This CSR report is dedicated to illustrating State Grid Corporation of China’s aspiration, action, and performance in maximizing the integrated economic, social and environmental value, as well as its implementation of social responsibilities in 2015 and the commitment for 2016.

Statement

State Grid Corporation of China (SGCC) declares that all information of the CSR report is substantiated, balanced, and comprehensive. It systematically illustrates SGCC’s aspiration, action, performance, commitment and future improvement in maximizing the integrated economic, social and environmental value. We ensure its authenticity, objectivity and promptness. We hope, by means of publishing the CSR report, to strengthen the communication with stakeholders and the society, establish mutual trust and cooperation based on the same value recognition, and promote sustainable development.

February 2016
Report Overview

The time frame covered by this report:

Reporting cycle:
SGCC’s CSR Report is an annual report, usually released by
the end of February the next year.

Organizational coverage:
SGCC (Refer to “Corporate Profile” for organizational
structure).

Previous reports:
SGCC released its CSR Report for 10 consecutive years on

Note on the data:
The data for 2015 used in this report are preliminary
statistics. They may be slightly different from the final
results. The data for 2014 are final statistics, part of which
differs slightly from the 2014 CSR Report.

Extended reading:
For information related to corporate governance, social
responsibility management, stakeholder’s participation
mechanisms, and index calculations, please visit the
com.cn/ywlm/socialresponsiility/index.shtml.

Language of the report and how to get a copy:
The CSR Reports are available in both Chinese and English, including
paper and electronic versions. Please email csr@sgcc.com.cn or call at
86-10-66598394 for a hard copy. Or you can download the report from
our website.

Procedure for Report Preparation:
Please visit our CSR website for more details.

References:
Sustainability Reporting Guidelines by Global Reporting Initiative
Guidelines to the State-owned Enterprises Directly under the Central
Government on Fulfilling Corporate Social Responsibilities by SASAC
SOEs’ Harmonious Development Strategy Implementation Outline During
the 12th Five Year by SASAC
State Grid CSR Performance Guide
Guidance on Chinese Enterprises’ Corporate Social Responsibility by
Research Center for Corporate Social Responsibility, Chinese Academy of
Social Sciences
CSR Guide for China’s Industrial Enterprises and Industrial Associations by
China Industrial Economic Federation
for Standardization ISO
AA 1000 Assurance Standards by Accountability Institute, Britain

How to identify the topics for 2015

Collect topics for the CSR report via:
+ Suggestions from the management;
+ Analysis from external and internal experts;
+ Topics from other entities;
+ Topics from external stakeholders;
+ Topics benchmarked with CSR standards.

Identify the topics
Abide by State Grid CSR Performance Guide, we continue
applying the two-dimensional matrix of “Value Creation &
Social Concerns”:
+ Topics significantly affecting value creation effect;
+ Topics greatly concerned by stakeholders;
+ Topics about social issues of common concern;
+ Topics emphasized by general standards;
+ Topics of importance to a power grid enterprise.

Value Creation Dimension: assess the relevance, importance, and
feasibility of specific topics to integrated value creation (It must take
into consideration the resources, potentials and advantages of the
company and stakeholders).

Social Concern Dimension: assess the degree of concern on
specific topics by the society and stakeholders (It must fully consider
the attention from CSR standards).
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2. Treat each stakeholder with responsibility

1. Ensure reliable and trustworthy power supply

3. Become a model of green development

4. Develop overseas business with responsibility

5. Guarantee operation transparency and be open to public supervision

 CSR is the fundamental expectation and requirement from all walks of life
 CSR is the starting point as well as the ultimate goal of the company’s operation
Build a responsible, reliable and trustworthy SGCC

Corporate Social Responsibilities of SGCC

Pursue maximized integrated economic, social and environmental value
Realize utmost contribution to sustainable development

1. Ensure reliable and trustworthy power supply
   (The key to create maximum integrated value)

2. Treat every stakeholder responsibly
   (Take responsibility for everyone involved in the corporate operation)

3. Become a role model of green development
   (Be responsible for the environmental effect caused by corporate operation)

4. Develop overseas business with responsibility
   (Social responsibility is the company’s eternal pursuit no matter where it operates)

5. Ensure transparent operation and be open to social supervision
   (Transparency and social supervision makes social responsibility trustworthy and sustainable)

Embed CSR into Corporate Operation

Provide safer, cleaner, more economical and sustainable energy supply with minimum economic, social and environment cost

- Fulfill the responsibility on scientific development, push for optimal allocation of the national energy resources
- Fulfill the responsibility on secure power supply, maintain public social security
- Fulfill the responsibility on management excellence, guarantee operational efficiency
- Fulfill the responsibility on technical innovation, lead independent industrial innovation
- Fulfill the responsibility on global vision, deepen global resource integration

Operate the company in a human-oriented way

Responsibility on Quality Service, responsible for customers
Responsibility on Agriculture, Countryside and Farmers, responsible for agriculture, countryside and farmers
Responsibility on Employee Development, responsible for employees
Responsibility on Win-win Partnership, responsible for partners
Responsibility as Corporate Citizen, responsible for the community

Operate the company in a manner responsible to environment

Responsibility on Environmental Protection and Low Carbon Emission, responsible for the environment

Develop overseas business with responsibility

Implement overseas business development strategy with responsibility on global vision

Transparency and stakeholders’ participation ensure social responsibility trustworthy and sustainable

Responsibility on Communication and Cooperation, ensuring stakeholders’ right to know, to participate, and to supervise, building trust, promoting mutual understanding, and cooperating to create integrated value
Chinese President Xi Jinping delivered a keynote speech at the UN Sustainable Development Summit on Sept. 26, 2015, proposing discussion on establishing global energy interconnection or GEI to facilitate efforts to meet the global power demand with clean and green alternatives. This is his another major global initiative next to “One Belt One Road” or known as OBOR. It is a major innovation on conventional concept of energy development that transcends history, and an important initiative by the Chinese government to respond to climate change and meet the post-2015 development agenda of the United Nations. It has a far-reaching significance to China’s rejuvenation and sustainable development of human society.

The OBOR initiative is a major idea proposed by CPC Central Committee in the new period for the new stage. GEI is its innovative development, and a key measure to implement the OBOR initiative. The two are intertwined and mutually reinforcing. GEI will greatly promote the communication on various national policies, facility interconnection, and trade and money flow, enhance the understanding among the people, and finally speed up OBOR implementation.

GEI is a major measure to boost energy revolution. Every big leap forward in productivity and major social progress in human history is paralleled with energy revolution. The development and utilization of coal and the invention of steam engine was a literal spark to the First Industrial Revolution. The development and unitization of oil and the invention of internal combustion engine and electricity pushed forward the Second Industrial Revolution. The construction of GEI can lead and push for the 3rd Industrial Revolution as it accelerates clean development and forms a new pattern with electricity as the center and clean energy as priority that can allocate energy resource globally and facilitate the upgrade of the industry around the world.

GEI is a powerful engine for the socioeconomic development. It will enable massive exploitation and use of various types of clean energy with high efficiency so that everyone has access to abundant, clean, cheap, efficient and convenient energy supply, with inexhaustible power to support socioeconomic development. The thorough integration of GEI, the Internet of Things and the Internet will heat up the development of new energy, new materials, smart manufacturing, EV and other strategic emerging industries. A broad space and arena will be created for people to start their own business and to make innovations. It is foreseeable that the economic growth, restructuring and industrial upgrading will be elevated.

Mr. Liu Zhenya, Chairman of SGCC
GEI is the fundamental solution to address global climate change, which is in a grim situation. The global average earth surface temperature has risen more than 1.0 °C since the industrial revolution. If we do nothing about it, the temperature rise will exceed 4 °C by the end of this century, bringing a serious threat to human survival and development.

GEI meets the global energy demand in a clean and green way. By 2050, the proportion of clean energy will reach 80%, replacing fossil energy equivalent to 24 billion tons of standard coal and reducing carbon dioxide emission by 67 billion tons. By then, the global carbon dioxide emission will be controlled at 11.5 billion tons, half of that in 1990. The target of limiting global temperature rise by 2°C can be realized.

GEI is an important platform for promoting world peace and development, able to strengthen win-win cooperation among countries, organizations, enterprises and various parties. Relying on a large-scale tap into renewable energy through global energy interconnection, it is possible to enhance South-South cooperation and South-North cooperation, and turn rich resources in Asia, Africa, South America and other regions into economic strength. It will help address power shortage, eliminate poverty, reduce regional disparities, and curb international disputes, promote "Sustainable Energy for All" and help build a human community of common destiny.

Currently, the world's energy development is faced with resource constraints, environmental pollution and climate change. To solve these three problems, we have to take the road of clean development, and implement "Two Replacements", that is, to implement clean replacement in energy production, replacing fossil fuels with clean energy like solar and wind power and forming a new pattern dominated by clean energy instead of fossil fuels; to implement electricity replacement in energy consumption, replacing fossil fuels like coal and oil with electricity, and increasing its proportion in end energy consumption.

GEI is a globally interconnected strong and smart grid with UHV grid as the backbone, which will serve as a platform for extensive development, deployment and utilization of clean energy globally. Its essence is UHV Grid + Smart Grid+ Clean Energy. UHV grid is the key, smart grid is the foundation and clean energy is the priority. Only by establishing GEI can we speed up the "Two Replacements" and achieve massive development, extensive allocation and efficient utilization of clean energy so as to promote ecological civilization to meet the needs of socioeconomic development.

GEI is divided into three phases. The first phase is domestic interconnection: from now on to 2020, speed up clean energy development and domestic grid interconnection, and enhance grid's allocation capacity, intelligence level and proportion of clean energy in various countries. The second phase is intracontinental interconnection: from 2020 to 2030, promote large energy base development and cross-border grid interconnection within the continent, and realize large-scale, efficient and optimal allocation of clean energy in a large scope within the continent. The third phase is intercontinental interconnection: from 2030 to 2050, speed up energy base development in the Arctic and the Equatorial region (wind power in the Arctic and solar power at the Equatorial region). By then, GEI will basically come into being, enabling clean energy as the dominant source, and addressing problems like world energy security, environmental pollution and greenhouse gas emission.

Ultra High Voltage (UHV) technology is essential to construct the GEI. UHV is mainly composed of 1000kV (and above) AC and ±800kV (and above) DC transmission. It has a larger transmission capacity over long distances with lower line loss, less footprint use, and better economic efficiency. The distances between the world's major clean energy bases and load centers are within the UHV transmission range. The strong and smart grid backboned by UHV grid integrates modern smart technologies, IT technology, advanced transmission technology and new energy integration technology. It is flexible and adaptable, able to accommodate the integration of clean energy and distributed generation, enabling instant plug-and-use of smart devices and interactive services. For more than a decade, SGCC has vigorously developed UHV and smart grid based on independent innovation and made major breakthroughs that are “Created by China” and “Led by China”. "UHV AC transmission key technology, equipment and engineering application" has won the National Award for S&T Progress (Special Prize).

GEI is in line with the objective laws of the world grid development and this great cause could benefit all mankind. SGCC will work towards the realization of the proposal by President Xi Jinping, pioneer development and promote breakthroughs of GEI, and make new contributions to sustainable energy development both in China and the world.
SGCC was established on December 29, 2002, an enterprise approved by the State Council to carry out state-authorized investment and a pilot state holding company. It has been rated as an A-Class enterprise by SASAC evaluation on operation performances for 11 consecutive years. As the largest utility in the world, SGCC has a stable ranking of the 7th on Fortune Global 500.

SGCC constructs and operates power grids as its core business. As a super-large state-owned enterprise crucial to national energy security and economic lifeline, with a mission to provide safer, cleaner, and more economical and sustainable power supply. SGCC operates as a group with RMB 536.3 billion registered capital and 1.72 million employees. SGCC provides power to over 1.1 billion people in 26 provinces, autonomous regions and municipalities, covering 88% of the national territory. The company also owns and operates overseas assets in the Philippines, Brazil, Portugal, Australia and Italy, etc. with good performance.

**Corporate Profile**

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**Organizational Structure—the Headquarters, SGCC**

| 1 | Administration Office (Board Office) | 12 | Dept. of AC Transmission Project |
| 2 | General Office | 13 | Dept. of DC Transmission Project |
| 3 | Global Energy Interconnection (GEI) Office | 14 | Dept. of Information and Communication Technology |
| 4 | Research Office | 15 | Dept. of Procurement (SGCC Bidding Management Center) |
| 5 | Dept. of Development and Planning | 16 | Dept. of Affiliates Management |
| 6 | Dept. of Finance & Asset | 17 | Dept. of Public Relations (SGCC Brand Building Center) |
| 7 | Dept. of Safety Supervision | 18 | Dept. of International Cooperation |
| 8 | Dept. of Operation & Maintenance | 19 | Dept. of Auditing |
| 9 | Dept. of Marketing (Dept. of Rural Electrification) | 20 | Dept. of Legal Affairs |
| 10 | Dept. of Science & Technology | 21 | Dept. of Personnel |
| 11 | Dept. of Construction | 22 | Dept. of Human Resource |
| 12 | Restructuring Office | 23 | Dept. of Retirement Affairs |
| 13 | Dept. of Logistics | 24 | Dept. of Corporate Culture (co-working with Youth League and Party Committee) |
| 14 | Supervision Office (co-working with the discipline team from Central Commission for Discipline Inspection of the CPC stationed in the company) | 25 | National Power Dispatching & Control Center |
| 15 | SGCC North China Branch | 26 | SGCC Operation Monitoring (Control) Center |
| 16 | SGCC East China Branch | 27 | SGCC Power Exchange Center (Beijing Power Exchange Center Co., Ltd.) |
| 17 | SGCC Central China Branch | 28 | Association of Enterprise Management |
| 18 | SGCC Northeast China Branch | | |
| 19 | SGCC Northwest China Branch | | |

**Organizational Structure—Branches**

| 110 (66) kV and above transmission lines of SGCC’s assets; **110 (66) kV and above transforming facilities; All above-mentioned data exclude overseas assets.**

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**on Fortune Global 500**

7th

Serving 88% of the national territory

Providing power to a population of over 1.1 billion

Added economic value

RMB 22.1 billion

Over 1.72 million employees

Length of transmission line*

889,900 km

Transformation capacity **

3,612 GVA

Profits

RMB 86.5 billion

Electricity sales

3,450.6 TWh

Revenue

RMB 2,075 billion

Total assets

RMB 3,114.9 billion

Investment in fixed assets

RMB 469.5 billion

Line loss

6.78%

Reliability of urban power supply

99.957%

Reliability of rural power supply

99.85%

Overall productivity

RMB 653,000 per person·year

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**SGCC**
A-Class Enterprise by SASAC Evaluation on Operation Performances for the 11th consecutive year
5 projects including Qinghai-Tibet Interconnection Project won National Award for S&T Progress (Second Prize).

As a Class financial performance by SASAC for the 5th consecutive year
Southern Hami-Zhenzhou UHV DC Project won National Gold Prize for Excellent Project.

7th on Fortune Global 500 for the 5th consecutive year
Fujian Xianyou Pumped Storage Hydropower Station won the National Gold Prize for Excellent Project.

Being awarded the Sovereign Credit Rating by three major international rating agencies for 3 consecutive years
500kV Eastern Puyang Substation won China Construction Project Luban Award.

Second Place of Chinese Top 500 Most Valuable Brands for 8 consecutive years
1 Gold Award and 12 memorial Awards of the 16th China Patent Award

First Place of Top 500 Chinese Service Enterprises for the 11th consecutive year
Won 2 First Awards, 8 Second Awards and 5 Third Awards of China Machinery Industry S&T Progress Award

295 units of SGCC awarded National Civilized Units
2 First Award, 4 Second Awards and 6 Third Awards of China Electric Power Innovation Award

Advanced Organisation for Point-to-point Poverty Alleviation Among Central State Organs
6 First Awards, 33 Second Awards and 67 Third Awards of provincial-level S&T Progress Award

Gold Prize of China Youth Volunteer Service Competition
Green Action of Global Compact Network China

National Model Worker (for 64 employees)
Five-star Enterprise on the 2nd CFIE Social Responsibility Star List

SOE Advanced Group (10 units)
Model Enterprise at the 10th Corporate Social Responsibility Forum: China

Best Corporate of HR Development and Management Award
Model Enterprise for Public Transparency 2015
The Aspiration

Awareness comes first in responsible development.

——Chinese President Xi Jinping

Speech at the UN Sustainable Development Summit

China proposes to establish a global energy interconnection to facilitate efforts to meet the global power demand with clean and green alternatives.
Global Energy Interconnection

A Chinese solution to the sustainable development of world energy

Essence of global energy interconnection
UHV Grid + Smart Grid + Clean Energy

It is the fundamental way out for the energy dilemmas. Energy security, environmental pollution and climate change have become severe problems that constrain human society’s sustainable development. Fossil energy resources are limited and they bring about high pollution and emission along with their development and utilization. Meanwhile, global clean energy is inexhaustible. Conventional energy development mode cannot sustain itself. We must push forward clean energy to replace fossil fuels.

It is the fundamental solution of clean and green development. The imbalanced distribution of clean energy and the random and intermittent nature of wind power and solar power generation requires an energy platform that is centered on electricity, and is capable of global allocation capacity if clean energy is to be massively developed. Global energy interconnection can connect large energy bases and distributed generation at the North Pole and the Equator, in every continent and in each country, convert clean energy into electricity, deliver it to various customers and realize large-scale clean energy development.

It is the inevitable course for sustainable energy development. Based on China's successful practice in UHV grid and smart grid and clean energy development, SGCC initiated a strategic concept for world energy’s sustainable development. GEI has won extensive support from UN Secretary-General Ban Ki-moon, World Bank Group President Jim Yong Kim, and international organizations such as IEA, WBCSD and IEC. It is a global technological revolution to lead the reform in world energy sector after steam, electricity and IT technology. GEI is in line with the trend of the world energy reform and the objective laws of grid development, as well as the common benefits of all mankind.
Explore, practice, verify, and improve a scientific CSR Concept

Thoroughly implement the spirit of the 5th Plenary Session of the 18th Central Committee of the Communist Party of China with an innovative, coordinated, green, open, sharing and sustainable development concept.

Put innovation at the heart of national development, continuously push forward the theoretical innovation, system innovation, technical innovation, cultural innovation and etc., so that innovation runs through all the work and becomes a common practice in the whole society.

Foster new drive for development
Develop new space for development
Deepen implementation on innovation-driven development strategy
Establish new industrial system
......

In line with China’s overall plan, correctly handle the major relationships in development, focus on promoting the coordinated development between urban and rural regions and between economic and social development, and promoting simultaneous development of new industrialization, informatization, urbanization and agricultural modernization, step up efforts to strengthen national hard power while enhance soft power, and constantly enhance integrated development.

Promote balanced development
Promote coordinated regional development
Promote coordinated development in rural and urban areas
Promote the awareness of nationhood, rule of law, and social responsibility
......

Adhere to the basic national policies of saving resources and protecting the environment, adhere to sustainable development, embark on the road of production development, affluent life and good ecology, accelerate the building of a resource-saving and environmentally-friendly society, and strike a balance between man and nature, build a beautiful China, and make new contributions to global ecological security.

Promote the harmony between man and nature
Accelerate the construction of the main functional areas
Promote the development of low-carbon cycle
Intensify environmental protection
......

Conform to the trend of China’s economic integration into the world economy, uphold the mutually beneficial and win-win strategy of opening up, develop a higher level of open economy, actively participate in global economic governance and public goods supply, improve China’s voice in global economic governance, and co-build an universal community of interest.

Open a new chapter of opening up
Improve strategic layout of opening up
Form a new system of opening up
Promote “Belt and Road” construction
......

Adhere to the law of “Development for the people, by the people and fruits of development shared by the people”, make more effective institutional arrangements, so that all people have greater access to development benefits, enhance the development motives, promote unity and move steadily toward common prosperity.

Realize a comprehensive well-off society for all
Increase the supply of public services
Implement poverty-alleviation projects
Promote the development of a healthy China
......
Implement the work laid out in the Central Government Economic Work Conference 2015, apprehend and adapt to the new normal and lead in the new normal, and strive to achieve the change of priorities in work.

Implement SASAC work deployments, and pay close attention to fulfill social responsibility, making it an important task for boosting the development of central SOEs

Overall objectives

Become an excellent enterprise with an outstanding CSR management system: with advanced CSR concept, improved management system and mechanisms, effective stakeholder management, and the long-term working mechanism basically formed.

Become an excellent enterprise to lead the industry to fulfill its social responsibilities: significantly enhance economic, social and environmental values with sustainable competitive advantages, drive upstream and downstream enterprises in the industry chain to jointly assume responsibility for common development, and become the benchmark of social responsibility across the whole industry.

Become a model enterprise of international influence with outstanding CSR: fulfill CSR in international operation and contribute to the world CSR management model and practices at international level, become a internationally respected company with strong competitiveness and market reputation.

Three Combinations

Adhere to and promote the combination of company reform and development with CSR: social responsibility shall be put throughout the whole process of company reform and development. Encourage enterprises to upgrade quality and efficiency, stimulate business vitality and creativity, and enhance market competitiveness.

Persist in and strengthen corporate management with CSR: make social responsibility an important starting point for corporate system and management innovation, re-examine and sort out management objectives, mechanism and content from the perspective of CSR concept and requirement, integrate production and management and improve enterprise management.

Strengthen the combination of CSR with corporate governance according to law: fully integrate CSR in governing the enterprise by law, fully reflect CSR concept and requirement in the drafting of company policies and regulations, and improve compliance so as to effectively guarantee and safeguard the legitimate rights and interests of the company and stakeholders.

Five focuses

Focus on innovative practices: innovate tools and methods for CSR management to achieve organic combination of business model innovation and social innovation.

Focus on equal operation: adhere to governing the company by law and integrity, effectively protect the interests of consumers and safeguard the legitimate rights and interests of all kinds of investors and creditors.

Focus on environmentally-friendly development: adhere to green development, promote low-carbon recycling and achieve sustainable use of resources.

Focus on harmonious sharing: implement national macro-control policies, play a pillar role in special periods and critical moments and become a good corporate citizen.

Focus on openness and transparency: constantly improve operational transparency, and win over public understanding and support.
Responsibilities Originate from Mission and Begins from Strategy

Corporate Value

Goal
Build a modernized company with "A Strong Grid, Excellent Assets, Services and Performance".

Corporate Vision
Build a world-class grid and a world-class enterprise

Corporate Mission
Delivery clean energy to a harmonious society
Ensure safer, cleaner, more economical, and sustainable energy supply and push for healthier development, more harmonious society and a better life

Corporate Tenet
To serve the country, customers, power generation enterprises and the socio-economic development.

Corporate Philosophy
Oriented to people, loyal to company and committed to serving the society

Corporate Spirit
In search of excellence
In pursuit of outperformance

Core Values
Integrity, commitment, innovation and dedication

CSR Fulfillment Concept
Develop the company
Serve the society
Oriented to people
Seek mutual advancement

Strategic Approach
Transform the development mode of the power grid
Transform the development mode of the company
Promote all levels of the company to develop and implement sustainable development strategies in line with the local conditions. Promote branches in provinces and prefectures (cities) to develop and implement practical sustainable development measures to maximize comprehensive value, improve operational transparency and shape a reliable, trustworthy, responsible SOE brand.

Push each branch and subsidiary to identify basic logic and the main content of sustainable development strategies. Determine the overall objective to pursue maximization of integrated economic, social and environmental value, improve operational transparency, build a reliable and trustworthy brand, and divide the overall objective into small targets that fit into local conditions of the region and the unit; determine the basic principles for policy implementation; set up strategic path and major operational deployment to achieve the overall objective; develop key performance indicators to measure overall goals; maintain effective process control and evaluation on policy enforcement, execute performance testing, and improve and perfect the sustainable development strategy.

In accordance with the requirements of sustainable development strategy, SGCC’s business development strategy has been fully optimized. Promote the integration of CSR concept into the development goal of building a modernized company with “A Strong Grid, Excellent Assets, Services and Performance”, absorbing ideas of sustainable development, harmonious development, green development, and cooperation and development. Build the vision inclusive of stakeholder, environment and society, fully pursue integrated maximized value of economy, society and environment, and attach great importance to ensure operational transparency and accept social supervision.

Actively engage key stakeholders in the development, implementation and improvement of sustainable development strategies. Actively promote the full participation of key stakeholders such as all levels of governments, experts and industry partners and others in the whole process of development, implementation and improvement of strategic planning, to ensure that policy actions and evaluation reflect the company’s full accountability.

Advocate CSR management’s integration into company’s strategic management
Direction and Core of Corporate Sustainable Development Strategy

Construct a Global Energy Interconnection

Implement the Four Comprehensive Strategies by the Central Committee to promote energy production and consumption revolution and realize scientific development of energy power and energy. Adhere to a global energy outlook and speed up the construction of global energy interconnection. Vigorously implement the “Two Replacements” and promote clean energy’s large-scale development, wide-range configuration and high-efficiency utilization, in order to ensure safe, clean, efficient and sustainable power supply and provide a strong support for the prosperity of China.

Global Energy Outlook

The Global Energy Outlook is the basic theory and standpoint on the global energy sustainability. Its core is to analyze and solve the global energy problems in an international, historic, differentiated and open perspective.

Two Replacements

Clean replacement is to replace fossil energy with clean energy like solar power, wind power, and hydropower in order to make clean energy the dominant energy form of the energy mix and provide a fundamental solution to resource and environment constraints in energy supply, and promote the sustainable development of energy.

Electricity replacement refers to replacing the direct consumption of fossil energy of coal and oil with electricity in order to raise the share of electricity in end consumption. The key is “to replace coal and oil with clean electricity coming from afar.”
Global Energy Interconnection (GEI)

GEI is a globally interconnected strong and smart grid with UHV grid as the backbone, which will serve as a platform for extensive development, deployment and utilization of clean energy globally. From its function and purpose, it is like the Internet of Things that integrates energy transmission, resource allocation, market transaction, information interaction and intelligent services; it is also a mega system jointly constructed and shared by everyone, as being interconnected, open and compatible. It is a platform of peaceful development of great economic, social and environmental significance.

Framework of GEI System

Global energy interconnection

Clean development and global allocation

Domestic interconnection, intracontinental interconnection, and intercontinental interconnection

Strong grid, extensive interconnection, highly smart, open and interactive

Energy transmission, resource allocation, market trade, industrial drive and public service

Sketch of GEI
Responsibilities are Rooted in Management and Accomplished through Mechanism

**Enhance capability**

- Carry out CSR training for all employees
- Develop and apply CSR management tools
- Conduct major CSR activities
- Intensify CSR exchanges from home and abroad
- Boost CSR knowledge management

**Enhance communication**

- Establish a sound CSR releasing mechanism
- Polish information disclosure mechanism
- Release a series of White Papers
- Establish systematic communication with different stakeholders
- Innovate communication channels catered to different stakeholders
- Intensify mass communication for major decisions and actions

**Explore penetration**

Explore the CSR penetration and innovation practices that set senior management as the leading role, incorporate professional expertise, construct teams and stations, mobilize all job positions, gain external support and sublimate by culture to strongly support the social responsibility with "All Employees' Participation, Full-Process Blending, and All-Round Coverage" and promote the penetration of CSR positions, teams and professionals.

**Implement projects**

Apply project management methods on specific businesses, and adhere to the orientation of problem, value, change and brand, to improve quality and efficiency with CSR concept.

<table>
<thead>
<tr>
<th>Be problem-oriented</th>
<th>Be value-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose the projects that can combine the CSR concept, or use the CSR management to solve the company's operation problems or the related social and environmental problems.</td>
<td>Choose the projects that can significantly enhance the comprehensive value creation ability and operation transparency, especially the projects significantly enhancing social and environmental values.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Be change-oriented</th>
<th>Be brand-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose the projects that can integrate CSR concept and promote the obvious changes of the company and its employees’ behaviors.</td>
<td>Choose the projects that can create a good development environment and demonstrate a responsible corporate image.</td>
</tr>
</tbody>
</table>

**Promote integration**

- Identify the standards of contents and actions for responsible operation
- Evaluate CSR performances and status during the company’s operation
- Formulate and implement the overall upgrade plan
Construct and improve managing mechanism for stakeholders’ participation

Participation mechanism for strategic stakeholders
- Take full account of stakeholder involvement in the respect of company values and development strategy
- Based on the overall development strategy of the company, systematically analyze the relationship with stakeholders from the aspects of law, social traditions and stakeholder requirements
- Based on the relationship between stakeholder group and the company, formulate strategies, objectives, policies and principles for stakeholder participation
- Through institutional arrangements, resource guarantee and action plan, ensure a win-win cooperation with the company’s stakeholders

Participation mechanism for business stakeholders
- The company should strictly abide by the Corporate Code of Conduct, establish a management philosophy that encourages stakeholders to involve in daily operations
- According to the CSR requirements of being “safe, efficient, green and harmonious”, analyze the impact of grid construction and operation on stakeholders and environment, and develop and implement stakeholder participation programs.
- Summarize lessons learned and continuously improve stakeholder participation rules. Develop targeted action plans, arrange necessary resources, and enhance the institutionalization, standardization and procedures of stakeholder involvement
The Action

Embed in mind and actualize in action
**Global Energy Interconnection**

Global energy interconnection already has the technical foundation for further development

Global energy interconnection can connect power grids in different continents with time zone and seasonal differences to solve energy and environmental problems that have been bothering human development for a long time, ensuring safe, clean and sustainable energy supply. Life will be better as the world is turning into a bright, peaceful and harmonious global village with sufficient energy, green land and blue sky.

—— SGCC Chairman Liu Zhenya

**UHV technologies have matured.** SGCC has successfully put 3 AC and 4 DC UHV projects into operation and now is constructing another 4 AC and 5 DC UHV projects. The company has successfully grasped UHV AC/DC transmission technologies. The transmission distance can reach 1,500 km for 1000kV UHV AC and 5,000km for ±1100kV UHV DC. The distance between large clean energy bases and load centers in the world is within the transmission distance of UHV transmission.

**Smart grid technologies achieve overall breakthroughs.** The company also built a bunch of advanced innovation-driven smart grid projects, including smart substations, smart EV charging and battery swapping network, smart power consumption information collection system and multi-terminal VSC-HVDC. Grid becomes a lot smarter. The successful practice in UHV and smart grid has laid an important foundation for constructing global energy interconnection.

**Clean energy develops rapidly.** Thanks to UHV and smart grid development, SGCC’s installed capacity of integrated clean energy reached 391GW, including 117GW of wind power and 39.7GW of solar power. SGCC now has the largest installed capacity of clean energy in the world.

**Large grid interconnection is accelerating.** There are some cross-border grid interconnections in North America, South America, Europe, southern Africa, and Gulf countries. A number of intercontinental interconnection proposals are under discussion. These will strongly promote GEI construction. By 2025, SGCC will have a synchronized network by building the synchronized interconnection project between the East China power grid and West China power grid.
Ensure reliable and trustworthy power supply

Fulfill the responsibilities of scientific development, management excellence, safe power supply and technical innovation

**UHV grid is the key to GEI**
- UHV grid ushers into a new era of massive construction.
- The function of comprehensive platform for optimal resource allocation now is fully exhibited.
- Integrated economic, social and environmental benefits are brought into full play.

Total power delivered via UHV

**434.7 TWh**

**Smart grid is the foundation of GEI**
- Promote smart grid pilot and demonstration projects
- Carry out most advanced technical research
- Make progress in national smart grid projects

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**Electricity sales in 2015**

**3,450.6 TWh**
Management innovation ensures quality and efficiency

- “3I5G” system improves operational efficiency
- Vigorously explore new areas and new businesses
- Construct a corporate platform for Big Data

Technological innovation could crack bottlenecks in development

- Improve first-class S&T innovation system
- Enhance management for scientific research
- Commercialize S&T results

Grid investment in 2015
RMB 452.1 billion

Patents owned by SGCC
50,165
Total National Science and Technology Awards: 51

Electricity traded at the National Power Market in 2015: 722.1 TWh

46,000 km of UHV power transmission lines put into operation in 2015

153.4 TWh of electricity traded via UHV in 2015

Implication on Value Creation
- Topics of guaranteeing reliable power supply
  - High
  - Low
- Promoting the development of smart grids
  - High
  - Low
- Serve the development of clean energy
  - High
  - Low
- Coordination and development of various levels of grids
  - High
  - Low

Constant improvement in management innovation
- Speed up UHV construction
- Improve S&T innovation in electric power
- Constantly improve management innovation
- Ensure the safe and stable operation of the power grid.
- Improve grid emergency management
- Coordinate the development of grids at various levels
UHV is the key to GEI

UHV grid enters into a new era of rapid development and large-scale construction. SGCC has built up 3 AC and 4 DC UHV projects and another 4 AC and 5 DC UHV projects are under construction. The 16 UHV transmission lines in operation or under construction are 28,800km long in total. The transforming (converting) capacity is 294GVA (GW). These projects cumulatively transmit 434.7TWh of electricity. Thanks to the support of large power grid, new energies’ integrated capacity has reached 160GW in SGCC’s service area, and with that, the company now owns the power grid with the world’s largest integrated wind power capacity and fastest growing solar power generation.

UHV’s advantage in optimal resource allocation is fully exhibited. Thanks to the support of large UHV grid, new energies’ integrated capacity has reached 160GW in SGCC’s service area, and with that, the company now owns the power grid with the world’s largest integrated wind power capacity and fastest growing solar power generation.

Integrated economic, social and environmental benefits of UHV grid are brought into full play. UHV has advantages of remarkable mid and long term economic benefits of big investment, which can forcefully drive upstream and downstream industries of power supply, electric equipment, energy-using equipment and raw materials, and play a very important role in stabilizing development, adjusting structure and benefiting people. It is estimated that Xilingol League–Taizhou and Shanghaimiao–Shandong ±800kV UHV DC transmission projects with a total investment of RMB47.5 billion, will increase RMB21.3 billion output in power transmission equipment manufacturing industry, directly drive RMB118.5 billion investment in power resource or related industries, create 33,000 jobs and boost GDP growth by RMB15.2 billion each year.
Fully master UHV core technology. UHV technology is essential for building global energy interconnection. Since 2004, SGCC joins all forces to carry out UHV work, achieves comprehensive breakthroughs in theory, technology, standards, equipment, construction, and operation, etc., and overcomes technical difficulties such as voltage control, external insulation configuration, electromagnetic environment, system equipment development, system integration and test capacity. SGCC has fully mastered the AC and DC power transmission core technologies, equipment manufacturing capacity and developed a complete system of UHV standards, of which UHV AC voltage has become the national and international standard. To sum up, China is the world’s first and only country in successfully mastering and having practical operation of UHV cutting-edge technologies.

**Constructed and under-construction UHV Projects**
Smart grid is the foundation of global energy interconnection

Promote smart grid innovation and demonstration projects. Accelerate 41 smart grid innovation and demonstration projects in 6 categories, including new energy development, distributed generation, convenient power consumption, EV infrastructure, smart city and grid intellectualization. Construct a batch of internationally leading smart grid quality and highlighted projects.

Carry out most advanced technical research. Study the technologies in new energy coordinated control, offshore wind power integration and detection, large-scale energy storage, and smart transmission and distribution. Focus on solving the problems of new energy integration and interconnecting the smart grid with "Internet +". Promote the application of Big Data, Internet of Things and cloud computing and carry out the smart grid practical equipment research, such as, optimal platform combining wind power and heating, live-line automatic maintenance platform for isolation circuit breaker, transmission line dynamic expansion analysis system, distributed generation coordinated controller and flexible ship shore power frequency converter.

Promote national smart grid projects. Based on the National 863 Program and S&T Support Program, SGCC carried out research and practices in the field of multi-type power joint operation, distributed generation, micro grid integration control, EV smart charge, discharge and power storage and comprehensive integration, and created a batch of advanced applicable technologies with the world-leading independent intellectual property rights and application prospects.

Highlighted projects in 2015

1. Flexible HVDC demonstration project
   In Zhoushan and Xiamen, flexible HVDC demonstration projects were put into operation successively, which effectively enhance the grid’s power supply capability, and ensure reliable power supply to Zhoushan Islands and Xiamen Island.

2. A new generation of smart substation
   Construct the new generation of smart substation demonstration projects of 500kV and 330kV. A total of 2,300 smart substations have been built.

3. Demonstration projects of smart transmission lines
   Deploy demonstration projects of smart transmission lines and take the lead in the direction of intelligent transmission to improve the urban transmission capacity while ensuring the grid’s safe operation.

4. Integrated demonstration project for smart grid
   Demonstration project in Chongming island, Shanghai is the China’s first GW-level containerized energy storage system affiliated with an independent wind farm, which has significantly improved the integration rate and power factor.

Build
2,300 smart substations

Put
342 smart grid demonstration projects into operation

China achieved for the first time a flexible control over power distribution on the grid

Flexible control over urban grid’s power flow direction and capacity has been a worldwide problem. On December 11th, 2015, China’s first “UPFC” project with independent intellectual property rights was put into operation in Nanjing, marking China has been at the forefront of the world’s flexible AC transmission technology development.

Metropolitan power lines are just like the roads, with load increasing year after year. Some lines are under-capacity, and some others are jammed. After UPFC project was put into operation, which is equivalent to an installation of “traffic lights” to the grid, through smart regulation, energy flow and flow direction are controlled, which has effectively raised power supply capacity of urban grid and reduced outage in peak hours without the need to build more new transmission channels.
Promote coordinated development of grids at different levels

Establish the first regional smart distribution grid in the capital.

Yizhuang Development District is a national economic and technological development zone and high-tech industrial park that is centered on electronic information, bio-pharmaceutical, automotive and equipment manufacturing. More than 100 World's Top 500 enterprises are located in this district. In 2015, State Grid Beijing Electric Power Company deployed the first regional smart grid and large-scale application of broadband carrier communication technology which has enabled full coverage of optical fiber networks. The rate of overhead lines insulation and user installation boundary load switch reached 100%. Through information sharing and business integration, automatic fault screening ability for the distribution network was enhanced and average fault isolation time has reduced from 226 minutes to 20 minutes, with 50% decrease of distribution grid failure rate. Outage notification can be directly sent to each household and installation procedure is facilitated with SMS navigation, meeting the demand for power supply reliability and high quality service by high-end industrial users and has been a great support to the development of the Zone.

Promote coordinated development of grids at different levels

Make a scientific ‘13th five year’ development plan. Guided by national energy strategy, we take into comprehensive consideration of auxiliary power sources and grid construction to meet the demands of economic and social development, energy export and rapid development of clean energy. The Thirteenth Five Year Planning for SGCC is compiled following the above principles.

Implement quality and efficient key projects. In 2015, SGCC invested more than 176.7 billion RMB in 110 (66)kV ~750kV power grid construction, with over 46,000 km of lines completed. The transformation capacity reached over 250GVA. The company improved Northwest 750kV main grid, and built a batch of key projects, such as the 750kV grid at Ningdong sending-end DC converter station and Juquan-Hunan auxiliary projects. SGCC commenced construction of 6 pumped storage Hydro power stations in Jinzhai, Anhui Province, and Yimeng, Shandong Province, and etc. The total pumped storage capacity under construction reached 17.3GW. SGCC also worked on the Fengman Dam reconstruction project.

Step up efforts in distribution grid renovation. According to the principles of the foundation reinforcement, precise investment, and lean management, we will conduct in-depth technical and economic feasibility studies to promote typical model design and consolidated technical guidelines. Integrate infrastructure, technical transformation and overhaul projects to make distributions to scientific and standardized grid construction and renovation. Emphases are made to solve issues such as irrational structure and equipment over-loading. We have completed distribution grid construction. SGCC has completed the distribution network upgrade in urban area of 30 major cities and central areas of 30 non-major cities. The automation rate of urban distribution grid reaches 55.75%.

Promote grid interconnection. We have pushed forward the Ekibastuz, Kazakhstan - Nanyang ±1100kV UHV DC project, Zhirkov, Russian - Bazhou, Hebei Province ±800kV UHV DC project, Xibo Obo, Mongolia Province- Tianjin ±660kV DC project, and Ili, Xinjiang Province- Islamabad, Pakistan ±660kV DC project.

Major engineering projects

<table>
<thead>
<tr>
<th>Project name</th>
<th>Project type and significance</th>
<th>Line length</th>
<th>Completion date</th>
</tr>
</thead>
<tbody>
<tr>
<td>The retrofitted project of Suizhong power plant to connect North China power grid</td>
<td>The first transmission channel under “Air Pollution Prevention and Control Action Plan”. It is an important transmission project connecting northeastern grid and North China grid.</td>
<td>15.4km</td>
<td>Put into operation on September 20, 2015</td>
</tr>
<tr>
<td>500kV auxiliary output project in Central Zhejiang</td>
<td>It can meet the power demand in Xiaoshan and Shaoxing and further improve the backbone grid of Zhejiang.</td>
<td>2x50.6km</td>
<td>Put into operation by phases from October 2014 to 2015</td>
</tr>
<tr>
<td>500kV transmission and transformation project in North Zhengzhou</td>
<td>It can enable grids in Henan to accommodate 8GW Tianzhong DC transmission capacity.</td>
<td>108.2km</td>
<td>Put into operation in November 2015</td>
</tr>
<tr>
<td>Tianshan (Southern Hami) converter station 750kV system interconnection transformation expansion project</td>
<td>It facilitates the development and accommodation of new energy in Hami, transmitting out the electricity generated from the phase 2 project of Hami wind power base.</td>
<td>5.098km</td>
<td>Put into operation on January 10, 2016</td>
</tr>
<tr>
<td>Xinjiang 750kV Kuche - Aksu - Bachu - Kashi power transmission and transformation project</td>
<td>It can increase transmission capacity from northern grid to three prefectures in southern Xinjiang Autonomous Region.</td>
<td>279.7km</td>
<td>Construction completed in September 2015 and put into operation in December 2015</td>
</tr>
</tbody>
</table>
Ensure a safe and reliable power supply

Strictly implement safety responsibility at all levels. In accordance with “three 100%” requirements on the personnel, time and efforts, we implement safe production responsibility system, so that the party and executives share the same responsibility, and dereliction is checked and punished to ensure responsibility and accountability and all the work and measures are in place. Strictly implement SGCC Reward and Punishment Provisions on Safety Work, and all the safety accidents apply accountability system strictly.

Carry out a comprehensive safety inspection and defect and risk remediation. The company carries out a comprehensive safety inspection system, covering all professionals, sites, and equipment, conducts in-depth investigation and remediation to all hidden defects, so each defect or risk is traceable, verifiable and responsibility accountable. Violations are severely punished to maintain safe production capabilities.

Strictly remove safety vulnerabilities. Insist on being problem-oriented, follow the “zero tolerance” principle, strengthen safety management and control in key aspects, intensify major hazard control, eliminate vulnerabilities and problems that affect safety, and avoid large area blackout and group injury or death as well as major accidents on equipment, traffic and fire.

Enhance emergency response capacity. Seriously adopt the Nine Rules on Safe Production and Emergency Management, promulgate and implement Emergency Regulations, Contingency Plan Management Mechanism and other regulations, and establish a comprehensive system of emergency regulations. Improve emergency plans, establish a rapid response mechanism and strictly enforce the 24-hour duty system even in holidays.

Accomplish power supply and emergency rescue tasks for major events

- Over 23,100 staff, 3,800 vehicles and 475 portable generators (vehicles) were put into the power supply for the 70th anniversary of the victory of the Chinese People’s War of Resistance Against Japanese Aggression and the World Anti-Fascist War.
- SGCC reacted quickly to the disasters, such as Tianjin Port explosion on August 12, the catastrophic landslide in Shangluo Shaanxi, Typhoon Chan-hom, Soudelor and Dujuan. It spared no efforts to rescue and recovered the power supply in the shortest time.

Guarantee power supply in important events, such as the 5th Plenary Sessions of the 18th CPC Central Committee, World Internet Conference, the 50th Anniversary of the Founding of the Tibet Autonomous Region and the 60th Anniversary of the Founding of the Xinjiang Uygur Autonomous Region.

New situation and new challenges of safe production

Influenced by natural disasters, regional differences, rapid development of new energy and other objective factors, the safe production of power grid is facing new situation and new challenges. One is that the global climate change is causing extreme weather and rare natural disasters, which are unpredictable and destructive. Another is the large-scale integration of new energy sources such as wind and solar energy, as well as the rapid development of distributed generation. Due to the variability of new energy, its large-scale integration will bring new challenges for power grid operation.

The company drew lessons from international advanced safety management concept and method, combining modern risk management theory with the actual situation of power grid enterprises to establish risk control of power grid operation mechanisms and comprehensively enhance equipment level, supply ability and risk resistance. Despite the circumstance of frequent blackouts in other countries, SGCC always keeps safe and stable operation.
Constantly improve operation and management performance

Firmly promote “3I5G” system. Conduct thorough research on major system optimizations such as intensive integration of prefecture and county business and intensive re-integration of businesses in large and medium-sized cities. Speed up the modern group control model for power grid enterprises with the core of “3I5G” system, by changing subsidiary companies, which were former wholly-owned county companies, to branch companies and bringing comprehensive plan and budget, business extension and application for installation and emergency repair into all levels’ monitoring or control centers’ supervision.

Further improve the universal regulations. The new mechanism with universal regulations on 28 subjects has been comprehensively built up covering 454 universal regulations and 238 non-universal regulations. Constantly improve the universal systems and make sure all staff learn and obey these regulations.

Vigorously explore new areas and businesses. SGCC has also been building a smart vehicle network platform integrating charging and swap facility monitoring, information service, charge and settlement, car service and other life services. Speed up the transformation and escalation of financial, industrial and international businesses and realize a profit of RMB 40 billion in total, which gives a strong support to profit growth.

Big Data platform enhances the management efficiency of company operations

State Grid Shandong Electric Power Company established a Big Data platform, which increased electricity load classification accuracy by 10%.

State Grid Shanghai Electric Power Company can predict the equipment failure at different voltage level in each region in a future date or a future month, with more than 70% accuracy.

State Grid Jiangsu Electric Power Company successfully predicted occurrence time of load peak in 2015, with accuracy in short-term load increased to 99.4%.

State Grid Zhejiang Electric Power Company increased processing efficiency of customers’ behaviors by 30%.

State Grid Anhui Electric Power Company carried out theft-proof alert analysis on electricity consumption data collection and its analysis efficiency was increased by 50%.

State Grid Fujian Electric Power Company had a short-term overload warning accuracy of more than 80%.

State Grid Sichuan Electric Power Company had its outage planning efficiency increased by 30%.

Call Center of SGCC’s staff service connection rate increased by 30%, customer waiting time reduced by 20%.

Build a corporate Big Data platform

Firmly support and participate in electricity reform. Adhere to the unification of national electricity market and accelerate the foundation and operation of Beijing Power Exchange Center Co., Ltd. Make full use of the unified national electric power market platform to better organize inter-provincial and trans-provincial transactions, gradually expand the trade scale and promote new energy accommodation. Adhere to the strict admittance rules and orderly increase the investment on increment distribution grid to promote its healthy development. Orderly push forward the electricity price reform in Anhui, Hubei and Ningxia.

Profits from financial, industrial and international businesses

RMB 40 billion

Accounting for 46.2% of the company’s total profits
Science innovation drives scientific development

Make S&T planning for the “Thirteenth Five Year Plan”. Focus on convergence between corporate planning and national planning and ensure that national S&T innovation tasks are included in corporate planning. Fully implement global energy interconnection, auxiliary research for Zhangbei renewable energy demonstration project, and half-wavelength transmission technology, ICT action supporting technology. Provide more support to scientific and research teams and laboratories, cultivate the independent innovation capability. Now SGCC has 18 national laboratories (centers).

Promote the industrialization of scientific and technological achievements. Strengthen standardization of new technology assessment and trial operation, improve the management system for the industrialization of scientific and technological achievements, and promote whole process management. Explore the establishment of incentive mechanism for commercialization of research results, strengthen core patent application, and enhance the industrialization of patents and technical standards.

Improve the scientific management level. Strengthen national research project management, establish a normal supervision mechanism of company’s projects to achieve full coverage and control of key project. Use information technology to establish credit systems for S&T research.

Xiamen Island, as the city center and the load center of Xiamen, is surrounded by the sea, lacking of large-scale power source. It has only four 220 kV power supply overseas channel. Xiamen flexible HVDC project is using the world’s first bipolar wiring scheme with the largest capacity and voltage, whose transmission capacity is 1GW. The project started construction in July 2014 and was put into operation in December 2015. After its completion, it could meet the increasing power demand in the island of Xiamen, and improve power supply reliability, transmission capacity and stable operation. It is equivalent to building a 1GW non-smoke, pollution-free power plant in the island, effectively promoting the development of clean energy.

On the National Science and Technology Award Ceremony on January 18, 2013, “UHV AC transmission key technology, equipment and engineering application” won the National Award for S&T Progress (Special Prize).

A glorious 12th Five Year Plan: from a technological catch-up to technological leading

- Total R&D investment reached RMB 34.6 billion
- Won 221 China Power Science and Technology awards
- Won 19 National Science and Technology Awards
- Led the compilations of 22 international standards
- Won 46 Chinese Patent Awards
- Formulated 839 national and industrial standards

Patents owned by SGCC
Be responsible for Each Stakeholder

Fulfill the responsibility on quality service, the commitment for ‘Agriculture, Countryside and Farmers’, win-win partnership and corporate citizenship

Responsible for customers
The responsibility on quality service is rooted in business
- Minimize outage time
- Efficiently operate 95598 customer service platform.
- Ensure safe power access for customers
  ... ...

Responsible for agriculture, countryside and farmers
The responsibility in serving agriculture, countryside and farmers is rooted in each obligation
- Promote urban-rural power supply integration
- Improve rural power supply service
- Consolidate safety management for rural power consumption
- Accelerate grid construction in non-electrified area
  ... ...

Accomplished 423 GVA installation capacity of business extension in 2015

Bring power access to accumulated 7.5 million people
Responsible for partners
The responsibility on win-win partnership is rooted in each joining hands
- Serve power generation companies.
- Support first-class equipment industry
- Encourage responsible procurement.
- ...

Centralized tendering volume reached
RMB 507.7 billion in 2015

Responsible for communities
The responsibility as corporate citizen is rooted in every good deed
- “UHV Scholarship Fund” expanded its influence
- Extensively carry out employee volunteer services
- Persist on aiding Tibet and Xinjiang
- ...

Staff’s volunteer service
2 million person-times in 2015
Be Responsible for Customers

SGCC adheres to the core value of “Your Power, Our Care” and is market-and-customer-oriented. It strictly implements working principles of unity, first-inquiring responsibility system, early information, and settling cases within a limited time. Fully engage in business expansion, ensuring power supply quality, metering charges, business office services, 95598 services, maintenance and repair, complaints, and etc. Enhance service coordination, innovate service models, and consolidate and develop the market with quality services in order to continuously improve service quality and customer satisfaction on power supply.

- Average outage time for urban users decreased to 3.74 hours per household in 2015
- Synthetic voltage qualification rate for urban areas: 99.989%
- Install 64.5 million smart meters in 2015
- Automatic customer information collection for 317 million households
A strong support for Taiwan enterprises

Zhangzhou Taiwan Investment Zone of Fujian Province is a National Economic and Technological Development Zone approved by the State Council, and it is an advanced manufacturing base for in-depth cooperation with Taiwan. Currently, the Zone has 875 industrial enterprises, and more than 300 of them are Taiwan-invested. The annual electricity consumption is expected to increase by 1069GWh. In order to provide good service for the development of the region, State Grid Zhangzhou Power Supply Company appointed a client manager for each Taiwan enterprise to regularly visit, survey, simplify the formalities on connection and installation, provide technical support on energy savings and loss reduction, guide enterprises to carry out equipment defect management and routine maintenance, which effectively helped Taiwan-invested businesses.

Electricity facilitates the construction of “Silk Road” Economic Belt

In 2015, Xi’an City, Shaanxi Province implemented nearly 60 projects such as Eurasian Economic Park in Chanba Ecological District and Xi’an Consulate Area in accordance with the “Silk Road Economic Belt” Strategy. Xi’an Power Supply Company of SGCC implemented “point to point” tracking service, and established regular and two-way communication mechanism with Chanba Ecological District. By far it has upgraded and relocated seventeen 110kV lines, three 35kV lines, built one 110kV substation and expanded another. Now another two 110kV substations are under construction. By significantly strengthening the grid in Chanba Ecological District, reliability of power supply is effectively improved, thus providing a strong support for regional economic development.

Minimize outage time

Power reliability kept improving. Average outage time for core areas in 30 key cities reduced to within 5 minutes, and the average outage time for Class A areas in 30 non-key cities is less than 50 minutes.

SGCC amended technical standards such as Technical Guidelines for Distribution Grid, Operation and Control Norms on integrating Distributed Generation into Distribution Grid, Operation Standards for live-line work on 10kV Distribution Grid.

SGCC carried out mesh-type repair in the distribution grid and improved the integrated working mode that is featuring information sharing and collaboration on order acceptance, scientific dispatching and on-site repair.

SGCC completed the inspection and acceptance work related to 18 distribution grid automation projects in Xuzhou, Jiangsu. Distribution automation coverage further expanded.

Live-line inspections of the distribution grid reached 571,800 times, thus reducing outage time by 33.58 million hours per household.

Repair and maintain the street lamps

SGCC amended technical standards such as Technical Guidelines for Distribution Grid, Operation and Control Norms on integrating Distributed Generation into Distribution Grid, Operation Standards for live-line work on 10kV Distribution Grid.
Improve the drills on electricity demand response

On August 5, Jiangsu’s electricity consumption broke the record of 84.8GW, of which air conditioning accounted for 30.66%. On the same day, State Grid Jiangsu Electric Power Company carried out a drill targeting non-industrial air conditioning across the whole province, and gave priority to power supply control on air-conditioning of non-industrial users such as shopping malls, hotels and office buildings when continuous high temperature or power failures cause power supply shortage in the entire or local network. This drill involved a total of 1,072 non-industrial users and regulated 141.8MW. Jiangsu Province Economic and Information Commission and State Grid Jiangsu Electric Power Company specially developed a demand response platform for this drill, and also fully communicated with users for invitation in advance through website, APP, SMS and telephone call. By guiding users to reduce peak load actively, the company guaranteed the production of enterprises, and also eased the pressure on the power grid, marking the transition of load management from government administration to market orientation was a success.

Large power users directly traded 186.7TWh of electricity in 20 provinces.

Do a good job in power demand-side management

Carrier out preparation for peak load in summer and winter, prediction on power demand-supply balance, and orderly power use execution in a subtilized and normalized manner. The capability to shave the load reached 1.71GW.
The Action

Build an “experiential” power supply business hall

On October 22, the first “experiential” power supply business hall in Qinghai Province was put into operation. The business hall was divided into business process area, new payment experience area, customer self-service area and other 4 functional areas. It set up 7 business processing windows, 5 self-service payment terminals, and 19 equipment like large-screen LCD screen and multi-functional writing desks. It also introduced smart identification, intelligent queuing machine, service evaluation, service pre-acceptance and other modules to provide customers with efficient and comfortable service, payment, consultancy and 24-hour self-service. In the new experience zone in the business hall, there were six smart terminals, providing customers with new payment methods and power supply services through Wechat, mobile APP, and 95598 interactive website.

Accessibility rate of 95598 call center service reached
99.14 %

Satisfaction rate on manned service
99.84 %

On-time return visit rate on fault repair, complaint, high-voltage business expansion and installation
100 %

One-time reply rate on consulting
99.94 %

Rate of timely order dispatch list
99.99 %

Conscientiously implement working principles of unity, first-inquiring responsibility system, and settling cases within a limited time through verifying typical complaints, paying visits to urban and rural users and paying unannounced visits to business offices, to strengthen service management and control in aspects like power supply quality, electricity metering, business expansion and installation, and service code of conduct implementation.

Carry out irregular inspections on order processing quality of 95598 complaints and establish a collaborative problem-solving mechanism on power supply service to ensure timely response to the demands and appeals of customers.

Speed up information threading and business integration on marketing, distribution and dispatching. Promote 5 collaborating business applications, that is, the repair positioning of 95598 customers, fault measure and direction, outage plan and arrangement, auxiliary draft on business expansion and application, and line loss management to minimize outage time.

Accelerate business expansion process, and issue Opinions on Promoting Services related to Business Expansion and Installation. Projects of 10kV capacity or less could be directly opened. The design review and intermediate inspection procedures for ordinary customers were cancelled. Business expansion procedures for high-voltage industry have been cut by more than 20%.

Conscientiously implement working principles of unity, first-inquiring responsibility system, and vertical connection and horizontal collaboration.

Amend Interim Measures on 95598 Operation, improve 95598 service quality management, operation management, operation support to raise the overall service quality.

Draft The Opinion on Strengthening 95598 Operational Management to Raise the Overall Service Quality, give full play to the centralized operation advantages across the whole 95598 network, and consolidate this closed loop operation system with vertical connection and horizontal collaboration.

Marketing and service employees are discussing and competing with their work
Construct a community to customers’ satisfaction

Shizuishan Power Supply Company of SGCC classified customers and services and supported them with a regional service manager team to provide point-to-point services such as pre-acceptance through channels like telephone, Wechat and community. Volunteers of CPC were concerned about the elderly, empty nesters, left-behind children, orphans, the disabled and other vulnerable groups and provided electricity purchase service at their doors, security inspections and “lighting action” to provide differentiated user-friendly services for the area. Since the implementation of this project, the number of complaints has decreased by 50% on a YOY basis.

Continue to build service layout where customers can pay their bills within 10 minutes

Chongming Island of Shanghai is characterized by narrow area, disperse residents and traffic inconvenience. In order to facilitate islanders to pay electricity bills, Chongming Power Supply Company worked to build a service network so that customers can pay their electricity bills in 10 minutes wherever they were on the basis of business networks and collection by postal offices and banks. Baxiao Village of Chenjia Town was more than 20km away from the nearest township payment spot, and paying electricity bills used to be a headache for villagers as it took an hour for a round trip. Since the company set up collection service points, electricity bill can be paid anytime, and many elderly people can pay their bills at the village entertainment and fitness center conveniently.

Ensure safe power use for customers

Speed up the construction of billing spots and Another 205,800 electricity bill collection spots were added in the year.

Emphasize online payment and third-party payment to establish an Internet trade platform integrating public utility payment, smart interactive service and financing innovative services.

Emphasize online payment and third-party payment to establish an Internet trade platform integrating public utility payment, smart interactive service and financing innovative services.

Standardize metering management

Carry out analysis and research on marketing related Big Data application

Deepening the application of full event collection, online monitoring and metering by devices. Continuously strengthen technical supervision on metering and measurement to ensure justice and accuracy of the measurement.

Speed up the construction of power meter and user information collection system

Deploy 64.5 million smart meters throughout the year and collect information from 317 million households.

Accelerate the construction of data collection integrating water, gas, heat and electricity.

Achieve data acquisition from 93,273 water meters, 9,313 gas maters, 11,229 heat meters, and 108,000 electricity users.
Full coverage of WeChat service
State Grid Jiujiang Power Supply Company established “N + 1” Wechat service platform, providing open, interactive, and cooperative micro services. “Power of Love” WeChat group involves hundreds of electricians and is faced to 72 special transformer customers in Jiujiang. There is a 23-member customer manager team composed of experts from internal marketing, operation inspection, scheduling, power supply service center and branding department to timely release blackout information and respond to customer appeals. Since “Power of Love” WeChat group’s launch 5 months ago, it has provided 400 times of services such as information notification, technical support and consulting services to its transformer clients, which has helped to enhance the customer loyalty and perception.

Improve service quality to interconnect with economic and social development
In 2015, State Grid Heilongjiang Electrical Power Company has optimized service quality to ensure power supply to Harbin New South Industrial City, China South City and CR Beer. The Company has visited its key and above-scale clients for more than 1,474 times, communicated with the government authorities and released 27 optimization measures. The company coordinated with key infrastructure projects, livelihood projects, FDI projects and development zone construction projects of Heilongjiang Province, and provided timely power use consultation, installation and capacity expansion services, to help customers optimize the power consumption pattern and accelerate the speed of electricity connection. It actively promoted the output of electricity generated in the province, sending out 3 TWh of electricity, equivalent to 1.2 million tons of standard coal, all coming from the eastern power plants of Heilongjiang Longmay Mining Holding Group, which was lifted out of difficulties along with its peers in the coal industry.

Publicize knowledge on safe power use door-to-door
Be Responsible For Agriculture, Countryside And Farmers

Over the years, the CPC and State Council have always prioritized issues related to agriculture, countryside and farmers as the lifeline of the people’s livelihood. ‘No.1 Document’ of the central government has focused on these 3 issues for 12 consecutive years. No. 1 Document in 2015 explicitly requested to continue upgrading rural power grids. SGCC has always endeavored to serve the party and state, vigorously implemented the rural power development strategy of a ‘new countryside, new electric power and new service’, and kept increasing investment in rural power grid construction and renovation so as to effectively implement general power supply responsibility to make new contributions to ‘agriculture, countryside and farmers’.

Customers’ concern

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<thead>
<tr>
<th>Customer concern</th>
<th>Effect on comprehensive value creation</th>
<th>High</th>
<th>Low</th>
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<tbody>
<tr>
<td>Improve rural power use services</td>
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<td>Speed up the power construction in areas with no access to electricity</td>
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<td>Rural grid construction in remote areas</td>
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<td>Carry out fixed point poverty alleviation</td>
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<td>Promote the integration of urban and rural power supply</td>
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<td>Speed up the upgrade and reform of rural grids</td>
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<td>Reinforce safety management on rural power</td>
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<td>Improve management relation with rural power enterprises</td>
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<td>Improve satisfaction for rural power supply</td>
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</table>

Topics on serving ‘agriculture, countryside and farmers’

- Invest in rural power grids in 2015 81.32 billion RMB
- General voltage qualification rate for rural users 99.065%
- Average annual interruption time for rural power users in 2015 13.14 hours per household
- Bring power to 210,000 people without access to electricity in 2015
Promote the integration of urban and rural power supply

In June, the Executive Meeting of the State Council decided to increase rural grid investment, so as to promote steady growth, adjust industry mix and benefit people’s livelihood. SGCC will resolutely implement related deployment. Earmark funds from central government budget and special construction fund for the upgrading of rural grid totaled RMB 87.911 billion, and for the whole year, the annual special budget for rural grid amounted to RMB 122.286 billion, which was a record high.

A good builder for beautiful countryside

Since 2015, in the beautiful Tianhuangping Town, Anji County, Zhejiang Province, State Grid Anji Power Supply Company has vigorously upgraded its power grid. It conducted technical evaluation on districts to be upgraded, signing framework agreement on transfer and integrity protocol with 100 administrative villages. It extended high-voltage lines moderately and shortened the radius of under-voltage power lines, enhancing the level of automation in distribution districts. In light of community service centers in the villages and co-built stations to solve agricultural irrigation routes repair and other issues. Moreover, the company used two metering methods, namely “one household, one meter” and “one area, one meter” for oxygen and heat supply to the farms and vegetable greenhouses respectively. The company implemented 320 projects, constructed 131 kilometers of lines, and benefited more than 18,000 households in 28 administrative villages.

Actively support the shrimp farmers

State Grid Shanghai Fengxian Power Supply Company regularly communicated with farmers, local agricultural commission and other stakeholders and included more than 2,300 household farmers into the emergency repair command system through optimizing maintenance programs and emergency repair processes. It also vigorously promoted the transformation of wiring insulation, scientifically arranged repair sites, promoted self-production and self-help knowledge door by door, established a power-generator leasing platform, and organized site visits and other activities to shrimp farming areas. The power supply service management for shrimp farming industry has been enhanced. The outage time was shortened from 81 minutes to 65 minutes. The insulating renovation work of supply line totaled 86.9 kilometers, which is a powerful support to the local shrimp farmers.
Solve the under voltage problem for 6.635 million rural households in 2015.

Newly build or reform low-voltage lines of 207,300 km.

75,000 households now have access to reliable electricity.

Since 2015, State Grid Xuchang Power Supply Company has implemented low-voltage management in terms of project’s plan preparation, design, construction, materials, and acceptance, formulated rigorous work plans and construction measures and organized 48 construction teams with 720 staff to strictly control the material production and transportation process. An accountability system was established and improved to proceed through the project according to schedule and construction management procedures in an orderly way. The under-voltage problem has been solved for 75,000 households. A Villager Jin Min of West Jizhuang village, Chencao Town said, ‘In the past, the power supply was not reliable even with money. Now the under voltage problem is solved and our days will be better’.
Promote the campaign for setting up payment point for each village

State Grid Chuzhou Power Supply Company used a variety of measures to promote the campaign to set up payment point for each village in line with the differences of competence of rural communities, power supply environment, and service requirements. It conducted survey on rural community to understand their payment method and service demands. The company sped up the deployment of POS machines, including small shops, electronics maintenance points and telecommunication equipment rooms in the communities as the bill collection points. It also carried out lots of promotion activities to reward customers, such as bonus points and gifts for advance payments to expand the service domains.

Promote the campaign for setting up payment point for each village

Ensure secure power supply in rural areas

Track natural disasters closely, like snow, storm and flood. In the face of typhoon in Zhejiang, Jiangsu and Fujian province and blizzards in Hubei and Hunan as well as earthquakes in Sichuan and Gansu, SGCC rescue team are mobilized and dispatched in time, and various measures are taken to guarantee power supply in disasters.

Ensure secure power supply in rural areas

Optimized payment points allocation

Cooperate to build payment spots so that there are places to pay electric bills even in remote villages. Now there are 591,500 payment points, with 94,300 newly added. It has become a reality for each village to own a payment point.

Optimized payment points allocation

Overall standardized management

Adhere to the principle of “Your Power, Our Care”, implement the “Three Tens” regulations (“Ten Commitments” of the power supply, “Ten Prohibitions” to modify staff behavior, and “Ten Measures” to strengthen dispatching transaction services), and solve the problem of “the Last Kilometer”.

Overall standardized management

Improve rural power supply service

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Improve rural power supply service

— in home-areas of many migrant workers such as Sichuan, Henan, Hubei, Anhui, and Hunan, construction and renovation projects to improve the power supply capacity and quality are implemented ahead of schedule, which have ensured power supply in the rural areas during the Spring Festival.
Light up the booming life of farmers

Kailu County of Inner Mongolia has always been reputed as “the Capital of dried paprika”. With rapid development of agricultural industrialization, demand for electricity is growing. State Grid Kailu County Power Supply Company has set up small teams in 15 power supply stations, distributed service cards, publicized knowledge on electricity service using village loudspeakers and provided 24-hour technical support. In the early days of seedling, they went to the fields to do repair and maintenance and so disqualified lines and electric equipment defects could be fixed in time, thus providing convenient electricity supply to agricultural production.

Reinforce safety management on rural power use

- **Reinforce safety management on rural grid projects**
  - It features full coverage, zero tolerance, strict law enforcement, and pragmatic use.
  - Carry out spring, autumn and special safety inspections into the sites of rural grid projects and the power construction sites in non-electrified areas to find out hidden dangers in construction sites and guard against the risk.
  - Use the Handbook on Risk Identification and Control in Construction of Rural Distribution Network, thoroughly investigate safety problems to settle loopholes in management.

- **Reinforce safety management on rural power consumption**
  - Conduct special campaign on electricity theft and aging electricity facilities in rural areas to eliminate security risks.
  - Carry out safety management innovation in rural areas, launch demonstration projects for innovative electricity safety management in rural areas, and release 34 typical know-how in rural electricity consumption safety.
  - As in the Spring Festival, rural power consumption load surges, knowledge on power-saving and scientific utilization of electricity is promoted to create a good environment for power use.

- **Solldify basic management for rural power safety**
  - Actively promote safety evaluation on county-level power supply enterprises, and facilitate county companies and township stations to enhance their security indicators.
  - Build safety training demonstration sites in prefecture (municipality) and county-level companies, and improve employees’ safety skills and knowledge.

- **Research on the current rural grid development**
  - Carry out research on the rural grid development and relevant policies. Revise technical principles for rural grid upgrading.
  - Combining the actual condition of rural power grid, report rural grid development needs to National Energy Administration and Central Rural Work Leading Group and other relevant departments, and actively strive for more policy supports on rural grid development during the “Thirteen Five-Year Plan” period.
  - Co-organized “Rural Grid Development Forum” and strengthen studies on major issues related to rural power.

New type of power use safety service and protection system in rural areas

Power supply service is now available in Liangshan, Sichuan province

Reinforce safety management on rural power use
Accelerate the power construction in areas without electricity access

Many farmers bought pumps, flour-milling machines, blowers and mixers to run their own family farms and agricultural product processing plants. Clean electricity replaces conventional energy like firewood, coal, and oil to improve energy efficiency and reduce pollution, so as to protect natural resources and the environment of farming areas.

In newly electrified areas, the farmers and herdsmen’s annual income per person was raised from 3,924 RMB to 5,167 RMB.

On average, every a hundred families have 74 TV, 26 refrigerators, 26 washing machines and 31 electric cookers.

Accelerate the power construction in areas without access to electricity. Overcome difficulties like harsh natural environment and language barriers and speed up project construction. A total of 38.1 billion RMB was invested to solve the power problem for 7.5 million population of 1.92 million households.

In recent years, the rapid rural urbanization and industrialization development of counties in Xinjiang led to the power demand increase. Since 2011, State Grid Xinjiang Electrical Power Company has invested a total of 17.082 billion RMB in rural grid construction and renovation projects. Projects “electricity for people’s benefits” and “electricity facilitating military service” were implemented in the sequence of “easy to hard, population condensed area to scattered area, plain to mountain”. SGCC completed a total of 1,889 projects to bring electricity supply to 984,100 people in 253,600 households.

During the “Twelfth Five Year Plan”, State Grid Xinjiang Electrical Power Company has brought millions of people who used to have no access to electricity living in Tianshan Mountains, Gobi desert and remote mountains into the era of electrification.
Be Responsible for Partners

Adhere to the spirit of win-win cooperation and treat partners with responsibility. Serve power generation companies with different measures simultaneously, and give priority to accommodate new energy. Support equipment manufacturers for independent innovation. Strictly manage biddings and responsible procurement to ensure partners’ interests. Strengthen the security training for external builders to ensure their personal safety.

<table>
<thead>
<tr>
<th>Customers’ concern</th>
<th>Topic for on win-win partnership</th>
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<tbody>
<tr>
<td>High</td>
<td>Promote the construction of the electric power market</td>
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<tr>
<td>Protect intellectual property rights</td>
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<tr>
<td>Advance in the upgrade of key domestically made electrical equipment</td>
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<tr>
<td>Low</td>
<td>Promote the construction of power trade platform</td>
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<td>Promote responsible procurement</td>
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<tr>
<td>Cooperate for key technical research</td>
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<td>Effect on integrated value creation</td>
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</table>

Accommodate 203.8 TWh of wind power and solar power in 2015

Issue RMB 93 billion bonds domestic and overseas in 2015

Centralized procurement of goods and materials 100%

Budget for college projects in 2015 RMB 170 million
Serve the development of power generation companies

Tap the peak load regulating potential of conventional generators. Strengthen the dispatching management of generators and appropriately participate in intensive peak shaving arrangement while satisfying heating demands. Strictly stick to the Pumped Storage Power Station Operation Guideline (Trial) released by NEA to make full use of pump storage power stations to improve wind power accommodation capacity for valley load.

Use the trans-provincial and inter-regional channels to expand new energy accommodation. Give full play to UHV grid in inter-regional dispatching and allocate the overall peak regulation resources to accommodate the wind power from Northeast China, Northwest China and Western Inner Mongolia in a larger scope. In 2015, the trans-provincial and inter-regional outgoing wind power and solar power delivered by SGCC reached 29.39TWh, with a year-on-year increase of 10.4TWh.

Exert the role of market mechanism to promote new energy accommodation. Several provinces and regions began to experience the market-trading mode of wind power. In 2015, SGCC initiated a 200GWh generation right transaction for the first time to replace thermal power of Hubei with wind power of Gansu. Another transaction between the extra wind power during valley load period of northeast and central electricity heating project in Beijing allows 1778GWh newly increased wind power generation annually in the northeast.

Serve offshore wind power

CGN Rudong 150MW offshore wind farm demonstration project is China’s first offshore wind power project meeting the “double 10” requirements, that is, 10 meters deep and 10 kilometers off the shore. The project, with a total installed capacity of 150MW, will generate about 400GWh of electricity per year, providing electricity for 170,000 households, saving 123,900 tons of standard coal and reducing 308,700 tons of carbon dioxide emission. SGCC Rudong County Power Supply Company considered the grid layout as a whole and constructed a 110kV offshore booster station, a 220kV onshore booster station and an onshore control center, to ensure efficient utilization of wind energy.

Provide qualified service for suppliers

SGCC works with over 50,000 suppliers all over the country, and they are participating in the bidding on the e-commerce platform for registration and review. After the commercial registration system reform of integrating the business license, the organization code certificate, and the certificate of taxation registration into one document with one unified code, supplier service center immediately collected the demands of suppliers, tracked the reform progress in different regions, upgraded the system and developed new functions cooperated with relevant departments. New suppliers could use the new unified social credit code to register and former certificate information has been replaced to ensure the bidding to be unhindered and convenient.
Establish first-class equipment industry

UHV leads the export of domestic equipment. UHV power grid has large investment demand and extended industrial chain. It has huge medium and long term benefits and a strong driving force. In 2015, SGCC, as a general contractor successfully won the bid of Brazil’s Belo Monte ±800 Hydropower UHV Transmission Project Phase II. The project was expected to promote the exportation of nearly 5 billion RMB domestic electric power equipment and encourage excellent domestic electrical equipment enterprises to set up factories in Brazil.

Lead equipment manufacturing innovation through general equipment development. Deepened the research and application of general equipment in power transmission and transformation projects, published and updated SGCC Standardization Construction Application Directory: General Design and Equipment of Power Transmission and Transformation (2015 edition). Broaden the applications in respect to every sections of engineering design, installation and acceptance, as well as their unity and universality. SGCC encourages the manufacturers to pursue technology optimization and innovation, and push forward a constant improvement of the equipment manufacturing capability.

Cooperate with external scientific research institutes to promote innovation. The company jointly worked with more than ten well-known scientific research institutes, such as Tsinghua University, Shanghai Jiao Tong University and Chinese Academy of Sciences, to undertake 12 state-level science and technology projects including key technologies of AC/DC hybrid distribution network, physical system of distribution network information and offshore wind power generator test. In 2015, 55 scientific research institutes participated in the company’s S&T projects, and 170 million RMB was invested in colleges’ scientific projects by SGCC.

Develop together with design and construction companies

Ensure the legitimate rights of design and construction companies
Prioritize qualified design, construction and supervision enterprises to participate in power grid construction. Adhere to reasonable construction period and cost to protect the interests of construction enterprises for their sustainable development. SGCC published Guidance to Standardize and Strengthen Subcontract Management to deepen qualified subcontractor management. The company carried out a special inspection and dismissed 12 problematic subcontract teams, putting an end to unlicensed and illegal subcontracting phenomenon.

Strengthen safety management for external construction personnel
Carry out targeted security education and training to improve the safety and professional skills of external construction personnel. Qualified training rate reached 100%. The training results can be effectively used in the fieldwork. Strengthen supervision and inspection on site, and implement strict assessment mechanism against external construction personnel's irregular and illegal actions to prevent accidents. Pay high attention to check the certificates of external construction teams and ensure all workers hold certificates for their jobs.

Work together with financial institutions for win-win cooperation

Strengthen cooperation with domestic financial institutions. In 2015, 86.1 billion RMB bonds were issued. SGCC cooperated with China Development Bank to introduce 12.6 billion RMB national special construction funds, saving 400 million RMB financing cost. Cooperate with Ping An Insurance Group and introduce 1.5 billion RMB bonds of insurance funds.

Expand overseas financing channels. The company continued to be rated by the three major international credit agencies S&P, Moody’s and Fitch as the National Sovereign Credit Rating. By conducting overseas project financing, the company successfully issued 1 billion Euro bonds for the first time outside China. It cooperated with ICBC, BOC and HSBC to study and formulate cross-border two-direction fund channels, and seeking for approval.
Promote responsible procurement

Expand centralized procurement. Include SGCC subsidiaries into the centralized procurement list to be more concentrated. In 2015, the centralized procurement coverage rate of material supplies reached 100%, and the coverage rate of service reached 95%. All were open procurement and willing to accept public supervision.

Strictly execute process. Improve general regulations and strengthen the standardized bidding and procurement process from document review, assessment and selection. During the process, adopt the "working ticket" mechanism on key businesses, standardize the evaluation discretion and promote the remote bid evaluation to further reduce integrity risk. Release the Decision-making Regulation of Leading Group and Specifications for Bidding Office Activity to make the collective decision mechanism more transparent.

Enhance the fulfillment performance. Contract implementation abiding by law is the basis of safe material supply. Thus the company revised the Implementation Details of Procurement Contract to further strengthen standard management, straighten out the process standards of contract signing, fulfillment, alteration, and settlement. Strengthen contracts alteration control, perfect the procedure to alter material contracts, and establish a tracing mechanism for abnormal contract alteration responsibility to ensure the interests of partners.

Optimize the e-bidding platform. By implementing one-track digital bidding procurement, suppliers could provide bidding documents more easily. The whole purchasing process control can be strengthened by online automatic bidding authorization. In October 2015, the e-commerce platform became one of the first batch digital tendering and bidding transaction platforms capable of exchange data with national public service platforms. It successfully passed examination to obtain operation license.
Be Responsible for Communities

Adhere to the requirements of being an excellent corporate citizen to jointly develop with the community and people in its business area, to not only create material well-beings for the society, but also create spiritual wealth and knowledge. Actively explore the proper way to interact with communities and the public, encourage their participation and form a systematic community participation mechanism.

Carry out 1.85 million times emergency repairs and troubleshooting

Establish Over 200 SGCC Hope primary schools

UHV Scholarship Fund raised RMB 30 million

Standardize the construction of 3,731 Party Member Service Teams
Insist on poverty alleviation for 21 years

Organize point-to-point poverty-relief work in Hubei and Qinghai provinces. Poverty alleviation in Zigui County, Changyang County, Badong County, and Shennongjia Forest of Hubei province has lasted for 21 years and the poverty alleviation in Maduo County, Golog Prefecture, Qinghai Province started in 2011. From 1995 to 2015, SGCC accumulatively invested RMB 2,866 million to power grid construction in the above-mentioned places in Hubei. Its RMB 108 million donation attracted RMB 360 million supplementary funds from local government for operating 326 poverty alleviation projects. From 2011 to 2015, the company accumulatively invested RMB 52.4 million in Maduo County with 21 projects. SASAC spoke highly of SGCC’s special power brand for poverty alleviation as a replicable poverty-relief approach with great demonstration effect, which improved poor areas’ development capacity. The company has won the title of “Advanced Organization for Point-to-point Poverty Alleviation Among Central State Organs” twice.

"Light-up Station" serves stay-at-home children

SGCC Anhui Electric Power Company actively responded to the appeal of the Communist Youth League about caring for migrant workers’ children and stay-at-home children. They started a “Bright Station” volunteer project caring for stay-at-home children, paying attention to their psychological health with growth facilitation, mental guidance, dreams-to-become-true, and social practice. They totally built 100 sites, covering all cities and counties within the province. On January 20, 2015, in Zhangguang Country, Nanqiao District, Chuzhou City, Anhui province, the company staff provides new hats and gloves for stay-at-home children who were laughing happily.

Poverty-relief funds
RMB 10.8 million

Free donation for poverty relief
RMB 12 million

Attract RMB 20.43 million local investment

Implement 41 poverty-relief projects

Examine power supply facilities
<table>
<thead>
<tr>
<th>Areas with poverty-relief efforts</th>
<th>Main actions</th>
<th>Results</th>
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<tr>
<td>Jinzhai, Anhui province</td>
<td>Promote the rural power grid upgrading in Jinzhai County. Actively implement PV generation projects to alleviate poverty in the rural areas, help improve local traffic situation and carry out pair support.</td>
<td>Formulate a multi-level assistance system, which was highly acknowledged by Anhui Provincial Government.</td>
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<td>Xiangxi, Hunan province</td>
<td>Raise more than 20 million RMB to strengthen the construction of rural power infrastructure. Organize labor export for 1,000 man-times, cultivate 70 specialized households of crop and animal productions, and plant 0.68 square kilometers’ rice and 1.5 square kilometers’ gold tea. Implement the tea-oil tree development project of 0.03 square kilometers.</td>
<td>Reduce rural residents’ burden for over 50 million RMB every year. Help 244,480 people out of poverty. The rural poverty rate was down to 25.29%.</td>
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<td>Mabian, Sichuan province</td>
<td>Direct donation is applied along with other methods to improve the local’s ability to generate income. Build Hope primary schools, stay-at-home children centers, and vocational education centers.</td>
<td>The poverty-relief efforts are effective and people in these poor regions become more capable. The development gap stops becoming larger and people’s living standards are improved.</td>
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<tr>
<td>Jinyun, Zhejiang</td>
<td>In Jinchuan County, Xinjian Town, implement pilot projects of distributed PV generation in 60 families with low-income. These projects earned over 2,000 RMB per household every year.</td>
<td>Most of the farmers got out of poverty.</td>
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<td>Lianyungang, Jiangsu province</td>
<td>Invest more than 1.5 million RMB to integrate auxiliary facilities and upgrade external power supply. SGCC has constructed China’s first contiguous roof distributed PV generation project that every household accommodates its own generated electricity and the surplus power integrated to the grid.</td>
<td>Provide stable income for poor rural families and form a new poverty alleviation model.</td>
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Point-to-point assistance promotes local socio-economic development

Continue to increase capital investment
Over the years, SGCC has invested more than 3 billion RMB. In 2015, SGCC invested 4.907 billion RMB in Tibet autonomous region and planned to construct a unified power grid in Tibet in the next five years with a total investment of about 53.3 billion RMB.

Advance power grid construction
In December 2011, Qinghai-Tibet Interconnection Project was completed with a total investment of 16.2 billion RMB. In November 2014, Sichuan-Tibet Interconnection Project was completed with a total investment of 6.5 billion RMB. Through the Phase I, II, III construction and upgrade of rural power grid, “Power for All” project and power transformation projects in areas without electricity, by the end of 2014, 51 counties, cities and districts in Tibet had been covered by power grid, supplying power to 2.12 million people. In 2015, the construction of 220kV and 110kV transmission and transformation projects in central Tibet was completed. SGCC accelerated the upgrade of rural power grid, put construction projects in areas without electricity into operation and expanded the large grid coverage to 58 counties.

Point-to-point assistance to Coqen County, Ngari Prefecture
In 2015, 29 million RMB was donated to strengthen 10kV power grid and expand PV power plants, and build new houses for farmers and herdsmen, kindergartens and auxiliary projects for primary and secondary schools, cinemas and e-commerce development projects. It renovated the TV station and village committee, and assisted the County Labor Union with funds for its construction and safety supervision.

Increase personnel aid
Select the third batch of 8 young managers of the deputy division director level to take a two-year in Tibet Electric Power Company.
Continuously increase capital investment
SGCC invested 18.368 billion RMB in Xinjiang Uygur Autonomous Region in 2015.

Serve “One Belt And One Road” (OBAOR) strategy
The energy interconnection project of China Pakistan Economic Corridor has been initiated. SGCC will strive to facilitate power interconnection with five countries in central Asia and share large energy bases in Kazakhstan as well as the abundant wind and solar resources in Central Asia. In the future, Mongolia, Russia and other countries will be interconnected.

Progressively promote power grid construction
In 2007, Xinjiang realized 220kV power grid interconnection. In 2010, the first 750kV power channel connecting Xinjiang with the main grid in northwest China was built and put into operation. In 2013, the second channel connecting Xinjiang with the northwest main grid was built and put into operation. In 2014, the first UHV DC Project transmitting electricity out of Xinjiang, Haminang-Zhengzhou ±800kV UHV project was constructed and put into operation. In 2015, SGCC completed the expansion construction of Hami converter station and Bachu - Kashi 750kV transmission and transformation project, enlarging the coverage area of 220kV power grid and effectively connecting 220kV grid with 750kV grid.

Advance rural power grid reform
SGCC Xinjiang Electric Power Company invested 7.063 billion RMB in “Power for All” project during the 11th Five-Year period, realizing power supply to 478,7 thousand people without access to electricity. In 2014, power construction in areas without electricity in Xinjiang was fully completed. Xinjiang Electric Power Company accumulatively invested 4.492 billion RMB, and solved the power supply problem of 9,841 thousand people, 7 frontier ports and many frontier defense armies. In 2015, the company upgraded rural power grids in 81 counties of 13 prefectures throughout Xinjiang, upgraded the 110kV and 35kV transmission and transformation facilities in rural areas, and improved people’s living standards and maintained social stability and national unity.

Aiding Xinjiang
2015 is the 60th anniversary of the establishment of Xinjiang Uygur Autonomous Region.
Help students, the elderly and the disabled

Implement the socialist core values and promote the “Young Volunteers Action” around the themes of safe power use, high-quality service, caring for children of migrant workers, respecting the elderly and assisting the disabled. Consolidate the constructions of SGCC's over 500 caring activities including “Home for Stay-at-home Students”, “House of Spring Seeding”, “Bar of Coming Hope”, “Bright Station”, “Love Supermarket”, “Sunshine Houses for Children on the Plateau”, “Little Orange Lamp” and “Firefly Education Aid Plan”.

Extensively conduct employee volunteer service

Create a brand for volunteering service. In 2015, about 2 million people participated in 180,000 volunteer activities, cumulatively helping communities of more than 700 thousand people. The company paid high attention to volunteer projects and position construction, aiming to build up a batch of influential volunteer brands.
Adhere to the law and operate business with integrity

Comprehensively strengthen the ethical party and clean government building. Constantly carry forward strict regulations, careful working attitude and rigid management, and establish the penalty and prevention system with efficient prevention, supervision and punishment. Keep promoting a clean government without corruption. Coordinate to solve major issues about the clean government immediately and keep an eye on important cases all the time. Formulate and publish the Opinions on Subject Responsibility and Supervision Responsibility of Promoting a Clean Government. All staff in different levels signed the Letters of Responsibility from the top down, and the content was contained in every responsible person’s annual performance appraisal. Form the “responsibility list” and “fulfilment card” to strengthen all party committees’ subject responsibilities and implement leading cadres’ two responsibilities in one position.

Strengthen the company governance by law. Forge a company ruled by law and all employees abide by law with full compliance and coverage in all processes. At the same time, govern, decide, operate, supervise and protect rights all according to the law. Compile the Law-based Enterprise Behavior Guidance, which proposes behavior requirements and route guidance to the leaders and workers from the perspectives of the law and the system.

Strengthen contract management. Improve the whole-process contract management system and complete 223 unified contract texts to enhance transaction efficiency and benefit. Combine the contract system with business system, to enhance risk prevention and protection ability and ensure compliance management in accordance with law to serve the economic and social development.

Optimize the internal control system. Improve the system, deepen the application of standards, implement a sound risk assessment mechanism, establish the professional risk process monitoring and information construction as well as foster the consciousness of corporate control culture. To better perfect, apply and improve internal control, give prominence to the value chain management, improve the internal control system, deepen the internal standard application, enhance the evaluation mechanism and promote the construction of information system. Reasonably ensure the legal compliance management with asset security and authentic financial reports as well as related information to improve operational efficiency and effectiveness.

Luneng football team won the champion of 2015 Super Cup

On February 14, 2015, Shandong Luneng Taishan football team defeated Guangzhou Evergrande team by 5:3 in penalty shootout in Hangzhou Huanglong Sports Center and won the Super Cup champion. It was Luneng’s first champion in this competition. For many years, Luneng team, adhering to the loyal patriotic spirit, indomitable fighting spirit of scaling new heights and solidarity collective spirit, created incalculable social values and spiritual wealth, which was a vivid interpretation of SGCC’s “In search of excellence, In pursuit of outperformance”, significantly enhancing the brand value of the company.
Become a Model of Green Development
Responsibility on Environmental Protection and Low Carbon Emission

Global energy interconnection draws a new pattern for energy development
- Construct global energy interconnection
- Promote “Two Replacements”
- Support and serve new energy development

1,537 EV charging & battery swapping stations have been built

Promote clean replacement
- Transmit clean energy out of the region or province
- Promote the construction and optimization of auxiliary grid projects
- Boost the development of large-scale clean energy bases

Accommodate 1011.7 TWh of clean energy in 2015
Promote electricity replacement

- Expand the field of electricity replacement
- Innovate the methods for electricity replacement
- Stimulate EV industry

Deploy 17,200 electricity replacement projects in 2015

Promote social energy conservation

- Construct social energy conservation service system
- Promote generation rights trading and energy-saving dispatching
- Promoting energy conservation in office buildings

Save 12.2 TWh of electricity in 2015
Integrate 116.64 GW of wind power in 2015
Accommodate 166.07 TWh of wind power in 2015
Integrate 44.465 GW of PV power in 2015
Accommodate 37.73 TWh of PV power in 2015
global energy interconnection constructs a new pattern for energy development

Break resource constraints to supply clean energy for all. With the help of the global energy interconnection, global clean electricity generation can reach 66,000TWh by 2050, an increase of nearly 10 times of that in 2010. The cost for solar power and wind power generation will be significantly lower than that of fossil energy. UHV and smart grid technology will enable global energy interconnection to cover every corner of the world so that no place will be left without electricity. Where there is man, there is adequate, uninterrupted power service.

Break time and space constraints to achieve efficient use of clean energy. With the help of global energy interconnection, massive global clean energy generation can be accommodated by filling the energy gap between different places out of time, seasonal and geographical variances. By 2050, the wind power exported from the North Pole and the solar generation exported from the Equator will reach 3,000TWh and 9,000TWh respectively. The electricity generated from the North Pole and Equator will account for 16% of the global electricity demand.

Break environmental constraints to ensure the clean energy domination in the energy mix. Relying on global energy interconnection, global clean energy will account for 80% of the total primary energy by 2050. It will substitute fossil energy equivalent to 24 billion tons of standard coal every year, cutting CO₂ emission by 67 billion tons and SO₂ by 580 million tons. By then global carbon emission from energy consumption will be reduced to 11.5 billion tons, half of that of 1990. The target of limiting global temperature rise by 2°C can be realized.
Promote clean replacement

**Promote the construction and optimization of auxiliary grid projects.** Actively promote auxiliary grid construction and do the best to meet clean energy integration and transmission demands. By the end of 2015, SGCC has invested RMB29.53 billion in 330kV (and below) new energy output projects with putting 26,924km transmission lines into operation.

**Actively accommodate the surplus hydropower in Sichuan.** Give full play to the UHV’s advantages in long-distance transmission and large-scale configuration and perfect the medium and long-term contract transaction mechanism. Sign the medium and long-term accommodation contracts for trans-regional, trans-provincial and provincial transmissions to deliver Sichuan’s surplus hydropower in flood season to the North, East, Central and Northwest China. In 2015, 123.22TWh of Sichuan’s hydropower was sent out, with a year-on-year increase of 11.039TWh. The largest output power was 28.6GW, with a year-on-year increase of 1.5GW.

**Promote cross-regional and inter-provincial clean energy delivery, such as wind power and solar power.** Make full use of UHV AC and DC cross-regional and inter-provincial channels. Organize the short-term trade to transmit wind power in the Northwest to North China through annual or short-term transactions and transmit wind power in Northeast to North China through market measures. It can add the electricity generation amount in Northwest and Northeast, where clean energy is abundant. In 2015, the cross-regional and inter-provincial output clean energy including wind power, solar power and hydropower reached 330.4TWh, 6.8% higher than the year 2014.

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**Develop Pumped Storage power Plants**

The development of pumped storage power plants is SGCC’s major project serving the development of clean energy. The company kicked off the development of two pumped storage power plant projects in June and September, 2015, with a total investment of RMB 46.14 billion and an installed capacity of 8.4 GW. The two projects, which are expected to be finished by 2022, mark a new period of accelerated development of pumped storage power plants in China. Currently, the total installed capacity of pumped storage power plants under the operation of the company has reached 16.46 GW, with projects providing another 17.3 GW still under construction. Among these projects, the first and second phases of Fengning Pumped Storage Power Plant have a total installed capacity of 3.6 GW, exceeding any other pumped storage plant in the world. It is expected that by 2017, the installed capacity of pumped storage power plants in China will reach 33 GW, surpassing the U.S. to become the country with the largest installed capacity of pumped storage power plants.

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Accumulative electricity generated from new energy reached 253.357TWh, an increase of 20.68% year on year.
- Wind power grew 14.3%  
- PV generation grew 66.37%

The integrated capacity of new energy reached 165.86GW, increased by 37.91% year on year.
- Wind power grew 32.69%.  
- Centralized PV generation grew 62.49%.  
- Distributed PV generation grew 78.4%.

Note: The above-mentioned data include western Inner Mongolia.
Promote electricity replacement

Constantly innovate the fields and methods of electricity replacement. Innovate replacement fields, methods and content and expand implementation scale from the traditional 5 fields to 15 fields. Improve the “green channel” guarantee mechanism in electricity replacement application for installation.

Assist the government to promote electricity replacement. Push forward the government to release 400 supporting policies, assist the National Energy Administration in planning the electricity replacement guidance on the national level and actively take the responsibility of formulating the national guidance on replacing coal by electricity.

Shore-to-ship power service helps promotes clean air campaign

SGCC Tianjin Electric Power Company began to provide shore-to-ship power service to ships in Dongtudi Pier in Tianjin Port. The company planned to develop 12 port-to-ship power demonstration projects and 42 shore power boxes. In 2015, the project helped Dongtudi Pier along the bank of Haihe River to substitute 4.03 GWh of electricity, saving 1,209 tons of gas and reducing 3,748 tons of carbon dioxide emissions, 202 tons of sulfur dioxide emissions and 64 tons of carbon-nitrogen compound emissions. It helped Tianjin to realize the goal of the Clean Air Campaign in 2015.

Replacing oil by electricity in oilfields

SGCC Songyuan Power Supply Company strengthened its efforts in promoting electricity replacement. Now the company has finished the project of replacing electricity for oil for 11 pumping wells in oil fields in Changjing through building 12 km of 10kV lines and deploying 7 distribution transformers with an installed capacity of 9.76 GVA.

Promote large-scale projects to replace coal by electricity

SGCC Dachang County Power Supply Company has been vigorously promoting large-scale projects to replace coal by electricity in cool air/heating supply. Other replacement technologies, such as electric furnace, electric boiler, and electric heating, were applied in cement manufacturing, the chemical industry and metallurgy. The notion of “electric household” was popularized in urban and rural areas. These efforts largely relieved the pressure on the environment and helped to create a win-win situation for the society and the businesses concerned.
Promote grid-side green development

Rationally dispose wastes and used materials. Since the launch of SGCC’s E-commerce platform in June 2011, gradual changes have taken place in the disposal and management of wastes and used materials in affiliated companies and departments. Currently, the centralized disposal on the E-commerce platform by provincial companies has replaced the fragmented disposal by local companies, with a trade volume of RMB 6.169 billion and a premium of 26.58%.

Comprehensively recollect SF₆. SGCC established SF₆ gas recollection and treatment center on provincial level to strengthen the regulation on the recollection, treatment and recycle of air, which contributes to the reduction in the emission of green house gases. In 2015, provincial companies recollected and treated 47.1 tones of SF₆ gas, which equals to a reduction of 1.126 million tons of CO₂ emissions.

Strengthen training and promotion for environmental protection. SGCC actively organized a variety of training activities on environmental protection. In 2015, the company organized 112 training courses on environmental protection with 4,550 participants, and organized more than 180 activities concerning the development of grid, energy conservation and emission reduction and knowledge on electromagnetic environment including SGCC Environmental Protection Promotion Campaign on June 5 World Environment Day.

“Electricity Caravan” helps with environmental protection in plateau areas

Situated in the core area of Sanjiangyuan National Natural Reserve, known as “the water tower of China”, the 330kV integration project between Golog and the main grid of Qinghai was to follow rigid requirements in environmental and water protection. Therefore, in order to protect the fragile plateau ecological environment, workers from SGCC Qinghai Electric Power Company didn’t build any roads or bridges, but used horse caravans known as “Electricity Caravan” to transport the material and facilities needed in the most conventional way in spite of all the difficulties. They laid a solid foundation for a green passage on the Qinghai-Tibet Plateau with bear hand and firm action.

Ensure safe, reliable, clean and environmental friendly power supply
Serve the development of EV industry

Accelerate the development of quick charge network in cities and along highways. Now with a total of 1,537 charging stations and 29.6 thousand charging piles having been built, a quick charge network along Beijing-Hong Kong-Macao Highway, Beijing-Shanghai Highway, Beijing-Taibei Highway, Shenyang-Haikou Highway, Qingdao-Yinchuan Highway, Shanghai-Chengdu Highway and Ningbo-Shanghai-Hangzhou Highway has been established. At the same time, a series of quick charge stations have been developed in Beijing, Tianjin, Hebei, Shandong and major cities in coastal areas along the Yangtze River covering 81 cities and 11,000 km of highways, accomplishing a charging and swapping capacity of 730 GWh for electric vehicles.

Explore “Internet +” charging service. The EV online platform has been put into trial, which is open to charging service providers. On the online platform, users can realize real-time access to quick charge facilities through mobile apps or logging into official website. They can also use mobiles apps or the official website to check for the location of quick charge facilities and related information to make reservation, navigation and payment, which is a convenient experience for users.

Improve the efficiency of the installation services for EV charging and battery swapping facilities. SGCC made great efforts to improve the installation services for EV charging and battery swapping facilities covering 17,800 households with a capacity of 362,200 kW, which provides convenient, quick and quality electricity supply services for privately invested EV charge facilities.

Promoting the standardization of EV charging and battery swapping facilities. SGCC set 10 international standards, 2 industrial standards and 9 corporate standards for charging and battery swapping facilities and initiated 1 new international standard. The series of standards won the first prize of Technological Standards Innovation and Contribution Award. The new international standard of IEC 62840-1 General Requirement for Electric Car Charging Facilities initiated by SGCC was released, which further helped the corporation to have more of a say in standard setting regarding this field among the international community.
Promote social energy conservation

Improve line loss management. The comprehensive line loss in 2015 was 6.78%, with an annual decease of 0.28 percentage points. The 750kV and 500kV main grids were further optimized with improved capacity in the automatic operation of voltage. These efforts realized coordinated close-circuit control of provincial grids in some areas, and made the distribution of electricity supply more rational, which significantly helped to reduce the line loss of main grids. The line loss for 750kV lines and 500kV lines dropped by 0.36 and 0.29 percentage points respectively, while that for 10kV (and below) was 5.23%, a drop of 0.12 percentage points, with the percentage of electricity loss dropping by 0.44 percentage points.

Strengthening the construction of energy conservation service system. In 2015, SGCC signed 635 contracts for energy reservation service projects, with a total investment of RMB 2.5 billion, which further strengthened the construction of the energy conservation service system with energy conservation services and energy efficiency management as the core. Currently, 27 energy conservation service companies have been founded and 685 energy efficiency groups have been established, attracting the participation of more than 5,996 corporate members. It leads to the establishment of an energy efficiency service network covering all the operation areas of SGCC. Meanwhile, the company also actively promoted the commercialization of research results, the exploration of new models for energy conservation services and the expansion of internal and external markets.

Promoting energy conservation in office buildings. SGCC actively promotes the monitoring of energy efficiency in office buildings, gradually starts the establishment of office building energy conservation monitoring platform to realize intensive management and digitalized control of internal office buildings. A smart micro grid system covering all the internal buildings has been built to provide real time monitor of the effect of energy conservation efforts. At the same time, the company also promotes the improvement of internal energy conservation facilities and adopts a green management model for new buildings, in which office facilities with high energy consumption will be gradually abandoned to ensure energy conservation in daily work.

635

energy conservation projects in 2015

RMB 2.5 billion

investment in energy conservation service

Save 2.69 GW

of electricity
Combat climate change

Accommodate clean energy. In 2015, the integrated capacity of clean energy of SGCC reached 391GW, with over 117GW of wind power. A total of 1011.7TWh of clean energy was consumed, reducing carbon dioxide emission by 813.23 million tons.

Conduct generation rights transaction and efficient generation and dispatching. The generation rights transaction reached 113.2TWh, lowered by 3% year on year. It saved 7.41 million tons of standard coal, cutting CO₂ and SO₂ emissions by 19.27 million tons and 130 thousand tons respectively.

Encourage energy conservation and emission reduction on the generation side

Lower the line loss rate. In 2015, the comprehensive line loss rate was 6.78%, lowered by 0.28 percent year on year, saving 10.4TWh of electricity and cutting CO₂ emissions by 8.2 million tons.

Boost cross-regional and inter-provincial power transaction. In 2015, the electricity traded in the National Power Market reached 722.1TWh and the traded capacity transmitted by UHV was 153.4TWh, an increased of 12.23%.

Encourage grid-side energy conservation and emission reduction

Promote standardized construction. The company continued to promote typical energy-saving, environmentally-friendly, and industrialized construction techniques with new technologies, materials and techniques to save 10% land occupation within the walls and reduce land use for construction by 20%.

Recycle resources. A total of 47.1 tons of SF₆ gas was purified and recycled in 2015, which equals a reduction on emission of 1,126 thousand tons of carbon dioxide.

Promote user-side energy conservation and emission reduction

Construct an energy-saving service system, which has saved 12.2TWh of capacity in 2015, 117% of the annual target. It saved 2.69GW of electric power, 137% of the annual target, reducing carbon dioxide emission by 3.66 million tons.

Implement electricity replacement. In 2015, the company has achieved electricity replacement by 76TWh, which equals to reducing the consumption of 34 million tons of standard coal. It cut CO₂ emission by 60 million tons and pollutants emission like SO₂ and NOₓ by 1.39 million tons.
Develop Overseas Business with Responsibility

Establish a global vision

Advance internationalization strategy based on global sustainable development
- Coordinate energy development strategy with a global vision
- Boost cooperation among stakeholders
- Implement international energy and industrial cooperation on "Belt and Road"
- SGCC’s overseas transmission lines in operation reached 110,000 km

Operate State Grid Brazil Holding Co. (SGBH) with responsibility
- Stick to sustainable and harmonious development
- Develop overseas business with responsibility
- Carry out CSR projects
- SGBH supplies power to an area of 2,931,500 km²
Support the sustainable development of overseas equity assets.

- Redes Energeticas Nacionais (REN)
- ElectraNet
- CDP Reti
- HK Electric Investments Limited

... ...

SGCC's overseas assets

38 billion USD

Operate Australian assets with responsibility

- Ensure safe and reliable energy supply
- Intensify knowledge and skill trainings for staff
- Popularize knowledge on safe power consumption

... 

SGCC's Australian assets serve

2.2 million people
<table>
<thead>
<tr>
<th>Topic choices on global vision</th>
<th>Effect on integrated value creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead the formulation of 26 international standards</td>
<td>1.8 billion US dollars</td>
</tr>
<tr>
<td>The contract value of SGCC’s overseas EPC reached 21.2 billion US dollars</td>
<td>438 newly signed international projects in 2015</td>
</tr>
</tbody>
</table>

- SGCC’s cumulative export value of equipment during the 12th Five Year Plan 1.8 billion US dollars
- Participate in the formulation of international standards 438 newly signed international projects in 2015
- Jointly work on global technological research 21.2 billion US dollars
- Contribute to the local socio-economic development 26 international standards
- Promote the establishment of global energy cooperation mechanisms
- Increase the degree of localized operation
- Care for employees’ safety, health and development
- Guarantee the transparency of major decisions
- Speed up electric power cooperation along the “Belt and Road”
Advance internationalization strategy based on global sustainable development

Coordinate energy development strategies with a global vision. Energy is the premise for the development of human society, while electricity plays a central role among all energy forms. Power grids constitute a platform for the production and consumption of all kinds of energy. The company has been implementing clean replacement and electricity replacement to establish a global energy interconnection to facilitate efforts to meet the global power demand with clean and green alternatives put forward by President Xi Jinping at the UN Sustainable Development Summit.

Promote the establishment of global energy cooperation mechanism. Intensify extensive cooperation with international sustainable development organizations. The company set up a joint office for global energy interconnection with IEA. Agreements were signed with American National Renewable Energy Laboratory (NREL) and Argonne National Laboratory. The company also carried out in-depth exchanges with international institutes, such as G-ESP and WBCSD. Staffs were assigned to work at WBCSD and IEA.

Hold China-US and China-Europe workshop on global energy interconnection. Work together with the Edison Electric Institute, Argonne National Laboratory, American National Renewable Energy Laboratory (NREL), and German Electrical and Electronic Communications Technology Institute to invite experts from government organs, energy and electric power companies, equipment manufacturing companies, research institutes, and universities from China, the US and Europe. SGCC Chairman Liu Zhenya made a keynote speech on “Jointly Tackle Technical & Equipment Cruxes and Promote Innovation-driven Development of Global Energy Interconnection”.

Organize the Global Sustainable Electrical Power (G-SEP) Committee meetings. Service as the rotary president, and organized the first committee meeting on policy, management and project in Xi’an. Carry out in-depth discussions and reach a broad consensus around actions of power companies in global climate change and how to jointly promote global energy interconnection and other issues.

Implement international energy and industrial cooperation along the “Belt and Road”

Promote energy cooperation of China-Pakistan Economic Corridor. Witnessed by Chinese President Xi Jinping and Pakistan Premier Nawaz Sherif, SGCC signed the agreement on electricity transmission and transformation project with Pakistan Ministry of Water and Power. It is prioritized and the only grid project in the energy cooperation of China-Pakistan Economic Corridor. As the first DC transmission project of SGCC with independently owned intellectual property rights in the world, this project can solve the bottleneck for transmit electricity from southern Pakistan, easing the power shortage in load centers in Mid Pakistan.

Carry out energy cooperation with Mongolia. Witnessed by Chinese President Xi Jinping and Mongolia President Elbegdorj Doyle Kyrgyzstan, State Grid Corporation of China and Mongolian Department of Energy signed a Feasibility Study Agreement on Coal-Electricity Integrated Transportation Project. The Project will transmit power to the load centers of China directly from designated mines and plants via special lines in Mongolia.

Carry out energy cooperation with Russia. SGCC and the Russian Rosseti signed “Agreement on the Establishment of a Joint Venture for Grid Cooperation Project”. The two sides will establish a joint venture company to carry out the investment, construction, operation and EPC of new projects and grid infrastructure renovation in Russia and other countries. In 2015 existing power lines between China and Russia were in smooth operation and supplied 3.3TWh of electricity.
UN Secretary-General Ban Ki-moon Met with SGCC Chairman Liu Zhenya

On September 14, UN Secretary-General Ban Ki-moon met with SGCC Chairman Liu Zhenya at the UN Headquarters in New York and reached a consensus on joint promotion of the development of global energy interconnection. During his visit, SGCC Chairman Liu Zhenya also met with Under-Secretary-General Kim Won-soo, former US Treasury Secretary and the president of Henry Paulson Foundation Mr. Henry Paulson, who exchanged their views on establishing global energy interconnection. Liu also visited the American National Renewable Energy Laboratory (NREL). The strategic concept of building global energy interconnection has been highly appraised. It has been considered as an important innovation to promote human sustainability. These partners will publicize an innovative development of global energy interconnection in their own fields.

Key international conferences participated by SGCC

<table>
<thead>
<tr>
<th>Event</th>
<th>Details</th>
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<tbody>
<tr>
<td>Business &amp; Climate Summit</td>
<td>SGCC Chairman Liu Zhenya made a keynote speech on “Global Energy Interconnection as the inevitable course for clean development”.</td>
</tr>
<tr>
<td>The UN Global Compact’s 15th Anniversary</td>
<td>SGCC Chairman Liu Zhenya reached an important consensus with leaders from the United Nations Global Compact and the Edison Electrical Institute regarding the development of global energy interconnection.</td>
</tr>
<tr>
<td>Release of the Global Energy Interconnection (English Version) and seminar</td>
<td>SGCC Chairman Liu Zhenya talked with representatives from international organizations and scientific research institutes. He also signed a strategic cooperation agreement with the American National Renewable Energy Laboratory (NREL) during his visit.</td>
</tr>
<tr>
<td>COP21</td>
<td>SGCC Chairman Liu Zhenya made a keynote speech at the Business Forum and Technological Innovation Forum.</td>
</tr>
<tr>
<td>79th Annual IEC General Meeting</td>
<td>SGCC President Shu Yinbiao was re-elected as IEC Vice Chairman.</td>
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</tbody>
</table>

Important international standards and initiatives participated and developed by SGCC

<table>
<thead>
<tr>
<th>Agency</th>
<th>Details</th>
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<tbody>
<tr>
<td>IEC</td>
<td>Three international standards, i.e. Technical Specifications on DC Bias Magnetic Suppression Device, Low-Voltage Connector for Mobile Energy Storage Unit (Electric Vehicles), and Guide on HVDC System Planning were established.</td>
</tr>
<tr>
<td>IEEE</td>
<td>Two international standards, i.e. Micro Network Planning and Design, AC Overhead Transmission Line Design, were established.</td>
</tr>
<tr>
<td>CIGRE</td>
<td>Initiate the establishment of 2 working groups on “DC Distribution”, and “Grid Stability Control System Framework Design”.</td>
</tr>
<tr>
<td>Cooperation Initiative on Low-Carbon Technology of Climate and Energy Working Group</td>
<td>Around the theme of global energy interconnection, improve the action plan, and sign the CEO Declaration.</td>
</tr>
</tbody>
</table>
Operate State Grid Brazil Holding Co. (SGBH) with responsibility

Stick to sustainable and harmonious development. SGBH complies with local laws and regulations, respects local religious practices and national culture taking long-term localized development as its strategic objective. It sponsored and participated in Sino-Brazil Innovation Dialogue. It was oriented to people and arranged 78 personnel training projects for Brazil, involving 648 people. 10 Brazilian employees were assigned to China in four batches for training.

Boost cooperation among stakeholders. The company has strengthened the exchanges of visits with senior officials from the Brazilian Ministry of Mines and Energy and ANEEL. Technical communication and cooperation was also promoted with local electric power counterparts to participate in the bidding and construction of the transmission greenfield concession projects to take root in Brazil and stick to long-term development.

Continuously participate in social welfare undertakings. The company invested 2.83 million BRI to sponsor social welfare programs, such as fire control education, “Cultural Exploration- Symphony of Male” program, Home for Children, Rio Tour of International Youth Table Tennis, and “Rio de Janeiro Four Seasons Long-distance Race”. The book *China in the Eyes of Brazilians* was published in both Chinese and Portuguese to enhance the cultural exchange between these two countries.

Operate NGCP with responsibility

Keep improving customers’ satisfaction. By hosting partnership forums, exchanges on a regular basis, it established a partnership with 278 clients. It cumulatively held 10 customer conferences and visited 115 customers within the Philippines. It also carried out 2 relay protection training classes, 6 training class for line workers. There were a total of 215 person-times. Spread transmission safety to 50,000 households in 177 covered districts.

Actively serve the local community. SGCC vigorously recovered damaged power facilities in areas affected by typhoons and other natural disasters, sponsoring the construction of 35 infrastructures like campus dorms, bridges, and water supply systems, and provided stationeries and schoolbags in 329 primary schools. In addition, it cooperated with the University of the Philippines to share training labs and set up scholarships and provided internships for 61 university students from the minority ethnic groups.
Operate SGSPAA with responsibility

Strengthen staff education and skills training. SGSPAA, as a subsidiary of SGCC, is committed to localization. The company organizes its executives to carry out a 10-day training in China in 2015, strengthening training on corporate culture and power generation technology.

Secure safe and reliable energy supplies. In New South Wales Storm, gas distribution staff of SGSPAA responded quickly to overcome the difficulties, resuming gas supply within 12 hours, and actively helped local power companies to restore power supply. Through careful management, line maintenance and regulations drafting, SGSPAA minimized the wildfire risks, and was applauded by related companies and local residents.

Start the campaign to promote education on electricity use safety. Through careful design, SGSPAA has used vivid languages to popularize knowledge on electricity use safety to millions of households, and set up a 24-hour hotline and SMS platform for real-time feedback to questions on power use.

500kV power transmission and transformation project in Ethiopia completed

On December 22, the 500kV power transmission and transformation turnkey project in Ethiopia undertaken by general contractor SGCC was completed. Among the construction employees, locals accounted for more than 80%. About 8,000 Ethiopian employees received construction and technical training. Besides, 50 kilometers of road were worked on with Chinese fund and a 5 km long country road was newly built, which has solved the traffic problem for 20,000 local residents. SGCC also donated power engineering and construction equipment to Ethiopian Electric Power Corporation and learning and sports facilities to the local schools, which were spoken highly by the local governments, communities and the media.
Support the sustainable development of overseas equity assets

Redes Energeticas Nacionais SA (REN). REN focuses on innovation and sustainable development to enhance research and development capabilities in the energy sector. It is committed to providing reliable, safe, efficient and economical public services for Portuguese consumers. In the areas of culture, society, education, and environment, it implements 33 social responsibility actions and has become an important practitioner of sustainable energy development in the international market.

ElectraNet. SGCC participates in the development of five-year business plan and development strategy for ElectraNet. ElectraNet strengthens and expands the grid, providing about AUD 150 million worth of electricity per year for the South Australian community. It rationally makes power grid planning, reduce social and environmental impacts, protect native flora and fauna as well as the rivers, protect aboriginal and European traditions, protect natural and cultural landscape in South Australia. The company also accelerates the development of renewable energy, supports sustainable development of community life and environment in the grid equipment operation area.

SP AusNet. SP AusNet engages in the power transmission and distribution, gas distribution and infrastructure services in Victoria State, serving more than 670,000 customers. It sets up a special foundation to actively support local community development, education and charity, attach importance to employee safety, health, and career development of female employees. It is in strict compliance with local environmental laws and regulations by taking various measures to control harmful emissions. It actively explores renewable energy development and utilization, providing safe, reliable, clean energy supplies to the local areas.

CDP Reti. Its subsidiary Terna owns 99% of Italian's transmission grid, providing safe, reliable, sustainable and economical power. It is also a member of United Nations Global Compact. Its subsidiary SNAM is Italian's national gas company, and it is a benchmark for gas infrastructure construction, operation and management in Europe, attaching great importance to climate change and biodiversity.

HK Electric Investments Limited. As a shareholder, SGCC actively supports HK Electric Investments in community welfare activities, establishing Wisdom Electricity Fund to provide funding and technical advice to old residential buildings to help improve energy efficiency, to help SMEs expand their business, and partner with third-party communities and societies to organize the "Third Age Academy" and promote retirees to actively participate in volunteer service, to develop "Community Residence" program and send volunteers to visit elderly people living alone each month and provide preferential tariffs for the vulnerable. In 2015, it won the "Hong Kong Star Brand" Enterprise Award again.
Guarantee Operation Transparency and Be Open to Public Supervision

Fulfill Responsibility on Communication and Cooperation

- **Continue giving advice on sustainable energy development**
  - Promote the construction of Global Energy Interconnection
  - Give proposals on the National “Two Sessions” concerning energy
  - Discuss on grid development with governments of different levels
  - … …

- **98 proposals from the delegates and members of the National “Two Sessions” concern SGCC**

- **Strengthen social communication**
  - Intensify communication and exchange
  - Improve information disclosure mechanism
  - Publicity on important topics
  - … …

- **Take the lead to release CSR report for 10 consecutive years**
Encourage stakeholders’ participation
- Improve the strategy and mechanism for stakeholders’ participation
- Strengthen stakeholders’ participation
- Reinforce communication through social media
  ...

Be open to social supervision
- Improve work according to the opinions and feedback of central government’s inspection
- Advance in constructing the work style
- Cooperate in industrial inspections and moral appraisal work.
  ...

Hold 720 press conferences

Open 302 corporate official WeChat accounts in SGCC system
Society's degree of concern on guaranteeing operation transparency and being open to public supervision

- Be open to social concern timely
- Be open to the supervision from the government and electricity oversight
- Improve information transparency and enhance channels
- Guarantee the openness and transparency of major decisions
- Jointly promote power grid construction with local governments
- Invite walks of life into SGCC
- Improve the operational serving of stakeholders
- Conduct 10,309 self-examinations and investigations

Effect on integrated value creation

- Build a team of 2,283 spokespersons
- Visits to SGCC website: 17,920,000

First Place
of Top 500 Chinese Service Enterprises
Continue giving advice on sustainable energy development

Promote the construction of global energy interconnection. On Sept. 26, 2015, Chinese President Xi Jinping spoke to the United Nations General Assembly at the UN Sustainable Development Summit. He said China will propose discussions on establishing global energy interconnection to facilitate efforts to meet global power demand with clean and green alternatives. SGCC advanced global energy interconnection as a strategic task. SGCC Chairman Liu Zhenya proposed to enhance research on world energy and resource, climate change, policies and laws, business model, and cooperation mechanism etc., in order to solidly construct a theoretic basis for global energy interconnection. It will also help to expedite infrastructure connection with Russia, Kazakhstan and other neighboring countries, laying a foundation for intra- and inter-continental interconnection. It will build a cooperative platform of exchange, and work along with international organizations to jointly facilitate the development of global energy interconnection.

Motions on energy were proposed in NPC and CPPCC sessions. Among the motions proposed by National People’s Congress and Chinese People’s Political Consultative Conference committee members and representatives, 98 were relevant with the development of SGCC, an increase of 23 compared with that in 2014. 10 out of these motions were proposed by our delegation, mostly concerning with accelerating the development of UHV, constituting global energy interconnection, clean replacement and electricity replacement, and constructing southwestern grid etc. Motions associated with UHV amounted 67, 12 more than that of 2014. “Developing UHV Grid” has been consecutively listed as one of NPC priority advice and CPPCC key motions.

Consult with governments of different levels on power grid construction. SGCC has held 10 talks and meetings respectively with Sichuan, Gansu, Hunan, Hubei, Qinghai, Shanxi, Inner Mongolia, Jiangsu and Shandong altogether 9 provincial or autonomous region governments and reached an extensive consensus on the construction of UHV and grid of all levels, the development of smart grid and power equipment industries, and the development and exploration of new energies. The meetings helped to create a favorable external environment for accelerating grid development, facilitating good service provided and energizing economic and social advances.

Enhance reporting to and communicating with the government. SGCC actively reports to and communicates with superior departments on our strategic work, among which the strategic conception of Global Energy Interconnection (GEI), UHV, Two Replacements, constructing southwestern grid, and our company’s operation in Brazil have received high attention.
Continue to strengthen social communication

Proactively enhancing communication and exchange. SGCC endeavored to realize the transformation of social communication, including replacing communication of work with communication of values, replacing simply focusing on reporting of major departments in charge and media publicity with the comprehensive communication with all stakeholders and the use of social media, as well as replacing information output with wide dialogue and interaction with the public. Taking advantage of reporting meetings to government on responsibility performance and practice, media meetings and press conferences, SGCC subsidiaries and associations systematically demonstrate our actions and achievements in serving the local people, and respond to social concerns and expectations from stakeholders.

Release CSR Report for 10 consecutive years. Use the report as a platform to release information and answer social responsibility topics concerned by stakeholders in a comprehensive way.

Release White Paper to Serve the Development of Economy and Society. We facilitate the normalization, systematization and institutionalization of the release of White Papers. Following the first White Paper on Green Development in China in 2010, and the first White Paper on Corporate Values in China in 2012, we successively released the White Paper on Promoting the Development of Wind Power and White Paper on Facilitating the Development of New Energy to demonstrate SGCC’s major measures on promoting the interconnection, operation and accommodation of new energy. Also, our subsidiaries and associations compiled white papers on a regular basis to serve the development of local economy and society, which incorporates the work of our company into local development strategies.

Complete information disclosure mechanism. We developed the Measure on the Management of Information Release in SGCC, completing the system of four-level spokespersons and enlarging the team of press spokespersons to 2,283 members. In addition, we gave full play to the use of official websites, Weibo and WeChat in information disclosure to ensure that stakeholders get access to the important information of SGCC in time.

Enhance the circulation of prioritized issues. Target on the prioritized concerns of the society, we enhance publicity on various themes correspondingly. Notions of constructing GEI, UHV, and serving the development of new energy etc. received wide acknowledgement and active response from the society.

Signed Article by SGCC Chairman Liu Zhenya Attracted Extensive Appraisals

On October 22, SGCC Chairman Liu Zhenya published a signed article in People’s Daily entitled Building Global Energy Interconnection to Promote Clean and Green Energy, which attracted extensive appraisals from all walks of life.

Global energy interconnection will fundamentally solve energy constraints, environmental pollution and economic crisis.

-- Shi Dazhen, the former minister of the Ministry of Power Industry

The global energy interconnection is an open, huge system closely linked to our lives. It is a superior design to solve world energy problems.

-- Lu Qiang, member of Chinese Academy of Science

The concept of global energy interconnection gives a solution for future global energy development from a theoretical height.

-- Shi Dinghuan, Director General of China Renewable Energy Society

“The path for future energy development charted by global energy interconnection will shed a positive and far-reaching influence on the energy development of the world.”

Cao Peixi, President of China Huaneng Group

In the documentary Constructor produced by CCTV, the first episode Across Jinsha River and the seventh episode A Fierce Battle on No Man’s Land depicted the work of our front-line employees in supporting Tibet earthquake relief and the construction of major projects.

Economic Daily published our series of comics, Maomao Wandering in the Global Energy Interconnection, which illustrates the connotation, framework, procedures, comprehensive benefits, and future visions of GEI through comics.
The Action

Guangming Daily consecutively published 4 key reports, including The World is So Wonderful because of Us, introducing the story of SGCC’s youth employees working at the grassroots level.

On March 3, the front page of CPPCC newspaper published Constructing Global Energy Interconnection to Implement the Belt and Road Initiative authored by Liu Zhenya, SGCC Chairman.

People’s Daily published SGCC Sails Overseas with Independent Innovation, covering the splendid achievements accomplished by SGCC through implementing internationalization strategy and going a characteristic way of independent innovation with funding support.

Science and Technology Daily reported in its front page SGCC’s major technological breakthrough of integrating GW-level generator into UHV grid for the first time in the world.

Programs like CCTV News have broadcasted 26 key reports, totaling 30 minutes and covering the start of UHV AC projects from Western Inner Mongolia to southern Tianjin and Yuheng to Weifang, and Jiuquan-Hunan UHV DC project. These reports highlight the importance of accelerating the development of UHV to steady growth, structural adjustment and livelihood improvement.

CCTV broadcasted Interconnection of SGCC and Four National Grids, introducing SGCC’s plan of grid connectivity with 9 grid interconnection projects in 4 countries in order to facilitate China’s the Belt and Road Initiative.

Hong Kong Wen Wei Po published Chinese Enterprise Contracted to Build Brazilian UHV Transmission Project. Southern Weekly published UHV’s Debut in the Country of Samba: “Intellectualized by China” Blooming Overseas, covering the story of UHV facilitating China’s equipment manufacturing to go global.

UHV grid has left quite an impression on the public.
Be open to supervision

Improve work according to the opinions and feedback of central government’s inspection. We will regard cooperating with central government’s inspection and implementing its feedback and comments as a major political task. Targeting at problems spotted in the inspection, we adopted measures of supervising and urging through publishing situations, solving the most concerned issues of the public, so as to complete 154 correction tasks and 35 correction measures in 15 aspects. In addition, we input efforts to complete and perfect a long-term mechanism on constant consolidation and improvement, which received full recognition from CPC Central Commission for Discipline Inspection, CPC Central Office of Inspection and CPC 8th Central Inspection Group.

Formulate featured educational and corrective measures of “Three Stricts and Three Steadies”

All customer complaints are timely dealt with.

Revise work through education and practice and review the implementation

We divided our work into 104 indicators categorized by 29 tasks from 11 perspectives, and pursued efforts to implement them. In addition, we provided “one pioneer and two excellent” awards that have selected 319 pioneer Party divisions of SGCC, 593 excellent Party members and 318 excellent staff on Party affairs.

Promote work style construction

Revise work through education and practice and review the implementation

We insisted on immediate action and immediate revision after receiving criticism, formulated and completed 32 relevant regulations and measurements. It is necessary to establish a multi-layer system of inspection on implementation, so as to facilitate the institutionalization, normalization and long-lasting effect of implementing the requirement of “Three Stricts and Three Steadies”.

Pragmatically facilitate featured education on “Three Stricts and Three Steadies”

Self-checking, self-correction and thorough investigation. We have conducted 10,309 self-checking, self-correction and thorough investigations in terms of service regulation and tailored power service. In addition, we secretly inspected subsidiaries in 8 provinces or municipalities and issued 8 inspection recommendation letters. We investigate directly and efficiently solve cases that receive complaints from clients with high frequency, service complaints that severely affect public image of the company and complaints involving large power companies. As a consequence, all cases are closed in time.
Encourage stakeholders’ participation

Constantly perfect strategies and mechanisms that involve the participation of stakeholders. We intensified comprehensive management on corporate social responsibility to build trust with stakeholders based on recognized values. In managing stakeholders, we adhere to the requirements of “All Employees’ Participation, Full-Process Blending, and All-Round Coverage”. For consecutive 10 years we have held “Into SGCC” activities, remained open to moral appraisal work and social monitoring, and listened to opinions and suggestions from all stakeholders.

Constantly enhance stakeholders’ participation. We conduct research and analysis on public opinions on power institutional reform, collect and comb through various comments, propose responding suggestions, effectively respond to social concerns and mobilize possible forces to reach consensus on reform and development. Meanwhile, we enhance communication with the government and public, enhancing the third party’s discourse power.

Enhance communication through social media. We actively explore the laws of communication of social media, like Weibo and WeChat, enhance team building of online commentators, facilitate stakeholders to participate in company management, and strengthen public understanding of the major strategies of SGCC as well as dialogue with different sectors of the society.

Construct a normal mechanism of interaction and communication

SGCC Changzhou Power Supply Company constructed a mechanism of interaction and communication on a regular basis, enhancing exchange with local media, key opinion leaders, shoot-off fans, influential forum VIPs, photography associations and other stakeholders. Based on the power demand in winter and summer, we held media meeting, “Power in the Eyes of Digital Shooting Clan” activity and so forth, to update media on our work in coping with power demand peak in summer, widely listen to opinions and demands from the society and respond to social concerns.

“Day of Measuring, Entering Your Home” activity

Oriented by client demand, SGCC Beijing Electric Power Company released Volunteer Call through its official Weibo account, selecting volunteer families representing different class in staircase power tariff. We provide smart meter examination, measure the use of power of household appliances, and issue test report, all of which are free. We assist our clients to find the most power-consuming appliances and increase the transparency of enterprise operation.

Main Associations and Organizations SGCC Participates

<table>
<thead>
<tr>
<th>Type</th>
<th>Associations / Organizations</th>
<th>SGCC’s Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Organization</td>
<td>China Enterprise Confederation</td>
<td>Vice Chairman</td>
</tr>
<tr>
<td></td>
<td>Economics (CFIE)</td>
<td>Chairman</td>
</tr>
<tr>
<td></td>
<td>Chinese National Committee on Large Dams</td>
<td>Vice Director</td>
</tr>
<tr>
<td></td>
<td>China Association for Quality</td>
<td>Vice Chairman</td>
</tr>
<tr>
<td></td>
<td>China Association for Standardization</td>
<td>Vice Director</td>
</tr>
<tr>
<td></td>
<td>China Business Council for Sustainable</td>
<td>Councilor</td>
</tr>
<tr>
<td></td>
<td>Development</td>
<td></td>
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<tr>
<td></td>
<td>China Association of Work Safety</td>
<td>Vice Chairman</td>
</tr>
<tr>
<td></td>
<td>China Bidding Association</td>
<td>Standing Councilor</td>
</tr>
<tr>
<td></td>
<td>China Chamber of Commerce for Import and</td>
<td>Councilor</td>
</tr>
<tr>
<td></td>
<td>Export of Machinery and Electronic Products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>China Electricity Council</td>
<td>President</td>
</tr>
<tr>
<td></td>
<td>China Society for Electrical Engineering</td>
<td>Vice President</td>
</tr>
<tr>
<td></td>
<td>China Electric Equipment Management Association</td>
<td>Vice Chairman</td>
</tr>
<tr>
<td></td>
<td>China Society for Hydropower Engineering</td>
<td>Vice President</td>
</tr>
<tr>
<td></td>
<td>China Electric Power Construction Association</td>
<td>Vice Chairman</td>
</tr>
</tbody>
</table>
The Performance

Performance is the basics for sustainable development.
Global Energy Interconnection

Global Energy Interconnection changes the world

Global Energy Interconnection is an effective solution for world energy and environmental challenges. Global energy can be interconnected via UHV technologies, which will lead the world towards sustainable development.

— Dr Fatih Birol, Director of International Energy Agency

Build a new pattern of energy development. Establish a world energy pattern dominated by clean energy. By 2050, clean energy should account for 80% of primary energy. All continents have adequate power supply. Centralized generation within large continental energy bases accounts for 69% and distributed power makes up for 15%.

Stimulate new momentum for economic growth. It is expected that from 2016 to 2030 China’s clean energy and related power grid investment can reach RMB820 billion a year, driving average annual GDP growth of about 0.6 percentage points.

Create a better social life. Rely on global energy interconnection to develop and utilize renewable energy. In this means, it is possible to enhance South-South cooperation and North-South cooperation, and convert the resource advantages of Asia, Africa, South America and other regions into economic advantages.

Open a new chapter of human civilization. Fundamentally solve ecological environment problems so that everyone can enjoy the ecological civilization. In 2050 global carbon emissions can be controlled within about 11.5 billion tons and clean energy can replace fossil fuels equivalent to 24 billion tons of standard coal each year.
Economic Performance

### Financial Performance

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue (billion RMB)</td>
<td>1675.4</td>
<td>1883.0</td>
<td>2049.8</td>
<td>2091.4</td>
<td>2075.0</td>
</tr>
<tr>
<td>Total assets (billion RMB)</td>
<td>2211.6</td>
<td>2333.5</td>
<td>2570.1</td>
<td>2892.9</td>
<td>3114.9</td>
</tr>
<tr>
<td>Total profits (billion RMB)</td>
<td>5.378</td>
<td>109.03</td>
<td>70.58</td>
<td>81.21</td>
<td>86.52</td>
</tr>
<tr>
<td>Pre-tax profits (billion RMB)</td>
<td>137.11</td>
<td>210.15</td>
<td>173.96</td>
<td>197.17</td>
<td>214.37</td>
</tr>
<tr>
<td>Return on equity (%)</td>
<td>4.54</td>
<td>8.36</td>
<td>4.72</td>
<td>5.18</td>
<td>5.15</td>
</tr>
<tr>
<td>Asset-liability ratio (%)</td>
<td>60.02</td>
<td>57.02</td>
<td>57.00</td>
<td>56.1</td>
<td>55.4</td>
</tr>
<tr>
<td>SASAC Evaluation on Operation Performances (Class)</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
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</table>

### Grid Capability

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment in power grid (billion RMB)</td>
<td>301.92</td>
<td>305.4</td>
<td>303.482</td>
<td>385.504</td>
<td>452.075</td>
</tr>
<tr>
<td>Length of transmission lines* (km)</td>
<td>655000</td>
<td>713000</td>
<td>1045300</td>
<td>843600</td>
<td>889900</td>
</tr>
<tr>
<td>Transformation capacity **(TVA)</td>
<td>2.39</td>
<td>2.81</td>
<td>3.24</td>
<td>3.365</td>
<td>3.612</td>
</tr>
<tr>
<td>Integrated capacity (GW)</td>
<td>818</td>
<td>880</td>
<td>962</td>
<td>1049</td>
<td>1161</td>
</tr>
<tr>
<td>On-grid electricity of integrated capacity (TWh)</td>
<td>3240</td>
<td>3390</td>
<td>3690</td>
<td>3660</td>
<td>3620</td>
</tr>
<tr>
<td>Technical R&amp;D input (billion RMB)</td>
<td>6.452</td>
<td>7.940</td>
<td>5.787</td>
<td>7.08</td>
<td>7.376</td>
</tr>
<tr>
<td>Total patents</td>
<td>10538</td>
<td>16399</td>
<td>28311</td>
<td>40143</td>
<td>50165</td>
</tr>
<tr>
<td>Total National Science and Technology Awards</td>
<td>36</td>
<td>39</td>
<td>43</td>
<td>46</td>
<td>51</td>
</tr>
<tr>
<td>Trans-regional and trans-provincial UHV transmission volume (TWh)</td>
<td>39.754</td>
<td>72.034</td>
<td>72.788</td>
<td>136.7</td>
<td>153.4</td>
</tr>
<tr>
<td>National and industrial standards led and compiled by SGCC</td>
<td>126</td>
<td>176</td>
<td>206</td>
<td>144</td>
<td>185</td>
</tr>
</tbody>
</table>

*Transmission lines of 110 (66) kV and above levels;  
**Transforming facilities of 110 (66) kV and above levels.

Note: The statistics for 2014 are final, which may differ from the ones in 2014 CSR Report. The statistics for 2015 financial performance are from the financial express reports, which may differ from the final statistics.
### Operational Efficiency

<table>
<thead>
<tr>
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<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall productivity (RMB yuan per person per year)</td>
<td>493200</td>
<td>550600</td>
<td>609000</td>
<td>643500</td>
<td>653000</td>
</tr>
<tr>
<td>Total asset turnover period (Day)</td>
<td>462</td>
<td>444</td>
<td>439</td>
<td>474</td>
<td>521</td>
</tr>
<tr>
<td>Comprehensive line loss rate (%)</td>
<td>6.53</td>
<td>6.73</td>
<td>6.83</td>
<td>6.81</td>
<td>6.78</td>
</tr>
<tr>
<td>Transmission capacity upgrade over the years (GW)</td>
<td>200</td>
<td>213</td>
<td>241</td>
<td>265</td>
<td>311</td>
</tr>
<tr>
<td>Number of equipment accidents</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of power grid accidents</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Power Supply Performance

<table>
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<tr>
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<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
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<tbody>
<tr>
<td>Electricity sales (TWh)</td>
<td>3092.5</td>
<td>3253.9</td>
<td>3522.7</td>
<td>3469.4</td>
<td>3450.6</td>
</tr>
<tr>
<td>Maximum load within SGCC’s service area (MW)</td>
<td>535500</td>
<td>561200</td>
<td>654000</td>
<td>631000</td>
<td>651000</td>
</tr>
<tr>
<td>Number of customers (millions)</td>
<td>286</td>
<td>309</td>
<td>343</td>
<td>378</td>
<td>420</td>
</tr>
<tr>
<td>Average blackout duration for urban users (Hour/household)</td>
<td>6.92</td>
<td>5.18</td>
<td>3.854</td>
<td>2.891</td>
<td>3.74</td>
</tr>
<tr>
<td>Average blackout duration for rural users (Hour/household)</td>
<td>29.35</td>
<td>23.21</td>
<td>12.965</td>
<td>10.64</td>
<td>13.14</td>
</tr>
<tr>
<td>Voltage qualification rate for rural users (%)</td>
<td>97.688</td>
<td>98.074</td>
<td>98.567</td>
<td>98.808</td>
<td>99.065</td>
</tr>
<tr>
<td>Electricity Trading Volume in the National Power Market (TWh)</td>
<td>399.87</td>
<td>515.890</td>
<td>601.9</td>
<td>678.9</td>
<td>722.1</td>
</tr>
<tr>
<td>Fulfillment rate for the &quot;Ten Commitments&quot; on power supply service (%)</td>
<td>99.99</td>
<td>99.998</td>
<td>99.999</td>
<td>99.999</td>
<td>99.999</td>
</tr>
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## Social Performance

### General Service

<table>
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<tr>
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<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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</thead>
<tbody>
<tr>
<td>Investment in the rural grid (billion RMB)</td>
<td>73.0</td>
<td>80.74</td>
<td>50.73</td>
<td>46.45</td>
<td>122.29</td>
</tr>
<tr>
<td>Incremental number of households connected to electricity (Thousand)</td>
<td>1375</td>
<td>1490</td>
<td>1659</td>
<td>1873</td>
<td>1917</td>
</tr>
<tr>
<td>Incremental number of people connected to electricity in rural areas (Thousand)</td>
<td>5226</td>
<td>5720</td>
<td>6419</td>
<td>7285</td>
<td>7496</td>
</tr>
<tr>
<td>The average gap between urban and rural annual blackout time (Hour/household)</td>
<td>22.43</td>
<td>18.03</td>
<td>9.11</td>
<td>7.8</td>
<td>9.4</td>
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### Public Donations

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<tr>
<th></th>
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<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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</thead>
<tbody>
<tr>
<td>Donations (Million RMB)</td>
<td>108</td>
<td>147</td>
<td>116</td>
<td>114</td>
<td>128</td>
</tr>
<tr>
<td>Via State Grid Foundation for Public Welfare</td>
<td>33</td>
<td>64</td>
<td>8.5</td>
<td>10.6</td>
<td>15</td>
</tr>
<tr>
<td>Staff’s volunteer service (Person-times)</td>
<td>640000</td>
<td>650000</td>
<td>713000</td>
<td>2200000</td>
<td>2000000</td>
</tr>
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### Win-win Partnership

<table>
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<tr>
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<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centralized tendering volume (billion RMB)</td>
<td>230.6</td>
<td>322.96</td>
<td>334.3</td>
<td>369.0</td>
<td>507.7</td>
</tr>
<tr>
<td>Total Luban Awards</td>
<td>17</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>23</td>
</tr>
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</table>

### Transparent Operation

<table>
<thead>
<tr>
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<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
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<tbody>
<tr>
<td>SGCC website’s traffic statistics (Visits)</td>
<td>5596000</td>
<td>5620000</td>
<td>8664000</td>
<td>12810000</td>
<td>17919000</td>
</tr>
<tr>
<td>Information reported to governments from SGCC Headquarters (Piece)</td>
<td>245</td>
<td>205</td>
<td>203</td>
<td>198</td>
<td>215</td>
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### Employee Development

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<tr>
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<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct investment in employees' training (billion RMB)</td>
<td>1.823</td>
<td>2.125</td>
<td>2.262</td>
<td>2.467</td>
<td>2.486</td>
</tr>
<tr>
<td>Training coverage rate (%)</td>
<td>93</td>
<td>93.5</td>
<td>94</td>
<td>94.3</td>
<td>94.55</td>
</tr>
<tr>
<td>Employee training Person-times (Thousand)</td>
<td>3280</td>
<td>3350</td>
<td>3400</td>
<td>3600</td>
<td>3604</td>
</tr>
<tr>
<td>Proportion of female employees</td>
<td>27.1</td>
<td>27.3</td>
<td>26.9</td>
<td>27.2</td>
<td>27.3</td>
</tr>
<tr>
<td>Labor unions</td>
<td>1236</td>
<td>1252</td>
<td>1936</td>
<td>1303</td>
<td>1522</td>
</tr>
</tbody>
</table>
### Serve Clean Energy Development

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated capacity from clean energy generator units (GW)</td>
<td>202.60</td>
<td>240.04</td>
<td>274.26</td>
<td>331.83</td>
<td>390.70</td>
</tr>
<tr>
<td>Including: integrated capacity of hydropower</td>
<td>156.17</td>
<td>168.16</td>
<td>185.37</td>
<td>198.82</td>
<td>207.82</td>
</tr>
<tr>
<td>Integrated capacity of nuclear power</td>
<td>6.40</td>
<td>6.40</td>
<td>8.49</td>
<td>12.75</td>
<td>17.02</td>
</tr>
<tr>
<td>Integrated capacity from new energy generator units (MW)</td>
<td>40030</td>
<td>65480</td>
<td>92470</td>
<td>120260</td>
<td>165860</td>
</tr>
<tr>
<td>Including integrated capacity of wind power</td>
<td>35190</td>
<td>56760</td>
<td>59590</td>
<td>87900</td>
<td>116640</td>
</tr>
<tr>
<td>Integrated capacity of PV power</td>
<td>2320</td>
<td>3330</td>
<td>14290</td>
<td>24450</td>
<td>44465</td>
</tr>
<tr>
<td>On-grid power from clean energy generator units (TWh)</td>
<td>594.3</td>
<td>717.7</td>
<td>767.9</td>
<td>921.8</td>
<td>1011.7</td>
</tr>
<tr>
<td>Including: on-grid hydropower</td>
<td>437.3</td>
<td>551.8</td>
<td>568.3</td>
<td>651.1</td>
<td>669.8</td>
</tr>
<tr>
<td>On-grid nuclear power</td>
<td>41.6</td>
<td>47.5</td>
<td>60.6</td>
<td>73.0</td>
<td>101.9</td>
</tr>
<tr>
<td>On-grid power from new energy generator units</td>
<td>115.4</td>
<td>118.4</td>
<td>139.0</td>
<td>197.742</td>
<td>239.940</td>
</tr>
</tbody>
</table>

### Comprehensive Power Conservation

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power saved by lowering the line loss (TWh)</td>
<td>2.310</td>
<td>1.05</td>
<td>1.89</td>
<td>17.1</td>
<td>10.4</td>
</tr>
<tr>
<td>Generation rights transactions (TWh)</td>
<td>105.939</td>
<td>109.748</td>
<td>113.848</td>
<td>116.785</td>
<td>113.154</td>
</tr>
<tr>
<td>Electricity replacement capacity (TWh)</td>
<td>—</td>
<td>—</td>
<td>14.0</td>
<td>50.3</td>
<td>76.0</td>
</tr>
</tbody>
</table>

### EV Development

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total EV charging and battery swapping stations</td>
<td>251</td>
<td>359</td>
<td>400</td>
<td>618</td>
<td>1537</td>
</tr>
<tr>
<td>Total EV charging and battery swapping poles</td>
<td>15000</td>
<td>18000</td>
<td>19700</td>
<td>24000</td>
<td>29600</td>
</tr>
</tbody>
</table>

### Carbon Dioxide Emission Reduction

<table>
<thead>
<tr>
<th>Year</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission reduced by clean energy accommodation (Thousand tons)</td>
<td>442854</td>
<td>552649.3</td>
<td>668291.3</td>
<td>741620</td>
<td>813230</td>
</tr>
<tr>
<td>Emission reduced by lowering the line loss (Thousand tons)</td>
<td>1900.4</td>
<td>853.2</td>
<td>1500</td>
<td>13700</td>
<td>8200</td>
</tr>
</tbody>
</table>
# Comprehensive Analysis of Key Indicators

## Revenue Growth (%)

Compare the revenue growth with world top 10 energy companies in 2014.

<table>
<thead>
<tr>
<th>Company</th>
<th>Revenue Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEPCO</td>
<td>10.56</td>
</tr>
<tr>
<td>SSE</td>
<td>4.83</td>
</tr>
<tr>
<td>SGCC</td>
<td>2.17</td>
</tr>
<tr>
<td>CFE</td>
<td>-0.38</td>
</tr>
<tr>
<td>EDF</td>
<td>-2.67</td>
</tr>
<tr>
<td>ENEL</td>
<td>-5.96</td>
</tr>
<tr>
<td>RWE</td>
<td>-6.32</td>
</tr>
<tr>
<td>TEPCO</td>
<td>-6.53</td>
</tr>
<tr>
<td>Kansai</td>
<td>-6.73</td>
</tr>
<tr>
<td>Electric</td>
<td>-6.83</td>
</tr>
<tr>
<td>Power</td>
<td>Co.</td>
</tr>
<tr>
<td>Iberdrola</td>
<td>-8.53</td>
</tr>
</tbody>
</table>

## Asset-Liability Ratio (%)

Compare the asset–liability ratio with world top 10 energy companies in 2014.

<table>
<thead>
<tr>
<th>Company</th>
<th>Asset-Liability Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGCC</td>
<td>56.10</td>
</tr>
<tr>
<td>KEPCO</td>
<td>62.63</td>
</tr>
<tr>
<td>SSE</td>
<td>67.26</td>
</tr>
<tr>
<td>E.ON</td>
<td>73.90</td>
</tr>
<tr>
<td>ENEL</td>
<td>80.44</td>
</tr>
<tr>
<td>Iberdrola</td>
<td>81.09</td>
</tr>
<tr>
<td>TEPCO</td>
<td>85.56</td>
</tr>
<tr>
<td>CFE</td>
<td>86.77</td>
</tr>
<tr>
<td>EDF</td>
<td>86.87</td>
</tr>
<tr>
<td>RWE</td>
<td>87.51</td>
</tr>
<tr>
<td>Kansai</td>
<td>87.75</td>
</tr>
<tr>
<td>Electric</td>
<td>Power Co.</td>
</tr>
</tbody>
</table>

## Total Assets Turnover (Times/year)

Compare the total assets turnover with world top 10 energy companies in 2014.

<table>
<thead>
<tr>
<th>Company</th>
<th>Total Assets Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSE</td>
<td>1.46</td>
</tr>
<tr>
<td>E.ON</td>
<td>0.91</td>
</tr>
<tr>
<td>SGCC</td>
<td>0.69</td>
</tr>
<tr>
<td>CFE</td>
<td>0.59</td>
</tr>
<tr>
<td>EDF</td>
<td>0.47</td>
</tr>
<tr>
<td>ENEL</td>
<td>0.44</td>
</tr>
<tr>
<td>RWE</td>
<td>0.38</td>
</tr>
<tr>
<td>TEPCO</td>
<td>0.37</td>
</tr>
<tr>
<td>Kansai</td>
<td>0.33</td>
</tr>
<tr>
<td>Electric</td>
<td>Power Co.</td>
</tr>
<tr>
<td>Iberdrola</td>
<td>0.29</td>
</tr>
</tbody>
</table>

## Highest Voltage Level (kV)

Compare the highest voltage level of power grid with some countries in 2014.

<table>
<thead>
<tr>
<th>Country</th>
<th>Highest Voltage Level (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGCC</td>
<td>1000</td>
</tr>
<tr>
<td>The US</td>
<td>765</td>
</tr>
<tr>
<td>India</td>
<td>765</td>
</tr>
<tr>
<td>Russia</td>
<td>750</td>
</tr>
<tr>
<td>Japan</td>
<td>500</td>
</tr>
<tr>
<td>Germany</td>
<td>400</td>
</tr>
<tr>
<td>France</td>
<td>400</td>
</tr>
<tr>
<td>The UK</td>
<td>400</td>
</tr>
</tbody>
</table>

## Ratio of Trans-regional and Trans-national Power Transmission (%)

Compare with the ratio of trans–regional and trans–national power transmission from other countries.

<table>
<thead>
<tr>
<th>Country</th>
<th>Ratio of Trans-regional and Trans-national Power Transmission (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGCC</td>
<td>18.49</td>
</tr>
<tr>
<td>France</td>
<td>14.81</td>
</tr>
<tr>
<td>Germany</td>
<td>10.21</td>
</tr>
<tr>
<td>Russia</td>
<td>2.63</td>
</tr>
<tr>
<td>The UK</td>
<td>0.76</td>
</tr>
<tr>
<td>India</td>
<td>0.39</td>
</tr>
<tr>
<td>Japan</td>
<td>0.02</td>
</tr>
<tr>
<td>The US</td>
<td>0.00</td>
</tr>
</tbody>
</table>

## Integrated Capacity of Clean Energy (GW)

Compare the integrated capacity of clean energy with some countries in 2014.

<table>
<thead>
<tr>
<th>Country</th>
<th>Integrated Capacity of Clean Energy (GW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGCC</td>
<td>331.83</td>
</tr>
<tr>
<td>The US</td>
<td>17.26</td>
</tr>
<tr>
<td>Germany</td>
<td>71.70</td>
</tr>
<tr>
<td>India</td>
<td>69.36</td>
</tr>
<tr>
<td>Japan</td>
<td>52.28</td>
</tr>
<tr>
<td>Russia</td>
<td>51.40</td>
</tr>
<tr>
<td>France</td>
<td>39.36</td>
</tr>
<tr>
<td>The UK</td>
<td>19.44</td>
</tr>
</tbody>
</table>
### Key Indicators for the 12th Five Year Plan

#### Economic Performance: Data of the End of 11th Five Year Plan VS. Data of the End of 12th Five Year Plan

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Year</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of 110kV (and above) transmission lines</td>
<td>km</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>609000</td>
<td>889900</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity sales</td>
<td>TWh</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>2689.1</td>
<td>3450.6</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue</td>
<td>billion RMB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>1531.8</td>
<td>2075.0</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owned patents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>6528</td>
<td>50165</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall productivity</td>
<td>RMB yuan per person per year</td>
<td></td>
<td>403000</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Social Performance: Data of the End of 11th Five Year Plan VS. Data of the End of 12th Five Year Plan

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>Year</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>The average gap between urban and rural annual blackout time</td>
<td>Hour/household</td>
<td>2010</td>
<td>23.66</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incremental number of people connected to electricity in rural areas</td>
<td>Thousand people</td>
<td>2010</td>
<td>5090</td>
<td>7500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans-regional and trans-provincial transmission capacity</td>
<td>TWh</td>
<td>2010</td>
<td>0.04</td>
<td>0.159</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centralized tendering volume</td>
<td>billion RMB</td>
<td>2010</td>
<td>175.1</td>
<td>507.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct investment in employees’ training</td>
<td>billion RMB</td>
<td>2010</td>
<td>1.78</td>
<td>2.486</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Environmental Performance: Data of the End of 11th Five Year Plan VS. Data of the End of 12th Five Year Plan

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit</th>
<th>Year</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated capacity from clean energy generator units</td>
<td>GW</td>
<td>2010</td>
<td>175.85</td>
<td>390.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-grid power from clean energy generator units</td>
<td>TWh</td>
<td>2010</td>
<td>490.3</td>
<td>1011.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power saved by lowering the line loss</td>
<td>TWh</td>
<td>2010</td>
<td>4.0</td>
<td>10.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total EV charging and battery swapping stations</td>
<td></td>
<td>2010</td>
<td>87</td>
<td>1537</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total EV charging and battery swapping spots</td>
<td></td>
<td>2010</td>
<td>8000</td>
<td>29600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Commitment

Never stop improving
Global Energy Interconnection

Promote an innovative development of global energy interconnection

Look forward to SGCC’s leadership and enthusiasm to participate in addressing climate change challenges and create a safer, healthier, more prosperous world for the mankind at present and in the future.

— UN Secretary-General Ban Ki-moon

Build strong grids. Accelerate the construction of UHV grid. SGCC will build two synchronous grids in eastern and western regions by 2020 and integrate these 2 grids into a unified grid in 2025. It implements “1U4G” strategy to promote the development of large-scale energy base, distributed generation and micro-grid.

Achieve grid interconnection with neighboring countries. Accelerate interconnection project with neighboring countries such as Russia, Mongolia, Kazakhstan, Pakistan, Myanmar, Laos, Nepal and Thailand. The interconnection with neighboring countries will be realized within a decade.

The construction of global energy interconnection has three phases. From now on to 2020, accelerate the clean energy development and domestic interconnection in all countries to boost their grid allocation capability, intellectualization and the proportion of clean energy. From 2020 to 2030, accelerate interconnection of large energy bases and grids within a continent to realize large-capacity, large scale, efficient, optimal allocation of clean energy. From 2030 to 2050, accelerate the construction of energy bases at the North Pole and the Equator (wind power at the North Pole and solar power at the Equatorial regions). Global energy interconnection basically comes into being.
Economic Performance

- Keep the debt-asset ratio under 56.7%.
- Invest over RMB400 billion in power grid construction.
- Promote 50 pilot projects of the new-generation smart substations to put into operation 46,000km AC lines of 110(66) kV (and above) with a transformation capacity of 240GVA.
- Improve the grid construction of the Northwest Main Grid 750kV HVDC Transmission Project.
- Approve and start building two 500kV projects for Air Pollution Prevention and Control Action Plan.
- Enhance the reliability and improve management in 30 key cities and 30 non-key cities.
- Urban distribution automation reaches over 50% in key cities.
- Invest RMB7.08 billion in R&D.
- Line loss is no more than 6.9%.
- Electricity sales reach 3,635TWh.
- Complete power trade of 720TWh in the National Power Market.
- Deploy 60.6 million smart meters.

Social Performance

- Prevent massive blackouts and accidents and reduce security incidents.
- Provide electricity access for 45 thousand households and 188 thousand people without access to electricity.
- Reliability of urban power supply reaches 99.975%.
- Reliability of rural power supply reaches 99.90%.
- The average gap between urban and rural annual blackout time is reduced to 6.57 hours per household.
- Solve the undervoltage problem for 5.05 million rural households within the year.
- Solve the weak links between 21 county-level grids and the main grid.
- Accomplish 330 thousand tasks with power uninterrupted on the distribution grid.
- Build a total of 342 smart grid pilot and demonstration projects.
- Staff training coverage rate is over 94.5%.

Environmental Performance

- Accomplish 65TWh of electricity replacement.
- Build three lines and one circle of inter-city highway quick charge network (Beijing-Taipei Highway, Shanghai-Chengdu Highway, Shenyang-Haikou Highway, and Yangtze-River Delta region).
- Speed up the construction of transmission channels for hydropower from Southwest China and from new energy bases.
- Accelerate the construction of pumped storage power stations in Xianju of Zhejiang, and Wendeng and Yimeng of Shandong.
- Complete the acceptance of provincial SF6 recycling centers.

Fulfilled commitments for 2015

Economic Performance

- The debt-asset ratio is 55.4%.
- Grid investment was RMB452.1 billion.
- Promote 50 pilot projects of the new-generation smart substations to put into operation 46,000km AC lines of 110(66) kV (and above) with a transformation capacity of 240GVA.
- The grid construction of the Northwest Main Grid 750kV HVDC Transmission Project was improved.
- 3 500kV projects for Air Pollution Prevention and Control Action Plan were in smooth progress.
- Enhance the reliability and improve management in 30 key cities and 30 non-key cities.
- Urban distribution automation reached 55.75% in key cities.
- Invest RMB7.376 billion in R&D.
- Line loss was 6.78%.
- Electricity sales reached 3,450.6TWh.
- Complete power trade of 722.1TWh in the National Power Market.
- Deploy 64.5 million smart meters.

Social Performance

- Prevent massive blackouts and accidents and reduce security incidents.
- Bring power access to 210,000 people.
- Reliability of urban power supply reached 99.957%.
- Reliability of rural power supply reached 99.85%.
- The average gap between urban and rural annual blackout time was 9.4 hours per household.
- Solve the undervoltage problem for 6.635 million rural households within the year.
- Solve the weak links between 21 county-level grids and the main grid.
- Accomplish 571,800 tasks with power uninterrupted on the distribution grid.
- Build a total of 342 smart grid pilot and demonstration projects.
- Staff training coverage rate was 94.55%.

Environmental Performance

- Accomplish 140.3TWh of electricity replacement.
- Build three lines and one circle of inter-city highway quick charge network (Beijing-Taipei Highway, Shanghai-Chengdu Highway, Shenyang-Haikou Highway, and Yangtze-River Delta region).
- Speed up the construction of transmission channels for hydropower from Southwest China and from new energy bases. Jiuquan-Hunan UHV DC Project began construction.
- Accelerate the construction of pumped storage power station in Xianju of Zhejiang. Six pumped storage power stations in Wendeng and Yimeng of Shandong, Tianchi of Henan and etc. began construction.
- Complete the acceptance of provincial SF6 recycling centers.
**Commitments for 2016**

**Economic Performance**

- Electricity sales reach 3,583TWh.
- Complete power trade of 729TWh in the National Power Market.
- Investment in fixed assets RMB456.8 billion.
- Grid investment no less than RMB439 billion.
- Total assets RMB3.3 trillion.
- Added economic value RMB21 billion.
- Revenue RMB2,100 billion.
- Build 76,000 kilometers 110(66) kV (and above) lines with a transformation capacity of 550GVA.
- Put into operation 47,000 kilometers 110 (66) kV (and above) lines with a transformation capacity of 310GVA.

**Social Performance**

- Bring electricity access to 13,000 natural villages within the year.
- Finish electric power upgrade projects in 27,000 natural villages.
- Begin the construction of 20 condensers during the year.
- Improve Northwest 750kV backbone grid.
- Expand the application scope of advanced technologies of new generation smart stations.
- Newly deploy 60,580,000 smart meters.
- Promote the metering of electricity, water, gas and heating “four in one”.

**Environmental Performance**

- Accomplish 100TWh of electricity replacement.
- Build and put into operation the pumped storage power stations in Xianju of Zhejiang and Hongping of Jiangxi.
- Speed up the construction of transmission channels for hydropower from Southwest China and from new energy bases.

- Overall productivity exceeds RMB686,000 per person-year.
- Asset-liability ratio no higher than 56.5%.
- Begin the construction of ±660 DC project in Pakistan.
- Put into operation 3 AC and 1 DC UHV projects within the year.
- Totally build 352 smart grid pilot and demonstration projects.
- The automation coverage of urban distribution grid in Chongqing exceeds 65%.
- R&D costs RMB66.6 billion.
- The line loss is no higher than 6.8%.

- Reliability of urban power supply reaches 99.964%.
- Reliability of rural power supply reaches 99.855%.
- The average gap between urban and rural annual blackout time is reduced to 9.5 hours per household.
- Solve the undervoltage problem for 2.365 million rural households within the year.
- Accomplish 800 thousand tasks with power uninterrupted on the distribution grid.
- Staff training coverage rate is over 94.6%.

- Strengthen management and standardize SF₆ recycle.
- Newly build 2,450 charge stations and 280,000 charging poles during the year.
- Realize the interconnection of all cities in Beijing-Tianjin-Hebei-Shandong and the Yangtze-River Delta regions. Build a quick public charge network within a radius of less than 3km in key cities.
Review of the 12th Five Year Plan

The five years that witness SGCC’s leapfrog development

- In the 12th Five Year Plan period, investment on power grid totaled RMB 1.8 trillion. The line length and transformation capacity for 110 (66) kV and above transmission lines increased by 46% and 64% respectively. Trans-regional and trans-provincial transmission capability increased by 2.5 times.
- A total of 3 AC and 4 DC UHV projects were built and another 4 AC and 5 DC UHV projects are under construction. Transmission lines and transforming (converting) capacity under construction reach 28,800 km and 294GVA (GW).
- Two “Heavenly Roads of Electricity” from Qinghai to Tibet and Sichuan to Tibet have been constructed, marking the completion of national power grid interconnection except for Taiwan.
- Continue to increase investment in the distribution grid. Investment on 110kV (and below) distribution grid accounts for 52% of the total. Annual outage time for urban and rural users is reduced by 5 hours and 18.8 hours respectively.
- The company is leading in smart grid theoretical research, technical standards, testing system and engineering practices. It has constructed a batch of smart grid demonstration projects like the National Wind/PV/Energy Storage and Smart Transmission Demonstration Project in Zhangbei and Sino-Singapore Tianjin Eco-city.

The five years when SGCC was open and marching towards the world.

- It successfully invested and operated energy backbone grids in six countries and regions. The overseas assets reached USD 38 billion, with profits of USD 1.1 billion, an increase of 5.6 times and 5.2 times respectively than that in 2010.
- SGCC won the bid for Brazil’s Belo Monte Hydropower UHV Transmission Project and other large grid EPC projects in Ethiopia, India, Poland and other countries. Its overseas project contracts and equipment export value reached USD billion and USD 1.8 billion respectively.
- Energy cooperation with neighboring countries was deepening and SGCC’s voice and influence in the field of energy and electricity in the world has been significantly enhanced.

The five years with significantly improved R&D innovation capability

- A total of RMB 34.6 billion was invested in R & D. A fully functional, world’s leading UHV and big power grid experimental research system was established. The company now has 18 national laboratories and the world’s largest electric power and telecommunication network and corporate information systems.
- The company obtained a number of achievements with independent intellectual property rights that occupy the commanding heights of the world grid technology. It won 19 National Science and Technology Awards, 221 China Electric Power Research Awards and 46 China Patent Awards. It obtained 50,165 patents in total, an increase of 6.7 times than 2010, ranking first among all the central SOEs. It led the compilation of 22 international standards, 839 national standards and industrial standards.

The five year with major reforms in system

- It comprehensively built a 3I5G system with economized management, conglomerate business, shared resources and efficient operation. It established a modern corporate management structure of the collaborative mechanism in economy, politics, culture, society and ecology.
- It has built the world’s leading power grid control center, operation monitoring center and call center. 34,800 substations are running unattended.
- It strengthened management on county power supply enterprises and township power supply stations, and completed the equity reform for 886 county power supply enterprises and enhanced healthy development and management.

The five years in which operating performance is significantly improved

- The company realized RMB401.1 billion profits and paid RMB932.9 taxes, both increased 2-fold and 1-fold respectively than that in the 11th Five Year. Revenue was over RMB2 trillion, with an average annual increase of 6.3%, ranking first among all the central SOEs. Total assets surpassed the milestone of RMB3 trillion with an average annual increase of 8.4%. Debt ratio was reduced by 6.4 percentage point compared with 2010.
- The company raised low-cost funds of RMB 910.8 billion domestically and USD 6.6 billion internationally, generating interest expense savings of RMB 54.7 billion. For three consecutive years, it has been awarded Sovereign Credit Rating by three international rating agencies.
- The total account of centralized bidding for materials reached RMB 1.7646 trillion, saving RMB 164.5 billion. Industry, finance and international business’ contribution to company profit increased from 25% to 46.2%.

The five years of comprehensive fulfillment of three major responsibilities

- The newly added integrated installed capacity was 420GW. The installed capacity of wind power and PV generation was increased by 3.1 times and 48 times respectively compared with 2010. SGCC has the world’s biggest integrated wind power capacity and the fastest PV generation growth. It accommodated 3,756.8TWh of renewable energy in these five years, reducing coal consumption by 1.19 billion tons, cutting CO2 emissions by 2.97 billion tons, SO2 emissions by 89.25 million tons and NOx emissions by 44.62 million tons.
- Total investment reached RMB 38.1 billion and electricity problems for 1.92 million households and 7.5 million people were settled and the goal of ‘Power for All’ was realized.
- The company successfully completed major disaster relief and guaranteed power supply for major events.
- Central government supervision, national audit and people oversight promoted the management of the company according to law.
- The brand of “SGCC” held a stable ranking of the 2nd of Chinese Top 500 Most Valuable Brands. It has been releasing its CSR report for 10 consecutive years.
Comprehensively build a modern company with “A Strong Grid, Excellent Assets, Services and Performance”.

**A Strong Grid**: establish two synchronous grids in East and West China, and forming a strong, extensively integrated, highly intelligent, open and interactive modernized grid with internationally advanced security capability, resource allocation capability and green development capacity.

Over 1,290,000 km of 110kV (and above) lines

Transformation capacity 6.1 TWA

Trans-national, trans-regional and trans-provincial transmission capacity 370 GW

**Excellent Assets**: significantly improve the asset utilization efficiency and corporate profitability, and expand the size of international assets, industrial and financial business.

- **Fixed asset investment**: RMB 2.7 trillion
- **Total assets**: RMB 4.5 trillion
- **Overseas asset investment**: Over USD 10 million
- **Asset-liability ratio**: 60.2%

**Excellent Services**: provide safe, reliable, cost-effective quality services to the electricity customers and market players, best meeting the electricity demand for economic and social development.

- Average blackout time for urban users drops 2.3 hours
- Average blackout time for rural users drop 8.3 hours

**Excellent performance**: safety, quality, efficiency, effectiveness and other major indicators reach international advanced level.

- **Electricity sales**: 4,400 TWh
- **Revenue**: RMB 2.6 trillion
- **Overall productivity**: RMB 1,050,000 per person per year
- **Added economic value**: RMB 27 billion

**Modern Company**: build an innovation-leading, powerful and modern enterprise group with scientific management, and core competitiveness, value creation and brand influence reaching the international advanced level.

- “3I5G” system continues to improve and run efficiency.
- Form the corporate structure of 2-tier legal persons and three-level management.

Implement “SGCC Sunshine Poverty Relief Action”

From 2016, we started to use solar energy resources in poor areas to construct photovoltaic power generation projects. The income is for poverty relief so that poor villages and households have a long-term, stable and sustainable income. It includes three major projects: “Power for each village” project, poverty alleviation by photovoltaic integration projects, and targeted poverty alleviation projects in five counties. The total project investment is RMB 36.7 billion and the average annual investment totals RMB 12.23 billion.

- **Population of point-to-point poverty relief**: 319,000
- **Investment on SGCC Sunshine Poverty Relief Action**: RMB 36.7 billion
- **Annually accommodated electricity fueled by clean energy**: 2,200 TWh
- **Cut CO₂ emissions by**: 1.78 billion tons
- **Cut SO₂ emissions by**: 880,000 tons

Outlook for the 13th Five Year Plan

**A Strong Grid**: establish two synchronous grids in East and West China, and forming a strong, extensively integrated, highly intelligent, open and interactive modernized grid with internationally advanced security capability, resource allocation capability and green development capacity.

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- Form the corporate structure of 2-tier legal persons and three-level management.

**Promote the construction of global energy interconnection**

Led by the construction of global energy interconnection: give full play to the role of global energy interconnection as an organizer, deepen strategic research on global energy interconnection, and strengthen key scientific and technological research on UHV transmission at a higher voltage, new large-scale energy storage, large power grid safe operation and control.

- Create a powerful force for common development of global energy interconnection
- Promote the demonstration projects for national and intercontinental grid interconnection with neighboring countries.
- Achieve breakthroughs in key technologies, equipment manufacturing, and standard-setting.

Accelerate the construction of Chinese energy interconnection: put into operation of 19 HVDC projects, with a total UHV line length of 95,000 km and a transforming (converting) capacity of 890 GW (GW). Distribution grid adapts to the rapid development of electric vehicles, distributed power integration and diverse needs of customers. Power grids at all levels can achieve safe, economical and efficient operation.

- **Integrated installed capacity of renewable energy in China**: 570 GW
- **The proportion of non-fossil energy in primary energy consumption raises to**: 15.5%
- **Annually accommodated electricity fueled by clean energy**: 2,200 TWh
- **Cut CO₂ emissions by**: 1.78 billion tons
- **Cut SO₂ emissions by**: 880,000 tons
### CSR fulfillment in 2015 and commitment for 2016 from provincial companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Featured CSR fulfillment from provincial companies in 2015</th>
<th>Featured CSR commitment from provincial companies for 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing Electric Power Company</td>
<td>Accomplish 6 auxiliary transmission and transformation projects for 4 thermoelectric centers. Reduce annual coal consumption by 9.2 million tons in the capital.</td>
<td>The annual blackout time for urban users in key areas is no more than 5 minutes</td>
</tr>
<tr>
<td>Tianjin Electric Power Company</td>
<td>Launch installation application services for individual new energy vehicle charge in 112 business halls in the city</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>9.2</strong> million tons</td>
<td><strong>5 minutes</strong></td>
</tr>
<tr>
<td>Hebei Electric Power Company</td>
<td>Construct 44 EV charging stations on highways, covering Beijing-Shanghai Highway, Beijing-Hong Kong-Macao Highway, and Qinghai-Yinchuan Highway, which promoted the extensive application of electric vehicles</td>
<td>Support the development of new energy. Integrate over 12GW of installed capacity of new energy in the region</td>
</tr>
<tr>
<td>Jibei Electric Power Company</td>
<td>Promote various electricity replacement technologies and advance the replacement of coal-fired heating by electricity in cities and townships. Finish the replacement of coal by electricity for 200,000 households</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>44</strong> households</td>
<td><strong>10GW</strong></td>
</tr>
<tr>
<td>Shanxi Electric Power Company</td>
<td>Obtain the preliminary land clearance documents for 3 UHV stations, namely, Northern Shanxi converter station, Northern Shanxi AC station, and Central Shanxi AC station</td>
<td>Stimulate electricity replacement. Well implement the projects of replacing coal by electricity in key cities like Jinan, and accomplish 9TWh of replacing electricity</td>
</tr>
<tr>
<td>Shandong Electric Power Company</td>
<td>Promote the quick charge network construction on highways and in cities. Finish the construction of 38 charging stations on highways and 6 municipal charging stations</td>
<td>Upgrade distribution grid and improve rural grids in 25,000 administrative villages</td>
</tr>
<tr>
<td></td>
<td><strong>3</strong></td>
<td><strong>25,000</strong></td>
</tr>
<tr>
<td>Shanghai Electric Power Company</td>
<td>Accomplish the maintenance and upgrade of power supply facilities before power meters in 6,500 old residential communities</td>
<td>Promote the operation and development of smart consumption and develop smart zones and smart communities. Establish smart communities for 200,000 households</td>
</tr>
<tr>
<td>Jiangsu Electric Power Company</td>
<td>Continue implementing the bright project and finish the maintenance and upgrade of power supply facilities before power meters in 900,000 households</td>
<td></td>
</tr>
</tbody>
</table>
### SGCC CSR Report 2015 - The Commitment

**SGCC CSR Report 2015·The Commitment**

<table>
<thead>
<tr>
<th><strong>Zhejiang Electric Power Company</strong></th>
<th><strong>Anhui Electric Power Company</strong></th>
<th><strong>Hubei Electric Power Company</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Finish the rural power line upgrade in 12,900 villages in the province</td>
<td>2016 Construct a smart, interactive service innovation system of “Internet + electricity marketing”, and provide e-services for 5,000,000 power users</td>
<td>2016 Promote the integration of 15,000 PV poverty relief projects into the power grid and provide purchasing fees and subsidies in time</td>
</tr>
<tr>
<td><strong>12,900</strong></td>
<td><strong>5,000,000 households</strong></td>
<td><strong>9,209 households</strong></td>
</tr>
<tr>
<td><strong>10 kV</strong></td>
<td><strong>2.9 TWh</strong></td>
<td><strong>1.2 million households</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Fujian Electric Power Company</strong></th>
<th><strong>Hunan Electric Power Company</strong></th>
<th><strong>Henan Electric Power Company</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Reinforce the construction and transformation on distribution grid. All towns have power supply on 10kV double-circuit power lines</td>
<td>2016 Promote electricity replacement in energy consumption and realize 2.9TWh of electricity replacement</td>
<td>2016 Accommodate a total of 52TWh of hydropower within the province or power purchased outside the province, accounting for 37.4% of the total power consumption</td>
</tr>
<tr>
<td><strong>10 kV</strong></td>
<td><strong>2.9 TWh</strong></td>
<td><strong>52 TWh</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Hunan Electric Power Company</strong></th>
<th><strong>Henan Electric Power Company</strong></th>
<th><strong>Jiangxi Electric Power Company</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Construct 4 smart grid projects and reduce environmental pollution in production and maintenance</td>
<td>2016 Accomplish electric power facility upgrade in 1,000 administrative villages of the “key livelihood projects”</td>
<td>2016 Accelerate the roof-top PV Generation project on urban and rural residential buildings. Strive to install this project on 10,000 households in three years</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td><strong>1,000</strong></td>
<td><strong>4.5 million households</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Jiangxi Electric Power Company</strong></th>
<th><strong>Sichuan Electric Power Company</strong></th>
<th><strong>Liaoning Electric Power Company</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Accelerate the roof-top PV Generation project on urban and rural residential buildings. Install this project on 5,513 households integrating 278.5MW of electricity</td>
<td>2016 Accelerate the roof-top PV Generation project on urban and rural residential buildings. Strive to install this project on 10,000 households in three years</td>
<td>2016 Upgrade the county-level and rural power grids in Ganzi, Aba and Liangshan and solve the under voltage problems for 1,470,000 households</td>
</tr>
<tr>
<td><strong>5,513 households</strong></td>
<td><strong>10,000 households</strong></td>
<td><strong>1,470,000 households</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Chongqing Electric Power Company</strong></th>
<th><strong>Liaoning Electric Power Company</strong></th>
<th><strong>Stakeholders</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2015 Solve under-voltage problem for 6,000 districts</td>
<td>2016 Promote the “Warm Winter Programme” to cover all the primary and secondary schools in high altitude before the end of the year and use electricity for heating</td>
<td>2016 Govern the under-voltage problems for 76,535 households and benefit 267,300 people</td>
</tr>
<tr>
<td><strong>6,000</strong></td>
<td><strong>9.2 GW</strong></td>
<td><strong>267,300 people</strong></td>
</tr>
</tbody>
</table>

**Note:** The numbers and details provided are estimates or targets set for the respective years (2015-2016) and projects.
<table>
<thead>
<tr>
<th>Company</th>
<th>Year</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jilin Electric Power Company</td>
<td>2015</td>
<td>Solve the under-voltage problem for rural areas and the investment in upgrading rural grid reached RMB 268 million</td>
</tr>
<tr>
<td></td>
<td></td>
<td>268 million</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>Invest RMB 500 million in rural grid projects and solve the under voltage problem for 950,000 rural households</td>
</tr>
<tr>
<td></td>
<td></td>
<td>950,000 households</td>
</tr>
<tr>
<td>Heilongjiang Electric Power Company</td>
<td>2015</td>
<td>Accommodate 7.4TWh of wind power, accounting for 10.7% of the total electricity sales</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.4 TWh</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>Accommodate 7.8TWh of wind power, accounting for 11% of the total electricity sales</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.8 TWh</td>
</tr>
<tr>
<td>East Inner Mongolia Electric Power Company</td>
<td>2015</td>
<td>Accommodate 15.4TWh of wind power, accounting for 53% of the total electricity sales</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15.4 TWh</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>Accommodate 16.5TWh of wind power, accounting for 54.64% of the total electricity sales</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16.5 TWh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support the relocation for Shaanxi immigrants and provide electric power to over 1,000 relocation settlements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,000</td>
</tr>
<tr>
<td>Shaanxi Electric Power Company</td>
<td>2015</td>
<td>Promote 50,000 smart phone purchase terminals so that users can buy electricity without leaving home</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50,000</td>
</tr>
<tr>
<td>Gansu Electric Power Company</td>
<td>2015</td>
<td>Serve the development of new energy and integrate over 17GW of installed capacity of new energy in the region</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17 GW</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>Step up targeted dynamic electricity access for poverty alleviation projects to ensure every household in 6,220 poor villages to have access to electric lighting and natural villages to have access to dynamic power</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6,220 villages</td>
</tr>
<tr>
<td>Qinghai Electric Power Company</td>
<td>2015</td>
<td>Implement the reconstruction of “One Household, One Meter” project that benefits the people. Finish this task for 40,000 households with high quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40,000 households</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>Accommodate over 10TWh of electricity fueled by new energy like PV and wind power</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 TWh</td>
</tr>
<tr>
<td>Ningxia Electric Power Company</td>
<td>2015</td>
<td>Set time limit for customer’s installation application and electricity access. Under-voltage residential customers will get electricity access within two working days since the day they apply for the service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 working days</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>Support new energy generation and integration. The installed capacity of wind and PV generation will reach 30% of the total integrated installed capacity of Ningxia’s grid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30%</td>
</tr>
<tr>
<td>Xinjiang Electric Power Company</td>
<td>2015</td>
<td>Export 28TWh of electricity out of Xinjiang</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 TWh</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>Export 31.4TWh of electricity out of Xinjiang</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.4 TWh</td>
</tr>
<tr>
<td>Tibet Electric Power Company</td>
<td>2015</td>
<td>The main grid supplies power to 524,800 households in 58 counties</td>
</tr>
<tr>
<td></td>
<td></td>
<td>524,800 households</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>Add three new ways to pay the bill: postal savings, Alipay and Unionpay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
## CSR Fulfillment in 2015 and Commitment for 2016 from Subsidiaries Directly Managed by SGCC

<table>
<thead>
<tr>
<th>Subsidiary/Institute</th>
<th>2015 Fulfillment</th>
<th>2016 Commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>China Electric Power Research Institute</td>
<td>The accuracy rate of test reports issued for the third party reaches 100%.</td>
<td>The accuracy rate of test reports issued for the third party reaches 100%.</td>
</tr>
<tr>
<td>State Power Economic Research Institute</td>
<td>Construct a planning and consulting agency that is authoritative in grid and UHV planning and research, leading the direction of modern distribution grid development, and dominating the area for grid construction consultation. Serve the construction of strong and smart grid.</td>
<td>Completion rate for UHV feasibility study and technical reasoning reaches 100%, and completion rate for all types of project appraisal and research tasks reaches 100%.</td>
</tr>
<tr>
<td>State Grid Energy Research Institute</td>
<td>Release at least 8 fundamental research annual reports on energy and electric power.</td>
<td>Release at least 8 fundamental research annual reports on energy and electric power.</td>
</tr>
<tr>
<td>State Grid Smart Grid Research Institute</td>
<td>Process 293 patents, including 232 patents for invention. Acquire authorization of 109 patents including 54 patents for invention. Apply for 10 international patents.</td>
<td>Process 300 patents, including 236 patents for invention. Acquire authorization of 113 patents including 56 patents for invention. Apply for 10 international patents.</td>
</tr>
<tr>
<td>SGCC Advanced Training Center</td>
<td>Organize trainings of 103,100 person-day.</td>
<td>Organize training and application in &quot;Internet +&quot;.</td>
</tr>
<tr>
<td>State Grid Institute of Technology (Youth League School)</td>
<td>Organize trainings of 1,600,000 person-times. The satisfaction rate of training quality is over 91%.</td>
<td>Organize trainings of 2,000,000 person-times. The satisfaction rate of training quality is over 91%.</td>
</tr>
<tr>
<td>State Grid Operation Company</td>
<td>The forced energy unavailability of converter stations in the service area is 0.11%.</td>
<td>The forced energy unavailability of converter stations in the service area is 0.2%.</td>
</tr>
<tr>
<td>SGCC Call Center</td>
<td>Ensure customer satisfaction rate is over 98%.</td>
<td>Satisfaction rate of 95598 hotline is no less than 98%.</td>
</tr>
<tr>
<td>NARI Group Corporation (SGCC Electric Power Research Institute)</td>
<td>Supply 2,400 equipment sets for wind power and PV power integration.</td>
<td>Accelerate the cultivation of strategic emerging industries, focusing on breakthroughs in key technologies and products concerning global energy interconnection, environmental protection and energy saving, smart city, carbon trading and carbon asset management and others. More than 20 achievements have been certified.</td>
</tr>
<tr>
<td>China Electric Power Equipment and Technology Co., Ltd (State Grid Project Management Company)</td>
<td>Newly sign 9 international EPC projects and finish 4 of signed domestic and foreign EPC projects.</td>
<td>Newly sign 4 international EPC projects.</td>
</tr>
<tr>
<td>State Grid XinYuan Co., Ltd (State Grid XinYuan Hydropower Co., Ltd)</td>
<td>Manage an installed capacity of 44.18GW.</td>
<td>The installed capacity of pumped storage in operation and under construction reaches 33.67GW.</td>
</tr>
<tr>
<td>State Grid International Development Co., Ltd</td>
<td>The equipment operation availability exceeds 99% for SGBH. The system availability on Luzon Island in the Philippines exceeds 99%.</td>
<td>The system availability of the grids of NGCP (including Luzon, Visayas and Mindanao) exceeds 99%.</td>
</tr>
<tr>
<td>State Grid General Aviation Co., Ltd.</td>
<td>Inspect over 125,000km power lines. Safe flight for over 10,000 hours. Take off and land for a total of 2,350 times.</td>
<td>Inspect over 125,000km power lines. Safe flight for over 10,000 hours. Take off and land for a total of 4,000 times.</td>
</tr>
<tr>
<td>State Grid Materials Supply Co., Ltd.</td>
<td>Answer the questions raised by suppliers as soon as possible, with a maximum gap of 5 working days since the day they are received.</td>
<td>Provide a strong material support to ensure UHV project put into operation on schedule, implement national energy strategy, air pollution prevention and control policy, and help optimize the allocation of energy and clean development.</td>
</tr>
<tr>
<td>Yingda Media Investment Group Co., Ltd.</td>
<td>To comprehensively promote the Year of Media Convergence and the Year of Digital Publishing, to further promote &quot;Two Transformations&quot; of the Group, and make company media business stronger and better.</td>
<td>Strengthen marketing capacity and resource building, consolidate the foundation of development, accelerate the transformation of media convergence and digital publishing, and cultivate new core competitiveness.</td>
</tr>
<tr>
<td>State Grid XJ Group Corporation</td>
<td>Complete 76 S&amp;T innovation projects.</td>
<td>Plan to apply for 500 patents</td>
</tr>
<tr>
<td>State Grid Pinggao Group</td>
<td>Ensure 100% high quality supply according to the milestone plan.</td>
<td>Expand the marketing network worldwide, ensuring that contribution of global business to performance accounts for over 10%.</td>
</tr>
<tr>
<td>Shandong Power Equipment Co., Ltd.</td>
<td>Provide quality products and services and ensure all UHV and key projects can be put into operation at their first try.</td>
<td>Provide quality products and services and ensure all UHV and key projects can be put into operation at their first try.</td>
</tr>
<tr>
<td>China Power Finance Co., Ltd.</td>
<td>Fully exert its function as a finance company with a fund accumulation rate of 99.1%.</td>
<td>Fully exert its function as a finance company with a fund accumulation rate of 99.1%.</td>
</tr>
<tr>
<td>State Grid Energy Conservation Service Co., Ltd.</td>
<td>Accomplish 6.77TWh of biomass power generation. Reduce the burning of 0.71 million tons of straw in open space, and save 3.04 million tons of standard coal.</td>
<td>Accomplish 77TWh of biomass power generation. Reduce the burning of 10 million tons of straw in open space, and save 3.14 million tons of standard coal.</td>
</tr>
</tbody>
</table>

Performing Subject
In search of excellence In pursuit of out-performance
Global Energy Interconnection

Combine forces to build global energy interconnection

If China’s UHV technology is a significant practice of the present century, the "Global Energy Interconnection" is undoubtedly a more future-oriented, visionary, ambitious idea that you can be put into practice.

—— Former Executive Director of the United Nations Global Compact, George Cole

**Establish a collaborative research mechanism.** Integrate various innovative resources and use major R & D projects as a link to share cutting-edge information, R&D facilities and scientific research achievements, and to conduct collaborative research with research institutes, colleges, and universities in upstream and downstream to complement advantages and enhance joint forces.

**Strengthen cultivation of outstanding talents.** By strengthening close collaboration with universities, research institutions, enterprises and other organizations, we are striving to train a large number of multi-disciplinary experts and talents with global vision, expertise and practical experience.

**Build a high-level cooperation platform.** Give full play to the role of relevant international organizations, research institutions, universities, energy and power companies, and establish a cross-border, cross-sector, multi-disciplinary platform for international exchanges and cooperation, organize influential high-level forums and seminars, create a number of high-level, open, international R & D centers and commercialization centers.
Corporate Responsibility to Employees

Treat every employee with responsibility, and consciously protect legitimate rights and interests of employees, ensure the safety and health of employees, pay attention to employees’ personal development and innovation, and build harmonious labor relations. Fulfilling responsibility on employee development is the prerequisite and basis for the company to fulfill other social responsibilities, and also an important manifestation of corporate social responsibility.

<table>
<thead>
<tr>
<th>Topics on corporate responsibility to employees</th>
<th>Employees’ degree of concern</th>
<th>Effect on integrated value creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure employees’ safety and health</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Be human-oriented and care about employees</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Care for the retirees</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Maintain employees’ legal rights in mechanism reform</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Staff work style</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Ease workload for teams</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Party’s mass line educational practices</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Investment on staff training RMB $2.486 billion</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Finish planned off-the-job training for 3,604,000 person-times</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Build 1,500 model worker innovation offices</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>620,000 employees offer their reasonable advice</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
Ensure decent labor

**Stick to equality in employment.** SGCC’s total employees account to 1,722,000 and their overall productivity stays at RMB653,029 per year per person, increased by 1.5% year on year. The talent equivalent density is 0.9992, increased by 0.0375 year on year. There are 253,000 female employees. 26,000 people were newly recruited in 2015. Staff turnover rate is 0.58%. The company implements the policy of equal pay for equal work to men and women. Salary level is defined by job positions, performance and capability. All employees participate in the Labor Union.

**Fully implement welfare guarantee system.** Establish a sound, scientific, standardized, reasonable and transparent employee welfare guarantee system under the law and ensure its fairness. Pay the pension, medical care, employment injury insurance, maternity insurance, unemployment insurance and housing fund for all employees in time and in full amount. Ensure all staff have social insurance.

**Establish a reasonable paid leave system.** 5 working days of annual paid leave for employees who have served over 1 year but less than 10 years accumulatively; 10 working days if they have served over 10 years but less than 20 years; and 15 working days for 20 years’ employment or longer. Protect employees’ rights for maternity leave/paternity leave.

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**Staff overall productivity**

RMB **653,029** per year per person

**Talent equivalent density**

0.9992
Control and eliminate occupational hazards

Having formulated SGCC Occupational Health Management Approach, Technical Specifications on Occupational Health of SGCC, Labor Protective Equipment Standard, SGCC insists on business development coordinated with occupational health. It has strictly implemented “Three Simultaneitys” on occupational health in construction projects such as pumped storage power plants and equipment manufacturing projects that have high risks of occupational hazards, so as to eliminate occupational hazards at the source. Conduct investigation and testing on hazards from power supply, hydropower, and equipment manufacturing to ensure the workplace is in compliance with occupational health standards. Actively conduct research in the field of occupational health, and improve occupational protection technology. Now it has 2 occupational health service institutions with Grade A classifications and 4 qualified occupational health surveillance institutions and 1 occupational disease diagnosis institution, hence a comprehensive occupational health service support system is established.

Ensure employees in growth and development

Adhere to the people-oriented strategy to boost a thriving enterprise. In 2015, 20 national talents joined us, including: one academician of Chinese Academy of Sciences, one from National Excellent Talent Project, one young expert with national outstanding contribution, and 17 experts with special State Council allowances. We have recommended 18 national-level talents, 10 leading scientists from enterprises, 8,000 excellent experts, 17,084 excellent back-up experts. The company has won the “Best Company Award for China Human Resources Development and Management.” The company has also selected 10 Special Grade model workers, 155 model workers, 230 advanced teams and 200 excellent team leaders.

Reinforce staff training to improve the team quality

According to the various positions and training requirements in the company, large-scale staff training is carried out in a variety of ways. Combined with “Three Stricts and Three Steadies” special education and rotation of party secretaries, through in-depth learning of important speech of General Secretary Xi Jinping, party style and discipline education are strengthened. Six topics of seminar on Ruling the Enterprises by Law, “3I5G”, reform and Innovation, international development, “Three Constructions” and innovative development are held to help managers to speed up the updating of knowledge, broaden their horizons, and enhance their professionalism and capabilities.
Chen Muyun  
**Chief of Capital Electricity (Municipality) Party Member Service Team, the Chief Engineer of Marketing Department of SGCC Beijing (Municipality) Electric Power Supply Company**

Since he started to work, Chen led the Party Member Service Team to establish 34 community service centers, and did volunteer service for the elderly house for 16 years. He actively served 260 senior people and families with the disabled. The team has carried out differentiated electricity service for more than 760 times, benefiting more than 50,000 people and he was awarded “Dedicated Employee of State-Owned Enterprises” by the SASAC and the Publicity Department, CCCPC.

Gao Junzhi  
**Retired cadre of Fujian Management and Training Center, SGCC**

Since 1991, Gao Junzhi lived frugally and donated accumulatively more than 200,000 RMB to help more than 330 dropouts return to school, and did her best to help the disaster-stricken people. She demonstrated a great love of the aged and was named as one of the fifth national moral role models.

Peng Daquan  
**Worker in SGCC Nanjiang County Power Supply Company**

On May 29, when constructing the electric line modification project for Ba-Shaan highway, Peng Daquan was hit on the head by a rolling stone when he was trying a rescue a colleague. He died at only 48 years old. His self-sacrifice deeds caused strong repercussions in the community, and 14 authoritative media have reported this heroic deed. He was named “Nanjiang Hero” by the local people.

Unimpeded growth passage for young employees

Wuling Mountain Area of Hunan is the main battlefield of poverty alleviation in the central region and even the nation, involving 37 counties, cities and districts. Targeting the difficulties of recruiting and retaining young talents for power supply companies in Wuling Mountain Area, Hunan Electric Power Company has cooperated with universities and colleges through contracted training and has accumulatively recruited 427 people over the past three years. It also has established a talent database and tailor-made the “Dual Tutorial System” for young employees, selecting experienced technicians and excellent cadres to provide professional guidance and career planning recommendations, providing a variety of trainings and development ways through job rotation to ensure that there is a smooth development program for the talents in this area.
Reduce the load on each team to unleash employee potential

Shandong Electric Power Company reduces load on more than 3,000 main business teams and reclassifies the responsibilities of each team, which has greatly enhanced work efficiency and quality, stimulated vitality of the teams so that mass innovation has become common practice. In just three years, two front-line employees have been granted the highest national science and technology award, and 70% of the patents are from the frontline staff. On January 9, Wang Jin’s Team of Shandong Electric Power Company was awarded the second prize of National Award for S&T Progress.

Shanghai Electric Power Company sets up 12 technology research teams covering power grid operation, maintenance, measurement, etc and has organized 3 sessions of technical innovation forums, which have enhanced team cohesion, promoted technical exchanges, and enhanced young technical experts’ creativity and critical thinking.

Gansu Electric Power Company implements 30 requirements on team building “Five Reinforcements, Five Downcuts”, subdivides them into 90 measures, and identifies the team as the basic point, business development and the working team as the focus, matching the demands and needs to achieve overall co-ordination. Master plan and a List of Basis Materials for the Team are formulated, which has reduced the load for the team by more than 20%.

Enhance vitality of grass-root employees

Boost training to reduce the load on the teams. Focus on training backbone staff and leaders of workshops and teams; optimize information management system for team building so that more teams can be up to standards. Now 95% teams have achieved the target. Further reduce the load on the team and study to formulate Guidance on Upgrading Team Building during the Thirteenth Five Year Plan Period, enhance the team management, work performance, business skills and team cohesion.

Allow model employee innovation offices to play a leading role. Giving full play to the radiation effect and branding image of model workers, we have set up more than 1,500 model worker innovation offices with 16,000 key employees that are granted 20,000 national patents. Promote standardization, institutionalization and standardization of model worker innovation offices. 123 technological achievements of employees won the Seventh National Electrician Technological Achievement Awards. Altogether 64 workers won the title of “National Model Worker”.

Promote team building and strengthen “Employees Family”. Strive to create a democratic, civilized, harmonious and cultural family for the employees. Pay attention to care for the private life of teams, and enrich their cultural life. Strike a balance between work and off-work for them. Improve communication mechanisms to promote employees to make contributions on their job posts.

Deepen staff democratic management and supervision

Strengthen democratic management and the construction of Staff Congress. Always adhere to the principle of running the company by employees, comprehensively promote full coverage and standardized implementation of Outline of Democratic Management by Workers.

Strengthen democratic management system. Urge all units to seriously implement Staff Congress Proposal Management Procedures and Management Approach on Employee Directors and Supervisors adopted by the Congress. Study and formulate Methods on Equal Consultation and Collective Contracts, engage employees in enterprise management, safeguard the legitimate rights and interests of workers. The 6th Session of the 2nd Congress has collected 248 proposals. All of them have been replied.

Strengthen supervision responsibilities of the trade union. Organize some staff representatives and president liaisons to conduct inspection tours on 18 units, push the grass-roots units to implement the congress resolutions and corporate priorities, and step up supervision on democratic process practice on major programs such as employee relocation of collective enterprises that have been transformed into joint-stock companies. Fully listen to and reflect reasonable demands of employees to protect and stabilize harmonious development of the enterprises.
Xiangyang Power Supply Company selects leaders for innovation and sets up 22 staff innovation offices and one research innovation team, making breakthroughs in research through brainstorming. It also invites stakeholders such as government, trade unions, scientific and technological commissions, schools and customers to attend “innovation salon” so as to jointly study and solve all kinds of problems affecting power supply service.

Chongqing Nan’an Power Supply Company promotes employee innovation with “Model Worker Zhang Yi Innovation Office”. The company has completed 16 scientific projects, released 38 QC innovations and won 38 national patents and 37 awards at provincial and ministerial level. “Portable Wire Grip” and 14 other QC innovations have been applied in Chongqing grid. This office is named by All China Federation of Trade Union (ACFTU) as the “National Model Worker Demonstration Innovation Office.”

“Hu Shaogang Office” of Liaoning Electric Power Company relies on employees to innovate and increases R & D efforts. It has been granted an international patent, and authorized 62 Chinese invention patents and 95 patents of utility model. It has published 4 scientific monographs, 7 EI papers, 32 papers in national core journals, and 15 papers in core journals. Over hundreds of achievements have been awarded by SGCC and Liaoning Electric Power Company, which has broadened the channels for staff’s growth and success.
Employees’ responsibility to the society

Promote CSR management in a comprehensive way so that CSR has all employees’ participation, full processes coverage and all-round integration. Thus, employees will have the view of comprehensive value and stakeholder, and the concept of transparent operation and green development. Convert internal work into social contributions and social expectation into work requirement, so as to realize “externalization of internal work and internalization of external expectations”.

<table>
<thead>
<tr>
<th>Social concern</th>
<th>Effect on integrated value creation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Topics on employees’ responsibility to the society</td>
<td></td>
</tr>
<tr>
<td>Optimize CSR work mechanism</td>
<td>46 Comprehensive CSR Management pilots</td>
</tr>
<tr>
<td>Establish CSR performance management system</td>
<td>Win a total of over 100 CSR awards</td>
</tr>
<tr>
<td>Carry out CSR penetration</td>
<td>Establish over 278 CSR integration projects</td>
</tr>
<tr>
<td>Intensify social communication</td>
<td>Training coverage rate in CSR pilot companies is over 95%</td>
</tr>
</tbody>
</table>
"All Employees’ Participation, Full-Process Coverage, and All-Round Integration" is the way, method and basic requirement to realize comprehensive CSR management. It involves every decision and activity of the company, and concerns everyone in the company. The company implements CSR penetration mechanism from top to bottom to establish the awareness for every employee to fulfill their social responsibility, create the atmosphere that everyone should promote their fulfillment based on their job posts, enhance their ability to fulfill CSR practices, and make its implementation the new way to work.

Promote the implementation of CSR penetration
Beijing Electric Power Company has identified six categories of CSR penetration projects, i.e. promoting construction and transformation of smart distribution grid, enhancing customer service experience, protecting power facilities, “electric power love” class projects, green power grid construction and retrofitting of the old districts. Through enhancing employees’ awareness of social responsibility, practical ability, capability of independent innovation, we can provide better services for economic and social development.
All Employees’ Participation

It requires employees in various positions to possess the will and ability to implement CSR effectively convert social responsibility ideas into concrete actions. External stakeholders are invited to work together to promote sustainable development, and cooperation will maximize comprehensive value.

Win-win of five parties guide the new ecological system for office power consumption

Shanghai Power Supply Company faced with blackout risks in some office buildings as some of the property management paid the electricity bill in arrears which has resulted in damaging the interests of some innocent owners, the government and other stakeholders. It chose 60 office buildings as pilot in 3 batches and implemented the “Excellent Energy” management certification and provided micro consultancy service for “Excellent Energy Up”. Besides it started deferred payment policies as “Excellent Energy Privilege” and also a regular communication mechanism on electricity, organized “Excellent Energy Voice” to spread the privileges so that all stakeholders could be involved in the co-management of electricity use and savings. In this way, it achieved a five party’s win-win situation, namely the power supply enterprise, property managers, property owners, the media and government. Electricity bill payment has been substantially increased, customer satisfaction significantly improved, property owners’ conflict eased, and the public feedback enhanced, which has ensured a maximization of economic, social and environmental benefits.

“WeChat Moments” to avoid electrical shock while fishing

In view of electric shock during fishing which caused major losses of people’s lives and property and serious social stability, Nanjing Gaoshun District Power Supply Company established an integrated communication and interaction platform on anti-fishing shock that includes fishing gear shop owners, fishing fans, fishing clubs, government, media and crab farmers and held 21 events on anti-fishing shock. It set up a WeChat group with 500 members, which has helped to eliminate 17 cases of fishing under high-voltage lines and close to engineering sites with hidden danger. These measures have greatly protected the personal safety, safeguarded the interests of all parties, promoted social stability, and established a harmonious relationship for all.
## Full-Process Coverage

Integrate social responsibility requirements into operation processes and functional management system so that the perception of CSR is imbedded in all decisions and activities of enterprise value chain. Optimize production and operation processes as well as functional management system.

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<table>
<thead>
<tr>
<th>S(Strength)</th>
<th>W(Weakness)</th>
</tr>
</thead>
<tbody>
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<td>Electric power is the premise for socio-economic development.</td>
<td>The company has no experience in point-to-point poverty relief. There is no such organization or institution.</td>
</tr>
<tr>
<td>Power supply company is public institute, which concerns livelihood.</td>
<td>It is not convenient to go to Jingangtai Village, as the transportation infrastructure is too poor.</td>
</tr>
<tr>
<td>Jinzhai County has abundant water resources.</td>
<td>There are few young men but a number of the ill, the disabled and the injured in the village.</td>
</tr>
<tr>
<td>Jingangtai Village has the will and foundation to develop PV generation. The company has an advantage in this industry.</td>
<td>Many people are out as migrant workers. So there are many stay-at-home children.</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>T(Threat)</th>
</tr>
</thead>
<tbody>
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<td>The integration of distributed PV generation from many households can have some impact on the grid's stability.</td>
</tr>
</tbody>
</table>

"Care for the revolutionary base and send warmth with electricity" for poverty alleviation

Anhui Electric Power Company pushed forward “Care for the revolutionary base and send warmth with electricity” CSR penetration project, sorted out poverty alleviation status quo with SWOT analysis to carry out targeted poverty relief, and promoted synergy between departments across the company as well as coordination between provincial, cities and county-level companies. By investing RMB 1.455 million in rural power grids upgrading and photovoltaic projects, the local household income increased from RMB 2,000 to RMB 3,000. Besides, RMB 2.6 million was raised to build roads and have solved the road access problem for more than 5,000 people. These efforts have been fully affirmed by stakeholders.

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### SWOT analysis on poverty alleviation status from Anhui Electric Power Company

<table>
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</tr>
</tbody>
</table>

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### Share public service outcomes and solve the difficulty for distribution projects to access villages

Targeting the difficulty of distribution projects to access villages, Handan Power Supply Company has mobilized the planning, policy-making division, marketing, operation and maintenance division and power supply companies at each country, effectively identified and responded to the demands of different stakeholders. Through partnership with production, operation and functional department and establishment of a responsibility management system for each different regions and personnel, the company conducted engineering projects in a civilized and green manner and engaged active participation of governments, grass-root organizations and villagers. Using performance tracking to set up a stakeholder evaluation mechanism and improve the functional management system, optimize production and service processes, improve the quality of equipment operation, and reduce failure rate of the distribution grid, the company has solved the access problem and served local economic and social development.

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### Relation network of stakeholders for distribution grid construction

**Government**
- Supervise
- Implement policies
- Ensure smooth distribution grid construction
- Coordinate compensation payment

**Power supply company**
- Promote socio-economic development
- Supervise the construction progress
- Negotiation and compensation of distribution grid construction

**Grass-root organization**
- Consign negotiation rights

**Local villagers**
- Supervise
**All-Round Integration**

In 2015, SGCC adhered to problem-oriented, value-oriented, change-oriented and brand-oriented principles, and achieved a closed-loop cycle of social responsibility management in all aspects from thinking, strategy, organization, system and assessment, through comprehensive integration of social responsibility to promote quality and efficiency, and optimize daily management process. It has annually audited 413 CSR penetration projects, and implemented 278 projects, forming a number of demonstration projects that can be promoted and publicized as role models.

Integrate comprehensive CSR management into rural grid

Method for CSR implementation of rural grid integration

Innovate “Double rings + five dimensions” model to help poverty-stricken students
Chongqing Electric Power Company innovated the “Double rings + five dimensions” model in line with the poverty-stricken county conditions and participated in charity work for the poor students through caring and financial support. It engaged volunteers in the company as well as kind people, planned the implementation of “light up the dream for school” public project integrating public welfare resources. Now it is exploring to promote the model of “Sunshine and love for students” programme set up by Qu Xiuquan to other districts and counties in Chongqing, driving more caring people to join in this action by material support, caring, and emotional.

“Double rings + five dimensions” model for charity management
Promote electric furnaces to create a green city of porcelain

Dehua Power Supply Company uses “Promote electric furnace and build a green city of porcelain” project as the starting point, through perfecting management system and optimizing service system and others, standardizes and institutionalizes this activity. The user desires have been adopted as the direction for improved management, and service needs are converted into business requirements and management improvement initiatives. A transition from “inactive service” to “active service” and “tailor-made service” is achieved. Oriented by problems, changes and brands, the company explores the means that all the service modules are operable, enforceable and manageable. It enhances communication and interaction with all stakeholders and enhances stakeholder awareness, recognition and support for the work of power supply. It has accumulatively helped more than 200 ceramics enterprises in energy replacement, making the use of alternative energy sources, achieving a total capacity of more than 130,000kVA, reducing soil erosion area by 33,333,333 square meters and carbon dioxide emissions by 100,000 tons. Thus it has been recognized as one of the 12 model cases of regional recycling economy.

“Collaboration between governance and enterprises” deeply rooted in old industrial cities

Zigong Power Supply Company adopts the way of joint funding by the government and electricity sector, using unified design criteria, construction standards, and access standards. It invests reconstruction funds of RMB 8.426 million, and transforms 10 old and abandoned communities with a construction area of 219,559 square meters and 2,730 households. In accordance with the lean management requirements expected by others, the company has optimized grid planning, construction, channel management and supporting facilities, innovated the mechanism for "collaboration between government and enterprises" promoted all stakeholders to participate, and restructured business procedure. The goal of “simplifying process, reducing renovation cost, improving infrastructure, reducing operating costs, improving service quality, and highlighting the brand image “ have been achieved. In 2015, “Light up happy community” programme has extended to 111 old residential communities, which have been abandoned by factories and mines. This programme has benefited local residents, and has made significant social benefits.
## UN Global Compact: Initiatives and Performance

### Ten principles of the UN Global Compact

#### Human Rights

1. Businesses should support and respect the protection of internationally proclaimed human rights;
2. Make sure that they are not complicit in human rights abuses.

<table>
<thead>
<tr>
<th>Action performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Abide by the international conventions, international practices signed or acknowledged by the Chinese government, follow the laws and regulations of the host countries, respect human rights in its operation, and promote human rights protection among stakeholders with its influence.</td>
</tr>
<tr>
<td>- Make sure that SGCC is not complicit in human rights abuses.</td>
</tr>
<tr>
<td>- Improve power construction projects in areas without electricity access, and solve the power problem for 1,920,000 households and 7,500,000 people without electricity.</td>
</tr>
<tr>
<td>- Integrate rural and urban power supply and accumulatively solve the undervoltage problem for 6.635 million households.</td>
</tr>
<tr>
<td>- Provide barrier-free service to the disabled at business premises to ensure their rights.</td>
</tr>
</tbody>
</table>

#### Labour

3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
4. the elimination of all forms of forced and compulsory labour;
5. the effective abolition of child labour;
6. the elimination of discrimination in respect of employment and occupation.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>- Promote frequent and normalized democratic management through the Staff Congress, President’s Liaison Meeting, and seminars to make public the affairs of the company. All 248 pieces of rational advice from employees have been processed and replied.</td>
</tr>
<tr>
<td>- Eliminate forced labor and child labor.</td>
</tr>
<tr>
<td>- Reject discrimination by nationality, gender, sex orientation, age, disease, race or religion, pay staff on their performance and their position, and implement of the principle of equal pay for equal work to men and women.</td>
</tr>
<tr>
<td>- Ensure decent work, provide payment and treatment in line with the national and the company’s conditions, pay attention to the balance of employees’ life and work, establish a reasonable paid-leave system, pay the pension, medical care, unemployment insurance and other social insurances for all employees.</td>
</tr>
</tbody>
</table>

#### Environment

7. Businesses should support a precautionary approach to environmental challenges;
8. undertake initiatives to promote greater environmental responsibility;
9. encourage the development and diffusion of environmentally friendly technologies.

<table>
<thead>
<tr>
<th>Action performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Integrated installed capacity of wind power within SGCC’s business area is 116.64GW. Promote large-scale development of PV generation with an integrated installed capacity of 44.465GW.</td>
</tr>
<tr>
<td>- Give full play to UHV’s advantage in allocating resources over long distances in a large scope. Accommodate surplus water resources in Sichuan in flood season. Transmit 123,227Wh of hydropower from Sichuan out.</td>
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<td>- Strengthen the construction of energy conservation service and system centered on energy conservation service and power efficiency management. Now SGCC has established 27 energy conservation companies and 685 energy efficiency service teams, forming an energy service network covering SGCC’s service area.</td>
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#### Anti-Corruption

10. Businesses should work against corruption in all its forms, including extortion and bribery.

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<td>- Comprehensively build an incorrupt management, sign Letters of Responsibility for Clean Governance from top to bottom and step by step, stipulate “List of responsibilities” “Responsibility Score Cards” to strengthen the implementation of main responsibilities for the party committee (party) and leading cadres.</td>
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<tr>
<td>- Persevere to correct “Four Wrong Work Styles”, practice strict economy and combat waste. Stipulate 38 rules and regulations on meeting management and the three public expenses, and further standardize corporate management.</td>
</tr>
<tr>
<td>- Carry out self-correction and thorough investigation for 10,309 times, and pay unannounced visits to eight provinces (municipalities) companies. Issue 8 notices for inspection and recommendations, and promptly correct violations.</td>
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<tr>
<td>- Promote transparent and fair operation. Strengthen governing the company by law. Improve the construction of internal control system. Be open to social supervision. Keep away the risk of corruption.</td>
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