Material Issue
Climate Change and Energy Management

**Strategies**

- **Promoting Low-Carbon Manufacturing**
  - Reduce unit wafer GHG emission (Metric tons of CO₂ equivalent /8-inch wafer e mask-layer ) to 18% below the year 2010 level 2020
  - Reduce unit wafer PFC emission (Metric tons of CO₂ equivalent /8-inch wafer e mask-layer ) to 60% below the year 2010 ; Reduce total PFC emission (Metric tons of CO₂ equivalent) to 20% below the year 2010 level 2020

- **Development of Renewable Energy**
  - Continuously purchase renewable energy note 2025

- **Improving Energy Efficiency**
  - Reduce unit wafer power usage (kWh /8-inch wafer e mask-layer ) to 12% below the year 2010 level 2020
  - Conserve a total of 2,800GWh beginning from 2016 2025

- **Strengthening Climate Resilience**
  - Zero days of manufacturing interruption caused by climate change disasters 2025

**TSMC 2020/2025 Goals**

- Continue adopting best practice approaches to mitigate emissions with the goal of being the industry’s Low-Carbon Manufacturing leader
- Continue to purchase green power and install solar power systems, increase green power usage
- Develop new energy-saving measures each year, actively implement energy-saving measures, and increase power usage effectiveness
- Build up prevention and emergency reaction plans for climate disaster and reduce the impact of climate disasters

**Note:** The regulatory and market environment isn’t mature in Taiwan. TSMC purchase renewable energy & set up long term goal once the conditions are mature.
Reduce unit wafer layer GHG emission to 15% below the year 2010 level
Reduce unit wafer layer PFC emission to 55% below the year 2010 level
Reduce total PFC emissions to 10% below the year 2010 level
Reduce unit wafer layer power usage to 11% below the year 2010 level
Annual power-saving of 200 GWh
Cumulative power-saving of 800 GWh

13%
Unit wafer layer GHG emissions were 13% less than 2010
Target: 13%

55%
Unit wafer layer PFC emissions were 55% less than 2010
Target: 50%

6%
Total PFC emissions were 6% less than 2010
Target: 4%

10.4%
Unit wafer layer power usage were 10.4% less than 2010
Target: 9%

510 GWh / 600 GWh
Annual power savings / Cumulative power savings
Target: Annual power-saving target of 280 GWh
Cumulative power-saving of 370 GWh
Climate change has greatly impacted the global ecosystem and people's lives. After the signing of the Paris Agreement, nations from around the world have affirmed the threat of climate change. TSMC clearly states in its Corporate Social Responsibility Policy and Environmental Protection Policy that adapting to climate change is part of its responsibility to sustainable management. TSMC continues to monitor the status of global climate change as well as changes in international and domestic mitigation efforts, and identifies potential risks and opportunities of climate change by utilizing a risk matrix on the aspect of government regulations, natural disasters, and behavioral impact. TSMC has made continuous long-term efforts to serve as an industry benchmark for energy conservation and carbon reduction, and has been strengthening the requirements for its supply chain to do the same. TSMC collaborates with international industry associations and government agencies to promote carbon mitigation and identify the best available technologies to establish industry standards. TSMC aims to raise the supply chain's ability to respond to climate change and reduce climate risks in operations management.
### Types of Climate Risks and Management Measures

#### Regulations
- **Mandatory reporting of greenhouse gases**
- Implement data inventory: investigate greenhouse gas emissions and energy usage
- **Greenhouse gas inventory 100% completed**
- **Regulatory control of greenhouse gases cap and trading**
- Implement carbon management: the Energy Conservation & Carbon Reduction Committee promotes energy saving and conducts quarterly review
- **Annual energy saving targets 100% completed**
- Established procedures on carbon credits and trade in Fab 10

#### Natural Disasters
- **Wind damage, flooding, and drought leading to reduced production or disruptions**
- Fab 15B designs followed climate resistance guidelines (all new fabs will follow)

#### Behavioral Impact
- **Related parties demanding a green supply chain**
- **Strengthened requirements for supplier-side greenhouse gas monitoring and increased their proportion in audit**
- **Proposed semiconductor energy conservation and carbon reduction benchmarks**

### Aspects

#### Consideration

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<th>Natural Disasters</th>
<th>Behavioral Impact</th>
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<tr>
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### Achievements in 2017

- **Greenhouse gas inventory 100% completed**
- **Annual energy saving targets 100% completed**
- **Established procedures on carbon credits and trade in Fab 10**
- **Energy efficiency of new generation production process raised**
- **Fab 15B designs followed climate resistance guidelines (all new fabs will follow)**
- **Strengthened requirements for supplier-side greenhouse gas monitoring and increased their proportion in audit**
- **Proposed semiconductor energy conservation and carbon reduction benchmarks**
TSMC stands by its environmental promises, and continues to follow through on its many sustainability measures. Promoting energy conservation, carbon reduction, water saving, and circular economy are all important parts of our efforts to demonstrate the effectiveness of our environmental management and corporate social responsibility. TSMC will continue to share its green manufacturing experience, help the industry gain the competitive advantages of green enterprises, and contribute to the sustainable development of the earth.

**Total Risk Management of Climate Change – Carbon Management Platform**

In response to global climate change and the Green House Gas Reduction and Management Act, TSMC established a cross-organizational platform for carbon management in 2016. The three main directives of the platform are: regulatory compliance, energy conservation and carbon reduction, and carbon asset management. TSMC planned and executed short, mid, and long-term reduction plans through the Energy Conservation and Carbon Reduction Committee, led by Vice Presidents of Operations with the support of the Corporate Environmental Safety Division in regulatory discussions around the country. Following the TSMC subsidiary in China, the American subsidiary WaferTech will also be required to lower greenhouse gas emissions in accordance with the Clean Air Act of Washington State in the United States. Faced with tightening rules and regulations regarding carbon emissions and trading, the Finance Department has decided to evaluate carbon asset risk, and devise mid to long-term plans based on energy conservation and carbon reduction goals, carbon credits, and renewable energy options.

**Key Initiatives**

- GHG inventory (ISO 14064)
- Phased Regulatory Goals
- Product emission standard
- Cap and allocation principle
- Taiwan Renewable Energy Certificates (T-REC)
- Carbon credit & trade flow
- Early project
- Offset project
- TCFD
- ISO 50001
- Science Based Target
- Facility energy saving
- Process tool energy saving
- F-GHG abatement
- Green building

J.K. Wang  
Vice President, Operations/300mm Fabs
Participated in establishing regulations for Phased C2F6 & C3F8 (cleaning process) replaced by C4F8
Formed a corresponding task force
Applied for greenhouse gas emission reduction rewards in Taiwan
Purchased 100 GWh of green electricity from Taiwan
Fully installed new equipment in Fab 15B and replaced 62% of the power company
TSMC (China) purchased 280 thousand metric tons of green electricity
Enhanced chiller unit performance by 9%
Achievements in 2017
Energy Conservation & Carbon Reduction e-platform
Fab 6 solar-powered system is the first semiconductor fab in Taiwan to receive T-REC (received 275 RECs)

Promoting Low-Carbon Manufacturing
Aiming to Be the Leading Global Benchmark
In response to the global mission of the Paris Agreement, TSMC continues to participate in the Carbon Disclosure Project (CDP) and joined Commit to Action, a voluntary enterprise carbon reduction initiative in 2017. The most important step in the initiative is to set reduction targets to keep the global temperature rise below 2 degrees. TSMC is the first semiconductor company in Taiwan to join the Science Based Targets Initiative, SBTi. Under the 2 degrees scenario, the semiconductor industry aims to lower greenhouse emissions intensity to 87% below 2010 levels before 2050.
TSMC successfully reached its targets by reducing gas used in the production process as well as exhaust gas. Due to these efforts, the greenhouse gas emission per product unit decreased 3% in 2017 over the previous year, and dropped 13% compared with 2010. In recent years, the increasing complexity of new generations of products has pushed TSMC to find more innovative methods in meeting government and company renewable energy policies to conserve energy and reduce carbon dioxide emissions.

Note: Established in 2003, the Carbon Disclosure Project (CDP) is an independent, London-based, non-profit organization which supports companies to disclose environmental impact through the collection of carbon emission surveys.
Greenhouse Gas Inventory for Upstream and Downstream Supply Chain

TSMC has required all its fabs around the world to establish greenhouse gas inventory and disclosure by the greenhouse gas protocol since 2005. New fabs must begin inventorying greenhouse gases within 1.5 years after initial production. Each year, every TSMC fab must complete scope 1 and scope 2 greenhouse gas inventories for the previous year and pass the external audit of a third-party organization with ISO 14064-1 verification. TSMC began the scope 3 emission inventory and verified by a third-party since 2017. In 2017, TSMC and subsidiaries ramped up production and acquired VisEra. As a result, total greenhouse emissions increased 11% over the previous year. TSMC fabs in Taiwan accounted for 90% of the total carbon dioxide emissions of 8.15 million metric tons. Due to the development of advanced processes and the related power demand, the scope 2 greenhouse gas emission ratio is three times larger than scope 1. In addition to monitoring its own greenhouse gas emissions, TSMC is also concerned with the carbon footprint of final products and looks into the emissions of its upstream and downstream supply chain. The Company requests suppliers to have the ability to conduct their own greenhouse emission inventory. The largest emission in scope 3 emission data is generated by raw materials, followed by fuel and energy related activities and waste disposal.

Scope 1 and Scope 2 Greenhouse Gas Emissions
Unit: Million metric ton CO2e

Scope 3 Greenhouse Gas Emissions
Unit: Metric ton CO2e

Greenhouse Gas Emission Intensity
Unit: Metric ton CO2e/8-inch e wafer-layer

Note 1: TSMC total annual greenhouse gas emission intensity data includes emissions from all TSMC fabs (as well as advanced backend facilities) in Taiwan and its subsidiaries WaferTech, TSMC China, VisEra.

Note: TSMC total annual greenhouse gas emission data includes emissions from all TSMC fabs in Taiwan.
Note 2: According to the announcement of Energy bureau that 1 kWh emits 0.529 kg of CO2 equivalent and 1kWh = 3,600 Kilojoules.

Note 1: Scope 3 emissions include only data from TSMC fabs in Taiwan
Note 2: Reduction targets are based on SBTI - Sectoral Decarbonization Approach (SDA)
Note 3: Emission intensity normalized by the baseline data in 2010.
Best Mitigation Results in the Industry

F-GHG is the main source of greenhouse gas emissions in the semiconductor manufacturing process, it accounts for over 80% of emissions. TSMC aims to lower direct emissions by optimizing gas usage and substituting F-GHG with low greenhouse warming potential gases and installing exhaust gas abatement equipment. In 2017, TSMC reduced 2.35 million metric tons of carbon dioxide on F-GHG emission reduction. Nitrous oxide (N₂O) is the second-largest source of direct emissions which TSMC is striving to reduce. Since 2016, TSMC and equipment vendors have been collaborating to develop high-performance N₂O abatement and tail gas reduction equipment, and have completed verification on certain models. TSMC leads the industry by being the first to incorporate N₂O gas abatement equipment into its new equipment standard. In 2017 TSMC’s F-GHG emissions lowered significantly; emissions per unit decreased 6% over the previous year, not only reaching TSMC’s own targets but is far outperforming targets set by the World Semiconductor Council’s voluntary PFC agreement.
Development of Renewable Energy

Owing to its corporate responsibility to protect the environment, TSMC continues to track developments in climate change. In addition to lowering power consumption, TSMC also takes concrete action by adopting renewable energy. TSMC fully supports the government’s policy, and commits to directly purchasing renewable energy once the regulatory and market environment is mature in the future. This move will effectively reduce greenhouse gas emissions and proactively supports the United Nations’ sustainable development goals.

Purchasing Green Power

In response to the government’s renewable energy policy, TSMC has purchased green power as a way of supporting the development of renewable energy. The Company purchased a total of 100 GWh of green power in 2017. This reduced carbon emissions by about 52.9 million kilograms, equivalent to the carbon absorbed by 5.29 million trees in one year. Since 2015, TSMC has been the biggest green power purchaser by cumulatively subscribing for 400 GWh of green energy for the last three years, accounting for 64.4% of the total green power sold in Taiwan.

Installing Renewable Energy Power Generation Equipment

TSMC has also installed solar panels inside its science parks to generate renewable energy for its facilities. In 2017, the Company’s total solar panel capacity expanded by 550 kW and combined with the 30 kW used by its subsidiary, VisEra Technology, total solar panel capacity reached 1,893 kW, generating 1.5 GWh. This reduced carbon emissions by 770 metric tons, equivalent to the carbon absorbed by 77,000 trees in one year. TSMC will continue to expand its solar panel capacity by 1,322 kW in 2018. In 2017, the newly installed Fab 6 solar power plant was certified by the National Renewable Energy Certificate Center. TSMC also obtained 275 renewable energy certificates for the entire year, making it the first semiconductor manufacturer in Taiwan to receive renewable energy certificates. All these pro-active measures highlight TSMC’s commitment towards the development of Taiwan’s renewable energy.

TSMC will monitor local renewable energy development aggressively, purchase renewable energy and continue to install renewable energy generation equipment to fulfill our responsibility of global citizenship and support government strategy. We want to support renewable energy through concrete measures to make on impact on the mitigation of climate change.

Improving Energy Efficiency

Comprehensive energy inventory

TSMC’s total energy consumption in 2017 was 12,016 GWh, of which power usage accounted for about 94.8% of total energy consumption. This was followed by natural gas, which accounted for about 5.2% of total energy consumption. Diesel consumption is less than 0.03% of total energy consumption.

TSMC’s electric power is mainly used in manufacturing by process equipment and facility systems. The Company uses ISO 50001 for energy management and cross-fab energy efficiency comparisons to find the best operating model and make company-wide adjustments to obtain

Installed Capacity of Renewable Energy

<table>
<thead>
<tr>
<th>Unit: kW</th>
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<tbody>
<tr>
<td>2014</td>
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<td>2015</td>
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<tr>
<td>2016</td>
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<tr>
<td>2017</td>
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<td>2018</td>
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</tbody>
</table>

| 1,050 | 1,190 | 1,312 | 1,893 | 1,322 |

Note: Total Installed Capacity of Renewable Energy Power Generation Equipment include TSMC (all fabs and packaging and testing facilities located in Taiwan) as well as its overseas subsidiaries (WaferTech, TSMC (China), VisEra Technology).

Total Energy Consumption

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<tr>
<td>2013</td>
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<td>2015</td>
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<td>2016</td>
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<tr>
<td>2017</td>
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| 2.8 | 3.1 | 5.1 | 4.5 | 4.2 |

| 6,229 | 7,545 | 8,460 | 9,358 | 11,388 |

Note: Total energy consumption includes TSMC (all fabs and packaging and testing facilities located in Taiwan) as well as its overseas subsidiaries (WaferTech, TSMC (China), VisEra Technology).

Note: The total conversion unit is 1 cubic meter of natural gas = 10.4 kWh, 1 kWh = 3,600 Kilojoules.

Our Business | Sustainable Governance | Focus One | Focus Two | Focus Three | Focus Four | Focus Five | Focus Six | Appendix
---|---|---|---|---|---|---|---|---
Focus One | Ethical Management | Focus Two | Innovation and Service | Focus Three | Responsible Supply Chain | Focus Four | Green Manufacturing | Focus Five | Inclusive Workplace | Focus Six | Common Good | Appendix

TSMC 2017 Corporate Social Responsibility Report
maximum efficiency from each kWh consumed. TSMC’s unit power consumption was 9.5 kWh/8-inch e wafer-layer) in 2010. 10.4% lower than 10.6 (kWh/8-inch e wafer-layer) in 2010. Additionally, this was 1.4% lower than the Company’s optimum performance of 9% in 2017. Natural gas is mainly used for boilers, Volatile Organic Compound (VOC) treatment systems and burn-type Point-of-Use Waste Gas Treatment systems to reduce direct fluoride gas emission and greenhouse gas emission. In 2017, TSMC consumed 0.055 cubic meters of natural gas per 8-inch wafer per mask layer. Diesel is primarily used in emergency power generators and fire pumps, which are only engaged during power supply disruptions, scheduled maintenance and emergencies, and is not a direct energy source for production. The Company consumed approximately 409 kiloliters in 2017.

Enhancing Power Usage Effectiveness

Due to the expansion and increasing complexity of advanced manufacturing process, TSMC expects power consumption will continue to increase. To maximize energy efficiency, and in response to the government’s energy-saving targets, TSMC has invested heavily in energy-saving measures and had laid out an implementation plan from 2016 to 2025 that targets an average annual energy-saving rate of greater than 1%. By 2025, new energy-saving measures are expected to reduce energy consumption by 2,800 GWh as well as reduce carbon emissions by 1.48 billion kilograms, which is equivalent to the carbon absorbed by 148 million trees in one year. Compared to the absence of energy-saving measures, total power consumption has fallen by 13%.
TSMC's energy management is based on ISO 50001. It develops energy-saving management platforms, implements energy audits, and strives for the most efficient use of each kWh. In 2017, TSMC's Facilities Department became the first to apply Big Data in the analysis of air-conditioning energy-saving parameters. In the process, it was able to develop an optimal control program, which can automatically adjust chilled water system and its auxiliary equipment to the best energy-saving point, effectively improving the efficiency of the chilled water system by 9%. TSMC also held classes on energy saving and carbon reduction to share its knowledge with the industry. The Process Equipment Department has focused on replacing inefficient components and optimizing equipment energy consumption. TSMC's annual energy-saving plan included 452 energy-saving measures across eight categories, reducing consumption by 510 GWh, eliminating 270,000 metric tons of carbon dioxide emission and saving NT$1.28 billion in electricity costs. In addition, reducing carbon emissions also saved NT$400 million in potential external carbon costs.

Note: Computed using a NT$1,500 fine per metric ton for direct and indirect carbon emissions (metric tons) levied by the Taiwan government.

Additional Energy-Saving Performance 2017

- **Lighting Energy Saving**
  - Non-cleanroom intelligent lighting
  - Replace LED light

- **Air Conditioning Energy Saving**
  - Energy saved from Automatic Chilled Water System
  - AC Energy-saving Adjustment

- **Performance Improvement**
  - Modified wet film for large AC humidifier

- **Standby Energy Saving**
  - Uninterrupted power system energy saving mode
  - Energy saving from site-type waste disposal standby machine

- **Energy Usage Management**
  - Reduced power consumption of process cooling water system
  - Reduced power consumption of process exhaust machines

- **Unit Replacement**
  - Replace with high efficiency, energy-saving units

- **Purchase Requirements**
  - New machine purchase, using high efficiency, energy-saving auxiliary equipments

- **Equipment Improvement**
  - Optimized power consumption of equipment units

Note: Carbon equivalent coefficient factor= 0.529 kg/ kWh

*Note: Computed using a NT$1,500 fine per metric ton for direct and indirect carbon emissions (metric tons) levied by the Taiwan government.*
Strengthening Climate Resilience

TSMC assesses climate-related risks annually to protect its operations against climate change and extreme weather. The Company’s standardized guidelines focus on weather-related factors which could disrupt daily operations such as drought, power shortages, flooding, and wind damage. All fabs are required to carry out assessments to prevent all potential damage from natural disasters and avoid any disruption to production. The newly-completed Fab 15B was designed specifically with climate resistance guidelines in mind, and other fabs have also made changes according to these guidelines.

Leading the Industry in Facing Climate Changes

TSMC understands the challenges of climate change. It is a difficult mission which requires the cooperation of the entire industry, from upstream to downstream vendors, and adherence to government policies to complete this task. TSMC fully supports the planning and implementation of government policies and acts as industry and trade association representative and committee member of the Energy White Paper and Greenhouse Gas Expert Advisory Committee, offering feasible benchmark solutions and advice. TSMC is also the ESH Committee Chairman of the Taiwan Semiconductor Council and World Semiconductor Council. In addition to hosting regular conferences and forums to discuss best approaches in energy conservation and carbon reduction, TSMC also actively pursues the best feasible benchmarks, including F-GHG Reduction Best Available Approach Guidelines and F-GHG and N₂O Abatement Approaches. TSMC possesses a strong resolve to lead the global semiconductor industry through its actions.
Case Study

Using Big Data Analysis to Develop Intelligent Chilled Water System

In 2017, TSMC analyzed the energy consumption of its plants and discovered that its chilled water system accounted for as much as 20% of its total power consumption. The issue of enhancing its plants’ operational efficiency, therefore, became an important concern. Through a study of Big Data and after examining close to 500,000 operational data, TSMC was able to successfully develop “an optimal energy-saving control program” for its chilled water system. While the conventional method focuses only on enhancing the energy efficiency of a single piece of equipment or device, this new model - the first in the industry - takes things a step further by taking into consideration the entire chilled water system, dynamically adjusting the temperatures of the chilled and cooling water. Furthermore, it automatically adjusts the system to its “optimal energy-saving point” based on varying external air conditions and on-site loads, and in the process, increases operational efficiency by as much as 9%

In addition to its innovative energy-saving measures, TSMC has always been strict and rigorous in conducting risk assessments. Prior to the full implementation of the “optimal energy-saving control program” for its chilled water system, the Company first tested the program on its Fab 12B plant for six months and monitored 260,000 air-conditioning parameters. After ensuring that no abnormalities were seen in 100% of the parameters, the program was officially incorporated into its production system in the third quarter of 2017. The system is currently part of TSMC’s advanced manufacturing process and has helped the Company conserve 58 GWh of electricity in 2017, an estimated 11% of the Company’s annual energy savings. The smart energy-saving chilled water system is considered a major breakthrough in the industry for energy conservation.

Company conserve 58 GWh of electricity in 2017, an estimated 11% of the Company’s annual energy savings. The smart energy-saving chilled water system is considered a major breakthrough in the industry for energy conservation.

For more details, please refer to our website: "TSMC Successfully Developed Industry’s First Chilled Water System Optimization, Energy-Saving Control Program"
TSMC Generously Shares its Energy-Saving and Waste Reduction Methods

TSMC is fully committed to environmentally friendly actions and integrates green management and development strategies into its corporate culture. Internally, the Company holds competitions for energy-saving proposals, inviting colleagues to brainstorm and share their ideas, with the aim of developing more efficient and more innovative energy-saving projects. Externally, the Company shares its energy-saving and waste reduction experiences with the public through education and training courses. As a continuation of the Company’s successful educational model in the past, TSMC again launched two free classes on “Energy Conservation Practices and Energy Management Strategies” and “Resource Regeneration” in Hsinchu, Taichung and Tainan in 2017. These classes, as well as actual plant visits, were personally handled by highly qualified TSMC employees, who shared their experiences in corporate benchmarking practices. Originally only six classes were scheduled but this was increased to nine due to the number of registered attendees. These talks attracted 357 participants from the manufacturing sector, the medical and healthcare field, as well as college professors and students.

2017 Energy-saving and Waste Reduction Course Plan

Energy-Saving
- Energy Monitoring and Management System
- Air Conditioning System Operational Optimization Strategy
- Sharing of AC Energy-saving Practices
- Sharing of TSMC’s Energy-saving Measures

Waste Reduction
- Recycling and Regulatory Practices
- Industrial Water Treatment Technology Enhancement
- Wastewater Classification and Recycling Evolution
- Waste Recycling and Recovery

Feedback from Participants

72% of participants, who joined this activity, changed their opinion and concept concerning energy-saving and carbon reduction

48% of participants who joined this activity, claimed that it helped them identify areas where they can conserve energy

Chia-Ho Chen
Senior Specialist of Taiwan High Speed Rail

72% of participants, who joined this activity, changed their opinion and concept concerning energy-saving and carbon reduction

48% of participants who joined this activity, claimed that it helped them identify areas where they can conserve energy

Chia-Ho Chen
Senior Specialist of Taiwan High Speed Rail
Host Tool Energy Saving Workshop, Accumulation of Green Innovation Energy

Green innovation is the responsibility of every TSMC employee. Through full implementation of energy reduction activities, hosts of cross-organizational energy-saving ideas competitions encourage their colleagues to continue to identify energy saving opportunities from daily operations and put them into action.

In 2017, TSMC initiated “Tool Energy Saving Workshop”. Through competition prizes and praise, TSMC encourages colleagues to brainstorm for innovative and feasible energy-saving solutions. Driven through cross-function study and learning, TSMC improves colleagues’ ability to solve tool energy saving problems.

Each competition proposal has to consider various power applications and process stability in the production process. All were reviewed in three aspects, as “Feasibility”, “Energy Saving” and “Innovation” from 16 TSMC internal judges. After the first screening for nine finalists and reexamination, the best proposals stood out.

In 2017, there were 223 energy-saving cases presented in the workshop. Three “Best Energy Saving Awards”, three “Innovation Awards” and three “excellent Awards” were chosen. The estimated energy saving from them is 198 GWh annually.

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<th>Benefit</th>
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<td>Energy Saving &gt; 6%</td>
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<tr>
<td>Optimization Setting on Recipe</td>
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<td>Energy Saving &gt; 10%</td>
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<tr>
<td>Use high performance / low energy components</td>
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<td>Energy Saving &gt; 20%</td>
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Case Study

Carried out the First Independent Ecological Survey of the Domestic Semiconductor Industry in Taiwan

In 2017, TSMC’s aggressive response to the United Nation’s Sustainable Development Goals (SGDs), (UN Sustainable Development Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems...and halt biodiversity loss.) and the Aichi Biodiversity Target, conducting the first independent eco-survey in the domestic semiconductor industry, as well as evaluating the impact of the Company’s operations on the environment and on biodiversity.

Results of the study showed that there were more than 493 species of plants and 209 species of animals found within TSMC’s science parks. The results of the ecological survey highlighted not only the extremely abundant and rich variety of species found inside TSMC’s science parks, but showed the balanced and harmonious stewardship of the Company with the environment.

TSMC has produced outstanding results in green sustainability. With its clearly defined ecological development goals and positive actions, the Company has, through its Green, conservation, Eco-Friendly, and Education Policies, sought to protect the country’s natural resources. The Company has carried out multi-level greening within its science parks as well as established a diverse habitat. For example, by establishing ecological zones, channels, and ponds to bring in water, the Company has provided a welcoming habitat for birds and butterflies. In addition, to ensure a balanced biodiversity, the Company has gradually introduced native plants on the ground, cultivating a rich collection of plant species that will attract butterflies and birds by offering copious opportunities to feed.

In 2018, as the Company strives to exert a greater green influence on its environment, it will focus on the conservation of rare and endangered species, including the migration of threatened species such as the Cuora flavomarginata (Chinese Box Turtle) to livable environments and the independent cultivation of Lavanduleaf dendranthema (delicate native flowers) and other endangered plants.

Four Ecological Sustainability Strategies of TSMC

TSMC’s ecological sustainability of green park

- Design of Green Belt in Series
  - A Series of Disconnected Green Belt
  - Expanding Green Area
  - Planting of Trees

- Ecological Environment Monitoring
  - Ecological Environment Monitoring
  - Non-toxic Maintenance Management
  - Encouraging Environmentally Friendly Farming

Note: UN Sustainable Development Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems...and halt biodiversity loss.