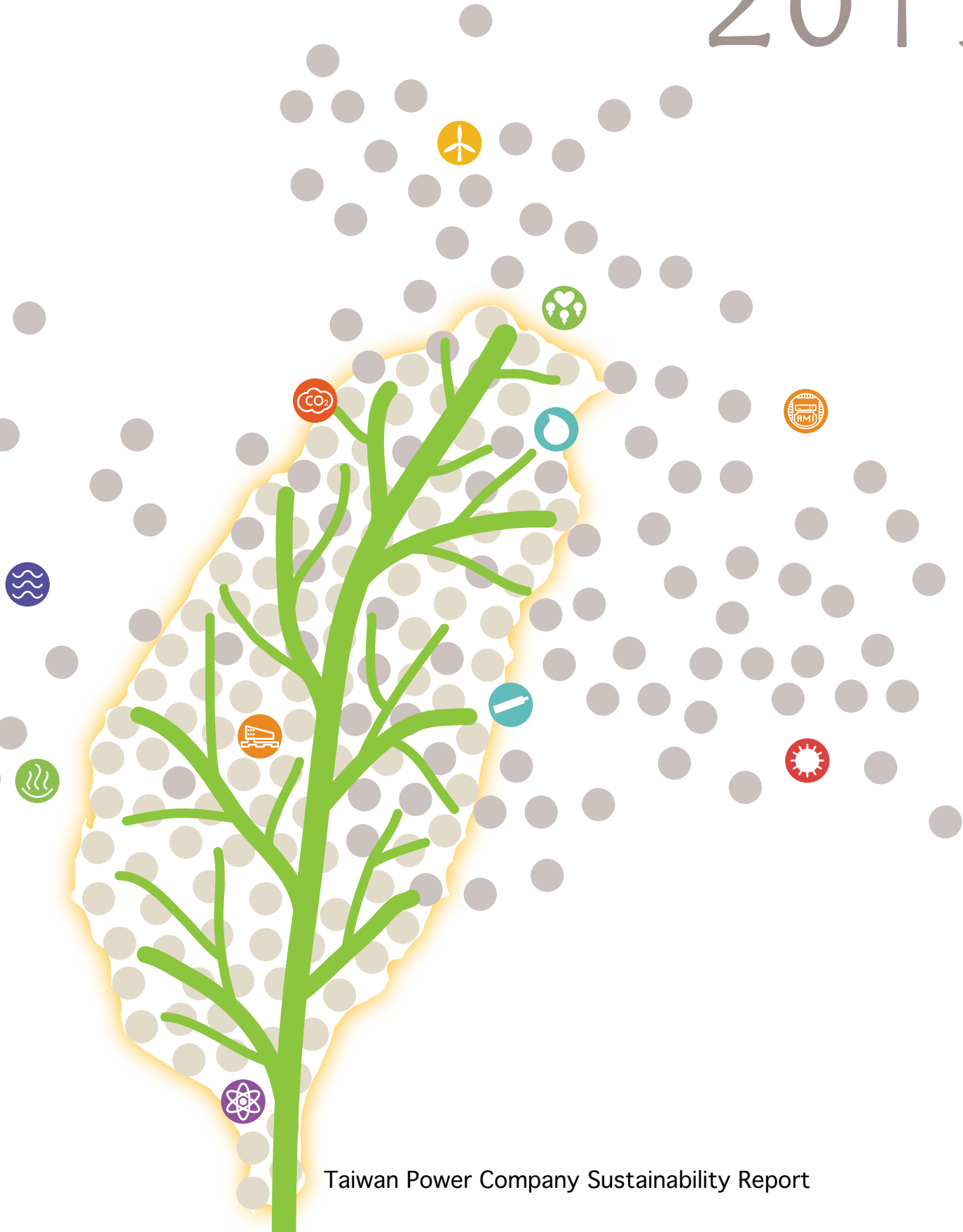




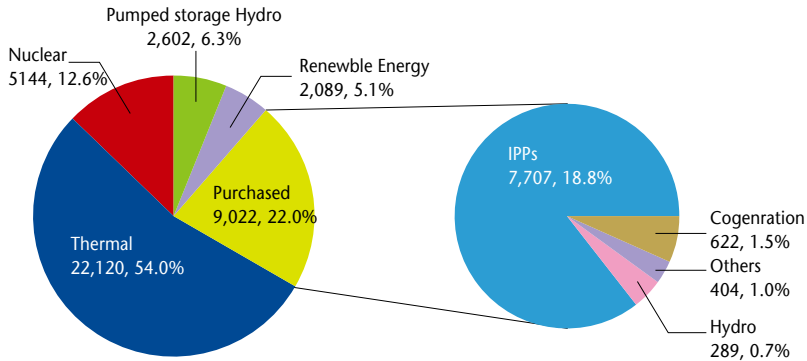
# Taiwan Power Company Sustainability Report

2013

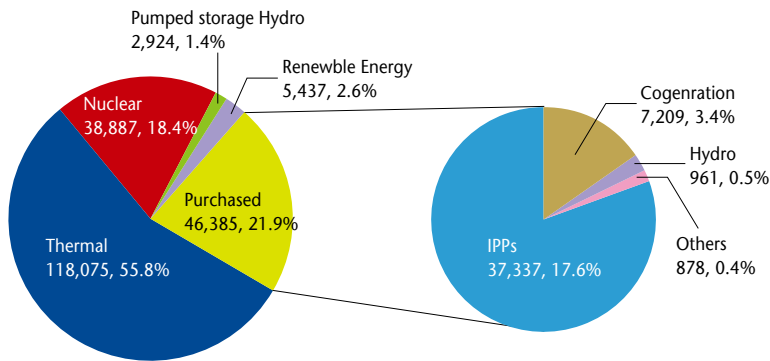


# Corporate Highlights

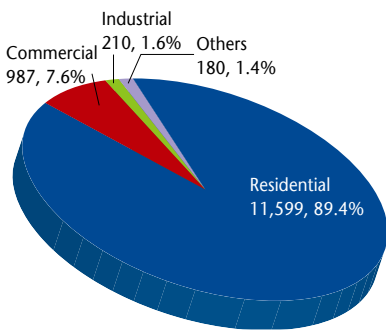
## Installed Capacity(40,977MW)



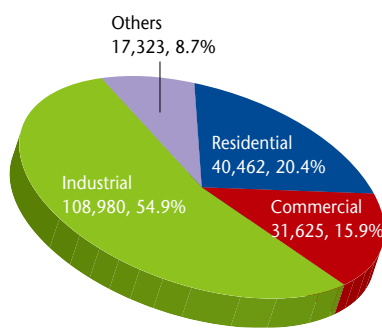
## Power Generation(211,708GWh)



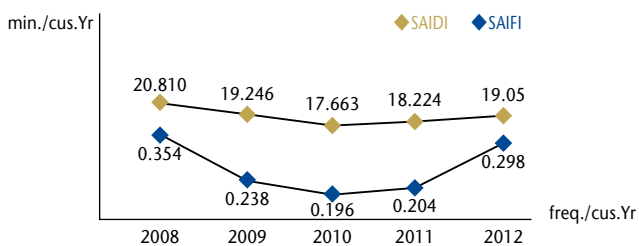
## Customers(12,977 Thousand)



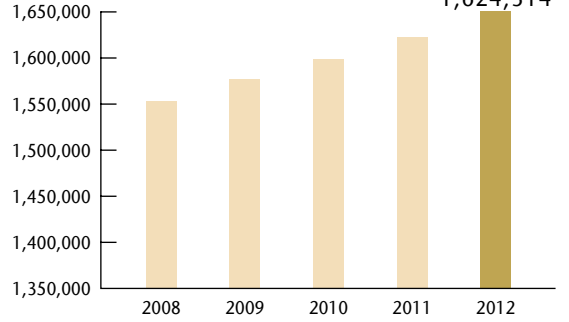
## Sales(198,391GWh)



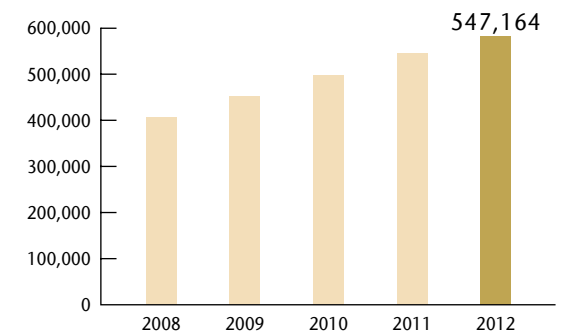
## Power Restoration Time and Frequency of Forced Outages



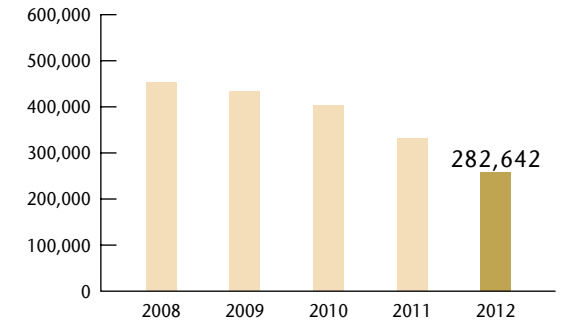
## Total Assets(million)



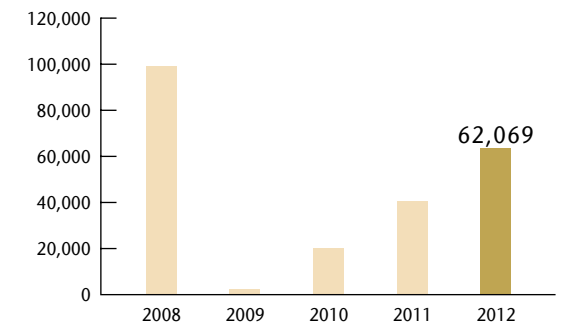
## Operating Revenues(million)



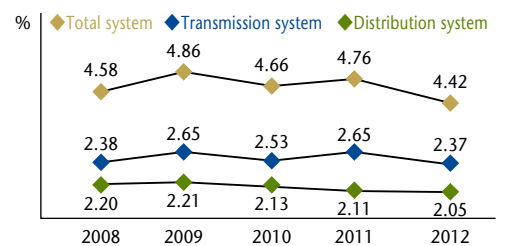
## Stockholder's Equity(million)



## Loss Before Income Tax(million)



## Line Loss



This is the seventh issue of the annual Sustainability Report published by the Taiwan Power Company ("Taipower"). This edition of the report follows the G3.1 guidelines of the Global Reporting Initiative (GRI) as well as the accountability principle standard (APS) set forth in AA 1000 APS (2008). The information compiled and disclosed here is based on three principles: inclusivity, materiality and responsiveness.

The focus of Taipower Sustainability Report 2013 is on "Sustainability Issues". The purpose of this report is to demonstrate to the public and the stakeholders Taipower's dedication and achievements in the management and implementation of sustainability through the following 3 aspects: management, social responsibility, and environmental sustainability.

## Period Covered by the Report

From January 1 to December 31, 2012 (for the sake of complete disclosure, some major issues in this report also cover data in 2011 and part of 2013).

## Scope of the Report

This report contains data and information regarding sustainability issues and achievements within the areas of management, social responsibility, and environmental sustainability. Taipower has voluntarily adopted the GRI G3.1 Guidelines and AA 1000 standard for the preparation of this report and this report has been confirmed by SGS-Taiwan to conform to GRI level A+ requirements.

## Inquiries

This report is available in both Chinese and English. The complete report (in the PDF format) can be downloaded from the Taipower website ("<http://www.taipower.com.tw/>"). In addition, Taipower has a dedicated webpage of Sustainable Development to with stakeholders about its performance in related to sustainability issues. Our next sustainability report is planned for publication in the third quarter of 2014.

Taipower sincerely hopes that this report will provide interested parties with a better understanding of Taipower's sustainability efforts. If there is any suggestion or comment, please contact with us as follows:

### Taiwan Power Company

Contact: Department of Corporate Planning Address: 12F No. 242 Sec. 3 Roosevelt Rd., Taipei, Taiwan (R.O.C.), 10016  
Telephone: +886 (02) 23666463 E-mail: [d00303@taipower.com.tw](mailto:d00303@taipower.com.tw) Website: <http://www.taipower.com.tw/>



2007 Sustainability Report/ 2008 Sustainability Report/ 2009 Sustainability Report/ 2010 Sustainability Report/ 2011 Sustainability Report/ 2012 Sustainability Report/  
Published in August 2007 Published in August 2008 Published in August 2009 Published in August 2010 Published in August 2011 Published in August 2012



This report is printed with environmentally-friendly paper free of heavy metals and environmentally-friendly soy ink

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# Profile of Taipower

The Taiwan Power Company ("Taipower") was established on May 1, 1946. It is a vertically integrated power utility. Its business scope includes: generation, transmission, distribution and sales. It's the sole power sales company in Taiwan. The electricity produced by independent power producers (IPPs) and cogeneration is sold in bulk to Taipower, who in turn sells this to the customer.

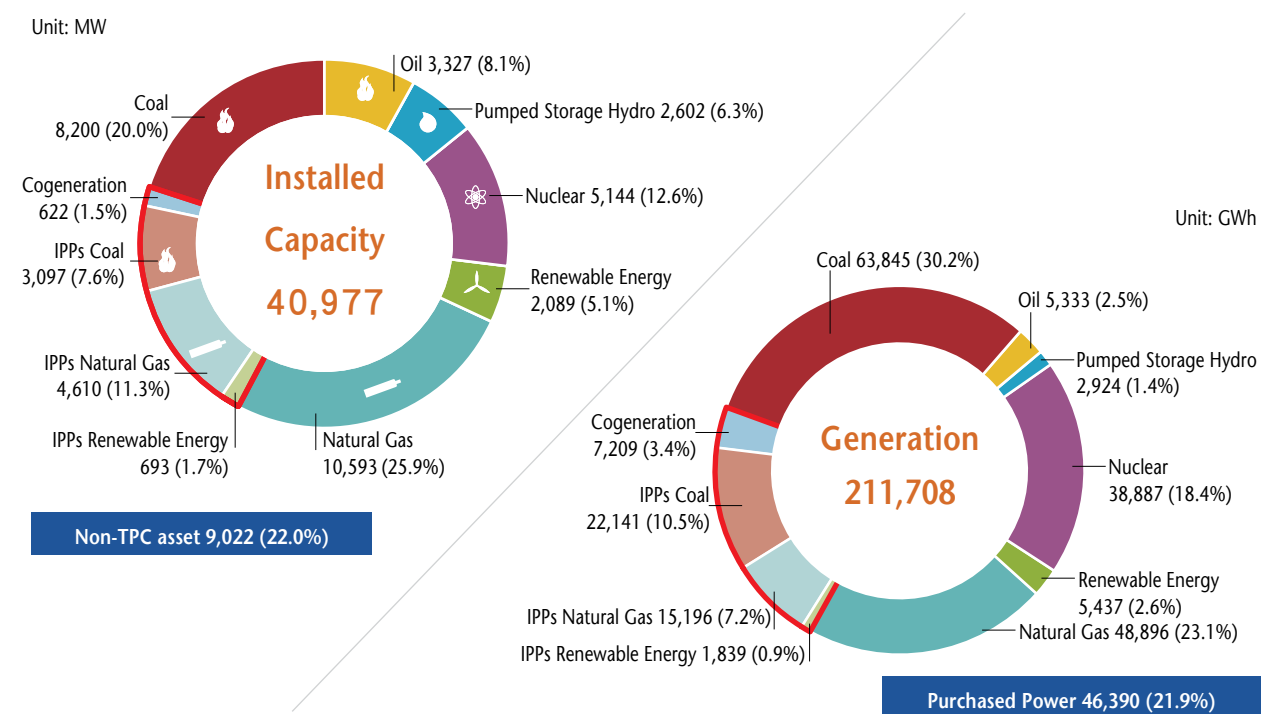
As of the end of 2012, the total installed capacity of Taiwan's power system reached 40,977 MW, of which Taipower accounted for 31,955 MW and non-Taipower assets for 9,022 MW. The major energy sources comprise hydro, thermal, nuclear, and renewable. The power grid includes 592 substations and transmission & distribution lines totaling 364,000 KM, providing electricity to a population of 23 million people in Taiwan, and the offshore islets of Penghu, Kinmen, and Mazu.

Taipower is a public utility shouldering the obligation of power supply. To meet future power demand and ensure sufficient power sources, in recent years, Taipower has been actively promoting various large-scale power development projects in the hope that the generation mix of base, mid, and peak loads can be improved and the reasonable reserve margin target figure of 15% can be maintained. To establish a sound power grid, the implementation of the Seventh Power Transmission and Substation Project will continue. In addition, a smart power grid will be developed in phases to cope with the requirements of high-tech industries for power quality.

Taipower understands quite well that it will confront challenges from competition in the near future after the liberalization of the power market. A broader international vision, a combination of more efficient management technologies and management strategies that focus on social responsibility and sustainable development will all be keys for Taipower to maintain its sustainable growth and improvement.

Recently, Energy Conservation and Carbon decrease have become important management issues for the global power industry. In order to demonstrate its concern about the global warming issue, and to comply with the government's Sustainable Energy Guidelines, Taipower has formulated the Greenhouse Gas Regulation Strategy to undertake the measures of greenhouse gas reduction and inventory monitoring, increase its ratio of renewable energy, and promote green electricity to fulfill its responsibility as a corporate citizen in the international power industry.

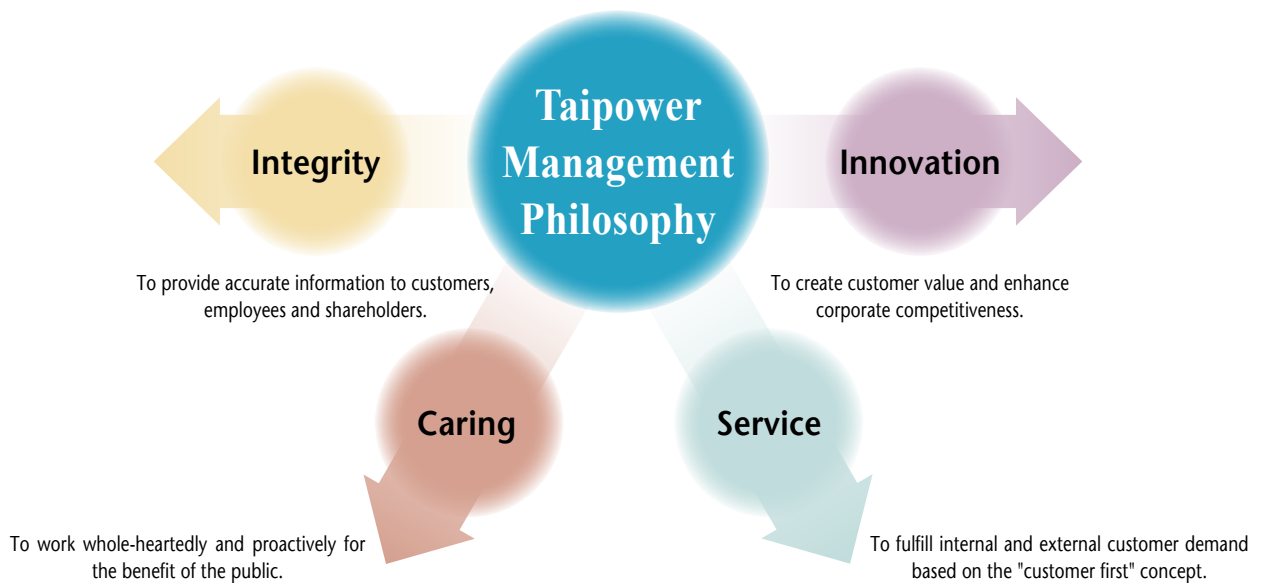
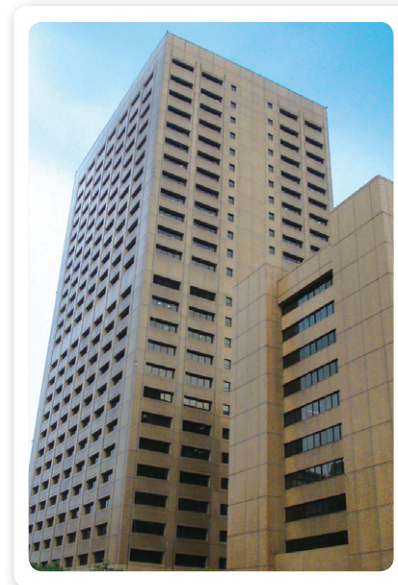
## Installed Capacity and Generation Mix in 2012



Founded: May 1, 1946  
 Coverage: Taiwan, Penghu, Kinmen, Matsu areas  
 Capital: NT\$330 billion  
 Stock: 96.92% government-owned, 3.08% private-owned  
 Total assets: NT\$1,624.314 billion  
 Employees: 27,082  
 Customers: 12.97 million

Resident	11,599,262	Industrial	209,932
Commercial	987,286	Others	180,141

Installed capacity: Taipower System: 40,977 MW,  
 (31,955 MW Taipower-owned)  
 Power generated and purchased: 211,708 GWh  
 Energy sales: 198,391 GWh



Taiwan Power Company's corporate culture is "people-first" and "the pursuit of excellence", "integrity" and "caring" are the management philosophy of "people-first", "innovation" and "service" are the management philosophy of "the pursuit of excellence".

### Taipower Mission

To offer diverse services to satisfy customers' demands, to promote the nation's competitiveness, and to protect the interests of employees and shareholders.

### Taipower Vision

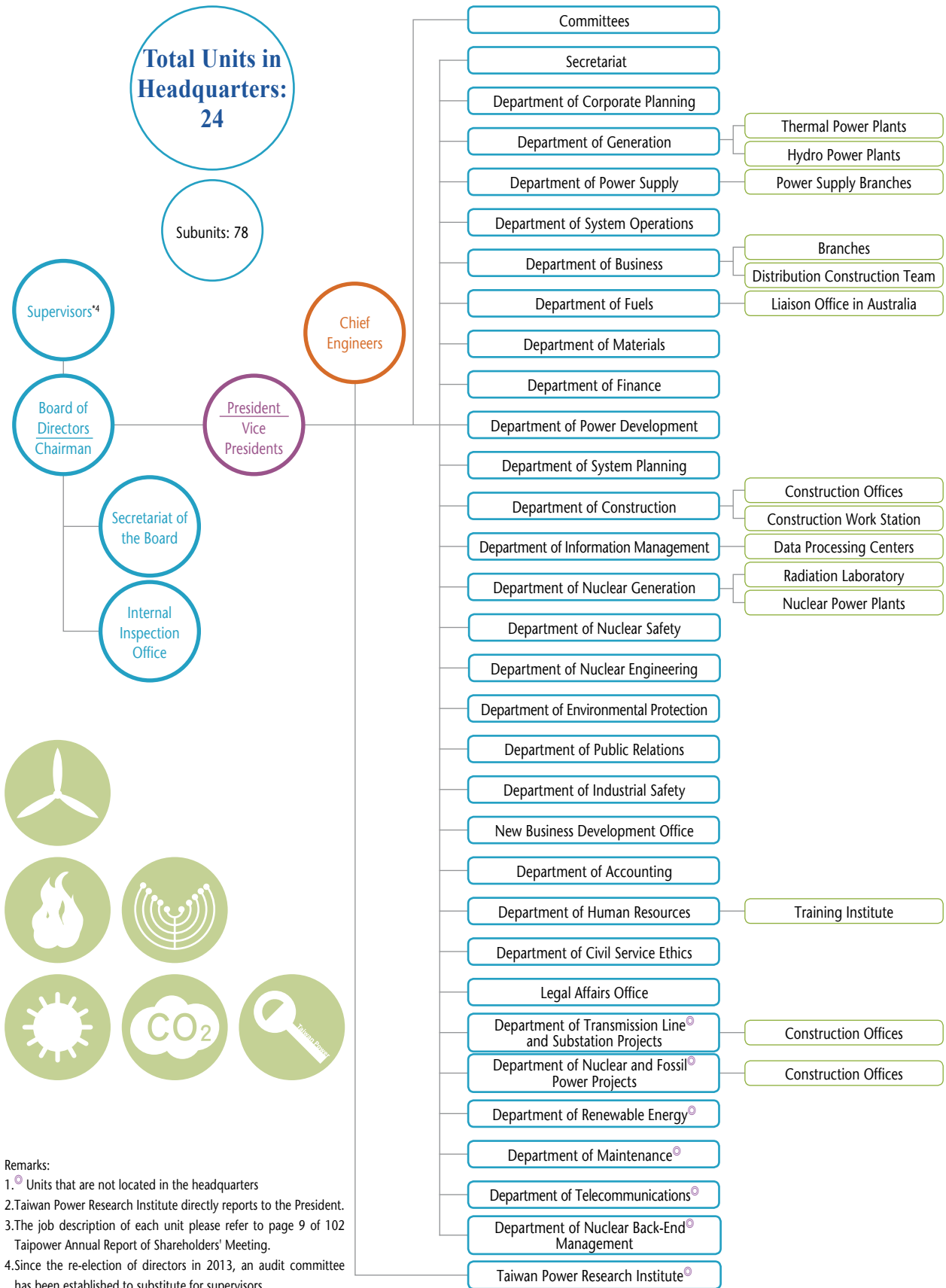
To become a prestigious and world-class power utility group.

## Power Development and Power Grid Map





### Taipower Organization Chart



Remarks:

- <sup>1</sup> Units that are not located in the headquarters
- Taiwan Power Research Institute directly reports to the President.
- The job description of each unit please refer to page 9 of 102 Taipower Annual Report of Shareholders' Meeting.
- Since the re-election of directors in 2013, an audit committee has been established to substitute for supervisors.

# Letter from the Chairman

Taiwan Power Company (TPC) faced severe challenges in 2012. Electricity tariffs have not yet reflected the true costs of fuels to a more reasonable rate and the concern of nuclear safety and that is dealt a blow to TPC's financial structure and sustainable operation.

TPC is a state-owned enterprise with a history of 67 years. It is a part of the glorious memory of Taiwan. In the past, TPC was in charge of both planning and implementation of power supply policies. This helped lay down a solid foundation for the later economic boom in Taiwan. Now, the role set by the government and the expectations of the people have changed and TPC has to face a diversity of stakeholder concerns. TPC has not only to focus on its profession but also to communicate with the public, making TPC's status, transformation and efforts well-known.

After taking over the position in 2012, I adopted the philosophy of integrity for running the company. In addition, in order to foster a better understanding of TPC's operation for the public and I devoted to allowing the public to access to real-time information of TPC and to release information as soon as possible through TPC's website. All information about the operation of TPC is transparent and can be easily accessed to external stakeholders and the public.

Even though being affected by many external factors, we still disclose the information honestly. The Taipower 2012 Sustainability Report was awarded a silver medal in the service industries category of the "2012 Taiwan Corporate Sustainability Report Awards" held by the Taiwan Institute for Sustainable Energy (TAISE); Taipower also won an award of special recognition in the "Corporate Climate Change Communication Awards." These credentials exemplify the recognition of our efforts.

The most critical issues for TPC now are not the tariff schedules and the cost of Nuclear Plant No. 4 but the clarification of the role of TPC. In the past, TPC was considered the policy-maker of energy for the government and the manager for power industry and the public assumed that it was a government sector. However, this circumstance no longer exists and we must redefine our role and change this mindset. Taipower is a corporate entity with corporate governance, and is responsible for its operational and financial performance. As such, TPC should take both the conflicts between government policy and the role of corporate into account. Although the change and clarification of its new role cannot be done overnight, I encourage our colleagues to make progress through every policy- and investment- making process, such as pursuing reasonable cost, efficient operation, reasonable profit, and social responsibility. At the same time, we must bolster communications between TPC and stakeholders inside and outside the corporation for understanding and support. As stated in the 2012 CSR, we have demonstrated our efforts and results as follows:

**1** We have renewed our official website to make it user-friendly to disclose the actual status of TPC operations. The content of the web pages is diverse and a much broader scope of information is disclosed. There are 21 topics set out in details, such as fuel procurement, tariff schedules, financial information, and the progress of Lung Men Power Plant, which the public concerns. Furthermore, it reveals personal stories, including that how Taipower's staff devoted themselves day and night, despite the danger or difficulty. There are anecdotes describing the "nuts and bolts" of the daily lives and the team spirit of TPC people on the web pages to give insights into how hard and whole-heartedly we serve the public.

**2** TPC has set up five task forces for upgrading its operational performance and responding to the operation improvement team of Ministry of Economic Affairs. These include the "Fuel Coal Purchase Review Team", "Land Vitalization Team", "Materials Management Project Team", "Long-term Financial Planning and Capital Spending Control Team", and the "Human Resources Development Team". Each has included external experts as team members to cover the broadest horizon and make recommendations. In the same year, TPC reduced costs and increased revenue by NT\$9.443 billion; enhanced the efficiency of fuel coal procurement by NT\$6.981 billion; reduced or deferred investment in facilities by NT\$6 billion; and reduced fuel and materials inventory levels by NT\$599 million.

**3** The Environmental Protection Administration approved the 1995-2010 preliminary project of the Talin Power Plant in 2012 which reduced of 178,000 tons CO<sub>2</sub>. The registration of the "7.03 MW Photovoltaic Power Plant Project" and the "Sea Water Power Plant at Wan Song and Bi Hai" was also approved by the EPA accordingly.

4

TPC held the “Light of Love – Year-End Senior Citizens Attentive Care” activities and offered scholarships for students from low income families. In addition, TPC also organized the story telling program in all kindergartens of Taiwan called “I Love Mommy Earth”. This program aimed at educating children on energy saving and environmental protection and urged them to expand the concept of energy saving into the families.

5

TPC has received many awards for its outstanding achievements which include the “Transmission and Distribution Project of the Year”, “Innovative Power Technology of the Year”, and “Information Technology Project of the Year” awarded by the Asian Power Award 2012 held in Singapore and the 12th Gold Awards in Public Construction Projects with “the Wan Song Hydro-electric Power Plant Expansion Project”, “the Underground High Voltage Power Cable Work between Nuclear Plant No.1 and Xi Zhi-Song Hu”, and “the Tou Zhong Power Transformation and Distribution Work Project” with two distinguished performance awards and one winner award domestically.

In the future, TPC will commit itself in its operations, and make its work, effort and the nature of the power industry be well-known. TPC will manage its operations from the public perspective, and make all disclosures transparent and intelligible to the public. In addition to the nuclear safety, TPC will keep communicating with the public on the issues of nuclear power and tariff schedules, and improve the efficiency of operations. By introducing the deregulation of the power industry, TPC will reengineer its organization to revitalize operations management and reduce costs, create value, bolster customer relations, and maintain corporate social responsibility in its entity. Making it both satisfy the needs of the customers and achieve the corporate goal of TPC. TPC has a bright future in Taiwan based on the corporate perspective and the company is sustainable. Therefore, I would like to ask for your continuing support and your opinions are valuable to TPC's improvement.

Sincerely,  
Chairman

*Hwang, Jung-Chion*



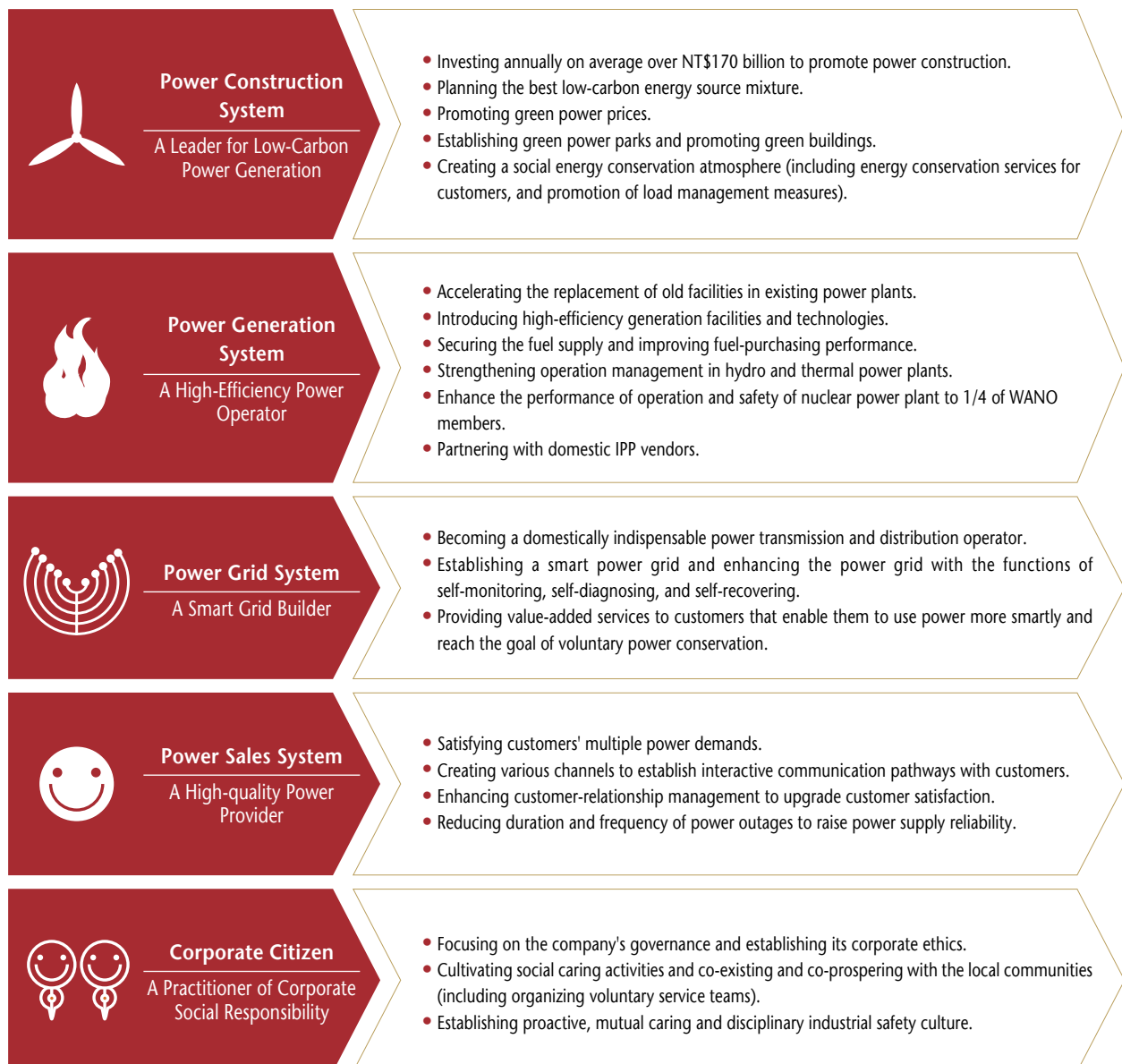
# Key Issues of Sustainability

## Operational Mechanism for Sustainable Management

Taipower holds that, sustainable development of the power industry should be based on energy security, economic efficiency, and environmental quality in order to satisfy the requirements of future development. These include:

- Utilize limited natural resources efficiently. Support national economic development and social progress with the minimum power development and efficient management.
- Balance energy security, economic efficiency, and environmental quality during power development.
- Fulfill our corporate social responsibility and create a bright future together with our shareholders through a business philosophy of integrity, caring, innovation, and service.

### Future Development Paradigm

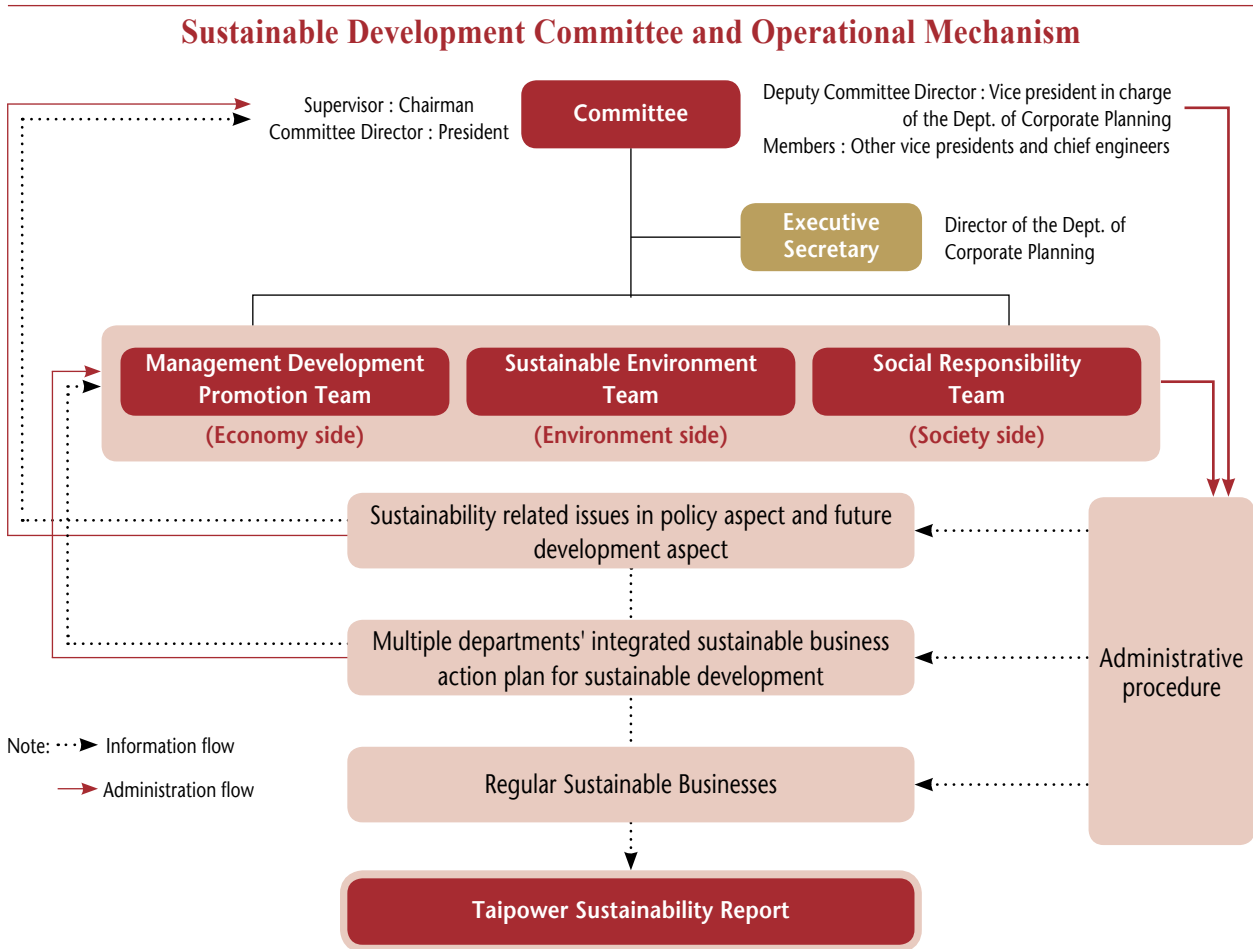


## Sustainable Development Committee and Operational Mechanism

In order to promote business development, safeguard the ecological environment, fulfill our corporate social responsibility, and encourage sustainable development-related work, Taipower set up the Sustainable Development Committee. Its mission and organization chart are as follows:

- Long-term corporate strategic planning and integrated management improvement.
- Environmental protection and ecological maintenance strategic planning.
- Corporate social responsibility strategic planning and promotion.
- The report on 10-year corporate strategic planning and sustainability.
- Other resolutions and follow-up management and control actions.

The Sustainable Development Committee is comprised of a Management Development Team, a Sustainable Environment Team and a Social Responsibility Team. Each team is chaired by appropriate directors and Vice Presidents are in charge of the relevant units.



Regular businesses related to each team will be handled by each team individually based on Taipower's administrative procedures; for businesses involving more than one unit, the convener of the involved teams should convene meetings and handle the matters through administrative procedures based on resolutions made at the meetings. Important matters concerning corporate strategy and future development should be submitted to the Sustainable Development Committee for consideration.

The Sustainable Development Committee convenes regular annual meetings on the review of sustainable development action plans and the editing of a Sustainability Report. The preparation for editing the future 10-year management strategy will also be done. Each team should convene a meeting at least once a year to discuss the revisions of the economic, environmental, and social aspects of the Taipower Sustainable Development Action Plans, follow up on the previous year's actions, and propose key issues of sustainability in the Sustainability Report for review by the Sustainable Development Committee.

## Identification of Key Sustainability Issues

Emphasis of the Taipower Sustainability Report 2013 is still on the selection and response to key sustainability issues. We believe this will benefit and help Taipower in its management and its coping with the challenges brought by rapid changes of society and the environment. Through the following four stages of discussion, the sustainable issues to be disclosed in this report were identified.

- Stage 1** Clarify, comprehend, and compile 2012 information from the following sources:
- Relevant laws and regulations
  - Stakeholders' (internal and external) feedback and suggestions
  - Media and the Internet reports
  - Organizational representatives
  - International power industries

- Stage 2** The "Sustainability Issues Meeting" was convened with representatives from the "Management Development Promotion Team," "Sustainable Environment Promotion Team," and "Social Responsibility Promotion Team". After a comprehensive discussion in accordance with Taipower's sustainable development principles and strategies and management development direction, each aspect of sustainability issues and key sustainability issues were confirmed. The importance of the issues was based on:
- Whether if issues have a significant impact on the future business development of Taipower
  - The concern extent of general public and shareholders
  - Taipower sustainability principles, wider economic, environmental and social impact

- Stage 3** The conclusions from the discussions were narrowed down to become the "Taipower Sustainability Issues Matrix". To ensure the completeness and accuracy of the issues, representatives from the sustainability promotion teams worked with the relevant units to define the issues and framework of the Taipower Sustainability Report 2012.

- Stage 4** The members of the Taipower Sustainable Development Committee conducted the final review to ensure the completeness and accuracy of "sustainability issues" and "response information," while also taking into consideration the stakeholders' viewpoints.

## Identification of Stakeholders

Taipower's stakeholders including industrial groups, government, representatives, shareholders, customers (including business users), as well as the surrounding plant communities resident, academic institutions, power companies or the general public, employees, contractors, media, etc. In order to appropriately respond to the needs of important stakeholders, Taipower reference AA1000 SES identification six principles as a basis for identification of important stakeholders.

In addition, based on four-stage identification process of key sustainability issues mentioned above, Taipower identified key sustainability issues in 2012 including:



- |  |  |
|--|--|
| <b>1</b> Promoting Reasonable Tariff Schedules                               | <b>6</b> Strengthening Nuclear Power Generation Safety                           |
| <b>2</b> Improving Financial Depreciation                                    | <b>7</b> Ensuring Fuel Supply Security and Stability                             |
| <b>3</b> Developing Renewable Energy and Improving the Energy Source Mixture | <b>8</b> Refining Customer Services  |
| <b>4</b> Enhancing Energy Conservation and Climate Change Adaptation         | <b>9</b> Strengthening Human Resources   |
| <b>5</b> Promoting Smart Grid  | <b>10</b> Enhancing Innovative Applications                                      |
|  | <b>11</b> Enhancing Information Disclosure and Internal & External Communication |

## Key Sustainability Issues and Response

In the sustainability development committee meeting of 2012 at Taipower, the committee members reviewed and discussed the result of the key sustainability issues and management performance in 2011, and listed the result of the key sustainability issues in 2012:

Key Sustainability Issue	Commitment	Goal	2012 Performance Achievements
<b>Promoting Reasonable Tariffs</b>	Keep disclosing information related to operations to enhance the public's understanding of Taipower; establish a reasonable tariff schedule adjustment mechanism and promote reasonable tariff.	<ul style="list-style-type: none"> <li>Tariff rates should reflect the costs of generation properly and encourage customers to use power efficiently through providing correct pricing signals; Taipower should avoid cross-subsidy of electricity so that the setting of tariff rates are fair.</li> </ul>	<ul style="list-style-type: none"> <li>The financial information has been continuously and regularly disclosed in Taipower's official website and is accessible by the public. According to a resolution of the Legislative Yuan made in 2008 regarding tariff schedule adjustment, the fuel costs have been reviewed quarterly since Q4, 2008. The "Quarterly Weighted Average Cost of Fossil Fuel per Unit of Power Generated and Purchased" has been disclosed online periodically.</li> <li>In 2012, under the three principles of "reasonable price, energy conservation and carbon emission reduction, as well as the concern for the livelihood of the people", a three-stage implementation of tariff adjustment was approved by the government which was planned to realistically include fuel costs in the pricing system. Keep the public regularly informed of the necessity and rationality of adjustment of the tariff schedule.</li> </ul>
<b>Improving Financial Depreciation</b>	Work with the MOEA Business Improvement Team to accomplish the goals and to improve Taipower's operation.	<ul style="list-style-type: none"> <li>In compliance with the MOEA Business Improvement Team's goals, Taipower aims to reduce costs by NT\$43.8 billion and increase returns by NT\$ 6.2 billion over the next five years (2012~2016) .</li> </ul>	<ul style="list-style-type: none"> <li>In 2012, the cost reduction and returns increase totalled NT\$9.443 billion. Coal purchases amounted to NT\$6.981 billion. Reduced and deferred investments came to NT\$6.0 billion and the costs for stock fuel and material were reduced by NT\$599 million.</li> </ul>
<b>Developing Renewable Energy and Improving the Energy Source Mixture</b>	Provide sufficient energy sources and balance regional power demand and supply.	<ul style="list-style-type: none"> <li>Working in compliance with the national energy policy to achieve the goals of nuclear energy dependence reduction, and the expansion of renewable energy and natural gas for generation.</li> <li>The supply and demand for power should be balanced in the northern, central and southern areas.</li> </ul>	<ul style="list-style-type: none"> <li>Fifty-five integrated and automated wind power forecasting systems have been established in Jhongtun, Kinmen, Mailiao, Changgong and Shihu.</li> <li>Two film-based photovoltaic energy demonstration systems have been set up in the Taipower Building and Gukwan Training Center.</li> <li>A long-term power development scheme has been planned according to long-run load forecasting, the approved and ongoing power-generating projects, the planned power-generating projects , the schedules of completion and commercial operation of the independent power plants and so on. Also, the Taipower report of long-term power development schemes has been produced by considering the energy supply-demand situation (domestic and abroad), emerging generation technologies, renewable energy and the deregulation of power industry.</li> </ul>
<b>Enhancing Energy-Conservation and Climate Change Adaption</b>	Stepwise implement Taipower's "Master Plan on Energy Conservation and Carbon Reduction " according to the goal of carbon reduction and the policy framework announced by the government.	<ul style="list-style-type: none"> <li>Accomplish the goal of carbon reduction set in the "National Master Plan on National Energy Conservation and Carbon Reduction" so as to make emission in 2020 return to that of 2005 and that of 2025 return to that of 2000.</li> </ul>	<ul style="list-style-type: none"> <li>In 2012, the Datan Power Plant and Fongshan Branch carried out the "Guidance Plan for Energy Industry Adaptive Action in Response to Climate Change", to conduct an analysis of the impact of climate change, a vulnerability check and risk evaluation for the facilities within their domain. The Assessment Report of Adaptability on Climate Impact will be completed by the end of 2013.</li> </ul>

Key Sustainability Issue	Commitment	Goal	2012 Performance Achievements
<b>Promoting Smart Grid</b>	Introduce advanced smart grid-oriented technologies for the generation, transmission, distribution and dispatch; improve the reliability and the quality of power, as well as to ensure the connection to the grid.	<ul style="list-style-type: none"> <li>• Improve the automated system for distribution feeders.</li> <li>• Considering the bulk renewable energy connects to the grid, continue to investigate the feasibility of improving the framework of the power system.</li> </ul>	<ul style="list-style-type: none"> <li>• Five hundred new automatic feeders' switches have been installed and incorporated into the monitoring process.</li> <li>• In 2012, 11,700 customers for ultra-high and high voltage services have been incorporated.</li> <li>• The procurement of Web-based IEC61850, 61968, 61970, 62351 Standards (the IEC61850 standard communications protocol was introduced).</li> <li>• A test to analyze the burning behavior of oxy-fuel in small burners was conducted (to assess advanced power- generation technology).</li> <li>• The comparison of the quality of photovoltaic power in summer and winter for high capacity applications (for the monitoring and application of power quality).</li> <li>• Wind power forecasting systems in Kinmen, Changgong and Mailiao were established (to analyze and predict the likely performance of such renewable energy power generation systems).</li> </ul>
<b>Strengthening Nuclear Power Generation Safety</b>	Strengthen the safety of nuclear power generation, and improve operational performance to earn the trust of the public in nuclear safety.	<ul style="list-style-type: none"> <li>• Continue to strengthen and improve the comprehensive assessment of nuclear safety.</li> <li>• Enhance the resistance to earthquake and tsunami.</li> <li>• Streamline manpower/ organizational operation and strengthen nuclear power generation safety.</li> </ul>	<ul style="list-style-type: none"> <li>• Certain improvements have been made according to the comprehensive safety assessment for nuclear power plants.</li> <li>• Evaluate and improve the tolerances of nuclear power plant under earthquake.</li> <li>• A construction project for tsunami protection walls for nuclear power plants has been carried out.</li> <li>• Completed pressure tests on all generators in nuclear power plants.</li> <li>• Established a procedure for emergencies. Conducted composite drills for preventing disasters.</li> <li>• In 2012, nuclear power supply accounted for 38,890 GWh.</li> <li>• Two scrams occurred in 6 generators over the entire year with an average capacity factor at 89.9%. Annual reduction of carbon emission reached 32.60 million tons.</li> </ul>
<b>Ensuring Fuel Supply Security and Stability</b>	Strengthen energy supply security to ensure a stable fuel supply for power generation.	<ul style="list-style-type: none"> <li>• Provide fuels to the power plants in the right quality, the right quantity, and at the right time to ensure power supply security and stability.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensured fuel supply security and stability and maintained fuel needed for power plants at safety inventory targets.</li> <li>• In 2012, the total fuel procurement expense were reduced by NT\$10.183 billion.</li> </ul>
<b>Refining Customer Services</b>	Listen attentively to customer comments and give their concerns and interests proper care, following Taipower's pledge of "Customer First".	<ul style="list-style-type: none"> <li>• Make sure the customers receive the full attention of Taipower staffs. Make improvements in service and always bear our "Service Focus, Customer First" commitment in mind.</li> </ul>	<ul style="list-style-type: none"> <li>• Attentive Service: Branches were directed to provide attentive services and to improve the environment in and around the business halls; to ensure a friendly atmosphere with a focus on marketing, and to take all the practical and feasible measures needed to ensure high quality services.</li> <li>• Water &amp; Power Associated Services: Since October 1, 2012, Taipower allied with the Taiwan Water Corporation to provide a cross-agency integrated service named "Water &amp; Power Associated Services" as a one-stop water and power service that accepts five summary transactions between the two utilities, these include ceding, address modification, application of serviceman's dependant benefits, application of E-billing and the setting of collection for bill payment.</li> <li>• Customer Service Workshop: Several sessions of the "Customer Service Workshop" were held for front-line staffs and those from Taipower customer service centers who were trained in alignment with "Customer First" thinking.</li> </ul>



Key Sustainability Issue	Commitment	Goal	2012 Performance Achievements
<b>Strengthening Human Resources</b>	The training of electrical professionals to ensure continuity in inheritance of vital know-how, and to enhance company competitiveness.	<ul style="list-style-type: none"> <li>Recruiting new employees as planned, upgrading workforce structure, cultivating professional capacity and strengthening utilization of human resources.</li> </ul>	<ul style="list-style-type: none"> <li>In 2012, Taipower recruited 611 new employees and 51 casual employees to avoid the shortage of human resources.</li> <li>Continue to provide a wide array of training programs for employees to fulfill their needs for self-improvement and carry on know-how.</li> <li>Established a scholarship system in universities at the graduate level and post-graduate level in disciplines of special skills and uncommon subjects as incentive for training professionals to possess special skills in power generation.</li> </ul>
<b>Enhancing Innovative Applications</b>	<p>Enterprise Resource Planning (ERP): Integrate all Taipower IT systems, including Financial accounting, financial management, procurement and materials management, and internal auditing control management etc., to establish a more efficient enterprise core process.</p> <p>Innovative Applications: Continue to enhance the management of strategic knowledge and to improve technical capacity for R&amp;D. Promote results and encourage further R&amp;D to keep creating knowledge, innovation and applications.</p>	<ul style="list-style-type: none"> <li>Since August 2012, all units of the company have been connected to the system.</li> <li>Introduce new methods and build up the existing core technology to handle on-site technicalities concerning the generation, transmission, distribution and sales, to provide customers with sufficient and reliable power.</li> <li>Use innovative technology that includes the development of products, improvements in processes, the introduction of new technologies, technical innovation and patents and technical promotion, with the final objective of reducing costs and increasing benefits.</li> </ul>	<ul style="list-style-type: none"> <li>Fifty-seven units were connected to the system in November 2011, and a further 63 units, including sales and engineering were linked to the system in August 2012. The phase 1 of the project was completed fully.</li> <li>The outcomes for R&amp;D and innovative in 2012 include:               <ol style="list-style-type: none"> <li>(1) NT\$447,815 (thousand) income increase ;</li> <li>(2) NT\$5,194,370 (thousand) cost reduction;</li> <li>(3) Comprehensive assessment <math>\alpha</math> : 4.08;</li> <li>(4) 185 reports;</li> <li>(5) 88 theses;</li> <li>(6) 36 new products;</li> <li>(7) 24 procedure improvements;</li> <li>(8) 12 new technology;</li> <li>(9) 19 technical innovations;</li> <li>(10) 5 patents;</li> <li>(11) 113 technical services;</li> <li>(12) 17 technical promotions; and</li> <li>(13) 7 policy directions.</li> </ol> </li> </ul>
<b>Enhancing Information Disclosure and Internal and External Communication</b>	Ensure good internal and external communication and enhance information disclosure to allow the public to learn about the actual operations of the company.	<ul style="list-style-type: none"> <li>Update the official website with the latest information in real-time. Continue to review and upgrade the content of the webpages, to accurately reflect current operation information.</li> </ul>	<ul style="list-style-type: none"> <li>In 2012, Taipower's official website disclosed information in six categories: "business information", "power generation information", "power supply-demand information", "customer information", "environment information" and "engineering information".</li> </ul>





# Governance with Accountability and Business Improvement

In a spirit of accountability, Taipower strengthened its corporate governance and risk management system, continuing to educate staff with corporate ethics, enhancing information transparency, and upgrading the effectiveness of corporate sustainable management performance.

## Corporate Governance and Corporate Ethics

On October 22, 2010 at the 11<sup>th</sup> (616<sup>th</sup>) meeting of the Board of Directors, the "Corporate Governance Regulations" were reviewed and approved to reinforce corporate governance. In addition to strengthening the function of the Board and the supervisors, improving the internal control structure and respecting the rights and interests of stakeholders, it also helped to establish a viable disclosure system to provide information on operation, and financial condition, The mechanism covers:

### Strengthening the Functions of Directors and Supervisors

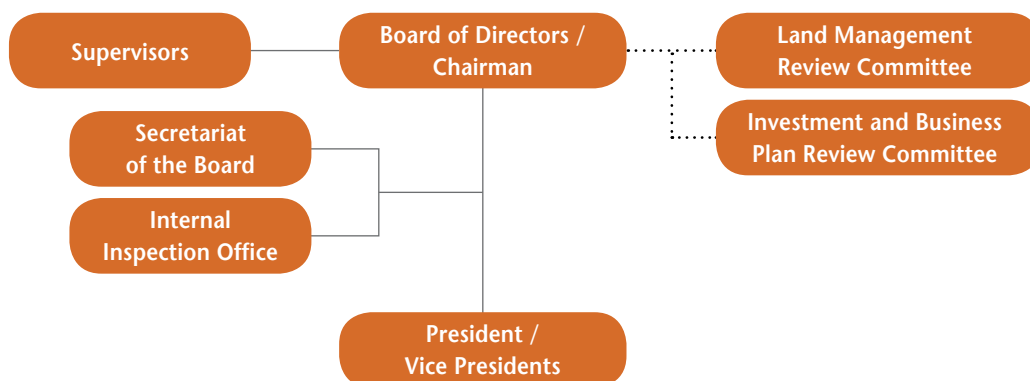
#### Strengthening the Functions and Effectiveness of the Board of Directors

In 2012, the Taipower Board of Directors consisted of 15 directors (14 male and 1 female directors), including 5 managing directors, 2 independent directors (with 1 being a managing director) and 3 labor directors. A board meeting is convened regularly each month. There were two functional project review committees for "Land" and "Investment and Business Plan." The two committees review important issues submitted by the managerial sector (all the units under the supervision of the president) before the meeting is held. In 2012, Taipower had called for 11 meetings with the "Land" Review Team and 14 meetings with the "Investment and Business Plan" Review Team. The resolutions of these meetings helped to forge the decision of the Board and are vital for the efficiency and effectiveness of the Board in parliamentary procedure and operation. Organization of the Board of Directors and Supervisors.

According to the provisions of the Securities and Exchange Act, independent directors attend the Board Meetings to review the issues submitted to the Board. During 2012, independent directors functioned as regulated and did not reject or defend any issues or resolutions made by the Board. Furthermore, according to "Operation Directions for Business entities of Ministry of Economic Affairs to Implement Independent Director System", the Ministry of Economic Affairs and Financial Supervisory Commission of the Executive Yuan approved that Taipower will appoint three independent directors at the 2013 Standing Meeting of shareholders to form an audit committee to substitute supervisors?

The Board of Directors provides a supervisory function according to the "Corporate Governance Regulation" and its performance is not only considered for annual assessment, but is also incorporated in the report of the Annual Meeting of Stakeholders and published through the "Market observation post system" as a reference for stakeholders.

### Organization of the Board of Directors and Supervisors



Note: Since the re-election of directors in 2013, an audit committee has been established to substitute supervisors.

### Carrying out the Functions of Supervisors

The 3 supervisors attend Board meetings, monitor the operation of the company and carry out regular and irregular checks on the company's financial and business conditions, and provide their comments in the Shareholders' Meeting. In 2012, the supervisors all exercised their authority abiding by the regulations.

### Strengthening the Effectiveness of the Shareholders' Meeting

Shareholders' Meetings are held once a year to ensure the rights of shareholders' participation and decision-making in company affairs. Minutes of the Shareholders' Meeting shall be recorded and posted on a government website and distributed to shareholders. The 2012 Shareholders' Meeting was held in compliance with the applicable regulations.

### Establishing an Information Exchange Platform for Independent Directors, Supervisors, and Accountants

Taipower appoints independent certified public accountants for audit and certification of its financial statements. The independent directors and supervisors also take part in the assessment of the independence and competence of the accountants and call for regular meetings for information and opinion exchange. Before proceeding to the audit of the financial statements, the accountants will report the audit plan to the independent directors and supervisors. After the audit and certification of the financial statements, the accountants will report to the Board for review and the supervisors review meeting, and will attend the meeting for exchanging points of view.

### Improving the Internal Control Structure

- Taipower should make timely adjustments in the design and implementation of its internal control system in response to changes in laws and environment.
- Taipower should implement its own internal auditing operation, and issue a Taipower Internal Control Effectiveness Statement and publish it in Taipower's annual report and the company's statement.
- The functions of internally project audits and roving audits should be upgraded to enhance internal management performance.
- Information Security (IS) should be undertaken to ensure that each unit is executing IS management properly.

### Strengthening the Information Disclosure System

A public information network was established. The company's operation, financial report, and relevant important information were periodically reported to raise the transparency of the company's operation information.

### Proactively Promoting Education on Corporate Integrity Principle and Ethics Standards

- Under the provisions in the "Integrity and Ethics Directions for Civil Servants" and "Ethics Code for Employees of the ministry of Economic Affairs", it amounted to 221 cases in 42 units which were involved across Taipower in 2012. The cases included: 48 of receiving gifts, 45 about meals, 121 about requests and canvassing, and 7 other cases. The cases recorded by the units were reviewed and confirmed as having been handled in a timely and proper manner according to the relevant rules, no violation were found.
- Taipower held anti-corruption training sessions and awareness campaigns (Ordinance on Integrity) that gave consideration to business attribution, employee attitude and the working environment. The approaches included:
  1. Employee Training: employee training sessions regarding ethics-related laws and regulations etc.
  2. Free Brochure: published books and printed material about the relevant Laws and Regulations were made available to all employees. Compilations of this material were also distributed to units as internal publications and brochures.
  3. Verbal Propagation: invited specialists held seminars and gave lectures about the relevant Laws and Regulations to gatherings of staff.
  4. Audio-Visual Propagation: company policy and the Laws and Regulations were also propagated by audio-visual means.
  5. Other Propagation: awareness campaigns and quiz contests were held and a range of pictures and posters were also used.
- 6. Achievements in 2012:
  - a. Sixty-two units held campaigns focusing on "Education and Training in Integrity". A total of 324 sessions were held. "Education and Training on Integrity" targeted unit employees, as well as some outsourced workforce members and vendors. Those who attended included 3,993 executives, 10,128 non-executives, and 921 others to a total of 15,042.
  - b. Audio-visual means such as electronic billboards, online sharing areas, marquees, electronic signage and e-mail were used and meeting opportunities were also taken to promote integrity-related ordinance. There were 1,097 sessions held and 48,252 members

participated. These included all our employees both executive and non-executive which cover 100% of Taipower employees.

- With respect to incentives for integrity and capability: 8 units implemented 10 incentives and 14 individuals were given rewards.
- A large anti-gift campaign entitled “Integrity-Sunshine-101” was held in Chung Cheng Martial Arts Stadium, Kaohsiung City between April 24 and 29, 2012. This event, which attracted 12,368 participants, helped them understand the actions and the commitment of the government to the pursuit of integrity through diverse interaction.
- The Taipower “Regulation for Periodical Review of the Norm of Professional Ethics and Code of Conduct” was drafted and adopted. This covers details of all the procedures used to carry out periodical review, builds a solid governance system, and strengthens employee accountability and moral and ethical senses.

**In 2012, the company aligned its social responsibility to the Corporate Governance Best-Practice Principles for TWSE/GTSM Listed Companies. Details of this can be found on pages 27 to 30 of the Annual Report of the 2012 Standing Meeting of Taipower Shareholders.**

## Business Strategy and Strategy for New Business Development

The energy prices remain high all over the world and Taipower’s tariff schedule failed to reasonably reflect the fuel costs. The accumulated losses in 2011 amounted to NT\$ 117.8 billion. The government approved the first-phase of tariff schedule adjustment on June 10, 2012 and urged the Ministry of Economic Affairs to form a “Business Improvement Team for Taipower and CPC ” in order to carry out a review of operational costs and performance in four aspects: business efficiency, procurement, personnel and other systems (e.g. deregulation of the power business). However, in view of the economic situation and domestic as well as international commodity prices, implementation of the second-stage tariff schedule for December 10, 2012 was deferred. This was a serious threat to the financial health of Taipower.

Without compromising either its obligation to supply power or stability, Taipower has proposed numerous measures for improving operation. These include, reducing costs, increasing return and enhancing its fuel procurement performance, so as to controlling the investment in capital assets, lowering the stocks of fuel and material, and striving to be released from its political mission, with the expectation of achieving business efficiency by becoming a “Corporate Entity” rather than an “Institutional” one.

Taipower has been working hard to move towards the consumer-oriented “service” by improving its service quality, ensuring good internal and external communication, and keeping its operation information transparent to the public to gain recognition of its attentive power services, Taipower had made complete disclosure of all the issues of public concerns through the internet and other media. The management has also made concerted efforts to enhance operational efficiency, and lower production costs.

### Business Strategy

With respect to the company approach to business, four fully comprehensive strategies have been adopted: “Creating Value”, “Reducing Costs”, “Proper Exercise of Social Responsibility” and “Improving Customer Services”. The related measuring indicators, strategies and plans of action have also been established to facilitate planning for future focus.

### Strategy for New Business Development

As to new business development, Taipower expands its business domain under the principle of “expanding the core power business, enhancing capacity, and managing side businesses.”

Side Business	Colliery mining with Bengalla in Australia, outsourcing training services, land development, property management, contracted operation and maintenance of electricity, contracted external maintenance and research and experimentation.
Re-investment	The Taiwan Stock Exchange Corporation, the Taiwan Cogeneration Corporation, the Australian Bengalla Coal Mine Company Pty Ltd, the Australian Bengalla Agricultural Company Pty Ltd and the Australian Bengalla Coal Sales Company Pty Ltd.
Other Business	New businesses under discussion include those concerning education, leisure, advertising and the reuse of coal ash as a resource.



## Risk Management

To cope with the rapidly changing internal and external management environment and to understand and manage possible operational risks, Taipower has launched the "Risk Management Implementation Plan." Through identifying, analyzing, evaluating and handling all the factors involved with short, mid and long-term risks, control measures can be implemented and mobilized as an immediate response to effectively manage any potential risk events. In 2012, there were 14 risk items, including "Power supply stability and safety", subject to risk control. (Note: The risk of events likely to occur 10 years in the future are regarded as long-term; 3 to 10 year risks are mid-term; and those likely to occur within 1 to 3 years are short-term risks.)

In 2012, Taipower's extra-high operational risks included "Losses caused by a failure of the tariff rate to reflect the increased fuel costs" and three other items. Risks below the tolerance line include "Power supply stability and safety" and seven other items. All these risks are continuously monitored by responsible units to reduce the incidence and impact of potential risk events.

The risk situations related to "Losses caused by a failure of the tariff rate to reflect increased fuel costs" include "having an operation deficit and failing to make a reasonable profit", "imbalance between supply and demand on the international coal market, leading to an increase of coal price", "increases in the price of fuel and natural gas caused by an increase in oil prices around the world" and "insufficient company capital to meet essential construction costs."

In response to the foregoing risk situations, Taipower has taken the following steps to control and minimize the impact of these events:

- Drawing up an operational plan to improve business performance and reduce the overall operational costs;
- Holding various campaigns to promote the concept of saving electricity and regularly introduce incentive measures such as "Energy Conservation Competitions" to make consumers be willing to save electricity, which in turn reduces power consumption and saves power supply costs;
- Closely controlling the demand for oil and natural gas to minimize the emergent need for purchase and to ensure a stable coal supply;
- Updating the developments in the capital market to properly plan the timing and securing of funds, and using different funding tools in an agile way to reduce the interest burden and financial risks.

### 2012 Taipower Risk Paradigm

Impact	Distribution					Risk Items
5					1	1 Losses caused by failure of the tariff rate to reflect the rising fuel costs.
4	6 7			2	10 4	2 Power construction impeded. 3 Aging workforce structure preventing the passing on of technology.
3		3 5		8 12		4 Disputes on tariff schedule adjustment. 5 Power supply stability and safety.
2		14	13			6 Release of radioactive material from nuclear power plants caused by natural disasters. 7 Delays of interim fuel storage facilities for spent nuclear fuel.
1			9			8 Employee safety and health related accidents. 9 Environmental events having an adverse impact on company image.
	1	2	3	4	5	10 Lungmen construction failed to meet quality and budget on time.
	Probability of occurring					11 Hacking of the information system.
Remarks:						12 The outbreak of labor-management disputes and employees' protests.
1. Black line in bold represents the risk tolerance line.						13 Damage to power equipment caused by natural disasters.
2. Definition of Colors						14 Lack of operational windfarms.

## Promoting Reasonable Tariff Schedules

The pricing of power needs not only to meet financial requirements, but also to support reasonable compensation rates of return. The income from sales must not only balances operational expenses but also provides reasonable profit for the dealer to allow the investment and construction required for power development.

The planned roadmap for a reasonable tariff schedule includes:

Short-term goals	<ul style="list-style-type: none"> <li>Strive to realize the Second-phase tariff adjustment and establish a pricing mechanism that truly reflects the market price.</li> <li>Taipower will propose to the government to draw up a supplementary budget to address Taipower's operational loss incurred by providing power to remote islets. Taipower will also request Government to authorize Taipower to include the expenses related to the Renewable Energy Development Fund in the selling price of electricity.</li> <li>Taipower will negotiate with related government agencies to compile budgets that account for Taipower offering reduced tariff incentives under the leadership of the MOEA.</li> </ul>
Mid- and long-term goals	<ul style="list-style-type: none"> <li>In addition to fuel prices, there are other factors that impact tariffs, including the generation mix of power produced and purchased, depreciation, interest, operation and maintenance costs and other projects. As a result, in the long-term, an overall tariff review mechanism that allows electricity prices to reasonably reflect the cost of electricity should be established, promoting energy saving and carbon reduction and ensuring sustainable management of the electricity industry.</li> <li>In order to prevent the cost of tariff incentives from being passed on to other customers and causing them to bear an unfair burden, the Electricity Act should clearly state that the budget of subsidy for the specific recipients needs to be compiled by industry competent authorities accordingly. Also, an "Electricity Rates Consultation Committee" should be established for the purpose of reviewing all tariffs, tariff incentive recipients and incentive ranges.</li> </ul>

The impact after tariff rate adjustment, the impacts on families, industrial and commercial, and commodity prices:

	Description
Household Expenses	<ul style="list-style-type: none"> <li>On The Survey of Family Income and Expenditure 2011 report issued, by Directorate General of Budget, Accounting and Statistics, Executive Yuan, household electricity accounted for 1.89% of total expenses. Given that the first phase adjustment in 2012 ,residential price &amp; household expenses rise 4.2% &amp; 0.08% respectively.</li> <li>In the 2012 adjustment plan, the electricity rate for residential customers (about 2/3 of the total) who use less than 330 Kwhs, or 660 over two months, would not be affected by the tariff rate adjustment.</li> </ul>
Industrial Costs	<ul style="list-style-type: none"> <li>According to "2011 Transactions at Buyers' Price" produced by the Directorate General of the Budget, Accounting and Statistics, Executive Yuan, power expenses in the industrial sector accounted for 2.12% of the total manufacturing costs. Given that the 2012 1<sup>st</sup>-phase-adjustment for industrial users represents a 12.8%, increase in the rate, an industrial user would face an annual cost increase of 0.27%.</li> </ul>
Consumer Price Index (CPI)	<ul style="list-style-type: none"> <li>According to the information released by the Directorate General of Budget, household energy consumption accounts for 2.2% of the CPI. Given that the 2012 2<sup>nd</sup>-phase-adjustment would increase the residential electricity price by 4.2%, the annual CPI would increase by 0.09%.</li> </ul>

## Improving Financial Depreciation

### Reducing Costs

Continue to exercise measures for cutting expenditure and raising revenue

After the 2013 plans for cutting expenditure and raising revenue are approved by the Ministry of Economic Affairs, Taipower will implement them in full according to the set goals, to improve business performance.

#### Business Improvement Team

In cooperation with the "Taipower Business Improvement Team" established by the Ministry of Economic Affairs in April 2012, Taipower has formed the "Coal Procurement Review Committee", a "Land Activation Task Force", a "Material Control Task Force", a "Long-Term Financial Planning and Capital Expenditure Control Task Force" and the "Human Resource Development Task Force" for these important issues to actively perform improvement, with focuses on the following aspects:

- Slowing down investment in fixed assets and reviewing target reserve margins timely.
- Reducing policy burdens and requiring government budgets.
- Activation of real-estate assets.
- Raising revenues and lowering administrative expenses.
- Facilitating electricity liberalization over the long-term and improving quality of service.



## Performing control measures on capital expenditure

The “Long-Term Financial Planning and Capital Expenditure Control Task Force” was established in August 2012 to properly manage budgets for the purchase and construction of fixed assets. In addition, the “Power Planning Task Force” was established in 2013 for the review of the cost effectiveness of power planning and development.

## Implementing Reasonable Tariff Schedules

Taipower will continue to advocate the implementation of the Second Phase adjustment of the tariff rates in October 2013 as scheduled, as well as future annual review and adjustment of electricity prices.

## Gradually reducing the policy burden

As a state-owned business, Taipower is obliged to provide electricity at a discounted rate to certain customers as laid out in the Electricity Act and other applicable laws and decrees. These discounted rates include the “Rate for Substations of Electrified Railways”, the “Rate for Public Water Systems”, the “Rate for Public Streetlamps”, the “Rate for Schools”, the “Rate for Agricultural Use” and the “Rate for Residents in Lanyu.”

Taipower bore these policy-level duties and it caused Taipower's deficit. Taipower will consult with related government agencies to draw up budget supplements to help cover lost revenue due to tariff incentives, aiming to maintain regular power industry operation. In addition, providing power to remote islets during the period of 2000 to 2011 brought deficit of NT\$48.4 billion. In response, Taipower has formally requested the government for supplemental funding year after year, receiving the response that Taipower should find ways to absorb the costs. The electricity prices have failed to reasonably reflect the costs for a long time and now this has placed a broad and inescapable burden of deficit upon the company.

To alleviate further financial degradation, Taipower will, according to Article 14 of “Isolated Islands Construction Act”, petition the government to budget for making up the operational deficit caused by off-shore islands’ power supply and to allow Taipower to add the amount it pays to the Renewable Energy Development Fund to the electricity prices, as supported by Article 7 of the “Renewable Energy Development Act.” In addition, Taipower will continue to review the existing preferential pricing measures, and under the direction of the Ministry of Economic Affairs, discuss the matter with the relevant agencies and request a budget to make up the amount of the discounts given.

# Business Improvement

## Goals and Results of Business Improvement

After the government expressed the intention of adjusting electricity prices in early 2012, it became strong public opinion that Taipower should improve its internal management. In response to a public voice from all sectors of society about its deficiencies and price adjustment, Taipower has worked with the Business Improvement Team of the Ministry of Economic Affairs (from April 2012) on a review of 26 separate issues concerning four aspects, including business efficiency, the procurement and personnel systems and others matters such as electricity liberalization, and the “Report of a Review for Taipower Business Improvement” completed at the end of June.

With great effort from all our employees, the goals for business improvement for 2012 were all achieved as scheduled. We shall continue to work to enhance the changes perceivable to the public, and to improve communication and information transparency to earn their trust and support.

Business Improvement Goals for 2012-2016	2012 Results
<ul style="list-style-type: none"> <li>• Reducing costs by NT\$43.8 billion</li> <li>• Increasing income by NT\$6.2 billion</li> <li>• Improving coal procurement performance by NT\$25 billion</li> <li>• Reducing or deferring investment by NT\$172 billion</li> <li>• Reducing fuel and material stock by NT\$3.15 billion</li> </ul>	<ul style="list-style-type: none"> <li>• Reducing costs and increasing income-Actual amount: NT\$9.443 billion (Target: NT\$ 3.529 billion)</li> <li>• Coal procurement performance - NT\$6.981 billion saved (Target: NT\$5 billion)</li> <li>• Reducing or deferring investment - NT\$6 billion reduced and deferred from the budget (Target: NT\$5.4 billion)</li> <li>• Reducing material stock Actual amount: NT\$599 million (Target: NT\$400 million)</li> </ul>

## Operation of Five Task Forces

In 2012, to speed up operational reorganization, Taipower established several new task forces, the “Coal Procurement Review Committee”, the “Land Vitalization Task Force”, the “Material Control Task Force”, the “Long-Term Financial Planning and Capital Expenditure Control Task Force”, and the “Human Resources Development Task Force” to handle major issues and actively reform its business operations. Each of the panels has both internal and external members who provide more macroscopic and proactive ideas and opinions for implementation.

### Land Activation Task Force: Enhancing Assets Activation

To strengthen its operational mechanism and function, the Land Vitalization Task Force was formed with the General Manager as convener to further improve the performance of asset activation. Experts in Real Estate, as well as members from the Industrial, Government and Academic fields were appointed as advisory commissioners. In 2012, two consultation meetings were held to collect professional recommendations for future activation of Taipower assets and three panel meetings were held to facilitate the progress of all cases.

Assets in the greater Taipei Area, or in areas where local governments had urged development, were selected as a first batch of activation targets. These targets have been planned for development and activated by means of joint construction, participation in urban regeneration or tendering for construction. Currently, Taipower takes five indicative projects as priority, including “Land in Jiaosi, Ilan”, “Land in CBD3, Kaohsiung”, “Land of the Old Office Facility on Heping E Road”, “Land of the Cargo Warehouse in Nangang” and “Land of the Primary Substation in Banqiao.” The tendering for construction on Land #1 in Jiaosi, Ilan was awarded to and contracted with a tenderer in 2012. The actual profits of the development came to NT\$369 million, that reached the goal for asset activation for 2012.

### Taipower Short-, Middle- and Long-Term Goals for Assets Activation

Item \ Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Activated Number	1	2	1	2	6	4	1	1	1
Activated Area (ha.)	0.26	0.79	5.31	2.03	2.06	4.29	16.25	3.62	0.70
Development Profit (Unit: NT\$ 100 million)	3.69 (Actual Amount)	7.00	30.00	9.24	125.29	292.82	1.90	225.00	0.43

Note: The profits in the table are royalty incomes (cash earnings) in construction and joint development cases; they are divided into market price of the assets (asset increments) in joint construction and urban regeneration cases; and are rentals (cash earnings) in cases of multi-objective use substations.

### Long-Term Financial Planning and Capital Expenditure Control Task Force: Reasonable Planning Assets Investment

In the past, to facilitate industrial and commercial prosperity and enhance the living standard, Taipower focused on an ample and reliable supply of safe power with no limits on capital expenditure and investment. However, since 2003, when world fuel prices rose so sharply, the electricity prices approved by the government have been far from the reflection of the true costs. As a result, Taipower has suffered serious deficit and is unable to raise loans to cover capital expenditure.

To address this issue, Taipower has established the “Long-Term Financial Planning and Capital Expenditure Control Task Force” convened by the Chairman and included external experts and scholars as consultant commissioners, for joint discussions and to determine reasonable assets investment.

### Material Control Task Force : Saving Costs for Operational Materials and Stock

To achieve the Taipower commitment to save NT\$4.55 billion in material costs over five years (2012-2016) as part of the business improvement plan, changes had to be made with respect to the sources of materials in both system and implementation aspects to reduce costs for stock and procurement. The “Material Control Task Force” was established in August 2012 to monitor and review the results of the refined systems of material procurement and stock management.





The panel is responsible for controlling the sources of material, directing procurement activities, setting the reduction in material stock and improving the procurement performance. Five meetings were held in 2012 and achievements include “savings in costs for the purchase of operational material” of NT\$771 million (Annual target: NT\$700 million) and “reducing material stock” by NT\$599 million (Annual target: NT\$400 million).

#### Coal Procurement Review Committee: Saving Expenses for Coal Procurement

In 2012, five advisory commissioners specialized in coal procurement were engaged and four panel meetings were held. The amendments to the “Directions for Coal Procurement” were accomplished as well as the formulation for procurement strategies. Plans for the coming years were made as well as a supplement of the disclosure on procurement information. At the end of 2012, the amount saved in coal procurement amounted to NT\$6.981 billion, reaching the annual goal for business improvement. The panel also reviewed a report from Wood Mackenzie, the consultant company specializing in energy sources and mining based in Australia. This report contains suggestions and an assessment of the existing Taipower coal procurement system, strategies, processes and procurement performance for 2012.

#### The Human Resources Development Task Force: Ensuring the Passing-on of Core Technologies and Avoidance of a Manpower Gap

To facilitate human resources development, improve utilization of the workforce, and demonstrate its determination to reform business operations, Taipower established the “Human Resource Development Task Force”. This task force holds regular meetings where experts and scholars are engaged to provide professional opinions and suggestions, to get rid of narrow-minded thinking in this state-owned business and gain new ideas for human resources management. In 2012, two meetings were held with a main focus on the Taipower “knowledge management and heritage of core technology.”

The suggestions made at these meetings have since been incorporated into Taipower HR strategies. These strategies cover six aspects of human resources development, including position planning, manpower allocation, recruitment, training, utilization and retention. Each of these includes specific measures and actions for improvement that will be implemented and controlled by the internal company mechanism to ensure that when facing a future retirement wave, Taipower will be well prepared to achieve the goal of “passing on core technologies and avoiding a manpower gap.”

## Taipower Management Performance and Achievements in 2012

Taipower devised its key performance indicators (KPI) in accordance with the company’s vision, management strategies, current major business directions, important points of the government’s policies and evaluation, and in consultation with the KPI system adopted by world-class energy groups in Europe, USA, and Japan. The corporate strategy of “Creating Value, Reducing Costs, Exercising Proper Social Responsibility and Improving Customer Services” was adopted in formulating the KPIs.

### Core Business Performance

#### Financial Performance

Item \ Year	2012	2011	Variation(%)
Operating Revenue (NT\$ million)	547,164	523,722	4.5
Pre-Tax Loss (NT\$ million)	62,069	43,286	43.4
Net Loss (NT\$ million)	75,786	43,283	75.1
Stockholders’ Equity (NT\$ million)	282,642	362,030	-21.9
Total Assets (NT\$ million)	1,624,314	1,629,499	-0.3

## Business Performance

Perspective	Key Performance Indicators	2011 Actual	2012		Accomplishments
			Target	Actual	
Finance	1. Improve Financial Structure				
	(1) Pre-tax income (NT\$100 Million)***	-432.86	≥-754.51	620.69	😊
	(2) Short-term Liquidity (%)*	-	-20 ~ -10	-21.16	😞
	2. Operating & Maintenance (O&M) Cost Control				
	(1) Power generation O&M cost control (NT\$ cent/KWh)	19.87	≤20.57	18.26	😊
	(2) Power supply O&M cost control (NT\$ cent/KWh)	13.86	≤15.39	13.59	😊
	3. Fuel Purchase Performance (Comparison between the actual purchase price and market price)				
	(1) Coal purchase performance (%)	-8.99	≤-6.6	-9.19	😊
	(2) Uranium fuel purchase performance (%)	-12.53	≤-5.00	-5.84	😊
	4. Power Purchase Expenditure Contro				
	(1) Purchase of IPP-Coal Electricity (TWh)*	21.67**	≥21.36	22.14	😊
	(2) IPP-LNG Plant (NT\$/KWh)	3.81	≤4.14	4.12	😊
	(3) Co-generation large units (NT\$/KWh)	2.24	≤2.38	2.52	😞
	5. Electricity Operation Performance				
(1) Line loss (%)	4.76	≤4.70	4.42	😊	
(2) Economic dispatch performance (NT\$/KWh)	1.63	≤1.79	1.58	😊	
Customers	6. Customer Satisfaction (scores)	87.2	≥86.1	85.5	😞
	7. Power Supply Reliability				
	(1) System Average Interruption Duration Index (SAIDI) (min./customer-year)	18.224	≤19.500	19.050	😊
	(2) System Average Interruption Frequency Index (SAIFI) (freq./customer-year)	0.204	≤0.29	0.298	😞
Internal Processes	8. Industrial Safety Performance				
	Total injury index	3.33	≤3.33	8.81	😞
	9. Nuclear Safety Performance				
	Number of nuclear system trips (freq.)	0	≤1	2	😞
	10. Implementation of Environmental Protection				
	(1) PM emissions (kg/GWh)	19	≤25	20	😊
	(2) SO <sub>x</sub> emissions (kg/GWh)	253	≤340	235	😊
	(3) NO <sub>x</sub> emissions (kg/GWh)	258	≤325	242	😊
	(4) GHG control (g/KWh)	516	≤549	508	😊
	(5) Tree planting (m <sup>2</sup> )	150,000	≥115,000	118,400	😊
(6) Fined for Pollution Incidents (cases)/amount (NT\$1,000)*	9/876	≤20/≤3,280	5/246	😊	



Perspective	Key Performance Indicators	2011 Actual	2012		Accomplishments
			Target	Actual	
Internal Processes	11. Renewable Energy Performance				
	(1) PV systems installed (MW)	6.095	≥1.078	1.017	☹️
	(2) Renewable Energy installed capacity approved (MW)	2.3087	≥15.42	15.76	😊
	(3) Wind and Solar Power Generated (GWh)*	811.6**	≥733	749.0	😊
	(4) Water (excluding pumped-storage) Power Generated (GWh)*	3,094.7**	≥3,826.5	4,707.5	😊
	12. Generation Unit Operation				
	(1) Heat consumption rate for Thermal power unit generated (kcal/KWh)	2,259	≥2,265	2,240	😊
	(2) NLG Power Generated (GWh)*	44,170**	≥44,560	51,949	😊
	(3) Upgrade nuclear power generation performance (excluding the overhaul capacity factor) (%)	99.38	≥98.29	99.95	😊
	13. Energy Conservation				
	(1) Promote energy conservation to customers – amount of energy conserved (GWh)	3,791	≥2,986	4,833	😊
	(2) Self-used electricity reduction (GWh)	159.79	≥95.08	122.26	😊
	14. Improve Base Load Capacity and Regional Balance				
	Capital Expenditure Implementation Rate (%)	97.71	≥95	98.69	😊
	15. Improving power supply quality and regional balance				
(1) The length of transmission lines and the capacity of substation completion rate (%)	107.14	100.00	100.07	😊	
(2) Distribution feeder automation, adding automatic line switches and incorporating them into monitors (switches)*	-	≥500	500	😊	
Learning & Growth	16. Innovation				
	(1) Management cases of core technology knowledge (cases)*	32	≥30	42	😊
	(2) No. of employee proposals	3,680	≥2,289	3,272	😊
	(3) Average training hours of employee per year (hr./employee)	59.4	≥40	55.6	😊
	17. Research and Development				
	(1) Income increase (NT\$ 1,000)	1,042,406	≥381,596	447,815	😊
(2) Cost reduction (NT\$ 1,000)	4,580,219	≥4,636,450	5,194,370	😊	

Note: 1. 😊 represents objective accomplished ☹️ represents objective not accomplished.

2. \* marks an item added in 2012.

3. \*\* marks the actual performance values as disclosed in the Taipower Annual Report 2011.

4. \*\*\* The figures for the 2011 actual performance value come from the approved final accounts of the National Audit Office and the figures for the 2012 actual performance value come from the Taipower proposed account.

## Management Performance over the Past 3 Years

In recent years, due to the stern effort of the government in promoting an energy saving and carbon decrease policy and the success of “The Extension of Electricity Bill Discount for Energy Saving Incentives Measure”, it resulted in only marginal increase in power supply volume over the past two years.

### Power Production and Sales

Item \ Year	2010	2011	2012
Installed Capacity (MW)	40,912	41,401	40,977
Total Production (GWh)	207,380	213,040	211,710
1.Generated by Taipower (GWh)	157,792	162,589	165,323
2.Purchased (GWh)	49,593	50,453	46,385
Power Sales (GWh)	193,313	198,631	198,391
Peak Load (MW)	33,023	33,787	33,081
Customers (thousand)	12,583	12,768	12,977

### Employee Productivity

Item \ Year	2010	2011	2012
Number of Employees	26,828	27,261	27,082
Employee Productivity			
1.Production per employee (MWh)	6,977	7,196	7,296
2.Sales per employee (MWh)	8,548	8,792	8,755
3.Revenue per employee (NT\$1,000)	22,602	23,169	24,147

### Power Supply Quality

Item \ Year	2010	2011	2012
Line Loss(%)	4.66	4.76	4.42
Power Supply Reliability			
1.SAIFI (freq./customer.year)	0.196	0.204	0.298
a.Scheduled Outage	0.063	0.066	0.230
b.Forced Outage	0.133	0.138	0.067
2.SAIDI (min./customer.year)	17.663	18.224	19.050
a.Scheduled Outage	13.952	13.894	13.331
b.Forced Outage	3.711	4.330	5.719

### Operational Performance

Item \ Year	2010	2011	2012
Thermal Power Plant Efficiency (LHV, Gross) (%)	42.52	42.51	42.98
Thermal Power Plant Incidents (freq./unit)	0.46	0.47	0.49
Nuclear Power Plant Generation (GWh)	40,029	40,522	38,887
Nuclear Power Plant Scram (freq./unit)	0	0	0.33





## Corporate Internal Control Effective Management

### Responsibility Center System

The company made reference to its vision, management strategies and major business directions, as well as the important points of government policies. The four-perspective spirit of the Balanced Scorecard was evaluated and adopted to establish several management goals that were to be implemented through the Responsibility Center System. In 2012, the 17 major management goals were: improvement in financial structure, control of operation and maintenance expenses, fuel procurement, power purchase, power operation, customer satisfaction, power supply reliability, industrial safety, nuclear safety, environmental protection, development of renewable energy, generation unit operation, energy conservation promotion, management of power construction projects, improvement of power supply quality and regional power supply balance, innovation and R&D.

### Comprehensive Quality Management

As an answer to public demand for power quality, Taipower has set a "Quality Management System" as the basis for comprehensive quality management, and integrated this into the related management systems to enhance operational efficiency. By 2013, a total of 85 units have secured ISO-9001 certification as recognized by the Bureau of Standards, Metrology & Inspection, MOEA, representing a 100% pass.

In addition, campaigns such as innovative proposals from employees, a quality control circle, accountable management and project improvement have been regularly promoted. In 2012, the Automation Circle of the Taichung Branch introduced an improvement that "enhanced the efficiency of automated optical fiber networks for feeders", the Hypercontrol Circle of the South Area Construction Office "significantly shortened the time required for drawing designs for electrical control systems" in new substations, and Talin Power Plant Dafa Circle added its improvement of "reducing failures of vacuum pumps", and received the "Bronze Tower Award" in the 25<sup>th</sup> National QCC Competition.

### Company-Level Material Management

To fulfill demand for local materials procurement and ensure effective inventory control, the procurement, distribution, storage and transport of material must be centrally controlled. In 2012, the amount of company-level material used reached NT\$10.908 billion, and accounted for 61.56% of the total operating material. This reached a turnover frequency of 4.23, which is much higher than the average figure of 3.72. The average inventory value gradually dropped to NT\$2.576 billion from NT\$3.074 billion in 2006, even though the transmission and distribution expansion projects were still in progress.

### Information Security Management

Taipower retained its ten ISO 27001 (Information Security Management System) verification certificates in 2012 and to strengthen secure email habits in the employees, a social engineering email drill was carried out every quarter. In 2012, the email opening rate dropped from 5.1% in the previous year to 3.02% and the clicking rate dropped from 0.73% to 0.695%. In addition, Taipower established a "Personal Information Protection Promotion and Implementation Task Force", and held several educational training courses to strengthen the measures for personal information protection.

### Financial Management

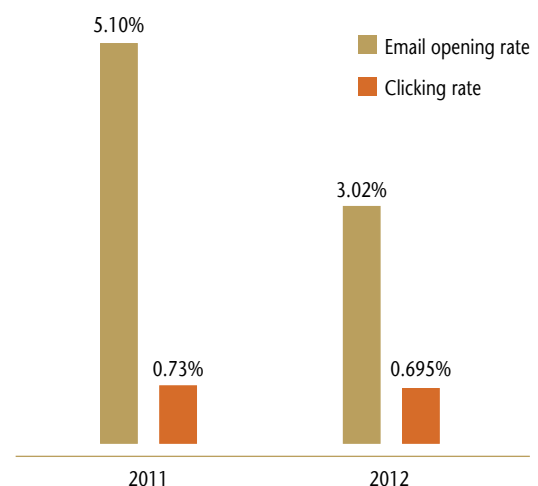
Taipower's credit ratings in 2012 were: Taiwan Rating: long-term twAAA, short-term tw A-1+, outlook-stable. Standard & Poor's: long-term A+, outlook-stable.

### Actual Supplier Expense Breakdown

Unit: NT\$

Item	Year	2012	%
Construction		59,374,447,258	13.16
Assets		358,450,445,767	79.44
Labor		33,390,469,495	7.40
Total		451,215,362,520	100.00

### Taipower Social Engineering Email Testing Statistics in 2011 and 2012





# Strengthen Nuclear Power Generation Safety

## Planning for Nuclear Power Generation Safety

### Comprehensive Safety Assessment of Nuclear Power Generation

To learn from the nuclear accident at Fukushima, Taipower launched a full-range assessment of all nuclear power plants and thereby setting up three task forces (the Nuclear Plant Seismic Margin Assessment Task Force, the Nuclear Plant Tsunami Comprehensive Safety Assessment Task Force, and the Nuclear Plant Spent Fuel Pool Task Force) to review and evaluate the ability of the plants to respond to complex disasters, in four directions respectively, namely, “nuclear power plant site selection,” “design standard,” “operation maintenance,” and “accident management.” Assessments of 11 items and an overall safety assessment were accomplished in the end.,

In addition to exercising emergency preparation drills, the operating nuclear power plants were evaluated by the Atomic Energy Council using comprehensive safety assessment based on a scenario similar to the Fukushima incident in Japan, and confirmed as being free from serious or immediate safety concerns. Taipower’s three running nuclear power plants have proposed 96 enhancement plans basing on the first stage comprehensive safety assessment by the Council. As of the end of December 2012, 89 of these plans had been completed.

The purpose of the assessment is to substantially improve the safety margin of the nuclear power plants by a complete planning and review of their resistance to earthquakes and tsunamis, and by improving their rescue capacity in terms of energy sources, water sources, the spent fuel pools and the integration of resources and preparation. A pressure test was also performed on each nuclear power plant according to EU regulations, so as to further review and confirm its sufficient capability in safety and the results of comprehensive nuclear safety assessment from the perspectives of extreme natural disasters (including strong earthquakes, tsunamis, and extreme climate), loss of power and water, and emergency response.

According to the general examination of the nuclear power plants, their defense-in-depth protection against a complex disaster that is beyond their original design. Take Fukushima as an example, it was raised from level 5 to level 7. When facing an emergency beyond their design capacity that causes the nuclear power plants to lose the water supply to the reactors, and also to lose all power, or when under threat from a post-earthquake tsunami, the nuclear power plants can immediately start the SAM process, to protect people, their assets and the environment with immediate decisions and actions. Taipower has the confidence and capability to ensure the safety of the generation units and also the lives and property of the public.

### Experts On-site Inspection and Testing

After the Fukushima accident, Taipower made an effort to access real-time information from key nuclear power countries and nuclear power organizations through participation in international nuclear power organizations and attendance in seminars and conferences in related technologies. In addition, Taipower also invited domestic and overseas experts in the field to conduct general assessments of all nuclear power plants in order to map out solutions. In the future, Taipower will take the experts’ advice to continue conducting enhancement measure and upgrade the safety capacity of nuclear power plants to protect against disasters through continuous review and improvement.

Taipower complied with the pressure test standards of EU and completed a series of pressure tests on the running nuclear power plants to confirm that the general assessment has helped to upgrade capacity for the protection against emergency and the minimization of damage. The pressure test on the Longmen, Nuclear Power Plant #4, was also completed on April 27, 2012. In March 2013, the Atomic Energy Council invited an expert team combined with the assistance of the Organization for Economic Co-operation and Development (OECD/NEA) to carry out a Peer Review on the “National Report of Pressure Tests on Working Nuclear Power Plants” as confirmation of the results.

## Safety Assessment of Longmen Plant (Nuclear Power Plant #4)

1. Unit #1 at Nuclear Power Plant #4 was already engaged in a pilot run. The civil engineering and the installation of mechanical equipment of Unit #2 are at the final stage. The installation of control panel equipment and the cable, as well as the completion test is in process.
2. After review, the Lungmen Plant (Nuclear Power Plant #4) has been confirmed to be in good order and satisfies the high-standard of design guidelines on safety. Also, the construction operations of this project have been conducted with top priority to ensure its safety. The plant will only be started up when every single safety concern has been eliminated through complete and deliberate procedures of trial runs and tests that verify full compliance of the system.
3. Before fuel is loaded into the Reactors at Lungmen Plant, an expert team from the World Association of Nuclear Operators (WANO), invited by Taipower, will conduct a Pre-Startup Peer Review. The Atomic Energy Council will also invite experts from the Nuclear Regulatory Commission (NRC) to conduct readiness inspection and expert on-site surveys as well as supervision, to satisfy nuclear power generation safety measures.
4. Nuclear Safety Assessment:
  - (1) As requested by the regulatory authority of the Atomic Energy Commission of the Executive Yuan, Taipower has completed the self-examination of the entire Lungmen Power Plant (Nuclear Power Plant #4) to confirm its sufficient capability against earthquakes, tsunamis and drainage system.
  - (2) Review the design of the nuclear power plant and propose measures to strengthen the capacity to resist complex emergencies. These included (a.) a review of the resistance to earthquakes (b.) a review of the resistance to tsunamis (c.) a review of the rescue capability and (d.) measures for management in the case of a severe accident. After the first phase comprehensive nuclear safety assessment by the Atomic Energy Council, a total of 67 enhancement proposals were made, 50 of these had been introduced by the end of December 2012.
  - (3) By following the approaches taken by the EU and Japan, Taipower conducted pressure tests on its nuclear power plants to further review its safety capability and the results of comprehensive nuclear safety assessment. Lungmen Power Plant submitted the "Report of Pressure Test Conducted on the Taipower Lungmen Nuclear Power Plant after the Fukushima Nuclear Incident in Japan" to the Atomic Energy Council on April 27, 2012.
  - (4) As of the end of December 2012, many countries including the US, Japan and EU proposed 32 major actions besides the comprehensive nuclear safety assessment. Taipower will evaluate these actions and proceed with the related operations.
5. To ensure proper and complete running tests, Taipower takes the experience of the power plants of Japan into account and add six items of cross-plant system integration tests for verifying and validating the overall function of distributed and Control System (DCIS).

## The Phase-out Plan of Nuclear

According to the law of the ROC, nuclear power plants shall be phased out in 25 years including the demolition of the facilities. Taipower has mapped out a preliminary plan for decommissioning nuclear power plant and will perform the tasks in five stages:

1. Preliminary operation before phasing out: including the preliminary investigation of the history and specific features of the site, the phasing out strategy, and operation research, the preparation of work plans and the phase out plan (including the environmental impact assessment report), presentation of the plans and documents for approval.
2. Transitional period for shutdown of machines.
3. Stop running stage.
4. Radioactive detection on the environment stage.
5. Recovery of the original site.

In the preliminary plan, Taipower will make appropriate adjustments depending on "the feasibility of technology," "the safety in the phase out process," "cost-efficiency," and "needs in actual operation."

The phase out of Nuclear Plant #1 is complicated and the time frame is tight. In addition, this plant will operate until 2018. We do not have any experience in phasing out a nuclear power plant and we do not have comprehensive legal framework for such a task yet. As such, Taipower has established a task force for such a purpose. At the preliminary stage, cross-function operation will be adopted for performing the duties of phasing out plant #1. In the future, this organization shall be subject to adjustment as needed.

# Measures for Strengthening Nuclear Power Generation Safety

## Adoption of “Defense in Depth” Safety Design Principle

### Natural disaster prevention

- Choosing plant sites located on a huge rock bed to resist strong earthquakes.
- Designing auto safety shutdown of units when strong earthquakes hit.
- Locating power plants at a sufficiently high altitude to prevent being hit by tsunamis and equipping power houses and facilities with strong-typhoon-resistant designs.

### Reduce incident extent and terminate incidents

- When monitoring a safety warning sign that will impact safety, safety protection facilities will be immediately and automatically activated in sequence to deal with the diversity of incidents.
- Preparing at least 2 sets of safety facilities, with each one independent and separated to avoid being a simultaneous failure in a single event.

### Prevent radioactive substance release

- Manufacturing fuel pellet with structure dense and rigid enough to sustain temperatures over 2,000.
- Installing fuel cladding that can sustain high temperature and high pressure.
- Constructing a 30-cm-thick high strength reactor pressure vessel.
- Installing multiple sets of emergency core cooling system with 9 circuits.
- Constructing an over 2-meter-thick reinforced-concrete containment.

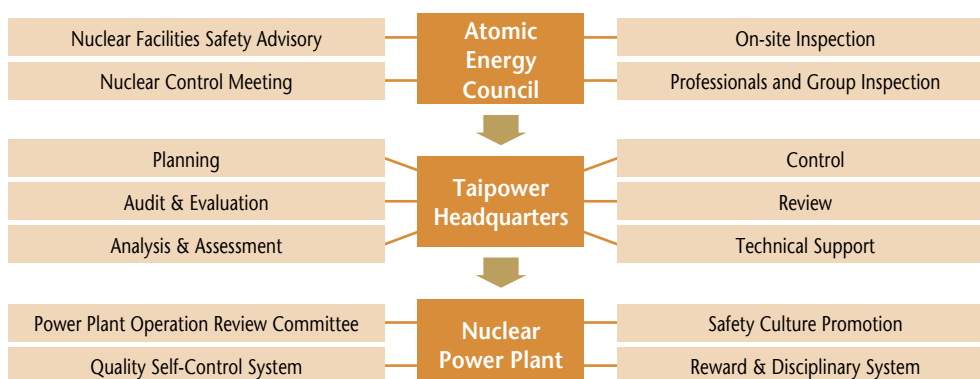
## Reinforcing Control Measures

- Promote evaluations of various quality-guarantees to ensure continuous enhancement of the safety operation of power plants.
- Divide work based on professionalism and proactively conduct the review and control of each important safety measure of the nuclear power plants.
- Strengthen professional control skills and pay attention to the changing trend of safety operation, and introduce operation experience, maintenance experience, and technological information from foreign countries.
- Implement power plant safety level analysis and evaluation to substantiate the foundation of safety management operation.
- Enforce regular, independent auditing operation, screen the weakness of safety performance, and eliminate potential shortfalls.

## Strengthening Nuclear Safety Organization and Culture

- Fortify employees’ attitudes towards safety and cultivate good work habits among them to reduce operational negligence.
- Raise personnel training performance and operation skills.
- Follow a rigorous nuclear quality-guarantee project to formulate implementation procedures and standards for each operation.
- Establish a strict safety and quality control system and a safety management organization to ensure safety at every level.

### Nuclear Safety Management System



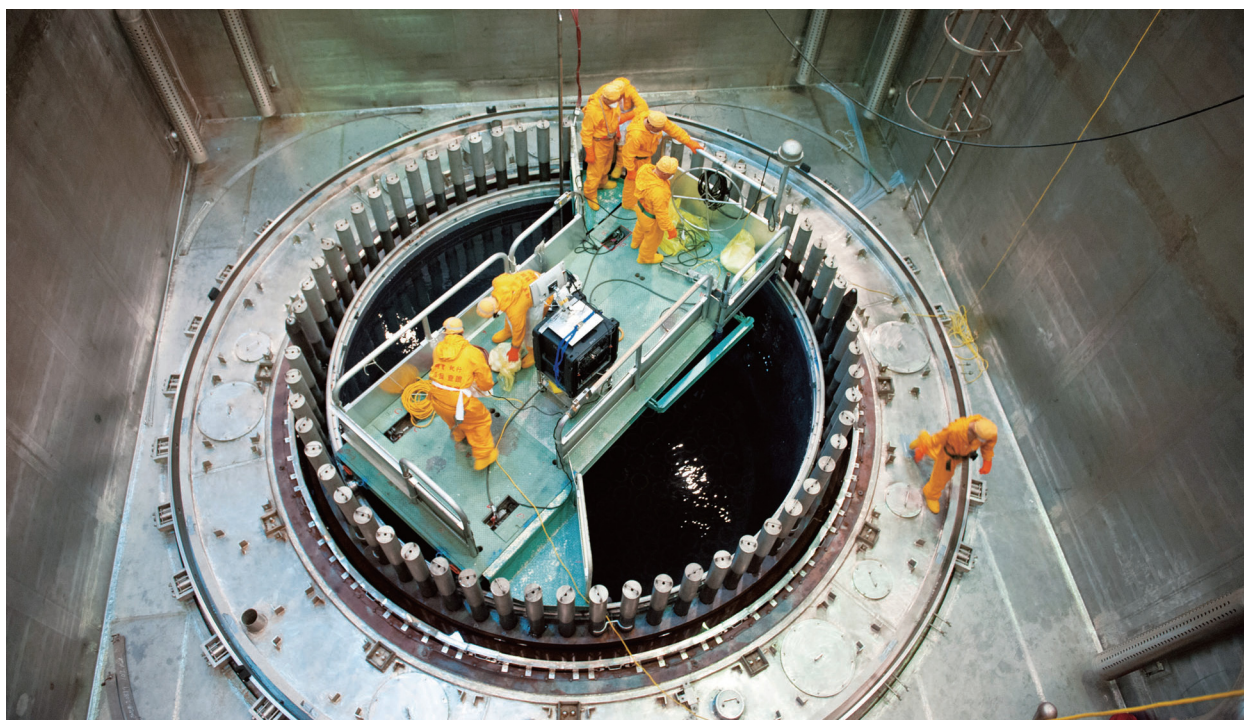




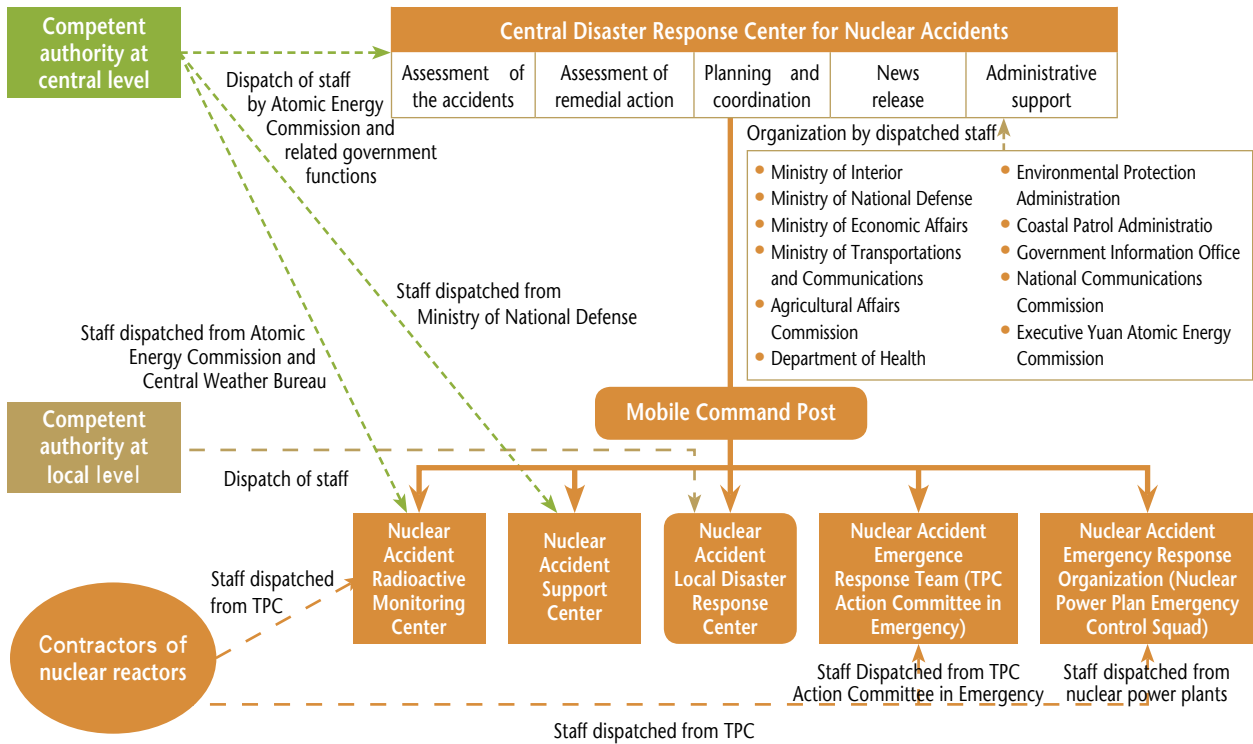
## Emergency Response Mechanism at Nuclear Power Plant

Though viable safety measures have been considered in the design of the nuclear power plants based on the risk management consideration, Taipower has established the “Taipower Nuclear Reactors Emergency Response Plan” in accordance with the “Nuclear Accident Emergency Response Act” and related bylaws as the Taipower emergency response designated unit in responding to nuclear emergencies and as a guideline for all nuclear power plants in the organization and procedure for responding to emergency situations during nuclear accidents.

Regular preparation	<b>Implementing response operation exercises</b>	<ul style="list-style-type: none"> <li>Conduct routine training in response to emergency situations, including: (1) General training: once every other year. (2) professional training: once a year. The training content includes general training in the emergency plan and the professional training in the emergency plan of special duties.</li> <li>All nuclear power plants shall provide training for the personnel assigned to the duties of responding to emergencies (Emergency Response Team), including initial and annual training.</li> </ul>
	<b>Implementing response operation drills</b>	<ul style="list-style-type: none"> <li>Every nuclear power plant has to conduct a drill once a year internally. Taipower, central and local governments, military, police, and medical units are all mobilized to participate in an annual nuclear safety exercise that is by turns held at each nuclear power plant.</li> <li>In addition to supervising agencies, Taipower also invites professionals and scholars to form an evaluation group to assess exercises on each response measure to make the emergency response plan more effective.</li> </ul>
	<b>Establishing emergency response readiness performance indicators</b>	<ul style="list-style-type: none"> <li>Each nuclear power plant shall enforce the “Emergency Readiness Performance Indicators” and the results are reported quarterly to the Atomic Energy Council as part of the control measures of the Atomic Energy Council for ensuring the safe running of the nuclear power units. Related performance indicators including: Drills/ exercise performance. Participation of the emergency response organization in drills. Reliability of the warning and reporting system.</li> </ul>
Response to accidents	<b>Adoting emergency response measures</b>	<ul style="list-style-type: none"> <li>In case of nuclear accident occurrence, nuclear power plants shall comply with related procedures in documentation to perform rescue and relief. Should the accident not be effectively controlled, the neighboring residents and environments will be jeopardized. Proceed to the “Nuclear Accident Emergency Response Act”, hereby, related government functions shall organize into the Nuclear Accident Central Disaster Response Center, Nuclear Accident Radioactive Monitoring Center, Nuclear Accident Local Disaster Response Center, and the Nuclear Accident Support Center for joint action in rescue and relief outside the plants.</li> <li>Taipower shall pay utmost attention to handling, controlling, mitigating, and eliminating accidents that may occur inside the plants as the prevailing mindset. In case of nuclear accidents, Taipower shall immediately establish an emergency response system to ensure the safety of the public.</li> </ul>



## Organization Chart for Nuclear Accident Emergency Response



## Nuclear Safety Operation Performance

The power production of the 6 units in the 3 nuclear power plants amounted to 38,887 GWh, with a capacity factor of 89.9% in 2012. The effective CO<sub>2</sub> reduction achieved by Taipower nuclear power generation reached 32.6 million tons (assuming the CO<sub>2</sub> emission of the supercritical generators to be 0.839 kg/kWh).

Nuclear Safety Performance Indicators	2012 Achievements
Major equipment renewal	• The replacement of rotors in two high-voltage steam turbine units in Nuclear Power Plant #3 was completed.
Unit Scram	• A total of 2 scram events occurred between the 6 nuclear units.
Abnormal Events at Nuclear Units	• Total 9 abnormal events occurred among the 6 nuclear units.
Safety Performance Control Light	• All units remained in the green light, well-performing level.
Others	• The 1 <sup>st</sup> Nuclear Power Plant Unit 2 in full fuel cycle continuously, safely and stably for 500 days.





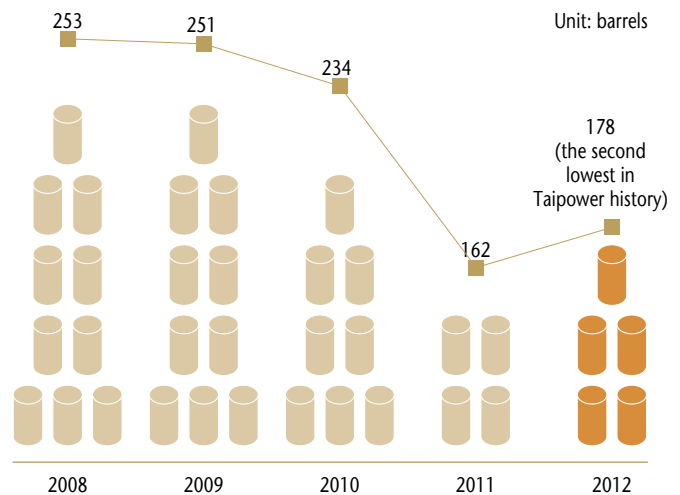
## Radioactive Waste Management

The low-level radioactive waste (radwaste) generated by the nuclear power operation can be incinerated, compressed, or solidified and stored properly in zinc-coated barrels. Under Taipower's strict control, in 2012, the total solid wastes from all nuclear power plants was 178 barrels, which was the second lowest of all years.

Taipower applies a 3-stage strategy for the management of spent nuclear fuel that is used internationally: pool storage, dry cask storage, and final disposal. The capacities of the storage facilities constructed in the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Nuclear Power Plants are all sufficient enough to meet the requirement for the operation period that's set for the power plants. In the future, all low-level radwaste will be sent to final disposal sites.

As the spent nuclear fuel pool storage facilities in the 1<sup>st</sup> and 2<sup>nd</sup> Nuclear Power Plants cannot accommodate the spent nuclear fuel produced over a 40-year period of operation by each reactor, Taipower is currently planning to construct dry storage facilities to enable each power plant to have sufficient storage facilities before the spent nuclear fuel is sent to final disposal sites.

Taking reference of widely used international measures, Taipower will adopt deep geological disposal methods for its spent nuclear fuel final disposal. Currently, Taipower is undertaking the tasks of investigating and evaluating the characteristics of the potential host rocks.



## Enhancing Promotion and Communication with the Public (please refer to pages 71-73)





# Upgrading Power Supply Stability

Despite the pressure coming from rising fuel prices and increasing demand Taipower continues to maintain an optimal balance among improved business performance, reasonable power costs and a reliable power supply by means of careful management of the fuel source and supply, and continuous development and improvement of the power grid and power generation structure.

## Developing Renewable Energy and Improving the Energy Source Mixture

### Promotion of Renewable Energy

Taiwan lacks energy resources and relies on imported fuel sources for 99% of its energy production. To reduce the dependence on imported energy supplies and also to cut down CO<sub>2</sub> emission from the use of fossil fuel, it is necessary to develop renewable energy aggressively and set it as a policy goal. The diversified renewable energies that include wind power, photovoltaic, hydraulic power, tide power and terrestrial heat. In view of its maturity and effectiveness, wind power is the most cost-effective and competitive option.

Photovoltaic Project		<ul style="list-style-type: none"> <li>The first phase of the photovoltaic project will be completed by the end of December 2014 with a total installed capacity of 19,600 kW and production of 24.957 GWh each year. This project is expected to reduce CO<sub>2</sub> emission by 10,500 tons each year.</li> </ul>
Wind Power Project	Project in progress	<ul style="list-style-type: none"> <li>Fourth Phase of Wind Power Project is scheduled to be completed by the end of June 2015. The total installed capacity will be 14,800 kW, generating 43.081 GWh each year. When considered as a replacement for gas-fired production, it is expected to reduce CO<sub>2</sub> emission by 18,000 tons each year.</li> <li>The Penghu Island Low-Carbon Island Wind Power Project is scheduled to be completed by the end of June 2016 with a capacity of 33,000 kW, producing 116.251 GWh each year. When considered as a replacement for gas-fire production, it is expected to reduce CO<sub>2</sub> emission by 49,000 tons every year.</li> </ul>
	Project under planning	<ul style="list-style-type: none"> <li>Fifth Phase Wind Power Project intends to install 19 wind power units with a capacity of 2 MW each at Linkou, New Taipei City; in Dachen, Changhua County; and in Budai Port, Chiayi County, totaled 38 MW. All wind power units are scheduled to be grid-connected and operational by the end of 2017.</li> <li>First Phase Changhua Off-Shore Wind Power Project intends to install 18 to 30 wind power units with a capacity of 3.6-6 MW each, totally 108-110 MW, located near the shore at Changhua. All Wind Power units windfarm units are scheduled to be grid-connected and operational by the end of 2020.</li> </ul>

### Simplifying the Grid-connection Process for Renewable Energy

- After the approval of the Renewable Energy Development Act, applications for grid-connection from the private sector have increased rapidly. Taipower has to weigh the power supply quality, safety, and regional workforce as well as the installer benefits for all these applications. Taipower has made a special effort to simplify the application process. For photovoltaic facilities with an installed capacity lower than 500 kW, the set time frames are:
  - (1) For an application that requires System Impact Analysis, the process shall be completed within 25 working days after the application is filed.
  - (2) For an application that does not require System Impact Analysis, the process shall be completed within 15 working days after the application is filed.
  - (3) For an application under 10 kW and no system impact concerns, we shall try to finish the process within 10 working days.
- To speed up the application process, a compilation of common mistakes found in applications for connection is used as a reference sample for the Photovoltaic Industry Association.

### Power Supply Stability

#### Improving Energy Source Mixture

Although renewable energy is getting important thermal power generation is still the major source of electricity in the short term and hard to be replaced. The ideal ratio of energy sources mixture proposed by Taipower is: Peak load at 10%~15%, medium load at 15%~30%, and base load at 55%~65%.

- Base Load Energy Source

In the past, the plan of coal-fired plants was difficult to execute and the capacity remained very low. In the last decade, the base load power source constituted 41.7%~49.5%, which was far behind the expected level of 55%~65%. In 2012, the ratio was 42.4 %. New sources of base load power are urgently needed.

- Medium Load Energy Source

In recent years, the construction of base load power sources faced by numerous problems. It was coupled with the government policy of the extensive use of fuel gas that most of the newly constructed power plants were equipped with combined cycle natural gas units for medium load. As such, the capacity of these plants in 2012 was as high as 47.8% of the total, to the extent that medium energy sources were much higher than the expected proportion of 15%~30%.

- Peak Load Energy Source

Over the past decade, the capacity of peak load energy sources was between 10.3% and 14.8% of the total, slightly lower than the expected proportion of 10%~15%.

In 2012, an integrated wind power forecasting system was established, covering 55 turbines in the wind power. Observation was conducted at three sites, including the Shulin Service Office, the Nantao Branch, and the South Visitor Center of the Third Nuclear Power Plant to collect data on direct and global radiance for further record and analysis.

#### Improving Operational Safety of Thermal Power Units

- Formulating "Maintenance Strategy for Key Components", Operation Standard", "Maintenance Standard Operating Procedure" and various "Maintenance Guidelines" to perform operation and maintenance work accordingly.
- Setting up licensing system and retraining mechanism for operators.
- Dispatching personnel to take part in "Full Flow Loop Training" to cultivate good working habits.
- In 2012, the total thermal efficiency reached 42.98% (LHV gross), the best in the history of Taipower.

#### IPP and Co-generation Power Purchasing Measures

- IPP (Independent Power Producer): In 2012, there were a total of 9 IPPs under effective power purchase agreement with Taipower, with a total purchase capacity of 7,652.1 MW.
- Cogeneration: Presently, Taipower's purchase of co-generated surplus power has to fall in line with a Ministry of Economic Affairs policy statement made on September 4, 2002, namely "Implementation Regulations for Cogeneration Systems", which established guidelines. Until the end of 2012, the number of wholesale purchase agreements for cogeneration companies was 55 with a total installed capacity of 5,987.6 MW and a guaranteed peak capacity of 2,154.5 MW.
- As Taiwan is a densely populated area, Taipower cannot easily construct new power plants; Taipower has looked to IPPs and other qualified cogeneration systems for power purchasing. In 2012, Taipower's purchases of outsourcing power amounted to 46,385 GWh, which makes up 21.9% of the total generated and purchased power amount of 211,708 GWh. These purchases help Taipower to reduce its use of higher cost fuel oil and natural gas for power generation, and thereby reducing Taipower's overall power generation cost.
- Since in 2008, Taipower started holding discussions with several IPPs for capital expenditure floating interest rate adjustments; yet, failed to garner any agreements. Based on the decision of Taipower's management improvement task force, Taipower began holding talks with several third-stage IPPs starting in late May, 2012, with those talks failing to result in a consensus. Later, Taipower turned to the MOEA's Bureau of Energy for assistance with talks, and proposed that if it failed to bring about consensus after four meetings, Taipower would file a lawsuit against the IPPs.
- On October 11, 2012, the Economics Committee of the Legislative Yuan cut Taipower's budget for power purchases from IPPs. In order to prevent this measure from affecting their normal operation, the IPPS decided to initiate new talks with Taipower and offered a revised proposal. While Star Buck Power, Sun Ba Power and Star Energy Power on November 22, 2012, Kuo Kuang Power, on November 28, held Interim Board Meeting respectively. The meetings resulted in a consensus on the amended agreement with Taipower. As of late January 2013, Taipower has reached a favorable repurchasing agreement with the 4 IPPs partially owned by Taiwan Cogeneration Corporation.

## Demand-Side Management

In order to provide the public with more stable, high-quality power, Taipower promotes load management and energy conservation measures through demand-side management (DSM) strategies, working with its customers to raise power consumption efficiency, change power consumption habits, balance peak and off-peak loads and reduce power waste.

### Load Management

Taipower has been committed to promoting DSM for more than 3 decades and has implemented several different load management measures to improve the load balance of the system. In 2012, Taipower has successfully reduced the load at peak hours by 4,847 MW. This is equal to 14.7% of the total peak load of 33,081 MW and significantly contributed to the balance of system load.

Measure	Description	Effect
Implementing "Season Rates" since 1989	Reduce the consumption during summer by setting diverse prices for different seasons.	Analysis showed that implementation reduced the load by 4,003 MW in the summer of 2013.
Implementing "Time-of-use Rates" since 1979	Encourage customers to use electricity during off-peak hours to reduce peak load and to reflect the cost of power supply during different time periods.	According to analysis, the implementation reduced the load by 3,479 MW on peak days in 2012.
Implementing "Ice Storage Central Air- Conditioning System" since 1991	Encourage customers to make use of off-peak load to store ice in the system and thus reduce the peakload. Power consumption during off-peak hours earns a 40% discount off the regular rate.	
Implementing "Central Air Conditioner Duty Cycling Load Control Measure" since 1991	Central air-conditioning system stops for 15 minutes after every 60 minutes of operation and package air conditioning system stops for 8 minutes after every 22 minutes of operation to reduce peak load.	
Implementing "Interruptible Rates" since 1987	Provide discount rates to encourage customers to reduce peak-hour demand through shifting the demands to off-peak hours to reduce peak load.	The implementation reduced the load by 1,368 MW on peak days.

### Saving Energy

For advocating the governmental policy of energy saving and carbon decrease, and for encouraging the public to form a habit of energy saving practice in daily life, Taipower, in 2012, continued to promote "Power-Saving Initiative Measures" and "Energy Conservation Competitions", with the attempt to encourage electricity save. In addition to the basic 5%, 10% or 20% discount, households of the counties and cities which won the top 3 places of good energy conservation performance were entitled to another 5-15% competition discount according to their rankings. The initiative measures combined with the "competition discount" could result in a discount of up to 35%.

After new measures were taken in 2012, the amount of power saved reached 4.833 TWh, tariff discounts on energy conservation amounted to NT\$9.871 billion, and CO<sub>2</sub> reduction reached 2.59 million tons, equivalent to 7,001 times the annual CO<sub>2</sub> absorption volume of the Da-an Forest Park.

## Power Projects

Energy Type		Project	Description
Nuclear & Thermal Plant Projects	Nuclear	<b>Nuclear #4 Project</b>	<ul style="list-style-type: none"> <li>The Fourth Nuclear Power Project uses two 1,350 MW Advanced Boiling Water Reactors (ABWR) units supplied by GE Hitachi Nuclear Energy Americas LLC. The total investment for this project has been adjusted to NT\$283.9 billion as approved by the MOEA on Oct. 25, 2012. The timeframe is still under evaluation.</li> </ul>
	Thermal	<b>Changgong Thermal #1 &amp; #2 Project</b>	<ul style="list-style-type: none"> <li>The project will involve installing two 800 MW ultra supercritical coal-fired units.</li> <li>As influenced by the schedule of an environmental assessment review, the progress of this project has been deferred for four years as approved by the Executive Yuan on Jan. 4, 2013.</li> <li>At the end of 2012, the project was 4.69 % complete.</li> </ul>

Energy Type		Project	Description
Nuclear & Thermal Plant Projects	Thermal	<b>Tongxiao Renewal &amp; Expansion Project</b>	<ul style="list-style-type: none"> <li>The existing low-efficiency units will be replaced by 4 new 720 MW ± 10% combined-cycle units. They are scheduled for commercial operation in July 2016, January 2017, July 2017 and January 2018, respectively.</li> <li>As of the end of 2012, the project was 3.88% complete.</li> </ul>
		<b>Shenao Renewal &amp; Expansion Project</b>	<ul style="list-style-type: none"> <li>This project aims to install two 800 MW ultra supercritical coal-fired units. The existing Shenao Thermal Power Plant is to be demolished before the new one is constructed. Investment is estimated at NT\$108.9 billion.</li> <li>As the construction of the coal-unloading pier came up against resistance from local people, project execution has not been smooth. According to the Taipower Power Development Program, the date for the commencement of commercial operation for Units 1&amp;2 has been revised to July 2020 and July 2021.</li> <li>As of the end of December 2012, the project was 2.48% complete.</li> </ul>
		<b>Linkou Renewal &amp; Expansion Project</b>	<ul style="list-style-type: none"> <li>The existing units are to be demolished and three 800 MW ultra supercritical coal-fired units will be installed. The total investment amount will be NT\$152.5 billion.</li> <li>The project is scheduled for completion in Dec. 2022, with Units 1, 2 &amp; 3 being scheduled for commercial operation in January 2016, January 2017 and July 2019, respectively.</li> <li>As of the end of 2012, the project was 20.36% complete.</li> </ul>
		<b>Talin Renewal &amp; Reconstruction Project</b>	<ul style="list-style-type: none"> <li>The project called for the installation of four ultra supercritical coal-fired units of 800MW each to replace the five low-efficiency ones. The old ones are being demolished before installation of the new ones.</li> <li>As the fact that the Environmental Impact Assessment (EIA) only allows for two units, Taipower has revised this project to include only two units. The investment was approved at NT\$104.1 billion on Oct. 11, 2012. The two units are scheduled to commence commercial operation on July 1, 2016 and July 1, 2017, respectively.</li> <li>As of the end of December 2012, the project was 12.7% complete. The demolition of Talin Coal Units #1 and #2 will be completed in Sep. 2013.</li> </ul>
Hydro Plant Projects	Hydro	<b>Wanda Expansion and Sunglin Hydro Power Project</b>	<ul style="list-style-type: none"> <li>Wanda Expansion (Wanda Unit #4): This project called for an intake somewhere upstream on the right bank of the Wushe Dam. Water is led from the dam to a powerhouse where is downstream and build half under-ground. A 19.7 MW vertical Francis turbine generation unit (Wanda Unit #4) with an annual production of 46.45 GWh has been installed in this plant.</li> <li>The Sunglin Hydro Power Project: A weir was constructed to collect the tailrace water from the Wanda Hydro Power Plant. The tailrace water runs into a powerhouse which is also half underground. Two vertical Francis turbine generation units, of 18.2 MW and 2.7 MW which have an annual production capacity of 78.8 GWh have been installed.</li> <li>Wanda Unit #4 has been in commercial operation since Sep. 18 2012, and the Sunglin Hydro Power Project has been in commercial operation since Dec. 27, 2012.</li> </ul>
		<b>Tachiachi Hydro Power Plant Chingshan Branch Retrofit Project</b>	<ul style="list-style-type: none"> <li>Four vertical Francis turbine generation units will be installed. Upon completion, the net peak capacity of the power system will be 368MW and the average annual power generation of this plant will be 621.71 GWh. The scheduled date of commercial operation is Dec. 2015.</li> <li>At the end of 2012, the project was 43.32% complete.</li> </ul>
Renewable Power Projects	Wind	<b>Current Status</b>	<ul style="list-style-type: none"> <li>Taipower has completed the installation of 161 wind power units, totaling 286.76 MW.</li> </ul>
		<b>Wind Project Stage 1 (Jan. 2003–Dec. 2008)</b>	<ul style="list-style-type: none"> <li>Fifty-nine wind power units have been installed and put into commercial operation in: Shinmen, Tatan (I), Guanyuan, Shianshan, Taichung Harbor, the Taichung Power Plant and Hengchun. These wind power units have a total installed capacity of 96.96 MW.</li> </ul>
		<b>Wind Project Stage 2 (Jan. 2005–Sep. 2011)</b>	<ul style="list-style-type: none"> <li>Fifty-eight units, with a total capacity of 116 MW, were installed and are in commercial operation at a number of sites, including Changgong (I), Yunlin Miailliao, Sihu, Linko and the Tatan Wind Power Stations.</li> </ul>

Energy Type		Project	Description
Renewable Power Projects	Wind	Wind Project Stage 3 (Jan. 2007~Jul. 2011)	<ul style="list-style-type: none"> <li>Twenty-eight units, with a total capacity of 59.6 MW, have been installed and are in commercial operation at a number of sites, these include the Changgong II, Yunlin Mailiao II, Changhwa Wanggong and Tatan II Wind Power Stations.</li> </ul>
		Wind Project Stage 5 (2012-2015)	<ul style="list-style-type: none"> <li>Twelve wind power units, totaling 14.8 MW, will be installed at the Luchu, Sihou II, and the 3<sup>rd</sup> Nuclear Power Plant II sites. Incorporation for power generation will be carried out in 2014.</li> <li>By the end of 2012, the project was 10.71% complete.</li> </ul>
		Jhongtun, Kinsha & Hushi Project	<ul style="list-style-type: none"> <li>Sixteen units, with a total installed capacity of 14.2 MW were installed and have started commercial operation.</li> </ul>
		Penghu Low-Carbon Island Project (2013~2016)	<ul style="list-style-type: none"> <li>The incorporation for power generation will be conducted by the end of 2015.</li> </ul>
	Photovoltaic	Photovoltaic	<ul style="list-style-type: none"> <li>The photovoltaic project originally planned for the installation of systems at Taipower-owned buildings and land and the selected sites provided by outsiders between 2008 and 2011. By the end of 2011, a total installed capacity of 10.43 MW had been completed. To comply with the directions of the government for an increase of the use of renewable energy and to speed up photovoltaic installation, Taipower has amended the project by adding 9.2 MW to the installed capacity and this has been approved by the Ministry of Economic Affairs. The amended project is now scheduled for completion by the end of 2014, with a total installed capacity of 19.6 MW.</li> </ul>

## Long-Term Power Development

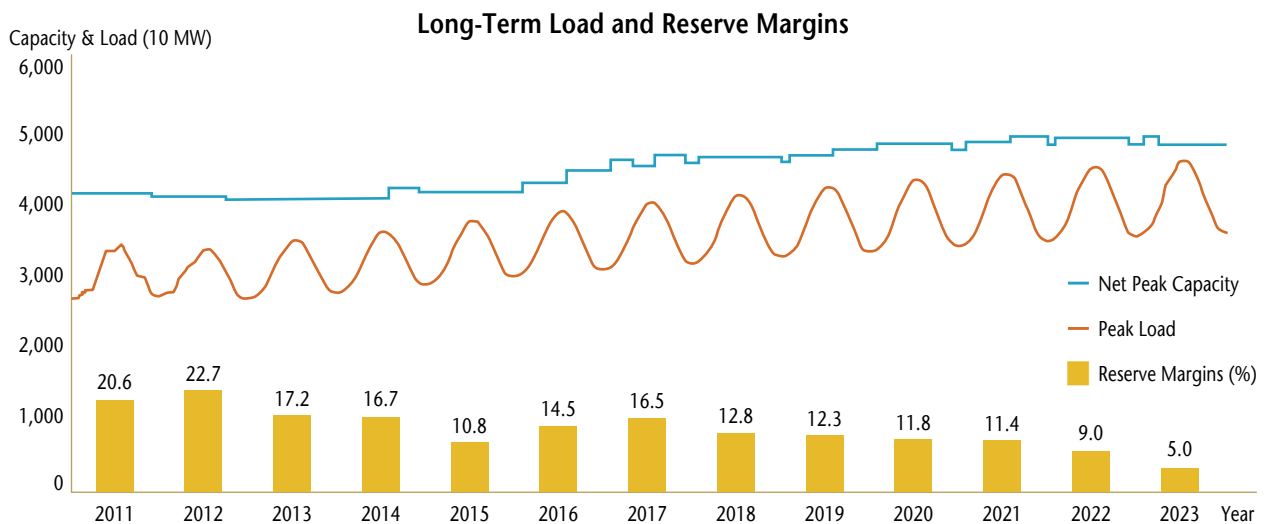
Summary of Taipower 10109 Long-Term Power Development Program (Long-term load forecasting was made with reference to the Taipower middle case of 10108 long-term load forecast revised in August 2012)

Project	Installed Capacity (MW)	Commercial Operation Year
Renewable Energy (Taipower)	429.4	
(1)Con. Hydro	48.6	2012-2020
(2)Other	380.8	2012-2023
Renewable Energy (IPP)	4,637.8	
(1)Con. Hydro	256.7	2020-2023
(2)Other	4,381.1	2012-2023
Taipower Thermal	12,247.0	
(1)Tongxiao C.C. upgrade (Gas)	26.8	2012-2013
(2)Offshore Islands (oil)	60.2	2012-2020
(3)Linkou Rebuild #1 ~ 3 (Coal)	3*800.0	2016-2019
(4)Talin Rebuild #1 & 2 (Coal)	2*800.0	2016-2017
(5)Talin Rebuild #3 (Coal)	800.0	2023
(6)Shenao Rebuild #1 ~ 2 (Coal)	2*800.0	2020-2021
(7)Tongxiao Rebuild C.C. #1-4 (Gas)	4*720.0	2016-2018
(8)Datan C.C #7~10 (Gas)	4*720.0	2019-2022
Lungmen #1 ~ 2 (Nuclear)	2*1,350.0	2014-2016
Total	20,014.2	



Note: The table was made according to the Taipower 10109 Long-Term Power Development Program. The actual date of commercial operation of each unit is subject to change by amendments made to reflect the progress of the projects. The latest information is updated on the Taipower on-line disclosure website ([http://www.taipower.com.tw/content/new\\_info/new\\_info01.aspx](http://www.taipower.com.tw/content/new_info/new_info01.aspx)).





## Strengthening Grid Structure

### Grid Construction Planning

In response to the government promotion of economic policies such as the “i-Taiwan 12 Projects”, Industrial Reconstruction and the New Blueprint of Global Link”, in terms of the provision of power, and to answer the needs of regional growth in power consumption, Taipower has formulated the 7<sup>th</sup> Transmission and Substation Project (after the 6<sup>th</sup> project) to continue the necessary construction of substations and to expand transmission to provide users all over the country with safe and reliable power.

The 7<sup>th</sup> Transmission and Substation Project, with a total investment of approximately NT\$238.9 billion, has been scheduled for implementation from Jan. 2010 to the end of Dec. 2015. The plan calls for 130 new substations to support a total installed transformer capacity of 23,560 MVA. The expanded line length will come to 2,370 CKM. The progress of the project, as at the end of 2012, is shown below:

#### To-Date Delivery Rate of 7<sup>th</sup> Transmission and Substation Project (Jan. 2010 to Dec. 2012)

Item	Total Target	Accumulated Target	Accumulated Performance	Difference
Line Construction (CKM)	2,370.20	899.225	918.304	19.079
		37.94%	38.74%	0.80%
Substation Construction (MVA)	23,559.69	10,683.33	10,805.15	121.82
		45.35%	45.86%	0.51%
General Progress		41.64%	42.31%	0.67%
Budget (NT\$100 million)	2,388.97	976.37	976.15	-0.22
		40.87%	40.86%	Delivery Rate 99.98%

#### To-Date Delivery Rate in 2012 (Jan. 2010 to Dec. 2012)

Item	Total Target	Accumulated Target	Accumulated Performance	Difference
Line Construction (CKM) 50%	178.41	178.410	197.489	19.079
		100.00%	110.69%	10.69%
Substation Construction (MVA) 50%	2,405.93	2,405.93	2,527.75	121.82
		100.00%	105.06%	5.06%
General Progress		100.00%	107.88%	7.88%
Budget (NT\$100 million)	253.47	253.47	253.26	-0.21
		100.00%	99.92%	Delivery Rate 99.92%

## Smart Grid Planning (Including AMI)

Taking the “National Smart Grid Master Plan” as the guide, and attempting to “ensure nuclear safety while reducing dependence on nuclear energy; to create green energy, a low- carbon emissions environment; and to gradually build a nuclear-free home,” as promoted by Taiwan’s latest energy policy, Taipower is following the direction given by the “Smart Grid Promotion Team” of the Ministry of Economic Affairs to implement and promote practices that contribute to the Taipower smart grid.

Overall development is to be carried out in three stages: Short-Term Early Infrastructure (2011~2015), Middle-Term Further Spread (2016~2020) and Long-Term Extensive Application (2021~2030). These will be promoted from the perspectives of smart power generation and dispatch, smart power transmission, smart power distribution, and smart customers. In this way, it is hoped that the goals of “ensuring stable power supply, enhancing energy conservation and carbon decrease, upgrading the ratio of green energy use and leading low-carbon industries” will be reached to enhance the general planning of the national smart grid.

By 2012, major achievements included: installation of 12,087 high-voltage AMIs, the installation and incorporation of 500 automated feeders, the installation of 16 optical-fiber communication systems, replacing 58% old the Relay systems with new digital ones. In addition heat-resistant conducting wire replaced 58% of the lines between Longtan N and Songshu II Road, and between Dapong, Fonggang, Dawu and Taidong II Roads.

## The Planning and Management of Power Transmission and Power Supply Systems

<p>Upgrading Power Supply Quality and Reliability</p>	<ul style="list-style-type: none"> <li>• There are two important indexes of power supply reliability: SAIDI (the System Average Interruption Duration Index) and SAIFI (the System Average Interruption Frequency Index). In 2012, SAIDI was 19.05 min./customer-year and SAIFI was 0.298 freq./customer-year.</li> </ul>
<p>Retrofitting and Replacing Equipment</p>	<ul style="list-style-type: none"> <li>• To ensure equipment safety and improve power supply stability, Taipower retrofits transforming and transmitting equipment for its substations. In 2012, the facilities that underwent retrofitting or new construction were: 121 units of transformers, breakers, etc., 387 transmission towers, 204.296 ckt-km of overhead transmission lines, 308.517 ckt-km of ground lines, and 48.652 ckt-km of overhead transmission lines were replaced by underground cables.</li> </ul>
<p>Improving Measures for Power Supply Quality in High-tech Science Parks</p>	<ul style="list-style-type: none"> <li>• Taipower had introduced the “High-tech Industrial Park Power Quality Management and Improvement Task Force” to implement a number of relevant measures for the upgrading of power supply quality in science parks.</li> <li>• In science parks in 2012, the average SAIDI (System Average Interruption Duration Index) was 0.309 min./customer-year, the second best in Taipower history, and SAIFI (System average interruption frequency index) was 0.038 freq./customer-year. The company will continue to devote itself to power grid enhancement and preventive maintenance work to provide sufficient high-quality power to satisfy demand in the science parks.</li> </ul>

## Improvements on Power Distribution and Sales Systems

<p>Installation of distribution lines</p>	<ul style="list-style-type: none"> <li>• To fulfill the actual needs of the annual load growth and to increase power distribution reliability and power supply quality, Taipower has installed distribution lines with the total length reaching 347,242 ckt-km as of the end of 2012.</li> </ul>
<p>Feeder automation</p>	<ul style="list-style-type: none"> <li>• Taipower has been implementing feeder automation projects (since 1995) that allow the collection of realtime information on network distribution. This is vital information about operation status that is needed when faults occur. The automation system provides means for fault isolation and the restoration of service, and the control functions are under the command of the dispatchers in the control center. This effectively reduces the outage times and range.</li> <li>• In 2012, the number of newly expanded feeders reached 500. By the end of 2012, the number of automated feeders was 19,657 or 44.97% of the total and the outage duration had been reduced from 60 minutes to less than 5 minutes for the automated feeders.</li> </ul>

## Ensuring Fuel Supply Security and Stability

In order to ensure the stability of fuel supply sources for each type of power generation, Taipower adopts the following measures to secure a sufficient amount of fuels and provide them to the power plants in the right quality and quantity and at the right time to ensure power supply security and stability.

### Diversify Supply Sources

Limits have been set for coal procurement from individual sources to ensure that dependence on a particular contracted supplier does not occur. These proportional limits are set for a number of coal producing countries and each contracted supplier. Taipower has also invested in an overseas colliery, to further secure alternative sources. For nuclear fuel procurement, each of the uranium source areas and long-term contracted suppliers is subject to an upper supply limit of 60%. Subsequent processing that includes conversion, enrichment and production is supported by 2 to 3 different vendors.

### Establish Safety Inventory

While the safety stock of coal as regulated by law is 30 days, Taipower has planned its own safety stock for 2013 on a basis of 36 days, and a 10 to 15 day stock of fuel oil is being maintained in 2013. The proper inventory of diesel fuel for safe operation is determined by the individual power plants according to their respective needs and with consideration of transportation. For nuclear fuel, enough stock of uranium is maintained to meet the needs for three-years. In addition, for each nuclear unit, one refill rod is kept in stock. Regarding LNG, the supply is secured according to "Communication mechanism and warning system between Taipower and Taiwan CPC for NLG demand and supply". CPC always maintains an available gas supply at its Yungan and Taichung facilities of more than 80,000 and 50,000 tons respectively, and close liaison is maintained for discussion and negotiation.

### Supply is Based Mainly on Term Contracts

Over recent years, term contracted supply accounts for 75 to 80% and stock-in-trade supply accounts for 20 to 25% of the total coal supply. The procurement of material uranium mainly goes to long-term contracts (the long-term contracted supply of uranium remained at least 50% of the total), while short- or middle-term contractors and stock-in-trade vendors are also used as alternatives. All the services for processing nuclear fuel rods are catered for by long-term contracts. Fuel oil is supplied by local suppliers and secured by demand-oriented fixed-term contracts. Taipower has entered a fixed-term contract for the supply of natural gas with the Taiwan CPC Company. Currently, CPC has long-term contracts with suppliers in Malaysia, Indonesia, Qatar, Australia and Papua New Guinea as well as Shell to secure an annual supply of 8.5 to 10 million tons.

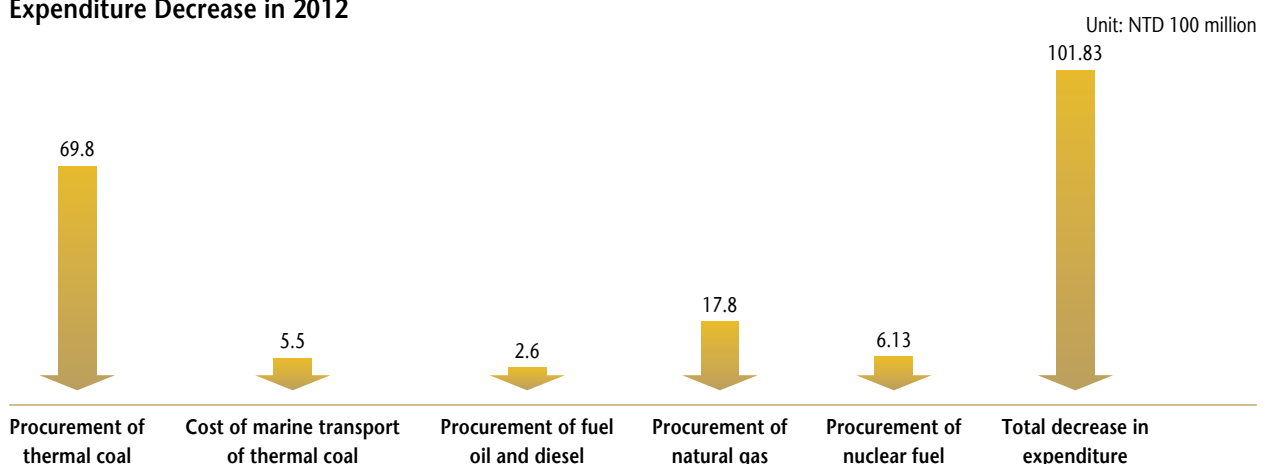
### Ensuring Coal Shipment Stability

In 2011, Taipower has added four 93,000 tons coal vessels together with the previous two 88,000 tons vessels, the total shipment volume of coal is approximately 8 million tons per year. The ratio of shipment by Taipower-owned coal vessels has increased from 9% in 2010 to 25% in 2012.

In addition to ensure the stable supply of fuels for power generation, Taipower also takes proactive action to reduce the cost of fuel purchase through easing procurement regulations, broadening the sources of coal supply, enhancing competitiveness in bidding, flexible use of market fluctuation, and pursuing the spot commodity purchase.

In 2012, as a result of the effective implementation of related strategies, the procurement of coal was controlled at 27.65 million tons, representing a reduction in expenses of NT\$6.98 billion. The cost of shipping coal was reduced by NT\$550 million. The procurement of fuel oil and diesel was reduced by NT\$260 million and NT\$1.78 billion was saved for natural gas procurement. The purchase of nuclear fuel was cut by NT\$613 million and the total amount saved from fuel procurement in 2012 was NT\$10.183 billion.

### Expenditure Decrease in 2012



## Enhancing Innovative Applications

### The Development of Electric Power Technology in 2012

Electric Power Technology	Subject	Taipower Development Priority
Supercritical and State-of-the-art Materials for Power Generation and Water Treatment Technology	Increase power generation efficiency	<ul style="list-style-type: none"> <li>The state-of-the-art materials and welding technologies for ultra-supercritical power generation: Introduce higher efficiency of supercritical coal-fired units and gas-fired combined-cycle units. Develop our own technology such as evaluation of material life, non-destructive testing, regenerating welding, etc.               <ol style="list-style-type: none"> <li>Tests of dissimilar metal welding (T92-T22) used in making supercritical boilers were carried out.</li> <li>Tests of dissimilar metal welding (T92) used in making supercritical boilers were carried out.</li> </ol> </li> <li>Water treatment technologies for ultra-supercritical power generation: Set up the apparatus and equipment for the experimentation of technologies for ultra-supercritical power generation devices and water treatment to assist the selection of materials for power generation and related quality verification or assessment of water treatment and monitoring technologies at the power plants for the time being and in the future.</li> </ul>
Clean Coal Power Generation Technology Testing and Assessment	Increase power generation efficiency	<ul style="list-style-type: none"> <li>IGCC: Taipower has already acquired the technology for thermal simulation of the Air-blown IGCC power generation system, which is its short-term objective. In the future, Taipower will make the combination of IGCC and the thermal simulation of the CO<sub>2</sub> removal technology system as its objective.</li> <li>Oxy-Fuel: Taipower is currently engaged in a joint research venture with National Cheng Kung University Research Foundation on the investigation of oxygen-enriched combustion. In the future, Taipower will continue to work in cooperation with academic and research institutes into stimulation of thermal capacity through oxygen-enriched combustion. Taipower has held seminars and invited experts in the fields of advanced power generation, clean coal and IGCC power generation to share their technologies.</li> <li>Gasification and Torrefaction: The IGFC power generating system formed by gasification of charcoal and hydrogen and the fuel cell can substantially enhance the efficiency of power generation.</li> </ul>
CO <sub>2</sub> Capture and Storage and Algae Fixed Carbon Technology	CO <sub>2</sub> recovery	<ul style="list-style-type: none"> <li>CO<sub>2</sub> Capture and Storage               <ol style="list-style-type: none"> <li>A dedicated platform has been established for evaluating CO<sub>2</sub> capture technologies in order to figure out energy losses and costs for CO<sub>2</sub> capture at power plants.</li> <li>Taipower has established self-owned assessment capability for geological carbon sequestration and performed analysis on field rock core samples. Taipower also participated in the MOEA CCS Strategic Alliance effort to expedite and promote domestic CCS technology in Taiwan.</li> </ol> </li> <li>Micro Algae Fixed Carbon Technology               <ol style="list-style-type: none"> <li>Improve photo bioreactor for algae culture to raise fixed-carbon rate and study the feasibility and cost of large-scale implementation.</li> <li>Promote research on algae resource applications and conversion into energy.</li> </ol> </li> </ul>
Renewable Energy and Diverse Power Sources	Enhance the capacity of the power grid	<ul style="list-style-type: none"> <li>Small-scale trial runs were carried out on data capture and analysis for systems that generate hydrogen, and store oxygen, from renewable energy systems that integrate fuel cells.</li> <li>The development and application of far-sighted or pioneering types of renewable energy such as vertical axis wind turbines for urban use, and diverse types of power generation technologies such as solid oxide fuel cells, to actively engage in plans for the development of renewable energy in multiple channels.</li> </ul>
Power Storage Technology	Enhance the capacity of the power grid	<ul style="list-style-type: none"> <li>Introduce advanced energy storing technologies and conduct evaluation on their performance, the building of concept demo systems and running long-term operation tests. Accumulating the experience and knowledge for their operation and maintenance; solving problems of abnormality and those needed for technical assessment, to be able to select suitable technology with a consideration of decision making and future operational needs; to increase the use of green energy resources and promote the development of low-carbon energy sources while still ensuring stable power supply quality.</li> <li>The research-end shall invest in storage technologies with high potential and the development of critical materials and components for the development of local technologies.</li> </ul>

Electric Power Technology	Subject	Taipower Development Priority
Smart Grid and Advanced Metering Infrastructure (AMI)	Enhance the capacity of the power grid	<ul style="list-style-type: none"> <li>Use digital technologies combined with advanced E&amp;E; automated monitoring and ICT with the electric grid as its core. Employ adaptive real-time optimized dynamic combined supply-side resources (centralized as well as distributed, including renewable energy); demand-side resources, management and response; adjustable resources and energy-storing systems; power-driven cars, etc. The building up of a self-healing power system with new systematic structure, new operation capability and optimized asset manageability. This self-healing power system will be developed as a "robust" power infrastructure that will support smarter generation, transmission, distribution and use of electricity. This will effectively integrate production, management, transaction and services of power, to ensure a good power supply-demand balance that is helpful for the mitigation of, and adaptation to, future climate change. This in turn will lead the country towards a future smart low-carbon society.</li> </ul>
Demand-side Management Technology	Enhance the capacity of the power grid	<ul style="list-style-type: none"> <li>Demand-end power management service: establish an AMI service portal and a deposit service system, to encourage users to voluntarily save electricity, and gain intangible benefit such as a decreased peak load and reduced power consumption.</li> <li>Use inverter control techniques and heatpipes to build a system that saves energy by limiting transformer operation.</li> <li>The design and development of a maintenance integrated management system for overhead transmission using an advanced web-based system to maintain a management technology database and tower geographical information system. In this way an integrated database can be built around the design and maintenance of the towers, overhead lines and area load variation in the overhead transmission systems of the power supply areas of Kaohsiung and Pingtung, to improve the efficiency of urgent repair, changing design and daily maintenance, as well as reducing time and workforce cost.</li> </ul>
Power Equipment Monitoring and Diagnosis Technologies	Enhance the capacity of the power grid	<ul style="list-style-type: none"> <li>In view of the goals of smart grid development, the promotion of power generation and the smart transmission grid while actively researching and developing a monitoring system suitable for Taipower, to reduce operational costs. The main direction of development between 2012 and 2014 is: 1. A monitoring and maintenance system for thunder-resistor in connection stations. 2. A diagnosis system for a partially discharging transmission-level underground cable lines. 3. A monitoring system for a transmission tower and its base. 4. A monitoring system for high-voltage motors and the improvement of a GIS on-line monitoring system.</li> </ul>

## Research & Development

Taipower continues to be active in research and development in order to enhance its corporate competitiveness and refine the quality of service. In 2012, R&D results included 185 reports, 88 theses, development of 36 products, improvement of 24 processes, introduction of 12 technologies, 19 technical innovations, 5 patents, 113 technical services, and 17 technical promotions.

## 2012 R&D Performance

Reduction of costs (NT\$ billion)	5.19
Increased income (NT\$ billion)	0.44
Contribution ( $\alpha$ )	4.08

Note: \*Contribution Ratio  $\alpha$  = R&D results achieved in the past five years which contributed economic benefit in the present year/R&D average expenditure over the past five years.

## Enterprise Resource Planning (ERP)

In the hope of using information technology to engage in enterprise management to upgrade its overall operation performance, Taipower has made a comprehensive plan to establish its ERP system in phases. Through this system, Taipower will implement its enterprise reengineering to clearly design written operation standards and management process and conduct prompt reviews and improvements. This will benefit sustainable management and development.

The implementation and promotion of the Stage 1 Project was successfully completed in 2012, with 120 units all being fully launched. The completed 2012 systems produced 1.62 million transaction documents, management reports and F&C reports.

### ERP System Project

Phase 1	Phase 2	Phase 3
Integrate all Taipower IT systems, including financial accounting, financial management, procurement and material management, internal auditing control management, etc., to establish a more efficient core enterprise operation process. (All were launched in 2012)	Continue integrating IT systems, including engineering management, facilities maintenance, human resources and business intelligence to establish and integrate core information systems for the integrated power industry.	Strengthen business intelligence and establish enterprise performance and strategy enterprise management to build a complete e-power utility.



# Enhancing Energy Conservation and Climate Change Adaptation

It is foreseeable that the climate extremes caused by global climate change will drastically increase the scale and frequency of disasters. As a main power supplier in the country, Taipower should realize that it must have a long-term disaster prevention and adaptation strategy to maintain power supply stability and safety, and support continuous development of the industry. Thus, Taipower should make strategies far in advance to deal with the effects triggered by continued climate change and to reduce damage to the assets of the country and its citizens.

## Climate Change Adaptation

Extreme temperatures and excessive rainfall will aggravate the frequency and scale of disasters and endanger relevant power supply facilities. Taipower's generation, transmission and distribution systems must therefore undergo preparations for long-term disaster prevention and countermeasures.

In responding to the challenges derived from climatic change, Taipower has already launched different adaptive measures and continued to make effort in related researches. These adaptation plans have been incorporated into the short-,mid-, and long-term researches and development plans for strengthening its adaptive capacity and to mitigate the impact of climatic change on power generation, supply, transmission, and distribution systems.

## Energy-Saving and Carbon-Reduction Strategies and Action Plans

Strategy	Action
Strategy 1	<p><b>Participation in the National "Climate Change Adaptation Plan"</b></p> <p>Taipower participated in the " planning of promotion of the guidelines and action plans for climate change adjustment" panel discussion hosted by the Council for the Economic Planning and Development and presented 5 action plans, including:</p> <ul style="list-style-type: none"> <li>• Climate change impact assessment and vulnerability inventory check assessment for Taipower energy supply facilities and their locations.</li> <li>• Climate change impact assessment and vulnerability inventory check assessment for the operation of the power grid system.</li> <li>• General power industry climate change adaptation capability improvement.</li> <li>• The planning and establishment of a climate change early warning and emergency response system for the integrated power industry.</li> <li>• Equipment deterioration monitoring and development of prevention technology for power generation, transmission and distribution.</li> </ul>
Strategy 2	<p><b>Execution of the "Power Facilities Climate Change Adaptation Action Plan"</b></p> <p>In 2012, the Datan Power Plant and Fengshan Office implemented the "Climate Change Adaptation Action Guide Plan for the Energy Industry" to analyze the impact of climate change, this included a vulnerability investigation and risk assessment. The Climate Change Adaptability Report will be completed by the end of 2013.</p>
Strategy 3	<p><b>Merging into Taipower Management System</b></p> <p>Taipower will incorporate the short-,mid-, and long-term adaptation strategies into its corporate management mechanism on the basis of its management system.</p> <ul style="list-style-type: none"> <li>• Short-term: Consider the possible impact of climate change on the power supply and demand and incorporate the strategy into "Power Supply Stability and Safety" of the "Risk Management Implementation Plan" for proper control.</li> <li>• Mid-term: Incorporate into Taipower "10 Year Business Strategy."</li> <li>• Long-term: In response to Taipower sustainable development objectives, Taipower incorporate the environmental dimension of its "Sustainability Action Plan" for the study and design of adaptation plan and strategic direction.</li> </ul>
Strategy 4	<p><b>Incorporate into the Short- to Long-Term R&amp;D Plan</b></p> <p>In consideration of the uncertainty of climate change and the technological sophistication of Taipower in its power supply system, the collection of related information, information exchange and interpretation became critical. Taipower planned to incorporate the climate change impact and the adaptation strategy into its short- to long-term R&amp;D plan for far-sighted, integrated, basic, and full-range research for preemptive action.</p>

## Results of the Implementation of the Energy-Saving and Carbon-Reduction Strategy and Action Plans

Domestic power consumption has increased with sustained economic development. In order to manage and achieve the GHG emission reduction goals and achieve the objective of “National Energy Saving and Carbon decrease General Plan” (control the emission volume of 2020 to the volume of 2005, and the volume of 2025 to the volume in 2000). Taipower has taken concrete strategies and actions to proactively reduce the GHG emissions to approach the vision of a low carbon society of the country.

For this, Taipower has established the “Energy Saving and Carbon Decrease Performance Promotion Meeting” in 2011, thereby set forth 9 promotion strategies and 35 action plans. Through concrete strategies and actions, Taipower seeks to reduce GHG proactively.

		Action plans	Achievements
Strategy 1	Expanding Low-carbon Energy	<ol style="list-style-type: none"> <li>Expand installed capacity of renewable energy.</li> <li>Complete units 1 and 2 of the Lungmen Power Plant.</li> <li>Maintain natural gas power at an appropriate ratio.</li> <li>Retire and renew the existing units.</li> <li>Adopt the best available technologies for new generation units.</li> </ol>	<ul style="list-style-type: none"> <li>The thermal generator units replacement: The gas-fired units were replaced by advanced combined-cycle units. The coal units were replaced by highly-efficient ultra super-critical units. After replacement, the power generation efficiency of the gas-fired and coal units reached 58.7% and 44.7% (LHV-Gross). Taking the recently approved Tongxiao Power Plant Renewal Project as an example, the new gas-fired units have a planned efficiency of more than 58.7%, and the new coal units in Linkou and Talin Power Plants under construction have a designed efficiency of 44.93% and 45.59%, respectively. After completion, the CO<sub>2</sub> emission of the new units in the Linkou plant will be 10% less than that of the old units.</li> <li>Addition of power generation by new energy and natural gas, and continuation of developing renewable energy. In 2013, power generation capacity of natural gas increased by 4,726.54 GWh as compared with the same period in 2012.</li> </ul>
Strategy 2	Upgrading the Efficiency of Existing Generation Units	<ol style="list-style-type: none"> <li>Upgrade the efficiency of existing thermal units.</li> <li>Upgrade output of existing nuclear units.</li> </ol>	<ul style="list-style-type: none"> <li>The efficiency of thermal power generators in 2012 was 42.98 % (LHV Gross), which is the best record in Taipower.</li> <li>In 2012, the high-intermediate pressure inner casings and the rotors in the steam turbine of the Taichung #4 generator, were replaced. The gas turbine units #5-2 in Tongxiao Power Plant had blade upgrades. Nuclear Plant #2 had its #2 gas unit low-pressure rotors changed. Nuclear Plant #3's high-voltage gas unit had a rotor replacement to increase efficiency.</li> </ul>
Strategy 3	Upgrading the Efficiency of the Transmission and Distribution Systems	<ol style="list-style-type: none"> <li>Improve efficiency of the operation of transmission and distribution systems to reduce line loss.</li> <li>Improve transmission and distribution facilities.</li> <li>Research, promote, and apply high-efficiency transmission, substation and distribution facilities.</li> </ol>	<ul style="list-style-type: none"> <li>In 2013, the line loss rate was merely 4.42%, which was higher than Korea, and better than that of developed countries, such as Japan and US.</li> </ul>
Strategy 4	Strengthening R&D on Power Grid Technology	<ol style="list-style-type: none"> <li>Construct a high-quality power grid for integrating distributed energy sources.</li> <li>Develop automation of substation and feeders and design for the installation of the new generation communication system.</li> <li>Apply energy storage system and electric and electronic technologies.</li> <li>Study new pumped storage hydro power for the development of renewable energy.</li> </ol>	<ul style="list-style-type: none"> <li>The reconfiguration of the power generation equipment in the micro-grid test site was completed. The Taipower standard operating procedure (SOP) for the examination of DG incorporation was set up. A new optical-fiber communication system was established and by the end of Dec. 2012, 900 sites had been connected. Feasibility research for the incorporation of renewable energy power generation equipment into the power distribution system that worked with an energy-storage system and smart inverters was completed. A new pumped-storage hydro power plant construction strategy was set in view of the development of renewable energy.</li> </ul>

Note: Line Loss Rate = Power lost through the line/Net purchased power \*100

		Action plans	Achievements
Strategy 5	Strengthening R&D on Energy Sources Technology	<p>15.R&amp;D in technologies for upgrading power generation efficiency and equipment reliability.</p> <p>16.R&amp;D in technologies for clean coal generation and fuel cell generation.</p> <p>17.Develop the technologies for carbon capture, storage, and reuse.</p> <p>18.R&amp;D in technologies for new energy power generation.</p> <p>19.Introduce and assess the demonstrative renewable energy generation system.</p>	<p>With respect to power and fuel technology: research was carried out on multi-fuel electric firing systems that used clean coal as fuel. The R&amp;D of new energy technology was focused on fuel cells, solar power, biomass energy, wind energy, new power generation facilities and energy storage. In addition, CO<sub>2</sub> capture and carbon biofixation were the key issues in research and development related to the reduction of carbon emission. In 2013, the major results were:</p> <ul style="list-style-type: none"> <li>• 3 units in the Taichung Power Plant received an improvement in coal flow balance, resulting in an annual reduction of CO<sub>2</sub> emission of 9,900 tons.</li> <li>• A feasibility analysis of mixing biomass fuel into the fuel burned in the existing unit sets was performed. The results suggest wood particles are the preferred choice for mixed combustion. However, mixed combustion will not become general practice until the technique for the reason that baking pellet fuel has matured and the supply is stable. More trials need to be conducted.</li> <li>• Solid oxide fuel cell stacks were investigated and cell capacity tests were conducted.</li> <li>• Two-phase flow experimental equipment for the Geological storage of CO<sub>2</sub> was designed and verified.</li> <li>• An integrated auto wind power forecasting system was established for the 55 wind units in Jhongtun, Kinmen, Mailiao, Changgong and Shihu, and a forecasting analysis of wind power generation was performed using neural network technology.</li> </ul>
Strategy 6	Developing and Trading Carbon Credits	<p>20.Invest or participate in domestic and abroad carbon decrease projects.</p> <p>21.Purchase domestic/abroad carbon emission quota.</p> <p>22.Plant trees to reduce carbon.</p>	<ul style="list-style-type: none"> <li>• Nine pilot projects carried out between 2000 and 2011 concerning the Hsiehho, Taichung, Hsinta and Talin Power Plants were verified. The Talin Power Plant projects carried out between 2005 and 2010 passed Environmental Protection Administration (EPA) examination on Nov. 22, 2012 and will be granted a certified Emission Reduction of 178,661 tons of CO<sub>2</sub>e. This is the first case to receive a CER certificate in Taiwan. The other eight cases are being examined by the EPA at this time.</li> <li>• Taipower checked 6 offset projects and filed applications with the EPA. These included, "7.03 MW Photovoltaic Plant Project" and the two offset cases, "Wanson, Bihaih hydro power generation projects" that passed the EPA examination on Nov. 22, 2012. Over the coming 7 years of the crediting period, the CER is expected to be 1.886 million tons of CO<sub>2</sub>e, making these the first two registered offset projects</li> </ul>
Strategy 7	Implementing Demand-side Management	<p>23.Infrastructure plan for AMI.</p> <p>24.Promote the demand-side electric energy management measures.</p> <p>25.Promote reasonable tariff schedules.</p> <p>26.Apply demand-side electrical energy management service techniques.</p> <p>27.Discuss and plan the establishment of an energy technology service company.</p>	<ul style="list-style-type: none"> <li>• In 2012, there were 30.9 million households saving power a significant increase compared to the same period in 2011. The electricity saving was up to 4,833 GWh, resulting a total power rate cut of NT\$9,871 million.</li> </ul>
Strategy 8	Enhancing Internal Energy Conservation	<p>28.Control internal productive and non-productive energy conservation.</p> <p>29.Promote green buildings and in-house energy conservation.</p> <p>30.Promote green IT and teleconferencing.</p> <p>31.Establish an energy conservation service team to provide energy conservation technology diagnosis and consultation services.</p>	<ul style="list-style-type: none"> <li>• In 2012, accumulated power savings amounted to 122.25 GWh; water saving was 136 MWh; fuel oil savings was 144 kilo liters; totally accumulated 1,572 tons carbon-reduction.</li> </ul>



		Action plans	Achievements
Strategy 9	Reinforcing Energy Conservation Promotion and Communication	32. Use the media to promote energy conservation and carbon decrease.	<ul style="list-style-type: none"> <li>In 2012, an energy-saving promotion was held in the Kaohsiung Martial Arts Stadium to increase the knowledge and practice of power saving by the public.</li> <li>Taipower held "2012 Ministry of Economic Affairs Corporate Guiding Result Exhibition" promoting knowledge and the concept of energy-saving and carbon emission decrease.</li> <li>Sixty-one sessions of the "I Love Mammy Earth Mobile Stories House" were held to teach and encourage children and their parents, to save power, reduce emissions and love the planet.</li> <li>Taipower effectively used electronic media, radio, TV and the Internet, and media such as magazines and newspapers to promote the concept of energy-saving and the reduction of carbon emission.</li> <li>Three sessions of "Power Construction Seminars for Primary and Secondary School Teachers" were held to encourage teachers to convey the importance of energy-saving and carbon emission decrease to their students.</li> </ul>
		33. Hold energy conservation and carbon decrease promotion campaigns.	
34. Promote energy conservation and carbon decrease techniques and methods.			
35. Host large-scale energy conservation and carbon decrease exhibitions and seminars.			

## Greenhouse Gas Inventory and Reduction

The main GHG emission is from thermal power generation, coal yards, transportation vehicles, insulation gas used for switchgear, and freezers and air-conditioning facilities in Taipower. In 2012, Taipower emitted 84,840 thousand tons of CO<sub>2</sub>e of GHG emissions, of which 99.2% came from thermal power generation. While the overall emission is slightly higher than that of 2011 at 84,576 kilotons, the emission intensity of 0.508 kg CO<sub>2</sub>e/kwh in 2012 is an improvement comparing to 0.516 kg CO<sub>2</sub>e/kwh of 2011.

In order to make its GHG information transparent and credible, Taipower entrusted a certification agency to conduct ISO 14064-1 verification. As of 2011, 17 units passed the ISO 14064-1 verification.

### GHG Emissions by all units (including generation and common process)

 Unit: 1,000 tons of CO<sub>2</sub>e

Gas Type	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	HFC
Subtotal	84,206	75	314	186	59
Total	84,840				

### GHG Emissions by all thermal power plants in 2012 (excluding common process)

 Unit: 1,000 tons of CO<sub>2</sub>e

Unit	Thermal Power Generation GHG Emission	Unit	Thermal Power Generation GHG Emission
Linkou Power Plant	3,113	Tongxiao Power Plant	3,987
Nanpu Power Plant	2,573	Taichung Power Plant	38,063
Talin Power Plant	4,616	Datan Power Plant	7,873
Hsinta Power Plant	20,042	Chienshan Power Plant	243
Hsiehho Power Plant	3,390	Tashan Power Plant	185

### GHG Emission Inventory Results

 Unit: 1,000 tons of CO<sub>2</sub>e

Emission Source	Emission 2011	Emission 2012
Oil -Fired Unit	5,525	4,347
Gas-Fired Unit	18,672	20,472
Coal-Fired Unit	59,777	59,367
Taipower (including power generation and common process)	84,576	84,840

## Preliminary Greenhouse Gas Reduction Project and Replacement Plan

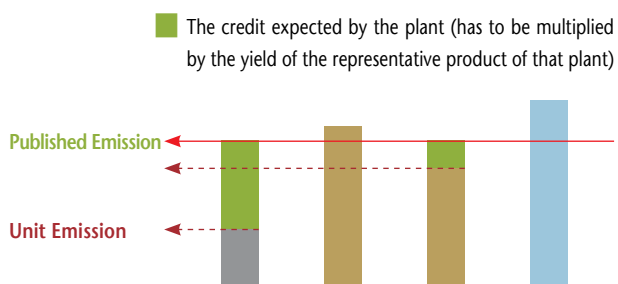
Taipower has actively pursued the reduction of emissions since the Energy Bureau of the Ministry of Economic Affairs promoted its Voluntary GHG Reduction for Energy Industry Project. After EPA published the Principle of Preliminary Greenhouse Gas Reduction Project and Replacement Plan, Taipower has followed this principle to replace its preliminary projects with plans to secure certified emission reduction that can be used to offset extra emission in a future case where total emission control is enforced.

In 2012, the Talin Power Plants projects (2005 to 2010) passed examination by the Environmental Protection Administration (EPA) and will be granted a certified Emission Reduction of 178,000 tons of CO<sub>2</sub>e. The "7.03MW Photovoltaic Plant Project" and the two offset cases, "Wanson, Bihaih hydro power generation projects" also passed examination by the EPA on Nov. 22, 2012. For the coming 7 years of the crediting period, the CER is expected to be 1.886 million ton of CO<sub>2</sub>e.

### Preliminary Project

When a combined-cycle unit set has an emission lower than that announced by the EPA, the plant may, according to the Principle of Preliminary Project of Greenhouse Gas Reduction and Replacement Plan, and applied with the EPA for examination and the grant of a credit for the Preliminary Project. By the end of 2012, Hsiehho, Taichung, Xingda and Talin have filed credit applications. The credit amounts requested from the EPA by the plants are shown below:

#### Concept of Early Action Project Credits



#### Overview of the Implementation of Early Action Project Credits

Power Plant	Year of Early Action Project	Credits
Talin	1990~2011	17.8
Taichung	1993~2011	Under Examination
Hsiehho	1990~1998	Under Examination
Hsinta	1990~2011	Under Examination

### Offset Project

Offset project means that a plant can apply for the registration of a Certified Emission Reduction by submitting a preliminary project. In 2011, Taipower filed 6 applications for replacement plans. The content and progress of these projects at the end of 2012 are given below:

Responsible Unit	Project	Crediting Period (years)	Expected CER (10,000 tons)	Current Status
Research Institute	7.03 MW Photovoltaic Plant Project	7	4.31	The application passed EPA examination on 11/22/2012.
Department of Power Generation	Wanson, Bihaih hydro power generation projects	7	184.30	
Xingda Power Plant	Xin#1 Boiler & Steam Turbine, Control System and Efficiency Improvement	10	49.23	EPA requested to amend the limits. Presently being processed.
Hsiehho Power Plant	H#4 Blower Motor Rotation Control Improvement	10	22.85	Examination is pending.
Datan Power Plant	Natural Gas Power Generation	10	3,829.33	
Tongxiao Power Plant	Natural Gas Power Generation instead of Fuel Oil	10	1,118.66	

## Management and the Reduction of SF<sub>6</sub>

In addition to safety and reliability, modern substation facilities need to be aesthetic in structure, safe for operation, easy to maintain, etc. Thus, Taipower has widely adopted the use of SF<sub>6</sub> insulated switchgear (GIS) equipment in power facilities, such as switchyards, substations and distribution lines. The quantity of equipment is large and varied.

To effectively manage the usage and emissions of SF<sub>6</sub>, Taipower has accurately controlled the variety and quantity of switchgears and SF<sub>6</sub> refill amounts through its "SF<sub>6</sub> reporting management information system". Each unit was requested to upgrade the quality of its facilities inspection and maintenance to reduce SF<sub>6</sub> leakage. The accurate amount of SF<sub>6</sub> usage and refilling as well as the impure SF<sub>6</sub> inventory are required to be posted in the information system.

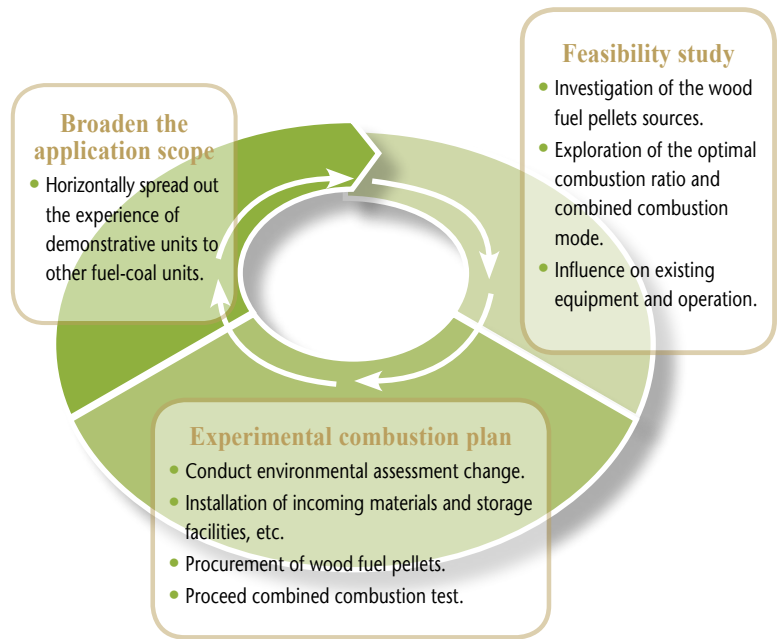
For the creation of reusable space, Taipower will recycle and collect the SF<sub>6</sub> gas into the empty cylinders for storage, and deliver to "National Halons and F-gases Management Center" for refining and transfer to the magnesium alloy industry for further use. This helps to extend the life span of SF<sub>6</sub> and reduce the emission volume of GHG.

### Bio-fuel Combined Combustion Plan

Taipower has unfolded the "feasibility study on the partial bio-fuel combined combustion at existing power generators" program in 2010. Currently, Taipower has assigned one generator at Taichung Power Plant for testing the combined combustion with coal and wood fuel pellets. Taipower is presently conducting a feasibility analysis of fly ash produced by combined combustion and also considering the expansion and promotion of combined combustion power generation depending on legislation and regulations.

### The status of SF<sub>6</sub> in 2012

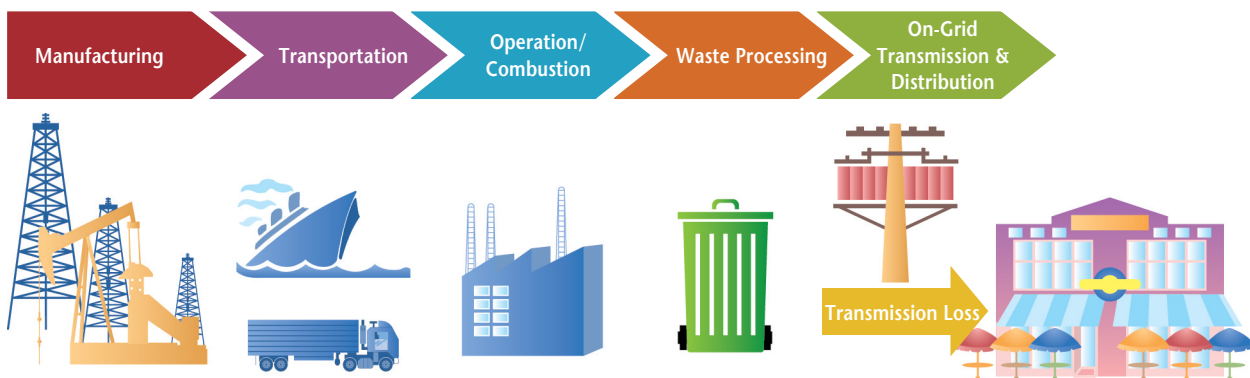
Item	Quantity (kg)	GHG (ton of CO <sub>2</sub> e)
Original Quantity	36,770	878,793
Facilities/ Refilling Frequency	1,079	-
Refilling	7,766	185,608
Purified SF <sub>6</sub> Emissions	47,768	1,141,664
Inventory	897	21,441



## Carbon Footprint of Power Industry

This is different from the power emission factor where only the operation combustion and distribution stages on the grid for power generation are considered. The carbon footprint is focused on an analysis of greenhouse gases emitted at all stages of power generation, from material mining, fuel shipment, power infrastructure construction, combustion, the on-grid transmission and distribution all the way to the final waste process. This allows users to review the current greenhouse gas emission from a more sensitive perspective and identify the areas showing a potential for carbon emission decrease.

To advocate the "Guiding and Promoting Inventory and Reduction of Greenhouse Gas Emission in the Energy Industry" issued by the Bureau of Energy, MOEA, Taipower replaced 11 units at its Department of Renewable Energy, Hsiehho, Linkou, Datan, Tongxiao, Taichung, Hsinta, Nanbu and Talin Power plants and at Nuclear Power Plants #1 and #2 unit in 2012. To perform tentative calculation of the carbon footprint in the cases of coal, oil, gas, nuclear, wind power and solar power.





# Creating an Environmental-Friendly Culture

Taipower continued making efforts in reducing operational risks caused by environmental issues. In order to reduce the impact caused by power industry-related activities, products and service on the environment, Taipower and its employees, abide by the following declaration, engage in various environmentally-friendly activities to minimize the impact of operation activities on the environment. Taipower demonstrates its determination in striving to become a world-class green energy group.

## Taipower Environmental Declaration

- Meet relevant regulations: In addition to environmental regulations, the regulations of landscape, ecology, and international issues should be taken into consideration.
- Emphasize pollution prevention: Environmental impact assessments should be put into practice.
- Conserve resources: Each unit should minimize its consumption of resources - oil, water, and electricity.
- Strengthen promotion and communication: Each unit should strengthen the company's internal and external promotion and communication tasks.
- Continue performance improvement: The ISO 14001 P-D-C-A concept to continue its performance improvement.

## Environmental Impact Assessment

While engaging in the environmental impact assessment process, Taipower entrusts professional organizations to conduct related research. In addition, for key environmental projects, Taipower consults with stakeholders, in order to ensure that the project content meets the public's needs and takes into consideration its impact on the neighboring natural environment, biology, society, and economy.

As influenced by various key factors such as energy policies, CO<sub>2</sub> emission issues and project requirements, the progress of reviews for EIA has been fairly slow. Taipower will continue its effort to communicate with its stakeholders also considers meet their expectations and develop the company's power facilities accordingly.

## Power Facility and Pre-Construction Environmental Impact Assessment

In the process of the environmental impact assessment, Taipower will conduct public opinion polls in development areas, including organizing public seminars, visiting and communicating with the local people, assessing the local physical and chemical environment, humanities, social and economic, ecological environment, and proposing environment-friendly measures and achieving the purpose of environmental protection.

## Feasibility Study on Thermal-Power Cogeneration

To maximize energy efficiency, thermal power generation now implements ultra-supercritical and combined-cycle units that are highly productive. Also, as required by the provisions of the "Environmental Impact Assessment Act" and of the "Guidelines for Conducting Environmental Assessment of Development Action", at the stage of evaluation of environmental impact, an assessment of the related applications of the target thermal-power cogeneration system has also to be made. This provides information for the industrial or residential areas, near the thermal power plant, for the planning of their heating or cooling needs.

## Energy and Resource Management

### Material Flow Management System

In view that information transparency has become an important index that reflects the sustainable development and social responsibility of a company, Taipower started setting up a Material Flow Management System (MFMS). By 2010, the first stage had been completed and a MFMS for 10 thermal power plants had been established for the rapid control of raw material utilization,

pollutant emissions, discharge, by product bidding amount changes and so on. This system has greatly improved the efficiency and accuracy of environmental information management. In May 2012, MFMS was also set up for the hydro-power generation system and for units of the power supply system. MFMS for a demonstration unit (Taitung Site) of the business system has been running since October 2012, and will be expanded horizontally to other business sites later.

Material flow management aims to properly control the input of fuel, electricity, water and chemicals required by the operators and also to quantify power output after generation and/or power transmission and distribution. At the same time, loss or pollution occurring in each stage of operation is categorized as a negative product (such as auxiliary power, line losses, pollutant discharge, etc.). Waste that is recycled or reused to generate additional income, or to reduce costs, is categorized as a by-product. Examples are: leftover materials, recycled waste water, coal ash, synthetic gypsum and so on.

## Energy-Conserving Promotion Activities and Achievements

To promote the concept of energy conservation, Taipower regularly holds electricity-conserving campaigns. These activities encourage people make reasonable use of electricity and also to make power conservation a common practice in society. The achievements include:

- Taipower branch sites continue to hold regular electricity-conserving promotions that include on-campus electricity-conserving campaigns that even teach classes on the easy repair of household appliances. People can learn reasonable using of power for light bulbs, air conditioners, refrigerators and the like. The use of high efficiency domestic electric appliances is also encouraged. In 2012, 1,279 sessions were held that attracted 263,000 participants.
- Consulting services are provided for customers that have power consumption over 100 kW. The concept of power efficiency and the use of highly efficient energy-saving equipment are introduced to energy conservation. In 2012, 5,022 householders were interviewed for this purpose.
- Also in 2012, around 370,000 copies of printed promotional material about the importance of saving electricity were published and distributed to the public.

## Water Footprint

Presently, the whole world has started to pay close attention to the issue of industry's "water footprint". In 2012, Taipower began calculating the quantity of water input and wastewater output of thermal power plants to understand the water resource utilization conditions. In the future, Taipower will comply with the government's "water footprint" promotion system to conduct water footprint inventory checks.

Unit: M<sup>3</sup>/year

Water Footprint	Power Plant	2010 (A)	2011 (B)	Direct effect on environmental protection (B-A)
Water Input (blue water)	Productive Water Use	10,077,268	10,033,941	-43,327
	Non-Productive Water Use	382,072	363,886	-18,186
Effluent of Treated Wastewater (grey water)	Treated Wastewater Discharge	1,179,308	1,172,786	-6,522

Note: The baseline data from 2011 was adjusted to facilitate comparison with current business activities in 2013.

## Wastewater Reuse

While adhering to the concept of water conservation, Taipower has been actively pursuing the goal of zero wastewater discharge. Rainwater collection (power plants and dormitories) and wastewater reuse projects are being promoted, and integral planning has been implemented to reduce the use of tap water inside the power plants.

As a result of the several different approaches to water saving in 2012, much of the industrial water that was recycled had excessive salt concentration from the flue gas desulfurization

## Thermal Power Plant Wastewater Reuse

Unit: tons

Category	Year	2010	2011	2012
	Reuse of rainwater		159,529	152,171
Reuse of wastewater and process water (Including Boiler Blowdown)		1,621,918	1,794,707	1,686,610

process (FGD). This recycled water was unusable because it could cause serious corrosion as well as salination of the soil; therefore, it was not counted in the total waste water.

## Environmental Accounting System

In 2003, Taipower established the environmental accounting system (EAS), and in 2006, developed the EAS information platform to help with EAS information entry work. Taipower's environmental accounting system includes not only environmental expenditure information, but also industrial safety and sanitation expenditure information. By expanding the scope of the system, Taipower is able to quantify the costs of all environmental-related activities (including environmental protection, occupational safety and sanitation), and this capability has enabled Taipower to become one of the few companies in Taiwan which can conduct real-time statistics and analyses of environmental expenditures.

In 2011 total environmental expenditure was NT\$13.32 billion, of which environmental protection accounted for NT\$7.07 billion, occupational safety NT\$4.87 billion and sanitation NT\$1.38 billion.

### 2010~2012 Environmental Expenditures

Unit: hundred million

Type \ Year	Environmental Expenditure	Industrial Safety Expenditure	Sanitation Expenditure	Total
2010	72.2	55.8	13.6	141.6
2011	88.7	54.7	14.6	158.0
2012	70.7	48.7	13.8	133.2

## Air Quality Maintenance

### Treatment of SO<sub>x</sub>, NO<sub>x</sub> and PM

To effectively control pollutant discharge from power plants, Taipower makes a conscientious choice of fuel and uses fuel that produces little ash and has low sulfur and nitrogen content. Taipower also uses clean energy as much as possible. In addition, continuous emission monitoring systems have been installed (CEMS) on all thermal power plant smokestacks to monitor and control the emission of air pollutants. The CEMS not only provide information about emission, but are also instrumental in the maintenance of the pollution prevention devices which need to be in optimum condition to keep the volume of pollutants to a minimum.

Air pollutants	Preventive Measures
<b>Particulate matters (PM)</b>	<ul style="list-style-type: none"> <li>Installed high-efficiency electrostatic precipitators (ESP) which are capable of removing 90%~99.8% of particular matter.</li> <li>Built a wind-shielding fence around the coal yard and installed a sprinkler system.</li> <li>Transported and unloaded coal in a closed environment, as well as compacted coal heaps and kept roads cleaned.</li> <li>Stabilized the coal surface by using a chemical, and recently, Taipower has planted trees around the yard to prevent the spreading of coal dust.</li> </ul>
<b>NO<sub>x</sub></b>	Installation of low-NO <sub>x</sub> burners (LNB) and selective catalytic reduction (SCR) for purifying the smoke.
<b>SO<sub>x</sub></b>	Installation of flue gas desulfurization (FGD) to remove over 90% of SO <sub>x</sub> emission.

The investment in the pollution prevention facilities from coal-fired power generation equals to 25%~30% of the total construction cost. By the end of 2012, the Taipower Hsinta Power Plant had established 4 indoor coal domes. In the future, all new Taipower thermal power plants will use indoor coal domes and closed conveyor belts to further reduce coal dust. In 2007~2012, improvement work has been done to 2 power generators at the Xingda Power Plants amounting to NT\$ 9.7 billion in investment cumulatively.

Type \ Year	Unit: kg/GWh		
	2010	2011	2012
SO <sub>x</sub>	342	356	328
NO <sub>x</sub>	354	364	327
PM	33	27	28

### Control of Ozone Depleting Substances

Taipower's use of ozone depleting substances (ODS) comes mainly from its use of halon (HCFC) fire extinguishers. According to its 2012 inventory, Taipower still has about 45.613 tons in stock. In order to meet the Montreal Protocol, Taipower sets its goal of limiting annual consumption of HCFC to be 25% of the base amount (159.539 ODP tons). In the future, Taipower will comply with government policy and regulations to gradually reduce the use of HCFC fire extinguishers to protect the ozone layer.



## Environmental Education Training

To help Taipower employees to realize the importance of environmental protection and to put these tasks into practice, Taipower engaged professional training agencies to conduct several environmental education training sessions in 2012. Different classes were held on environmental management systems, the check and review of environmental regulations, waste management and management of GHG, inventory checks, and several other related subjects, for a total of 384 participants. In addition, each of Taipower's operation units, when necessary, invites environmental experts and scholars to deliver speeches and conduct training sessions every year. In 2012, there were 18,888 participants in total.

In compliance with the Environmental Education Act, each employee of Taipower must take at least four hours of education and training in environmental protection every year. In 2011, Taipower employees (26,455 persons) fulfilled the required hours, and declared the result online.

In 2012, there were two keynote addresses given to our senior managers by the General Manager and Vice General Manager. In addition, seven education programs for employees on environmental protection have been given. The topics included: climate change as a common challenge to human beings in the 21 century, the position of Taipower and its role in the context, and how to properly balance the development of power plants and the grid with conservation of the ecosystem by providing a compensation mechanism to developmental behavior. These programs raised employee awareness of the need for environmental protection and encourage the conversion of these ideas into actions to maintain the health of the environment.

## Green Procurement

In order to realize the concept of co-existence and co-prosperity for environmental protection and economic development, the Environmental Protection Administration of the Executive Yuan enforced the "Government Agency Green Purchase Program", hoping to utilize the extensive purchasing power of agencies to make green products the top priority in their purchase plans, encourage the production and use of green products, and make the consumption of green products a prevailing social practice for environmental protection.

Taipower responded to the government policy of green purchase and thereby actively prompting its subordinate units to make efforts in practicing green purchases like office paper, office appliances, electric appliances and other equipments. In addition, Taipower also designated items for "green purchase" as a part of the performance indicators in "environmental management". After years of endeavor, Taipower has enhanced its performance in green purchase incrementally year after year, and has outstanding result in "low pollution, recyclable, and energy savings".

As a result of active promotion, in 2012 the amount of the green purchases reached NT\$220 million, of which environmental protection products accounted for 92.5%. Taipower encouraged the manufacturing and utilization of green products within the country with positive actions and helped cultivate an atmosphere of green consumption.

## Low Carbon Park

### Participation in Penghu Low Carbon Island Program

In order to help transform the society into a low carbon society, Taipower has participated in the "Penghu Low Carbon Island Construction Program" in 2011. The primary objective of installing eleven 3,000~3,600 kW wind turbine units at Lungmen, Jiangmei and Dachiken, was to turn Penghu County into the first renewable energy living circle in Taiwan and allow over 50% of the power supply on the island to be generated from renewable energy. The idea is to make Penghu County a low carbon island for clean living and set it as the low carbon island benchmark at a world-class level. In addition, this also helps to develop the ecological tourist industry on a low carbon island and boost up the development of related industries. Taipower also plans to establish a power transmission platform for submarine cables to allow convenient dispatch of power between Taiwan and Penghu to transmit the clean, green energy generated at Penghu to Taiwan through the power transmission platform.

Taipower expects that the establishment of the low carbon island model can amplify the effort of energy conservation and the application of renewable energy for industrial development, and could gradually upgrade the idea of the low carbon community into a low carbon city and ultimately a low carbon country.

## Setting an Energy-Conserving Living Area

In 2012, Taipower complied with the vision of New Taipei City government in turning the city into a low carbon city through converting the Northern Electric Power Exhibition Hall and the dormitory area at Nuclear Plant #2 into a low carbon community. The planning strategy is “low carbon building, low carbon transport, renewable energy, green environment cultivation, and resources recycling and reuse.” Taipower aims at winning the New Taipei Polar Bear Class Low Carbon Community Mark and supports the development of the low carbon community with full effort.

The New Taipei City Government differentiates the low carbon community mark at three levels:

- Penguin Class Low Carbon Community Mark: scores  $\geq 60$  and  $< 80$  in verified low carbon community.
- Polar Bear Class Low Carbon Community: scores  $\geq 80 < 100$  in verified low carbon community.
- Platinum Class Low Carbon Community: scores 100 in verified low carbon community.

## Green Buildings

### Promoting Constructional Design Focusing on Nature and Ecological Protection

Taipower conducts all its construction projects, in compliance with the fundamental principle of “conforming to nature, respecting nature and not fighting against nature.” Safety is well secured and the company strives to minimize any impact, interference and damage nature caused by its activities. Taipower puts “ecology-based, safety-oriented” construction into practice, where the area of construction is consciously kept to the minimum. The design principle is reflected in:

- Full consideration of the ecological, geographical, and human conditions when initial comprehensive planning is done.
- Protection of road side-slopes by planting as much as possible, for example by using the stakes and wattle to secure plants that are preferably local inhabitants.
- Designing drains or river-side surfaces to be rough and porous and friendly to the local flora and fauna.
- Minimizing the structural matrix, without compromising function, to reduce the visual impact of the structure.
- Performing an overall evaluation of the area to be developed to select the most suitable and least intrusive methods of construction.

In future, Taipower will give top priority to safety and minimize interference and impact on the environment by using proper construction methods and schemes. Also we hope to reduce waste, preserve energy, protect the environment and all the lives thereon, and try not to hurt nature and achieve a vision of “doing sustainable construction that protects the ecological system.”

### Winning Smart and Green Building Labels

Taipower plans green buildings to realize energy saving and carbon emission reduction and resist global warming. In 2012, 8 Taipower buildings received Green Building Candidate Certificates, and 18 buildings were marked with the Green Building Label.

<p>Policy- and Promotion-Side</p>	<ul style="list-style-type: none"> <li>● As provided in the Taipower “Note for Construction Design” for a general-purpose building, shutters have to be installed on the South, East and West facades to lower indoor temperature and reduce the need for air conditioning, with the consequent energy conservation and reduction of the carbon footprint.</li> <li>● The material mix shall contain a certain percentage of green building material and recycled material.</li> <li>● The use of ice-storing air conditioning systems is encouraged. Ice stored at night, or during off-peak hours, is melted during the day to provide cooling. This function can effectively shift the power load to the night and peak-time power consumption.</li> </ul>
<p>Future Goal</p>	<ul style="list-style-type: none"> <li>● Taipower will continue to develop its ideas and approaches to green building and apply them to both new and existing buildings to improve energy-conserving efficiency.</li> <li>● Taipower will use technologies such as energy management to integrate power, air conditioning, elevators, lighting, and automated control systems to make buildings smart and effective in terms of energy use.</li> <li>● Taipower will set its own standards for green buildings that are even higher than those set by the government, particularly with respect to the energy consumption of buildings. For any construction project that needs Green Building Candidate Certification, Taipower will ask for a score that is higher than the regulated threshold.</li> </ul>





## Environmental Conservation and Ecological Diversity

### Fishery Resources Restoration

Seeing that coastal fishing resources in Taiwan have been on the decline and with the understanding of people's dependence on marine resources, Taipower stepped forward to show its responsibility to the society to boost the economy of the region, and to protect the marine ecology. In practice, Taipower continues to release fry fish of high economic value off the coast of the locations of its thermal and nuclear power plants in order to rejuvenate the fisheries resources and marine ecology in demonstrating its corporate social responsibility. As of the end of 2012, Taipower has released more than 11.72 million fry fish off the coast of the locations of its thermal and nuclear power plants in the past 11 years.

### Coral Preservation

In addition to participating in Kenting National Park's "Hengchun Peninsula Coral Reefs Comprehensive Conservation Program" over the years, Taipower has appointed the Marine Biology Museum for the "Investigation and Monitoring of the Ecology at the Coral Reef at the Sea Zone off South Bay" and installed three underwater remote monitoring systems (since 2003) near the water intake of the 3<sup>rd</sup> Nuclear Power Plant. These remote monitoring systems allow Taipower to monitor the status of the coral reefs around the clock and to project live images of the reefs for public viewing at Taipower's Southern Visitors Center. Taipower has made the best of its effort in the coral reef conservation for performing its corporate social responsibility in environmental protection, and achieve coexistence and mutual prosperity with the local community.

### Promotion of Planting and Green Landscaping

Taipower shows its concern for the earth and its dedication to Taiwan, and makes planting a vital aspect of its mission. In the past, Taipower has established green belts in all power plants, power supply facilities, work sites, and training centers. The planted area has reached 300ha to date.



In 2012 Taipower also planted a 60ha. forest at the Phoenix Mountain Military Infantry School, Kaohsiung, and worked with the Miaoli County Government to plant 48ha. of forest as part of a planting project. Taipower also joined hands with Taoyuan County Government to complete 26ha. of planting work. In the future, Taipower will continue to promote carbon decrease campaigns, to help save the planet from global warming by real action.

### Environmental Protection Research Collaboration

Project Name	Collaborated Partner	Project Content
"Integrated planning project of environmental conservation and exhibition in Wanda and Taichung power plants"	Observer Ecological Consultants Co., Ltd.	<ul style="list-style-type: none"> <li>• Gather information on existing ecological surveys and monitoring at Wanda Power Plants. Search the literature on the targeted groups of animals, the scope of inhabitation, environmental requirement, and related ecological information. Sort out the materials worth retaining or further explanation. Conduct analysis on the scope of data and conduct supplementary investigation.</li> <li>• Proceed with the collection of species for incubation as needed for subsequent breeding.</li> <li>• Gather information on environmental assessment and ecological monitoring of the surrounding area of Taichung Thermal Power Plant, literature on birds inhabiting along the coastline of central Taiwan, and use the space inside the power plants and facilities for the breeding and inhabitation of sensitive breeds and related ecological information. Taipower planned to rejuvenate the inhabitation and breeding of certain species of birds through the exhibition and education on ecological resources and the environment.</li> </ul>
"Using used electric utility poles as artificial reefs: an investigation and study of the resource enhancement"	International Ocean Sustainable Culture and Environment Protection Foundation	<ul style="list-style-type: none"> <li>• Conduct an extensive survey on the artificial fishery reef zones with the positioning of cement cable poles, gather information on the types of fishery and other resources at cable pole reef, square cement reef, steel reef, and boat reef.</li> <li>• The investigated reef zones include Shanao, New Taipei City; Baishin, Miaoli; Wuchia, Taichung; Yungan, Kaohsiung (outside Port Hsinta); Yanliao, Hualien; Yiwan, Shiaogang, Zhuwu and Guiwan (Ludao) in Taitung; and Haiko, Pingtung, ten in total. These sites are potential locations for future artificial fishery reefs made from used poles.</li> </ul>

## Environmental Protection Fines Reduction

Through detailed management and check plans, intensified measures and internal control mechanisms, and strengthened check and preventive measures in environmental protection, the number of violations against environmental regulations has substantially dropped in 2012. In the future, Taipower will continue its effort to fulfill its commitment to environmental protection.

Type \ Year	2010	2011	2012
No. of violations	9	9	6 
Fines (in NTD 1,000)	820	876	346 

## Recycle and Reuse of Industrial Waste and Power-Generation Side Products

### Reuse of Coal Ash

The majority of waste generated from Taipower's thermal power plants is coal ash (fly ash and bottom ash), most of which can be reused to reduce the environmental burden. Presently, fly ash is commonly used in civil construction. In fact, Taipower has used fly ash in power facilities construction and promoted its use. In the meantime, Taipower has promoted the use of bottom ash for ditch repaving projects in construction units. This greatly raises the reuse quantity and rate of coal ash. In 2012, and auction price for the sale of coal ash amounted to NT\$ 109 million or at the utilization rate of 85.6%. (Note: Utilization Rate = Sold Amount/Produced Amount)

### Reuse of Gypsum

During the combustion process in coal-fired power plants, the sulfur contained in the coal is converted onto SO<sub>x</sub>. The sulfur content of coal is converted into SO<sub>x</sub>, and then emitted with the flue gas. To reduce air pollution, Taipower has installed exhaust desulfurization facilities at its three coal-fired power plants (Linkou, Taichung and Hsinta) to eradicate SO<sub>x</sub> and uses limestone slurry to transform SO<sub>x</sub> in flue gas into gypsum. Taipower used lime paste to give CaSO<sub>4</sub> · 2H<sub>2</sub>O or commonly known as raw gypsum through the process of absorption, neutralization, oxidation and crystallization. The gypsum produced by Taipower can be reused by local cement makers and fire retardant board makers. In 2012, the production of gypsum amounted to 733 thousand tons per year and its utilization rate reached 101.6%. (Note: Utilization Rate = Amount Sold/Amount Produced)

### Bidding for Industrial Waste

Other industrial waste, such as waste wires and cables, metal scrap materials, etc., are being reused by Taipower through waste disposal contractors through an open bidding process. In accordance with government regulations, bidding contractors should be qualified Industrial Waste Processors and perform their reuse operations according to regulations to reduce the environmental risks involved in waste treatment.

#### Industrial Waste Bidding Amount

Unit: 1,000 tons

Type \ Year	2010	2011	2012
Waste wires, cables and metal scrap materials - centralized for auction sales	8.773	6.801	9.678
Coal ash production volume	1,957	2,104	2,126
Coal ash auctioned volume	1,687	1,835	1,820
- Landfills and land reclamation	270	269	306

Note: 1. Reuse after sales through auction. 2. The output of coal ash = auctioned volume + the volume in landfills and land reclamation.

#### Industrial Waste Bidding Amount

Unit: NT\$ 100 million

Type \ Year	2010	2011	2012
Waste wires, cables and metal scrap materials	12.83	9.88	15.05
Coal Ash	1.35	1.46	1.09
Total	14.18	11.34	16.14



## Removing Silt and Maintaining the Safety of Reservoirs

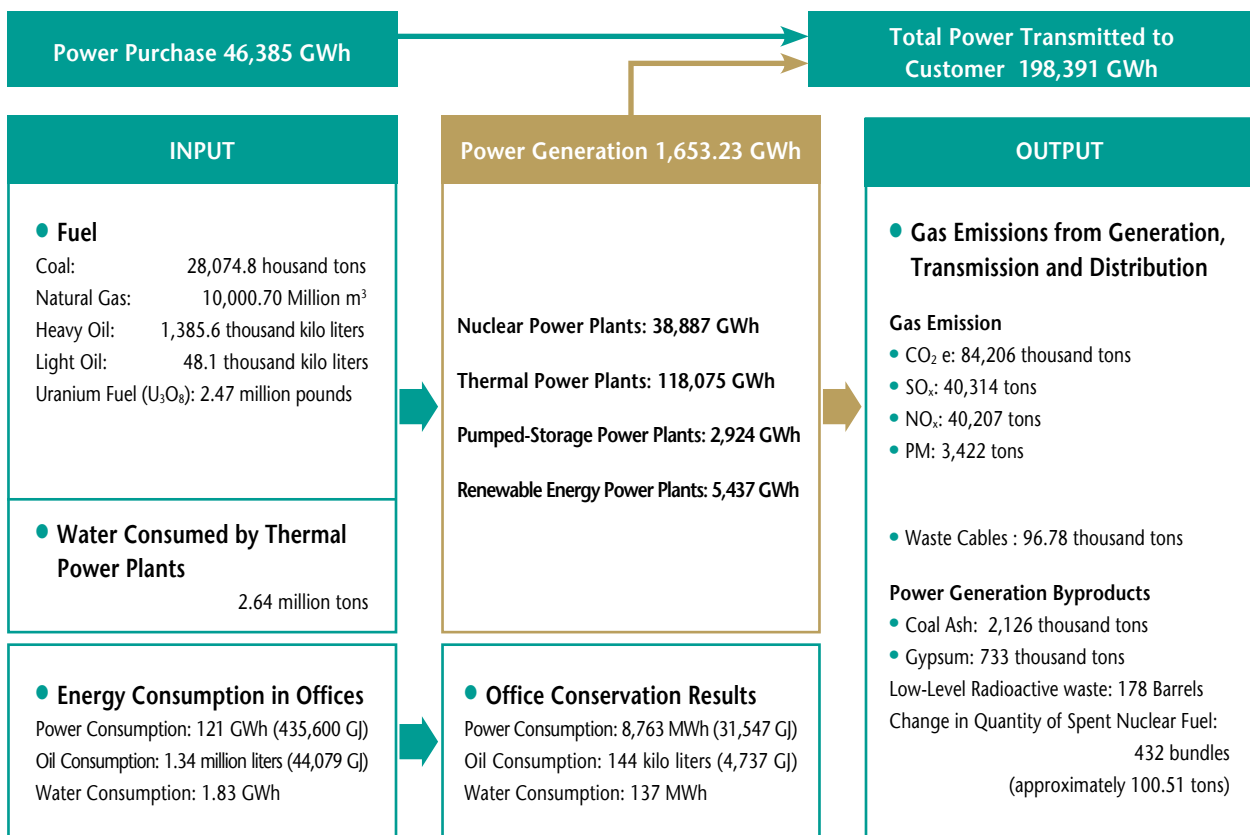
Taiwan is a populous small island with steep terrain and frequent earthquake. The extreme climate changes in recent years have brought about typhoons and downpours that often cause mudslides that worsen the sedimentation problems of reservoirs. The problems of sedimentation and safety have attracted much social attention.

Currently, there are 21 reservoirs under Taipower's administration. To mitigate the influence of reservoirs silt, Taipower has made tremendous effort in cleaning up the mud and launched proper safety measures to ensure safety of the dam and reduce possible loss and damage and thereby reduce the probability of hazards to the lives and property of the people living downstream. Taipower, as a state-owned enterprise, assumes its corporate social responsibility for disaster prevention, disaster mitigation, and the sustained use of water resources.

In terms of the removing silt of reservoirs, in 2012 Taipower cleared 630,000 m<sup>3</sup> of mud sediment from five reservoirs under its administration which helped to increase the storage capacity of the reservoirs and enhance the efficiency of power generation. At the same time, Taipower also took positive effort in the study of the techniques in the reduction and prevention of mudslides.

In terms of the safety maintenance, Taipower has regularly implemented a safety evaluation of its reservoirs in accordance with the "water conservation structure check and safety evaluation" promulgated by the Ministry of Economic Affairs. In 2012, according to a safety evaluation, no concerns were found at the Ayu, Lohao, Guishan and Cukeng reservoirs, or the Shipan, Mugau, Sheilian and Nanshi Dams, which are all administered by Taipower. In addition, Taipower conducts emergency response drills for events such as the collapse of reservoirs to ensure operation safety.

## Environmental Footprints of Taipower's Operations of 2012



Note: 1KWh=0.0036GJ, 1Gallon Gasoline=0.125GJ





# Employee Cultivation and Workplace Harmony and Safety

Protecting the safety and health of workers and reducing injury incidents and occupational illness of the employees and contractors, as well as helping employees enjoy a good career development are Taipower's core value concepts towards its employees and work partners. Taipower expects every employee and work partner to enjoy a safe and healthy working environment.

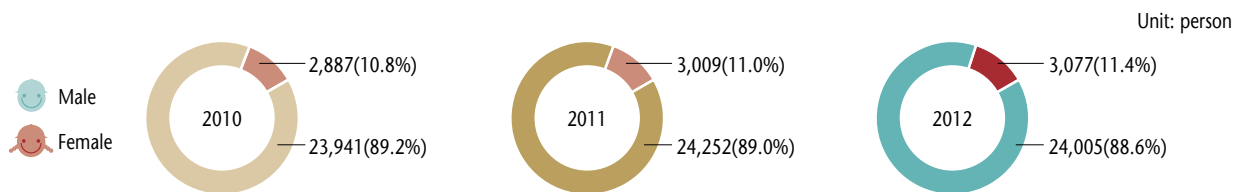
## Taipower Human Resource Structure Snapshot

### Employment Status

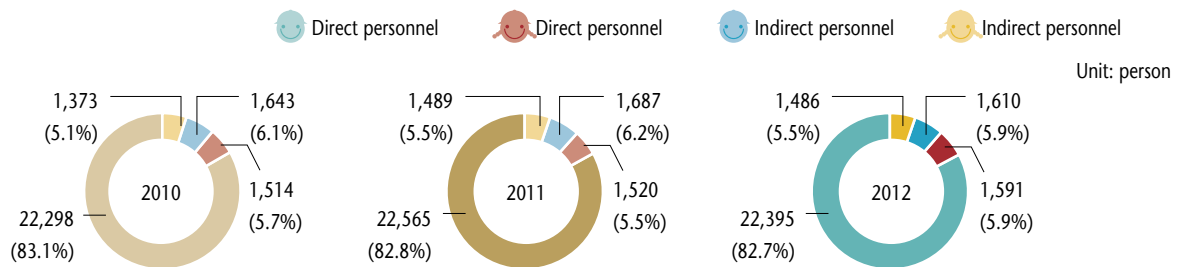
Total number of employees (All employees are of R.O.C. nationality)



### Male and Female Personnel Rate



### Direct Personnel and Indirect Personnel Rate by Gender



### Employee Turnover Number and Rate (by age, gender, or region)

Age	Year	2010		2011		2012	
		Male	Female	Male	Female	Male	Female
Under 30		18(0.06%)	14(0.05%)	38(0.13%)	18(0.07%)	23(0.08%)	13(0.05%)
30-50		37(0.14%)	13(0.05%)	66(0.25%)	21(0.08%)	57(0.21%)	33(0.12%)
Over 50		457(1.70%)	45(0.17%)	292(1.07%)	32(0.11%)	633(2.34%)	53(0.20%)
Total		512(1.90%)	72(0.27%)	396(1.45%)	71(0.26%)	713(2.63%)	99(0.37%)

Unit: person

## Number of Parental Leave Applications and Reinstatement Rate

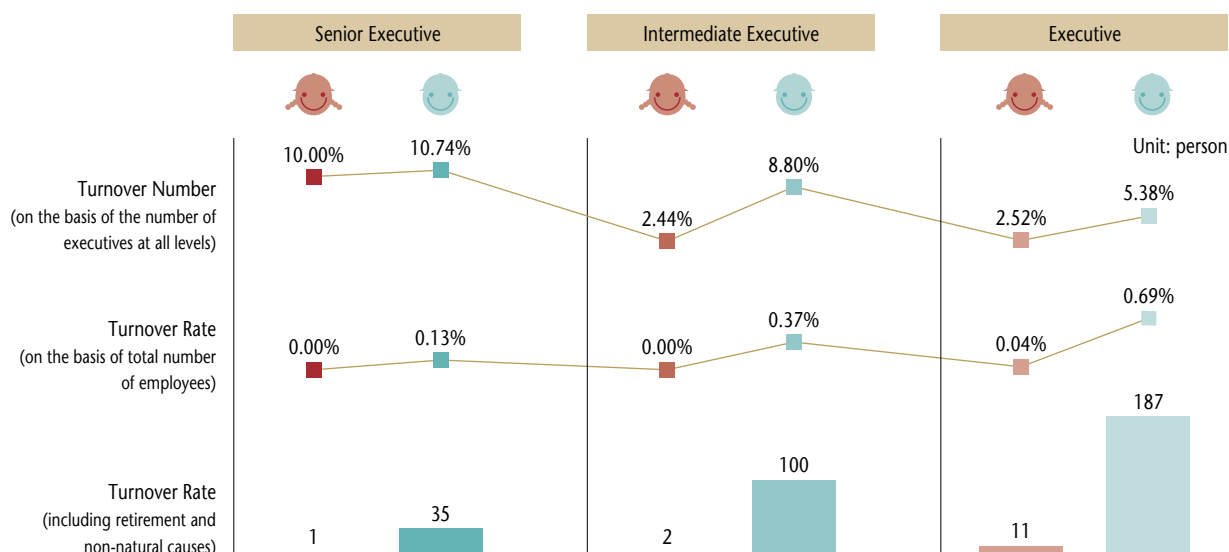
Unit: person

Item	Year		
	2012		Total
			
Number of persons entitled to apply for parental leave in 2012	1,345	182	1,527
Number of persons applied for parental leave in 2012	8	23	31
Number of persons reinstated in 2012	3	12	15
Number of persons reinstated for one year after 2012	5	6	11
2012 Reinstatement rate	100%	100%	100%
2012 Remaining rate	100%	85.71%	91.67%

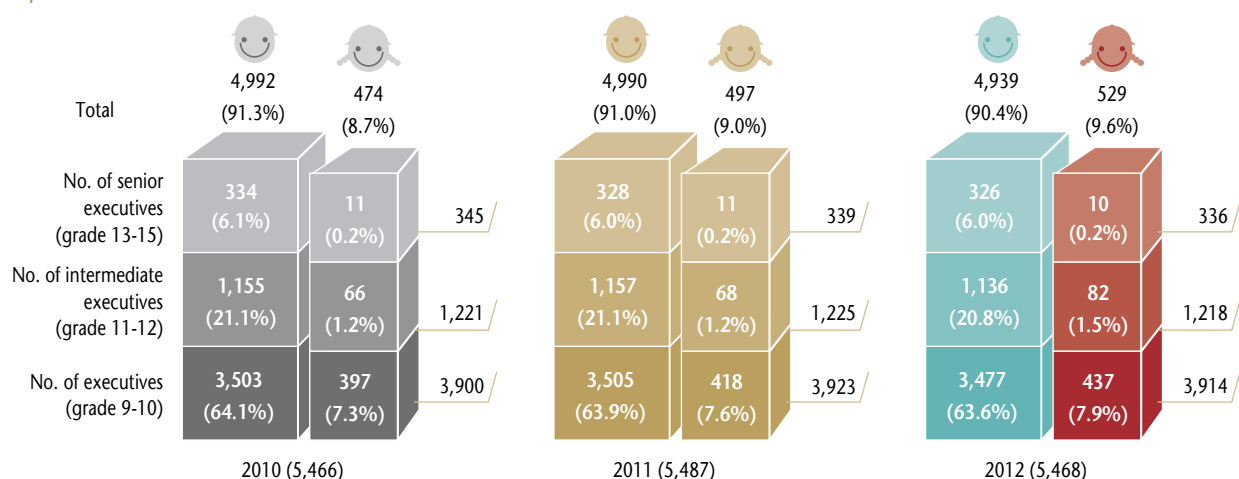
Note:

1. The "Number of persons entitled to apply for parental leave in 2012" is based on the number of employees who have taken parental leave (including the leave of the spouse) in the last three years (2010-2012).
2. The "Number of person reinstated in 2012" included those who have taken leave in 2010 but applied for reinstatement in 2012, taken leave in 2011 but applied for reinstatement in 2012, and taken leave on 2012 but applied for reinstatement in 2012.
3. The method of calculation for "2012 Reinstatement rate": Number of persons reinstated in 2012/the number of all persons reinstated in 2012.
4. The method of calculation for "2012 Remaining rate" = those reinstated in 2011 and who remained in office in 2012/the total number of persons reinstated in 2011.

## 2012 Turnover Rate



## Proportion of male and female executives



# Strengthening Human Resources Management

## Recruiting and Training New Employees

As of the end of 2012, Taipower had 27,082 employees. In order to avoid a manpower gap and strengthen the continuing development of technology, Taipower has launched a recruitment campaign in 2012 and has hired 638 persons in 23 categories. They underwent a 6-month period of probation. Each unit set up learning goals for the new employee's tentative assignments and selected proper sectors for probation. In addition, according to their career planning, the company provided them with long-term training and assistance. Under the system of talent cultivation, the employees who take in multiple training programs will be able to grow with the company's business.

In 2012, a screening test for the cultivation program was held to screen 412 employees for 14 classes. Another screening test was held for employment localization, planned for the selection of 7 people. The cultivation program this year started on Nov. 5. Interns will be educated and trained for one year. Upon completion of the program, interns who satisfy the requirements and qualifications will be hired to add new blood to the organization and ensure the on-site transference of technologies.

## Continuing On-the-Job Training

In 2012, to strengthen competitiveness, promote manpower resources and development, and enhance management performance, Taipower undertook the following local and overseas training programs in which 50,524 employees participated in on-the-job and off-the-job training. 67 went abroad for internship, 3 for inspection, 44 for business, 99 for meetings, 5 for research, 14 for overseas contracting, and 4 to be stationed abroad, for a total of 236 persons. Taipower has also made positive efforts to encourage the licensing system for its employees to upgrade their professional skills. The employees were supervised in acquisition of the related certificates and licenses. In 2012, 1,887 employees obtained different certificates and licenses.

Item \ Year	2011	2012
External training (persons/times)	54,240	50,524
Overseas Study (persons/times)	24	3
Internship (persons/times)	104	67
Certificates and licenses (persons/licenses)	1,935	1,887

## Conducting Executive Training

Each level's executives play a key role in promoting and implementing Taipower's management strategies. In order to continuously add new talent to executive levels, in 2012, 330 employees with good performance participated in the supervisory training; 226 participated in the intermediate supervisory training and 504 participated in supervisor training (including 116 as senior supervisors). These training sessions with other diversified on-the-job training sessions are beneficial to manpower reserve and utilization.

Unit: person

Item \ Year	2011	2012
Senior supervisory job training	110	116
Intermediate supervisory training	198	226
Supervisory Training	334	330

## Establishing Knowledge Communities

Taipower established a "knowledge communities" system to provide a platform for its employees to share and exchange work experience and professional knowledge. Through these interactions, employees' loyalty was also solidified. The measures included:

Knowledge Management System	<ul style="list-style-type: none"> <li>Taipower blog, business coordination sites, Taipower brain trust, Taipower integrated search, etc.</li> </ul>
Knowledge Management Content	<ul style="list-style-type: none"> <li>Fifty-nine business coordination sites, 241 knowledge communities, 8,109 experts, 84,360 knowledge documents and 270 learning benchmarks, all of which contributed to the future transformation of Taipower.</li> <li>The Taipower integrated search system has been viewed 15,001 times, and consulted 4,847 times.</li> </ul>
Installation of Taipower KM integrated index search system	<ul style="list-style-type: none"> <li>The search system can integrate employee training materials, the reference database and knowledge system and also support multi-dimensional retrieval. Our employees can use the new system to access knowledge data, give feedback and hold discussions to create new knowledge or add new value to it.</li> </ul>



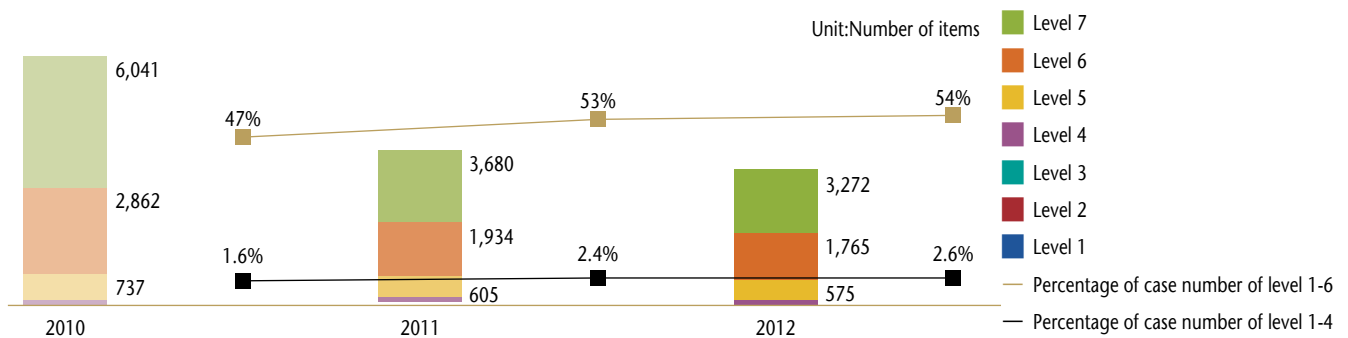
## Establishing Taipower E-Learning School

Riding the wave of the knowledge economy, Taipower plans to continue promoting the lifelong learning concept and integrating resources, such as various practical trainings and Taipower's internal E-Learning School (ELS), to form learning type organization to strengthen employees' competitiveness. In 2012, Taipower ELS offered 730 on-line courses and opened outside learning websites to provide employees with a 24/7 environment to conduct their voluntary on-line learning. In 2012, the average number of hours spent reading per employee on ELS was 10.3 hours, and learning 55.6 hours, both surpassing the goal of learning hours.

Result of Taipower E-Learning	Year	2010	2011	2012
Number of online courses (course)		514	562	730
Taipower E-Learning Course Viewing and Passing Hours (hour)		7.4	9.5	10.3

## Establishing an Employee Proposal System

Taipower established the "implementation guidelines of the employee proposal system" in 1994. This system provides a platform for the employees to openly demonstrate their potential and creativity and offer suggestions for improvement in a spirit of team work. Employees can propose projects to pursue improvement and innovation for the company's management and operation, to the extent that productivity and operation performance can be enhanced. In the early years, our employees placed high value on quantity; however, we focus on quality now. To encourage qualified proposals, excellent ones have been recognized and rewarded since 2008. In 2012, there were 3,272 proposals, of which 1,765 were rewarded. This is a clear sign that employees have become enthusiastic about participating in this innovation proposal program.



## Incentives for Proposal of New Process/New Method of Work

Taipower has committed to the continuous pursuit of quality. To encourage innovation, the "Evaluation and Award Standards for New Processes and Methods" and the "Principle for Measuring Efficiency of New Processes and Methods" were established in 2011 and 2012. In addition, employee proposals that show a significant contribution to company operation by providing a substantial profit above NT\$10 million will receive a substantial reward since 2013.

## Strengthening Corporate Ethics and Work Discipline

- Having Executives Set Examples to Shape a High Quality Culture: Executives should set examples of integrity and self-discipline to bring about a good climate for their unit and shape an ideal corporate culture.
- Enhancing Work Discipline and Upgrading the Company's Corporate Image: In order to substantiate the tasks of random checks and enhance rewards and punishments to raise the effectiveness of incentives and alerts, working discipline and the record of rewards and punishments should be taken into consideration when conducting employees' work evaluation, promotion, training and rotation.

## Creation of a Fair Employment Environment

### Gender Equality

Article 5 of the Employment and Service Act requires that "For the purpose of ensuring equal opportunity in employment, an employer is prohibited from discriminating against any job applicant, or employee, on the basis of gender..." As such, Taipower always adheres to the spirit of gender equality in its recruitment, in its entrance test design and in its career planning for employees. Taipower will not discriminate against sexgender, religious preference, race, and nationality.

## Employment of Disabled and Aboriginal People

To guarantee equal employment opportunities for minorities, Taipower has abided by the regulations stipulated in the People with Disability Rights Protection Act and the Indigenous Peoples Employment Rights Protection Act.

In 2012, Taipower employed 918 employees with disabilities (3.33% of Taipower's total number of employees, higher than the legal requirement of 3%), and 162 employees of aboriginal descent (0.59%).

Category of employees	Year	2010	2011	2012
Total employment no. of people with disability/Percentage of people with disability (persons / %)		842 / 3.11%	923 / 3.38%	918 / 3.33%
Total employment no. of aboriginal people /Percentage of people with disability (persons / %)		161 / 0.59%	166 / 0.61%	162 / 0.59%

## Labor-Management Relations

### Executive-Employee Communication Meetings

- Taipower, according to the provisions of Regulations for Implementing Labor-Management Meetings, regularly holds labor-management meetings for effective communication. In 2012, 394 company-level meetings were held. For major labor-management issues, Taipower timely contacted Power Labor Union to give explanation and discussion for 28 times and successfully settled down the disputes.
- For ensuring good communication, "Note for Communicating with Employees" was established to encourage the supervisors to perform good communication with their staff, with special emphasis on employees' interests and rights. A dedicated mechanism was also set up for handling, tracing, and controlling the matters about employees' opinions, so as to further enhance communication efficiency.
- In 2012, six explanation sessions were held to communicate the current situation of the company (with 2611 persons attending), and one explanation meeting for addressing a major labor-management issue was held (with 73 persons attending, including some union cadres), in which Taipower's policies and messages were well communicated and fine labor-management relationship has been maintained.
- In 2012, four symposiums were held for our Chairman, supervisors and union cadres to make discussion, with totally 356 persons present.

### Employee Assistance Program (EAPs)

Purpose	<ul style="list-style-type: none"> <li>• Internal and external resources were integrated and applied to help employees solve their difficulties or problems in their work, lives, emotions, and health. A Taipower employee supportive network has been established to raise the performance of the employees and the organization.</li> </ul>
Status	<ul style="list-style-type: none"> <li>• Currently, 80 Heart-to-Heart Counseling Programs have been established and 630 employees worked on a voluntary basis to organize the assistance programs, concern for employees, preliminary interview, and referral service.</li> </ul>
Employee Assistance Activities	<ul style="list-style-type: none"> <li>• There are 5,000 persons participating preliminary interviews each year. The Heart-to-Heart chapters in each functional unit organized up to a thousand events for assisting employees, including the colloquium for basic level workers, keynote speech, book reading gathering, birthday party, recreation programs, cancer examination, and weight loss contest for strengthening bonding among employees and creating a harmonious and healthy working environment.</li> <li>• Publish the "Heart-to-Heart Bimonthly" magazine. The content of this magazine is diverse and attractive. This is the platform of exchanging information for the employees and also a resource of knowledge on work, health, living, and mental and physical health. The magazine also yields the desired result of print media communication and supervision in writing.</li> </ul>
Projects	<p>Taipower launched the diverse EAPs ((Employee Assistance Programs)) to meet the needs of the organization and the employees, including:</p> <ul style="list-style-type: none"> <li>• "Safe and Health Workplace Assistance Project" and "Workplace Sexual Harassment Prevention Plan" were launched to enhance the employees' awareness of mental and physical health. The plans also use internal and external resources to hold health-related campaigns to create a working environment that is full of care, friendship and mutual respect.</li> <li>• "New Employee Assistance Project", "Pressure and Emotion Management Assistance Project", "Happy Workplace and Working Safety Assistance Project", "Work-Life Balance Plan", "Employee Financial Consultation Project" and "Legal Consultation Assistance Project" have been also in place to help the employees.</li> </ul>
2012 Achievements	<ul style="list-style-type: none"> <li>• Taipower was visited by many external institutions, including Fu Jen Catholic University, Taiwan University of Science and Technology, Taoyuan County Government, John Tung Foundation and so on. In addition, Taipower were also invited to attend and share its insight and experiences in the activities held by Taipei City Community Mental Health, Taiwan Employee Assistance Professionals Association, National Police Agency, New Taipei City Labor Standards Inspection Office and The Council of Labor Affairs. These activities were employee-oriented seminars or workshops, in which Taipower shared information from the company's internal magazine "Join-Heart Garden" and received positive responses.</li> <li>• Taipower was recognized and awarded by the government unit with "Health Workplace Self-Certification" as a model non-smoking workplace, Health Activation Mark, Health Promotion Mark, and Health Weight-Loss Performance, and Happy Workplace Good Business.</li> </ul>





## Employee Welfare Policy

According to Article 2 of “Employees’ Welfare Funds Act”, the employees’ welfare fund is 0.05% to 0.15% of the total operating revenue and it is allocated monthly. When the summer rating applies, the rate becomes 20% to 40%. The welfare fund is managed by Taipower Employees’ Welfare Committee (an independent entity) under the principles of fairness, benefit, popularity, effectiveness. The welfare advantages include subsidies for marriage, maternity and family decease, children educational scholarships, medical insurance allowance, bonuses or gifts for major festivals, employees’ campaigns in the fields of sport, music and education, with the contribution to stabilize employees’ working moods, balance employees’ mental and physical development, and care of employees.

## Care and Arrangement for Retired Employees

- For providing good care to the retirees, Taipower hires experts to give keynote speeches about retirees’ metal and physical conditions to ready-to-retain employees. For retirees, farewell parties will be held and Taipower will give them memorial presents. At the three major festivals every year, namely Chinese New Year, Dragon Boat Festival, and Middle Moon Festival, the retirees will be visited by the company’s representatives and receive cash gifts. When any retiree has serious disease or meet natural disasters, the company, upon being aware of the situation, will try its best to help. For the retiree used to work at a Taipower’s facility owing its in-house medical services, the retiree and his/her certain family members can still use the medical service after his/her retirement. The functions supported by the welfare department of Employees’ Welfare Committee (such as grocery stores and barbershops) are open to the retirees and their family members.
- When Taipower’s business units or employees have the need of translation, edition, research or the like, where the retirees may have the specialty or experience to help, they may hire or appoint the retirees to do the job and give compensation as agreed.
- Taipower’s retirees are all members of Taiwan Power Industry Retiree Association. As these members are all highly experienced in Taipower’s business and have good relationship locally, they have given the company with great help in communication and in business promotion, particularly in the cases where the construction of power facilities were obstructed.

## Occupational Safety and Health

Whether a company conducts good safety health management highly affects the company’s occupational accident risk and sustainable growth. For setting up a perfect safety health management system, and continuing to improve safety and health facilities, Taipower pays great efforts to promote accident-reducing measures and workplace health enhancing activities. Taipower also launched Occupational Safety and Health Management System (OSHMS) to further ensure all-dimension safety/health management, and internalize it as a part of the company’s operation management, thereby realizing systematic development of OSHMS, in turn effectively reducing workplace hazard and risk and creating a safe, comfortable working environment.

### Honors awarded to Taipower’s occupational safety and health management 2012

Participating Units	Events	Awards
Taiwan Power Company	National Competition of Workplace Safety and Health Week Performance in 2012	Distinguished Award National and Private Enterprises Group A
Jugong-Wufeng double-in double-out Mountain Jio 161KV Line #87A~#8A Tower and Stringing Construction	Outstanding Public Work Project in Labor Safety and Health in 2012 Finalist	Finalist
Power Plants: Hsinta, Chenshan, Taichung, Nuclear #3; Northern Region Construction Office, Department of Nuclear and Fossil Power Projects; Business units: Kinmen, Keelung, Yinlin; Service centers: Yinlin Service Center; Business Office: Fengbin, Hualien; Jiatung, Pingtung; Dapi, Yinlin; Mailiao Yinlin; 13 units in total	Bureau of Health Promotion, Department of Health, Executive Yuan	2012 Self-certification of Health Workplace

## Employee Safety and Health Management Measures

For enhancing the employees' knowledge about occupational safety and health and for promoting good culture of safety and health, Taipower actively draws up various schemes, with the hope to have its business and function units, by way of sharing safety-health knowledge and mechanism such as education and training, to actively promote workplace safety and health, strengthen industrial safety propaganda, coaching, implement prevention and control, and ensure operational safety and health.

<p>Establishing Labor Safety &amp; Health Organization</p>	<ul style="list-style-type: none"> <li>• "Department of Labor Safety and Health" is dedicated to promote industrial safety.</li> <li>• The Labor Safety and Health Committee were established. Taipower's president serves as the chairman of the committee. There are 33 members (including one chairman, one vice chairman and 31 committee members).</li> <li>• Among the Labor Safety and Health Committee, 14 are from the Taipower Union, accounting for 42% of the total, a percentage that is higher than the legal requirement.</li> </ul>
<p>Establishing Taiwan's Occupational Safety &amp; Health Management System (TOSHMS)</p>	<ul style="list-style-type: none"> <li>• Assistance was offered to each unit to establish a TOSHMS. As of the end of 2012, 57 Taipower units, including generation, repair &amp; maintenance, nuclear power, power supply, business, construction, and so on have passed TOSHMS certification.</li> </ul>
<p>Promoting Training and Incentives</p>	<ul style="list-style-type: none"> <li>• The following tasks were undertaken: educating new employees about occupational safety regulations, strengthening the promotion of industrial safety among employees, and reeducating employees on industrial safety regulations and professional skills. In 2012, the participants totaled 33,000.</li> <li>• An industrial safety training program was recently launched, allowing the trainees to participate in and experience the real danger, so as to value safety practice.</li> <li>• The employees with outstanding performance in promoting industrial safety work were openly recognized and awarded.</li> </ul>
<p>Enhancing Disease Prevention and Health Awareness</p>	<ul style="list-style-type: none"> <li>• Contracted doctors were invited to the company's facilities to conduct works for preventing occupational hurt and disease, and for providing health service.</li> <li>• Various health-promoting campaigns were held, including weight loss, drug consultation, mental health and disease prevention.</li> <li>• Taipower worked with Health Promotion Administration, Ministry of Health and Welfare to promote more health-promoting campaigns, such as workplace self certification.</li> <li>• Taipower provided employees with general and special health checks, and record the results for future tracking and monitoring, in order to improve the condition of health management.</li> </ul>

## Contractor Safety and Health Management Measures

For minimizing contractor's work injury, Taipower not only urges contractors to well manage the safety and health on the responsible work, but also actively assists contractors in setting up an industrial safety management system and in implementing it by themselves, so as to well fulfill its responsibility of caring the partners. The particular industrial safety measures include:







<p>Reinforcement Safety Awareness</p>	<ul style="list-style-type: none"> <li>• Exercising TBM-KY (Tool Box Meeting &amp; Kiken Yochi) to prevent accidents.</li> <li>• Inviting contractors to anti-accident propaganda, demonstration of safe operation and similar campaigns held by either Taipower or the related authorities.</li> <li>• Inviting contractors to educational courses/training about industrial safety/health held by Taipower, such as workers in effect training and zero-accident program.</li> <li>• Producing training material about hazard identification for the contractor to use for education, training or propaganda.</li> </ul>
<p>Performing industrial safety check</p>	<ul style="list-style-type: none"> <li>• Intensifying industrial safety check before and after Chinese New Year, during flood season and in summer time to prevent the peak of occupational accidents.</li> <li>• Having an industrial safety supervising team perform check, diagnosis and guidance, so as to help and urge contractors to implement self management and ensure safe and healthy on-site operation.</li> <li>• Taking mutual-defense mechanism for industrial safety to actively identify safety weakness and high-risk operation existing in the contractors' performance and to offer assistance as well as recommendation.</li> </ul>
<p>Promoting Labor Safety Examination. Immediate Monitoring System (RSMS)</p>	<ul style="list-style-type: none"> <li>• Using the real-time monitoring system provided by the Council of Labor Affairs to allow the management to have real-time control through the Internet on safe and health on-site operation.</li> <li>• For operations at remote sites and of impermanence, contractors are required to take safety measures on high-risk operation and photo the operation for record, so as to foster the contractors' self management in industrial safety.</li> </ul>



<b>Conducting Assistance and Audits</b>	<ul style="list-style-type: none"> <li>Proactively replace any industrial safety managing staff member who is determined as incompetent.</li> <li>Holding industrial safety propaganda for contractors in all regions and inviting their employers, industrial safety members, and foremen to educate Taipower's philosophy and knowledge about safety and health, as a way to foster the contractors' self management in industrial safety.</li> <li>Biannual symposiums are hosted by Taipower's local heads for face-to-face discussion with contractors' project managers and industrial safety members.</li> <li>Directly using the pecuniary punishment collected from the contractors who violated the provisions about safety and health as set forth in the contracts to improve their safety and health management, thereby, enhancing the overall industrial safety performance.</li> </ul>
<b>Accident Review and Horizontal Development</b>	<ul style="list-style-type: none"> <li>Horizontally expanding Taipower's review on serious occupational accidents and subsequent preventive solutions, so as to avoid re-occurrence.</li> <li>Conducting overall review on the standards for safety operation to update them with the on-site needs.</li> <li>Holding safe operation drills to improve operational capability and operational control.</li> </ul>

With the excellent cooperation of all our employees and contractor partners, in 2012, the actual performance value of the employees' Frequency-Severity Indicator is 8.81, and the actual performance value of the contractor' serious occupational accidents is 5. In the future, Taipower will keep promoting diverse industrial safety management measures, and actively participating in the schemes of accident prevention planned by the governmental agencies, including Council of Labor Affairs, so as to work with the government in securing a safe and happy workplace for our employees.

## Taipower Occupational Injury Indicators

Year	Item	Occupational injury (no. of cases)	Disabilities from accidents (persons/ times)	The loss of work days (no. of days)	Total work hours	Ratio of occupational injury to loss of work hours	Ratio of loss in work days	Frequency of disability	Frequency-Severity Indicator
2010		21	24	7,649	51,057,011	0.08	29.96	0.47	8.36
		1	1	6,000	6,156,869	0.03	194.90	0.16	12.48
	Total	22	25	13,649	57,213,880	0.07	47.71	0.43	10.11
2011		18	20	1,606	49,751,074	0.07	6.45	0.40	3.57
		1	1	115	6,172,727	0.03	3.72	0.16	1.69
	Total	19	21	1,721	55,923,801	0.06	6.15	0.37	3.33
2012		13	18	13,563	49,576,750	0.07	54.72	0.36	9.87
		0	0	0	6,127,463	0	0	0	0
	Total	13	18	13,563	55,704,213	0.06	48.70	0.32	8.81

Note:

- The ratio of GRI occupational injury to the loss of work hours = total occupational accidents/total work hours × 200,000\*  
(\*:Basing on 50 weeks per year and 40 work hours per week for 100 employees)
- The ratio of GRI loss of work days = total loss of work days/ total work hours × 200,000\*  
(\*:Basing on 50 weeks per year and 40 work hours per week for 100 employees)
- Frequency of disability (FR) and Frequency-Severity Indicator act as safety indicators
- Frequency of disability = Times of disability/ Total person-work hours \*10<sup>6</sup>
- Severity of disability = Total workday lost/ Total person-work hours \*10<sup>6</sup>





# Communication between Taipower and Stakeholders

## Refining Customer Services

### Guaranteeing Power Supply in High-tech Science Parks

In order to provide reliable power for industrial users Taipower established the “High-tech Industrial Park Power Quality Management and Improvement Task Force” and the “Industrial Parks and Processing Zone Power Quality Management and Improvement Task Force” to ensure the power supply quality in the science parks and provide related consultation services on technical issues.

Stricter requirements for reliability and quality in High-tech industries, Taipower continues improving power supply reliability, constructing underground cables, and fortifying the operation maintenance to reduce equipment failure and Taipower also adopted external diagnosis techniques to eliminate potential problems that may cause accidents and shortened the response time to emergency situation for repair and recovery of power supply to upgrade the power supply quality in science parks. Related measures include:

- The installation of power supply quality monitoring equipment for analyzing electric power quality related issues.
- Education for business users to install or correct the time setting for relay, procurement of tool certified the robustness of tolerance, reducing the susceptibility of power quality for processing equipment, and implementation of power quality mitigation equipment.
- Improving the communication and reacting mechanism between the area dispatch centers and electricians of the large customers.
- Assisting the training of electricians of key accounts and applying the 3H management mechanism (Hazimete [starting], Henka [change], and Hisashiburi [intervals]) to reinforce industrial safety mechanism to prevent human negligence in operation.
- Strengthening the customer-oriented service culture and, according to the points for dedicated staff service management, appointing staff members to provide advisory service to the customers in the science park that have power consumption over 100kW, including checking the customers’ equipment and conducting review and tests for free.
- Constructing feeder automation in the high-tech park and using digital monitoring to ensure power supply quality.

### Reducing Scheduled and Forced Power Outage Frequency and Duration

To ensure the reliability Taipower has established reliability targets for generation, transmission and distribution. With it, Taipower can assess operating performance and enhance the reliability. The Facilities System Incident Review Meeting is held every month to review the causes of incidents happened in the previous month in the system and proposes optimal improvement measures for each case.

Reducing the time and frequency of forced outage, Taipower is expediting feeder automation construction, to improve the accuracy of the distribution geographic information system, and realize overall control of the forced outage in the push for outage-free operation.

KPI	year	2010			2011			2012			Note
		2010	2011	2012	2010	2011	2012	2010	2011	2012	
System average interruption duration index(SAIDI) (min/customer, year)	Performance of Forced Outage	13.952	13.894	13.331							Reasons why SAIDI in 2012 increased from 2011: while the load has increasingly burdened the system, there are many power constructions not going well due to external resistance. Thus, the limited system expansion has led to a bottleneck of power supply. As the facility aged, it worsens. Thus, the actual performance of both 2011 and 2012 are inferior to that of the previous year.
	Unexpected Outage	3.712	4.33	5.719							
	Total	17.663	18.224	19.050							
System average interruption Frequency index(SAIFI) (freq/customer, year)	Performance of Forced Outage	0.063	0.066	0.0673							
	Unexpected Outage	0.133	0.138	0.2304							
	Total	0.196	0.204	0.298							

In the future, Taipower will continue to improve its line maintenance and upgrade its equipment, which help to reduce downtime frequency, so as to improve operational efficiency and line use, in turn reducing our operational costs. However, in view that the current system is becoming saturated in terms of time and frequency of outage over these years, Taipower in the future shall enhance its precaution and improve the system by continuously refining its line maintenance and upgrading its equipment, so as to reduce unexpected outage and ensure power supply quality.

## Consumer Services

### Process of Complaints

Taipower's website provides useful information for customers, such as electricity and life, electricity library, service locations, customer service information, tariff schedules, information related to electromagnetic fields, and website counter services. Taipower publishes the Taipower Customer Service White Paper to show its commitment to integrity, caring, innovation and service. The White Paper can be downloaded at <http://www.taipower.com.tw>".

To satisfy new customers and impress long-term customers with the company's improvement, Taipower has worked hard customer complaints. Through a customer complaint management system, Taipower compiled and classified customers' suggestions as an important reference for future business improvement.

If customers have any questions regarding applications, bill collections, power outage incidents, rights and interests and other relevant questions, they can call the toll-free number 1911, contact branch offices' service centers or Taipower service offices and/or use the Taipower website's customer opinion box ([service@taipower.com.tw](mailto:service@taipower.com.tw)) for assistance.

In 2012, 2,527 complaints were recorded, of which 1,561 were received via e-mail. Most complaints related to areas such as line relocation (611 cases, 24.2%), and power supply quality (405 cases, 16%).

### Customer Complaints

Unit: cases

2009	2010	2011	2012
3,056	2,713	1,665	2,527

### Customer Satisfaction

Taipower highly values the opinions of customers and has entrusted an outside professional agency to conduct periodical customer satisfaction surveys with regular, medium and large customers (more than 100 KW) through telephoning. The overall customer satisfaction rate has remained above 85 in scores over the past 4 years.

### Customer satisfaction Scores for the Past 4 years

2009	2010	2011	2012
86.0	86.1	87.2	85.5

Note: For the score of customer satisfaction survey, the maximum is 100.

To fulfill customers' expectation, Taipower will continue to review and improve various ways of providing more convenient service to customers and strengthen its communication with customers as well.

### Continuous to Reduce Inconvenience

To upgrade the environmental effectiveness, in addition to promoting the improvement of existing distribution facilities and developing new-model facilities, Taipower communicated and negotiated actively with customers to improve those distribution facilities that were presented as inconvenience to traffic and pedestrians.

Whenever power cannot be reconnected in time due to problems with facility installation, Taipower will make an honest effort to inform the customer and look for ways to resolve the issue as soon as possible. Taipower is committed to providing high-quality power.

In order to reduce the inconvenience caused by power outages, Taipower strengthened its maintenance inspection procedures to reduce incidents and promoted feeder automation projects and improved distribution lines to reduce the frequency and duration of power outages.



## Confidentiality of Customer Information

To meet the regulations of the Personal Information Protection Act, Taipower conducted an inventory check on personal information files and systems in 2010 to review the necessary fields and amend related business regulations. To protect the confidentiality of customer information, Taipower established a comprehensive security mechanism for different groups.

Employees	Contractors	Public
Raising awareness of information security and confidentiality through guidance and training.	Taipower requires all external contractors that may access internal information of Taipower to sign the "Data Access Security Agreement" and requires all employees of contractors to sign the "Statement of Information Confidentiality" to ensure the company's information security.	Inputting customers' detailed personal information for their applications, inquiries and bill payments to ensure customer information security.

## Information Security (IS)

To deal with the increasingly hackers, Taipower has prepared its network with emergency mechanism, as well as real-time monitoring mechanism, for maintaining an information network available all the time. Moreover for the important web-based service systems, Taipower performs 24-7 security control to protect its customer information from unauthorized access and illegal use. Taipower's management system, as of the end of 2012, the units with IS grades A and B continued to retain their ISO 27001 IS management system certifications.

To enhance employee's awareness of IS, Taipower promotes the concept of "information security, everybody's responsibility". The performance of the drill satisfied the requirements of National Information & Communication Security Taskforce, Executive Yuan.

Taipower periodically reviews its IS policies and performs on-site checks on each unit. Drills on a continuous operation plan are held every year to strengthen each unit's responses to IS events. In 2012, Taipower participated in MOEA's information security report drill, and Taipower's 27 participating units were tested to be qualified as high-performance units, evidencing our well practice.

## Unified Counter Service

Counters at Taipower's branch service centers and Taipower's Service Offices can handle all applications through a shared system. In addition, Taipower has provided multiple channels for processing power applications: in person, on the Taipower website, by telephone, via fax and through the mail in order to save customers' time and energy.

To satisfy customers' needs and make power supply service better, all service regions will proactively contact customers to arrange the "projected date of power supply" to applicants applying for additional power supply to save time in the process. The power supply will be connected at the arranged date hoping to enhance the customer satisfaction.

## E-Application Channels and E-Mail Notification Service

Other than those application submitted over the counter, or via telephone, facsimile and mailing, Taipower also provides a cross-agency service jointly provided with Taiwan Water Corporation, and on-line transactions. In 2012, there were about 48,000 applications processed through the Taipower website, accounting for 2.1% of the total number of applications.

To simplify the operation and to enhance efficiency, the application process has been completely opened to citizen digital certificate. Under internet era, Taipower initiated an e-mail service especially for high-voltage customers providing information on power bills, business regulations, payment deadlines, power supply recovery deadlines and etc.

## Multiple Bill Payment Service

Customers may pay their electricity bills at Taipower branch. With the exception of some 2,000 user where electricity bills will still be collected by personnel dispatched by Taipower, other customers may pay their electricity bills through a wide array of channels:

- Prearranged fund transfer from designated account at financial institutions, postal saving and deposits, or credit card.
- Pay over-the-counter of financial institutions, post offices, and 24-hr convenient stores (to lighting and low voltage users only). There are more than 15,100 locations for bill payment.
- Fund transfer through telephone voice service, mobile phone, ATM, internet, multimedia MOD (for lighting and low voltage users only). This method of payment is not restrained by time and space, and is efficient and convenient.

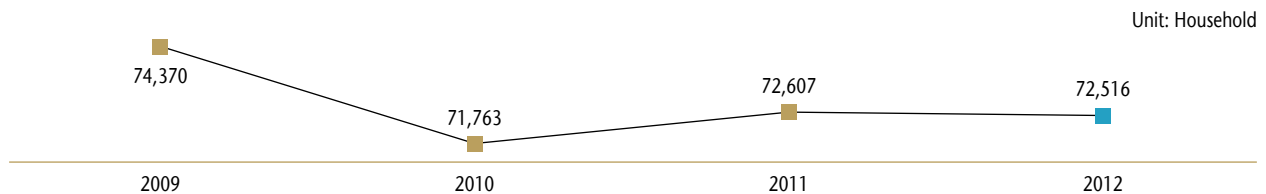


### Call Center Service

A call center system was installed in northern and central Taiwan. With the telephone number of 1911, the Call Center offers 24-hour service including applications, tariff rates, power line repair and maintenance, complaints, etc.

### Special Customer Service

To establish a means of direct communication with its customers, Taipower continues offering special customer service. The designated Taipower employees will periodically and actively visit high-voltage customers and village offices to understand their needs, provide them with technical consultation, and solve their problems. This is done in an attempt to win the customers' support and trust.



### Customer Opinion Box

Taipower's e-mail inbox on the Taipower website provides a channel for customers to express opinions directly through the website. All suggestions are collected by the responsible department, which then sends the suggestions out to related units for reply. The suggestions are compiled, analyzed, controlled and followed up. In 2012, 5,937 e-mails were processed. This e-mail system has become an important communication channel between Taipower and its customers.

#### No. Of Cases

Unit: Cases

2009	2010	2011	2012
7,166	6,290	6,004	5,937

### Attentive Services at Branches

Branches were directed to provide attentive services by improving the environment in and around the business halls, providing friendly service, focusing on marketing, and conducting practical and feasible measure in all aspects to ensure quality service. Also, "Standard Operational Procedure for Receiving Electricity Application", "Standard Operational Procedure for Telephone Manner" and "Standard Operational Procedure for Volunteers and Circuiting Service Staff" were launched for staff to follow, thereby, showing Taipower's warm service, professional ability and polite attitude.



### Water & Power Associated Services

For acting as an attentive service provider to the public, since October 1, 2012, Taipower has allied with Taiwan Water Corporation to provide a cross-agency integrated service named "Water & Power Associated Services" as a one-stop water and power service that accept five summary transactions between the two utilities, including ceding, changing postal address, applying soldiers' dependant benefit, applying E-bill and setting standing order for bill payment. With this service, people can visit any nearby spot of Taipower or Taiwan Water Corporation to have the foregoing transactions made, significantly saving time for traveling and waiting. In 2012, Taipower received 3,382 water-related cases, and Taiwan Water Corporation received 3,082 power-related cases. The service scope may be expanded according to customers' needs.



### Customer Service Workshop

For enhancing the customer service staff's manner and highlighting the importance of attitude and enthusiasm, Taipower continuously holds related training sessions, and regularly holds "Customer Service Workshop" for them to exchange experience, share ideas and encourage each other, jointly forming the culture of "Customer First".

# Enhancing Information Disclosure and Internal & External Communication

## Features for 2012 Official Website Revamping

Power industry is highly professional and requires long-term planning and investment. For facilitating the public to learn our management and operation fully, Taipower revamped its official website in 2012 to adopt a layout that makes information more accessible to the public, thereby achieving more diverse and transparent disclosure.

<b>Feature 1</b>	The new version was designed from the perspective of the public, so the issues of major concern are well disclosed here, including fuel procurement, pricing and other 19 items. The website is now enriched with humanism and displays our employees' diligent and conscientious work.
<b>Feature 2</b>	The visual effects and interface become more interesting and friendly, giving out a bright impression. The homepage now provides news ticker of various topics. The latest news will also be posted in a real-time manner and videos can also be incorporated. The font size can be changed according to the users' needs, allowing visitors of all ages to view comfortably.
<b>Feature 3</b>	The monitoring and analyzing functions were improved, allowing Taipower to use the data about daily views, service volumes, visitor source areas, viewing period, retention time (for each page and the whole website) to better know the public's concerns and to make further improvement in the website design.



## Achievements of Communication with External Stakeholders 2012

### Enhancing Social Communication (Promotion of Corporate Image)

In order to win the trust and support of the public and customers and to upgrade its corporate image, Taipower always devotes great efforts in communication, promotion and service.

- Based on the major issues of power development, transmission and distribution, and Taipower's service spirit, Taipower held the "2012 national power communication and promotion and the competition of multimedia and print poster advertisements" events. These enabled the students and the public to collect various pieces of valuable knowledge about the power industry, helping them acquire a further understanding of power construction issues.
- Taipower holds "Power Construction Seminars for Primary and Secondary School Teachers" during the summer and winter vacations every year to provide teaching materials and cultivate power knowledge in primary and secondary schools.
- In order to upgrade its corporate image, Taipower has also strengthened its media presence by doing the followings: (1) producing video clips to show Taipower's power construction, its long-term social care activities or its environmental protection efforts; (2) printing informative fliers; (3) and recording broadcast tapes available to major media outlets. In addition, Taipower has already distributed press releases, arranged interviews and called press conferences to ensure the public stays informed on company operations.





## Communication between Taipower and Stakeholders

Stakeholder	Issue	Communication Interface	Participation Status	Performance in 2012	Unit/Contact Telephone
Industry groups (unions, associations)	<ul style="list-style-type: none"> <li>Exchange opinions on power supply service and business</li> </ul>	<ul style="list-style-type: none"> <li>Business colloquium</li> <li>Visits</li> </ul>	<ul style="list-style-type: none"> <li>Organize colloquium and seminars with TTECA and Taipower on business issues</li> <li>Hold seminars for Association of Power Facility Inspection &amp; Maintenance in Taiwan</li> </ul>	<ul style="list-style-type: none"> <li>Organize 2 colloquiums</li> </ul>	Dept. of Business 02-23666670 02-23666693
Government	<ul style="list-style-type: none"> <li>Electricity pricing issues</li> <li>Budget Review</li> <li>Nuclear energy safety and nuclear power economy</li> </ul>	<ul style="list-style-type: none"> <li>Ministerial meetings</li> <li>Legislative Yuan Budget Review</li> <li>On-site visit</li> </ul>	<ul style="list-style-type: none"> <li>Bureau of Energy, Ministry of Economic Affairs consults the professional opinions by holding "Electricity Pricing Formula Expert Team" meeting periodically.</li> <li>Taipower budget review was completed in line with the review agenda of the Legislative Yuan.</li> <li>Arrange for government officials, media, Legislators and their assistants, universities professors and their colleges, and tour guides to visit power plants.</li> </ul>	<ul style="list-style-type: none"> <li>Bureau of Energy, Ministry of Economic Affairs regularly holds the "Electricity Pricing Formula Expert Team Meeting."</li> <li>Taipower's budget review was in compliance with the agenda of the Legislative Yuan</li> <li>3 plant visits</li> </ul>	Dept. of Business Dept. of Accounting 02-23667311 Nuclear Communication Team 02-23668477
Representatives of the People	<ul style="list-style-type: none"> <li>Tariff schedule adjustment plans</li> <li>Nuclear power issues</li> <li>Ratio of power generation and load capacity</li> <li>Power transmission and distribution work plans</li> <li>Promotion of renewable energy</li> <li>Installation and safety of power facilities</li> <li>Information on power supply service</li> </ul>	<ul style="list-style-type: none"> <li>Report on project status</li> <li>Coordination meetings</li> <li>On-site inspection</li> <li>Visits</li> <li>On-site observation</li> <li>Policy statements</li> </ul>	<ul style="list-style-type: none"> <li>Check the meeting schedules and arrange visits to related executives for preliminary understanding.</li> <li>Provide written information.</li> <li>Participate and control the entire process.</li> <li>Follow-up on instructions of the meetings.</li> <li>Filing and controlling of related documents.</li> <li>Meeting for communication with the legislators and their assistants.</li> <li>Provide communication brochure.</li> <li>Provide policy statements for the Legislative Yuan or people visiting Lungmen.</li> </ul>	<ul style="list-style-type: none"> <li>Give explanation to the query from the legislators for clarification. Make effort to gain their support of major policies of Taipower.</li> <li>Establish and update the integration database of business of the functional units of Taipower.</li> <li>Provide positive information timely.</li> </ul>	Dept. of Public Relations 02-23666340 Nuclear Communication Team 02-23668477
Shareholders	<ul style="list-style-type: none"> <li>Financial status</li> <li>Share dividends</li> <li>Shareholders' meeting information</li> <li>Share transaction problems</li> </ul>	<ul style="list-style-type: none"> <li>"Shareholder area" on the Taipower website</li> <li>Shareholder opinion box</li> <li>Shareholder proposals presented in shareholders' meetings</li> <li>Market observation post system (MOPS)</li> </ul>	<ul style="list-style-type: none"> <li>Set up "Shareholder Area" on the Taipower website to disclose the relevant information of the issues that the shareholders and the public are concerned about.</li> <li>All the information of shareholders' meetings, shareholder proposals, dividends and shareholding changes among Taipower personnel are disclosed on the MOPS.</li> </ul>	<ul style="list-style-type: none"> <li>One "Standing Shareholders' Meeting" was held.</li> </ul>	Dept. of Finance 02-23666831

Stakeholder	Issue	Communication Interface	Participation Status
Customers (Including corporate customers)	<ul style="list-style-type: none"> <li>Actively understand customer needs and their behavior and provide consultation on power consumption techniques</li> <li>Provide services on tariff rates and business inquiries, handle applications for power supply, repair, maintenance of facilities, and customer complaints</li> </ul>	<ul style="list-style-type: none"> <li>Visits to large customers in person</li> <li>1911 service hotline</li> <li>Toll free 0800 service hotline</li> <li>E-mail service</li> </ul>	<ul style="list-style-type: none"> <li>The designated Taipower employees will periodically visit high voltage (over 100 KW) customers and village offices.</li> <li>Establish customer service centers in northern and central Taiwan to provide 7/24 service. Users on the main island can dial the phone no. 1911 for service or inquiry.</li> <li>Users may dial 0800 to make inquiry about related business policies.</li> <li>Using e-mail to notify service and to send out information on power bills, revision of business regulations, power consumption exceeding the contracted amount, payment deadline, forced power outage, etc.</li> <li>"Customer Opinion Box" and "Online Customer Satisfaction Survey" provide customers with multiple channels for expressing their opinions.</li> </ul>
The Community and Residents in the neighborhood of Power Facilities	<ul style="list-style-type: none"> <li>Exchange opinions on power service measures and business</li> <li>Allow the public to better understand the scarcity and value of power through different channels and help them cultivate a proper concept of energy saving</li> <li>Introduction and promotion of nuclear safety</li> </ul>	<ul style="list-style-type: none"> <li>Power-saving service</li> <li>Different types of promotional events</li> </ul>	<ul style="list-style-type: none"> <li>Free power-saving consultation and diagnosis service are provided to community residents.</li> <li>Organize promotional events for Mammy Classroom, social groups, key accounts; share common knowledge in power consumption, simple repair of home appliances, and energy saving in schools, and hold demonstration events for energy saving practice.</li> <li>Participate promotional activities organized by schools, local communities, non-profit organizations and associations.</li> </ul>
Academic Agencies, Power supply enterprises or the public	<ul style="list-style-type: none"> <li>Questionnaires on customer satisfaction of technical service</li> <li>Promotion of R&amp;D accomplishments</li> </ul>	<ul style="list-style-type: none"> <li>Questionnaires</li> <li>Exhibitions</li> <li>Technical workshops</li> </ul>	<ul style="list-style-type: none"> <li>After Taipower's Research Institute provided technical and research-related services, customers' feedback and satisfaction level were asked for Taipower's future improvement.</li> <li>Participate in the "2012 Taipei International Invention &amp; Technology Trade Show" with the display of 15 products of "Power supply equipment and materials," "Power supply monitoring," and "New technologies of power generation and energy." Researchers were appointed to the scene to explain the R&amp;D innovation achievement of Taipower.</li> <li>Participate the 24<sup>th</sup> Modern Engineering and Technology Seminar (METS): Taipower and TRI-GEL jointly carried the preparation of Group II, "Group of Sustainable Environmental Technology", topics including climate change adaption, sustainable environmental energy technology, and applications of anti-disaster technology, development of renewable energy, smart grid and energy storage.</li> </ul>
Employees	<ul style="list-style-type: none"> <li>Enhance communication and interaction with employees</li> <li>Settle labor-management disputes</li> <li>Explain Taipower's current situation Sessions</li> <li>Symposiums of Chairman, supervisors and union cadres</li> <li>Labor Safety and Health Committee Meetings</li> </ul>	<ul style="list-style-type: none"> <li>Call for labor-management meetings in accordance with "Labor-Management Meeting Implementation Procedure"</li> <li>Call for meetings under Taipower's "Rules for Communicating with Employees"</li> <li>Labor Safety and Health Committee Meeting</li> </ul>	<ul style="list-style-type: none"> <li>Hold labor-management meetings at corporate and functional levels.</li> <li>Communicate with the labor union on major labor issues timely to solve disagreements.</li> <li>Make employees to learn the company's operation and bolster their morale by holding seminars.</li> <li>Labor Safety and Health Committee Meeting.</li> </ul>
Contractors	<ul style="list-style-type: none"> <li>Industrial safety seminars and promotion meetings</li> <li>Project assistance</li> </ul>	<ul style="list-style-type: none"> <li>Industrial safety seminars and promotion meetings</li> <li>The implementation of industrial safety and health</li> </ul>	<ul style="list-style-type: none"> <li>Contractor safety and health promotion meetings were held in northern, southern, and central Taiwan.</li> <li>Organize colloquiums for contractors twice a year.</li> <li>Assist contractors to enhance their capability for self-management of work</li> </ul>
Media	<ul style="list-style-type: none"> <li>Nuclear power safety and nuclear power economy</li> <li>Nuclear waste</li> <li>Reserve margin</li> <li>Tariff rate issue</li> <li>IPP contract amendment</li> </ul>	<ul style="list-style-type: none"> <li>Press conference</li> <li>Interview reports</li> <li>Print media</li> <li>Internet</li> <li>Electronic media</li> <li>Forum</li> </ul>	<ul style="list-style-type: none"> <li>Provide print and electronic media interview reports.</li> <li>Advertisements.</li> <li>Produce microcinema for promotion.</li> <li>Host forum.</li> <li>Attend TV political panel shows</li> </ul>



Performance in 2012

Unit/Contact Telephone

- No. of specific customer visits: 72,516
- Over 2.02 million calls were received by 1911 and 0800. Average call waiting time was 8.75 seconds.
- 5,937 e-mail messages were processed.



Dept. of Business  
02-23666672  
02-23668472

- Accomplished service programs in 201 communities across the nation, including northern, central, and southern Taiwan and the offshore islands, with the participation of 4,092 persons.
- A total of 1,279 events for energy conservation promotion have been held with the participation of 263,000 persons/times.
- In 2012, Nuclear Power Plant #1-,#2 & #3 engaged local communication, interviews and interactive events, with 49 times with schools, and 191 times with other stakeholders.

Dept. of Business  
02-23667661

Department of Nuclear  
Generation 02-23667097  
02-23667661

- There were 91 questionnaires produced on technical service and 35 on research project in 2012.
- The "2012 Taipei International Invention & Technology Trade Show" was held from September 20th to 23<sup>rd</sup>, 2012

- Held "Group of Sustainable Environmental Technology", the 24<sup>th</sup> Modern Engineering and Technology Seminar, on Nov. 12<sup>th</sup>, 2012.



Taipower Research Institute  
02-23601174  
02-23601178  
02-23601166

- RCall for 394 meetings at company and functional-level meetings.
- Organize 28 conferences for communication with the employees on major labor-management issues.
- Organize 6 seminars to communicate company's operation in northern, central, and southern Taiwan with the participation of 2611 persons.
- Organize a "Major labor-management issue meeting" with the participation 73 persons.
- 4 symposiums were held for our Chairman, supervisors and union cadres, with totally 356 persons participated.
- Call for 6 meetings on labor safety and health.

Dept. of Human Resources  
02-23667355

Dept. of Industrial Safety and Health  
02-23668638

- 11 safety and health promotion meetings were held in 3 areas.
- Organized 132 colloquiumsfor contractors.
- Organized 88 project assistances.

Dept. of Industrial Safety and Health  
02-23668638

- Hold press conferences as needed.
- 70 persons/times interviews were given by Taipower spokesperson or relevant units.
- Post 10 nuclear-related advertisements.
- Host Forum "Diverse Exchange for Caring Difficult Position of Energy Areas in Taiwan".
- Attend 2 TV political panel shows.

Dept. of Public Relations  
02-23666340  
Nuclear Communication Team  
02-23668477

## Taipower Outreach

### Business Council for Sustainable Development, Taiwan, ROC, BCSD-Taiwan

Taipower joined the BCSD-Taiwan in 2003 and has since continued to support the organization's initiatives and actions. This includes the "Taiwan Enterprise Sustainability Forum" platform established by representative enterprises in Taiwan. Through learning from other industries' sustainability issues, and the integration and implementation of action plans used by similar trade industries, Taipower and its partners work together to become a sustainable development enterprise.

Taipower actively sponsored the demonstration project for Taipei city titled "Lighting up the Community" held by BCSD-Taiwan on Oct. 2012 as this campaign highly affects the society and other similar activities. The side reasons of this sponsorship include that Taipower is one of the core members of BCSD and that our present Chairman also acts as the Council' Director, who also promotes this campaign.

Taipower has prepared the sustainability report in accordance with the G3 guideline of Global Reporting Initiative (GRI) in past years. Since 2012, Taipower actively participates in the enterprise conference under the GRI-G4 guideline pronounced by GRI, and shares the experience of sustainability with other enterprises.

### East Asia Electric Power Technology Conference

The conference 2012 was held in Beijing by China Electric Power Research Institute(CEPRI) during 25-29 June. Taipower also participated the conferences held by Japan Central Research Institute of Electric Power Industry (CRIEPI),and Korea Electro-technology Research Institute (KERI) focused on smart grid, and visited the ultra high-voltage EC testing base and Wind Power Integration R&D Center in Hebei province, which help Taipower's R&D development greatly.

### AESIEAP Technical Committee Working Group Meeting

AESIEAP Technical Committee's Meeting is part of AESIEAP CEPSI conference. Taipower hosted the meeting on September 4 and 5, 2012, and invited AESIEAP's Secretary, the Technical Committee Vice-Chairman, three working group leaders and other related parties to attend the meeting. The meeting was attended by representatives from six different countries/areas, namely, Taiwan, Indonesia, Malaysia, Korea, the Philippines and Macau. The meeting focused on three work forces of smart grid, carbon management system, electricity pricing structure and its designed mechanism, and also discussed the mid- and long-term planning of the committee.

### The AESIEAP 19<sup>th</sup> Conference of the Electric Power Supply Industry (CEPSI)

The 19<sup>th</sup> CEPSI was held from October 14 to 19, 2012 at the Bali Nusa Dua Convention Center in Bali, Indonesia. Totally 1,197 professional participants coming from 20 countries in Asia-Pacific area and the West joined it. Taipower's delegation comprised of 14 members and was led by G. M. Chuang, Vice General Manager. Five research papers were presented then. In addition, Taipower took part in AESIEAP's 38<sup>th</sup> Board Meeting and the technical committee's special workshop and led three work forces to give a 90-minute presentation and the second work force's research on carbon asset management was also presented in the special workshop.



### Association of Industrial Relations, ROC.

Taipower has been a member of Association of Industrial Relations, R.O.C. since 1984, and, responding to its corporate responsibility, always pays great efforts to develop harmonious relationship between the company and its employees.

### Institute of Nuclear Power Operations, INPO

The publications and the database of INPO are some of the most credible references in the nuclear power industry. All nuclear power providers in the United States are basic members of the INPO.

INPO has international members from 16 countries. Since the nuclear generation units owned by Taipower are all American-originated units, learning from American companies can help us increase the reliability, performance, and safety of our nuclear power plant operations. As an international member of INPO, Taipower can directly interact with U.S. nuclear power operators and nuclear power plants.

### World Association of Nuclear Operators, WANO

WANO unites every company and country in the world to achieve the highest possible standards of nuclear safety and reliability. There are currently 36 operators, and the association serves as an important channel that transcends political barriers for the exchange of experience between nuclear power plant operators. The publications and the database of WANO are some of the most credible references in the nuclear power industry. After 3-11 Fukushima incidents, WANO realized that any incident of a single generator can seriously impact the operation of all nuclear power plants in the world. With this understanding, WANO has shifted its focus to prevention and mitigation of any accidents.

Its member states are responsible for providing their experience in nuclear power plant operations and delivering their information on nuclear power plant incidents to all members through a reporting system, to prevent similar incidents from recurring.

To enhance nuclear power operation safety and performance, Taipower joined WANO as a member. Taipower can communicate with its fellow members around the world, participate in relevant activities and interact with other nuclear power operators to maintain its operation safety and keep up with others.

### Technological Exchange with Central Research Institute of Electric Power Industry of Japan (CRIEPI)

The 24<sup>th</sup> CRIEPI/TPC General Meeting was held in Tokyo from 3 to 6 Dec. 2012. During this annual meeting, Taipower held substantial discussions with CRIEPI on a variety of topics such as electric vehicle charging stations, integration of renewable energy, ultra-supercritical power plant material and co-firing biomass with coal. Particularly, as to the operation of electric vehicle charging stations, suggestions provided by CRIEPI experts are helpful to Taipower's future R&D.

## Others

In 2012, Taipower participated in the topics of smart grid, reliability, low-carbon generation, environmental protection, solar power and wind power in Japan, China, Indonesia and other places to enhance Taipower's image.

## 2012 Awards

### Taiwan Corporate Sustainability Report Award

In 2012, Taipower won a silver award for Class Service and a special award of "Climate Change Information Disclosure Award" held by "Taiwan Institute for Sustainable Energy". Mr. Lee Han-shen, President of Taipower, attended the awarding ceremony on Nov. 29, 2012 to receive the awards from and have a picture with Wu Den-yih, Vice President, R.O.C.

Taipower has published its sustainable reports annually since 2007, and has participated in the competition for 5 consecutive years from 2008. After winning silver and golden awards in 2010 and 2011 respectively, Taipower had even greater success in 2012, by being awarded with two awards, including the Class Service "Silver Award" and "Climate Change Information Disclosure Award." This honor is not solely attributable to Taipower, the company, but to all our employees' for recognizing their efforts.

Taipower will continue to improve itself with a humble attitude. In addition to supplying stable and reliable power, Taipower is also expected to act as an excellent "corporate citizen" by actively engaging social works and charity campaigns and enhancing environmental and ecological protection, so as to shape our corporate ethics and earn the trust and support of the public.





## The Asian Power Award

In the 8<sup>th</sup> "Asian Power Award 2012 held by Asian Power Magazine, Taipower was honorably awarded with three major awards, including "Best Asian Transmission and Distribution Project of the Year", "Innovative Power Technology Golden Award" and "Information Technology Project Silver Award." This is a tremendous encouragement to Taipower and has great help to enhance Taipower's international image.

The Asian Power Award recognizes award winners which have the best performance and contribution with respect to power business in Asia, and can be regarded as the Oscar Academy Award in power sector. All the three awarded projects have improved the stability and quality of power supply in Taiwan, wherein : (1) Best Asian Transmission & Distribution Project of the Year for the Upgrading Power Supply Quality by Enhancing the Power System Network and Maintenance Project; (2) Innovative Power Technology Golden Award for the Transmission Line Equipped with Coupling Ground Wires Project; and (3) Information Technology Project Silver Award for the Database of Boiler Inspection-Analysis System Project.



## Public Works Golden Award

In the 12<sup>th</sup> Public Work Golden Award 2012, Taipower won two outstanding awards and one nomination with its "Wansong Hydro power Enhancement Project", "Nuclear Power Plant 1, Xizhi-Songhu Ultra High Voltage Underground Cable Project" and "Touzhong Electrical Substation project".

"Public Work Golden Award" is held by Public Construction Commission, Executive Yuan to conscientiously assess and select the best project of the year. Thus, this award represents the highest honor of public work in Taiwan. Taipower has an excellent tradition of construction and always follows the most strict quality control mechanism. Since the foundation of Golden Quality Award in 2000, Taipower has won 9 awards of outstanding, 13 awards of goodness, 5 nominations, and numerous awards of outstanding individual contribution, being the organization receiving the most rewards in construction sector.



## Reply to Press Issues

- Taipower issues press release to explain to the public.
- Taipower clarifies its reasons by newspaper, magazine or TV. As the subject earns the media concern, Taipower will name a spokesperson to receive interviews or call up a press conference.
- Taipower published press release through the homepage of its official website and on MOEA's website for public access.



# Social Participation

Taipower has always committed itself to being a good corporate citizen. In addition to satisfy the customer's demands, strengthen safety mechanism, care for the work safety of our contractors, and Taipower actively participates in community activities, assists the disabled and helps local charitable construction projects in order to fulfill its commitment to create a win-win situation with its stakeholders.

## Amounts of Social Investment in 2012

Expenses by the "Approval Committee of Power Development Foundation

Unit: NT\$ Million

Public welfare activities  
Beach Clean-up Activity  
Taipower Volunteers





## Social Care and Community Services

### Light of Love- Year-End Senior Citizens Attentive Care

Chinese Lunar Year is a time for family reunion. Taitung County has the highest percentage of elderly population in Taiwan. Among those with low incomes. Taipower held the “Light of Love - Year-End Senior Attentive Care” activities with Taitung Christian Hospital and the A Kernel of Wheat Foundation.

In 2012, 109 seniors who lived alone were invited to dinners. They were also accompanied on a festival shopping trip and gifts were presented. Gifts were also sent to 121 disabled seniors. This attentive care activity drew 30 Taipower volunteers to participate and deliver love to remote villages and towns.

### Volunteering Services

Taipower volunteers were grouped into 53 teams with a total of 2,178 persons (1,718 are employees, and 460 are families of employees, retired employees and social workers). In 2012, the volunteer corp. had organized different forms of events for social charities in 131 instances, including the promotion of energy saving and safe use of electric power, service and emergency assistance to the disable, action for social and human concern, and environmental protection. These efforts of the volunteers yielded positive results to the society, the public, and the business of Taipower.

### Community Energy Conservation Service

To comply with the government’s energy conservation and carbon reduction policy and to cope with the global energy shortage crisis, Taipower provided a free power-saving promotion service to communities. This was done to advocate accurate power-saving skills and the use of high-efficiency energy conservation products, and it offers suggestions for the improvement of public power consumption facilities.

There were two kinds of community energy saving services provided – consultation and diagnosis. Assemblies were used to promote energy-saving efforts and share energy-saving related knowledge and experience. In 2012, 201 community service events (including 34 sessions of village heads’ energy-saving propaganda) were held, covering every area of the country (north, central south,) and offshore islands). A total of 4,092 residents participated in community energy conservation service, which helped the public to substantiate energy saving on a daily basis.

Reducing the consumption of standby energy, selecting appliances with the “energy saving” label or “energy efficiency rating label,” using of energy efficient and high performance lighting facilities, and giving recommendations on energy saving in using electrical equipment of public facilities are things can be done to make energy saving a habit in everyday of life and enable everyone to play the part as a world citizen on carbon reduction.

### Beach Clean-up Activity

The activity has been held for 19 years. Each year, Taipower will call for its employees and local residents to join together in cleaning up the coastal areas (beaches) near where power plants are located and at off-shore islet areas to restore the shoreline to its pristine state.



## Giving Back to Township and Villages

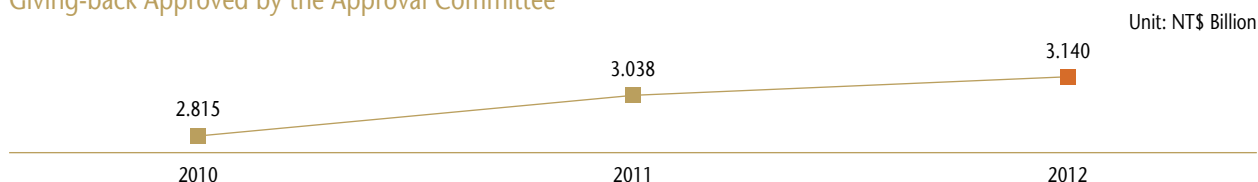
### Subsidies for Local Charitable Activities and Assistance

In order to strengthen the welfare of residents living in areas near power facilities, Taipower established the Approval Committee of Power Development Foundation (APDF), a body in charge of distributing subsidies for local construction projects.

In 2012, Taipower offered a total of NT\$3.14 billion in subsidiary projects, making a great contribution to local public construction, education and culture activities, public welfare activities, etc. Major achievement of APDF in 2012 includes:

- Planning proactively the landscape surrounding the power plants.
- Assisting infrastructural programs in the local community.
- Assisting qualified social welfare institutions in all areas.
- Advocating the government's energy-saving and carbon-reduction policy by sponsoring NT\$ 33 million for the low-income family.
- Providing scholarship for education and culture.
- Assisting the development of local industries.
- Supporting the disable (emergency assistance, low income families).

### Giving-back Approved by the Approval Committee



## Emergency/Disaster Assistance and Subsidy for Electricity Bills

### Subsidies to Remote Islets

Taipower complies with the government mandate to provide power to remote islets. And their tariff rates base on the regulations stipulated in the Offshore Islands Development Act and the Subsidy Regulations on Losses of Electric Utility Operator for Offshore Islands. In 2012, Taipower offered electricity bills subsidies to remote Islets amounting to NT\$6,100 million.

### Urgent Repair after Disasters

- Due to its special geography, Taiwan frequently suffers natural disasters, such as, typhoons and earthquakes. Taipower works with local governments to establish emergency centers for prompt response to all needs and rescue activities. In such occasions, Taipower also actively keeps the authorities and opinion leaders informed with the updated news and development about the situation of disasters and the repair progress.
- Typhoons, such as Morakot in 2009 and Tembin in 2012, devastated southern Taiwan. Taipower immediately launched emergency repair and recovery tasks, and continued to help disaster survivors. By actively participating in the meetings among the government, builders and non-government organizations, Taipower engaged the infrastructure project, such as Transmission Line Improvement Project in Kaohsiung. With love and care, Taipower provided people warm and safe houses with brightness and hope. Taipower's efforts earned an enthusiastic response from the communities and the people.






## Cultural Education

### Public Arts

In accordance with the Culture and Arts Reward Act and the Regulations Governing the Installation of Public Art, Taipower budgeted for public art pieces in its buildings and major construction projects to enhance the environment aesthetically.

Regular Buildings	<ul style="list-style-type: none"> <li>• Taipower has completed the selection of public arts for "Sulin Site of Research Institute" and "Training Center" in New Taipei City. The selected art pieces installed in 2013 as planned, and the promotional campaigns (including performing artists' events) will be launched as well. "Public Art in New Taipei City" has been scheduled to be completed in 2014 totalled NT\$27.92 million.</li> <li>• The selection meetings for public arts in Hualien and Taichung were held in 2013, and the same for Taoyuan and Kaohsiung is scheduled in 2014.</li> </ul>	
Major Projects	<ul style="list-style-type: none"> <li>• The public arts for Wanta Expansion and Sunglin Hydro Power Project were installed in 2012.</li> <li>• The installation of public arts in Nangang Exhibition Center will launch in 2013.</li> </ul>	
Circuit Box Embellishment	<p>Taipower have actively promoted embellishment of its transformer cases with painting. For securing the operation of power system and the rights of the pedestrian, the transformer cases are made compact and colored. The transformer cases at selected sites may be further patterned to improve aesthetic. The patterns have been selected in consideration with the local government's requirements and local features.</p> <ul style="list-style-type: none"> <li>• In 2012, the units of equipment patterned by Taipower: 9,196</li> <li>• In 2012, the units of equipment patterned under external requests: 85</li> </ul>	

### The Seeds of Hope Program

Starting from 2005, Taipower has cooperated with the Hualien Mennonite Hospital, the Taitung Christian Hospital and the Pingtung Christian Hospital to hold the "Seeds of Hope Program" to jointly create part-time job opportunities for college students to cultivate caring and serving the people from their work.

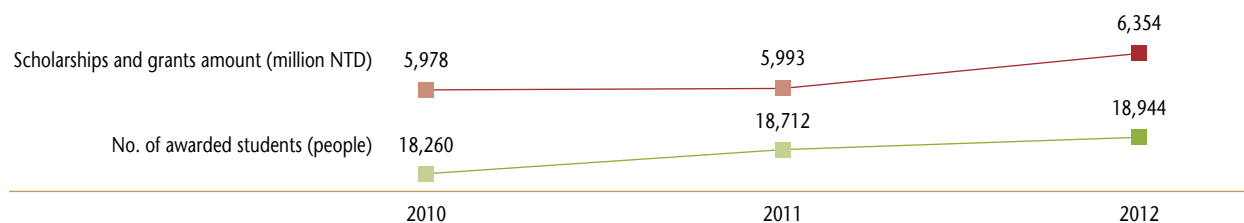
Over the years, this program has encouraged many young people to serve their hometowns and earn part of their tuition by from it.



Students can work as administrative or healthcare assistants. They may also arrange to help the elderly living alone in housekeeping, home visits, meal delivery, intensive care center and nursing homes, and help school children with their homework. Through these experiences, the students can have a real sense of service which in turn will drive them forward for caring the people in their daily lives.

### Student Scholarships

Taipower grants scholarships in an annual basis to recognize students of all grades who live and study in difficult conditions yet have outstanding performance. In 2012, Taipower launched the "student scholarship event" in 24 power plants across the country and the amount given to 18,944 awarded students amounting to NT\$63.54 million.



### Firefly, Children's Reading Plan

As educational resources in the Tatung and Hualien regions are very limited, lots of students there are in great need of assistance. Taipower and the A Kernel of Wheat Foundation continued to jointly promote the “Firefly, Children’s Reading Plan” in 2012. There were fifteen after-school classes set up in these two areas, providing mobile book carts, character education classes, summertime growing reading camp, little angel heroes gathering, etc. and so on to enhance the students’ reading and learning capability.

#### 2012 Firefly Children Book Reading Plan Result

After School Classes	The priority was given to primary school students from under privileged mid-and-low income, single parent families and those raised by grandparents. There were in total 326 students who attended these classes.
Mobile Book Cars	Mobile book carts went to the tribes in the remote areas and communities every two weeks. In 2012, there were in total 216 times with 12,016 participants.
Summertime Growing Reading Camps	Fifteen summertime reading camps were held with 62 participants in 2012.
Little Angel Heroes Gathering	The gathering was held in Xinsheng Elementary School, where the participating children from certain after-school educational institutions were encouraged to perform their talents. There was also a static exhibition of children’s works on site. Totally 260 children and teachers participated with joy.

### I Love Earth Moving Stories House

Taipower has created a story-tell tour named “I Love Earth Moving Stories House”, traveling around all its operational sites to have trained kindergarteners to visit kindergartens and tell stories to children aged 3-6. The stories are specially made to enhance awareness of conserving energy and protect the environment. Through face-to-face contact, the moral can be rooted into our little audiences’ mind.

In 2012, 60 sessions were held that engaged 2,300 children. The interesting and attractive teaching was highly appreciated by kindergarten teachers. We expect the children to share the right concept of power use with their parents and live a energy-saving life.



## Development of Local Industries

### Assisting Local Industries Development – unique feature for each township

In order to boost local prosperity and local industrial development, Taipower assists local governments in the towns and villages surrounding the power facilities by holding local industrial activities that embody historical, cultural, and economically beneficial features. Meanwhile, professional approaches are adopted to enhance the marketing of industries and tourism resources. The unique culture and image of each town and village is then established to promote local prosperity and the development of other industries and businesses.



In 2012, Taipower helped promote industrial and location-themed activities in the following localities: Pingsi: Sky Lantern Festival, Yongan: Grouper Cultural Festival, Mituo: Milkfish Cultural Festival, Luju: Tomato Cultural Festival, Sanchih: Water Bamboo Festival, Nantou: Sun Moon Lake Black Tea Festival, Gongliao: Gongliao Ocean Music Festival, Jinshan: Sweet Potato Festival, Shimen: International Kite Festival, Zhuolan: Fruit Season Promotion Sales, Taoyuan: Lotus Season Festival, Jiading: Mullet Cultural Festival, Linyuan: Golden Perch and Shrimp Local Culture Festival, Hengchun: Pole Climbing Festival and Flying Fish Promotion & Fishmen Festival celebration 2012, etc.

## Sports Events

### Taipower Sports Team

Over 60 years, Taipower has worked hard to provide quality electricity, as a strong prop of Taiwan's economic growth. Also, Taipower has paid great efforts to sport promotion and has contributed to numerous excellent performances. With Taipower's sponsorship, many sport talents and teams have won honor for Taiwan in different international games. Taipower has sponsored a men's baseball team, a men's soccer team, a men's volleyball team, a women's volleyball team, a women's basketball team and a women's badminton team, and all of these amateur teams are classified in Social Group A. Particularly, the sponsored soccer team won championship in the 2012 Mediatek Intercity Football League, and the sponsored baseball team was awarded as the champion of Social Group A Taiwan City Baseball Championship 2012. The men's and women's volleyball teams both won the business regular season games. The women's badminton team won the third place in women's single event and the first place in women's double event in 1<sup>st</sup> National Tournament 2012, and won the first place in women's single event and the second place in women's double event in 2<sup>nd</sup> National Tournament.

The sponsored teams not only strive for victory in various games, but also use intervals between training and contesting to participate in the company's public interest activities, in which the members voluntarily coach student teams of the nearby schools. As they are highly welcome by the community and the schools, they create a positive impact on the company's social image.



# Financial Statements

## Taiwan Power Company

### Statements of Income

Year Ended December 31, 2012

NT Dollars and Shares in Thousands, Except Per Share Amount

Item	Amount
<b>OPERATING REVENUES</b>	
Sale of electricity	\$ 540,058,373
Other	<u>7,105,501</u>
Total operating revenues	547,163,874
OPERATING COSTS	<u>585,750,475</u>
GROSS LOSS	( 38,586,601)
<b>OPERATING EXPENSES</b>	
Marketing	6,416,328
General and administrative	1,354,295
Research and development	<u>3,297,190</u>
Total operating expenses	<u>11,067,813</u>
OPERATING LOSS	( 49,654,414)
<b>NONOPERATING INCOME AND GAINS</b>	
Foreign exchange gain, net	446,705
Equity in net income of investees, net	181,822
Gain on disposal of property, plant and equipment	136,987
Interest	45,578
Dividend revenue	26,931
Other	<u>4,709,882</u>
Total non-operating income and gains	<u>5,547,905</u>
<b>NONOPERATING EXPENSES AND LOSSES</b>	
Interest	12,558,647
Loss on disposal of property, plant and equipment	991,040
Other	<u>4,413,003</u>
Total non-operating expenses and losses	<u>17,962,690</u>
LOSS BEFORE INCOME TAX	( 62,069,199)
INCOME TAX EXPENSE	<u>13,716,610</u>
NET LOSS	( 75,785,809)
<b>BASIC NET LOSS PER SHARE</b>	
	Before Tax After Tax
	<u>(\$1.88)</u> <u>(\$2.30)</u>

Note: The statement was examined by CPA.

## BALANCE SHEETS

NT Dollars and Shares in Thousands, Except Par Value

ASSETS	Amount	LIABILITIES AND STOCKHOLDERS' EQUITY	Amount
<b>CURRENT ASSETS</b>		<b>CURRENT LIABILITIES</b>	
Cash	\$ 3,312,718	Short-term debts	\$ 51,588,769
Notes receivable, net	220,216	Short-term bills payable, net	173,327,241
Accounts receivable, net	33,107,868	Accounts payable	38,971,525
Other receivables	2,338,970	Interest payable	4,586,783
Inventories	33,461,618	Accrued expenses	19,347,670
Prepaid expenses	2,647,158	Contract payable	9,853,175
Deferred income taxes	121,998	Current portion of long-term debts	118,900,788
Other current assets	40,206	Other current liabilities	2,459,202
Total current assets	<u>75,250,752</u>	Total current liabilities	<u>419,035,153</u>
<b>INVESTMENTS AND FUNDS</b>		<b>LONG-TERM DEBTS</b>	
Investments accounted for by the equity method	2,250,161	Loans, net of current portion	443,965,311
Financial assets carried at cost	79,206	Bonds, net of current portion	368,926,659
Funds	1,000,000	Long-term contract payable	3,304,933
Total investments and funds	<u>3,329,367</u>	Deferred income	40,407,149
		Total long-term debts	<u>856,604,052</u>
<b>PROPERTY, PLANT AND EQUIPMENT</b>			
Cost		Reserve for land value increment tax	56,230,082
Land	98,632,753		
Land improvements	25,872,749	<b>Other liabilities</b>	
Buildings	108,813,174	Accrued pension cost	4,956,675
Machinery and equipment	2,038,644,915	Others	4,846,138
Transportation equipment	19,129,103	Total other liabilities	9,802,813
Leasehold improvements	7,282,204	Total liabilities	<u>1,341,672,100</u>
Miscellaneous equipment	4,117,851		
Nuclear fuel	35,225,702	<b>STOCKHOLDERS' EQUITY</b>	
	2,337,718,451	Capital stock - NT\$10.00 par value, authorized - 40,000,000 shares	
Revaluation increment	209,464,244	Issued and outstanding - 33,000,000 shares	330,000,000
Total cost and revaluation increment	2,547,182,695	Accumulated deficit	(193,576,898)
Accumulated depreciation and amortization	1,515,217,877	Equity adjustments:	
	1,031,964,818	Cumulative translation adjustments	(8,893)
Constructions in progress	493,213,770	Net loss not recognized as pension cost	(4,912,928)
Net property, plant and equipment	<u>1,525,178,588</u>	Unrealized loss on financial instruments	(3,360)
		Unrealized revaluation increment	142,294,435
<b>INTANGIBLE ASSETS</b>		Accumulated depreciation on appreciation of property, plant and equipment	8,849,826
Deferred pension cost	-	Total equity adjustments	146,219,080
Other intangible assets	2,723,236	Total stockholders' equity	<u>282,642,182</u>
Total intangible assets	<u>2,723,236</u>		
<b>OTHER ASSETS</b>			
Properties leased to others, net	5,209,947		
Idle properties, net	6,962,317		
Deferred charges	1,402,958		
Deferred income taxes	515		
Miscellaneous	4,256,602		
Total other assets	<u>17,832,339</u>		
<b>TOTAL</b>	<b><u>\$1,624,314,282</u></b>	<b>Total of liabilities and stockholders' equity</b>	<b><u>\$1,624,314,282</u></b>

Note: The statement was examined by CPA.

# Third-Party Assurance Statement



## ASSURANCE STATEMENT

### **SGS TAIWAN'S INDEPENDENT ASSURANCE REPORT ON SUSTAINABILITY ACTIVITIES IN THE TAIWAN POWER COMPANY'S SUSTAINABILITY REPORT OF 2013**

#### **NATURE AND SCOPE OF THE ASSURANCE/VERIFICATION**

SGS Taiwan Ltd. (hereinafter referred to as SGS) was commissioned by Taiwan Power Company (hereinafter referred to as TPC) to conduct an independent assurance of the Sustainability Report of 2013. The scope of the assurance, based on the SGS Sustainability Report Assurance methodology, included the text, and data in accompanying tables, contained in TPC's all operational sites in Taiwan of this report.

The information in the TPC's Sustainability Report of 2013 and its presentation are the responsibility of the superintendents, CSR committee and the management of TPC. SGS has not been involved in the preparation of any of the material included in the TPC's Sustainability Report of 2013.

Our responsibility is to express an opinion on the text, data, graphs and statements within the scope of verification set out below with the intention to inform all TPC's stakeholders.

The SGS Group has developed a set of protocols for the Assurance of Sustainability Reports based on current best practice guidance provided in the Global Reporting Initiative Sustainability Reporting Guidelines. These protocols follow differing options for Assurance depending the reporting history and capabilities of the Reporting Organization.

This report has been assured using our protocols for:

- evaluation of content veracity at a moderate level of scrutiny; and
- evaluation of the report against the Global Reporting Initiative Sustainability Reporting Guidelines (G3.1 2011).

The assurance comprised a combination of pre-assurance research, interviews with relevant employees at headquarter of TPC in Taiwan; documentation and record review and validation with external bodies and/or stakeholders where relevant.

Financial data drawn directly from independently audited financial accounts has not been checked back to source as part of this assurance process.

#### **STATEMENT OF INDEPENDENCE AND COMPETENCE**

The SGS Group of companies is the world leader in inspection, testing and verification, operating in more than 140 countries and providing services including management systems and service certification; quality, environmental, social and ethical auditing and training; environmental, social and sustainability report assurance. SGS affirms our independence from TPC, being free from bias and conflicts of interest with the Organization, its subsidiaries and stakeholders.

The assurance team was assembled based on their knowledge, experience and qualifications for this assignment, and comprised auditors registered with SA 8000, EICC, QMS, EMS, SMS, EnMS, GPMS, GHG Verification Lead Auditors and experience on the SRA Assurance service provisions.



**VERIFICATION/ ASSURANCE OPINION**

On the basis of the methodology described and the verification work performed, we are satisfied that the information and data contained within TPC's Sustainability Report of 2013 verified is accurate, reliable and provides a fair and balanced representation of TPC sustainability activities in 01/01/2012 to 12/31/2012.

The assurance team is of the opinion that the report can be used by the Reporting Organization's Stakeholders. We believe that the Organization has chosen an appropriate level of assurance for this stage in their reporting. The report is the second to be assured by an independent assurance team and TPC has taken a bold step by offering the report to evaluation against Global Reporting Initiative's G3.1 guidelines. This shows a deserved confidence in their reporting process.

In our opinion, the contents of the report meet the requirements of Global Reporting Initiative G3.1 Application Level A<sup>+</sup>.

**GLOBAL REPORTING INITIATIVE REPORTING GUIDELINES CONCLUSIONS, FINDINGS AND RECOMMENDATIONS****Principles, Standard Disclosures and Indicators**

The report, TPC's Sustainability Report of 2013, is adequately in line with the Global Reporting Initiative G3.1 application level A<sup>+</sup>. The principles of Materiality and Stakeholder Inclusiveness may be further enhanced in next report. It is recommended to have higher degree of direct involvement of stakeholder engagement and formalize both process and criteria applied to assess materiality to ensure better consistent result. It is also recommended to have more disclosure on the performance of supply chain management and organizational governance required in GRI G4 in future reporting.

**Signed:**

**For and on behalf of SGS Taiwan Ltd.**



**Dennis Yang, Chief Operating Officer**  
**Taipei, Taiwan**  
**8 August, 2013**  
**WWW.SGS.COM**

# GRI Index

GRI Index		Page	GRI Index		Page
<b>Strategy and Analysis</b>					
1.1	CEO Statement about the organization and strategic sustainability	8-9	4.6	Processes for the highest governance body to ensure conflicts of interest are avoided	16-17
1.2	Key impacts, risks and opportunities	8-9	4.7	Process to determine board expertise on sustainability	16
<b>Introduction</b>					
2.1	Name of the reporting organization	1	4.8	Mission and value statements	5
2.2	Products and/or services	4	4.9	Procedures for overseeing of the organization's economic, environmental, and social performance	11,16-17
2.3	Operational structure	7	4.10	Processes for evaluation of the highest governance board's performance with respect to governance of economic, environmental and social topics	11,16-17
2.4	Headquarter location	1	4.11	Precautionary approach or principle	19
2.5	Countries in operation	5	4.12	External charters / principles	None
2.6	Nature of ownership	5	4.13	Association memberships	74-76
2.7	Markets served	5-6	4.14	List of stakeholders	71-73
2.8	Scale of the organization	5	4.15	Stakeholder identification	12
2.9	Significant organizational changes	None	4.16	Approaches to stakeholder engagement, including by types and by contacting frequency with stakeholders	71-73
2.10	Awards received	76-77	4.17	Topics raised by stakeholders	12
<b>Report</b>			<b>Economic Indicator</b>		
3.1	Reporting period	1	<b>Disclosure on Management Approach</b>		21-26
3.2	Previous report	1	<b>Economic Performance</b>		
3.3	Reporting cycle	Annual	EC1	Direct economic value	78, 84-85
3.4	Contact point for questions	1	EC2	Financial implications due to climate change	44-49
3.5	Process for defining report content	12-15	EC3	Benefit plan	Retirement pensions are allocated for all employees according to applicable law
3.6	Boundary of the report	1	EC4	Major financial government assistance	Taipower is a state-owned business.
3.7	Limitations on the report's scope	None	<b>Market Position</b>		
3.8	JVs, subsidiaries, and outsourcing	None	EC5	Entry level Wage	Taipower is a state-owned business, and all the wages and bonus are issued as regulated.
3.9	Data measurement techniques and calculation basis	Refer to each chapter	EC6	Local suppliers	64-65
3.10	Effects of information re-statement	None	EC7	Local recruitment	60
3.11	Major changes from previous reports	None	<b>Indirect economic impact</b>		
3.12	Standard disclosures	88-91	EC8	Infrastructure investment and services for public benefit	80-82
3.13	External assurance and existing measures	86-87	EC9	Indirect economic impacts	83
<b>Governance, Commitment and Agreement</b>			<b>Environmental Indicator</b>		
4.1	Governance structure	16	<b>Disclosure on Management Approach</b>		
4.2	Indication whether chairperson is also executive officer	No concurrent position	50		
4.3	Independent members at the board	16			
4.4	Mechanisms for shareholder/employee participation	71-73			
4.5	Executive remuneration and performance	17			

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<b>Energy</b>		
EN1	Weight or volume of materials used	57
EN2	Rate of recycled materials used for production	None
EN3	Direct primary energy consumption	57
EN4	Indirect primary energy consumption	57
EN5	Energy conservation	36, 57
EN6	Initiatives for energy-efficiency and renewable energy	34,37-38,79
EN7	Initiatives for reducing indirect energy	36, 57
<b>Water</b>		
EN8	Water withdrawal	57
EN9	Effect of water withdrawal	55
EN10	Water recycled	51
<b>Biodiversity</b>		
EN11	Land assets in sensitive areas	None
EN12	Impacts on biodiversity	55
EN13	Habitats protected or restored	55
EN14	Strategies for biodiversity	55
EN15	Endangered species	No relevant issues
<b>Emission, sewage and wastes</b>		
EN16	Greenhouse gas emissions	47
EN17	Other greenhouse gas emissions	47
EN18	Initiatives to reduce greenhouse gases	45-49
EN19	Ozone-depleting substance emissions	52
EN20	NO <sub>x</sub> , SO <sub>x</sub> and other air emissions	52
EN21	Water discharge by quality and purpose	51
EN22	Waste by disposal method	56
EN23	Significant spills	No spill
EN24	Transportation of hazardous waste	No relevant issues
EN25	Habitats affected by discharge and runoff	55
<b>Products and services</b>		
EN26	Environmental impact mitigation	52-54
EN27	Packaging materials	Taipower is a public power utility, thus not applicable
<b>Compliance</b>		
EN28	Non-compliance sanctions	56

GRI Index		Page
<b>Transportation</b>		
EN29	Environmental impact of transport	None
<b>Overall situation</b>		
EN30	Environmental protection expenditure	52
<b>Social Indicators - Labor Practices &amp; Decent Work</b>		
Disclosure on Management Approach		58
<b>Employment</b>		
LA1	Breakdown of workforce	All Taipower's employees are full-time workers
LA2	Employee turnover	59
LA3	Benefits to full-time employees	63
<b>Labor-Management Relations</b>		
LA4	Employees with collective bargaining agreements	Accounting for 97% of all employees
LA5	Minimum notice periods	Act as regulated by law
LA6	Workforce in joint health committee	64
LA7	Occupational injuries and absenteeism	Absence rate of 2.94%
LA8	Training on serious diseases	64-65
LA9	Trade union agreements on health	Accounting for 2.9% of all the topics
<b>Training and Education</b>		
LA10	Average hours of training per employee every year	61
LA11	Programs for lifelong learning	60-61
LA12	Percentage of employees receiving regular performance and career development reviews	None
<b>Diversification and equal chance</b>		
LA13	Composition of governance bodies	58,62
LA14	Ratio of basic salary of women to men by employee category	No disparity
LA15	Return to work and retention rates after parental leave, by gender	59
<b>Social Indicators - Human Right Indicator</b>		
Disclosure on Management Approach		61-62
<b>Investment and procurement</b>		
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	No re-investment in 2012 and thus no associated human right assessment conducted.

GRI Index		Page
HR2	Supplier screening on human rights	64-65
HR3	Training on human rights	Average hour of human rights issue related training is 2.03 hours, accounting for 11.51% of all employees.
<b>Anti-discrimination</b>		
HR4	Discrimination	No relevant issues
<b>Freedom of association and collective bargaining</b>		
HR5	Association and collective bargaining	Taipower has a labor union and Taipower making no interference with the union
<b>Child labour</b>		
HR6	Child labour	No child labour hired, as acting in accordance to the Labor Standards Act
<b>Forced labour</b>		
HR7	Forced labour	No relevant issues
<b>Safety measures</b>		
HR8	Human right training for security personnel	None
<b>Assessment</b>		
HR9	Violations of rights of local employees	No relevant issues
<b>Corrective measures</b>		
HR10	Total number of operations that have been subject to human rights reviews and/or impact assessments	17
<b>Corrective measures</b>		
HR11	Number of grievances related to human rights filed, addressed, and resolved through formal grievance mechanisms	No relevant issues
<b>Social Indicators - Social Indicator</b>		
Disclosure on Management Approach		78
<b>Community</b>		
SO1	Operational impact on communities	50
<b>Corruption</b>		
SO2	Corruption risks	17-18
SO3	Anti-corruption training	17-18
SO4	Actions against corruption	17-18,61
<b>Public Policy</b>		
SO5	Lobbying	None
SO6	Political donations	None

GRI Index		Page
<b>Anti-competitive behavior</b>		
SO7	Anti-competitive behavior	Not applicable as Taipower is a public power utility
<b>Compliance</b>		
SO8	Regulatory non-compliance sanction	None
<b>Community</b>		
SO9	Operations with significant potential or actual negative impacts on local communities	50
SO10	Prevention and mitigation measures implemented in operations with significant potential or actual negative impacts on local communities	50
<b>Social Indicators - Product Indicator</b>		
Disclosure on Management Approach		34
<b>Customers' health and safety</b>		
PR1	Health and safety impacts along product life cycle	All Taipower substations having the detected electromagnetic field value lower than the exposure limits set by WHO and Taiwan's EPA (2012) as 60Hz 833 mG.
PR2	Non-compliance with health and safety standards	4 cases
<b>Labeling of products and services</b>		
PR3	Product information	Facilities for generating, transmitting and distributing power all having safety warning as regulated
PR4	Non-compliance with product information standards	None
PR5	Customer satisfaction	67
<b>Marketing, promotion and communication</b>		
PR6	Communication programmers not complying with marketing- and advertising-related laws	Not applicable
PR7	Non-compliance in marketing practices	No relevant issues
PR8	Complaints regarding customer privacy	No relevant issues
PR9	Product non-compliance	None
<b>Supplemental Indicator for Power Business</b>		
<b>Introduction</b>		
EU1	Installed capacity(MW), broken down by primary energy source and by regulatory regime	4-5
EU2	Net energy output broken down by primary energy source and by regulatory regime	57

GRI Index		Page	GRI Index		Page
EU3	Number of residential, industrial, institutional and commercial customer accounts	5	EU17	Days worked by contractor and subcontractor employees involved in construction, operation & maintenance activities	The major operation & maintenance activities were all conducted by Taipower's in-house staff
EU4	Length of above and underground transmission and distribution lines by regulatory regime	Supervoltage transmission power line 3,894 km; primary and secondary power transmission 13,032 km; power distribution 347,242 km	EU18	Percentage of contractor and subcontractor employees that have undergone relevant health and safety training	100%
EU5	Allocation of CO <sub>2</sub> e emissions allowances or equivalent, broken down by carbon trading framework	46,48	<b>Society-aspect management policy</b>		
<b>Economy-aspect management policy</b>			EU19	Stakeholder participation in the decision making process related to energy planning and infrastructure development	71-73
EU6	Management approach to ensure short and long-term electricity availability and reliability	34-40	EU20	Approach to managing the impacts of displacement	29-30
EU7	Demand-side management programs including residential, commercial, institutional and industrial programs	36	EU21	Contingency planning measures, disaster/emergency management plan and training programs, and recovery/restoration plans	31-32
EU8	Research and development activity and expenditure aimed at providing reliable electricity and promoting sustainable development.	36-40,42-43	<b>Society/Communication engagement</b>		
EU9	Provisions for decommissioning of nuclear power sites	29	EU22	Number of people physically or economically displaced and compensation, broken down by type of project	No relevant issues
<b>Usability and reliability</b>			<b>Product-aspect management policy</b>		
EU10	Planned capacity (MW) against projected electricity demand over the long term, broken down by energy source and regulatory regime	34-35,38-39	EU23	Programs, including those in partnership with government, to improve or maintain access to electricity and customer support services	34-40
<b>System Efficiency</b>			EU24	Practices to address language, cultural, low literacy and disability related barriers to accessing and safely using electricity and customer support services	Customer services provided in Mandarin, Taiwanese and English, and brailled bills available
EU11	Average generation efficiency of thermal plants by energy source and by regulatory regime	23-26	<b>Product/consumers' health and safety</b>		
EU12	Transmission and distribution losses as a percentage of total energy	24,26	EU25	Number of injuries and fatalities to the public involving company assets, including legal judgments, settlements and pending legal cases of diseases	8 accidents, causing 9 injured and 1 dead
<b>Biodiversity</b>			<b>Availability</b>		
EU13	Biodiversity of offset habitats compared to the biodiversity of the affected areas	50,55	EU26	Percentage of population unserved in licensed distribution or service areas	Power grid penetration reached 99.967%
<b>Labor management</b>			EU27	Number of residential disconnections for non-payment, broken down by duration of disconnection and by regulatory regime	Total 136,157 households. Power would be recovered on the day of payment
EU14	Programs and processes to ensure the availability of a skilled workforce	60-62	EU28	Power outage frequency	26,66
EU15	Percentage of employees eligible to retire in the next 5 and 10 years broken down by job category and by region	Employees eligible to retire in the next 10 years accounting for 43.82% of existing employees	EU29	Average power outage duration	26,66
EU16	Policies and requirements regarding health and safety of employees and employees of contractors and subcontractors	63-65	EU30	Average plant availability factor by energy source and by regulatory regime	Thermal Power 89.68% Pumped Storage Hydro 95.05% Conventional Hydro 89.20% Nuclear Power 89.26% Wind Power 91.72% Solar Energy 78%
<b>Employment</b>					

# 2012 Chronology

## Feb

02.09

Two generators in Lanyu Power Plant were completed and put into commercial operation, making a net increase of 1,000 kW for the overall installed capacity.



## Apr

04.24

Taipower and Kaohsiung Education Bureau jointly held Energy Conservation Demonstration Tour 2012.



## Sep

09.12

Taipower celebrated the successful launch of its ERP system.



09.18

Four units in Wanda Power Plant were completed, increasing the installed capacity by 19,700 kW. The photovoltaic power generation stations (row-water pool areas for # 1 and # 2 generators) in Datan Power Plant were completed, contributing 651.42 kW to the overall installed capacity. The photovoltaic power generation stations (D and E row-water pool areas) in Taichung Power Plant were completed, adding 1,508.64 kW more in the installed capacity. All of the above constructions were put into commercial operation on the same date.



## Oct

10.22

Taipower was awarded with a gold medal for the "Most Innovative Power Technology of the Year" and a silver medal for the "Best Power Transmission and Distribution Project of the Year" the "Asian Power Awards 2012."



May

05.15

Taipower's former chairman Mr. Edward K. M. Chen resigned and was temporarily succeeded by Mr. Huang Chung-chiu, Administrative Vice minister of the Ministry of Economic Affairs, who formally charged the position on June 5.



05.31

The third power plant had its newly built photovoltaic facility completed and put into commercial operation, making a net increase of 1,209.6 kW for the overall installed capacity.



Aug

08.31

No. 1 and No. 2 Generators in Talin Power Plant were decommissioned, making the installed capacity reduced by 600,000 kW.



Nov

11.23

The renewal of one generator in Lanyu Power Plant was completed, adding 1,500 kW of installed capacity, and making a net increase of 1,000 kW for the overall installed capacity. The construction of the new photovoltaic facility in Chimei, Penghu was completed, increasing 154.56 kW of the installed capacity.



11.28

Taipower won various awards for its outstanding performance in the 12<sup>th</sup> Public Construction Golden Quality Award, including nine awards of excellence, two awards of excellence and one nomination.



11.29

The Taipower 2012 Sustainability Report was awarded a silver medal in the service category as well as a special award of excellence for the "Disclosure of Information on Climate Change" in the "2012 Taiwan Corporate Sustainability Report Awards" held by the Taiwan Institute of Sustainable Energy.

Dec

12.27

A decommissioning event was held to celebrate the coal railway of Linkou Power Plant finishing its service.



Sunglin Hydro Power Project of Wanda Power Plant was put into commercial operation.





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