5.1 Business Activities

5.1.1 Business Scope

As the founder and a leader of the dedicated semiconductor foundry segment, TSMC has built its reputation by offering advanced and specialty wafer production processes and unparalleled manufacturing efficiency. TSMC strives to provide the best overall value to its customers, and the success of TSMC’s business is manifested in the success of its customers.

TSMC provides a full range of integrated semiconductor foundry services that fulfill the increasing variety of customer needs. In the process, it has experienced strong growth by building close relationships with customers. Semiconductor suppliers from around the world trust TSMC with their manufacturing needs, thanks to its unique integration of cutting-edge process technologies, pioneering design services, manufacturing productivity and product quality.

In May 2009, TSMC established the New Businesses organization to explore non-foundry related business opportunities. In August 2011, the New Businesses organization was formally separated from the main TSMC organization as two wholly owned subsidiaries, TSMC Solid State Lighting Ltd. (TSMC SSL) and TSMC Solar Ltd., responsible for solid state lighting and solar business activities, respectively. In January 2015, TSMC announced a sale of all TSMC SSL shares held by TSMC and TSMC’s subsidiary to Epistar Corp. After this transaction, TSMC completely exits TSMC SSL.

5.1.2 Customer Applications

TSMC manufactured more than 8,800 different products for over 450 different customers in 2014. These chips are used across the entire spectrum of electronic applications, including computers and peripherals, information appliances, wired and wireless communications systems, automotive and industrial equipment, consumer electronics such as DVDs, digital TVs, game consoles, digital still cameras (DSCs), and many other applications.

The rapid evolution of end products drives our customers to utilize TSMC’s innovative technologies and services, while at the same time spurring TSMC’s own development of technology. As always, success depends on leading rather than following industry trends.

5.1.3 Consolidated Shipments and Net Revenue in 2014 and 2013

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shipments</td>
<td>Net Revenue</td>
</tr>
<tr>
<td>Wafer Domestic (Note 1)</td>
<td>1,737,743</td>
<td>112,704,075</td>
</tr>
<tr>
<td>Export</td>
<td>6,524,083</td>
<td>611,020,808</td>
</tr>
<tr>
<td>Others (Note 2) Domestic (Note 1)</td>
<td>N/A</td>
<td>5,766,553</td>
</tr>
<tr>
<td>Export</td>
<td>N/A</td>
<td>33,292,376</td>
</tr>
<tr>
<td>Total Domestic (Note 1)</td>
<td>1,737,743</td>
<td>118,493,281</td>
</tr>
<tr>
<td>Export</td>
<td>6,524,083</td>
<td>644,313,184</td>
</tr>
</tbody>
</table>

Note 1: Domestic means sales to Taiwan.
Note 2: Others majorly include revenue associated with mask making, design services, and royalties.

A watch needs every single cog to function together to be accurate. TSMC is dedicated to its core foundry business, and emphasizes innovation in all fields and seamless cooperation to adapt to the industry’s ceaseless changes.
5.2 Technology Leadership

5.2.1 R&D Organization and Investment

In 2014 TSMC continued to invest in R&D with Total R&D expenditure amounting to 8% of revenue, a level that equals or exceeds the RD investment of many other high technology leaders.

TSMC recognizes that the technology challenge required to extend Moore’s Law, the business law behind CMOS scaling, is becoming increasingly complex. The efforts of the R&D organization are focused on enabling the Company to continuously offer its customers first-to-market, leading-edge technologies and design solutions that contribute to their product success in today’s complex and challenging market environment. In 2014 the R&D organization met these challenges by introducing into manufacture the industry leading 16FF+ technology, the first integrated technology platform to make use of 3D FinFET transistors. The R&D organization continues to strengthen the pipeline of technology innovations that are required to maintain technology leadership. The 10nm technology advanced development continues with the goal of entering production in 2015, while the 7nm technology has now moved into the advanced development stage.

In addition to CMOS logic, TSMC conducts research and development on a wide range of other semiconductor technologies that provide the functionality our customers require for mobile SoC and other applications. Highlights achieved in 2014 include: introduction of our TSV platform, and expansion of the range of CoWoS® 3D packaging technology to the most advanced Si technologies; development of ultra-low power RF technologies in 28nm, 40nm and 55nm nodes aimed at meeting the demand for IoT (Internet-of-Things) applications; and a 100V GaN power transistor technology.

TSMC maintains a network of important external R&D partnerships and alliances with world-class research institutions, such as IMEC, the respected European R&D consortium, where TSMC is a core partner. TSMC also provides funding for nanotechnology research at leading universities worldwide to promote innovation and the advancement of nano-electronic technology. In 2014 TSMC announced the formation of joint research centers at National Tsing Hua University and National Cheng Kung University, with the aim of developing greater understanding into the devices and materials used in the manufacture of advanced Si technologies.

5.2.2 R&D Accomplishments in 2014

R&D Highlights

• 10nm Technology

TSMC’s 10nm technology was successfully qualified for volume manufacture and currently in mass production.

• 16nm Technology

16FF+ technology passed full reliability qualification in the fourth quarter of 2014. This technology features FinFET transistors with a third generation High-k/Metal Gate process, a fifth generation of transistor strain process, and advanced 193nm lithography. This enhanced version of TSMC’s 16FF technology operates 40% faster than planar 20nm System-on-Chip technology (20SoC) or consumes 50% less power at the same speed. More than 15 customers and IP vendors have verified their IP with the 16FF+ technology.

• 7nm Technology

TSMC plans to enter 7nm full development in 2016 for risk production in 2015 and volume production in 2016.

• Lithography

The focus of TSMC’s R&D efforts in lithography is 10nm development. This technology requires special resolution enhancement techniques to enable immersion tools to image geometries beyond 16nm. Coupling these enhancements with advanced patterning that was developed for the 20nm and 16nm nodes allows the immersion technique to meet 10nm requirements.

In 2014, TSMC received delivery of a second NXE3300® extreme ultraviolet (EUV) scanner. The associated process and equipment R&D is on-going. TSMC has been working with ASML to raise its capabilities to meet the requirements of the 7nm technology node. Looking beyond 7nm, and 10nm node and beyond, TSMC has developed a new advanced patterning scheme that allows copper line width and spacing to be further reduced. A low resistivity metal scheme was developed. The circuit delay of copper lines developed with these advanced processes is highly competitive and is lower than that projected by the International Technology Roadmap for Semiconductors (ITRS).

• Advanced Transistor Research

Enhancing the speed and lowering the power requirements of advanced logic technologies requires innovation in transistor architectures and materials. TSMC is at the forefront of research in these areas with a focus on high mobility channel materials, such as germanium and III-V compound semiconductors. Record-breaking germanium transistor performance was recently achieved and reported at the 2014 IEDM.

5.2.3 Advanced Package Development

TSMC offers a wide variety of lead-free packaging technologies for mobile/handheld devices and applications. In 2014, TSMC qualified 16mm FinFET Si with ultra-fine pitch copper (Cu) bump BoT (Bump-on-Trace) packaging technology, and the innovative Fan-in WLP technology (UBM-Free Fan-in-WLP) with excellent reliability performance.

5.1.4 Production in 2014 and 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity: Unit Capacity (12-inch equivalent wafers)</th>
<th>Output</th>
<th>Amount: Amount NT$ thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>6,171,121</td>
<td>3,296,499</td>
<td>426,706,846</td>
</tr>
<tr>
<td>2013</td>
<td>3,588,680</td>
<td>1,754,564</td>
<td>201,285,624</td>
</tr>
</tbody>
</table>

5.3.1 Lithography

TSMC is investigating EUV mask manufacturing. EUV masks are needed to make EUV lithography widely available. TSMC is engaged in the definition and optimization of EUV mask manufacturing system requirements. In addition, TSMC is investigating how to effectively use EUV masks in the manufacturing environment.
Specialty Technologies
TSMC offers a broad mix of technologies to address the wide range of applications.

- **Mixed Signal/Radio Frequency (MSRF) Technology**
  TSMC has started to develop ultra-low power RF technologies in 28nm, 40nm and 55nm nodes aimed at the expected strong demand in low power and low cost IoT (Internet-of-Things) applications, and began development of a 0.18um SDS process to replace traditional compound semiconductor-based solutions in cellular/RF switch applications.

- **Power IC/BCD Technology/Panel Drivers**
  The second generation of 0.18um BCD technology has been extended to offer lower cost and higher performance devices, enabling more integration in mobile power ICs.

- **Micro-electromechanical Systems (MEMS) Technology**
  In 2014, TSMC’s modular MEMS technology was qualified for manufacture of accelerometers and high-resolution noise cancellation microphones. Future plans include development of next generation products, and BioMEMS applications.

- **GaN Technology**
  TSMC is the first foundry to implement GaN technology in a 6-inch fab. The R&D team completed development and qualified for manufacture a high electron mobility transistor (100V E-HEMT) configuration for high power, high frequency applications with low Ron resistance and high breakdown voltage.

- **Flash/Embedded Flash Technology**
  TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, NOR-based cell technologies, including 1-T cell and Split-Gate flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies. At the more mature 65nm/55nm node, TSMC achieved several important milestones in embedded flash technologies.
of the fundamental physics of nanometer CMOS transistors are core aspects of our efforts to improve the understanding and guide the design of transistors at advanced nodes. The findings of these studies are being applied to ensure our continued industry leadership at the 20nm and 16nm nodes and to extend our leadership to the 10nm and 7nm nodes. One of TSMC’s goals is to extend Moore’s Law through both innovative in-house work and by collaborating with industry leaders and academia. We seek to put the envelope in finding cost-effective technologies and manufacturing solutions.

With a highly competent and dedicated R&D team and its unwavering commitment to innovation, TSMC is confident of its ability to deliver the best and most cost-effective SoC technologies for its customers, thereby supporting the Company’s business growth and profitability.

TSMC R&D Future Major Project Summary

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Description</th>
<th>Risk Reduction/Estimated Target Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>10nm logic platform technology and applications</td>
<td>3rd-generation FinFET technology for both digital and analog products</td>
<td>2015</td>
</tr>
<tr>
<td>Thin film technology and applications</td>
<td>CMOs platform technology for SoC</td>
<td>2018</td>
</tr>
<tr>
<td>3D-IC</td>
<td>Cost-effective solution with better performance for advanced node processes</td>
<td>2015 – 2016</td>
</tr>
<tr>
<td>Non-planar transistor technology</td>
<td>EUV and multiple-sheath extend silicon line</td>
<td>2015 – 2019</td>
</tr>
<tr>
<td>Long-term research</td>
<td>Special thick Si technology including new NMOS, NMOS, RF, analog and 5nm transistors</td>
<td>2015 – 2019</td>
</tr>
</tbody>
</table>

The above items accounted for roughly 75% of the total R&D budget in 2015. The total R&D budget is expected to increase to about 10% of revenue in 2016.

5.3 Manufacturing Excellence

5.3.1 GIGAFAB™ Facilities

TSMC’s 12-inch fabs are a key part of its manufacturing strategy. The Company currently operates three 12-inch GIGAFAB™ facilities—Fab 12, Fab 14, and Fab 15—each of which is capable of producing a total of 2,583,000 12-inch wafers in 2014. Production within these three facilities supports 0.13μm, 90nm, 65nm, 40nm, 28nm, 20nm process technologies, and their sub-nodes. To provide leading-edge manufacturing technologies, part of the capacity is reserved for research and development work and currently supports 10nm and beyond technology development. TSMC has developed a centralized fab manufacturing management system to pursue higher customer benefits of consistent quality and reliability performance, greater flexibility of demand fluctuations, faster yield learning and time-to-volume, and minimized costly product re-qualification. It enabled Fab 14 to accelerate 20nm capacity ramping to 60,000 wafers output per month in one quarter to satisfy customers’ demand.

5.3.2 Engineering Performance Optimization

TSMC has implemented statistical process control, advanced equipment control, advanced process control, circuit probe data and integrated big data analysis systems to optimize equipment performance to match device performance. TSMC engages in engineering big data analytics, and applies the technology in the management and control of equipment, processes and yields. The Company has developed various systems such as intelligent tool tuning, engineering big data mining, and equipment chamber matching. The intelligent automation systems, driven by the decisions based on big data engineering, assure the high efficiency and stability of TSMC’s equipment. It also analyzes the correlations between electrical, physical measurements and production-related parameters to identify critical variables that influence product quality and yields, so as to fulfill customers’ special process requirements and diversified product demand simultaneously.

Accurate modeling and control at each process stage drives intelligent module loop control. The process control, dispatching via sophisticated computer-integrated manufacturing systems enables optimization from equipment to end products to achieve precision and lean operations in a sophisticated semiconductor manufacturing environment.

5.3.3 Precision and Lean Operations

TSMC’s unique manufacturing infrastructure is tailored for a high product mix foundry environment. Following its commitment to manufacturing excellence, TSMC has equipped a sophisticated scheduling and dispatching system, full automated manufacturing, industry-leading automated materials handling systems and intelligent mobile devices, and employed Lean Manufacturing approaches to provide customers with on-time-delivery and best-in-class cycle time. Real-time equipment performance and productivity monitoring, analysis, diagnosis and control minimize production interruption and maximize cost effectiveness.

5.3.4 450mm Wafer Manufacturing Transition

TSMC joined the Global 450mm Consortium (G450C) located in the College of Nanoscale Science and Engineering (CNSE) of New York University at Albany, New York. The consortium includes five IC makers and CNSE (which represents New York State and provides the clean room facility), as well as key 450mm tool suppliers as associated members.

Currently, TSMC has 16 experienced employees working in the consortium. TSMC has assumed the Operation General Manager position in the consortium and commits to lead the industry for a cost-effective 450mm transition.

5.3.5 Raw Materials and Supply Chain Risk Management

In 2014, TSMC continued Supply Chain Risk Management review meetings periodically with operation, quality and business teams to proactively identify and manage risk of supply capacity insufficiency, quality issue and supply chain interruption. TSMC also worked with its suppliers to enhance the performance of quality, delivery, sustainability, and to support green procurement, environmental protection and safety.

Raw Materials Supply

<table>
<thead>
<tr>
<th>Suppliers Accounted for at Least 10% of Annual Consolidated Net Procurement</th>
<th>Unit NTS Purchased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>8,486,410</td>
</tr>
<tr>
<td>Company B</td>
<td>6,147,991</td>
</tr>
<tr>
<td>Company C</td>
<td>5,671,062</td>
</tr>
<tr>
<td>Others</td>
<td>20,753,109</td>
</tr>
<tr>
<td>Total net Procurement</td>
<td>51,027,589</td>
</tr>
</tbody>
</table>
5.3.6 Quality and Reliability
A characteristic of TSMC’s industry reputation is its commitment to providing customers with the best quality wafers and service for their products. Quality and Reliability (Q&R) services aim to achieve "quality on demand" to fulfill customers’ needs regarding time-to-market, reliable quality, and market competition over a broad range of products.

Q&R technical services assist customers in the technology development and product design stage to design-in their product reliability requirements. Since 2008, Q&R has worked with R&D to successfully establish and implement new qualification methodology for High-k/Metal Gate (HKMG) as well as for FinFET structures in 2013. Q&R has collaborated with SEMI, Semiconductor Equipment and Material International, to establish an IC Quality Committee since May 2012 in order to enhance product quality of the semiconductor supply chain. For backend technology development, Q&R worked with R&D and the Backend Technology and Service Division to complete the Package-on-Package (PoP) technology development and started production at major outsourcing assembly and testing houses in 2014 for mobile product application. Over 100 million PoP have been shipped to customers without major quality issues.

In 2014, Q&R conducted a deep-dive audit on the new material suppliers for 20nm/16nm advanced technology and announced the incoming material quality requests to enhance supplier's delivery quality. Q&R also implemented innovative statistical matching methodologies to achieve the goal of enlarging the manufacturing window with better quality control. The scope of the methodology includes raw material, facility, metrology and process tools, wafer acceptance test (WAT) data and reliability performance. Since 2011, Q&R tightened the post-fab outgoing visual inspection criteria for wafer quality improvement to AQL 0.4% from AQL 0.65%.

To sustain production quality and to minimize risk to customers when deviations occur, manufacturing quality monitoring and event management span all critical stages – from raw material supply, mask making, and real-time in-process monitoring, to bumping, wafer sort and reliability performance. Failure, materials and chemical analysis play important roles in TSMC quality; these capabilities are used from the early stages of process development through assembly and packaging, including analysis of incoming materials, airborne molecular contaminants, and failure analysis of customer returns. In 2014, TSMC aggressively invested in state-of-the-art electron and microscope and surface analysis capabilities. In view of the importance of ensuring the quality of incoming chemicals and materials, this year TSMC implemented detection of metal impurities in certain chemicals to the parts-per-trillion level. In collaboration with customers and suppliers, significant progress has been made in dynamic fault isolation, traditionally a domain of integrated device manufacturers and fabless companies. This effort will continue into 2015 with the addition of new capabilities to satisfy the needs of a broader range of customers and improve the quality of TSMC products.

In compliance with the electronic industry’s lead-free and green IC package policy, Q&R qualified and released lead-free bumping and Cu bumping to satisfy customer demands, and made lead-free bump packages possible for 0.13um, 45nm, 40nm, 28nm and 2050C technology products as well as Cu bump package possible for 28nm and 2050C by collaborating with the major outsourc assembly and testing subcontractors. This enabled TSMC customers to introduce and ramp lead-free products with excellent assembly quality. In 2014, TSMC Q&R ramped wafer-level Chip Scale Package (CSP) to 20K per month, lead-free to 120K per month and Cu bumping to 12K per month without major quality issues. For mainstream technologies, Q&R qualified ultra, extreme low leakage and high endurance embedded Flash IP, IPD (Integrated Passive Device), hybrid of Copper, and Copper-Aluminum technology with customers. Q&R continues to build reliability testing and monitoring to ensure excellent manufacturing quality of specialty technologies on automotive, high-voltage products, CMOS image sensors, embedded Flash memory and Micro-Electro-Mechanical System products.

TSMC Q&R is also responsible for leading the Company towards the ultimate goal of zero-defect production through the use of continuous improvement programs. Periodic customer feedback indicates that products shipped from TSMC have consistently met or exceeded their field quality and reliability requirements. In 2014, a third-party audit verified the effectiveness of the TSMC quality management system in compliance with ISO/TS 16949: 2009 and IECQ QC 080000: 2012 certificates requirements.

5.4 Customer Trust
5.4.1 Customers
TSMC’s worldwide customers have diverse product specialties and excellent performance records in various segments of the semiconductor industry. Customers include fabless semiconductor companies, system companies and integrated device manufacturers, such as Advanced Micro Devices, Inc., Broadcom Corporation, Freescale Semiconductor, Inc., Huawei Tech, Marvell Technology Group Ltd., MediaTek Inc., NVIDIA Corporation, NXP Semiconductors, Omniscript Technologies, Qualcomm Inc., Texas Instruments Inc., etc.

Customer Service
TSMC believes that providing superior customer service is critical to enhancing customer satisfaction and loyalty, which is very important to retaining existing customers, attracting new customers, and strengthening customer relationships. With a dedicated customer service team as the main contact window for coordination and facilitation, TSMC strives to provide world-class, high-quality, efficient and professional services in design support, mask making, wafer manufacturing, and backend to achieve optimum experience for our customers and, in return, to gain customer’s trust and sustain company profitability.

To facilitate customer interaction and information access on a real-time basis, TSMC-Online services offer a suite of web-based applications that provide a more active role in design, engineering, and logistics collaborations. Customers have 24-hour a day, seven-day-a-week access to critical information and are able to subscribe customized reports through TSMC-Online services. Design Collaboration focuses on content availability and accessibility, with close attention to complete, accurate, and current information at each level of the design life cycle. Engineering Collaboration includes online access to engineering lots, wafer yields, wafer acceptance test (WAT) analysis, and quality reliability data. Logistics Collaboration provides access to data on any given wafer lot’s status in order, fabrication, assembly and testing, and shipping.

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

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

Customer feedback is routinely reviewed and considered by executives and then developed into appropriate improvement plans, all-in-all becoming an integral part of the customer satisfaction process with a complete closed loop. TSMC has maintained a focus on customer survey data as one of our key indicators of performance, not just of past performance but also as a leading indicator of future performance. TSMC has acted on the belief that customer satisfaction leads to loyalty, and customer loyalty leads to higher levels of retention and expansion.

Customers that Accounted for at Least 10% of Annual Consolidated Net Revenue

<table>
<thead>
<tr>
<th>Customer</th>
<th>2014 Net Revenue</th>
<th>As % of 2014 Total Net Revenue</th>
<th>Relation to TSMC</th>
<th>2013 Net Revenue</th>
<th>As % of 2013 Total Net Revenue</th>
<th>Relation to TSMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer A</td>
<td>157,651,417</td>
<td>21%</td>
<td>None</td>
<td>150,931,067</td>
<td>22%</td>
<td>None</td>
</tr>
<tr>
<td>Others</td>
<td>485,175,810</td>
<td>70%</td>
<td>None</td>
<td>496,402,217</td>
<td>76%</td>
<td>None</td>
</tr>
<tr>
<td>Total Net Revenue</td>
<td>642,826,427</td>
<td>100%</td>
<td>None</td>
<td>647,333,284</td>
<td>100%</td>
<td>None</td>
</tr>
</tbody>
</table>
5.4.2 Open Innovation Platform® (OIP) Initiative

Innovation has long been both an exciting and challenging proposition. Competition among semiconductor companies is becoming more active and intense in the face of increasing customer consolidation, and the commoditization of technology at more mature, conventional levels. Companies must find ways to continue innovating in order to prosper further. Companies innovating openly from the “outside in” as well as from the “inside out” accelerate innovation through active collaborations with external partners. This active collaboration of TSMC with external partners is known as “Open Innovation”. TSMC has adopted this path to innovate via the Open Innovation Platform® (OIP) initiative. OIP is a key part of the TSMC Grand Alliance.

The TSMC Open Innovation Platform® (OIP) initiative is a comprehensive design technology infrastructure that encompasses all critical IC implementation areas to reduce design barriers and improve first-time silicon success. OIP promotes the speedy implementation of innovation amongst the semiconductor design community and its ecosystem partners with TSMC’s IP, design implementation and DFM capabilities, process technology and backend services.

A key element of OIP is a set of ecosystem interfaces and collaborative components initiated and supported by TSMC that more efficiently empowers innovation throughout the supply chain and, in turn, drives the creation and sharing of newly created revenue and profits. TSMC's Active Accuracy Assurance (AAA) initiative is critical to OIP, providing the accuracy and quality required by the ecosystem interfaces and collaborative components.

TSMC’s Open Innovation model brings together the innovative collaborative components. The foundry segment's earliest and most comprehensive collaboration effort, TSMC OIP is able to deliver the needed design infrastructure with timely enhancement of EDA tools, early availability of critical IPs and quality design services when customers need them. This is critical to success in order for customers to take full advantage of the process technologies once they reach production-ready maturity.

In October 2014, TSMC hosted an OIP Ecosystem Forum at the San Jose Convention Center in California, with keynote addresses from TSMC executives as well as OIP ecosystem partners. The forum was well attended by both customers and ecosystem partners and demonstrated the value of collaboration through OIP to nurture innovations.

TSMC’s OIP Partner Management Portal facilitates communication with our ecosystem partners for efficient business productivity. This portal is designed with an intuitive interface and can be linked directly from TSMC-Online.

5.5 Employees

5.5.1 Human Capital

Human capital is one of the most important assets of TSMC. The Company is committed to providing quality jobs with good compensation, meaningful work, and a safe work environment for its employees. Moreover, it is dedicated to foster a dynamic and fun work environment. The Company’s efforts in fostering a “Great Place to Work” are highly recognized, and TSMC has received many awards, including the major prize in Ministry of Labor’s first “Work-Life Balance Award” in 2014.

TSMC believes that all employees should be treated with dignity and respect. The Company is committed to upholding workers’ rights and respects internationally proclaimed human rights, as outlined by the United Nations Universal Declaration on Human Rights and the International Labor Organization’s fundamental conventions on core labor standards.

At the end of 2014, TSMC and its subsidiaries had over 43,591 employees worldwide, including 4,385 managers, 18,552 professionals, 3,530 assistants, and 17,124 technicians. The following table summarized TSMC workforce at the end of February, 2015:

<table>
<thead>
<tr>
<th>Job</th>
<th>12/31/2013 (Total)</th>
<th>12/31/2014 (Total)</th>
<th>02/28/2015 (Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>4,070</td>
<td>4,070</td>
<td>4,080</td>
</tr>
<tr>
<td>Professionals</td>
<td>12,190</td>
<td>18,152</td>
<td>18,681</td>
</tr>
<tr>
<td>Assistant Engineer-OP</td>
<td>3,288</td>
<td>3,530</td>
<td>3,581</td>
</tr>
<tr>
<td>Total</td>
<td>19,544</td>
<td>17,351</td>
<td>17,901</td>
</tr>
</tbody>
</table>

5.5.2 Recruitment

The growth of TSMC relies on the continued services and contributions of its devoted employees; in order to strengthen the momentum of its growth, the Company is dedicated to cultivating a young talent pipeline for recruitment both locally and around the world. TSMC deploys a number of recruiting activities and university programs, including joint Development Programs, University Shuttle Program, Summer Internship, Job Fairs in Taiwan, U.S., Singapore and India, as well as a series of Fresh Graduate Career Symposia for soon-to-be graduates. These multiple channels effectively enable TSMC to recruit from targeted pools in support of the Company's constant growth.

TSMC's continuous growth requires constant talent sourcing and recruitment activities to support its business. The Company recruited over 3,200 managers, professionals, and administrative staffs, as well as over 2,300 assistants and technicians in 2014.

5.5.3 People Development

The development of employees is an integral and critical factor for the growth of a company; employees' learning and development should incorporate the essence of “systematic, disciplined and planned”. TSMC is committed to cultivating a continuous and diverse learning environment and it has initiated “TSMC Employee Training and Education Procedure” to ensure the Company’s and individuals' development objectives can be achieved through the integration of internal and external training resources.

Based on the nature of the individual’s job, work performance and career development path, the Company provides employees a comprehensive network of learning resources, including on-the-job training, classroom training, e-learning, coaching, mentoring, and job rotation. For each employee, a tailored Individual Development Plan (IDP) is provided.

The Company provides employees with a wide range of on-site general, professional, and management training programs. In addition to engaging external experts as trainers, hundreds of TSMC employees are trained to be qualified instructors to deliver their valuable know-how in internal training courses.

5.6 Education Foundation

The benefits and contributions of TSMC’s devoted employees; in order to strengthen the momentum of its growth, the Company is dedicated to cultivating a young talent pipeline for recruitment both locally and around the world. TSMC deploys a number of recruiting activities and university programs, including joint Development Programs, University Shuttle Program, Summer Internship, Job Fairs in Taiwan, U.S., Singapore and India, as well as a series of Fresh Graduate Career Symposia for soon-to-be graduates. These multiple channels effectively enable TSMC to recruit from targeted pools in support of the Company's constant growth.

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TSMC’s training programs include:
- New Employee Training: includes basic training and job orientation for new employees. Furthermore, newcomers’ managers and the Company’s well-established Buddy System are in place to support the newcomers in their assimilation process in both corporate culture and work requirements.
- General Training: refers to training required by government regulations and/or Company policies, as well as training on general subjects for all employees or employees of different job functions. Such training includes subjects of industry-specific safety, workplace health and safety, quality, lab emergency response, languages, and personal effectiveness.
- Professional/Functional Training: provides technical and professional training required by different functions within the industry. TSMC offers training courses on equipment engineering, process engineering, accounting, information technology, and so forth.
- Management Training: programs are tailored to the needs of managers at all levels, including new, experienced, and senior managers; optional courses are also available.
- Direct Labor (DL) Training: enables employees of the production line in acquiring the knowledge, skills and attitudes they need to perform their jobs well and to pass the certification for operating equipment. Training includes DL Skill Training, Technician “Train-the-Trainer” Training, and Manufacturing Leader Training.

In 2014, TSMC conducted 1,453 internal training sessions, which translated to a company-wide total of 844,174 training hours with the participation of 536,493 attendees. Employees on average attended over 19 hours of training with the training expenses reaching NT$83 million. Apart from internal training resources, our employees are also subsidized when taking external short-term courses, credit courses and degrees.

5.5.4 Compensation
TSMC provides a diversified compensation program that is competitive externally, fairly internally, and adapted locally. TSMC upholds the philosophy of sharing wealth with employees in order to attract, retain, develop, motivate and reward talented employees. With excellent operating performance, employment at TSMC entitles employees to a competitive compensation. TSMC’s compensation program includes a monthly salary, an employee cash bonus based on quarterly business results, and employee profit sharing when the Company distributes its profit each year.

The purpose of the employee cash bonus and profit sharing programs is to reward employee contributions appropriately, to encourage employees to work consistently toward ensuring the success of TSMC, and to link employees’ interests with those of TSMC’s shareholders. The Company determines the amount of the cash bonus and profit sharing based on operating results and industry practice in the Republic of China. The amount and form of the employee cash bonus and profit sharing are determined by the Board of Directors based on the Compensation Committee’s recommendation, and the employee profit sharing is subject to shareholders’ approval at the Annual Shareholders’ Meeting. Individual awards are based on each employee’s job responsibility, contribution and performance.

In addition to providing employees of TSMC’s overseas subsidiaries with a locally competitive base salary, the Company grants annual bonuses as a part of total compensation. The annual bonuses are granted in line with local regulations, market practices, and the overall operating performance of each subsidiary, to encourage employees’ commitment and development within the Company.

5.5.5 Employee Engagement
Taiwan’s Labor Standards Act and the fundamental convention of ILO prohibit all forms of forced or compulsory labor. TSMC stands firmly with the protocols and never forced labor from involuntary persons with menace of any penalty. The Company encourages employees to maintain a healthy and well-balanced life while making use of their time spent at work with high efficiency and better effectiveness. To enrich employees’ work experience, TSMC continuously implements programs to enhance their communication, well-being, benefit, recognition and rewards. The various initiatives include the following communication, benefit and recognition programs:

Employee Communication
TSMC values two-way communication and is committed to keeping the communication channels between the management level, subordinates and peers open and transparent. To ensure that employees’ opinions and voices are heard, and their issues are addressed effectively, impartial submission mechanisms, including quarterly labor-management communication meetings, are in place to provide timely support. Our continuous efforts lie in reinforcing mutual and timely employee communication, based on multiple channels and platforms, which in turn fosters harmonious labor relations and creates a win-win situation for the Company and employees.

A host of two-way communication channels are constructed to maintain the unobstructed flow of information between managers and employees, including:
- Regular communication meetings are held for the various levels of managers and employees.
- Periodic employee satisfaction surveys are conducted, with follow-up actions based on the survey findings.
- The corporate intranet, myTSMC, the website features Chairman’s Talk, corporate messages, Executive interviews, and other activities of interest to employees.
- elicon Garden: the website hosting TSMC’s internal electronic publication is updated on a bi-weekly basis with inspirational content featuring outstanding teams and individuals, as well as major activities of the Company.
- Complaints regarding major management, financial, and auditing issues are handled by the following channels with high level of confidentiality:
  - The independent Audit Committee; and
  - Ombudsman system led by an appointed Vice President.
- Employee Opinion Box provides a channel for employees to express their suggestions or opinions regarding their work and the overall work environment.
- Fab Caring Circle: in each fab takes care of the issues related to employees’ work and personal life; the system is dedicated mainly to direct labors (DL) of the Company.

The establishment of the above effective communication channels is one of the key factors contributing to TSMC’s cooperative employee relationship over the years. Under R.O.C. law, employees are granted the right to organize labor unions, and TSMC respects this important right and complies with applicable laws prohibiting activities that hinder our employees’ freedom of association. As of this writing, we have not seen any recent union activity from our employees.

In 2014 and as of the date of this Annual Report, there had been no loss resulting from labor disputes.
The award programs include:

- Service Award represents TSMC’s appreciation toward senior employees’ dedication and commitment to the Company.
- Excellent Instructor Award praises the outstanding performance and contribution of the Company’s internal instructors in training courses for employees.
- Function-wise awards dedicated to innovation, including Idea Forum, and TQE Awards, etc.

Apart from corporate-wide awards, in 2014, TSMC employees continued to be recognized through a host of prestigious external awards, including Outstanding Engineer Award, Outstanding Young Engineer Award, National Model Worker Award, and National Industrial Innovation Award.

5.5.6 Retention

Continuous growth underlies the commitment of TSMC towards its stockholders and employees, and the retention of outstanding employees is crucial in fulfilling this commitment. From employee’s initial adaptation to professional and career development, TSMC works proactively to provide employees with good compensation, innovative, meaningful and fun work, as well as a safe work environment.

Employees’ overall satisfaction with the Company’s efforts are reflected in the 2014 TSMC Core Values Survey, of which 97% of participants agreed that they are willing to commit fully in their work to make TSMC an even more successful company; while 95% of them concurred with the statement that they are willing to contribute their talents to TSMC and grow together with the Company for the next five years. In 2014, the Company recorded a healthy and manageable turnover rate of 6%.

5.5.7 Retirement Policy

TSMC’s retirement policy is set according to the Labor Standards Act and Labor Pension Act of the Republic of China. With the Company’s sound financial system, TSMC ensures employees a solid pension contribution and payments, which encourages employees to set long-term career plans and raises their commitment to TSMC.

5.6 Material Contracts

Shareholders Agreement

Term of Agreement: Effective as of 03/30/1999 and may be terminated as provided in the agreement

Contracting Parties:
Koninklijke Philips Electronics N.V. (Philips) and EDB Investments Pte Ltd. (EDB)

In September 2006, Philips assigned its rights and obligations under this agreement to Philips Semiconductors International B.V. which has now been renamed NXP B.V. In November 2006, NXP B.V. and TSMC purchased all SSMC shares owned by EDB. EDB is no longer a contracting party to this agreement.

Summary:
TSMC, Philips and EDB had formed a Singapore joint venture “Systems on Silicon Manufacturing Company Pte Ltd.” (SSMC) for providing semiconductor foundry services. Philips Semiconduc tor (now NXP B.V.) and TSMC are committed to purchasing a certain percentage of SSMC’s capacity.

Technology Cooperation Agreement

Term of Agreement: 03/30/1999 - 03/29/2004, automatically renewable for successive five-year terms until and unless either party gives written notice to terminate one year before the end of then existing term.

Contracting Party:
Koninklijke Philips Electronics N.V. (Philips) and EDB Investments Pte Ltd. (SSMC) for providing semiconductor foundry services.

Summary:
TSMC agreed to transfer certain process technologies to SSMC, and SSMC agreed to pay TSMC a certain percentage of the net selling price of SSMC products.

Patent License Agreement

Term of Agreement: 12/20/2007 - 12/31/2017

Contracting Party:
A multinational company

Summary:
The parties entered into a cross licensing arrangement for certain semiconductor patents. TSMC pays license fees to the contracting company.

Manufacturing, License, and Technology Transfer Agreement

Term of Agreement: 04/01/2004 - 03/31/2006, automatically renewable for successive one-year terms until and unless both parties decide otherwise by mutual consent in writing

Contracting Party:
Vanguard International Semiconductor Corporation (VIS)

Summary:
VIS reserves certain capacity to manufacture TSMC products on mutually agreed terms. TSMC may also transfer certain technologies to VIS, for which it will in return receive royalties from VIS.

Investment Agreement and Shareholder Agreement

Term of Investment Agreement:
Effective as of 08/05/2012

Term of Shareholder Agreement:
Effective as of 10/31/2012 and may be terminated as provided in the agreement

Contracting Party:
ASML Holding N.V. (ASML)

Summary:
TSMC joined the Customer Co-Investment Program of ASML Holding N.V. (ASML) and entered into the investment agreement and shareholder agreement. The agreements include an investment of EUR837,815,664 by TSMC Global Investments Pte Ltd. to acquire a non-voting 5% in ASML’s equity with a lock-up period of 2.5 years.

Research and Development Funding Agreement

Term of Agreement: 10/31/2012 - 12/31/2017

Contracting Party:
ASML Holding N.V. (ASML)

Summary:
TSMC shall provide EUR276 million to ASML’s research and development programs from 2013 to 2017.

Note: TSMC is not currently party to any other material contract, other than contracts entered into in the ordinary course of our business. The Company’s “Significant Contingent Liabilities and Unrecognized Commitments” are disclosed in Annual Report section (II), Financial Statements, page 71-72.