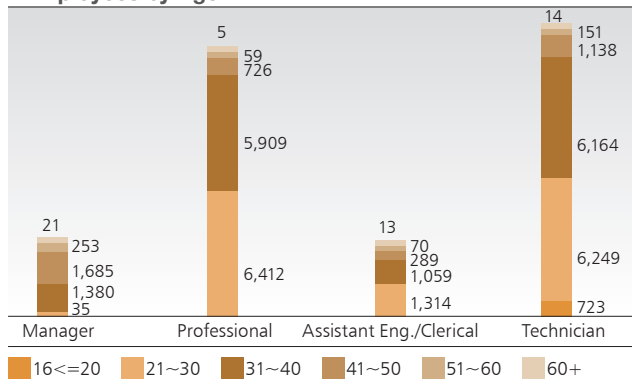
In 2011, females comprised 46% of all employees. In TSMC's main operation site, Taiwan, more men choose to major in semiconductor related studies compared with women; therefore, male comprised 83% of all managers and professionals in the Company.

### Employees by Geography



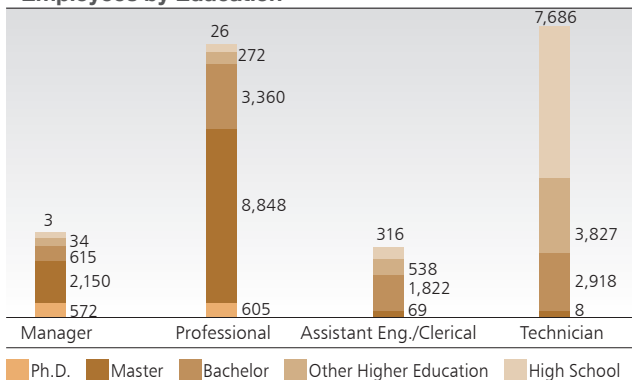
There are almost 34,000 employees in TSMC and about 90% employees are located in Taiwan. We have overseas subsidiaries in many countries, such as China, the U.S., Europe, Japan and Korea. Among these, China and the U.S. provide manufacturing, business and technical service while Europe, Japan and Korea provide only business and technical support.

### Employees by Age



Employees of age from 20 to 40 comprised 85% of total employees in TSMC.

### Employees by Education



Semiconductor is a knowledge-intensive industry, and our leading edges lie in the innovation and contribution of our employees. Among these, about 74% of our managers and professionals are with master's degree or above.

Considering the vitality of the Company as well as the external economic environment, we consider a healthy turnover rate

should be around 5% to 10%. In 2011, the turnover rate for all employees was 5.9%. By gender, the turnover rate of male was 6.0% and 5.8% for female. By geography, the turnover rate in Taiwan was the lowest (5.3%), and the turnover rate of the Asia region was the highest (11.4%) which was influenced by the local labor market, but decreased 9 percentage points compared with 2010. By age groups, employees under 30 comprised 57% of all turnover; employees between 30 to 50 comprised 41% and 2% is from employees above 50. Moreover, the annual average turnover rates of the past three years have all been below 10%.

### Turnover Rate by Gender

Gender	2011	2010	2009
Male in Avg.	6.0%	7.4%	10.2%
Female in Avg.	5.8%	9.0%	9.8%
Total in Avg.	5.9%	8.2%	10.0%

Note: The total of the annual turnover rate is the sum of monthly turnover rates.

### Turnover Rate by Location

Location	2011	2010	2009
Taiwan in Avg.	5.3%	7.4%	9.2%
Asia Region in Avg. (includes China, Japan and Korea)	11.4%	20.4%	25.5%
North America in Avg.	10.0%	10.9%	7.5%
Europe in Avg.	10.7%	7.0%	6.3%
Total in Avg.	5.9%	8.2%	10.0%

### 5.1.2 Recruit the Right People

We recruit talent via open and fair approaches, considering an applicant according to his or her qualifications to the requirements of the position, rather than race, gender, age, religion, nationality, or political affiliation. Although we faced a slow global economic growth in 2011, TSMC recruited nearly 3,000 new employees to support our business for future

challenges and at the same time creating job opportunities for our society.

Categories	Groups	Male	Female
Age	Under 30	1,357	1,021
	31~50	384	132
	Above 50	17	5
Location	Taiwan	1,473	717
	Asia*	188	410
	North America	91	29
	Europe	6	2
Total		1,758	1,158

\*Asia region includes China, Japan and Korea.



TSMC proactively recruits diversified semiconductor talent — the campus career fair in Indian Institutes of Technology

Moreover, TSMC values diversity of our employees. In addition to hiring talents locally, we also proactively recruit talent around the world. Our recruitment focus includes the U.S., India and Singapore where semiconductor talent are

more abundant. The Company participated in “HiRecruit”, an annual event organized by the Taiwan government for overseas technological talent recruitment. Furthermore, we also organized campus career fairs in top universities in the U.S., India and Hong Kong. In 2011, we successfully recruited dozens of postgraduate professionals from the Indian Institutes of Technology.

### Attract Talent Early and Build A Platform for Innovation

To ensure a sustainable talent pipeline for semiconductor industry, TSMC facilitates long-term talent supply and the devotion of research energy via strategic university relationship programs. These programs focus on the following two primary objectives.

#### a. Inspiring and Attracting New Talent to Pursue A Career with TSMC

TSMC strives to continuously inspire young students to pursue advanced education and career opportunities in the semiconductor field through a variety of activities. Major activities are described in the table below.

Programs	Achievement
Summer Internship	Provide summer internships for hundreds of top domestic and overseas university students each year. The ratio between domestic and overseas students is six to one. During the internship, each student is assigned to work on a project that is closely associated with his or her major. Each intern is also assigned a designated buddy who helps him or her to learn and blend into TSMC's workplace and culture quickly. The program is designed to provide opportunities for interns to apply what they have learned from their studies, to experience the industry environment, and to make an early connection with TSMC teams so these young students can be prepared for future careers and enhance their competitiveness.
Semi Elite Camp	In cooperation with The National Nano Device Laboratories and top domestic universities, TSMC hosted the Semi Elite Camp, which aimed at inspiring top undergraduates to devote themselves to solid-state-related researches in their advanced studies. The camp invited top TSMC executives and distinguished highly-regarded professionals to share their vision and prospects of the semiconductor industry. The Camp demonstrates how TSMC partners with academia, government and industry to increase students' interest in critical technology areas.
On-Site Visits	These visits give students an early understanding of the work environment of the semiconductor industry and promote interaction between schools and industry.
Career Talks in Campus	Top TSMC executives and esteemed professionals share their vision and career experiences with undergraduates, inspiring them to devote themselves in related research areas.



TSMC proactively attracts students who are going to graduate — campus recruitment



Semi Elite Camp — CTO, Dr. Jack Sun shared the prospects and future of semiconductor to students

#### b. Collaboration to Establish A Platform for Innovation

TSMC is dedicated to developing leading-edge technologies that provides the foundation for semiconductor innovation. We continuously support and partner with academia and other research institutions to encourage advanced researches and innovations in the areas. Major activities are described in the table below.

Programs	Achievement
University Shuttle Program	Provide multi-project wafer access and state-of-the-art equipment capacity support to top domestic and overseas universities. This allows them to test new research models without having to purchase costly equipment and enables them to turn their innovative research into real results for the industry.
Joint Development Program	Provide funding to larger-scale university research labs for nearly 100 research projects, totaling around NT\$200 million every year. In 2011, the Company assisted National Taiwan University on the development of the 1 <sup>st</sup> 3-D vision chips produced by 40nm process. The achievement is a significant breakthrough in the video and semiconductor process of 3D fields and was published in International Solid-State Circuits Conference (ISSCC). This program enables continuous novel or innovative academic semiconductor research, and in turn, has attracted more students to join these research labs for their advanced studies. About 80% participated students joined TSMC after their graduation.
Outstanding Student Research Award	To inspire and recognize outstanding semiconductor and green energy-related research by graduate students. Their research papers are evaluated by highly-regarded TSMC Academicians and Fellows. In 2011, 213 students from 10 countries including the U.K., the U.S., Australia, Asia and other regions participated in the contest. 26 finalists were invited to visit Taiwan and to attend the award ceremony.



Inspire innovation via Joint Development Program — the research team of National Taiwan University (NTU). (Source: College of Electrical Engineering and Computer Science, NTU)



Encourage and support research — the ceremony of Outstanding Student Research Award

### Provide Job Opportunities for Disabled Persons and Comply with Child Labor Policy

TSMC works proactively to find appropriate positions for disabled persons. By the end of 2011, the number of hired disabled persons increased 66% compared with 2010.

While the pool of disabled persons was inadequate to enable us to fulfill the minimum statutory requirements, the Company has periodically paid subsidies to the Disabled Employment Fund for having not yet employed the government-mandated number of disabled persons. Nevertheless, we are fully committed to hiring disabled persons. Externally, we will work closely with public employment service agencies as well as schools in order to identify more diversified and stable sourcing channels for disabled persons. Internally, we will continue to reinforce the importance of disability employment requirements to extend participation and support from hiring functions.

In addition, the Company complies with the law. We never hire persons under 16 years old.

### 5.1.3 Compensation and Rewarding People for Long-term Growth

Based on our belief that “employees are the Company’s most important asset” and “maintaining balance between the interests of employees and shareholders,” TSMC provides competitive compensation packages, attracting and retaining the best talent who provide the energy for the Company’s continuous growth.

Over the years, with the outstanding performance of our employees, our operational performance has excelled and our shareholders have gained above-average profit. The total compensation of our employees is better than the average of our peer companies in the semiconductor industry and other Taiwanese companies as well.

Our total compensation includes salary and cash bonus/profit sharing, which is based on individual expertise, job responsibility, performance, commitment, and operational achievement, rather than gender, religion, race, nationality or political affiliation.

TSMC appropriately adjusts employees’ salaries annually, taking the results of global salary surveys, market salary scales, and economic indices into consideration. As for employee cash bonus and profit sharing, the total amount and distribution are based on the recommendation of the Compensation Committee to ensure distribution is closely linked to the Company’s financial and operational performance. The amount for each individual employee is determined by individual responsibility, contribution and performance. The cash bonus is distributed quarterly, as we believe this balances our employees’ cash flow and provides a timely reward, encouraging them to contribute continuously.

Profit sharing is distributed following the approval by the Annual Shareholder’s Meeting.

In 2011, despite the uncertainty in the global economy, TSMC increased all employees’ salaries in April based on our outstanding operational performance and profit. In addition, the total amount of cash bonus and profit sharing in 2011 is 17.9 billion. The total compensation of a typical newly hired engineer in TSMC would be equal to 24 months’ salary, outperforming our industry peers.

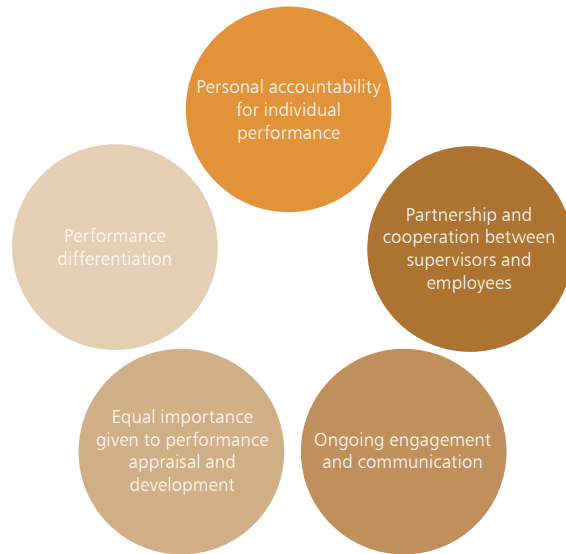
As a global company, the Company provides employees of overseas subsidiaries with a locally competitive base salary. At the same time, we grant short-term and long-term bonuses as part of our compensation packages based on local regulations, industry practices and operational performance to encourage overseas employees’ continuous contribution in the future growth of the Company.

### 5.1.4 The Engine of Employee Growth

TSMC is in a competitive industry and environment, and our employees’ capabilities and knowledge have to be continually renewed to respond to our business challenges successfully. The Company combines performance management and employee development, providing diversified and rich learning resources to enhance our employees’ capability.

**Comprehensive Performance Management and Development**  
TSMC’s performance management and development system aims to fully develop employees to their maximum potential. It provides an environment for employee development, and facilitates ongoing engagement and communication between supervisors

and employees. We approach performance management along the dimensions of strategy, integration and development. The five principles of our performance management are:



Through goal-setting and execution by the organizations and the employee, as well as the mid-year and year-end performance evaluations, we assess the status of goal achievement and conclude each employee's development focus.

### Diversified and Rich Learning Resources

Based on individual job nature, work performance, and career development track, a tailor-made Individual Development Plan (IDP) is established for our employees. Based on IDP, we forecast next year's training plan. In 2011, the Company's total training costs reached more than NT\$55 million. We provided almost 800,000 training hours and a total of 410,000 attendees participated in training sessions; employees attended 24 hours of training on average.

	2007	2008	2009	2010	2011
(A) Headcount as of 12/31	23,148	22,843	24,466	33,232	33,669
(B) Training hours*	726,907	641,939	561,403	968,457	795,448
(C=B/A) Average Training Hours per Employee	31.40	28.10	22.95	29.14	23.63

Note: Includes data for WaferTech beginning from 2009

	Manager	Indirect Labor	Direct Labor	Total
(A) Headcount as of 12/31	3,374	15,856	14,439	33,669
(B) Training hours	82,561	559,952	152,935	795,448
(C=B/A) Average Training Hours per Employee	24.47	35.31	10.59	23.63

Note: Includes data for WaferTech beginning from 2009

TSMC provides diversified training and development programs as below:

Programs	Description
General Training	<ul style="list-style-type: none"> <li>Required by government regulations and company policies.</li> <li>Includes personal effectiveness training, industry-specific safety, workplace health and safety, quality, fab emergency response, languages training.</li> </ul>
Professional/Functional Training	<ul style="list-style-type: none"> <li>Required by various functions within the Company</li> <li>Includes equipment engineering, process engineering, accounting, legal and information technology, among others.</li> </ul>
New Employee Orientation	<ul style="list-style-type: none"> <li>Consists of classroom learning and job orientation, which delivers the core values of TSMC and shapes simulated scenarios of our working environment.</li> <li>Managers and our well-established Buddy System are actively engaged in the assimilation process. By the end of 2011, TSMC had cultivated 4,713 buddies to assist newcomers in quickly adapting to our environment and culture.</li> </ul>
Direct Labor (DL) Training	<ul style="list-style-type: none"> <li>Enables production line employees to acquire the knowledge, skills and attitudes needed to pass the certification to perform their job well.</li> <li>Includes DL Skill Training, Technician "Train-the-Trainer" Training, and Manufacturing Leader Training.</li> </ul>
Management Training	<ul style="list-style-type: none"> <li>Designed to cultivate management capabilities and responsibilities to meet the development needs of managers at all levels.</li> <li>Includes New Manager Program, Experienced Manager Program, Senior Manager Program as well as other various elective courses.</li> </ul>
Tailor-Made Training	<ul style="list-style-type: none"> <li>Tailor-made courses to meet the needs of specific organizations according to business requirements.</li> </ul>



Manager Forums—managers and experts discussed the approach to motivate young generation



Employees learned together via classroom discussion

Every TSMC employee can access to appropriate training via various approaches:



By the end of 2011, TSMC e-learning system offered 1,522 e-learning courses, covering Engineering and Technical courses, Functional and Professional courses, Management courses, and others. In 2011, a total of 250,052 employees participated in 202,903 hours of e-learning.

We encourage employees to attend external training programs. In 2011, a total of 1,461 employees took short-term courses totaling 20,794 training hours, 172 employees took credit courses and degrees totaling 46,340 training hours, and 382 employees took language courses totaling 11,352 training hours.

#### A Cradle for TSMC Teachers—the Internal Instructor Program

To facilitate knowledge sharing and leverage internal know-how, TSMC cultivates internal instructors through a well-established internal instructor development system. In 2011, 101 internal instructors completed their required training, which contributed to a total of 544 qualified internal instructors by the end of 2011.

The Company has conducted a TSMC Excellent Instructor Program to show our appreciation to internal instructors and to enhance our learning culture since 2001.

#### Senior Manager's Viewpoint on Training:



The Company shows gratitude on the contribution of internal instructors.

For a fast-growing fab, the most important thing is to enable our employees through training. The passion and energy generated from the internal instructors make lots of achievements. Teaching becomes a positive cycle which brings great effectiveness to the Company, to our employees and to the instructors themselves.

#### Pursuing Better Learning Effectiveness

To ensure the training quality, TSMC evaluates training effectiveness via questionnaires and pre- and post-course assessment, and the results become the foundation of our enhancement. The Company sets an evaluation standard for all programs and reviews those that do not deliver the desired outcomes. When training programs fail to meet their objectives, they are carefully reviewed and corrective actions are taken immediately. In 2011, overall participants' feedback on course quality was satisfactory, with the average evaluation score reaching 90 out of a possible 100. The percentage of training program failing to meet the objectives was also kept under 2%.

## 5.2 Work-Life Balance

To ensure work-life balance, TSMC provides a work environment with various social and cultural activities as well as services, and benefits, which promote employee productivity, morale, and healthy family life.

### 5.2.1 Expanding Interpersonal Relationships

TSMC considers each employee as an individual as well as a part of the social network. Our employees obtain the support from work environment which brings positive energy. The Company established the Employee Welfare Committee and provides a platform for employees who have similar interests to form or attend clubs. Through this channel, our employees can cultivate interests after work, and gain opportunities to develop relationships with one another. In 2011, TSMC assisted employees to form and operate 65 clubs, such as cycling, extreme sports, dance, tai-chi, calligraphy, cooking and others. More than 6,000 employees attended activities held by these clubs.



TSMC employees enjoy colorful life by participating clubs.

Family is also part of our interpersonal network. We hold lots of parents-children activities regularly and encourage our employees to participate in. Employees can balance their family life and expand their social networks. More than 23,000 employees and family members attended and enjoyed our activities.



TSMC proactively facilitates family interaction.



TSMC employees and their families enjoy shows together.

### 5.2.2 Arts and Culture

TSMC promotes arts and culture in the company and encourages employees to attend. In 2011, we held 9 concerts, 18 speeches, 26 plays for children, and 73 movie screenings. In addition to enjoying performances by popular artists, employees also enjoyed speeches on diverse topics such as current events, relationships, and inspirational stories.



We invited employees' favorite artists to perform in the company.



We hold plays and create the opportunity for parent-children interaction.

In addition, company galleries display works such as traditional Chinese painting, oil painting, block prints, calligraphy, ceramics, and photography. These works of arts not only beautify our work environment, but also make the Company a relaxing environment for employees. In 2011, a total of 1,080 pieces of art are displayed.

### 5.2.3 A Convenient and High Quality Work Environment

#### Dining Service

TSMC has cafeterias which provide a great diversity of dining options and comfortable environments. Our food court provides Taiwanese, Southeast Asian, and Japanese cuisine as well as fruit. We also provide healthy vegetarian and non-vegetarian buffets, totaling around 100 dishes for our employees to choose from.

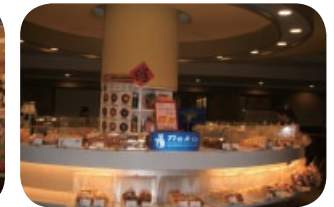
In order to ensure and enhance employee dining satisfaction, an electronic dining satisfaction survey system was established in 2009. With this system, we can easily understand employees' preferences and satisfaction levels and make timely enhancement on food quality and service based on the results. In 2011, the satisfaction rate is 91.6% which is 7.2% higher than the previous year.

#### Convenient Services

The Company provides permanent services such as fitness centers, bookstores, coffee shops, 24 hours convenience stores, juice bars, barbershops, dental clinic, and health centers. In addition, weekly on-site services include laundry, banking, telecommunications, insurance, household appliances and other conveniences are offered.



TSMC employees enjoy various timely conveniences in the work environment.



#### Childcare Service

TSMC provides a healthy and safe environment for the pre-school education of employees' children. Our kindergartens were built with green construction materials and fire proofed. To provide a safe environment, there are no sharp angles in the interior designs. We also minimize the threat of influenza with separated air conditioning in every room.



TSMC kindergartens emphasize happy learning.



All facilities are with no sharp angles.

In 2011, The TSMC kindergarten was selected as a role model by the Association of Science Park Industries. TSMC not only gives employees' children a great place to learn, but also helps the employees to be better and happier parents.

### Transportation Service

To save energy, reduce carbon emissions and provide better service, the Company provides shuttle buses with regular itineraries between fabs. To ensure safety and monitor driving status, all shuttle buses are installed with GPS systems.

### Accommodation Service

Accommodation service is provided for employees who live far from the Company in consideration of their safety and convenience. In addition to providing a comfortable living environment, a "Dormitory Caring System" is established to ensure employees' safe access to dormitories and to respond to potential emergencies.

## 5.2.4 Benefits – Safeguarding Employees' Rights

### A Comprehensive Insurance Plan

In addition to Statutory Labor Insurance and National Health Insurance, TSMC provides comprehensive insurance plans to employees and their family by which they can obtain better protection with lower price. Each employee is covered by our group insurance plans from the first day they are on board. The coverage includes life insurance, accident insurance, hospital insurance, cancer insurance, and business travel insurance. Employees also have the flexibility to participate in self-pay insurance plans to extend coverage to their family.

### Pension Plan

TSMC's employee pension plan is set according to the Taiwan Labor Standards Act and Labor Pension Act. With the Company's sound financial system, we ensure employees a solid contribution and regular pension payments in order to provide a secure and comfortable life after retirement.

### Flexible Leave Programs

TSMC provides flexible leave programs which exceed the requirements of the Labor Standards Act. Our employees are eligible for annual leave after completing 3 months of service at TSMC. Furthermore, they are granted 120 hours fully-paid and 120 hours half-paid sick leave per year. Our employees can also 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 the Company before the end date of his or her leave of absence. Take parental leaves for example, in 2011, 274 employees took parental leaves, and the average return to work rate is 67% and retention rate is 96%.

	Total	Male	Female
Number of employees that took parental leaves in 2011	274	33	241
Number of employees that should return to work in 2011 (A)	218	30	188
Number of employees that returned to work in 2011 (B)	145	23	122
Return to Work Rate (B/A)	67%	77%	65%
Number of employees that returned to work in 2010 (C)	134	42	92
Number of employees that returned to work in 2010 and are still employed at least 12 months (D)	128	41	87
Retention Rate (D/C)	96%	98%	95%

### Other Welfare Benefits

TSMC also provides other subsidiary benefits including:

- Financial assistance to help employees who encounter difficult circumstances.
- Subsidies for marriage, childbirth, and funeral
- Cash gift for main festivals and birthday

- Traveling subsidies
- Discounts provided by over 4,000 designated vendors
- Website provides a platform for shopping and exchanging information

The insurance plan, pension plan, leave programs and other welfare benefits for the employees of our overseas subsidiaries all comply with or better than local regulations to ensure a secure and carefree life for our employees worldwide.

## 5.3 Engaged People

TSMC is committed to establishing positive employee relationships and creating a highly engaged work environment. Moreover, our employees are highly committed and loyal. These positive factors all generate productivity and higher performance.

### 5.3.1 Reinforcing Employees' Sense of Belonging

Our employees share a common vision and values, and thus can work toward the same direction. Each TSMC employee is required to take the core value training. To meet our business needs, we hired a large number of employees in 2010. Therefore, we conduct a series of customized core value training to ensure our new employees' sense of belonging and cohesion. In 2011, we delivered the core value training in organizations with large numbers of new hires with over 2,200 employees attended.

TSMC holds "Sports Day" every year to raise employees' cohesion and reinforce the spirit of teamwork. Through various sports competitions, our employees interact and cooperate with one another. More than 34,000 TSMC employees and family members attended Sports Day in 2011.

Our employees show cohesion and teamwork in Sports Day.



Cheer leaders



Tug of war



Relay race

### 5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations

TSMC values two-way communication and is committed to maintaining open and transparent communication channels between the management level and their subordinates, as well as among peers, which in turn fosters harmonious labor relations and creates a win-win situation for the Company and the employees.

Regular communication meetings are held for various levels of managers and employees. Periodic employee satisfaction surveys are conducted to ensure that the employees' opinions and voices

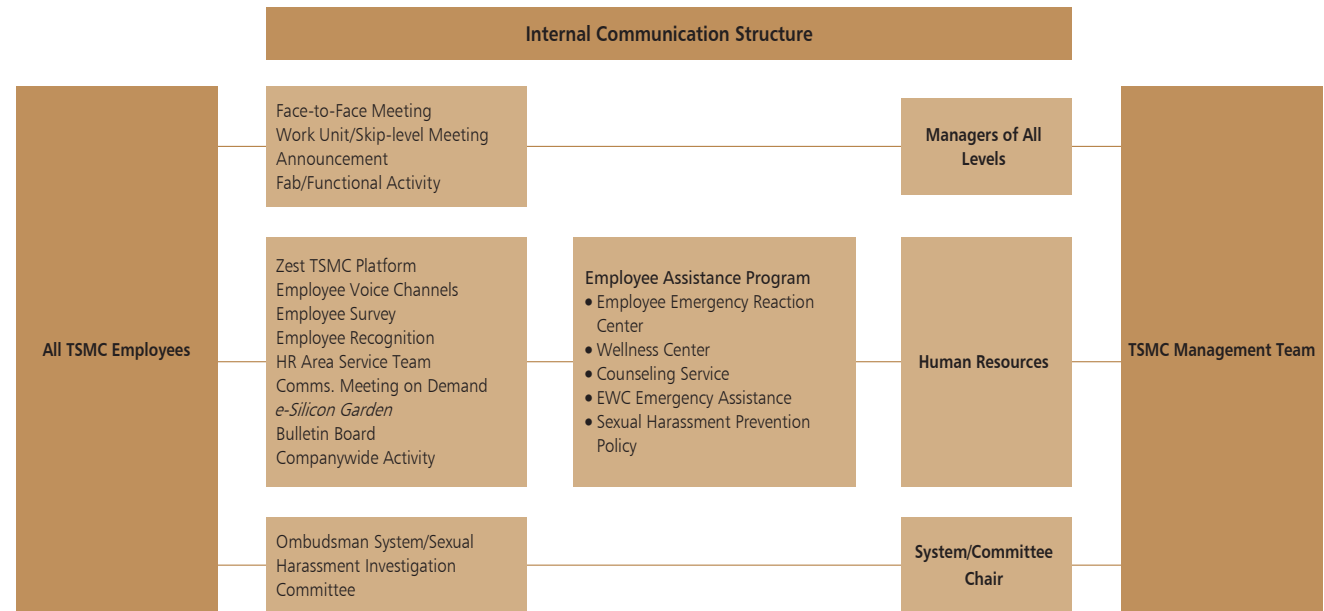
are heard, and their issues are addressed and timely solved. The comprehensive communication channels provided by TSMC are detailed in the following chart, the Internal Communication Structure.

"e-Silicon Garden", TSMC's internal publication, has been in existence since the Company was founded in 1987, and a migration to an electronic version was completed in 2009. To serve employees worldwide, the bi-weekly publication is available in both Chinese and English, with content ranging from work to fun. In 2011, visitor traffic to the website amounted to over 100,000 hits each month.

The Company also sets and promotes policies and measures to ensure gender equity and sexual harassment prevention

in accordance with employment laws, fostering a fair work environment for employees of both genders. We provide training course for all employees and include related courses into our orientation training. In 2011, the Company leveraged a variety of creative initiatives in reinforcing employees' perceptions regarding gender equity, including a promotional campaign using a video clip provided by Ministry of the Interior (MOI), which attracted the participation from 24,000 employees.

We offer multiple and well-structured communication channels and implement quarterly labor-management meetings to foster a harmonious labor relations. So far, no employees have issued a request to form a union.





### 5.3.3 Recognizing Employees' Dedication, Fostering A Warm Work Environment

TSMC sponsors various award programs to recognize employees' outstanding achievements, both as a team or on the individual level. Through these award programs, TSMC aims to encourage employees' sustainable development that in turn adds to the Company's competitive edge.

In addition to day-to-day recognition from managers on the employees' contribution, various award programs sponsored by TSMC include:

- TSMC Medal of Honor, presented exclusively by the Chairman for those who contribute significantly to the Company's business performance.
- TSMC Academy Election to recognize outstanding TSMC scientists and engineers whose individual technical capabilities contribute to the Company greatly.
- Outstanding Engineer Award for each Fab, and Total Quality Excellence Conference Award to recognize employees' continuous efforts in creating value for the Company.
- Service Award to appreciate senior employees' devotion and commitment to the Company.
- Recommending employees for external prestigious awards; in 2011, TSMC employees continued to be recognized through a host of national awards, including the National Model Worker Award, Top 10 National Outstanding Managers Award,



The Company recognizes employees' contribution.



Our employees honored by National Industrial Innovation Award.



A simple smile creates the warmest work environment.

Outstanding Engineer Award, Outstanding Young Engineer Award, as well as the first National Industrial Innovation Award.

TSMC rolled out a global campaign called "TSMC Smile Week" in 2011 to foster a warm work environment that values open appreciation. The campaign encompassed the theme of "Smile, easy and touching" and featured 3 sub-programs, including "promotional videos", "smile photo collection" and "appreciation message board". With support from regional and overseas offices, a total of 5,000 smile photos from TSMC employees were collected around the globe, while 4,000 appreciation messages were posted. This campaign echoes the Company's continuous efforts in serving as an uplifting influence in society.

### 5.4 Employees' Physical and Mental Well-being

Employees' physical and mental well-being is the cornerstone of productivity. The Company works proactively to build a healthy work environment via health promotion activities, assistance programs, and multi-dimensional practices.

#### 5.4.1 The Multi-Dimensional Caring System – Safeguarding Employees' Health

The TSMC health center at each Fab operates 24 hours a day and employs nurse specialists more than required by law to

ensure our employees receive appropriate care. Services provided include:

- Medical services for on-site and off-site injuries and medical transferring;
- Training for emergency medical teams
- On-site clinics and dental services
- Risk management service on health care issues.

TSMC offers on-site health examinations as well as specialized examinations for employees with special tasks every year. The examination items and frequencies are both beyond regulations.

In 2011, a total of 99.1% employees participated in the health examination.

Every citizen in Taiwan receives medical coverage through National Health Insurance. Beyond this, the Company proactively follows up our employees' health examinations result based on hyperlipidemia, hepatitis B & C, metabolic syndrome and other health issues. In 2011, through our well-established medical network, we transferred 341 employees to proper medical institutions and provided health education for 3,868 employees. We keep developing our employees' self-management capability on their personal health. The Company actively follows up and conducts related promotions based on the examination results for our overseas employees as well.



We provide on-site health examination.



We provide health promotion courses.

### 5.4.2 Promoting A Healthy Lifestyle

The Company strives to address the health issues which our employees care the most and plan various programs to assist them to execute a healthier lifestyle.

According to the results of the 2010 health examination, hyperlipidemia and being overweight were the main health problems for our employees. Therefore, we held a “Weight Control Camp” for our employees. A total of 335 employees participated in and total weight reduced was 1,679.5 kilograms. Participants shared many practical and useful tips for losing weight, reflecting the enhancement of their health-consciousness. Furthermore, the Company won the Health Bureau’s “The Best Healthy Workplace” award in 2011.

In addition, TSMC conducted diverse health promotion activities, such as aerobics camp, women’s health care, acupressure



Sports centers provide various equipment and facilities to encourage regular exercise.

massage service, liver disease prevention, blood donation, flu vaccination, as well as lectures on physical and mental health. The total number of participants reached 12,207 in 2011.

To encourage a culture of regular exercise, the Company regularly holds intramural sports competitions. In 2011, TSMC held 761 games, including basketball, table tennis, badminton, billiards, and swimming, and more than 37,000 participants attended.

Moreover, the Company provides sports centers, swimming pool and fitness centers, providing over 70 sessions of fitness courses, such as aerobics, yoga and cycling. In 2011, around 10,000 employees and their family members enjoyed these activities per month.

### 5.4.3 Employee Assistance Program

The Company organizes diversified employee assistance programs to enhance our employees’ physical and psychological health. In 2011, the Company received the first “Outstanding Employee Assistance Program” award from the Executive Yuan Council of Labor Affairs, indicating that our service of systems, work, life and health are well-developed and could be a role model for other domestic companies.

The Company has cooperated with the Hsinchu Lifeline since 2001. We work together to provide professional consultations which cover issues of family, relationship, marriage, and others. A total of 42 introduction sessions were held to promote the service to our employees. In 2011, 770 employees used this service and the number is 34% higher than the previous year. This shows that our employees are more aware of the resources they have and are more willing to take action to care for themselves and people around them.

In addition, we established employee assistance teams to provide a mechanism to help employees in need. In 2011, the Company successfully assisted 29 employees with disruptions in their personal life.

### 5.5 Safety and Health

One of TSMC Chairman Dr. Morris Chang’s 10 principles of corporate social responsibility is to not only provide good job opportunities, but also to provide good remuneration and work environments. TSMC revised its safety and health policy in 2010 and set zero accidents as a new safety and health goal. To meet this goal, TSMC practices strict safety and health management procedures, maintains stringent standards for facility and hardware operations, and promotes continuous improvement programs. Based on this principle, TSMC seeks to improve the safety and health management performance of the semiconductor industry and supply chain through active social engagement.

#### Selection of Material Safety and Health Topics

TSMC has a long record of assisting the government in establishing regulations and promoting health and safety projects, and pays close attention to the views of academia, media, customers, and employees concerning occupational safety and health to understand the topics of greatest concern our stakeholders. We have concluded that the most material occupational safety and health topics are occupational safety and health management, emergency response and corporate contagious disease prevention, which are issues that TSMC has worked on for a long time. Workplace stress and employee health have recently become new topics of concern for the government, society, employers, and employees, and an area that requires further attention. Detailed measures are as follows.

### 5.5.1 Safety and Health Management

TSMC believes that good safety and health management is an important part of the company's commitment to take care of employees and their families, and a way of giving back to society and the community. In practice, TSMC's safety and health management is based on the framework of the OHSAS 18001 management system, and uses information technology to continually improve our goals to prevent accidents, improve employee safety and health, and protect company assets. All TSMC fabs passed the 2007 version of OHSAS 18001 certification, and all fabs in Taiwan are also TOSHMS (Taiwan Occupational Safety and Health Management System) certified.

TSMC's current safety and health management operations can be divided into several dimensions as below:

#### 5.5.1.1 Hardware Safety and Health Management

The effectiveness of a facility's hardware safety and health performance is largely determined in the design phase. TSMC follows local regulations, international codes, and internal standards when planning, designing, and building new facilities or rebuilding existing facilities for production, IT, general services, or other purposes. A designated team takes responsibility for safety and health management using the procedures below:

- **New Tool and Chemical ESH Management Procedure**

TSMC's New Tool and Chemical Committee (NTCC) ensures that all new tools and chemicals meet international codes such as SEMI-S2 as well as local regulations and TSMC standards. In order to reduce risks before operation, the committee not only reviews tool safety, but also evaluates the related safety issues of location, accessory equipment, safety interlock, and facility

system connections. To comprehensively evaluate the safety of new tools and chemicals, the NTCC includes experts in a broad variety of fields, including process, equipment, facility and safety specialists.

- **Safety Management of Change (SMOC)**

All new TSMC fab designs, as well as changes in design or operation procedure in existing TSMC fabs that could alter safety or fire prevention conditions, are required to follow SMOC procedure. SMOC cases undergo strict review by facilities, equipment, ISEP, and ESH departments before implementation. There were 1,344 SMOC reviews in 2011.

- **New Equipment Safety Sign-off Procedure**

All production-related tools and new facility systems must follow a three-phase safety sign-off procedure before operation.

Phase 1: The tool sponsor must confirm interfaces between facility systems and the new tool are under safe conditions before turning on non-HPM (Hazardous Production Materials) related utilities.

Phase 2: The tool sponsor must verify hazardous gases and chemical supply systems, fire protection, toxic gas monitoring, tool safety interlocks, laser and radiation protection, the tool's local gas or chemical delivery system, and exhaust abatement before turning on the tool.

Phase 3: The tool sponsor must remedy any shortcomings found in phase 1 and phase 2, execute IR scans for electrical utilities, and put all safety requirements into the new tool's regular maintenance procedures.

- **Used Tool Safety Control**

In addition to new tool safety controls, TSMC has also set up a procedure for used tool safety management. All used tools purchased by TSMC are required to go through this safety

control procedure, which uses tool configuration inspection data and a safety interlock verification checklist to confirm that tool settings and safety interlocks are functioning correctly. After these basic checks, the tool must also go through tool installation safety signoff procedures to ensure it is safe for use after release.

#### 5.5.1.2 Operation Safety and Health Control

In TSMC's daily operations, we not only prevent accidents through strict controls on high-risk work, contractor management, chemical safety controls, and routine audits, but also maintain emergency response plans and hold regular drills to minimize the impact of potential accidents on the environment, society, employees and property.

- **High-risk Work Control**

TSMC's high-risk work management procedure classifies any work that may cause serious injuries, casualties or major property damage as level-1 high-risk operations and assigns such work for priority management. Please refer to "6.2 Managing Contractors' ESH" for details.

- **High-risk Area Control**

Defined fab high-risk areas and developed related management procedures to prevent accidents.

#### 5.5.1.3 Safety and Health Committee

Each TSMC fab has a safety and health committee chaired by the fab director which meets each month to discuss ESH-related matters. Labor representatives, chosen by employees in accordance with the law, account for more than one-third of all the committee members, providing a forum for managers and employees to discuss safety issues face-to-face.

#### 5.5.1.4 Programs in 2011

- Improvement of contractor management by strengthening the booking system for contractors entering the fabs.
- Introduced new procedures for high-risk area management to prevent accidents
- Establishment of departmental ESH key performance indicators (KPI), linked to the TSM e-platform, to strengthen each department's self management.
- Guideline integration of personal protective equipment for safe loading of raw and waste chemicals.
- Expansion of gas detection range by lowering the limit of gas monitoring systems so as to allow for early detection.
- Development of the safety management procedure for second-hand tools.
- Implementation of cross-fab safety audits.
- Integration of management for cross-fab safety risk issues.

#### 5.5.1.5 Social Engagement

TSMC's ESH team dedicates itself to minimizing risks to TSMC, and shares its rich management experience with the semiconductor industry, suppliers and society.

Supply Chain: TSMC reduces accidents and improves contractor ESH management through audit and assistance programs. Our close cooperation with companies in our supply chain over the past several years has begun to yield results as some suppliers have started to embed ESH management models into their own systems, providing additional protection to laborers.

High-tech Industries: We believe safety and health are universal values in society. TSMC openly shares its safety and health experience through the Safety and Health Committee of the Allied Association for Science Park Industries.

#### 5.5.1.6 Occupational Injury and Illness Statistics

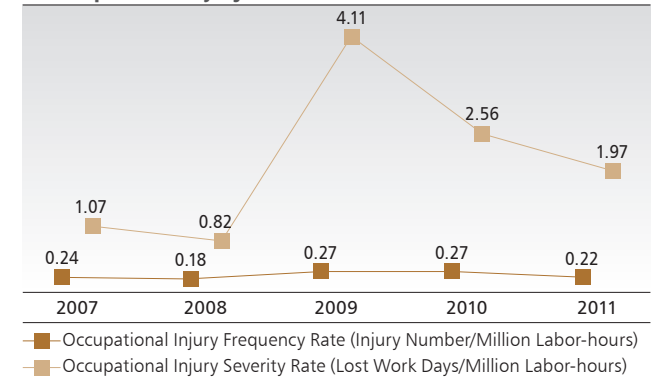
TSMC uses the Disabling Injury Frequency Rate (FR, cases of disabling injuries and illness per million labor-hours) and Severity Rate (SR, lost workdays caused by disabling injuries and illness per million labor-hours) defined by Taiwan's Council of Labor Affairs (CLA) to evaluate the effectiveness of the Company's occupational health and safety programs. Taiwan's FR and SR are five times that of the ILO's (International Labor Organization) definition of disabling injuries and illness per two hundred thousand labor-hours. TSMC's FR and SR have consistently been significantly lower than Taiwan's semiconductor industry average.

TSMC strives to maintain a safety culture that ensures a safe and healthy workplace. The causes of all occupational injuries are analyzed and improvement programs are implemented based on the data. Our program further requires us to regularly collect and analyze data on types of high-frequency occupational injuries and departments with higher incident rates. These reviews focus as a first priority on incidents that are relatively serious, affect multiple departments, or happen more frequently.

#### Disabling Injury Frequency Rate (FR) and Severity Rate (SR)

The FR and SR of TSMC fabs in Taiwan were 0.22 (23% men and 77% women) and 1.97 (11% men and 89% women) respectively in 2011 – much lower than the Taiwan semiconductor industry average FR of 0.53 and SR of 6 in 2011. For continuous safety performance improvement, TSMC re-assessed ESH risks for all fabs in Taiwan in 2011. In total, 2100 risks were identified, and relative control measures were taken to ensure that all risks are reduced to acceptable levels.

Occupational Injury Statistics for TSMC Fabs in Taiwan



#### 5.5.2 Emergency Response – the Only Way to Reduce the Impact of Accidents

The first priority of TSMC's disaster response policy is to ensure the safety of personnel and neighboring residents, followed by avoiding pollution of the environment, and finally to reduce property losses and maintain normal production. We believe that when natural disasters or accidents occur, proper treatment in the incipient stage of the event not only minimizes the probability of personnel injury and environmental pollution, but also significantly reduces losses and lowers the difficulty of resuming production. TSMC therefore pays considerable attention to emergency response. From emergency equipment setup, creation of emergency procedures, training, drills, and other preparations, TSMC follows the process of "planning, implementation, evaluation and improvement".

In 2011, to ensure the quality of annual emergency response drills, TSMC drew on past experience to compile a standard exercise to serve as a reference for units with different equipment and facilities to hold drills for earthquakes, fires, gas leaks, chemical spills, power dips, and other accidents. These standard exercises help each facility put key response procedures in place and improve facility system recovery practices after earthquakes.



ERC personnel relocates to 2nd ERC



ERC reports situation to commander



Facility Recovery preparation



Facility Recovery team set up

### Permanent Emergency Response Center, Hardware Standardization

All TSMC fabs maintain an emergency response center, or ERC. Two full-time ERC staff are on duty around the clock. If any accident or abnormal event occurs, ERC staff on duty will be informed immediately through monitoring systems. An emergency response team will be promptly and effectively assembled by staff on duty to handle the event. The following systems are equipped at each ERC:

- Rescue procedures and information: includes plant layout, tool maps, and emergency response flowcharts;
- Fire, Safety and Monitoring Systems: includes fire and gas monitoring systems, emergency ventilation systems, CCTV systems, gas and chemicals shutdown emergency off (EMO), and paging systems;
- Emergency response equipment: includes various types of protective clothing, personal protective equipment, self-contained breathing apparatus, portable detectors, and leak handling equipment. In addition, each factory has designated a second ERC outside of the fab equipped with appropriate emergency response equipment to continue emergency response if the ERC is affected by disasters, and to facilitate the rapid establishment of a command post. Monitoring systems in the first ERC can be accessed through wireless networks while ERC on-duty staff evacuate to the second ERC.

### Standardization of Emergency Response Procedure and Enhancement of Personnel Training

TSMC has detailed emergency response organizations, handling procedures, and business continuity plans for a variety of unexpected situations such as earthquakes, fires, chemical spills, toxic gas leaks, natural disasters and sudden interruption of utilities. Each fab also designates emergency response commanders and team duty officers each day to respond with unexpected situations at any time.

Emergency response team members are trained in communications, disaster relief operation, factory systems, on-site control, rescue, and logistic support. Types of training include the following:

- ERT training: includes ERT basic and advanced training, and incident commander training;
- Fire fighting training: Professional fire fighting skill training at the Hsinchu Fire Bureau training base;
- Annual full evacuation drill: Chiefly focused on responding to an earthquake of intensity 5 or higher;
- Quarterly ERT drill: A quarterly drill is requested for each production-related department to build familiarity with emergency response skills, equipment and factory surroundings.

### Collaboration with Public Resources and Drills with Contractors

Each TSMC factory performs annual emergency response and evacuation drills for different situations to train TSMC employees as well as contractors and vendors. We invite the regional fire brigade to join the drill, or experts to be our advisors, according to the size and type of drill. Participants include employees and contractors to enhance collaboration in real accidents and rapidly establish control over the disaster. These measures are compliant with international occupational health and safety management systems which state that the organization's safety activities should be extended to employees, contractors and nearby stakeholders. Areas and situations covered by drills include clean room, facility, mechanical rooms, lab, kitchen, dormitory and shuttle bus.

TSMC's U.S. subsidiary WaferTech held nine collaborative familiarization events with over one hundred local first responders in 2011. These tours familiarized the Fire Department emergency responders with WaferTech's buildings, manufacturing process chemicals and gases, support equipment and emergency response structure.

### 5.5.3 Moving Beyond Traditional Occupational Health Practices to Promote Physical and Mental Health

#### 5.5.3.1 New Occupational Health Management Programs in the Semiconductor Industry

##### Stress-Resilient Traits Assessment Program

Job stress and workers' health have recently become new topics of concern for the government, society, employers, and employees as areas that require further attention and occupational health efforts. Since 2011, the government has been advocating the amendment of Labor Safety and Health Act to incorporate the idea of the employer's responsibility to protect the mental health of workers. TSMC has prioritized workers' stress as one of the Company's major occupational health subjects. Since 2011, TSMC has collaborated with academics to develop assessment tools on understanding stress-resilient traits and provide further resources, such as the Employee Assistance Program (EAP), to improve the status of employees' physical and mental health. See Chapter 5.4.3 for more on our EAP services.

##### Building Workers' Resilience and Ability to Cope with Stress



Mental health activity poster

Employees' mental health problems may impact their performance, their physical health, and the safety of other employees. TSMC believes that physically and mentally healthier workers have better work performance and contribute to the company's success. TSMC provides free individual counseling services and



Mental health lecture

holds workshops and lectures on workplace mental health issues to improve employee health and wellbeing. See Chapter 5.4.3 for more on our mental health promotion activities.

##### Office Ergonomics Intervention for Special Needs

As working patterns change and employees increasingly use computers as their primary tool, TSMC launched an office ergonomic program to adjust the height of office chairs and desks to meet the needs of taller or shorter employees beginning



in 2010. Whenever new employees of significantly above- or below-average height enter the company, assessment and intervention will be proactively initiated by site ESH professionals.

##### Reduce Ergonomic Risk in Clean Room

TSMC requires that all new tools meet SEMI-S8 requirements and that appropriate supplementary control measures be taken to reduce ergonomic risk. As the semiconductor industry transitioned to 300mm (12-inch) wafers from 200mm (8-inch) wafers, TSMC's initiative to automate 300mm front-opening unified pod (FOUP) transportation improved productivity and also prevented accumulative damage caused by long-term manual handling of 300mm FOUPs.

##### Setup Off-site Center of Manufacturing Process Control and Monitoring

In 2011, TSMC launched a program of off-site control and monitoring of manufacturing processes in Fab 12. Instead of working with the manufacturing equipment in the cleanroom on a daily basis, some employees can work in their office



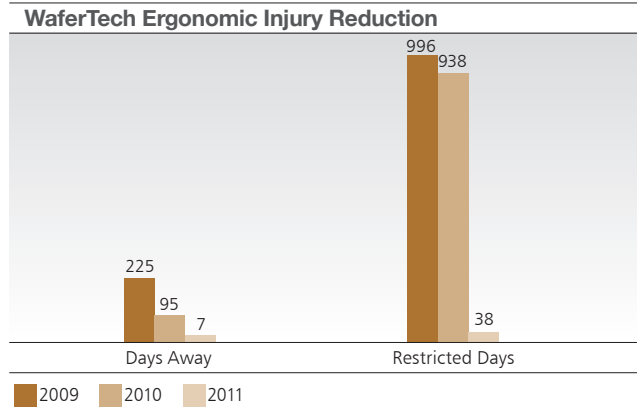
Outside cleanroom process control and monitoring center

through the integration of automation and remote control systems. The change reduces the time spent in cleanrooms and also provides employees a more comfortable and healthier working environment.

##### WaferTech Ergonomic Injury Reduction

WaferTech has worked continuously to improve the ergonomics of its operations. In 2010, we implemented a new program

called “The Body Shop” which features a part-time, on-site physical therapist. This therapist completed detailed physical job requirement assessments across the whole site. Using this knowledge, the therapist was able to clearly understand the work that employees do and specify exercises that the employees can do to decrease work and non-work related aches and pains. As a result, significant injuries (termed “recordable” in the U.S.) decreased over 60% from 2010 to 2011. In addition, it has significantly decreased the number of days employees are away from their job or otherwise restricted from fulfilling their duties.



### 5.5.3.2 Corporate New Contagious Disease Prevention Program

#### Taking Care of Employees’ Physical and Mental Health is A Corporate Responsibility

TSMC believes that taking care of employees’ physical and mental health is fundamental to maintaining normal business operations and also part of a corporation’s social responsibility.

To face emerging infectious diseases that pose a threat to the workplace, we have a dedicated corporate ESH organization which constantly monitors emerging infectious diseases around the world, assesses any potential impact on the workplace, and provides a strategic response plan. New influenza has become an extremely important issue in recent years, and we not only protect the health of employees, we also encourage them to apply their prevention knowledge at home so they can work with peace of mind.

#### TSMC Novel Influenza Response & Prevention Plan

The “TSMC Novel Influenza Response & Prevention Plan” is based on our past experience with epidemics such as SARS in 2003 and H1N1 new influenza in 2009. This plan also integrates prevention plans by the World Health Organization, the U.S. Centers for Disease Control, The Taiwan Center for Disease Control’s “Novel Influenza Combat Plan”, Singapore’s “Influenza Pandemic Preparedness and Response Plan”, as well as consultations with domestic epidemiological experts and distinguished medical doctors.

If a major outbreak of novel influenza occurs, TSMC will hold regular response and prevention meetings, and TSMC’s Senior VP of Materials Management and Risk Management will monitor global epidemiological developments and coordinate preparations. If Novel Influenza cases occur in Taiwan, TSMC will initiate a new set of procedures in accordance with the stage of the epidemic to lower its impact on employees and operations.



Health promotion poster

TSMC monitors global epidemic status, employee disease prevention education, stockpiling of disease prevention materials, kitchen disease prevention management, leave and travel management, case management, notification and medical assistance, procedures for mask wearing and hand washing, supplier/contractor and visitor prevention control, body temperature measurement procedures, work-at-home plans, routine disinfection of the work environment, reduced meeting frequency, medical waste treatment, and other preventive measures.

#### Collaboration with Subsidiaries and Suppliers on Novel Influenza Prevention

To reduce the impact of H1N1 on overseas subsidiaries such as TSMC China, WaferTech, and TSMC North America, TSMC also convened overseas coordinators to immediately initiate prevention procedures and announce appropriate responses based on changes in the pandemic. In addition, TSMC also requires that suppliers set disease prevention policies and establish contingency plans for major labor shortages during the peak period of the pandemic.

### Continuous Monitoring of the Threat of Seasonal Influenzas

Seasonal influenza (such as H1N1, H3N2, type A or type B flu) or other infectious diseases (e.g. tuberculosis, typhoid fever) may become a highly contagious risk and affect employees. TSMC will continue to control a variety of infectious diseases workplace risks and to gain experience, avoid over- or under-reaction, and maintain a constant level of epidemic prevention. TSMC uses various methods to enhance the knowledge of individual employees on epidemic prevention, and also encourages employees to use this information to protect the health of their families.

### 5.5.3.3 Promoting Workers' Health

#### Special Health Examinations

TSMC offers regular health examinations for employees and special health examinations for employees managing tasks such as ionizing radiation, solvent operations, or operations with average daily sound pressure level above 85 decibel for 8 working hours.



Employee annual health examination

Workers with higher risk of adverse health outcomes are subject to grade 1 or 2 health control by the TSMC Wellness Center. TSMC provides health examination

records and workplace hazards monitoring information to occupational physicians for causal assessment. In 2011, no reports of abnormal findings in health examinations were caused by occupational exposure. (See Chapter 5.4.1 for more on health caring system.)

### 5.5.4 Hosting the First Joint Forum on Workers' Health

#### Initiating A Collaborative Forum: We Care About Workers' Health

TSMC co-hosted a Forum on Workers' Health on September 22, 2011, attended by more than 300 participants from government and academia as well as managers from leading companies. The forum covered topics including employee fatigue in the workplace, stress management for employees, employee assistance programs and health promotions, enterprise risk management for global infectious disease control, labor safety and health policy, and health risks of nanomaterials. TSMC believes that employees' physical and mental health is fundamental to maintaining normal business operations and also part of a corporation's responsibility. By creating an opportunity



for experience sharing and dialogue between industry, government, and scholars, we aim to provide a healthier working environmental for all workers.



2011 Workers' Health Forum



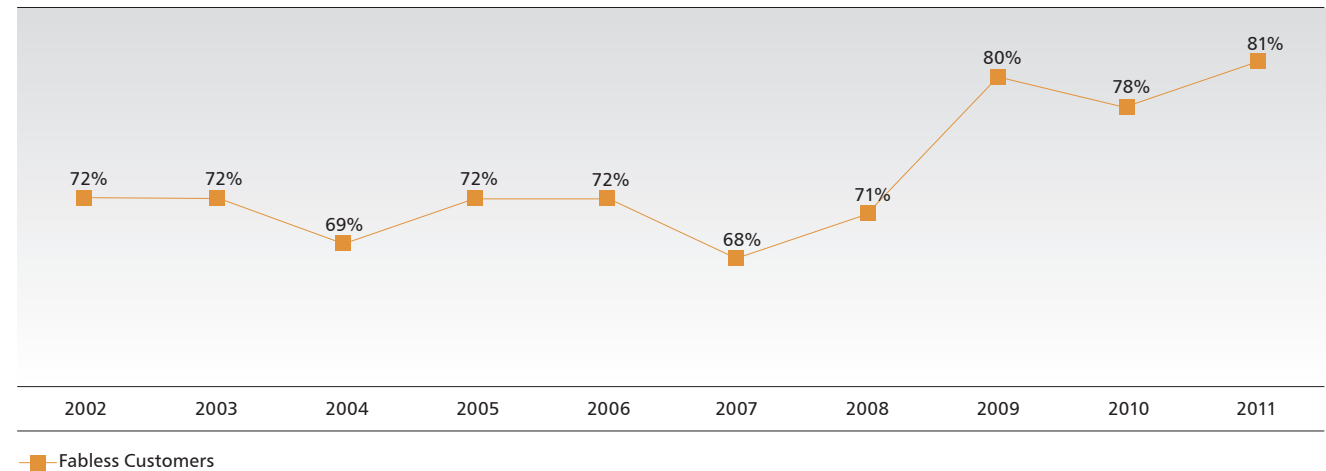
# 6. Customer Service and Supplier Management

## 6.1 Customer Service and Satisfaction

### 6.1.1 Customer Trust

Customer trust is one of TSMC's core values. At TSMC, customers come first. Their success is our success, and we value their ability to compete as we value our own. Through many years, TSMC has been advancing our technology and expanding our capacity in order to fulfill customers' needs. Based on the trust of our customers, TSMC has also helped to refocus many customers' priorities from maintaining their own fabs to concentrating on design. We strive to build deep and enduring relationship with our customers, who trust and rely on us to be part of their success over the long term.

Fabless Customers



### 6.1.2 Customer Service

TSMC is committed to providing the best service to our customers and believes that customer service is critical to enhancing customer loyalty. In turn, customer loyalty leads to higher levels of customer retention and to expansion of business relationships. TSMC's goal is to maintain its position as the most advanced and largest provider of semiconductor manufacturing technologies and foundry services. TSMC believes that achieving this goal will help retain existing customers, attract new customers, and further strengthen customer trust.

TSMC has a dedicated team, interface or champion throughout the management chain for serving our customers. To facilitate customer interaction and information access on a real-time basis, TSMC has established a wide range of web-based services covering applications in design, engineering, and logistics collaboration. They are collectively branded as eFoundry™.

### 6.1.3 Customer Satisfaction

TSMC regularly conducts surveys and reviews to ensure that customers' needs and wants are adequately understood and addressed. Continual improvement plans supplemented by customer feedback are an integral part of our business processes. The channels we use include an annual customer satisfaction survey, quarterly business reviews, and customer audits.

TSMC's Annual Customer Satisfaction Survey is carried out by an independent third party consulting firm. Our goals are to understand customers' specific needs and expectations from TSMC, and to obtain formal and direct feedback from our customers to measure TSMC's performance and identify TSMC's weaknesses for development of improvement strategies.

The findings and analysis of customer feedback are presented to TSMC's executive team, and appropriate details are shared

throughout TSMC organizations. Based on survey input, all the related functional and regional teams work together on action plans, and progress is monitored closely.



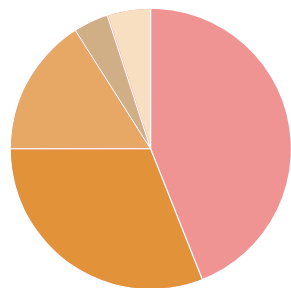
NVIDIA and TSMC celebrated the shipment of the one-billionth GeForce graphics processor designed by NVIDIA and manufactured by TSMC.

### 6.2 Supplier Management

TSMC has always treated suppliers as partners, and works together with them over the long term to build a stable and sustainable semiconductor supply chain. In addition to taking into account supply chain product quality, delivery, and cost, TSMC also works with our suppliers to protect the environment. We also pay attention to the human rights, safety and health issues of suppliers' plants as well as business continuity and risk management, so that we may fulfill our corporate social responsibility together.

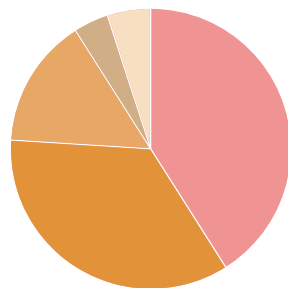
Successful Customers		
<p><b>Technology Leadership</b></p> <ul style="list-style-type: none"> <li>• Advanced Technology           <ul style="list-style-type: none"> <li>▪ Best speed-power optimization</li> <li>▪ Highest density for cost effectiveness</li> </ul> </li> <li>• More than Moore's Technology           <ul style="list-style-type: none"> <li>▪ Enriched functionality</li> <li>▪ More portability</li> <li>▪ Energy efficient</li> </ul> </li> </ul>	<p><b>Manufacturing Excellence</b></p> <ul style="list-style-type: none"> <li>• Capacity Leader</li> <li>• Responsive and Flexible</li> <li>• Best Yields and Cycle Time</li> <li>• Fast Ramp</li> <li>• Quality</li> </ul>	<p><b>Customer Trust</b></p> <ul style="list-style-type: none"> <li>• 100% Dedicated Foundry</li> <li>• Total Solution Service</li> <li>• Partnership Collaboration</li> <li>• Long Term</li> <li>• Win-Win</li> <li>• Trustworthy</li> </ul>
Financial Strength and Manufacturing Capacity		

TSMC has driven for localization of raw material and spare parts of equipment in recent years. In addition to reducing transportation cost, mitigating supply risk and reducing carbon generation, TSMC also hopes to support local industry and create more job opportunities. Following the March 11, 2011 earthquake in Japan, some Japanese suppliers have transferred production sites to Taiwan to better ensure their service to customers. TSMC's sourcing percentage from Japan has been reduced to 41% in 2011 from 44% in the previous year, while the sourcing percentage from Taiwan increased 4 percentage points. To create a win-win situation for TSMC and suppliers, TSMC will continue supporting local companies, encourage localization from foreign suppliers and drive for lower production cost, supply risk and even better competitive advantage.



**TSMC Material Source Profile**  
(according to 2010 procurement amount)

- Japan (44%)
- Taiwan (31%)
- USA (16%)
- EUR (4%)
- Others (5%)



**TSMC Material Source Profile**  
(according to 2011 procurement amount)

- Japan (41%)
- Taiwan (35%)
- USA (15%)
- EUR (4%)
- Others (5%)

## 6.2.1 Ensuring Supplier Compliance

### Quarterly Business Review

TSMC conducts quarterly meetings with our suppliers' senior managers to review performance, including quality, delivery and sustainability performance. We ensure suppliers comply with TSMC requirements through semi-annual or quarterly monitoring of key indicators through a scorecard and checklist.

### Certification for Management System

TSMC encourages its suppliers to be certificated for ISO 14001, OHSAS 18001 or other environmental and ESH management systems.

### Site Audit and Assistance

TSMC visits our suppliers and performs audits according to an annual plan. When special concerns arise from these audits, we work with suppliers to develop appropriate solutions for fulfilling our expectations. These solutions are executed by specified sponsors with a clear goal and time frame. In addition, to confirm that chemical and other raw material suppliers meet environmental health and safety regulations, TSMC held a chemicals management and regulatory compliance seminar to require that all suppliers sign a "regulatory compliance questionnaire" to confirm the compliance of all chemical suppliers in 2010.

### Intelligent Information

TSMC works closely with raw material suppliers to exchange inventory information, so that in-bound supply chain inventories are transparent and demand fluctuations can be detected early. Faced with the challenge of the global financial crisis and the March 11 earthquake and tsunami in Japan, we collaborated with our suppliers to build a strong and lean supply chain to

mitigate the risk of supply interruption and avoid making surplus materials.

### Joint Emergency Response Drills

TSMC follow the cycle of Plan-Do-Check-Act to select critical suppliers for emergency response drills, perform a simulated emergency scenario and review any shortcomings.

## 6.2.2 Establishing A Sustainable Supply Chain

In recent years, global consumers increasingly feel that corporations have a responsibility to supervise their suppliers. As a global leader in the semiconductor industry, TSMC has an ongoing commitment to improve the sustainability performance of suppliers and work together to create sustained value. We supervise and collaborate with our suppliers in a number of sustainability fields, including the Restriction of Hazardous Substances, climate risk management, earthquake risk response, fire prevention, occupational safety and health management, and business continuity plans. These efforts can reduce the risk of interruption to our supply chain, and are also part of our corporate social responsibility.

### 6.2.2.1 Supply Chain Risk Management Committee

TSMC has brought together fab operations, materials management, risk management, and quality system management in an internal committee dedicated to managing our supply chain. This committee is focused on risk mitigation and enhancing supply chain agility. The steering team directs annual goals and reviews progress each quarter. The committee's working team tracks the effectiveness of continuous improvement projects and assists suppliers to improve green procurement, environmental protection, regulatory compliance, certification acquisition, and industrial safety assurance.

At the same time, we monitor changes in demand and supply through regular communication with suppliers or public information, monitor supply chain inventory, and draft backup plans. The working team holds monthly meetings to monitor progress. Furthermore, we actively address supply chain issues and manage potential supply chain risks.

### 6.2.2.2 Developing Supply Chain Standards in Fire Protection, Earthquake Response, Safety, Health, and Risk Management

TSMC views supply chain risk management as part of the company's competitive advantage. In a globalized world, any major natural disaster or accident can have an impact on TSMC. Therefore we pay close attention to any risk to our supply chain partners, and take the initiative to provide assistance when necessary.

Our concerns include:

- Business continuity plan: TSMC requires our suppliers to establish their own business continuity plans for a variety of potential natural or man-made threats. Appropriate plans, procedures, actions and periodic drills are required to ensure continuous operations and reduce the impact of accidents on TSMC.
- Geographical risk: TSMC analyses the geographic location of manufacturers in our global supply chain by using mapping tools. When a major accident or natural disaster occurs around the world, we can immediately begin business continuity plans and take the initiative to provide our supply business partners with the resources needed to resume production.
- Earthquake Risk Management: TSMC proactively helps companies that need assistance by teaching them how to strengthen their anti-earthquake engineering.

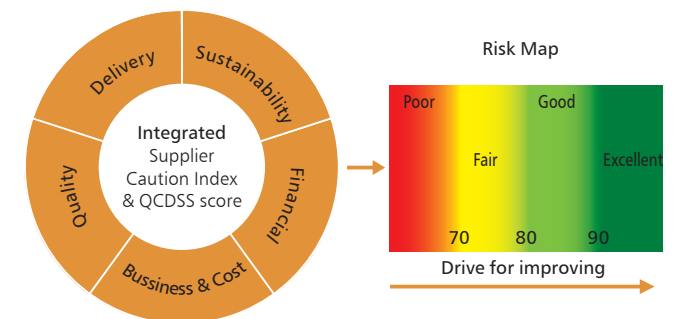
- Climate change risk management: Due to the increased risk of water shortage and flooding in recent years resulting from global climate change, we require our suppliers to prepare contingency plans, such as support from overseas production, to reduce the impact of such an event.
- Fire risk management: We believe that fires can be prevented, and share our own loss prevention and fire protection management experience with our suppliers.
- General environmental, safety and health: TSMC requires major suppliers to obtain OHSAS 18001 certification or other health and safety management system certification.
- New influenza pandemic response and prevention: TSMC shares its experience in corporate pandemic response and prevention with our major suppliers.
- Transportation risk: Suppliers must manage the quality of their transportation or logistic service and vehicles, In particular, appropriate training and contingency plans are required in the transport of dangerous or hazardous chemicals.
- Suppliers' Supply Chain Risk Management: In addition to requiring suppliers to manage their supply chain risk, we also require suppliers to have the ability to review their suppliers' risk management and to enhance the reliability of the supply chain.
- Interruption of information systems risk management: Some suppliers are highly dependent on IT systems in their production. TSMC asks that they have mechanisms for remote backup of information systems. Computer server rooms are also required to have fire and earthquake protection to reduce the impact of accidents.

### 6.2.2.3 Developing A Supply Chain Sustainability Risk Map

TSMC's efforts in sustainable supply chain management in the past several years have answered our customers increased concerns in this area. Despite the difficult and forward-looking nature of some of our measures, we are dedicated to continuing our efforts.

In 2009, TSMC developed a Sustainability Evaluation Score to assess suppliers' supply chain risk and sustainability. We use this score, combined with delivery, quality, financial, operational, and other risks, to form a supply chain risk map. TSMC refers to these maps as an important basis for procurement strategy. In 2011, TSMC surveyed a total of 56 critical suppliers, including silicon wafer, gas, chemicals, quartz parts, masks, parts cleaning and other raw materials suppliers, transport companies and logistics services, which covered more than 90% of our total purchase amount.

#### Supply Chain Risk Management



## Response to the March 11 Earthquake and Tsunami in Japan, and Flooding in Thailand

Japan experienced its worst earthquake in a century on March 11, 2011. Following the earthquake, TSMC immediately set up a business continuity team, integrating operations, procurement, risk management, customer service and quality assurance units to appropriately respond to possible impacts. This major earthquake had no impact on our operations due to these efforts. Following up, TSMC developed a risk reduction plan for raw materials from high-risk areas, and established a database of supply locations to grasp the impact of the regional natural disasters on the supply of raw materials.

At the end of July, 2011, the southern region of Thailand experienced heavy flooding lasting nearly three months due to continuous torrential rain. Production of many downstream components for the world electronics industry, such as computer hard disks, was affected. TSMC analysed raw material supply risk following the Thai floods and confirmed that the disaster would have no impact on the company's operations.

## Supplier Audit and Assistance on ESH

Over the past year, TSMC continued to audit 56 major suppliers encompassing 90% of our total purchasing through questionnaires or on-site audits. If major shortfalls in environmental protection, safety or health are discovered, we require that senior management commit to improvement. For suppliers lacking resources for self-improvement, we organize experience-sharing seminars or perform on-site counseling to improve performance.

The establishment of a sustainable supply chain is a win-win strategy, which enhances the safety of our suppliers, their employees, and their, and indirectly enhances the competitiveness

of TSMC. The company will continue its efforts to reduce supply chain risk and contribute to customers, investors, and society.

## Enhancing TSMC Chemical Suppliers' Environmental, Safety, and Health (ESH) Knowledge

A number of Taiwan government agencies, including the Environmental Protection Administration, Council of Labor Affairs, Ministry of Economic Affairs, Atomic Energy Council, and National Fire Agency have recently announced a number of new or amended regulations managing chemical environmental, safety, and health risks. On July 15, 2011, TSMC offered a free but compulsory forum for chemical suppliers to gain a better understanding of these regulations, attended by 170 participants from 100 companies. Topics in the Forum included "Taiwan regulations: Suppliers' responsibility regarding chemical ESH information", "How to prepare a Material Safety Data Sheet (MSDS)" and "What is the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)". Through this forum, TSMC aimed to enhance its suppliers' knowledge and ensure that suppliers are fully responsible for the substances contained in their products subject to laws and regulations in Taiwan.

**2011 TSMC Supplier Forum of  
ESH Information & Regulations for Chemical Substances  
July 15, 2011 @ Hsinchu, Taiwan**

✓ Supplier ESH Information Enhancement  
✓ 170 participants from 100 companies

Time	Agenda	Speaker
13:45-14:00	Registration	
14:00-14:30	Introduction and background	TSMC Deputy Director: Pang Ming-Hua
14:30-14:35	ESH regulations and TSMC supply chain ESH management	TSMC Senior Engineer: Ho-Ting Lin
14:35-14:38	Supplier's responsibility of chemical ESH information	SAHTECH Director: Jow-Ru Li
14:38-14:40	Break	
14:40-14:50	How to prepare a Material Safety Data Sheet (MSDS) for a product with examples	SAHTECH Manager: Yang-Jiang Chen
14:50-15:05	What is the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and how to prepare it on the label with examples	SAHTECH Manager: Yang-Jiang Chen
15:05-15:30	Discussion	



**Topics in the Forum:**

- "How to prepare a Material Safety Data Sheet (MSDS) for a product with examples"
- "What is the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and how to prepare it on the label with examples"

## 6.2.2.4 Green Procurement

### Developing Suppliers' Green Standards

TSMC is committed to building a "green supply chain", attending to global environmental issues, and exerting its influence to encourage supply chain partners to follow. Our assessment of suppliers' green performance includes:

- Energy saving and carbon reduction management: suppliers are required to collect carbon inventory data in their manufacturing plants, develop a product-based carbon footprint, and provide carbon reduction performance data.
- Water resources and water management: suppliers are required to collect water inventory data in their manufacturing plants to establish a water footprint, and to provide a specific water resource management plan.
- Green Products and Hazardous Substances Control Specification: In response to global hazardous substance controls and eco-friendly product specifications, we ask suppliers to comply with PFOS/PFOA/Conflict Minerals/RoHS/REACH and other global chemical control standards.
- Waste management: supplier should continuously improve waste reduction performance and raise recycling and reuse ratios in their manufacturing facilities.
- Tire-2 suppliers' green supply chain: Suppliers must work with their upstream suppliers on environmental protection, reduction of carbon emissions, and water conservation-related measures.
- Environmental Management System and the establishment of environmental objectives: suppliers must have ISO 14001, RC 14001, or other relevant environmental management system certification.
- Other environmental protection standards: This includes the use of green procurement, adoption of green building designs, promotion of environmental education and others.

### **Requiring Raw Materials Suppliers to Eliminate Hazardous Substances**

TSMC promotes “green procurement”, and requires raw materials suppliers to provide a statement to ensure that their products do not contain internationally banned hazardous substances harmful to the environment to ensure that products meet customer requirements such as the EU RoHS Directive. If significant deficiencies are found in supplier environmental audits, the supplier will be reviewed and asked to improve at a quarterly meeting chaired by a purchasing group manager.

### **Green Requirement for Process Tool Vendors**

TSMC requires equipment vendors to consider water, power, and material conservation when designing new generations of equipment, and also requires a long-term blueprint for carbon reduction and future environmental strategy. TSMC also verifies that energy performance of each tool meets or exceeds conditions set in the procurement contract after tool installation is completed.

### **Promoting Green Label Office Supplies**

TSMC encourages the use of office equipment and supplies with green labels, including computers and peripherals, recycled printer paper, recycled paper towels, and environmentally friendly cleaning supplies. Purchasing of office supplies and equipment with eco-labels increased 22.5% in 2011, amounting to more than NT\$250 million.

### **6.2.2.5 Concern for Supply Chain Labor Standards**

Over the past several years, the Electronics Industry Citizenship Coalition (EICC) has continuously shown concern for labor rights and working conditions. As a member of the electronics industry supply chain, TSMC has adopted EICC standards for protection of labor rights and taking care of the working conditions of

employees, requiring its own supply chain manufacturers to comply with environmental, health and safety, labor rights and working conditions standards.

### **Conflict Mineral Management**

TSMC requests our suppliers to comply with restrictions on using mineral resources from conflict areas. In addition, suppliers are requested to disclose their smelter-related information before they are qualified and adopted as a supplier for new materials. TSMC requires suppliers with incomplete information or unqualified smelters to improve, and may also seek an alternative source.

## **6.2.3 Managing Contractors' ESH**

TSMC endeavors to be a good corporate citizen and meet its social responsibilities. We believe in going beyond providing a safe workspace for employees to establish a higher ESH standard with our partners in all industries. TSMC is committed to communicating with suppliers and contractors on environmental, safety, and health issues and encouraging them to improve their ESH performance. TSMC treats contractors like our employees and works together with them to adopt good safety protection, and leads members of our supply chain to reduce their environmental impact.

### **6.2.3.1 Identifying High-risk Work for Priority Management**

TSMC has established standards for high-risk work to strengthen contractor safety management. TSMC began adopting high-risk work management and self-management to govern work performed by contractors in 2005. TSMC's high-risk work management classifies work that may cause injuries, casualties or major property damage as level-1 high-risk operations. These include work in confined spaces, work with electrical shock risk,

hot work, or disconnection of gas or chemical piping. Work that may result in system shutdowns or production interruptions are classified as level-2 high-risk operations. TSMC explicitly defines safety precautions and control procedures to be taken by personnel according to different operations.

### **6.2.3.2 Contractor OHSAS 18001 Requirement and Worker Skill Certification**

In terms of self-management, TSMC requires that contractors performing level-1 high-risk work must complete worker certification and establish their own OHSAS 18001 safety and health management system before they are eligible to bid on contracts. This self-management is aimed at increasing contractors' sense of ownership and responsibility with the goal of promoting safety awareness and technical improvement for all contractors in the industry. Workplace accidents have decreased by half since these requirements were implemented in 2005.

In addition to routine audits by third party certification agencies, TSMC also conducted audits of OHSAS 18001-certified contractors. If an audit finds that a contractor is not qualified, the contractor's level-1 high-risk work qualification may be revoked.

TSMC plans to continuously promote its contractor safety certification program in the future, perform regular audits, and recognize outstanding contractors. In addition, TSMC holds an annual “Contractor ESH Forum” to announce ESH requirements and share safety management experience. TSMC believes that we can help the community and the environment by leading our contractors to reach higher standards of environmental, safety, and health protection and create a better workplace.

### 6.2.4 TSMC Supply Chain Management Forum and Excellent Supplier Award

In keynote address of the 2010 Supply Chain Management forum, Chairman and Chief Executive Officer Dr. Morris Chang emphasized that doing business in an environmentally sustainable way is part of our corporate social responsibility to society, and noted the public's expectations that business will continue to reduce their environmental impact. Chairman Chang also pointed out that with suppliers' support, TSMC has not only reached its goal of reducing PFC emissions to 10% below the 1997 and 1999 average in 2010, the company was also recognized by the Dow Jones Sustainability Index with the highest overall score out of all semiconductor companies in the index.

TSMC held its 11<sup>th</sup> Supply Chain Management Forum on Dec. 2<sup>nd</sup> of year 2011 with the theme of "Collaborate on Technology Advancement". In addition to recognizing the support and contributions from its suppliers, TSMC also awarded outstanding suppliers of equipment, materials and facilities. In addition, a special award on "Achievement in Local Presence for Supply Chain Resilience" was established to affirm the contributions

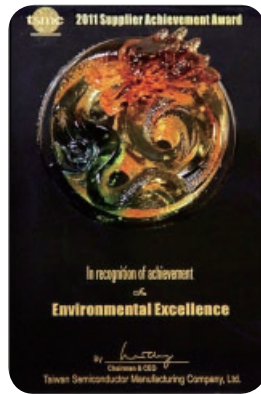


2011 TSMC Supply Chain Management Forum

of suppliers establishing production sites in Taiwan, expressing TSMC's will to support local industry and its pursuit of supply chain sustainability.

#### TSMC "Green Supplier Award"

At its 2011 Supply Chain Management Forum, TSMC presented its first "Achievement in Environmental Excellence" award to a



supplier demonstrating outstanding performance in overall environmental protection. Assessment criteria included efficiency (including water saving, power saving, and reduced consumption), code compliance, carbon inventory, hazard restriction, environmental management system (ISO 14001, QC 080000), and green project/commitment or green joint development program with TSMC.

During the forum, TSMC risk management executives stated the company's green procurement policy and 10 CSR principles, and emphasized that TSMC has been striving for environmental protection as a corporate social responsibility and has entered the businesses of solar energy and solid state lighting. In addition, TSMC has placed energy saving into its criteria for supplier and subcontractor selection, and also requires suppliers and contractors to meet a number of environmental and energy conservation requirements. TSMC supports our suppliers and assists them with overall improvement.

### 6.2.5 Summary the Achievement of Supply Chain Management in 2011

Item	Goal	Result Summary
Green supply chain – product carbon footprint	Collaborate with 15 major suppliers to develop a product carbon footprint for 300mm (Fab 12) and 200mm (Fab 5) wafers and gain PAS2050 certification	Achieved
Green supply chain – product carbon footprint	Complete carbon inventory and carbon resource management survey for 56 major suppliers in Japan, the United States, and Taiwan to encourage energy saving and carbon reduction	Achieved
Green supply chain – water resource and water saving	Complete water management survey for 56 major suppliers in Japan, the United States, and Taiwan to encourage water saving	Achieved
Green supply chain – PFOS hazardous substance management	Complete verification of replacements for products containing PFOS photoresist before the end of 2011	PFOS completely phased out
Green supply chain – PFOA hazardous substance management	Complete verification of replacements for products containing PFOA photoresist before the end of 2012	Ongoing
EICC compliance on labor, environment protection, safety and health, human right and social standard	Verify that major suppliers are compliant with EICC standards	Confirmed through questionnaires, on-site audits, and quarterly business reviews that 56 major suppliers are in line with EICC requirements in labor, environmental protection, health and safety, human rights and social standards
Supply chain risk – business continuity plan	Confirm that 56 major suppliers maintain basic business continuity plans (as per the BS 25999 standard and customer requests)	Achieved



## 7. TSMC Social Participation

TSMC feels a deep sense of responsibility to care for the earth and the next generation, and it is part of our TSMC's corporate social responsibility for the long haul. We aim to bring the Company's resources together with our employee's wisdom and love to build a sustainable society, protect the earth, care for the disadvantaged, and eliminate the gap between urban and rural areas.

In 2011, the TSMC Volunteer Society, TSMC Education and Culture Foundation, and colleagues participating in the Typhoon Morakot Reconstruction Project served in Hsinchu, Taichung,

Tainan, Chiayi, and other regions. They brought their warmth and care to elderly veterans, youth in halfway houses, students in remote areas, and aboriginal villagers whose homes were virtually destroyed by Typhoon Morakot three years ago, giving them companionship, encouragement, spiritual and support as well as timely economic aid.

We also continued to promote science and art education. In addition to bringing students from remote regions around Taiwan to visit science, history, and art museums, we built the "World of Integrated Circuits" exhibit at the National Museum of Natural Science and plan to establish a Children's Art Education Center at the Taipei Fine Arts Museum. We also combined public and private sector resources to raise the standard of secondary school physics experiments and train teachers to develop tomorrow's scientific talent.

In the area of sustainability, we believe in selfless sharing. TSMC held charity donation drives for disadvantaged groups in society for a sixth year. We also held our first Industrial Water Conservation Course, offering more than a decade of water-saving experience with small and medium enterprises and government agencies through free classes. We hope our knowledge can lead other industries to conserve water with us and gradually solve the problem of water scarcity, water inequality, as well as competition between industrial and household water consumption.



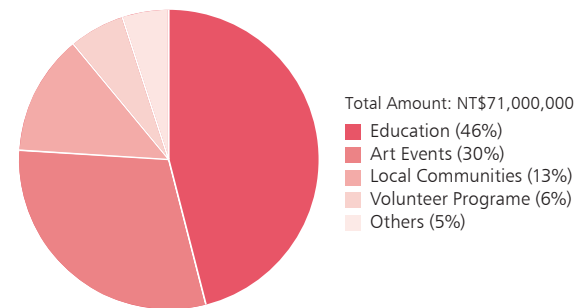
We hope that all these efforts can become a force to uplift society so that, in the words of the analects of Confucius, “children receive nurturing, youth receive learning, adults are employed, and the elderly are cared for”. What’s more, we hope that society can make use of these resources to grow in knowledge, love, happiness, health, and prosperity. We also hope that our passion and dedication can serve as an example and motivate society to treasure the earth’s natural resources.

## 7.1 TSMC Education and Culture Foundation

Established in 1988, the TSMC Education and Culture Foundation, led by Chairman Dr. F.C. Tseng, focuses its resources in the four areas of education, community building, promotion of arts and culture events, and the employee volunteer program as part of TSMC’s efforts in corporate social responsibility.

In 2011, the TSMC Foundation devoted NT\$71 million to promoting education and culture. The Foundation was presented The Social Education Public Award by the Ministry of Education, a prestigious recognition of TSMC’s long-term social contribution. The highlights of the Foundation’s projects this year include supporting the Taipei Fine Arts Museum to establish the TSMC Children’s Art Education Center, launching Science Teacher Camps for senior high physics teachers, sponsoring the Berliner Philharmoniker’s second visit to Taiwan, producing the broadcast program “Chuang-tzu in Hsin’s View”. In addition to financial sponsorships, the TSMC Foundation supports the TSMC Volunteer Society, which organizes employees to commit themselves to caring for underprivileged people in the community.

### Sponsorship by the TSMC Foundation in 2011



#### 7.1.1 Commitment to Education

A pool of talented people is essential to the development of our economy. As a leader in Taiwan’s knowledge-based industry, we regard cultivating talent for society as a core responsibility of TSMC. The Foundation tailors various programs to target a whole range of education at different age levels.

At the primary school level, in addition to taking students from remote townships to visit science museums and arts centers, we supported the Taipei Fine Arts Museum to establish an education space for children’s arts education. For secondary schools, we place equal emphasis in both science and humanities. In science, we gathered private and public resources to train senior high school physics teachers for higher educational skill. In humanities, we continue to hold various activities to improve students’ appreciation for arts. At the college level, the Foundation has established the “TSMC Mentor Scholarship” to recruit senior TSMC employees to mentor students both in school and in their future careers.

### The Primary-School Level – Cultivating Science and Aesthetic Education

#### TSMC Aesthetic and Science Tour

Science and aesthetic education are two main focuses of the TSMC Foundation. To bridge the urban-rural gap, we launched the “TSMC Aesthetic Tour” in 2003 and “TSMC Science Tour” in 2010 to take children from remote townships to visit museums and science education centers to inspire their interest in art and science.

In art education, this year the “TSMC Aesthetic Tour” took some 3,000 students from rural areas to visit the National Palace Museums to inspire their appreciation for the beauty of traditional Chinese art. We also organized children to visit the exhibit “Monet Garden”, held in the Taipei Fine Art Museum. Over 30 of Claude Monet’s paintings from Musée Marmottan Monet in Paris showcased to the children the beauty of Impressionist masterpieces. Over the past several years, the Foundation has invested NT\$60 million in this project. In total, over 60,000 children from over 500 schools nationwide have participated in the tour.

In Science, this year “TSMC Science Tour” took more than 2,000 children from remote school districts to the National Taiwan Science Education Center, National Museum of Natural Science, and National Science and Technology Museum. Assisted by professional guides, children interacted with various exhibits first-hand to experience the charm of science.

### TFAM—TSMC Children Art Education Center

In recent years, dedicated education spaces have become a trend among major public art museums throughout Taiwan. For example, the Kaohsiung Museum of Fine Arts established an affiliate Children's Museum of Fine Arts, the National Taiwan Museum of Fine Arts unveiled its Family Room, and the National Palace Museum opened its Children's Gallery. These established education spaces offer social interaction and learning in addition to exhibits.

Following this trend, Taipei Fine Arts Museum cooperated with the TSMC Foundation to establish a "Children's Art Education Center", the most substantial alteration of the museum's space since its opening. The upcoming "Children's Art Education Center" consists of a gallery, workshops, and a courtyard to serve as a dedicated art education space to serve children throughout north Taiwan. This project is scheduled to be completed and inaugurated in 2013.

### Hope Reading Program

Since 2004 TSMC has sponsored the Hope Reading Program initiated by the Common Wealth Educational Foundation. This program is a campaign to narrow the gap in educational resources between rural and urban areas caused by disparities in wealth. By providing books to children in remote and underprivileged areas of Taiwan, TSMC hopes to promote literacy and inspire interest in reading among these children so that they will have good books to read and the opportunity to one day leave poverty behind through education. From 2004 to 2011, the Foundation provided two hundred rural schools with 130,000 books and supported 25,000 children.

### The High-School Level—Nurturing Science and Humanities

#### "Raising the Level of High School Physics Experiments"

##### Program

In 2010, in collaboration with the Ministry of Education and the Wu Chien-Shiung Foundation, the TSMC Foundation pledged a donation of NT\$20 million over five years to create the project "Raising the Level of High School Physics Experiments."

"Raising the Level of High School Physics Experiments" is comprised of two major parts. The first is to establish a full series of high school physics experimental kits, which are legal copies based on the training material of the International Physics Olympiad. These experimental kits will serve as an important database for high school physics education. The second part is to hold a camp for science teachers. With the assistance of the Ministry of Education, we will recruit science teachers to participate in the science camp during summer and winter vacations. This year the summer camps recruited 70 high school physics teachers and lifted their teaching and experimental abilities through a week of training. We hope these teachers will nurture and inspire more students to realize their potential in science.



Ms. Lin Mei-ei, from National Taichung Senior High School, has been teaching physics for 24 years. She leads students to participate in the International Physics Olympiad and her teams have made impressive achievements. Speaking on the "Raising the Level of High School Physics Experiments" program, she was excited to express that participation in the training camp not only lifted her ability but was also a sort of encouragement. In her view, the experiences of senior teachers are a treasure. The more the abilities of the teachers have, the better students learn.

—Cited from United Daily Night. Reported by Mr. Hsu Mu-chun

### Science Talent Camp

To cultivate talented young scientists, the Foundation continued to sponsor the Wu Chien-Shiung Science Camp, as well as the Wu Ta-Yu Science Camp, and sponsored the Madame Curie Chemistry Camp for the first time in 2011. These camps provide talented students with the opportunity to hold discussions with world-class scientists with the goal of inspiring students and helping them realize their potential.

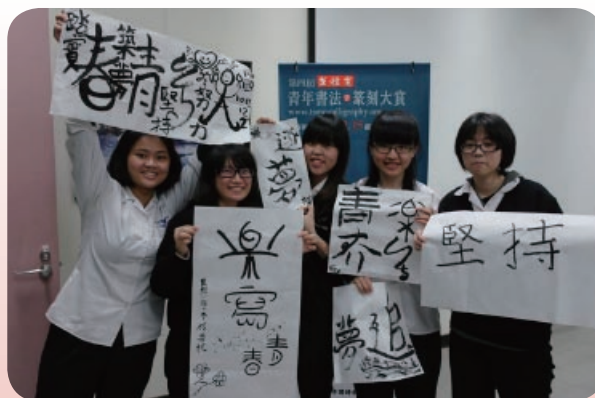
2011 was the fourteenth anniversary of the Wu Chien-Shiung Science Camp, and the camp invited 4 world-class scientists in the fields of physics, astronomy, and biology to speak to 139 gifted youths and 37 science teachers for one week. The theme of the 10th Wu Ta-Yu Science Camp was "Ecology and

Evolution” and 10 world-class scientists in related fields were invited to present their studies and new trends in their fields to 88 outstanding students from China, Hong Kong and Taiwan. This year we also sponsored the Madame Curie Chemistry Camp. A total 140 students from senior and junior high schools gathered to listen to speeches by top-notch masters to inspire their interest in chemistry.

### TSMC Youth Calligraphy Contest

The art of calligraphy is a distinguished legacy of Chinese culture. To preserve this art in the modern era of technology, the TSMC Foundation encourages young people to learn calligraphy and continue this artistic tradition. In addition to the contest, the Foundation also organized various campaigns in 2011 to cultivate student and public appreciation of calligraphy.

In addition to the calligraphy competition, we also held a “Taipei Painting and Calligraphy Tour” and three workshops at high schools. We took the students on a stroll through old calligraphy and painting shops. Through these experienced shop owners, the young people not only learned what to look for when choosing their own ‘four treasures of the study’, but also learn about calligraphy and experienced the joy of traditional arts. The TSMC Foundation hopes to encourage younger generations to appreciate traditional Chinese art through calligraphy.



The students who participated in the workshop expressed their true feelings by calligraphy just like many Chinese artists have for 2,000 years. Through Mr. Hsiao Shi-chon’s guidance, students were inspired to learn the freedom and beauty of writing calligraphy.

—Mrs. Chen Chi-hong from Zhongshan Girls High School



### TSMC Youth Literature Award

The Foundation has held the “TSMC Youth Literature Award” for 8 years, and works entered in the competition have become more sophisticated and diverse each year. Numerous former winners continue to submit new works to newspapers and magazines. Since last year, we have been inviting noted writers and poets to get together with former winners. Through close communication, the young writers are encouraged to have the confidence to create. The literature gathering has also become an important feature of this literature award.

### The College Level—Aiding Underprivileged Students TSMC Mentor Scholarship

In 2011, the TSMC Foundation continued to sponsor the “TSMC Mentor Scholarship” to support underprivileged students attending National Tsing Hua University and National Central University. In addition to providing financial support, the Foundation recruited senior TSMC employees to mentor the students regularly. We hope that the rich experience of TSMC employees can provide insightful advice for students both in school and in their future career paths. At the same time, the Foundation continued to endow chair professorships to strengthen academic research.

Campuses are a source of outstanding talent for businesses. Being the mentor to college students helped me understand their thoughts on studying and future career development. Through our direct interaction, I suggest that the students choose a job based on long-term growth rather than salary. Under this logic, they can create their balance between work and life, which is not only my personal experience, but also the TSMC way. The mentorship system let us gain a deeper understanding of young people, help students learn about their career options earlier, and helps both students and businesses make the right decisions.

—The Director of TSMC Fab 6, Mr. Chen Shih-shong

Through the interaction, we introduced students to the development of the semiconductor industry. We also offered our sincere suggestion on his life and career plan, and encouraged him to devote himself to society. Talented people are the most important assets of TSMC. Through care for underprivileged students, TSMC pro-actively carries out its responsibility of social citizenship.

—The Director of TSMC Fab 12 Phase 4/5, Mr. Chen Pei-hong

### 7.1.2 Promotion of Arts and Culture

The TSMC Education and Culture Foundation is devoted to the promotion of arts and culture. Over the years, the Foundation pioneered several original approaches and positive feedback from the public has prompted many companies to join our efforts. In addition to inviting international performance groups to Taiwan, we also aspire to raise the quality of domestic performing arts through exchange, and to give society deeper knowledge and appreciation of the arts.

#### Sponsorship of the Berliner Philharmoniker

The Berliner Philharmoniker's first performance in Taiwan in 2005 drew an audience of 30,000 to listen to the music of this world-leading orchestra in an outdoor plaza. That concert showed these elite performers the passion of Taiwan's music-lovers, and helped to inspire the Berliner Philharmoniker's "Digital Concert Hall" project, fulfilling the ideal of music without borders.

The TSMC Education and Culture Foundation was honored to have another opportunity to support this world-class orchestra's performance in Taiwan, and contribute to cultural exchange between East and West. This year, Sir Simon Rattle and the Berliner Philharmoniker not only performed magnificent masterpieces for Taiwan's music-lovers but made high-quality video and audio recordings to leave a record of the performance for future listeners for the first time in Taiwan. In addition to indoor concerts, there were 5 live broadcast concerts in Taipei, Hsinchu, Taichung, and Hualien. Over 80,000 listeners gathered to enjoy the Berliner Philharmoniker's wonderful music. We also arranged for 200 young music students from the Hsinchu area to attend Sir Simon Rattle and the Berliner Philharmoniker's rehearsal. We hope that this close-up view of a master conductor in action will open broader artistic horizons for these students.



The Berliner Philharmoniker visited Taiwan again. Over 80,000 audiences around Taiwan enjoyed their remarkable concerts.

#### Chung-Tzu in Hsin's View—A Broadcasting Program

The TSMC Foundation has long been devoted to reviving Chinese traditional culture. Since 2008, the Foundation worked with Hsinchu radio station IC Radio to present a series of broadcasts by Professor Hsin Yih-yun on the Analects of Confucius. We hope that Professor Hsin's simple but inspiring lessons help more people understand the wisdom of the Analects.

After the Analects of Confucius, the Foundation continued to promote another Chinese Classic, Chuang-tzu. We again invited Professor Hsin Yih-yun to produce a Radio program "Chuang-tzu's in Hsin's View". Through Professor Hsin Yih-yun's rich knowledge and vivid examples, we hope that more people can understand Chuang-tzu's philosophy, and gain wisdom from it.

#### TSMC Literature Award

Following the TSMC Youth Literature Award, the TSMC Foundation launched the TSMC Literature Award to encourage young writers under 35 years old to create novels between 60,000 words and 80,000 words. This literature competition gained overwhelming positive responses from literature societies. The winning works, selected from hundreds of novels from all over the world, gained accolades from all judges. The Foundation will continue to hold the competition every two years to cultivate young talents in literature.

#### The Literature Saloon at the Taipei Story House

The TSMC Education and Culture Foundation firmly believes that the protection of cultural assets not only involves structural maintenance but also spiritual replenishment through continual rejuvenation of cultural heritage sites. Acting on this conviction, the foundation in 2007 provided funding for the monthly Literature Salon at Taipei Story House. Through regularly held book readings by the authors, the spirit of the humanities has been instilled in the physical structure of heritage sites. These events allow artists and writers to come together in old homes filled with history. They have also given the edifice itself a new lease on life.

### 7.1.3 Community Building — the TSMC Hsin-chu Festival

TSMC's major manufacturing facilities are based in Hsinchu and Tainan. Facilitating a better living environment and active community for our workers is a responsibility that TSMC takes very seriously. In order to contribute to local communities and bring the arts to these high-tech cities, the Foundation began to focus its funding on fine arts activities in Hsinchu and Tainan in 2003. By organizing exquisite exhibits and performances in these cities and packaging them into the "TSMC Hsin-Chu Arts Festival", we hope to encourage a greater appreciation of arts in these site communities. Since 2003, over 220,000 citizens have participated in the TSMC Hsin-chu Festival.

This year, the Hsin-chu Art Festival gathered national and international masters to present the most fantastic performances to our communities. Professor Fang Yu held a series of lectures to introduce beautiful Chinese classic poetry by Li Shang-yin.



In 2011 over 20,000 citizens participated the TSMC Hsin-chu Festival.

The Peking opera master, Li Po-chun, brought the Taipei Li-yuan Chinese Opera Theatre to present the opera "The Scholar of Ba-Shan" to showcase the beauty of Chinese Theatre. Two classical music masters, Shlomo Mintz and Kun Woo Paik, were invited to join the festival for the first time, and brought the audience two beautiful concerts. More than 20,000 inhabitants from every corner of the communities enjoyed over 70 performances in the Hsin-Chu Art Festival.

### 7.2 TSMC Volunteer Program

Social responsibility has always been part of the culture of TSMC. The TSMC Foundation has been dedicated to promoting education and culture, providing aid for the underprivileged, advocating energy saving, and caring for communities. In 2003, the TSMC Foundation launched an employee volunteer program, a channel for the company's most valuable assets, high-tech professional employees, to give to society. Employees and their family members have been invited to participate in the following programs:

- TSMC Volunteer Docent Program
- TSMC Book Reading Volunteer Program
- TSMC Energy-saving Volunteer Program
- TSMC Community Volunteer Program

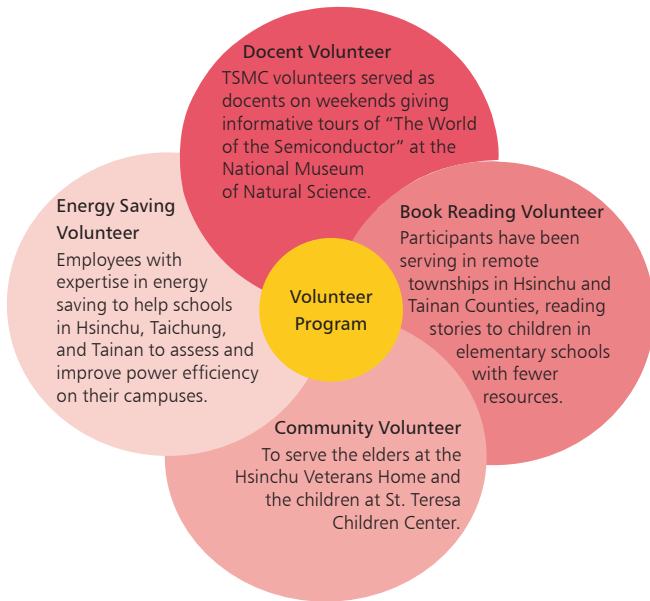
TSMC volunteers serve as docents on weekends or holidays giving informative tours of "The World of the Integrated Circuits" at the National Museum of Natural Science, Taichung. So far, more than 2,800 volunteers have served a total of over 41,500 hours.

Participants of the TSMC Book Reading Volunteer Program have been serving in remote townships in Hsinchu and Tainan Counties, reading stories to children in elementary schools with limited resources. Since the program was initiated in 2004, 1,033 volunteers have dedicated more than 17,500 hours to sharing stories with over 10,000 students.

The Energy-saving Volunteer Program was formed in 2008 by TSMC employees with expertise in energy saving to help two high schools in Hsinchu to assess and improve power efficiency on their campuses. In 2009, the service was extended to four high schools in Tainan. Currently, more than 50 volunteers are working on reducing carbon emissions.

The TSMC Community Volunteer Program was launched in 2010 to serve the elders at the Hsinchu Veterans Home and the children of the St. Teresa Children's Center. The predecessor of the program was the Typhoon Morakot Relief Project Team, a task force formed in 2009 to provide aid to typhoon victims in southern Taiwan. In March 2012, the program extended its care to children with Type 1 diabetes in Taitung. Volunteers have been visiting and emailing the children. Currently 426 employees have volunteered more than 4,200 hours of their time to the Community Volunteer Program.

## TSMC Volunteer Program Service



### 7.2.1 TSMC Volunteer Docent Program: Promoting Science Education

Sharing knowledge is one important way for a corporation to serve and respond to its communities. The spread of knowledge furthers people's understanding of their environment and may inspire future generations and bring forth change in society.

Based on this principle, as well as to promote science education and to further people's understanding of the IC industry, TSMC made a donation to the National Museum of Natural Science (Taichung) in 1997 to set up an exhibition hall—The World of the Integrated Circuit. In 2003 and 2011, TSMC sponsored the renovation of the hall, adding interactive displays to show the principles and the development of integrated circuits, as well as the linkage between the IC industry and daily life. In 2004,

TSMC Foundation recruited employees and their family members to serve as volunteer docents at the exhibition hall on weekends and holidays.

As many as 194 people volunteered in 2004. In 2006, youth volunteers were also recruited. Employees were encouraged to invite their high school-aged children to join the Volunteer Docent Program. Working together helps parents and children to strengthen their relationships. In 2007, the program was expanded to recruit new blood from TSMC-affiliated companies, including Vanguard, VisEra, Xintec, and Global Unichip.

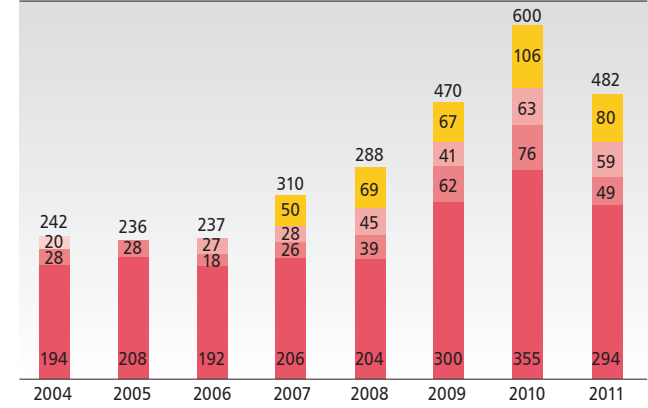
TSMC volunteer docents are active in promoting science education. Volunteers rush to sign up whenever a new schedule is posted online in the beginning of each quarter. By the end of 2011, a total of 2,800 volunteers had participated, and volunteer docents have served more than 41,500 hours. Their enthusiasm and professionalism has been highly appreciated by visitors, and each year the group is recognized as an "Outstanding Volunteer Team" by the National Museum of Science.



Docent Volunteer Vice-President J.J. Lin accepted certificate of merit from President of National Museum of Natural Science



## Accomplishments



Total volunteers: 2,883

Total hours served: over 41,500 hours

■ Employees

■ Family Dependant

■ Youth Volunteer

■ MTK

■ VIS, VisEra, GUC

### 7.2.2 TSMC Book Reading Volunteer Program: Spreading Seeds of Knowledge

The future hope and competitiveness of Taiwan lies in the next generation, and education is the key to the development of these children. Noting the disparity in educational resources between rural and urban schools and hoping to help reduce the this gap to open a window for underprivileged children, the TSMC Foundation has sponsored the Hope Reading Program organized by *CommonWealth Magazine* since 2004. Besides donating 20,000 books annually to 200 schools in remote rural areas, the Foundation recruited employees and their family members to form a volunteer team to read to the children in the hope of sparking their interest in books.

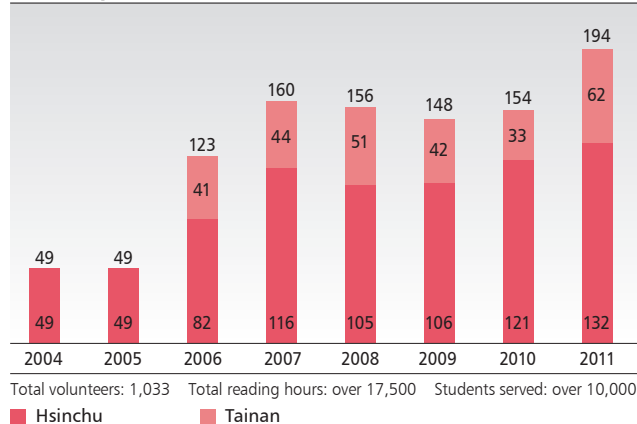
During the first year, 49 volunteers joined and began serving two elementary schools in remote townships in Hsinchu. Over the years, more and more people joined in the program. Now more than 100 people travel to the remote schools to tell stories

to students on a regular basis. With increasing numbers of participants, the program was extended to Tainan beginning in 2006. Currently, volunteers are serving in five schools, encouraging children to read and make use of the books donated through the Hope Reading Program. Foreign employees were recruited in 2009 to volunteer in the English Reading Program at Lufeng Elementary School in the hope of helping the children to improve their confidence in speaking English and overall English skills.

In addition, volunteers prepare plays or plan activities during holidays to further encourage children's interest in reading. Working regularly with students over the long term, the volunteers have developed profound friendships with them. These students not only enjoy exploring the world of reading with TSMC volunteers but also enjoy their warm friendship.

The Book Reading Volunteer Program benefits both the children and the volunteers. The children's eager looks and enthusiastic responses have drawn the volunteers to travel long and far to

### Accomplishments



President Guo of Lufeng Elementary School give Book Reading volunteers the certificate of meritorious services

read to them, and the volunteers learn that they are gaining a great deal while giving. Since its initiation, the program has recruited 1,033 volunteers, the total reading hours have exceeded 15,800, and over 17,500 have participated. The volunteers' selfless service has been greatly appreciated by the schools and the children. This program has become a great model, frequently cited by media, helping to spread the spirit of encouraging reading through reading aloud.

Link to the CommonWealth Foundation: <http://reading.cw.com.tw/>

### 7.2.3 TSMC Energy Saving Volunteer Program: Preserving the Earth

With global warming and the depletion of limited natural resources and fossil fuel, saving energy has become the common goal of all human beings. TSMC recruited employees with expertise in energy conservation to start the Energy-saving Volunteer Program, and has provided schools in Hsinchu and Tainan areas with professional consulting services. The team helps to devise plans for schools to improve power efficiency and reduce carbon emissions.

The Energy-saving Volunteer Program initially served neighborhood schools. Two high schools in Hsinchu were chosen, and a team was sent to each school to assist in lowering water, electricity and telecommunication bills, as well as improving environmental safety and air-conditioning. After assessing the facilities, collecting data, and evaluating power efficiency, the teams proposed energy-saving plans and ways to reduce the school's carbon emissions.

The Energy-saving Volunteer Program was formed in 2008 by 25 TSMC employees. Over 1,200 working hours of service, the volunteer team has suggested 168 environmental safety strategies with potential to reduce 360 tons of carbon emissions. The team's professional service has been much appreciated by these schools. In 2009, the service was extended to schools in Tainan, and in 2010, the team began to accept requests from schools with need. In addition to offering energy-saving assessments, the Energy-saving Volunteer Program promotes education on how to save energy, and Jinping Elementary School in Hsinchu County is the pilot school. In 2011, the service was extended to the Taichung area, and the Program succeeded in helping Taichung First Boys' High School and Taichung First Girls' High School save a great deal of energy.

The Energy-saving volunteers not only endeavor to save energy for the company but also wish to do what they can to preserve the earth and Taiwan.

### 7.2.4 TSMC Community Volunteer Program: Caring for the Disadvantaged

When we started recruiting volunteers, we kept asking how the volunteers could use their expertise to help those who need them the most.

In 2009, Typhoon Morakot struck southern Taiwan, and TSMC employees, deeply saddened for the suffering caused by it, immediately established the Typhoon Morakot Project Team and provided assistance and relief measures to typhoon victims. This experience prompted TSMC employees to ponder what else we could do to help our community. Consequently, the Typhoon Morakot Project Team became the Community Volunteer Program in 2010, aiming to reach out to the needy.

The elderly and the young are the focus of the TSMC Community Volunteer Program. Volunteers regularly visit the elderly at Hsinchu Veterans Home and the children at St. Teresa Children's Center.



Volunteers & Veteran finished art works together.

Volunteers visit the Hsinchu Veterans Home every week to spend time with the elderly veterans. There are all sorts of activities designed for people with different energy

levels. Volunteers cook, have tea, play croquet, sing karaoke, and do art projects such as rock-painting with them. Volunteers hope that the art projects, cooking projects, exercise, singing, and chatting will bring joy to the elderly.

Volunteers also visit and give warm personal and timely care to the children at St. Teresa Children's Center. They take the children to visit the elderly at the Veterans Home, hoping to instill the spirit of helping others, as well as respecting and



Notice reminder before two-day camp moving on.

taking care of the elderly. During summer vacation, volunteers accompanied the children to a two-day camp to participate in activities designed to help them learn to be more independent.

Starting with 156 volunteers there are now 426, and they devoted over 4,200 hours in 2011.

New volunteers were recruited in March, 2012 to extend care to children with Type 1 diabetes in the Taitung area. In April, 2012, forty volunteers will visit these children for the first time.

### 7.3 Alishan County Reconstruction Plan

Typhoon Morakot struck Taiwan on August 8, 2009, causing severe damage to the natural beauty of Mt. Alishan. The villages of the aboriginal Tsou tribe were among the most severely damaged areas as the typhoon not only destroyed their homes overnight but also dealt a severe blow to their livelihoods – tourism and agriculture.

As a semiconductor manufacturer based in the Hsinchu Science Park, TSMC originally had little connection with the Tsou tribe, who live in Alishan at an altitude of 1,075 meters and make a living through tourism, cultivating tea, and harvesting bamboo shoots. But under the guidance of the Executive Yuan Morakot Post-Disaster Reconstruction Council, TSMC made use of its operational experience and invested considerable manpower and resources to participate in the reconstruction of Shanmei and Lijia village in Alishan County.

Undaunted by the long and difficult journey of more than 500 kilometers to the Tsou villages of Alishan, TSMC visited many times to understand local industry, ecology, and aboriginal culture before drafting an industry reconstruction plan. Our goal is to gradually improve the economic strength of the Tsou through eco-friendly agriculture, raising the added value of agricultural products, ecotourism, and Tsou cultural tourism. Through this, we aim to support business innovation in the Tsou community, bring hope to the tribe, and attract young people to return to the village and sustainably develop Tsou traditions for generations to come.

After continued communication with the government and the villages and reaching consensus, TSMC gradually set its primary mission and developed the project details of the industry reconstruction plan. The Company then took direct responsibility for contracting and supervision to effectively control cost and construction quality.

TSMC's main projects in Lijia and Shanmei are as follows:



## Milestones in TSMC's Alishan Reconstruction Program



Typhoon Morakot devastates the homeland of the Alishan Tsou tribe



TSMC Volunteer Association President Ms. Sophie Chang visits the Alishan villages



Building a photo and video archive of Tsou tribe culture (War Ceremony)



Surveying the site for the Lijia Bamboo Shoot Processing Plant



TSMC employees organize group purchases of Alishan agricultural goods



First round of selections for the Tsou tribe logo competition



### • Assisting Villagers in Legalizing Homestay Accommodations

The villagers of Lijia manage hostels by building traditional houses on their ancestral lands and renting out extra rooms for use as homestay hostels for visitors. As they are unfamiliar with legal procedures, many of these hostels are unlicensed. TSMC has devoted resources to assist hostel operators in gaining hostel licenses to give visitors an opportunity to experience the beauty of Tsou villages and ensure the comfort and safety of their accommodations.

### • Building A Bamboo Shoot Processing Plant to Raise the Added Value of Agricultural Products

Bamboo Shoots are Lijia's mainstay produce, and are cultivated by every family in the village. As bamboo shoots have a relatively short shelf life, villagers often sold their produce to wholesalers

at far below market price. To raise villagers' income, TSMC began building the Lijia Village Bamboo Processing Plant in June 2010 to help villagers create more added value for their produce by processing their agricultural goods. Construction was completed in April 2011, and TSMC proceeded to purchase machinery including boilers, steam cookers, and sanitization equipment.

In addition, TSMC also arranged practical training in bamboo shoot processing and vacuum packaging to build up the villagers' ability to process their agricultural goods.



TSMC also plans to commission the Taiwan Development



Institute to provide instructors and consultants in food inspection and organic produce certification and assist the village to gain certification for their bamboo

shoots and to build up a marketing channel for Lijia's agricultural products. This bamboo shoot processing plant makes use of Tsou tribe architectural features and was built using only local construction materials in line with green construction principles.



Building a photo and video archive of Tsou tribe culture (Millet Harvest Festival)



Selecting a site for the Lijia Tea Processing Facility



Lijia tea processing facility applies for government approval



Main structure of the Lijia Bamboo Shoot Processing Plant completed



Building a photo and video archive of Tsou tribe culture (Fo'na Ceremony)



Shanmei sponsorship project is completed and Tanayiku park successfully reopens



Lijia Bamboo Shoot Processing Plant under construction



Lijia agricultural marketing class project begins



Tsou tribe invited to TSMC Sports Day for dance performances and charity sale



TSMC launches Shanmei sponsorship project



Construction on the Lijia Bamboo Shoot Processing Plant completed



Sponsorship of Lijia astronomy equipment and training expenses to diversify eco-tourism resources



• **Building Processing Raise the Added Value of Mountain Tea**  
Tea is Lijia's highest-value agricultural product, and TSMC hopes to assist villages in improving the quality of their tea leaves in order to gain a better income. TSMC completed applications to build a tea processing plant in June 2011, and immediately commenced construction in July. The tea plant received its operational license and held its opening ceremony in April 2012. In addition to the plant, TSMC provided equipment to process 1,200



kilograms of tea per day, including tools for withering, maceration, fermentation, shaping, drying, and packaging, as well as air conditioning systems.



TSMC also arranged for the Tainan Vocational Training Center to hold a two-month course for the villagers on basic tea production, ranging from cultivation to management to fermentation. We hope to widen the market for Lijia's Alishan mountain oolong tea one step at a time.

• **Assisting the Tribe in Marketing Agricultural Products**  
To help the Tsou tribe differentiate their products and establish an

overall image, TSMC held a contest to design a logo identifying the Tsou tribe and its products. The winning image was selected from among 140 contestants and is currently used on agricultural goods, handicrafts, tourism marketing, online marketing, and promotions, to build a unique market position for Lijia products.



• **Increasing Tourism Resources to Create Economic Benefit**  
We assisted in the restoration of



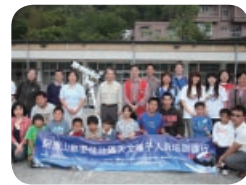
Opening ceremony for the Lijia Bamboo Shoot Processing Plant



Bamboo Shoot Processing Plant begins operations



Lijia Village Thanksgiving Tour to TSMC



Planetarium holds stargazing training in Lijia



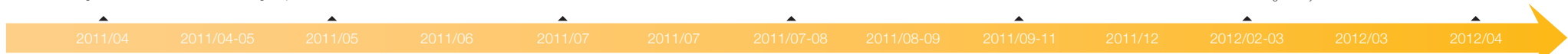
Stargazing program



Boiler and product processing training course for Bamboo Shoot Processing Factory



Opening ceremony for Tea Processing Plant



2011/04

2011/04-05

2011/05

2011/06

2011/07

2011/07

2011/07-08

2011/08-09

2011/09-11

2011/12

2012/02-03

2012/03

2012/04

Classes in Bamboo Shoot Processing at Nanchuang Township Agricultural Cooperative



Completed construction license application for Tea Processing Plant



Tea Processing Plant groundbreaking ceremony



Tainan Vocational Training Center holds two-month tea processing training course



Lijia/Shanmei produce and handcraft charity sale



Completed application for Tea Processing Plant operational license



the Shanmei tribe's "Hope Pavilion", agricultural product sales center, general hall and traditional dance performance center to help with the reopening of the Tanayiku Natural Ecology Park, which supports the villagers by bringing back visitors and



generating revenue from tourism. In addition, we launched a stargazing project in Lijia to provide equipment and training funds for astronomy guides so the village can make use of their beautiful skies and make stargazing a highlight of Lijia tourism. Due to its success in 2011, the stargazing project will continue in 2012.

TSMC is directly involved with reconstruction work in Lijia and Shanmei, respects aboriginal culture and works in harmony with the natural environment. TSMC's reconstruction personnel have so far devoted 2,000 hours of labor on Alishan, and continue

to learn and accumulate reconstruction experience through interaction with villagers, the natural environment, and all levels of government. We hope to use the power of the private sector to alleviate the disparity between rural and urban areas and work for a better Taiwan.



## 7.4 Other Social Participation

### 7.4.1 TSMC Industrial Water Conservation Course

Taiwan averages 2,000 millimeters of rainfall each year, 3.4 times the global average. However, it does not retain water well due to dense population and mountainous terrain. The dry season that begins in October continues to May of the following year can last half a year to nine months, making Taiwan's water shortfall the 18th most severe in the world.

To address this issue, TSMC Senior Vice President Ms. Lora Ho and Volunteer Association President Ms. Sophie Chang devised an innovative way for TSMC to give back to society using water conservation knowledge accumulated through many years of experience, leading TSMC to hold its first Industrial Water Conservation Course in 2011. We imparted our lengthy experience in water conservation through free classes aimed at small and medium enterprises in textiles, petrochemicals, food, precision machinery, and other sectors, as well as related government agencies. We hope our knowledge can lead other industries to conserve water with us and gradually solve the



The TSMC Industrial Water Conservation Course in session.

problem of water scarcity, water inequality, as well as competition between industrial and household water consumption.



TSMC Volunteer Association President Ms. Sophie Chang encourages students in her opening speech at the TSMC Industrial Water Conservation Course.

of expert lectures and factory visits. We decided against large, open lectures and opted for small classes to offer a practical and high-quality learning environment.

TSMC's starting point for the Industrial Water Conservation classes was a spirit of selfless sharing to uplift society by offering our knowledge. We invested our technology and experience gleaned from 15 years of water conservation and from building 15 fabs in Hsinchu, Taichung, and Tainan, as well as our stringent daily environmental and safety standards. By sharing this with other manufacturers that require large volumes of water, particularly small and medium enterprises, we aim to shorten their learning curve and spare then need for heavy early research and development costs, as well as save water, energy, and reduce carbon emissions in their daily operations. They are

TSMC held three full-day courses at our sites in Hsinchu, Taichung, and Tainan respectively. Due to enthusiastic registration for the courses, we added another two courses in Hsinchu, for a total attendance of 176 professionals. Course material was designed to be practical and useful, and consisted

also able to set goals for their own factories by observing the scale, operational efficiency, and good management practices of a major manufacturer.

Encouraged by a strong response from the industrial sector, we plan to broaden the impact by expanding our Industrial Water Conservation Courses into the "TSMC Industrial Conservation Platform". By providing a channel for regular, focused exchanges between energy conservation experts in diverse industries, we aim to efficiently collect and combine know-how to create synergies. For 2012, the theme of the platform will be "Energy-Saving Operations", taking another step towards our goal of a green Taiwan and sustainable Earth.

### 7.4.2 Charitable Donations



As a corporate citizen grateful to society, TSMC has continuously cared for the community in which we live and its many social welfare institutions. TSMC continues to devote itself to environmental protection and office energy savings. Our employees value their belongings but we encourage them to recycle or reuse useful items instead

of discarding them, and we seize the opportunity to share our love and care by initiating charitable donation programs.

## Background and Activities

From 2006 to 2010, TSMC employees voluntarily organized annual charitable donation programs. The activities raised a total of more than 3,800 boxes of materials, including home appliances, clothes, books, toys and stationery. Stacked vertically, these donations would be 3.5 times the height of Taipei 101! The items were donated to more than 20 schools in remote areas and socially vulnerable groups. Starting in 2011, we invited other TSMC business groups, along with affiliated companies such as TSMC Solar, TSMC Solid State Lighting, VIS, and VisEra to join this activity and also express their love and care for the community.

During the recent economic downturn, the welfare organizations have been faced with a shortage of basic daily living materials. We distributed the items that we collected, such as heaters, blankets and winter clothing to low-income households and handicapped, elderly people living alone.

## Recipient Organizations

Hsinchu: Genesis Foundation for the Homeless, Guansi Catholic Hua Kuang Center, Jhudong Shiguang Center for the Disabled,



Elementary Schools in Jianshi Township, and others. The Hsinchu Mental Health Association, Chenhsing Village Activity Center, and Hsinchu Association of Spinal Cord Injury were added at the end of 2011.

Hualien/Taitung: Hsiu Lin Elementary School and 14 other Elementary schools in remote areas.

South Taiwan: Huashan Social Welfare Foundation of Shanhua District, Christian Mountain Children's Home, and others.

## 7.4.3 The Disaster Relief of Japan's Earthquake/Tsunami Program



TSMC employees put their care for those suffering from the Japanese natural disasters into practice.

As a global citizen and with the proximity of Japan and Taiwan, TSMC felt deeply for those suffering from this natural disaster. Upon hearing the happening of the earthquake, the Company held "The Disaster Relief of Japan's Earthquake/Tsunami" program at once and encouraged its employees to make monetary donation to support those suffering in Japan.

A 9.0 magnitude earthquake struck the northeast region of Japan on March 11th, 2011, followed by the tsunami of waves measured 10-meter high that severely damaged the coastal area of Japan. The earthquake is reported to be the largest ever in Japan since official record was taken, which caused the country thousands of deceased and injuries.

A total of 12,892 employees joined the disaster relief program with the monetary donation amounted to NTD 25,541,828. The consolidated donation was transferred to the following charity organizations, including 1) World Vision Organization; 2) The Red Cross Society, R.O.C; and 3) Tzu Chi Organization to be used to support those most in need.

Every little support counts; the disaster relief program showcased the commitment of TSMC employees in doing their best to assist those most in need, especially under critical circumstances like Japan's 311 earthquake.

## 7.4.4 WaferTech Community Volunteer Program



WaferTech Supports of Relay for Life



WaferTech Holiday Giving Tree

WaferTech employees have a long history of contributing to community. The employees themselves have established annual School Supply Drives, Food Drives and, at Christmas time, buy presents such as winter coats and shoes for the homeless. Employees also are involved in organizations that help support cancer research such as Relay for Life and Race for the Cure.



# 8. Environmental Protection

TSMC's environmental policy, as set down by Chairman Dr. Morris Chang, is to do our utmost to achieve environmental sustainability and to be a world-class company in environmental protection. TSMC's strategies to achieve our environmental goals are to comply with regulations, strengthen recycling and pollution prevention, manage environmental risks, instill an environmental culture, build a green supply chain, and fulfill our corporate social responsibilities.

TSMC acknowledges responsibility for environmental protection. We not only comply with the environmental regulations of the locations where we operate, but also track new developments in global environmental issues, and take the lead in adopting new environmentally-friendly measures. In addition to protecting the environment of our manufacturing sites in Taiwan and around the world, we lead our suppliers to establish a green supply chain. At the same time, TSMC also shares environmental protection knowledge and offers recommendations to government to face various new challenges together.

## Selection of Material Environmental Topics

TSMC has a long-term record of assisting the government in establishing regulations and promoting projects, and pays close attention to the views of academia, media, customers, and employees concerning the environment. We also participate in non-governmental environmental sustainability-related activities to understand the issues of greatest concern to our stakeholders. We have concluded that the most material environmental topics are global climate change, water management, green product, and pollution prevention. (Please refer to 3 "Stakeholder Engagement" in this report) TSMC continues to study and respond to the environmental topics that concern stakeholders.

## Environmental Protection Major Activities in 2011

TSMC's major activities and achievements in environmental protection in 2011 include:

### TSMC Internal

- Continued to promote energy saving and adopted the ISO 50001 Energy Management System in 2011. The Fab 12 Phase 4 data center in the Hsinchu Science Park completed ISO 50001 Energy Management System certification, making TSMC Taiwan's first company to earn this certification for a high density computing data center.



- Continued to minimize waste in wafer processes and succeeded in collaborating material suppliers to reuse spent CMP slurry in our process; Also succeeded in recycling spent developer Tetramethyl Ammonium Hydroxide.
- Continued to expand our green building project for new fabs. The Fab 14 phase 4 manufacturing facility and Fab 12 phase 4 office building were certified under the Taiwan Ecology, Energy Saving, Waste Reduction, Health (EEWH) and U.S. Leadership in Energy and Environmental Design (LEED) standards. These are in addition to our existing fabs that have already gained LEED and EEWH certification: Fab 12 Phases 4 and 5, and Fab 14 Phase 3.

#### TSMC's Suppliers

- Led and assisted 15 major suppliers in Taiwan to establish their ability to determine product carbon footprints, and gained 3rd party verification for the carbon footprint of TSMC's 12-inch wafers and packaging subcontractors ASE Inc. and SPIL Co.'s Integrated Circuit packaging products according to the PAS2050 standard in February 2011. TSMC also received 8-inch wafer PAS2050 certification in November 2011.
- Established the "TSMC Supplier Achievement Award" this year, which was awarded to TSMC suppliers demonstrating environmental excellence at the "TSMC Supply Chain Management Forum" in December 2, 2011.

#### Collaborated and Shared with External Parties

- Participated in the establishment of the World Semiconductor Council's best practice technology guide for perfluorinated compound (PFC) emissions reduction, which is now a guideline for achieving the association's global voluntary reduction goal over the next decade.

- Held a series of Industrial Water Conservation classes to share many years of knowledge and experience in water conservation and recycling with the local business community. We hope that through this activity, we bring maximum benefit to society and fulfill our corporate social responsibility.

### **The achievement status of our 2011 quantitative environmental goals are as follows:**

TSMC continued improve our energy saving, water conservation and waste reduction technology, and implemented this technology in our newly constructed fabs.

- Greenhouse gas - perfluorinated compound (PFC) emissions reduction: After we achieved our PFC total emissions reduction goal in 2010, we continue to move forward on emissions reduction. PFC emissions in 2011 were 10% less than 2010 due to our continuing reduction efforts and economic factors.
- Energy conservation: TSMC reduced power consumption per 8-inch wafer equivalent per mask layer by 18% from 13.1 kwh in 2009 to 10.7 kwh in 2011.
- Water conservation: TSMC's water use per 8-inch wafer equivalent per mask layer in 2011 decreased by 20% compared to 2009 from 74.4 liters to 59.8 liters, and also decreased by 5% compared to 2010.
- Waste reduction: Achieved a waste recycling rate of 91.8%, surpassing our 90% target for operational fabs but lower than 2010 due to the reduction of recyclable chemical waste. In addition, our landfill rate decreased 15% compared to 2010.

TSMC will continue expanding production capacity to fulfill global semiconductor demand. Although we have achieved the highest level of energy intensity performance in the global semiconductor industry and met an extremely challenging PFC emissions reduction goal in past 10 years, we will continue improving our productive efficiency to reduce energy and resource consumption as well as our environmental impact.

#### We have therefore set the following goals:

- Greenhouse gas PFC reduction: Reduce PFC emission intensity to 30% below the year 2010 level by 2020 by adoption of best practices recognized by the World Semiconductor Council.
- Energy saving: Reduce power usage intensity to 2% below the year 2010 level by 2015.
- Water saving: Reduce water usage intensity to 2% below the 2010 level by 2015.
- Waste reduction: Achieve 95% waste recycling rate by 2015.

#### Forming a Corporate Green Committee

In 2011, our Senior Vice President of Materials Management and Risk Management led the establishment of a "Corporate Green Committee", which includes the Risk Management & Corporate ESH Division, the New Fab Planning Division, the Facility Technical Board, the Industrial Safety and Environmental Protection Technical Board, the Materials Management Division, R&D, and the Corporate Communications Division. The mission of the committee is to establish our environmental policies and goals and to promote continuous improvement projects.

## 8.1 Climate Change

### TSMC is Highly Concerned about Climate Change

Global climate change is a major environmental concern for the United Nations and governments around the world, as well as TSMC. We continuously monitor global climate change and international response trends as one of our enterprise risk management items to be evaluated and controlled, with regular reviews by senior executives, and reports are made to the Board of Directors for specific topics.

#### 8.1.1 TSMC's Strategy in Response to Climate Change

##### Climate Change Strategy

TSMC's strategies for responding to climate change are to:

- Consider both climate change mitigation and adaptation.
- Consider both green manufacturing and green product.
- Consider both TSMC and its supply chain.
- Integrate industry, government and academia to solve climate change issues.

TSMC not only continues to inventory and reduce its own greenhouse gas (GHG) emissions, but also takes actions on climate change adaptation in cooperation with industry, government and academia, including risk assessment and measures such as flood and drought control. These measures have grown to gradually cover the supply chain in recent years and we monitor our progress in achievement of mitigation through product carbon footprints and water footprints. These measures also reduce operational risk for the company caused by climate change and help to fulfill the company's social responsibility.

### Monitoring Climate Change Risks in Three Dimensions

TSMC believes that climate change should be regarded as important corporate risk, which must be controlled to improve corporate competitiveness. Climate change risks include legal risk, physical risk and other risks. Our control measures are as follows:

- Climate legal risk control: The global greenhouse gas control regulations and agreements of each country are becoming more and more stringent. Enterprises are legally required to disclose GHG-related information periodically, and also limit GHG emissions. The cost of production including materials and energy may also grow along with future legal requirements such as carbon or energy taxes. TSMC continues to monitor legislative trends and communicate with various governments through industrial organizations and associations to set reasonable and feasible legal requirements. We also recommended the Taiwan government to acknowledge industries' voluntary reduction achievements through 3<sup>rd</sup> party verification before related legislation comes into effect.
- Climate disaster risk control: Abnormal climate caused by the greenhouse effect has increased the frequency of climate disasters each year. Storms, floods, drought, and water shortages are occurring more frequently, causing a considerable impact on business operations. Although TSMC and our suppliers were not impacted by the flood in Thailand in 2011, the significant impacts on other industries' supply chains demonstrates the importance of climate disaster risk control.

TSMC believes that climate change control should consider both mitigation and adaptation, and requires cooperation between industry and government to reduce risk. Therefore, in addition to water saving measures at our own facilities and those of our upstream and downstream partners, TSMC is also leading the industry to collaborate with the central government agencies and conduct a project to assess and mitigate climate natural disaster risk in three Taiwan Science Parks. The project also aims to establish a response and reporting system which can be effectively integrated with disaster relief resources. In order to ensure electricity and raw water supplies, TSMC participates in the Taiwan Science Park Industrial Union Experts Committee platform, and is actively involved in regular meetings with Taipower Company and the Taiwan Water Corporation to discuss supply and allocation for response issues.

- Other climate risk controls: Climate change is a global issue of concern to the global supply chain including the necessities of energy saving and carbon reduction and disaster prevention. For example, Wal-Mart, the world's largest retailer, also announced in 2009 it would require all suppliers to place ecolabels on their products within 5 years. The Electronic Industry Citizenship Coalition (EICC) has also required members' suppliers to disclose GHG emissions information. TSMC not only discloses our own GHG emissions information each year, we also assist and require our suppliers to establish a GHG inventory system and conduct reduction programs. TSMC's suppliers are required by TSMC to submit GHG emissions and reduction information as an important index of sustainability scoring in our procurement strategy.



## 8.1.2 Climate Change Mitigation

### 8.1.2.1 Greenhouse Gas Inventory

TSMC believes reducing GHG emissions is a key method for mitigating global warming and climate change, and conducting an inventory provides supporting data for reduction. An accurate inventory allows us to set priorities and reduction goals, raise the efficiency of the reduction process, and confirm reduction results. Therefore, we believe it is better to inventory greenhouse gases as early as possible.

TSMC believes that a company must know its actual GHG emissions as the first step toward energy conservation and carbon reduction, and makes this reduction an important item in establishment of a green supply chain. In addition to organization-level inventory, TSMC has also extended carbon inventories to our supply chain. In doing this, TSMC can establish a capability for product-level carbon footprint inventory and carbon management, thus increasing the competitive advantage of the products we manufacture. These efforts have won recognition from government, domestic and international environmental groups, major investors, and customers.

TSMC's GHG emissions can be categorized into Scope 1, 2 and 3 sources. Scope 1 emissions are the direct emissions of TSMC fabs including process gases (PFCs, HFC, N<sub>2</sub>O, CH<sub>4</sub> and CO<sub>2</sub>), fuel such as natural gas, gasoline and diesel, and fugitive emissions from septic tanks and fire fighting equipment. Scope 2 emissions are mainly indirect emissions such as purchased electricity and steam. Scope 3 emissions are mainly indirect emissions including employee business travel, product and raw material transportation, suppliers' manufacturing, and waste disposal. We required our



TSMC GHG Inventory Verification Statement (Verified by BSI)

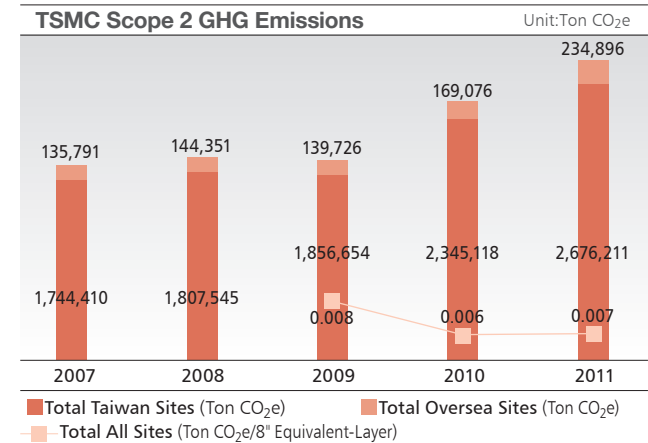
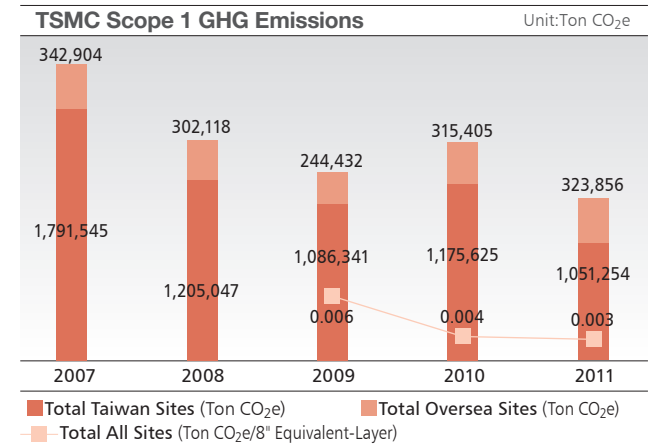
suppliers to establish a GHG inventory system and submit the information to TSMC beginning in 2009. However, some suppliers are still unable to provide TSMC sufficient GHG inventory information, and emissions from employee commuting and product transportation are minor, so Scope 3 emissions are not included in this report. TSMC will continue to make efforts in this area.

In 2005, TSMC became the first Taiwan company to complete a thorough inventory of GHG emissions and to receive official ISO 14064-1 certification issued by an external verification party. TSMC also set up a dedicated internal ESH information system for each fab to register GHG inventory data regularly.

TSMC China and WaferTech have also adopted ISO 14064-1 standards for their GHG inventory, and submit their inventory results to TSMC headquarters annually.

TSMC's U.S. subsidiary WaferTech continues to conduct GHG reduction to achieve a GHG reduction goal of 20% by 2017. WaferTech is actively engaged in Semiconductor Industry Association activities related to GHG measurement and reduction.

TSMC annual Scope 1&2 GHG inventories are as the figures on the right.



Note: TSMC's Taiwan sites followed Taiwan EPA guideline to re-calculate GHG emissions from 2000 to 2011, and the recalculations were verified by a 3rd party in May 2012. The data in tables above have been revised according to 3rd party verification results.

### 8.1.2.2 GHG Information Disclosure

TSMC takes a pro-active attitude towards carbon disclosure, and publicly discloses climate change information through various channels. We constantly review ourselves and obtain recommendations from external parties through continuous information disclosure. The related disclosure channels are as follows.

- In 2006, the Taiwan Semiconductor Industry Association (TSIA) began a GHG inventory project for all members, including TSMC. This project followed the ISO 14064-1 standard to conduct a GHG inventory and acquire verification by an accreditation agency. TSMC voluntarily reports GHG inventory data to the Taiwan Environmental Protection Administration (EPA) and TSIA.
- Since 2005, TSMC has been participating in an annual survey held by the nonprofit Carbon Disclosure Project (CDP), which includes the GHG emission and reduction information for all TSMC fabs, subsidiaries, joint ventures, and overseas offices. TSMC also takes further action to review the regulatory, natural disaster, financial, and operational risks and opportunities created by global climate change. The related information is disclosed on the CDP website (<https://www.cdproject.net/en-US/Pages/HomePage.aspx>).
- TSMC has disclosed GHG emissions and reduction related information for Dow Jones Sustainability Index evaluation every year since 2001.

- Our GHG-related information has been disclosed in this CSR report on our company website annually since 2008. TSMC also provides information to customers and investors upon request.

TSMC also reports its GHG emission and reduction information through the Electronic Industry Citizenship Coalition (EICC) web-based carbon reporting system. TSMC's customers which are also the members of EICC members can access TSMC's GHG information through the EICC system.

### 8.1.2.3 GHG Emission Reduction

#### Achievement of Our Ten-Year PFC Emission Reduction Commitment

The semiconductor manufacturing process generally uses perfluorinated compounds (PFCs) such as CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, SF<sub>6</sub>, NF<sub>3</sub>, CHF<sub>3</sub>, C<sub>3</sub>F<sub>8</sub>, and C<sub>4</sub>F<sub>8</sub>, which are the major greenhouse gas emissions from the manufacturing process. After many years' efforts, TSMC has achieved its goal of reducing perfluorinated compound emissions to 10% below the average emission level of 1997 and 1999. This emission target remains fixed as TSMC continues to grow and construct new fabs, and has been a great challenge to us.

TSMC continued to actively participate in the World Semiconductor Council's establishment of a global voluntary reduction goal for the next ten years. TSMC integrated past experience to develop best practices, which have been recommended by the Taiwan Semiconductor Industry Association and adopted by the World Semiconductor Council member companies as major measures to achieve these organizations' 2020 reduction goals.

### 8.1.2.4 Energy Conservation Measures

#### Energy Conservation in Taiwan

TSMC's primary source of energy is electric power, followed by natural gas. Consumption of other types of energy is negligible. As Taiwan's land area is small, and the development of renewable energy is limited, electric power currently comes primarily from coal and gas-fired generators, which emit large amounts of CO<sub>2</sub> despite efforts by the power company to improve efficiency. In response to this, Taiwan government is conducting a renewable energy project focusing on expansion of wind and solar power, and TSMC is pleased to see this development. Before the completion of this government project, energy conservation is an important part of CO<sub>2</sub> emission reduction for industries in Taiwan. TSMC has consistently promoted energy conservation at all its facilities, reducing CO<sub>2</sub> emissions while saving costs at the same time.

#### TSMC Energy Saving Committee

At the end of 2010, TSMC set up a dedicated cross-department committee for energy conservation, which consists of the technical board, facility, equipment and environmental and safety personnel. The committee will define energy conservation indices and propose five-year action plans to reduce energy consumption efficiently and achieve a better level of unit energy consumption. Technical boards will focus on improving energy efficiency of the facility and process tools in existing fabs, and transfer experience to adopt as standards for new fabs and new process tools; the new fab planning department will adopt the best-known energy-conserving designs for new fab construction. At the same time, TSMC will also try to purchase energy-efficient equipment by adjusting procurement specifications and encourage and promote suppliers' green certification.

## 2011 Major Energy Saving Activities

In 2011, TSMC successfully completed a number of energy conservation programs in existing fabs with outstanding results. Some of them have become standard designs for new Fab projects. The major activities are as listed below.

- Retrofitted chilling pumps' flow control to be frequency adjustable from original constant and full flow design.
- Shut down or minimized the utility requirements of standby local scrubbers.
- Adopted off-line UPS to reduce energy loss.
- Installed heat recovery dryer and upgraded control system for existing Compressed Dry Air systems to improve operational efficiency.
- Adopt new airfoil fans to increase energy efficiency.
- Recycled general exhaust for reuse in cleanrooms.
- Evaluated replacement of tool-based heat exchangers with central process cooling water system.
- Evaluated new types vacuum pumps for reducing energy consumption effectively.

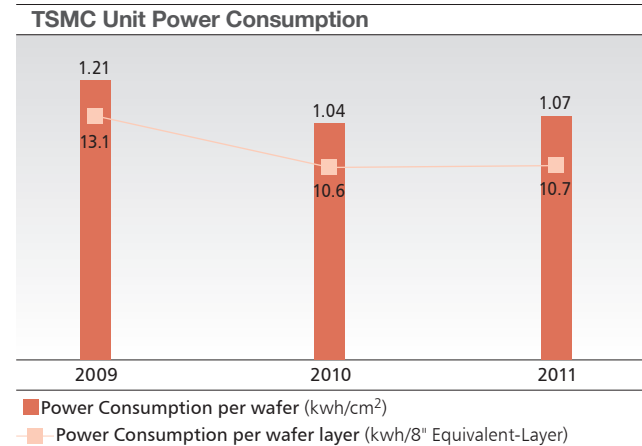
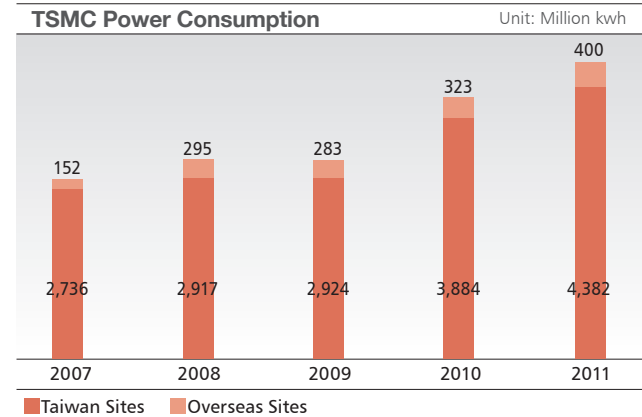


WaferTech new PCW Free Cooling System Ribbon Cutting

- Recycled heat from volatile organic compound (VOC) treatment equipment by using a heat exchanger, reducing natural gas consumption.
- Installed heat recovery to chiller to heat raw water in winter and reduce natural gas consumption.
- WaferTech installed and began using a new process cooling water (PCW) Free Cooling system that uses pumps, heat exchangers and cooling towers to cool PCW during cooler weather months, rather than using chillers with high electrical demand. WaferTech expects to reduce energy consumption annually by approximately 4 million kilowatt-hours.

## Power Consumption Records

TSMC continuously promotes energy saving and primarily focused on facilities systems. In the past two years, we have increased our efforts in reducing consumption by manufacturing equipment. The power consumption density as calculated by wafer area is highly dependent on photo mask layers and production ramp-up in new fabs. In general, the complexity of logic ICs (foundry's major product) is higher than standard memory such as DRAM, and results in more layers as well as higher power consumption. TSMC is nonetheless one of the semiconductor industry's most energy-efficient companies, and continues to implement additional power-saving measures. TSMC reduced power consumption index per 8-inch wafer equivalent per mask layer of wafer output (kwh/8" Equivalent-Layer) by 18% from 13.1 kwh in 2009 to 10.7 kwh in 2011.



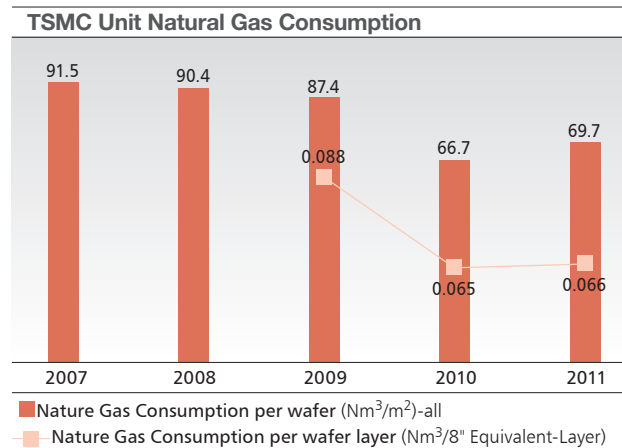
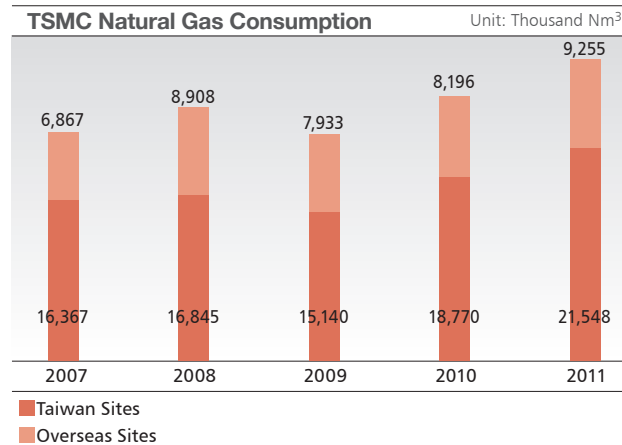
Note 1: TSMC's annual power consumption includes all production factories and supporting organizations, including WaferTech, TSMC China, bumping, testing, EBO, R&D, office, and landscape.

Note 2: The statistic data for unit power density is for wafer fabs in Taiwan and overseas. Beginning in 2009, this index was rationalized by introducing layer index due to product complexity.

## Direct Energy Use Status

TSMC's direct energy consumption includes nature gas and diesel. In TSMC, natural gas is used only for boilers and Volatile Organic Compounds (VOC) adsorption and incineration treatment systems, and its usage is optimized effectively. VOC treatment systems consume most of the natural gas, and we optimized nature gas use through the following measures: (1) Optimizing desorption volume by using rotor Variable Frequency Driver for VOC treatment system. (2) Optimizing VOC burning temperature. (3) VOC burning heat recycled by heat exchanger. TSMC reduced average natural gas consumption per 8-inch wafer from 0.088m<sup>3</sup> in 2009 to 0.066Nm<sup>3</sup> in 2011, a remarkable reduction of approximately 25%, and continues driving for further reduction. Total consumption in 2011 increased slightly from 2010 due to several factors, including new fab ramp up for customer demand and low utilization rates for 200mm fabs.

Diesel is primarily used in emergency power generators and fire pumps, which are only engaged during power supply disruptions, emergencies, and regular tests. Diesel is not a direct energy source for production and we used about 250,000 liters in 2011.



Note 1: The statistic data for nature gas consumption includes all fabs in Taiwan, as well as all overseas fabs, packing and testing facilities, bumping, EBO,R&D, and others.

Note 2: Prior to 2009, natural gas consumption was calculated by total natural gas consumption divided by total wafer out. After 2009, this index was calculated by photomask layers to incorporate considerations of product complexity.

## 8.1.3 Climate Change Adaption

### Collaborating with the Central Government to Evaluate and Control Climate Change Risk in Science Parks

TSMC and other semiconductor companies gained the support of the Science Park Industrial Association, Science Park Administration, National Science Council, Water Resources Agency, Taipower, and Taiwan Water Corporation to re-evaluate risks caused by climate change and extreme weather, including: interruptions to water supply, power supply, gas supply, transportation and communication, well as flood, damage, wind damage, and drought. These re-evaluations will be used to develop response and improvement programs for implementation in the Hsinchu, Taichung and Tainan Science Parks.

The core considerations of the climate change risk assessment project for the Hsinchu, Central, and Southern Taiwan Science Parks are:

- The risks of typhoons and flooding.
- Long-term drought risks.
- Climate change risks that may lead to the restriction of industrial development.

#### Climate change risk control strategy:

- Mid-term and long-term risk control.
- Disaster emergency response.
- Establishing related reference standards for future new construction.

### 8.1.4 Supply Chain Climate Change Management

TSMC not only engages in climate change management but also requests and assists suppliers to follow. Our measures are as follows:

- Energy saving and carbon reduction management: Suppliers are required to collect carbon inventory data in their manufacturing plants, develop a product-based carbon footprint and provide carbon reduction performance data.
- Water resources and water management: Suppliers are required to collect water inventory data in their manufacturing plants to establish a water footprint, and to provide a specific water resource management plan.
- Climate change risk management: Due to the increased risk of storms, water shortage, flooding and transportation and communication disruption in recent years resulting from global climate change, we require our suppliers to prepare contingency plans, such as support from overseas production, to reduce the impact of such an event. Our first-tier suppliers are also required to manage their suppliers.

## 8.2 Water Resource Management

Water resource management and allocation has become an important issue in many countries due to the impact of global climate change. The changes in rainfall in between dry and rainy seasons in Taiwan have become increasingly extreme since 2009, and the risk of droughts and floods has become increasing apparent. These developments have highlighted the importance of water resource management, water saving and water shortage emergency response programs. TSMC is aware that the extreme rainfall is the result of global warming and climate change. These issues may require decades to resolve, and during that time, water resource management is a necessary part of TSMC's corporate climate change risk management and disaster adaptation. In addition, TSMC also acknowledges that water

resource management requires greater collaboration with the government when compared to other climate change response measures. The combination of these factors has led TSMC to establish its water resource management policy and strategy.

### TSMC Water Resource Management Policy and Strategy

TSMC's goal is to be a leading global company in water resource management. Our water resource management policy is to promote water savings to reduce water usage per unit production, and to promote collaboration between industries, government and academia to ensure that water shortages do not occur. Our strategy for reaching this goal is both to save water in daily operations and adapt to water shortages, and implement these measures both internally and in our supply chain. TSMC's daily water management is first to save water in the production process, followed by reclaiming and recycling. In addition, an effective real-time online water resource management platform helps TSMC significantly reduce water consumption.

TSMC's core water resource management activities are focused on:

- Collaborating with the central government to evaluate the climate change risk of Taiwan's Science Parks, and to adopt measures reducing the impact extreme climate disaster, beginning with basic infrastructure.
- Collaborating with the local government, public utilities, and other companies to coordinate local water resource allocation, set up water saving goals, and share experience.
- Promoting internal and supply chain water inventories, conserve water, and establish a water footprint.

### Collaboration with Local Authorities in Water Allocation and Conservation

Since water resources are inherently local, TSMC shares its

water-saving experiences with other semiconductor companies through the Association of Science Park Industries to promote water conservation. At the same time, TSMC collaborates with the Science Park Administration to discuss raw water allocation and emergency response plans for water shortages. Also, TSMC has resolved many water quality issues successfully, including Total Organic Carbon (TOC) contamination and water dam eutrophication research. We also continue to hold technical forums to discuss water reclamation and assist small facilities in the Science Park to perform good water resource management in order to achieve the Science Park's goals and ensure long-term balance of supply and demand.

### Actively Sharing Experience with External Parties

TSMC held its first Industrial Water Conservation class in three science parks around Taiwan in 2011, inviting companies interested in water reuse and recycling to learn from our experiences and achievements. We hope that this will encourage the industrial sector to find more ways to conserve water.

### Water Conservation – Reduction and Recycling

TSMC's facilities collect process water discharges through independent drainages, and reuse the water for the manufacturing process or secondary uses after treatment. These secondary uses, which do not come into human contact, include make-up water of cooling towers and wet scrubbers, cleaning water for sludge dewatering filters in wastewater treatment systems, and toilet water. Secondary uses of water are also optimized to reduce make-up water quantity. In order to fully utilize drainage after process, TSMC separates drain pipe into more than 20 categories based on their characteristics and more than 15 categories of treatment systems.

TSMC is a fast-growing company, and in addition to adopting a minimum process water recycling rate of 85%, we also select low water consumption process tools, implement process water drainage segregation, set up process water reclaimed systems in new factory construction, and continue promoting water saving measures after mass production. The purpose of these measures is to reduce our raw water demand.

TSMC also cooperates with industry experts to implement new technology for water reuse, such as reclaiming oxide slurry and reusing wastewater from refined oxide slurry.

### Major Water Saving Measures in 2011

Since 2008, Some TSMC fabs have achieved a process water recycling rate of higher than 20%, leading the global semiconductor industry. Our total process water recycling rate reached 84.6% in 2011, which met or exceeded the criteria set by the Science Park Administration and also exceeded the worldwide semiconductor industry standard. TSMC's major water saving measures are as follows:

- Optimization of water usage for process tools, air pollution control wet scrubbers, cooling towers, ultrapure water systems, and wastewater systems.
- Installation of organic/acid water recycling systems, separated collection according to water quality, recycling water to ultrapure water systems or secondary uses such as cooling towers.
- Installation of general and copper-containing CMP wastewater recycling systems, recycling wastewater to ultra-pure water systems or secondary water use.
- Installation of wet scrubber water recycling systems to recycle wet scrubber effluent after treatment.

- Installation of treatment system to treat caustic wastewater with ammonia, recycling wastewater to ultra-pure water systems or secondary water use.
- Changed dosing chemical system for cooling towers, which greatly improved water quality and lowered water makeup frequency to reduce the quantity of makeup water.
- Recycling of air conditioning condensation for cooling tower use.
- Establishment of rainwater storage system on roofs to supply plant irrigation systems, toilets, and wet scrubber water use.
- Use of water saving faucets for employees.
- 100% use of recycled water for toilet flushing.
- Controlled water use for external wall cleaning and irrigation to avoid unnecessary consumption.

### Water Saving Achievements and Process Recycling

In 2011, we saved a total of 37,730,000 cubic meter of water, which can provide a town with population of 400,000 with 1 year of water, or 1.2 times the volume of Hsinchu's Baoshan Reservoir II.

### TSMC Water Conservation Performance

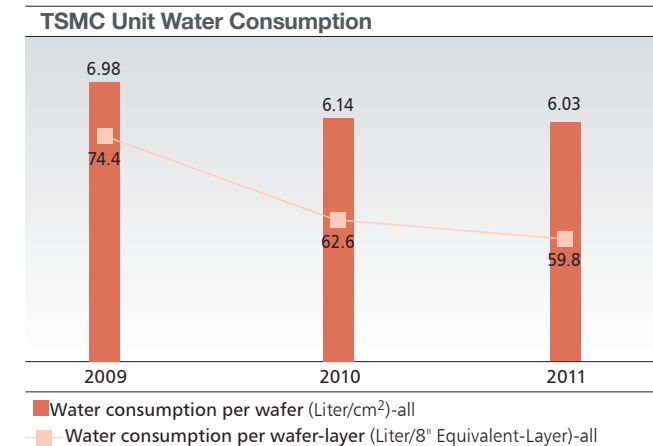
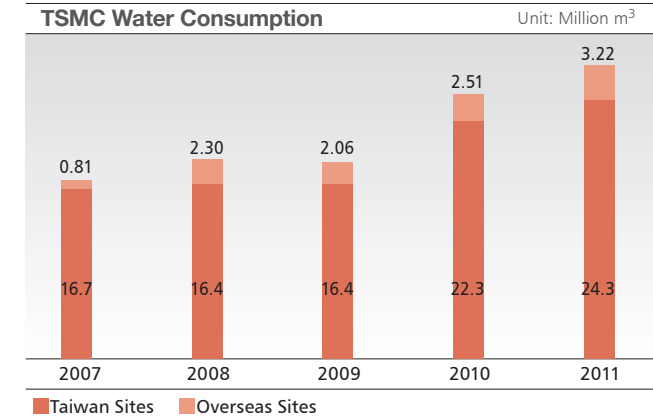
Item	2007	2008	2009	2010	2011
Average process water recycling rate (%) <sup>1</sup>	80.1%	80.4%	83.4%	84.1%	84.6%
Process water saved (Million m <sup>3</sup> )	23.14	26.37	27.05	34.66	37.73
Water saved, measured by standard swimming pools <sup>2</sup>	9,256	10,548	10,822	13,866	15,094
Water saved, measured by the full capacity of Baoshan Reservoir II <sup>3</sup>	0.72	0.82	0.84	1.08	1.17

Note:

1. Average process water recycling rate is defined by the Science Park Administration.
2. A standard 50x25x2m swimming pool contains up to 2,500 cubic meter of water.
3. Baoshan Reservoir II is the major reservoir of Hsin-Chu Science Park and the full capacity is 32.18 million tons.

### Utility Water Usage

TSMC's water use per 8-inch wafer equivalent per mask layer (note 2) in 2011 decreased by 20% compared to 2009 from 74.4 liters to 59.8 liters, and also decreased by 5% compared to 2010.



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

Note 2: The statistic data for unit water consumption density is for the water usage of wafer fabs in Taiwan and overseas. Beginning in 2009, this index was rationalized by introducing a layer index due to product complexity.

## 8.3 Green Product

### TSMC Wins First "Taiwan Green Classic Award"

TSMC was awarded the Ministry of Economic Affairs (MOEA) Bureau of Foreign Trade's first "Taiwan Green Classic Award" in the categories of "Green Classic Product" and "Green Classic Service" in 2011.

"Green Classic Product" demonstrates that TSMC collaborates with upstream materials suppliers and downstream assembly and testing service providers to reduce product environmental impacts. We reduce the resources and energy consumed for each unit of production to provide our customers with more advanced, efficient, and ecological products. The "Green Classic Service" exemplifies the effectiveness of TSMC's green management. In addition to helping customers design low-power, high-performance products to reduce resource consumption over the product's life cycle, TSMC practices clean manufacturing to provide additional green value for our customers.



TSMC Wins First "Taiwan Green Classic Award"

### TSMC Collaborates with Suppliers to Reduce Product Environmental Impact Footprints

TSMC's products take both quality and environmental impact into account. We believe that green products need to consider the entire product life cycle, including raw material mining, transportation, product manufacturing, use, and waste disposal to thoroughly evaluate environmental impact. The product carbon footprint, water footprint, or other environmental impact footprints are important indicators in the environmental performances of products.

Therefore, we require good hazardous substance management, pollution prevention, energy saving, waste reduction and other clean production measures in our own factories. We also require and assist suppliers to do so, and even require suppliers to require their suppliers to do so, in order to establish a green supply chain.

### Comply or Surpass International Product Environmental Laws

1. Product Hazardous Substance Management: By practicing QC 080000, TSMC ensures that products comply with regulatory and customer requirements, including:
  - The EU Restriction of Hazardous Substance (RoHS): Restriction of hazardous substances in electric products including Lead (<1,000ppm), Cd (<100ppm), Hg (<1,000ppm), Cr6+ (<1,000ppm), PBB (<1,000ppm) and PBDE (<1,000ppm). All TSMC's products are compliant with EU RoHS. The bumping process still requires lead due to technology constraints, and is exempted under the EU RoHS. TSMC continues to develop "Lead-free" bumping to fulfill customers' needs.

- Halogen-free electronic products: In general, our customers request the concentration of Bromine and Chlorine in products to be less than 900ppm respectively and less than 1,500ppm in total. All TSMC's products are in compliance.
- Perfluorooctane Sulfonates (PFOS) restriction standards: TSMC has completely phased out PFOS from its process since 2010.
- EU REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) directive: All TSMC's products are compliant with the REACH dangerous chemicals and SVHC (Substance of Very High Concern) limits.
- EU Waste Electrical and Electronic Equipment (WEEE) Directive: This regulation is to require the recycling of electronic final products. TSMC's chips are recycled along with electronic final products after use by consumers.
- In addition to current global regulations and customer requirements, TSMC continues to monitor international regulation trends to prepare for responses.

2. Conflict Minerals Free Management: The U.S. "Dodd-Frank Wall Street Reform and Consumer Protection Act" ("Section 1502") and the Electronic Industry Citizenship Coalition (EICC) requires electronic product manufacturers to trace their metal mining sources, including gold, tantalum, tungsten and tin, to avoid minerals mined in conditions of environmental destruction and human rights abuses, notably in the eastern provinces of the Democratic Republic of the Congo. TSMC is conducting a supply chain survey to require suppliers to disclose the information of smelters and mines. Some suppliers are unwilling to reveal their name and origin of their suppliers due to commercial confidentiality. However, TSMC shall continue to require its suppliers to improve and expand their disclosures so as to fulfill regulatory and customer requirements.

### Create Green Value for Products

1. Assisting customers on energy-saving product design: TSMC's world-leading manufacturing technology helps customers achieve green product design and manufacturing. For example, low power, high efficiency power management chips both contribute to the global environment and provide a useful function for consumers.
2. Clean production provides customers green value: TSMC continues to develop manufacturing technology to provide more advanced and efficient manufacturing services. These improvements aim to reduce unit energy and resource consumption and pollutant generation, and also lower energy consumption and pollution in the product use stage.

### Leading Upstream and Downstream Partners to Complete a Supply Chain Product Carbon Footprint

TSMC continues to require that suppliers set up greenhouse gas (GHG) inventory procedures, and assists them in doing so. First, we led suppliers to complete the industry's first IC Product Category Rule and Environmental Product Declaration in 2009, and then we led upstream and downstream partners to complete a 12-inch wafer and packaged integrated circuit product carbon footprints, which was passed third-party certification based on the British PAS2050 product carbon footprint standard in February 2011. In November 2011, our 8-inch wafer was also passed PAS2050 carbon footprint certification. TSMC plans to complete 6-inch wafer carbon footprint certification in 2012, and can fulfilling all customers' requirements.

### Monitoring Semiconductor Product Water Footprint

There has been much global discussion of water risk management and product water footprints, and these issues have been included in surveys by the Dow Jones Sustainability Indexes and the Carbon Disclosure Project. However, there are currently no international standards for product water footprints. TSMC has always viewed water as a precious resource, and has for many years required our own plants and those of our suppliers to conserve water. In addition to including a water footprint as well as other environmental impact footprints in the 2009 integrated circuits Type III Environmental Product Declaration, TSMC also includes water footprint calculation data in our supplier questionnaire. We will continue tracking international water footprint standards and prepare for new developments.

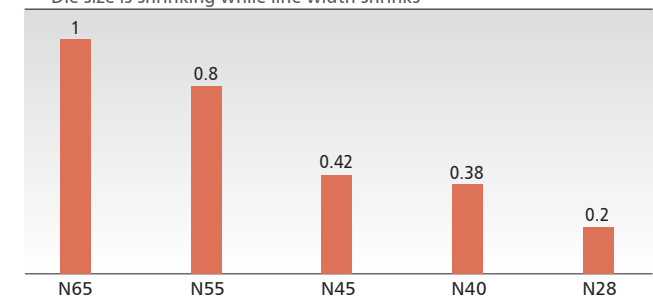
### Reducing Product Life Cycle Energy and Resource Consumption

The continuous development of TSMC's advanced semiconductor process technologies realizes Moore's law, which holds that process technology moves forward by one generation every 18 months. Each generation, the line width of circuitry shrinks, making the circuits smaller and lowering energy consumption, as well as raw materials consumed per unit area. At the same time, the smaller die size of the IC also means that it consumes less power. For example, 28nm technology can accommodate approximately the 5 times number of electronic components as 65nm technology. ICs made with 28nm technology in active or standby mode consume roughly one fifth of the power of 65nm products based on our internal test results.

TSMC continues to lead the foundry segment with the most advanced 28nm technology, having achieved volume production at 28nm, and our 28nm process offering includes 28nm High Performance (28HP), 28nm High Performance Low Power (28HPL), 28nm Low Power (28LP), and 28nm High Performance Mobile Computing (28HPM). Among these technology offerings, 28HP, 28HPL and 28LP have all been qualified and demonstrated first Silicon success in FPGAs, GPUs, CPUs, and mobile SOCs products. The 28HPM was qualified for production at the end of 2011.

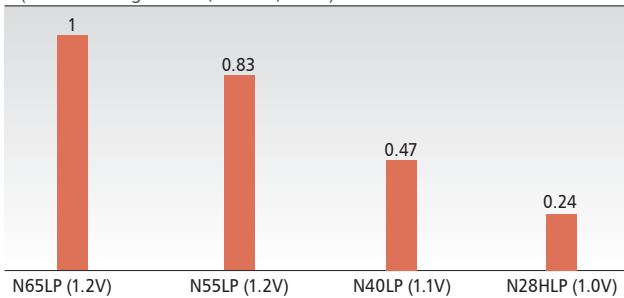
The number of customer 28nm production tape outs has more than doubled as compared with that of 40nm. At 28nm, there are currently more than 80 customer product tape-outs. The TSMC 28nm process has surpassed the previous generation's production ramp and product yield at the same point in time due to closer and earlier collaboration with customers. TSMC is already producing 28nm products for customers, and will continue to strive to provide our customers with more advanced, energy-saving, and more environmentally friendly products.

**Die Size Cross-Technology Comparison**  
- Die size is shrinking while line width shrinks

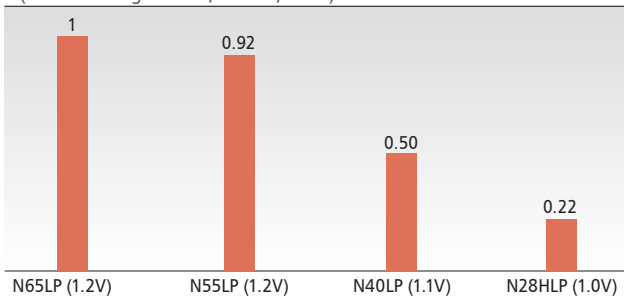




**Active Power Cross-Technology Comparison**  
(TSMC 21 stage circuit, 1.1Vdd, 125C)



**Standby Power Cross-Technology Comparison**  
(TSMC 21 stage circuit, 1.1Vdd, 125C)



### Helping Customers to Design Low-power and High-efficiency Products

TSMC's analog power technology research and development team utilizes 6-inch and 8-inch wafer fabs to develop leading performance Bipolar-CMOS-DMOS and Ultra-High Voltage technology. They also provide sophisticated manufacturing technology to support customers in achieving their green energy product design concepts and to produce industry-leading power management chips with more stable and efficient power supply, and lower energy consumption for broad-based applications in consumer, communication and computer markets.

TSMC provides power-efficient design platforms to its customers. Using such design platforms, customers can develop energy-saving products to be manufactured by TSMC. For example, TSMC collaborates with a third-party IP partner to integrate their patented energy-saving technology and TSMC's advanced manufacturing technology to provide a "Power Trim Service" to our customers.

In 2011, TSMC unveiled Reference Flow 12.0, the latest version of its industry-leading design methodology. Reference Flow 12.0 introduced two-and-a-half dimensional and three dimensional integrated circuits (2.5-D/3-D ICs) using silicon interposer and through silicon via (TSV) technologies; 28nm model-based simulation Design for Manufacturing (DFM) speed-up; and advanced Electronic System Level (ESL) design initiative enabling TSMC's process technology PPA power, performance, and area (PPA) to be integrated into system level design. AMS Reference Flow 2.0 offers an advanced multi-partner AMS design flow addressing the growing complexity of 28nm process effects and design challenges for superior DFM and Restricted Design Rule (RDR) compliance and reliability.

The introduction of Reference Flow 12.0 and AMS Reference Flow 2.0 addresses critical design issues for the next generation of 28nm and 20nm applications.

In addition, TSMC continues to cooperate with customers to develop advanced semiconductor technology, and to integrate more functions into smaller chips, speeding up the expansion of wireless communication products in new markets, and allowing next-generation mobile communication products to provide more powerful functions and lower energy consumption.

### Product Packing Materials Management and Reduction

TSMC uses recyclable plastic and paper as packing materials for shipping products. These packing materials comply with EU regulations requiring lead, cadmium, mercury and chromium (IV) concentration of less than 100ppm, and also contain no polyvinylchloride (PVC).

We reuse packing materials as much as possible to control usage. TSMC recycles packing materials 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. Our wafer shipping boxes are completely made from reused sources. These measures have reduced both packing material consumption and waste generation.

### 8.4 Pollution Prevention

TSMC believes that pollution prevention is one of a corporation's most important responsibilities. TSMC's pollution prevention is based on the ISO 14001 environmental management system, and uses the "Plan-Do-Check-Act" management model to promote continuous improvement. We believe that conserving raw materials, energy, and resources as well as reducing waste and pollutants both saves production costs and protects the environment.

#### Pollution Prevention is the Bottom Line

Taiwan has very limited land, large population and high density of industrial factories. Therefore, some of its environmental regulations may be among the strictest in the world. To address increasingly stringent environmental standards, TSMC has established good communication channels with the government, and participates in discussions in the early stages of legislation to facilitate reasonable and feasible standards. Each plant

also performs assessments to evaluate conformity to new standards, and improvement and preventive measures are taken immediately if nonconformance is discovered.

TSMC has established comprehensive management and operations procedures for pipe-end treatments such as air and water pollution controls, and ensures these procedures are carried out precisely. TSMC has also installed monitoring systems on the discharging sides of pollution control facilities for online monitoring. Facility personnel follow emergency response and reporting procedures to take proper actions if operating conditions diverge from preset limits.

**Assisting Non-semiconductor Subsidiaries in Early Pollution Control**

TSMC assists its non-semiconductor subsidiaries, TSMC Solid State Lighting and TSMC Solar in assessing risk for their specific wastewater, air emissions, wastes, and chemicals to reduce their environmental impacts.

**Resource Recycling is Our Consensus**

For waste management, TSMC has transitioned from traditional “treatment and disposal” to a concept of effective resource management and implements this concept in daily operations. 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. In addition, TSMC actively collaborates with raw material suppliers to reduce chemical usage and waste chemicals. We also study the feasibility of waste recycling by raw materials suppliers to reach our goal of sustainable resource recycling.

With this waste resource management model, TSMC has successfully raised its waste recycling rate each year, reduced its incineration and landfill rate, and cut waste disposal cost by generating waste recycling income. In 2011, TSMC’s waste recycling rate reached more than 91.8% and the landfill rate was less than 1%.

**8.4.1 Source Reduction – Raw Materials Usage Reduction**

TSMC seeks to optimize processes to minimize raw material use and waste production, protecting the environment while reducing costs at the same time. TSMC has a designated unit that periodically reviews raw materials reduction performance. Internally, we optimize our process recipe for raw material usage, which can not only reduce production cost but also reduce the generation of pollutants and wastes. Externally, we require our process tool suppliers to review and minimize the chemical usage step by step. We are now discussing with our process tool suppliers to adopt the SEMI-S23 guideline to optimize the consumption of energy, resource and chemicals. We have also included SEMI-S23 as a process tool procurement specification.

TSMC uses raw wafers as a major direct material in its manufacturing process. Raw wafers are composed of very high purity silicon, and cannot be recycled for wafer manufacturing processes. However, control wafers used for monitoring process conditions are reclaimed for reuse. We estimate one control wafer can be reused for 10 times, which reduces both cost and wastes.

**Raw Wafer Usage**

	2009	2010	2011
8-inch wafer equivalent (piece)	11,299,463	12,685,217	12,513,393

**8.4.2 Water Pollution Control**

**Strategy of Segregated Treatment, Strict Monitoring, and Environmental Protection before Production**

TSMC’s water pollution control strategy is first to reduce pollutants in process wastewater, followed by water recycling and treatment of pollutants in water. Effluent water quality must be better than or compliant with governmental standards.

TSMC’s major water-using process is an ultra-pure water system which turns raw water into ultra-pure water mainly used in process tools for cleaning chemical residue on wafer surfaces. To reduce total water usage, TSMC’s effluent water from ultra-pure water systems and process tools are graded by purity. The cleanest is reused in the manufacturing process; the second grade taken from the recycling treatment is employed in secondary uses such as cooling-tower water. Wastewater that cannot be recycled is discharged to treatment facilities for final wastewater treatment.



TSMC adopts a strict front-end wastewater categorization strategy to improve treatment efficiency. Wafer fabs' wastewater can be divided into fluoride, copper, general acid, and various polishing wastewaters. All kinds of wastewater are strictly categorized at process tools, and collected to wastewater treatment facilities through separated piping. In order to manage these drains strictly, there are more than 20 categories of drainage types, carefully operated and maintained by professional teams to comply with the standards of the Science Park Administration (SPA). The water is then discharged to the SPA wastewater treatment plant for further treatment after professional teams ensure the discharge complies with SPA standards. The treated wastewater is discharged to rivers from the SPA's wastewater treatment plants in compliance with river discharge standards. The SPA also conducts random measurement of the discharges of each company in Science Park.

TSMC operates only after ensuring that the environment will not be polluted. Each fab is equipped with effective wastewater treatment systems including complete backup systems, such as emergency power supplies, to reduce the likelihood of abnormal discharge. Operating status of all of TSMC wastewater treatment systems are monitored 24 hours a day by shift personnel. If operating conditions diverge from the preset limits, a warning signal is sent and wastewater discharge is halted. Data gathered for monitoring system effectiveness have been designated an important tracking item to ensure effluent quality.

### Developing New Technologies to Respond to New Regulations

In addition to complying with SPA standards, TSMC continually works with industries and universities to improve discharge quality in areas such as COD (Chemical Oxygen Demand), TMAH

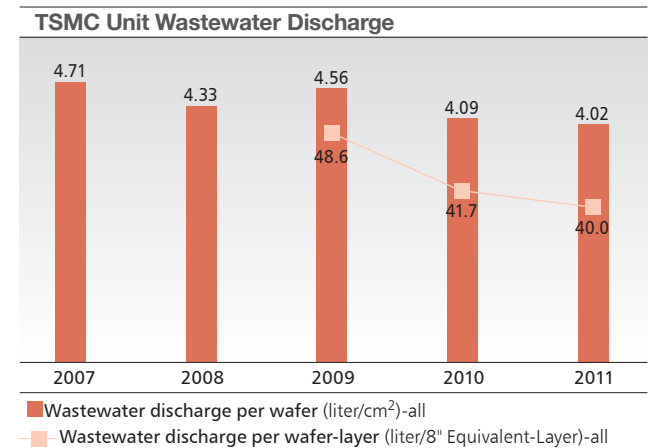
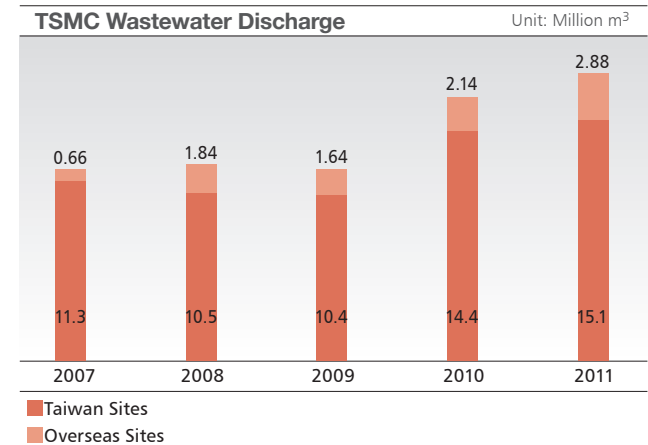
(Tetra-methyl ammonium hydroxide) and NH<sub>3</sub>-N to reduce hazards to water bodies. For example, we reduced COD for 12-inch fab discharge by 62.5%.

In addition, TSMC continues to explore new wastewater treatment and chemical recycling technologies. For example, TSMC led the industry in performing a series of experiments to obtain the optimal processing technology for NH<sub>3</sub>-N-containing backside grinding wastewater, high concentration fluoride and phosphorus acid wastewater and TMAH recycled by external contractors, which attests to our dedication to protecting the environment.

In 2010, the Taiwan Environmental Protection Administration (EPA) announced a wastewater effluent standard for the optoelectronics industry. The standards for acute toxicity to aquatic bio-organisms may be the strictest in the world and will affect our wafer fabs as well as our new LED and solar factories. We are beginning compliance evaluation and communicating with government authorities, including Taiwan's Environmental Protection Administration and Science Park Administration, to develop a feasible management model.

### Wastewater Discharge Quantity

TSMC's wastewater quantity per 8-inch wafer equivalent per mask layer (note 2) in 2011 decreased by 19% compared to 2009 from 48.6 liters to 40.0 liters, and also decreased by 5% compared to 2010.



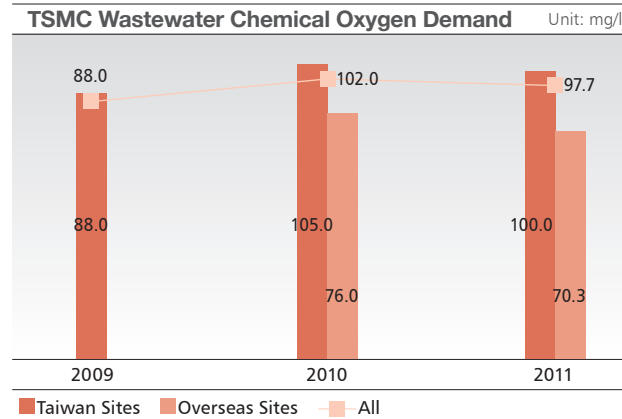
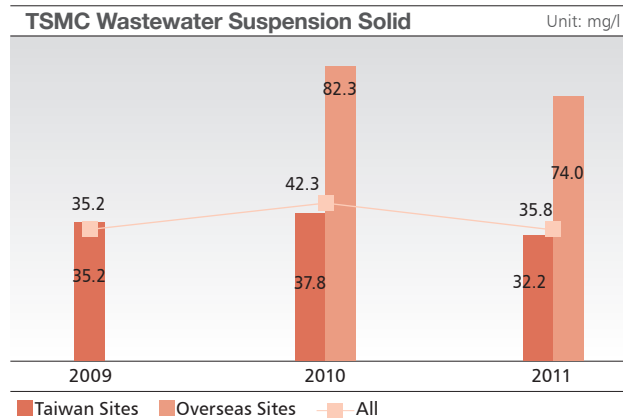
Note 1: TSMC annual wastewater quantity includes all fabs in Taiwan, as well as all overseas fabs, packing and testing facilities, bumping, EBO, R&D, and water consumed by non-production activities.

Note 2: The statistic data for unit wastewater quantity density is for wafer fabs in Taiwan and overseas. Beginning in 2009, this index was rationalized by introducing layer index due to product complexity.

## Wastewater Effluent Monitoring

All TSMC fabs are equipped with continuous monitoring equipment to monitor and record changes in water quantity and quality, such as acidity and fluoride ion concentration, in order to take appropriate responses when abnormal situations occur. We also conduct offsite sampling and analyze wastewater effluent quality at least four times a year, which also provides a calibration reference for online analyzers, ensuring that TSMC complies with water quality standards.

In 2011, TSMC wastewater effluent quality was close to 2010 levels, indicating good stability in all fabs. The wastewater effluent quality data includes: pH between 5 to 9 (SPA's standard is 5 to 10), Suspended Solid was controlled from 14 to 80 mg/L (SPA's standard is below 300), COD was controlled from 29 to 180 mg/L (SPA's standard is below 500).



### 8.4.3 Air Pollution Control

#### Effective Treatment Based on Waste Air Specification

TSMC's air pollution control strategy is to optimize process to reduce pollutants in air exhaust, and then to abate pollutants in air exhaust through high-efficiency equipment to comply with or surpass legal requirements. Air pollutant concentrations in TSMC's exhaust are far below the standards required by Taiwan's EPA, according to actual measurements performed over the years.

Wafer fabs emit three major types of exhaust: acid exhaust, base exhaust, and volatile organic compounds. Heat exhaust emitted by process equipment does not cause air pollution. Air pollution control systems depend on various categories and characteristics of pollutants. TSMC installs local scrubbers behind process tools in order to treat toxic, flammable and PFC gases. First, high temperatures or other physical and chemical measures are used to significantly reduce the concentration of pollutants in tool exhaust. The gas is then inducted to central waste gas treatment

equipment for end-point treatment. Endpoint treatment includes zeolite-rotary-wheel absorbing equipment for volatile organic compounds (VOC) treatment and wet scrubber equipment for acid or base gases.

#### Stable Operation, Continuous Monitoring

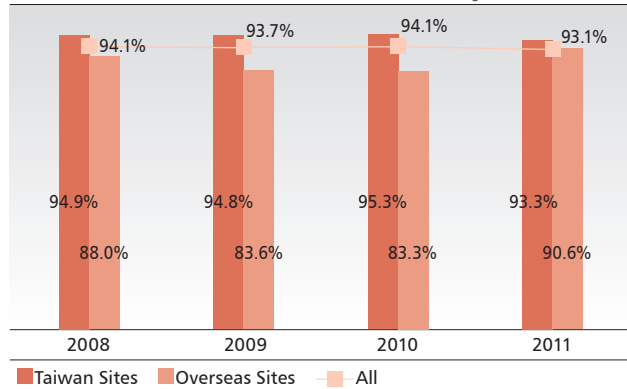
The performance of All TSMC fabs, including overseas facilities, are fully compliant or exceed the air pollutant emissions standards in the areas where they operation. TSMC has deployed high performance air pollution control equipment with at least N+1 backup systems so that all pollution control equipment can continue waste gas control 24 hours a day, 365 days a year in case of equipment breakdown. To ensure normal equipment operations, TSMC has installed backup fuel supply systems for VOC pollution control equipment that will engage if the original fuel supply system experiences difficulties. Operational status of all of TSMC air pollution control systems is monitored 24 hours a day by shift personnel. Data collected by system efficiency monitoring have been classified as an important tracking item in order to ensure air exhaust quality. In 2009, we added an electronic quarterly air pollution report system that can automatically confirm the accuracy of declarations.



## Air Emissions Record

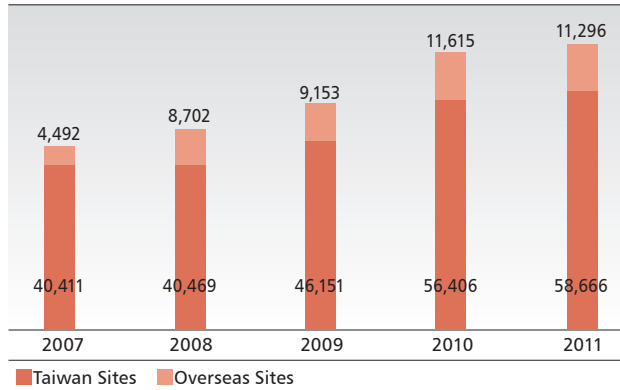
In 2011, the average removal efficiency of VOC exhaust remained at a relatively high level of 93.3% in Taiwan's TSMC fabs and 90.6% in overseas fabs, well above the legal standard or local regulations.

### TSMC VOC Destruction Removal Efficiency

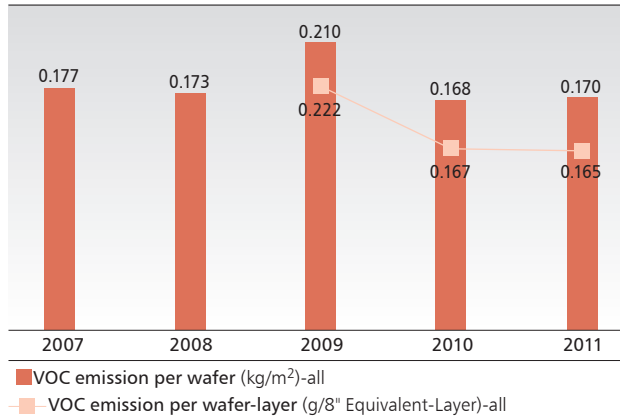


TSMC's VOC volume per 8-inch wafer equivalent per mask layer (note 2) in 2011 decreased by 25% compared to 2009 from 0.222g to 0.165g, and also decreased by 1.2% compared to 2010. In addition, based on the Taiwan EPA's formula for calculating SOx and NOx emissions, TSMC estimates that our NOx emission was 85 tons and SOx emission was 42 tons in 2011.

### TSMC VOC Emission



### TSMC unit VOC emission



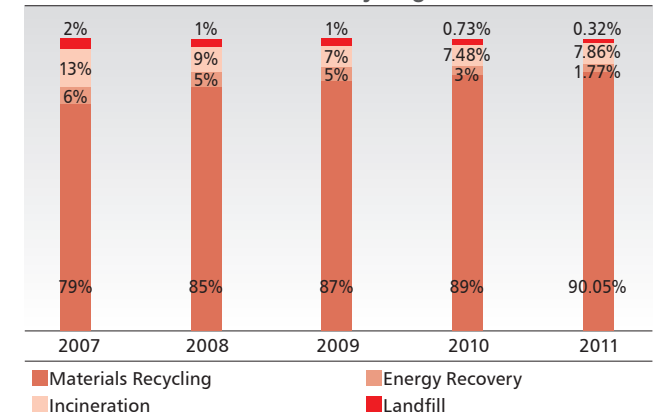
Note 1: The statistic data for VOC emission includes all fabs in Taiwan, as well as all overseas fabs, packing and testing facilities, bumping, EBO, and R&D.

Note 2: Prior to 2009, VOC emission density was defined by total VOC emission quantity divided by total wafer out beginning in 2009, this index was rationalized by introducing a layer index due to product complexity.

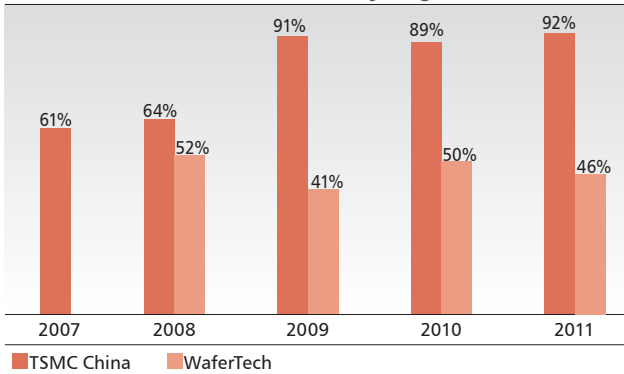
## 8.4.4 Waste Reduction and Resource Recycling

TSMC has made great efforts in reducing raw materials usage with significant achievements on waste reduction and recycling over the past decade. Although the categories of wastes are growing more complex, TSMC continued to develop new waste recycling technology with potential suppliers to raise its recycling rate and reduce waste disposed in landfills. TSMC's Taiwan sites continued to carry out reduction and recycling programs in 2011, and our waste recycling rate reached 91.8%, exceeding 90% for the fourth consecutive year, while our landfill rate was below 1% for the fourth consecutive year. Our overseas subsidiaries also strive to improve their waste recycling rates.

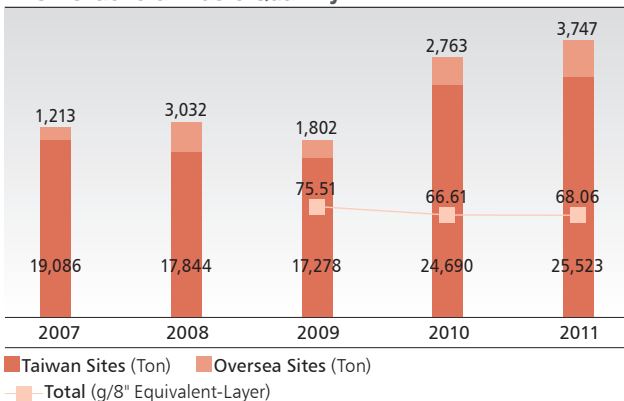
### TSMC Taiwan Sites Waste Recycling Status



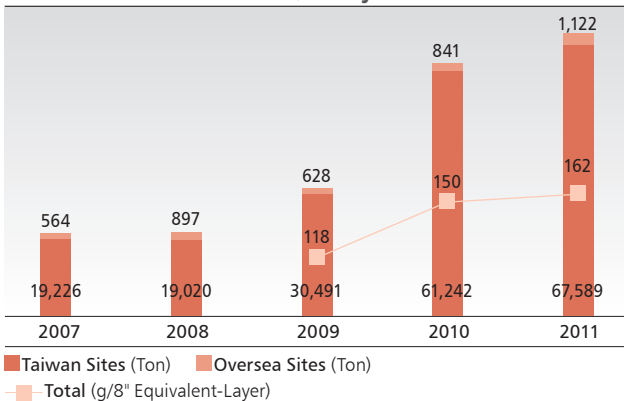
**TSMC Overseas Sites Waste Recycling Rate**



**TSMC General Waste Quantity**



**TSMC Hazardous Waste Quantity**



**Innovative Waste 3R Projects**

In 2011, TSMC initiated several environmental programs which focused on selected less-hazardous chemicals for reduction, recycling and reuse. For example:

1. Sulfuric acid reduction: We collaborated with process equipment vendors to reduce sulfuric acid usage and waste generation.
2. Process chemical replacement: Replaced copper etching chemical with heavy metal-free chemicals to reduce environmental impact.
3. Calcium fluoride sludge reduction:
  - This effort includes the separation and collection of higher concentrations of hydrofluoric acid for offsite recycling, thus reducing the quantity of chemicals used for wastewater treatment. This recycling of used hydrofluoric acid is the world's first, and is jointly developed by TSMC and our supplier to make pure calcium fluoride, which is used as a flux in steel manufacturing.
  - We also plan to set up drying equipment at all sites for reaching the target of reducing weight and volume of calcium fluoride sludge.
4. Continued to develop know-how with our suppliers to recycle chemical wastes: For instance, we recycled used CMP and developer fluid and for reuse in our process or other industrial processes, reducing waste and conserving natural resources.

**Computer Reuse and Recycling Campaign**

TSMC fully supported ASUSTek Computer Inc.'s "Computer Reuse and Recycling Campaign" project. The Ministry of Economic

Affairs also supported this campaign. TSMC has donated more than 34,000 used personal computers, notebook computers, and LCD monitors since 2007, making up one third of the total amount received in this project to become the largest donor.

Our purpose in participating in this campaign is to promote the concept of material recycling. Through this recycling campaign, refurbished computers are donated to students in rural elementary and junior high schools and to disadvantaged minorities to narrow the digital divide, caring for society and protecting the environment at the same time.

**8.5 Environmental Management System**

**8.5.1 Environmental Management System Establishment**

**Establishing A Pro-Active Environmental Management Vision**

TSMC aims to be a world-class company in environmental protection. Our environmental performance complies with legal requirements and also measures up to recognized international practices.

**A Comprehensive Internal Environmental Management Organization**

TSMC's environmental management organization consists of the central planning unit, the Operational Organization Technical Board, and designated departments in each manufacturing facility. These organizations work together collaboratively with clearly defined responsibilities. We use ISO 14001 and QC 080000 standards to manage environmental performance at all our manufacturing facilities. It is mandatory for all new manufacturing facilities to receive these certifications within 18 months of installing the first manufacturing equipment.

### TSMC Leadership in Data Center ISO 50001 Certification

TSMC adopted the ISO 50001 Energy Management System in 2011 to extend its energy conservation efforts. The Fab 12 Phase 4 data center completed ISO 50001 Energy Management System certification in 2011, becoming Taiwan's first company to earn this certification for a high-density computing data center. TSMC believes ISO 50001 supports energy saving and carbon reduction, and plans to apply the ISO 50001 Energy Management System to manufacturing facilities in addition to data centers.

### Continuous Improvement in the Spirit of Our Management System

To sustainably mitigate enterprise risks and to fulfill our corporate social responsibilities, we focus on:

- Air and water pollution prevention and control
- Waste reduction and recycling
- Greenhouse gas reduction (energy efficiency and perfluorinated compound emission reduction)
- Resource conservation (water savings and chemical substance use reduction)
- Energy-saving products and restriction of hazardous substances

### Collaborating with Suppliers to Expand Sustainability Performance

TSMC also collaborates with our suppliers proactively on managing global ESH risks, and work towards supply chain sustainability, including:

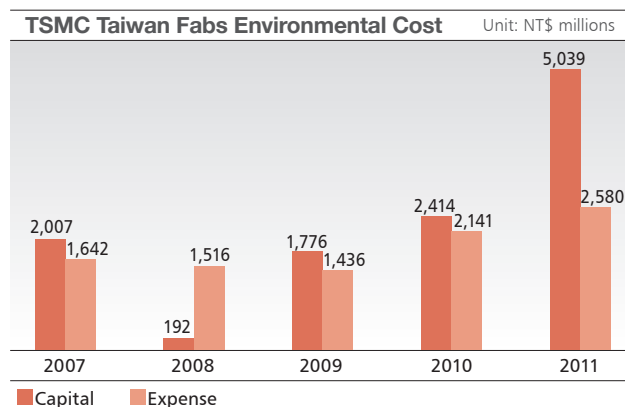
- Carbon footprinting
- Water footprinting
- Conflict minerals management
- Hazardous substance restriction management

Information on TSMC supply chain sustainability management can be found in Chapter 6 of this report.

### Environmental Accounting

The purpose of TSMC's environmental accounting system is to identify and calculate environmental costs for internal management. At the same time, we can also evaluate the economic benefits of environmental programs so as to promote economically efficient programs. With environmental costs expected to continue growing, environmental accounting can help us manage more effectively. TSMC's environmental accounting measures are to define the various environmental costs and set up independent environmental account codes, then provide these to all units for use in annual budgeting. This online system can output data for environmental cost statistics. Our economic benefit evaluation calculates cost savings for reduction of energy, water or wastes according to our environmental programs.

TSMC's environmental cost statistics chart is as below. The annual environmental cost is growing in line with continuing new construction and environmental projects.



Note: Expense includes pollution control equipment operation and maintenance, management, measurements, certification and other non-capital fees.

The environmental benefits disclosed in this report include real income from projects such as waste recycling and savings from major environmental projects. In 2011, benefits from environmental programs and waste minimization totaled more than NT\$717 million.

### 2011 Environmental Efficiency of TSMC Fabs in Taiwan

Unit: NT\$ thousands

Items	Description	Efficiency
1. Environmental projects	Savings of energy, water, raw material use, equipment operation and waste treatment cost from the major environmental projects	563,000
2. Recycling of industrial waste	Recycling of used chemicals, wafers, targets, batteries, lamps, packaging materials, paper cardboard, metals, plastics, and other wastes	154,190
Total		717,190

### Environmental Management in TSMC Subsidiaries

TSMC requires our major subsidiaries, including TSMC China, WaferTech, TSMC Solid State Lighting and TSMC Solar to have the same environmental management measures as TSMC. Subsidiaries are required to be consistent with our environmental policy and work standards.

Our subsidiaries have actively set up environmental management systems, and they conform with our practice of requiring facilities to obtain ISO 14001 certification within 18 months of mass production.

TSMC assists its non-semiconductor subsidiaries, TSMC SSL and TSMC Solar to assess risk for their specific wastewater, air emissions, wastes, and chemicals to ensure legal compliance. TSMC and its subsidiaries register various environmental

performance indices in TSMC's e-platform periodically for monitoring and management to pursue continuous improvement.

### 8.5.2 Environmental Compliance Record

TSMC has no significant chemical leaks, environmental penalties, or fines in 2011.

## 8.6 Green Promotion Activities – Acting as A Positive Influence

### 8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus

Starting in 2005, TSMC committed to a policy of constructing all new manufacturing facilities and office buildings according to the most up-to-date green building standards. The standards are the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standard, and Taiwan's Ecology, Energy Saving, Waste Reduction, and Health (EEWH) standard. The intention of this program is to achieve certification by national and international green building standards for all new fabs. TSMC achieved its first green building in 2008 and has the most green building certifications of any corporation in Taiwan with four LEED Gold certifications (Fab 14 Phase 3 Fab, Fab 12 Phase 4 Fab, Fab 14 Phase 4 Fab and Fab 12 Phase 4 Office), as well as three buildings with Diamond level certification (Fab 14 Phase 3 Fab, Fab 12 Phase 4 Fab and Fab 12 Phase 4 Office) under the EEWH standard.

TSMC initiated a green campus development policy at the end of 2010 to raise the efficiency of green buildings, optimize resource-sharing to reduce cost, eliminate unnecessary equipment and conserve resources, and to thrive alongside the natural environment through comprehensive site planning.



Fab 12 Phase 4

TSMC plans to make Fab 12 in Hsinchu, Fab 15 in Taichung, and Fab 14 in Tainan into the company's three main green campuses. TSMC is committed to a green manufacturing policy and environment protection.

### Promotion of Green Building Experiences – external visits

More than 3,300 people have visited TSMC to learn about our green buildings, including delegations from APEC, the International SEMATECH Manufacturing Initiative, government agencies, University departments in related fields, and other corporations.

### Assisted the Government to Establish A "Green Factory" Standard

In 2009, TSMC proposed draft guidelines for green industrial buildings in Taiwan. The Architecture and Building Research Institute (ABRI) gave its support to TSMC, The Southern Taiwan Science Park Administration, NCKU, NTUT, Delta Electronics, AUO, Chimei Optoelectronics and United Microelectronics Corp. for a joint initiative to establish a "Green Factory Certification

Standard". This initiative was completed in 2010, and is applied to factory green building certification. In 2010, we also extended this program to work with the Ministry of Economic Affairs Industrial Development Bureau (IDB), NTUST and NCKU to establish a "Green Factory CDM (Clean Development Mechanism) Certification Standard". We completed this second initiative in 2011 to provide a standard to identify environmental performance in factory processes. These two standards were integrated into a "Green Factory Standard" by the Taiwan Ministry of Economic Affairs, and issued on January 2012 to take effect in April 2012. These two certification standards are flexible and highly applicable due to voluntary actions of industries, establishing an excellent model for collaboration between industry, government and academia. TSMC expects these standards will be adopted by various industries in Taiwan and raise the environmental performances of Taiwan businesses.

### TSMC Green Building Practices

#### Energy Saving Design

- **Energy optimization design:** TSMC uses DOE-2 software to simulate and analyze its building energy efficiency. Taking Fab 12 Phase 4 example, variable flow control for chilled water and warm water can achieve 7.2% energy saving. Employing a heat recovery system for our chillers creates another 6% energy saving. Variable flow control for HVAC & exhaust fans can reach 5.6% energy saving. Optimized temperature control for cooling towers can achieve 0.1% energy saving. Each project was able to reduce energy consumption a further 20% compared with the baseline standard of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE 90.1). Raising reclamation rate of clean room air up to 40% can save another 1 million kwh of electricity power consumption every year.



- **Heat Recovery System:** TSMC collects waste heat from chillers instead of boiler systems to reduce power consumption and initial cost. Waste heat recovered from chillers eliminates the need to install boilers and reduces energy use. Initial cost for the heat recovery system was NT\$56 million while resulting in operating cost savings up to 32 million kwh of electricity per year.

- **Heat Pump Recycle:** This heat pump system absorbs heat from the air or machinery and recycles it to produce hot water, reducing CO<sub>2</sub> emissions. This design is also safer than conventional designs, with no fire or gas leakage concerns.

- **Energy Saving Lighting Design:** TSMC uses dimmer controls in lobbies and lighting sensors in office areas. High ceilings near windows introduce maximum daylight and lighting sensors control the lighting on-off settings on the window side. Every seat has individual lighting control to reduce unnecessary power consumption. Our newly constructive office uses digital addressable lighting interface system (DALI) to control lighting illuminance and individual on/off.

- **Smart Control System:** Occupancy sensors have an auto-switch function to control lighting and air-conditioning in public areas. Individual HVAC switches are installed to provide controllability during energy saving mode at night time.

### Indoor Environmental Quality

TSMC has achieved outstanding performance in environmental sustainability, energy and carbon reduction to reduce sick building syndrome. Individual HVAC switches keep maintain indoor air quality. Indoor carbon dioxide monitoring facilities were installed, and when the concentration of carbon dioxide is



Vertical Garden in Fab 14 Phase 4 Office

above 1,000ppm, fresh air is increased in order to maintain air quality. Measures were taken to prevent the diffusion of pollutants during construction, and the building was flushed out with fresh air before occupancy to ensure the air quality and the health of personnel. Fab 12 Phase 4 consumes 29.4% less energy than the Phase 1 office, and also consumes 40.2% less water. Overall energy saving of fab buildings are 27.2% below the baseline standard set by ASHRAE.

### Design for Material Reduction

In order to reduce materials consumption and CO<sub>2</sub> emissions, all of TSMC's new construction buildings use blast furnace slag cement to replace partial concrete. We have also adopted lightweight partitions in interior wall construction to reduce material usage and speed up construction progress. All piping and conduits are exposed for future maintenance. This design dramatically reduces structural damage to the building caused by maintenance. Equipment installed on rooftops are raised from the floor and installed with vibration dampers to control noise. Construction waste is classified, and 91% of the waste was recycled.

### Building Envelope Design

Two roof materials were used to prevent the heat island effect and save operational electricity by 60,000 kwh per year. The first material is white brick with high solar reflective index, (SRI>78). The second one is white metal plates (SRI>82). A "Giga Bridge" connects fabs with a clean room class environment for automated materials handling systems to improve logistical efficiency and reduce carbon emissions.

### Sustainable Ecology

The concept of sustainability is carried through from building plan to design and construction. We have designed a diversified eco-pond and green belt around our green buildings. Rainwater and HVAC condensed water are collected for landscape irrigation. The pond structure features rocks with many holes to provide habitats for insects, aquatic plant and other small species. The eco-pond reduces interference between humans and wildlife, giving birds a place to hatch their next generation.

In addition to a green roof, our building structure has several receding balconies for employee recreation. A multistory vertical garden creates a natural ecosystem in the building. Some 8,700 plants absorb CO<sub>2</sub> and provide a backdrop to conversation. A hard cape around the building employs water permeable brick to control surface water runoff by avoiding unnecessary landscaping.

Finally, TSMC provide shuttle routes for commuting employees, as well as an online carpool system and designated bicycling areas. This reduced CO<sub>2</sub> emissions by 9,570 tons, equivalent to a year's CO<sub>2</sub> absorption volume for ten Da-An Forest Parks in Taipei. TSMC believes if a thing is worth doing, it's worth doing well.

### 8.6.2 Green Promotion

TSMC continues to raise employees' environmental awareness through education programs, including new employee training, family day, and the "Loving the Earth Begins with Me" program. These convey environmental ideas that are reflected in our employees' actions, and many departments also seek opportunities to conserve energy, save water, and reduce waste. External promotion activities not only include green supply chain management but also active collaboration with academia, industries and local governments in our operation sites around the world. We aim to using our influence as a corporation to protect the environment and to meet our corporate social responsibilities.

#### Enhancement of Employee Environmental Awareness

TSMC holds the environmental protection program "Loving the Earth Begins with Me" annually. In addition to professional environmental education courses, TSMC makes use of designated environmental bulletin boards in each fab as well as promotional materials in elevators, restrooms, and employee publications to embed environmental concepts in employees' everyday work



Green Promotion Posters

and life. About 30% of TSMC employees participated in a Q&A lottery activity.

In order to give employees easy access to up-to-date environmental knowledge, we maintain an internal environmental protection website which files related information and maintains links to global environmental protection-related websites.

#### Participation in External Environmental Protection Activities

In addition to our own environmental protection work, TSMC also works closely with local governments, academia, and communities to act as a positive influence in environmental protection. TSMC actively participates in organizations such as the Chinese National Federation of Industries, the Taiwan Electric and Electrical Manufacturers' Association (TEEMA), the Association of Science Park Industries, the Taiwan Semiconductor Industry Association (TSIA), Semiconductor Equipment and Materials International (SEMI), the Taiwan Business Council for Sustainable Development (BCSD-Taiwan), and the Taiwan Corporate Sustainability Forum. TSMC is connected with the latest developments in environmental thinking and shares its experience with local industries, and offers timely policymaking suggestions to the government.

In 2011, TSMC participated in the "One man one tree – Yes, I can do" tree planting activity held by BCSD-Taiwan. Despite cold and rainy weather, 500 participants from a broad range of companies gathered to show that the Taiwan's companies can collaborate to protect the environment. TSMC's participants hope the trees can quickly grow strong and contribute to a greener environment.



"One man one tree – Yes, I can do" tree planting activity

#### Science Park "ESH Month" Activities

TSMC is an active participant in community environmental protection activities, such as the "ESH Month" held by the Science Park Administration and the Association of Science Park Industries. The goal of "ESH Month" is to give Science Park Employees a deeper understanding of workplace safety and sustainable development. It brings together companies around the Science Park as well as residents living in the communities around the science park. In the 2011 ESH Month, TSMC held an ESH forum that drew many attendees.

#### Continued Participation in the Southern Taiwan Science Park River Patrol and Guard Team, Sponsored Public Roads to Build A Beautiful Neighborhood

TSMC led the establishment of the Southern Taiwan Science Park river patrol and guard team, and works together with environmental authorities to control and rectify activity that may endanger environmental water quality. TSMC also pays attention to the environment around our sites. For example, we voluntarily take care of the public roads around our sites, and continue conduct daily cleaning and monthly pest control.

## Participated in the “World Citizen Café” Held by Taiwan EPA to Discuss Climate Change Issues



Taiwan’s Environmental Protection Administration (EPA) invited representatives from industries, government, academia,

communities and non-governmental organizations to participate in a “World Citizen Café” discussion to compile their comments on global climate change issues as a reference for future policies. TSMC was pleased to be invited and sent participants to understand the concerns of various parties. At the same time, we also shared our strategies towards mitigating climate change with other participants.

## Environmental Protection Promotion Activities in TSMC Subsidiaries



TSMC China invited Songjiang Industrial Zone Enterprise Service Department deputy minister to supervise its annual emergency evacuation drill.

TSMC China Ltd. continues to maintain good relationships with local government through academic exchanges and related experience sharing. In addition, TSMC China also provides resources to assist the

China Semiconductor Industry Association in preparation for participation in World Semiconductor Association activities.

TSMC’s U.S. subsidiary WaferTech conducts energy saving, waste reduction and recycling aggressively. In 2011, WaferTech saved 3.7 million kilowatt-hours of power consumption from process cooling water. Its hazardous waste recycling rate reached 77% and waste treatment cost was reduced 46% through collaboration with waste recycling contractors. WaferTech also successfully transferred 80 tons of hazardous waste from incineration to recycling. In addition, more than 150 tons of solid waste was transferred from landfill to recycling, and 630 tons of liquid waste chemicals were also recycled. In 2011, WaferTech held the tenth annual Earthweek event, which seeks to raise employee’s environmental awareness by recycling events, displays and promoting alternative transportation. In 2011 employees recycled 3,165 pounds of e-waste and 225 gallons of paint as part of this event.



for excellent green procurement. As TSMC SSL is TSMC’s first step into the solid state lighting industry, TSMC SSL held a LED safety and health conference, and invited ESH experts from the Safety and Health Technology Center to evaluate and discuss the specific ESH issues in this new business. Senior TSMC SSL

Although TSMC’s green industry subsidiaries TSMC SSL and TSMC Solar are in the start-up stage, they have already established an ESH management system and stepped on track in a very short time. TSMC SSL adopted green construction materials, and also was recognized by the Hsinchu City Government

managers participated in this conference and committed to ESH development.

## 8.6.3 Ecological Preservation

All TSMC wafer fabs in Taiwan and China are located in industrial parks, which conducted environmental impact assessment (EIA) on local communities before development, and continue to meet EIA commitments for environmental protection after development. Therefore, all TSMC wafer fabs in Taiwan and China are operating under the industrial parks’ or its own EIA commitments, and do not have a significant environmental impact on their local ecological environments.

TSMC continues to promote the construction of green buildings, and incorporates the concept of ecological preservation in site planning. Facilities constructed in the past three years not only comply with green building standards for energy saving, water conservation, and waste reduction, but also preserve native Taiwan plants and provide ecological ponds as habitats for birds and insects. We have observed birds nesting in the trees around our fabs, as well as butterflies and dragonflies in the air. The results of our efforts have gradually become evident.

Although TSMC’s U.S. subsidiary fab, WaferTech, is not located in an industrial park, it maintains a designated department to take responsibility for monitoring and maintaining on-site ecological preservation. WaferTech has successfully completed a 10-year wetlands mitigation project, where 29 acres of wetlands are in a permanent preservation area, including 8 acres of enhanced wetlands. This project preserves valuable habitat for local wildlife and is home to beavers, deer, rabbits, coyotes and a variety of birds.

# Appendix

TSMC CSR Performance Summary

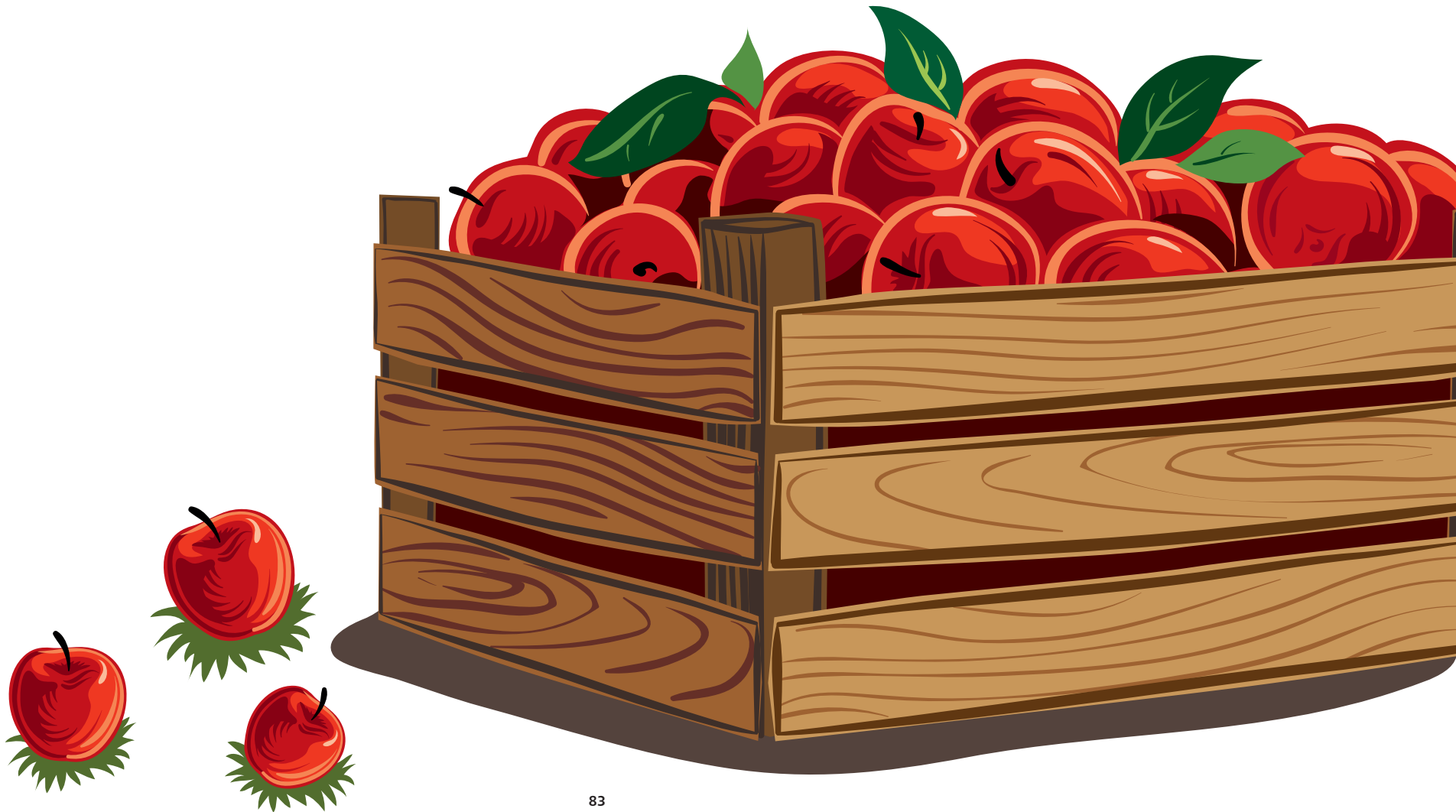
Independent Assurance Opinion Statement

GRI G3.1 Index

ISO 26000 Index

United Nation Global Compact Comparison Table

Contact Information



# TSMC CSR Performance Summary

Key Indicators	2007	2008	2009	2010	2011
<b>Economic</b>					
Revenue (Billion NT\$)	323	333	296	420	427
Net Income (Billion NT\$)	109	100	89	162	134
Provision for Taxes (Billion NT\$)	12	11	6	8	11
R&D Expenditures (Billion NT\$)	18	21	22	30	34
Capital Expenditures (Billion NT\$)	84	59	88	187	214
<b>Environmental</b>					
Greenhouse Gas Emission (Million Tons CO <sub>2</sub> equivalent/8" Equivalent-Layer)	-	-	0.014	0.010	0.010
Greenhouse Gas Emission (Million Tons CO <sub>2</sub> equivalent)	4.015	3.459	3.327	4.005	4.286
Scope 1	2.134	1.507	1.330	1.491	1.375
Taiwan Sites	1.791	1.205	1.086	1.176	1.051
Overseas Sites	0.343	0.302	0.244	0.315	0.324
Scope 2	1.881	1.952	1.997	2.514	2.911
Taiwan Sites	1.745	1.808	1.857	2.345	2.676
Overseas Sites	0.136	0.144	0.140	0.169	0.235
Energy Consumption (TJ – including electricity, nature gas and diesel)	-	12,554	12,437	16,188	18,407
Direct Energy Consumption (TJ – including nature gas and diesel)	-	981	880	1,028	1,177
Indirect Energy Consumption (TJ – electricity)	-	11,573	11,556	15,160	17,230
Water Consumption (Million m <sup>3</sup> )	17.51	18.70	18.46	24.81	27.52
Taiwan Sites	16.70	16.40	16.40	22.30	24.30
Overseas Sites	0.81	2.30	2.06	2.51	3.22

Key Indicators	2007	2008	2009	2010	2011
Process Water Recycling Rate (Taiwan Sites) (%)	80.10	80.40	83.40	84.10	84.60
Process Water Saving (Taiwan Sites) (Million m <sup>3</sup> )	23.14	26.37	27.05	34.66	37.73
Waste Generated (Metric Tons)	40,089	40,793	50,199	89,536	97,981
General Waste Generated (Metric Tons)	20,299	20,876	19,080	27,453	29,270
Taiwan Sites	19,086	17,844	17,278	24,690	25,523
Overseas Sites	1,213	3,032	1,802	2,763	3,747
Hazardous Waste Generated (Metric Tons)	19,790	19,917	31,119	62,083	68,711
Taiwan Sites	19,226	19,020	30,491	61,242	67,589
Overseas Sites	564	897	628	841	1,122
Waste Recycling Rate (%)	84.68	86.43	89.55	90.88	90.60
Taiwan Sites	85.78	89.57	91.17	91.88	91.82
Overseas Sites	61.03	56.97	57.59	67.03	73.24
<b>Social</b>					
Numbers of Employee	23,148	22,843	24,466	33,232	33,669
Employee Training Hours	726,907	641,939	561,403	968,457	795,448
Safety - Injury Frequency Rate (Injury Number/Million Labor-hours) (Taiwan Sites)	0.24	0.18	0.27	0.27	0.22
Safety - Injury Severity Rate (Lost Work Days/Million Labor-hours) (Taiwan Sites)	1.07	0.82	4.11	2.56	1.97
Charity Donation (Million NT\$)	141	144	270	190	152

# INDEPENDENT ASSURANCE OPINION STATEMENT

## 2011 TSMC Corporate Social Responsibility Report

The British Standards Institution is independent to Taiwan Semiconductor Manufacturing Company, Ltd. (hereafter referred to as TSMC in this statement) and has no financial interest in the operation of TSMC other than for the assessment and assurance of this report.

This Independent assurance opinion statement has been prepared for TSMC only for the purposes of assuring its statements relating to its corporate social responsibility (CSR), more particularly described in the Scope, below. It was not prepared for any other purpose. The British Standards Institution will not, in providing this independent assurance opinion statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used, or to any person by whom the Independent assurance opinion statement may be read.

This Independent assurance opinion statement is prepared on the basis of review by the British Standards Institution of information presented to it by TSMC. The review does not extend beyond such information and is solely based on it. In performing such review, the British Standards Institution has assumed that all such information is complete and accurate.

Any queries that may arise by virtue of this independent assurance opinion statement or matters relating to it should be addressed to TSMC only.

### Scope

The scope of engagement agreed upon with TSMC includes the followings:

1. The assurance covers the whole report and focus on systems and activities during the 2011 calendar year on the TSMC headquarter, all fabs located in Taiwan and all other sites excluded except for partial ESH information in two wholly-owned subsidiaries, but excluding the specific performance information for the Greenhouse Gas emissions.
2. The evaluation the nature and extent of the TSMC's adherence to all three AA1000 AccountAbility Principles in this report as conducted in accordance with type 2 of AA1000AS (2008) assurance engagement and therefore, the information/data disclosed in the report is not verified through the verification process.

This statement was prepared in English and translated into Chinese for reference only.

### Opinion Statement

We conclude that the 2011 TSMC Corporate Social Responsibility Report Review provides a fair view of the TSMC CSR programmes and performances during 2011. We believe that the 2011 economic, social and environment performance indicators are fairly represented. The CSR performance indicators disclosed in the report demonstrate TSMC's efforts recognized by its stakeholders.

Our work was carried out by a team of CSR report assurors in accordance with the AA1000 Assurance Standard (2008). We planned and performed this part of our work to obtain the necessary information and explanations we considered to provide sufficient evidence that TSMC's description of their approach to AA1000 Assurance Standard and their self-declaration of compliance with the GRI guidelines were fairly stated.

### Methodology

Our work was designed to gather evidence on which to base our conclusion. We undertook the following activities:

- a top level review of issues raised by external parties that could be relevant to TSMC's policies to provide a check on the appropriateness of statements made in the report.
- discussion with managers on TSMC's approach to stakeholder engagement. Moreover, we had sampled two external stakeholders to conduct interview.
- interview with 36 staffs involved in sustainability management, report preparation and provision of report information were carried out.
- review of key organizational developments.
- review of the extent and maturity of the relevant accounting systems for financial and non-financial

reports.

- review of the findings of internal audits.
- the verification of performance data and claims made in the report through meeting with managers responsible for gathering data.
- review of the processes for gathering and ensuring the accuracy of data, followed data trails to initial aggregated source and checked sample data to greater depth during site visits.
- the consolidated financial data are based on audited financial data, we checked that this data was consistently reproduced.
- review of supporting evidence for claims made in the reports.
- an assessment of the company's reporting and management processes concerning this reporting against the principles of Inclusivity, materiality and responsiveness as described in the AA1000 AccountAbility Principles Standard (2008).

## **Conclusions**

A detailed review against the AA1000 AccountAbility Principles of Inclusivity, Materiality and Responsiveness and the GRI G3.1 guidelines is set out below:

### **Inclusivity**

TSMC continually commits to its stakeholders in this report. The effort has been shown in conducting the participation of stakeholders for developing and achieving an accountable and strategic response to CSR. The 2011 report reflects this. The reporting systems are being developed to deliver the required information. There are fair reporting and disclosures for economic, social and environmental information in this report, so that appropriate planning and target-setting can be supported. In our professional opinion the report covers the TSMC's inclusivity issues and has demonstrated social responsible conduct supported by top management, however, the future report should be further enhanced by the following areas:

- Encouraging update sustainable development trend about Semiconductor sector continuously and integrated with corporate core strategy to ensure sustainable development performance.

### **Materiality**

TSMC has established relative procedure in corporate level, as the issues which were identified by all departments have been prioritized according to the extent of impact and applicable criterion for sustainable development of company. Therefore, material issues were completely analyzed and the relative information of sustainable development was disclosed to enable its stakeholders to make informed judgments about the company's management and performance. In our professional opinion the report covers the TSMC's material issues, however, the future report should be further enhanced by the following areas:

- Revisit the materiality assessment, since issues change over time and to strengthen the breadth and depth of original issues according to market and development of the company.

### **Responsiveness**

TSMC has continuously committed to implement the CSR practice and demonstrate relative performance information to respond to the expectations and perceptions of its stakeholders as appropriate. In our professional opinion the report covers the TSMC's responsiveness issues, however, the future report should be further enhanced by the following areas:

- Show how TSMC uses its claimed leadership position to influence others.

### **Performance information**

Based on our work described in this statement, specified sustainability performance information such as GRI G3.1 core indicators disclosed in this report, TSMC and BSI have agreed upon to include in the scope. In our view, the data and information contained within 2011 TSMC CSR Sustainability are reliable by means of vouching, re-tracking, re-computing and confirmation.

### **GRI-reporting**

TSMC provided us with their self declaration of compliance within GRI G3.1 Guidelines and the classification to align with application level A+. Based on our review, we confirm that social responsibility and sustainable development indicators with reference to the GRI Index are reported, partially reported or omitted. In our professional opinion the self declaration covers the TSMC's social responsibility and sustainability issues, however, the future report will be improved by the following areas:

- Developing specific subject on social aspect according to annual core strategy to highlight performance of community involvement and service.



### Assurance level

The High level assurance provided is in accordance with AA1000 Assurance Standard (2008) in our review, as defined by the scope and methodology described in this statement.

### Responsibility

This CSR report is the responsibility of the TSMC's CEO as declared in his responsibility letter. Our responsibility is to provide an Independent assurance opinion statement to stakeholders giving our professional opinion based on the scope and methodology described.

### Competency and Independence

The assurance team was composed of Lead auditors and Carbon Footprint Verifiers experienced in Engineering sector, and trained in a range of sustainability, environmental and social standards including AA1000 AS, ISO14001, OHSAS18001, ISO14064 and ISO 9001. BSI is a leading global standards and assessment body founded in 1901. The assurance is carried out in line with the BSI Fair Trading Code of Practice.

*For and on behalf of BSI:*



*Peter Pu*  
*Managing Director BSI Taiwan*  
*17 May, 2012*



**AA1000**  
Licensed Assurance Provider  
000-4

# GRI G3.1 Index

● Fully disclosed    ● Partially disclosed

Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
<b>1. Strategy and Analysis</b>					
1.1	Statement from the most senior decision-maker of the organization.	●	1. Letter from the Chairman and CEO	3	
1.2	Description of key impacts, risks, and opportunities.	●	1. Letter from the Chairman and CEO 4.8 Risk Management	3, 21	
<b>2. Organizational Profile</b>					
2.1	Name of the organization.	●	2.1 An Introduction to TSMC	5	
2.2	Primary brands, products, and/or services.	●	2.3 Business Overview	6	
2.3	Operational structure of the organization, including main divisions, operating companies, subsidiaries, and joint ventures.	●	2.1 An Introduction to TSMC	5	
2.4	Location of organization's headquarters.	●	Contact Information	101	
2.5	Number of countries where the organization operates, and names of countries with either major operations or that are specifically relevant to the sustainability issues covered in the report.	●	2.1 An Introduction to TSMC	5	
2.6	Nature of ownership and legal form.	●	2.1 An Introduction to TSMC	5	
2.7	Markets served (including geographic breakdown, sectors served, and types of customers/beneficiaries).	●	2.2 Market Overview	6	
2.8	Scale of the reporting organization.	●	2.10 Financial Highlights	11	
2.9	Significant changes during the reporting period regarding size, structure, or ownership.	●	2.3 Business Overview 2.4 Business Development	6, 7	
2.10	Awards received in the reporting period.	●	2.9 Awards and Recognitions Received in the Reporting Period	11	
<b>3. Report Parameters</b>					
3.1	Reporting period (e.g., fiscal/calendar year) for information provided.	●	Overview	2	
3.2	Date of most recent previous report (if any).	●	Overview	2	
3.3	Reporting cycle (annual, biennial, etc.)	●	Overview	2	
3.4	Contact point for questions regarding the report or its contents.	●	Contact Information	101	
3.5	Process for defining report content including: Determining materiality; Prioritizing topics within the report; and Identifying stakeholders the organization expects to use the report.	●	3. Stakeholder Engagement	13	

Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
3.6	Boundary of the report (e.g., countries, divisions, subsidiaries, leased facilities, joint ventures, suppliers). See GRI Boundary Protocol for further guidance.	●	Overview	2	
3.7	State any specific limitations on the scope or boundary of the report (see completeness principle for explanation of scope).	●	Overview	2	
3.8	Basis for reporting on joint ventures, subsidiaries, leased facilities, outsourced operations, and other entities that can significantly affect comparability from period to period and/or between organizations.	●	Overview 2.1 An Introduction to TSMC	2, 5	
3.9	Data measurement techniques and the bases of calculations, including assumptions and techniques underlying estimations applied to the compilation of the Indicators and other information in the report. Explain any decisions not to apply, or to substantially diverge from, the GRI Indicator Protocols.	●	Overview	2	
3.10	Explanation of the effect of any re-statements of information provided in earlier reports, and the reasons for such re-statement (e.g., mergers/acquisitions, change of base years/periods, nature of business, measurement methods).	●	Overview	2	
3.11	Significant changes from previous reporting periods in the scope, boundary, or measurement methods applied in the report.	●	Overview	2	
3.12	Table identifying the location of the Standard Disclosures in the report.	●	GRI G3.1 Index	89	
3.13	Policy and current practice with regard to seeking external assurance for the report.	●	Overview Independent Assurance Opinion Statement	2, 86	
<b>4. Governance, Commitments, and Engagement</b>					
4.1	Governance structure of the organization, including committees under the highest governance body responsible for specific tasks, such as setting strategy or organizational oversight.	●	4.2 Board of Directors	17	
4.2	Indicate whether the Chair of the highest governance body is also an executive officer.	●	4.2 Board of Directors	17	
4.3	For organizations that have a unitary board structure, state the number of members of the highest governance body that are independent and/or non-executive members.	●	4.2 Board of Directors	17	
4.4	Mechanisms for shareholders and employees to provide recommendations or direction to the highest governance body.	●	3. Stakeholder Engagement	13	
4.5	Linkage between compensation for members of the highest governance body, senior managers, and executives (including departure arrangements), and the organization's performance (including social and environmental performance).	●	4.2 Board of Directors	17	
4.6	Processes in place for the highest governance body to ensure conflicts of interest are avoided.	●	4.6.2 Code Administration and Disciplinary Action	19	

Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
4.7	Process for determining the composition, qualifications, and expertise of the members of the highest governance body and its committees, including any consideration of gender and other indicators of diversity.	●	4.2 Board of Directors 4.3 Audit Committee 4.4 Compensation Committee	17, 18	
4.8	Internally developed statements of mission or values, codes of conduct, and principles relevant to economic, environmental, and social performance and the status of their implementation.	●	4.6.1 Ethics Values	19	
4.9	Procedures of the highest governance body for overseeing the organization's identification and management of economic, environmental, and social performance, including relevant risks and opportunities, and adherence or compliance with internationally agreed standards, codes of conduct, and principles.	●	4.3 Audit Committee	18	
4.10	Processes for evaluating the highest governance body's own performance, particularly with respect to economic, environmental, and social performance.	●			Our Finance senior VP reviews our CSR activities by quarterly.
4.11	Explanation of whether and how the precautionary approach or principle is addressed by the organization.	●	4.8 Risk Management	21	
4.12	Externally developed economic, environmental, and social charters, principles, or other initiatives to which the organization subscribes or endorses.	●	8.1 Climate Change	63	TSMC and the TSIA have signed a memorandum of understanding with the Environmental Protection Agency of the Executive Yuan of the R.O.C. to set a PFCs emission reduction policy and implementation plan.
4.13	Memberships in associations (such as industry associations) and/or national/international advocacy organizations in which the organization: * Has positions in governance bodies; * Participates in projects or committees; * Provides substantive funding beyond routine membership dues; or * Views membership as strategic.	●	2.7 Membership in Industry Associations	8	
4.14	List of stakeholder groups engaged by the organization.	●	3. Stakeholder Engagement	13	
4.15	Basis for identification and selection of stakeholders with whom to engage.	●	3. Stakeholder Engagement	13	
4.16	Approaches to stakeholder engagement, including frequency of engagement by type and by stakeholder group.	●	3. Stakeholder Engagement	13	
4.17	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.	●	3. Stakeholder Engagement	13	
<b>5. Management Approach and Performance Indicatorss</b>					
<b>Economic</b>					
DMA	Disclosures on Management Approach	●	2. Company Profile	5	
EC1	Direct economic value generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings, and payments to capital providers and governments.	●	2.10 Financial Highlights	11	

Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
EC2	Financial implications and other risks and opportunities for the organization's activities due to climate change.	●	8.1 Climate Change	63	
EC3	Coverage of the organization's defined benefit plan obligations.	●	5.2.4. Benefits – Safeguarding Employees' Rights	30	
EC4	Significant financial assistance received from government.	●	2.10 Financial Highlights	11	
EC5	Range of ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation.	●	5.1.3 Compensation and Rewarding People for Long-term Growth	26	
EC6	Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation.	●	6.2 Supplier Management	41	
EC7	Procedures for local hiring and proportion of senior management hired from the local community at significant locations of operation	●	5.1.1 Stable and Healthy Workforce	23	
EC8	Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement.	●	7.3 Alishan County Reconstruction Plan	55	
EC9	Understanding and describing significant indirect economic impacts, including the extent of impacts.	●			TSMC does not evaluate indirect economic impacts.
<b>Environmental</b>					
DMA	Disclosures on Management Approach	●	8. Environmental Protection	61	
EN1	Materials used by weight or volume.	●	8.1.2.4 Energy Conservation Measures 8.2 Water Resource Management 8.4.1 Source Reduction – Raw Materials Usage Reduction	65, 68, 73	
EN2	Percentage of materials used that are recycled input materials.	●			TSMC does not use recycled materials in manufacturing process.
EN3	Direct energy consumption by primary energy source.	●	8.1.2.4 Energy Conservation Measures TSMC CSR Performance Summary	65, 84	
EN4	Indirect energy consumption by primary source.	●	8.1.2.4 Energy Conservation Measures TSMC CSR Performance Summary	65, 84	
EN5	Energy saved due to conservation and efficiency improvements.	●	8.1.2.4 Energy Conservation Measures 8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus	65, 79	
EN6	Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives.	●	8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus	79	
EN7	Initiatives to reduce indirect energy consumption and reductions achieved.	●	8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus	79	

Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
EN8	Total water withdrawal by source.	●	8.2 Water Resource Management	68	Our water source is 100% from city water.
EN9	Water sources significantly affected by withdrawal of water.	●	8.2 Water Resource Management	68	
EN10	Percentage and total volume of water recycled and reused.	●	8.2 Water Resource Management	68	
EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.	●	8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus 8.6.2 Green Promotion	79, 81	
EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.	●	8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus 8.6.2 Green Promotion	79, 81	
EN13	Habitats protected or restored.	●	8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus 8.6.2 Green Promotion	79, 81	
EN14	Strategies, current actions, and future plans for managing impacts on biodiversity.	●	8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus 8.6.2 Green Promotion	79, 81	
EN15	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.	●	8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus 8.6.2 Green Promotion	79, 81	
EN16	Total direct and indirect greenhouse gas emissions by weight.	●	8.1.2.1 Greenhouse Gas Inventory	64	
EN17	Other relevant indirect greenhouse gas emissions by weight.	●	8.1.2.1 Greenhouse Gas Inventory	64	
EN18	Initiatives to reduce greenhouse gas emissions and reductions achieved.	●	8.1.2.3 GHG Emission Reduction	65	
EN19	Emissions of ozone-depleting substances by weight.	●			TSMC does not use class 1 or 2 ozone-depleting substances.
EN20	NOx, SOx, and other significant air emissions by type and weight.	●	8.4.3 Air Pollution Control	76	
EN21	Total water discharge by quality and destination.	●	8.2 Water Resource Management	68	Our treated wastewater is discharged to rivers from the Science Park's wastewater treatment plants. The rivers are: Hsinchu Science Park-Keya River: Central Taiwan Science Park-Wu River: Southern Taiwan Science Park-Yanshui River
EN22	Total weight of waste by type and disposal method.	●	8.4.4 Waste Reduction and Resource Recycling	76	
EN23	Total number and volume of significant spills.	●	8.5.2 Environmental Compliance Record	79	
EN24	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	●	8.4.4 Waste Reduction and Resource Recycling	76	TSMC is compliant with environmental laws for hazardous waste disposal.

Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
EN25	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.	●	8.4.4 Waste Reduction and Resource Recycling 8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus	76, 79	TSMC's treated wastewater is discharged to the Science Park wastewater treatment plant, there is no significant environmental impact.
EN26	Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation.	●	8.3 Green Product	70	
EN27	Percentage of products sold and their packaging materials that are reclaimed by category.	●	8.3 Green Product	70	
EN28	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations.	●	8.5.2 Environmental Compliance Record	79	
EN29	Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.	●	8.1.2.1 Greenhouse Gas Inventory 8.3 Green Product	64, 70	There is no significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.
EN30	Total environmental protection expenditures and investments by type.	●	8.5.1 Environmental Management System Establishment	77	
<b>Social: Labor Practices and Decent Work</b>					
DMA	Disclosures on Management Approach	●	5. A Great Place to Work	22	
LA1	Total workforce by employment type, employment contract, and region broken down by gender.	●	5.1.1 Stable and Healthy Workforce 5.1.2 Recruit the Right People	24, 25	
LA2	Total number and rate of new employee hires and employee turnover by age group, gender, and region.	●	5.1.1 Stable and Healthy Workforce	23	
LA3	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation.	●	5.2.4 Benefits – Safeguarding Employees' Rights	30	
LA4	Percentage of employees covered by collective bargaining agreements.	●	5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	31	
LA5	Minimum notice period(s) regarding significant operational changes, including whether it is specified in collective agreements.	●			TSMC complies with notification process regulations. If an employee has been employed continuously between three months and one year, 10 days advance notice will be given. For those employed continuously between one year and three years, 20 days advance notice will be given. For those employed continuously for at least three years, 30 days advance notice will be given.
LA6	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.	●	5.5.1.3 Safety and Health Committee	34	
LA7	Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region and by gender.	●	5.5.1.6 Occupational Injury and Illness Statistics	35	

Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
LA8	Education, training, counseling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases.	●	5.5.3.2 Corporate New Contagious Disease Prevention Program	38	
LA9	Health and safety topics covered in formal agreements with trade unions.	●	5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	31	
LA10	Average hours of training per year per employee by gender and by employee category.	●	5.1.4 The Engine of Employee Growth	27	
LA11	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings.	●	5.1.4 The Engine of Employee Growth	28	
LA12	Percentage of employees receiving regular performance and career development reviews by gender.	●	5.1.4 The Engine of Employee Growth	26	
LA13	Composition of governance bodies and breakdown of employees per category according to gender, age group, minority group membership, and other indicators of diversity.	●	5.1.1 Stable and Healthy Workforce	23	
LA14	Ratio of basic salary of women to men by employee category, by significant locations of operation.	●	5.1.3 Compensation and Rewarding People for Long-term Growth	26	
LA15	Return to work and retention rates after parental leave, by gender.	●	5.2.4 Benefits – Safeguarding Employees’ Rights	30	
<b>Social: Human Rights</b>					
DMA	Disclosures on Management Approach	●	5. A Great Place to Work	22	
HR1	Percentage and total number of significant investment agreements and contracts that include clauses incorporating human rights concerns or that have undergone human rights screening.	●			Our new sites are in Science Park and compliant with Science Park’s Environmental Impact Assessment commitments.
HR2	Percentage of significant suppliers, contractors and other business partners that have undergone screening on human rights and actions taken.	●	6.2.2 Establishing A Sustainable Supply Chain	42	We don’t apply the requirements to our contractors in our contract.
HR3	Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained.	●	5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	31	
HR4	Total number of incidents of discrimination and corrective actions taken.	●	5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	31	There were no discrimination case in 2011.
HR5	Operations and significant suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and actions taken to support these rights.	●	6.2.2.5 Concern for Supply Chain Labor Standards 6.2.5 Summary the Achievement of Supply Chain Management in 2011	45, 46	
HR6	Operations and significant suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the elimination of child labor.	●	6.2.2.5 Concern for Supply Chain Labor Standards 6.2.5 Summary the Achievement of Supply Chain Management in 2011	45, 46	



Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
HR7	Operations and significant suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of all forms of forced or compulsory labor.	●	6.2.2.5 Concern for Supply Chain Labor Standards 6.2.5 Summary the Achievement of Supply Chain Management in 2011	45, 46	
HR8	Percentage of security personnel trained in the organization's policies or procedures concerning aspects of human rights that are relevant to operations.	●			All security personnel of TSMC are required to complete training regarding reception courtesy.
HR9	Total number of incidents of violations involving rights of indigenous people and actions taken.	●			There were no violations involving rights of indigenous people in 2011.
HR10	Percentage and total number of operations that have been subject to human rights reviews and/or impact assessments.	●			Our new sites are in Science Park and compliant with Science Park's Environmental Impact Assessment commitments and legal requirements.
HR11	Number of grievances related to human rights filed, addressed, and resolved through formal grievance mechanisms.	●	5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	31	There were no grievances related to human rights filed in 2011.
<b>Social: Society</b>					
DMA	Disclosures on Management Approach	●	4. Corporate Governance	17	
SO1	Percentage of operations with implemented local community engagement, impact assessments, and development programs.	●	7.1 TSMC Education and Culture Foundation	48	
SO2	Percentage and total number of business units analyzed for risks related to corruption.	●			Business units of risks related to corruption are defined, and all of them have completed 2011 annual declaration of conflicts of interest.
SO3	Percentage of employees trained in organization's anti-corruption policies and procedures.	●	4.6 Code of Ethics and Business Conduct	19	
SO4	Actions taken in response to incidents of corruption.	●	4.6.2 Code Administration and Disciplinary Action	19	
SO5	Public policy positions and participation in public policy development and lobbying.	●	8.1.1 TSMC's Strategy in Response to Climate Change 8.2 Water Resource Management	63, 68	
SO6	Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country.	●	4.5 Political Contributions	19	
SO7	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes.	●	4.6 Code of Ethics and Business Conduct	19	
SO8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations.	●	4.7 Regulatory Compliance	20	
SO9	Operations with significant potential or actual negative impacts on local communities.	●	8.6.2 Green Promotion	81	
SO10	Prevention and mitigation measures implemented in operations with significant potential or actual negative impacts on local communities.	●	8.6.2 Green Promotion	81	

Profile Disclosure	Description	Extent of Reporting	Related TSMC CSR Report Section	Page(s)	Explanatory Notes
<b>Social: Product Responsibility</b>					
DMA	Disclosures on Management Approach	●	8.3 Green Product	70	
PR1	Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures.	●	8.3 Green Product	70	
PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning health and safety impacts of products and services during their life cycle, by type of outcomes.	●			There were no non-compliance cases with regulations and voluntary codes concerning health and safety impacts of products and services during their life cycle in 2011.
PR3	Type of product and service information required by procedures, and percentage of significant products and services subject to such information requirements.	●	2.3 Business Overview 8.3 Green Product	6, 70	
PR4	Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes.	●			There were no non-compliance cases with regulations and voluntary codes concerning product and service information and labeling in 2011.
PR5	Practices related to customer satisfaction, including results of surveys measuring customer satisfaction.	●	6.1.3 Customer Satisfaction	41	
PR6	Programs for adherence to laws, standards, and voluntary codes related to marketing communications, including advertising, promotion, and sponsorship.	●	4.7 Regulatory Compliance 8.3 Green Product	20, 70	
PR7	Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship by type of outcomes.	●			There were no non-compliance cases with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship in 2011.
PR8	Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data.	●			There were no substantiated complaints regarding breaches of customer privacy and losses of customer data in 2011.
PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services.	●	4.7 Regulatory Compliance	20	

# ISO 26000 Index

Core Subjects and Issues		Related CSR Report Section	Page(s)	Explanatory Notes
Organizational governance	Decision-making processes and structures	4. Corporate Governance 4.1 Governance Structure 4.2 Board of Directors 4.3 Audit Committee 4.4 Compensation Committee	17, 18	
Human rights	Due diligence			Our new sites are in Science Park and compliant with Science Park's Environmental Impact Assessment commitments and legal requirements.
	Human rights risk situations			TSMC complies with law and respects each employee's human rights.
	Avoidance of complicity	4.6 Code of Ethics and Business Conduct	19	
	Resolving grievances	5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	31	
	Discrimination and vulnerable groups			TSMC carries out its human resources policy and practice without the consideration of race, gender, age, religion, nationality, or political affiliation.
	Civil and political rights	4.5 Political Contributions 5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	19, 31	
	Economic, social and cultural rights	5.2 Work-Life Balance	28	
Labor practices	Fundamental principles and rights at work	5.2.4 Benefits – Safeguarding Employees' Rights	30	
	Employment and employment relationships	5.1.2 Recruit the Right People	24	
	Conditions of work and social protection	5.2 Work-Life Balance 5.3 Engaged People	28, 30	
	Social dialogue	3. Stakeholder Engagement	13	
	Health and safety at work	5.4 Employees' Physical and Mental Well-being 5.5 Safety and Health	32, 33	
The environment	Human development and training in the workplace	5.1.4 The Engine of Employee Growth	26	
	Prevention of pollution	8.4 Pollution Prevention	72	
	Sustainable resource use	8.2 Water Resource Management	68	
	Climate change mitigation and adaptation	8.1 Climate Change	63	
Protection of the environment, biodiversity and restoration of natural habitats		8.6.1 Build Green Fabs, Green Campus, and Assisting the Government to Establish Green Factory Guidelines, Moving beyond Green Fabs to Green Campus 8.6.2 Green Promotion	79, 81	

Core Subjects and Issues		Related CSR Report Section	Page(s)	Explanatory Notes
Fair operating practices	Anti-corruption	4.6 Code of Ethics and Business Conduct	19	
	Responsible political involvement	4.5 Political Contributions	19	
	Fair competition	4.6 Code of Ethics and Business Conduct	19	
	Promoting social responsibility in the value chain	6. Customer Service and Supplier Management	40	
	Respect for property rights	2.6 Trade Secret Protection	8	
Consumer issues	Fair marketing, factual and unbiased information and fair contractual practices	4.6 Code of Ethics and Business Conduct	19	
	Protecting consumers' Health and safety			TSMC is a wafer foundry. We don't provide final products to consumers.
	Sustainable consumption	6.2.2 Establishing A Sustainable Supply Chain	42	
	Consumer service, support, and complaint and dispute resolution	6.1.3 Customer Satisfaction	41	
	Consumer data protection and privacy	2.6 Trade Secret Protection	8	
	Access to essential services	6.1.2 Customer Service	41	
	Education and awareness	6.1.2 Customer Service	41	
Community involvement and development	Community involvement	7.1 TSMC Education and Culture Foundation	48	
	Education and culture	7.1 TSMC Education and Culture Foundation	48	
	Employment creation and skills development	5.1.2 Recruit the Right People	24	
	Technology development and access	2.4 Business Development	7	
	Wealth and income creation	2.8 Investor Engagement	8	
	Health	5.5 Safety and Health 5.5.1.5 Social Engagement	33, 35	
	Social investment	7.1.1 Commitment to Education	48	

# United Nations Global Compact Comparison Table

Category	10 Principles	Related CSR Report Section	Page(s)	Explanatory Notes
Human Rights	Businesses should support and respect the protection of internationally proclaimed human rights;			TSMC complies with law and respects each employee's human rights.
	Make sure that they are not complicit in human rights abuses.	4.6 Code of Ethics and Business Conduct 6.2.2 Establishing A Sustainable Supply Chain	19, 42	
Labor	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;	5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	31	
	The elimination of all forms of forced and compulsory labor;	5.3.2 Open Communication Channels, Unobstructed Employee Participation, Harmonious Labor Relations	31	
	The effective abolition of child labor; and	5.1.2 Recruit the Right People	24	
	The elimination of discrimination in respect of employment and occupation.	5.1.2 Recruit the Right People	24	
Environment	Businesses should support a precautionary approach to environmental challenges;	8. Environmental Protection 8.5 Environmental Management System	61, 77	
	Undertake initiatives to promote greater environmental responsibility; and	8.5 Environmental Management System	77	
	Encourage the development and diffusion of environmentally friendly technologies.	8.3 Green Product	70	
Anti-Corruption	Businesses should work against corruption in all its forms, including extortion and bribery.	4.6 Code of Ethics and Business Conduct	19	

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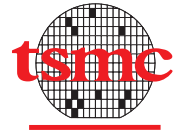
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