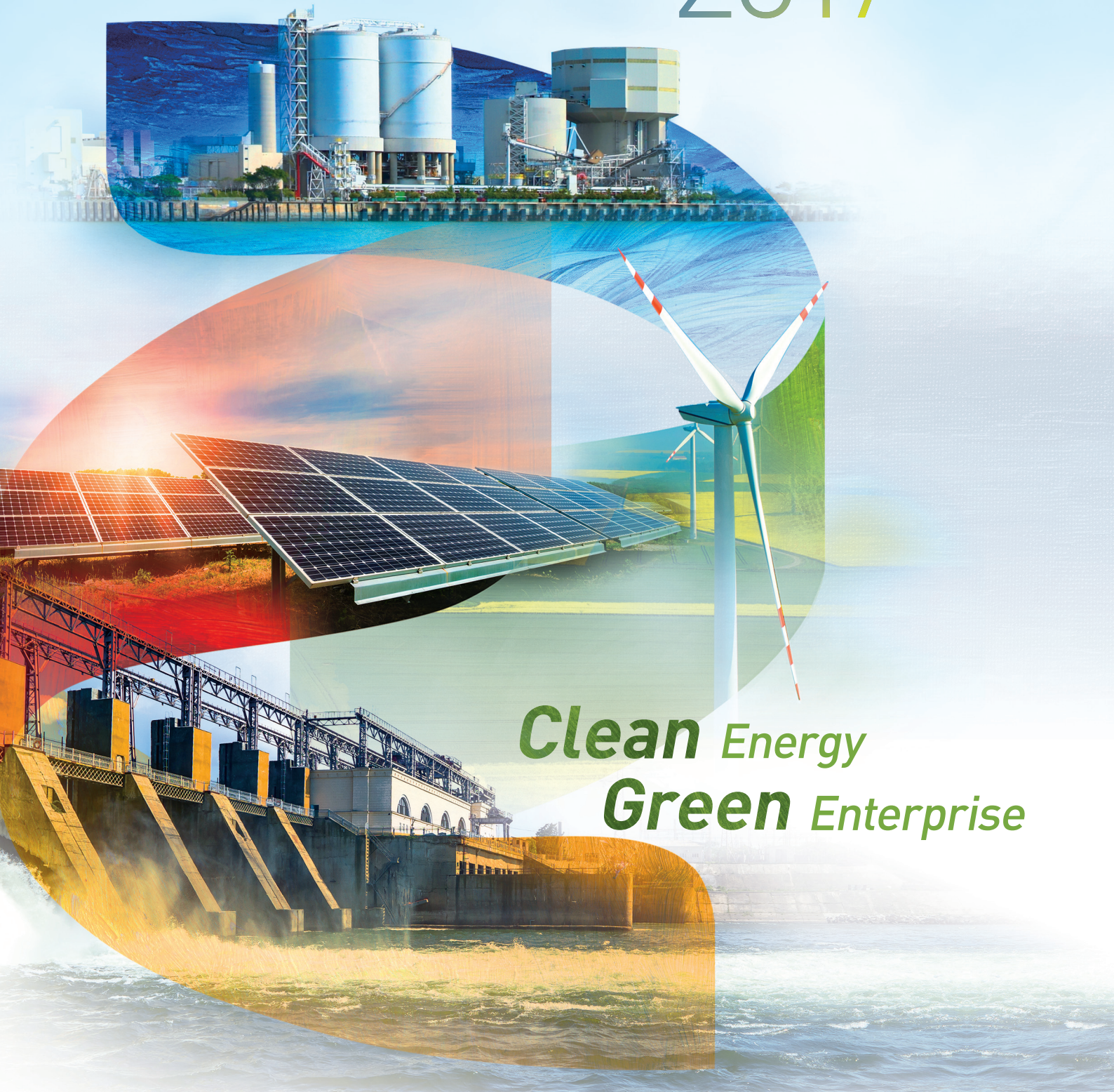




China Power International Development Limited
中國電力國際發展有限公司

(incorporated in Hong Kong with limited liability)
(Stock Code : 2380)

Environmental Protection and Social Responsibility Report 2017



Clean Energy
Green Enterprise

Environmental Protection and Social Responsibility Report

ENVIRONMENTAL PROTECTION

Adhering firmly to the core value of “giving light and power to the world, leaving clear water and blue skies to our children”, the Group, by virtue of its consistent inputs for energy conservation and emission reduction, advocating the development of clean energy and actively promoting sustainable development in social, economic and environmental terms, is committed to becoming a resource-saving and environment-friendly enterprise with high proportion in clean energy, low consumption of energy and resources, and low discharge of pollutants.

1 Climate Change – Coping Strategies and Actions

The PRC government places consistently strong emphasis on environmental protection and continuously improves its legislation on renewable energy. A number of environmental protection policies were promulgated with a view to enable economically sustainable development. With China officially becoming a party to the Paris Climate Change Agreement in 2016 indicating a serious commitment to tackling climate change, the PRC government issued in the same year the national economic “13th Five-Year” plans for energy and power development, in which the targets for clean energy developments were specified up to 2020. In general, PRC enterprises are confronting new requirements for environmental protection and social responsibilities. The Group acknowledges that it is incumbent upon, and obligatory for, energy and power companies such as the Group to actively cope with global climate change, formulate corresponding strategies and engage in relevant actions.

1.1 Our Strategies

Aims and Directions for Development

The Group is committed to establishing itself as a clean low-carbon integrated energy company and contributing to the effective responses to global climate change. The Group’s directions for development for achieving existing goals are as follows:

- (1) Enhance the development of clean energy: continue to increase the proportion of clean energy by maintaining our lead in hydropower and making further progress in the development of quality wind power and photovoltaic power projects, while controlling and slowing down the development of coal-fired power.
- (2) Achieve comprehensive purification of the existing coal-fired power: to comprehensively complete the ultra-low emission technical upgrades for coal-fired power in order to reduce the pollutants and greenhouse gases emission per unit of power generated; to enhance the efficiency of the power generating units in order to reduce the consumption of fossil fuels per unit of power generated.
- (3) Reduce investment in coal-fired power: shutdown those coal-fired power generating units with small capacity, low parameters and not feasible to carry out the ultra-low emission technical upgrades; actively seek for cooperation with other enterprises to develop the existing coal-fired power in order to reduce the proportion of shareholding in coal-fired power enterprises.
- (4) Develop technological innovation: to strive for breakthroughs in the area of clean energy and low-carbon emission technologies with greater research and development inputs.

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Basis of Actions

The actions committed by the Group are based on:

- (1) Policy guidance: commitments made by the PRC government upon joining the Paris Climate Change Agreement, targets as set out in the national economic “13th Five-Year” plans for energy and power development of the PRC, “Air Pollution Prevention and Control Action Plan”, “Action Plan of the Upgrade and Renovation for Coal-fired Units to Achieve Energy Saving and Emission Reduction (2014–2020)”, among other policies.
- (2) Regulatory standards: “Environmental Protection Law of the People’s Republic of China”, “Air Pollution Prevention and Control Law of the People’s Republic of China”, “Emission Standard of Air Pollutants for Coal-fired Power Plants” and other environmental protection regulatory standards issued by the central and local governments.

Strategic Support

The Group accelerates the implementation of its transformational development strategy and strives for the developments in clean energy, integration, smart technology and international expansion. In particular, development in clean energy was ramped up in a bid to reduce reliance on traditional energies and transform from high-carbon into low-carbon generation, which is a major component in our transformational development strategy. The established strategy of the Group strongly supports various initiatives in coping with climate change.

1.2 Our Works

Air pollution

In strict compliance with the “Emission Standard of Air Pollutants for Coal-fired Power Plants”, “Ambient Air Quality Standards” and other pertinent laws and regulations as well as in response to the requirements under “Action Plan of the Upgrade and Renovation for Coal-fired Units to Achieve Energy Saving and Emission Reduction (2014–2020)”, the Group effectively controlled the emission of airborne pollutants by installing dedusting, desulphurization and denitration facilities and procuring coals with less pollutant contents.

During 2017, the Group carried out the denitrification and capacity increase renovation project plan. All of its power plants have taken the catalyst for increasing the SCR reserve layer, among which Fuxi Power Plant has installed SNCR devices to carry out catalyst replacement and regeneration for the initial layer. This will enhance the catalyst performance of the initial layer, thereby further reducing the emission of nitrogen oxides, increasing power output, reducing heat loss, and lowering the cost.

During 2017, as part of the ultra-low emission technical upgrade for the generating unit no. 1 of Wuhu Power Plant, the wet electrostatic dust precipitator was installed to further reduce emission of flue gas and dusts, and GGH tubes were also installed to eliminate the visual pollution from white smoke plume. In order to eliminate outdated production capacity, Yaomeng Power Plant shut down a 310MW coal-fired power generating unit with small capacity and low parameter in order to reduce the emission of airborne pollutants.

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Basic Measures Adopted to Reduce Air Pollution

Develop Clean Energy	<ul style="list-style-type: none"> Actively develop clean energy projects, such as hydropower, wind power, photovoltaic power and natural gas power Develop integrated intelligent energy projects to facilitate the developments of clean and highly efficient energy in various regions
Strengthen Energy-saving Management	<ul style="list-style-type: none"> Improve fuel management by enhancing calorific value of coals-as-received and coals-as-fired for reducing fuel wastage Optimise operational management by reducing oil usage for start-up of power generating units Maximise the utilization rate of power generating units to prevent and minimise oil usage for low-load stable combustion Enhance management of equipment depletion to minimise oil usage during malfunctioning of auxiliary machines
Enhance Coal Sourcing Management	<ul style="list-style-type: none"> Enhance utilization efficiency of coal by procuring quality coal with high calorific values and low sulphur contents
Promote Technology Applications of Clean Energy	<ul style="list-style-type: none"> Increase inputs in technical improvement with a stronger emphasis on desulphurization, denitration and capacity increase transformation, technical upgrades on power supply of high-frequency electrical dedusting and techniques for demolishing the exhaust bypass
Commence Responsible Production	<ul style="list-style-type: none"> Properly plan the production sites by planting trees and lawn, arranging sprinkler to conduct sprinkling in the plant area regularly and as needed Engage in constructing dry coal sheds and install additional sprinklers and dust gauze in the coal fields for dust control and improving the work environment on-site Timely cope with changes in the environment on-site by installing air pollution monitoring instruments to monitor air quality on a real-time basis
Advocate for Transparency of Environmental Information	<ul style="list-style-type: none"> Disclose emission information for pollutants such as sulphur dioxide, nitrogen oxide, and flue gas and dusts at production sites with reference to specified environmental standards and actively accepting public scrutiny

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Exhausts gas

As part of our environmental protection upgrade plan, the Group embarked upon the third environmental protection technical upgrade with an aim for ultra-low emission. As of the end of 2017, all the 19 coal-fired power generating units of the Group's power plants have completed their ultra-low emission technical upgrades. All power plants except Pingwei Power Plant II have passed the environmental inspection and acceptance and received a total of approximately 4,067,000MWh of ultra-low emissions power incentives from the local provincial government.

Discharge of sulphur dioxides, nitrogen oxides, and flue gas and dusts by the Group reduced significantly as benefitted from our ultra-low emission technical upgrades, with the total discharge decreased year-on-year by 3,548 tonnes, 3,618 tonnes and 915 tonnes, respectively.

Nature and type of discharge	Unit	2017	2016	(Decrease)/ increase	Change
Density of nitrogen oxide discharge	g/kWh	0.095	0.185	(0.090)	-48.65%
Total discharge of nitrogen oxide	'000 tonnes	4.540	8.158	(3.618)	-44.35%
Density of flue gas and dusts discharge	g/kWh	0.013	0.035	(0.022)	-62.86%
Total discharge of flue gas and dusts	'000 tonnes	0.623	1.538	(0.915)	-59.49%
Density of sulphur dioxide discharge	g/kWh	0.063	0.150	(0.087)	-58.00%
Total discharge of sulphur dioxide	'000 tonnes	3.035	6.583	(3.548)	-53.90%
Density of carbon dioxide discharge	g/kWh	800	802	(2)	-0.25%
Total discharge of carbon dioxide	'000 tonnes	36,399	35,783	616	1.72%

Although carbon dioxide emissions have risen due to the increase in power generation, the Group has reduced the emission of greenhouse gases such as carbon dioxide by developing clean energy projects, effectively curbing such increases. In 2017, the Group's clean energy power generation amounted to 18,662,142MWh, representing a reduction in carbon dioxide discharge by 14,929,714 tonnes.

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Wastes

The Group strictly complies with the “Standard for Pollution Control on the Storage and Disposal Site for General Industrial Solid Wastes (一般工業固體廢物貯存、處置場污染控制標準)” and reduces its waste discharge by establishing a comprehensive residue and ash disposal system and upgrading the relevant equipment to enhance leakage prevention treatment. In order to recycle and reuse the wastes, the Group set out administrative measures and annual targets for the comprehensive utilization of waste coal ashes to fully explore and realize the potential application of waste coal ashes. In 2017, the comprehensive utilization ratio of waste coal ashes in the power plants of the Group amounted to 81.46%, a decrease of 1.5 percentage points from that of 2016. The decrease in comprehensive utilization ratio was mainly attributable to the sharp fall of the sales volume of waste coal ashes as a result of strengthened enforcement efforts of environmental protection departments in certain provinces and cities. The discharge of non-hazardous wastes increased as a result of disposing the excessive waste coal ashes.

Nature and type of discharge	Unit	2017	2016	(Decrease)/ increase	Change
Density of hazardous wastes discharge	g/kWh	0	0	–	–
Total discharge of hazardous wastes	'000 tonnes	0	0	–	–
Density of non-hazardous wastes discharge	g/kWh	28.8	24.8	4	16.13%
Total discharge of non-hazardous wastes	'000 tonnes	1,381	1,108	273	24.64%

Wastewater

Each of the power plants of the Group discharged wastewater in strict compliance with national standards, including “Integrated Wastewater Discharge Standard (污水綜合排放標準)” and “Wastewater Quality Control Index for Limestone — Gypsum Wet Flue Gas Desulfurization of Coal-fired Power Plants (火電廠石灰石 — 石膏濕法煙氣脫硫廢水水質控制指標)”, and actively implemented the “Action Plan on Prevention and Control of Water Pollution (水污染防治行動計劃)”. In 2017, the Group thoroughly investigated the utilization of water resources, in-depth desulphurization treatment of wastewater (zero-discharge of wastewater) and water recycling treatment of each of its power plants, adopted corresponding technical policy for each individual power plant and strengthened the management of wastewater treatment, ensuring that the discharge is up to standard and maximizing the recycling and reuse of wastewater. In 2017, all power plants except Yaomeng Power Plant of the Group have realized zero-discharge of wastewater and wastewater discharge reduced significantly by 1,101,000 tonnes.

Nature and type of discharge	Unit	2017	2016	(Decrease)/ increase	Change
Total discharge of industrial wastewater	'000 tonnes	742.2	1,843.2	(1,101)	–59.73%

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1.3 Utilization of resources*Coal resources*

The Group is engaged in in-depth optimization of its power mix and gradually closes down those coal-fired power generating units in the capacity of 300MW or below which have high coal consumption rate. During the year, the Group successfully closed down a power generating unit in the capacity of 310MW of Yaomeng Power Plant. Comprehensive environmental protection and energy-saving upgrades and transformation are conducted in a planned manner on existing regular coal-fired power generating units, increasing the comprehensive utilization rate of coal resources. Meanwhile, the Group continues to enhance its management of coal sourcing by procuring quality coal with high calorific values and low sulphur contents. Development of clean energy is greatly promoted to increase the proportion of power generation of clean energy.

In 2017, the Group completed ultra-low emission technical upgrades for six coal-fired power generating units. As of the end of 2017, the Group has completed ultra-low emission technical upgrade for all 19 coal-fired power generating units and continued to lower its exhausts gas discharge and net coal consumption. The Group's net coal consumption rate in 2017 amounted to 304.23 g/kWh, a decrease of 0.70 g/kWh from last year, equivalent to a saving of approximately 32,383 tonnes of standard coal.

Water resources

In active response to the government's requirement of conserving energy and reducing consumption, the Group strictly complies with the "Quality Standard for Recycling and Reuse of Urban Wastewater for Industrial Use (城市污水再生利用工业用水水质)" and conducts in-depth study on water-saving techniques to comprehensively enhance the utilization rate of water resources. In the process of coal-fired power generation, water supply is derived from the recycled water discharged from power plant constructions by virtue of an improvement on the water supply system design plan, extracting no water from natural sources. The overall water consumption ratio for power generation was lowered as water resources were recycled for repeated use through optimization and modulation in the process of hydropower generation. In 2017, water consumption slightly decreased by 140,000 tonnes.

	2017	2016	(Decrease)/ increase	Change
Total water consumption (million tonnes)	64.22	64.36	(0.14)	-0.22%
Water consumption per unit (g/kWh)	1,337	1,443	(106)	-7.35%

The patent "rack-cleaning harrows for trash-screening racks" invented by Wu Qiang Xi Power Plant effectively improves efficiency of water use by using specially designed rack-cleaning harrows to wash residues off the racks over the water inlet of the power generating unit.

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Other resources

The Group consistently adheres to the low-carbon environmental protection principle. It has strengthened its management over consumption of water, electricity, paper and fuel in office, and launched energy-saving measures such as water conservation and upgrade of lighting system. Moreover, it has reduced the number of meetings held and adopted video conferencing as a normal practice, enhanced the staff's awareness of green office as well as their working efficiency. Despite the increase in number of subsidiaries due to the Group's continuous efforts to expand its business during the year, the Group has achieved great success in terms of its green office effectiveness with its entire staff strictly implemented the green office measures.

Green office effectiveness for the Group

	2017	2016	(Decrease)/ increase	Change
Total power consumption (kWh)	8,973,920	9,085,294	(111,374)	-1.23%
Total paper used (tonnes)	27.84	32.00	(4.16)	-13.00%
Total fuel consumption of corporate vehicles (litre)	655,790	702,041	(46,251)	-6.59%
Video conferencing (times)	575	695	(120)	-17.27%

Green Office Measures

Green Trips	<ul style="list-style-type: none"> Enhance management and increase utilization rate of corporate vehicles Conduct monthly surveys and analyses to track fuel consumption of vehicles, and arrange necessary repairs and maintenance to reduce emission Encourage employees to commute by corporate shuttle bus Using video and telephone conferencing to replace certain business trips
Enhance Power Management	<ul style="list-style-type: none"> Clean and make energy-saving upgrades on boiler units and central air-conditioner system in the office by means of technical upgrade projects Adjust the central air-conditioning and the street lights on and off time on real-time basis according to the temperature and sunshine duration Adjust the number of elevators in power and in use according to the commute traffic of employees Implement energy-saving plan from 6:00 p.m. and turn off unnecessary power supply after security checks at night
"Paperless" Office	<ul style="list-style-type: none"> Use synchronized OA office system and cell-phone based patrol system to realize a paperless low-carbon office Adopt double-sided printing to enhance paper utilization rate Realize paperless meetings by holding certain conference electronically and reading meeting documents via digital tablets

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1.4 Environment and natural resources

Development of clean energy

The Group's attributable installed capacity for clean energy in 2017 amounted to 4,695.9MW, accounting for 27.54% of the Group's total attributable installed capacity. The Group's power generation of clean energy such as hydropower, wind power and photovoltaic power in 2017 amounted to 18,662,142MWh, accounting for 27.99% of the Group's total power generation.

Substantial breakthrough was achieved in the Group's integrated energy projects development. The Hefei Airport Project was listed as the first national exemplary construction project for multi-functionality, complementarity and optimization. In addition, the Group has entered into cooperation agreements with a number of municipal governments and industrial parks, including the Comprehensive Intelligent Energy Project of Beike Industrial Park (北科產業園區綜合智慧能源項目) and Comprehensive Intelligent Energy Project of Bazhou City (霸州市綜合智慧能源項目). Development of clean energy projects are in progress as the new "Photovoltaic plus" comprehensive utilization business model was invented and projects such as "agriculture-photovoltaic complementary project" of Shangdong Xintai and "fishing-photovoltaic complementary project" of Anhui Xiejiaji have commenced operation successively during the year. The Group weighs equally on both onshore and offshore wind power generation. On one hand, onshore wind power generation projects are being promoted, for instance, the wind power projects for Toksun Power Plant II in Xinjiang and Shangjiangxei Power Plant in Jiangyong, Hunan already obtained government approval. On the other hand, offshore wind power resources in places such as Shandong are being explored actively.

Building clean coal-fired power

The Group continued to increase its investments in environmental protection by taking proactive effort on ultra-low emission technical upgrades and installing denitration and desulphurization facilities for its coal-fired power generating units. The Group's total investments in environmental protection in 2017 amounted to approximately RMB685,580,000.

The Group practically enhanced the maintenance and operation management of its environmental protection facilities to ensure that discharge of pollutants complies with the required standards. In 2017, the operational ratio of desulphurization facilities for the Group's coal-fired power generating units was 100% (2016: 100%) at the desulphurization efficiency ratio of 98.42% (2016: 96.67%). Operational ratio of our denitration facilities reached 100% (2016: 99.92%) at the denitration efficiency ratio of 92.98% (2016: 84.14%). Control of discharge of airborne pollutants has been effectively improved.

Commencement of Green Construction

The Group adheres to the "Three Simultaneous" environmental protection principle for engineering projects, pursuant to which it has commenced environmental assessment in all the three stages of engineering design, construction as well as inspection checks with a view to realizing green construction by improving the construction sites and timely implementing pollution preventive measures. In addition, the Group has strengthened the work in relation to conservation of ecological environment and biodiversity in places where its power plants are located. It has also strengthened trainings on environmental protection, launched environmental charitable activities and enhanced the awareness of its staff and the public towards conservation of ecological environment. In 2017, there was no environmental emergency and environmental-related issue that required reporting at the construction sites.

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SOCIAL RESPONSIBILITY

The Group complies with the quality, safe, healthy, and environment protection principle of “Quality Products and Services, People-oriented, Risk Controls, Green Operations”, pursuing high standards of operations and striving to minimize the adverse impact on the society and the environment. The Group is also improving its standards on clean production to provide safe, economical and clean products and services to customers and the society.

2 Employment and Labour Practices – A People-Oriented Approach

Our employees are the driving force behind our sustainable development. We have always been committed to the provision of a sound workplace for employees and the protection of employees’ lawful rights. Health and safety of the employees are our concern and a wide-ranging platform has been in place for career development of the staff so as to create a corporate culture of loyalty and cohesiveness, promoting the mutual growth of the staff and the corporation.

2.1 Employment

In compliance with the requirements for protecting labours’ rights and responsibilities as set out in the “Labour Law of the People’s Republic of China (中華人民共和國勞動法)”, the Group establishes a social security system to make contribution for the required five types of insurance and one pension fund for the employees. A sound corporate pension fund and a supplementary medical insurance system in addition to the basic medical insurance plan were in place. Meanwhile, a solid leave-taking system was established in the Group for the employees to safeguard their rights effectively.

In 2017, the Group had a total of 9,780 registered employees, comprising 2,391 female employees which accounted for 24.45% (2016: 24.47%) of total employees. All employees are covered by labour contracts and social insurance, and there has been no infringement of employees’ rights. In 2017, the staff turnover rate of the Group was 1.51% (2016: 6.07%), which was 148 employees.

Staff headcount by gender and its turnover rate for 2017

Gender	Total number (person)	Percentage (%)	Number of resigned employees (person)	Turnover rate (%)
Female	2,391	24.45	64	2.68
Male	7,389	75.55	84	1.14

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Staff headcount by employment type and its turnover rate for 2017

Employment type	Total number (person)	Percentage (%)	Number of resigned employees (person)	Turnover rate (%)
Senior management	20	0.20	0	0
Middle management	266	2.72	8	3.01
General staff	9,494	97.08	140	1.47

Staff headcount by age group and its turnover rate for 2017

Age group	Total number (person)	Percentage (%)	Number of resigned employees (person)	Turnover rate (%)
29 or under	1,688	17.26	63	3.73
30–39	2,168	22.17	59	2.72
40–49	3,866	39.53	19	0.49
50 or above	2,058	21.04	7	0.34

Staff headcount by region and its turnover rate for 2017

Region	Total number (person)	Percentage (%)	Number of resigned employees (person)	Turnover rate (%)
North China	2,759	28.21	32	1.16
East China	2,896	29.61	58	2.00
Central China	3,191	32.63	27	0.85
South China	130	1.33	3	2.31
Southwestern China	677	6.92	26	3.84
Northwestern China	127	1.30	2	1.57

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2.2 Health and safety

The Group strictly complies with the “Laws of The People’s Republic of China on the Prevention of Occupational Diseases (中華人民共和國職業病防治法)”, the “Production Safety Law of the People’s Republic of China (中華人民共和國安全生產法)” and other laws and regulations relating to safety and hygiene, and improves the working conditions for construction on a continuous basis. The Group has implemented visualized, regionalized and digitalized management for its safety works. Safety signages are complete and clear. Dangerous and hazardous zones are encircled with fences with access restrictions. Employees are equipped with labour tools and labour protection gear that are compliant with safety standards and the proper use of these tools and gear are being supervised. The Group consistently maintains sound and reliable facilities for prevention against occupational disease at the production sites and discloses the passing results of regular inspection on occupational hazardous factors. Staff health checks are organized regularly to protect the lives and properties of the employees. In 2017, there was no work-related death or working days lost due to work-related injury for the Group’s employees.

Raising employees’ awareness of work safety helps mitigate the risks of accidents and protect the lives and properties of the employees effectively. Providing production safety training for staff remains the Group’s first priority. In 2017, the Group organized 270 trainings in respect of safety education with 76,253 participants in total, which reinforced the staff’s understanding and knowledge of the laws and regulations, procedures and systems as well as the protocols for production safety, and clarified their rights and responsibilities in respect of production safety.

2.3 Development and training

The Group optimizes its staff allocation to maximize complementary effects in terms of age, know-how and expertise. We see the pooling of talents as a priority task, with special emphasis on training up high-calibre young employees to provide a solid talent foundation for the long-term development of the Group. Technical experts are groomed gradually to provide manpower and technical support for the Group’s development. In 2017, the Group invested approximately RMB25,159,500 in staff training.

In order to provide a smooth development channel for its staff, the Group actively understands its employees’ expectation for career development and arranges on-the-job studies and rotation of staff among various positions as well as various departments of business management, professional techniques and operation skills with a view to satisfying the employees’ need for diversified development.

In 2017, the Group provided induction training for its new employees to enhance their understanding of the basic information of the corporation, the relevant management rules and regulations as well as their job duties. Staff can also master actual operation methods via experiential trainings. In addition, the Group organized regular training courses for outstanding core staff members to develop corporate governance ability of the middle-level management through accumulation of corporate operations and management experiences.

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The Group places emphasis on staff participation and learning, and regularly organizes various types of competitions. Skill races are used as a platform to promote team building and cultivate skilled talents. Meanwhile, the Group also focuses on cultivating the comprehensive skills of employees. In 2017, the Group organized young talent training course for a 90-day centralized training with English learning and international business training content to improve the employees' ability and standard of English and cultivate technology management and business talents with international vision.

In conjunction with the transformation of the Company, during the year, the Group actively invited experts from the power and energy sector to organize various trainings, including the special trainings on Integrated Energy Management System (the "IEMS") hosted by professors from Tsinghua University, during which our staff gained more knowledge of and understanding more about the development of IEMS and enhanced their awareness towards integrated energy services. The Group has also invited senior lecturers from Shanxi University to host courses to further enhance the staff's professional knowledge of wind power and photovoltaics power generation.

Training by employment type and its coverage for 2017

Employment type	Number of training (times)	Per capita training hours (hours)	Training coverage (%)
Senior management	44	34	80
Middle management	181	92	91.5
General staff	2,050	78	93.5

2.4 Labour practices

The Group has strictly complied with the national "Labour Law (勞動法)", "Labour Contract Law (勞動合同法)" and other laws and regulations. We enter into labour contracts with employees and pay for their social insurance pursuant to the laws. We ensure no sexual or racial discrimination and equal salaries for male and female employees, while the practices of child labour and forced labour are strictly prohibited. The Group has established a democratic system for corporate administration based on the staff representative assembly and workers' union to offer genuine protection for employees' rights of participation, expression and supervision. Employees may report incidents of violation to the Group at any time if they note any violations in the process of recruitment or operations, such as child labour and forced labour.

The Group also took the initiative to conduct its recruitment fairs in key colleges such as Xi'an Jiaotong University, Zhejiang University, Southeast University and Huazhong University of Science and Technology in strict compliance with campus recruitment procedures, and made full use of the recruitment platform from SPIC to collect information on job candidates. Professional examination institutes were also engaged to draft questions and make objective and fair evaluations, ensuring a fair, just and open recruitment. In 2017, the Group enrolled a total of 593 fresh graduates.

During the year under review, all business units in which the Group has operational control, complied with the local labour laws. No fines or charges were imposed due to violation of laws.

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2.5 Care for staff

The Group organizes and launches a diverse range of cultural and recreational activities that provide broad opportunities for employees to nurture interests and hobbies as well as to learn new skills. In 2017, the Group held activities related to the culture of Lunar New Year, talent shows and sports competitions, among others.

The Group continues to operate the “Golden Autumn Schooling Assistance (金秋助學)” programme as part of its ongoing effort to improve its mechanism for staff aid, helping out children of employees in financial difficulties by relieving their family burdens, thereby extending our care to the families of our employees. In 2017, the Group carried out 535 caring activities targeting specific groups such as employees in need, retired employees and disabled employees to have a total of 949 underprivileged staff relieved, and granted RMB413,000 as financial relief for serious illness, while offering “Golden Autumn Schooling Assistance” bursaries amounting to RMB88,000 to the children of 61 underprivileged employees to continue their studies.

3 Operational Practices — Securing a Stable Development

The Group works diligently to provide safe and reliable power supply for economic and social development and persists in value-sharing with the industry chain, seeking to drive economic development at the places where it operates and share with the community the benefits of development. The Group incorporates the philosophy of social responsibilities in its management and operations, taking into account the features of the power industry and its own characteristics, and makes contributions to the sustainable development of the society and the environment, in a bid to constantly enhance its competitiveness in respect of social responsibilities.

3.1 Supply chain management

The Group persists in developing fair and impartial working relationships with suppliers. Bulk purchases of fuels and other materials are subject to a management regime that separates the three functions of purchase, delivery inspection and acceptance, and supervision, in a bid to eliminate corruption at source. Contracts and agreements are performed in stringent compliance with contractual requirements and each supplier is treated with respect and equality.

While fulfilling its own social responsibilities, the Group also incorporates concepts and requirements of social responsibilities in the management of suppliers. A stringent and standardized system for the selection and management of suppliers has been formulated, in a bid to safeguard a healthy and orderly marketplace in a joint effort with other parties in accordance with the “Implementation Measures for the Management and Evaluation of Fuel Suppliers”, “Regulations for the Management of Material Suppliers”, “Implementation Measures for the Evaluation of Tender Suppliers”, “Administrative Measures for Recording the Misconduct of Suppliers” and other pertinent regulations.

Approval of fuel suppliers is subject to the fulfilment of precedent conditions based on the mine resources or transport support provided by the potential suppliers, which are assessed and examined in a comprehensive manner with reference to their qualifications, skill competences, product qualities, pricing, after-sale services and reputations, and are graded as I, II and III in accordance with the “Catalogue for Grading and Classification of Materials”. The Group focuses on examining suppliers of Grade I and II and those which are newly added and planned to be eliminated. The Group also performs verification of suppliers’ qualifications on, among others, safety work and staff training, in order to raise suppliers’ awareness of social responsibility management. In 2017, the Group assessed 1,811 (2016: 1,664) suppliers of fuels and other materials, and identified 110 unsatisfactory suppliers, 60 of which were blacklisted.

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Fuel and equipment suppliers of the Group in 2017 analyzed by region are as follows:

Region	Number of suppliers
North China	228
East China	615
South China	75
Central China	444
Northwestern China	79
Southwestern China	254
Northeastern China	116

As a power producer, the Group mainly sells electricity generated from its power plants through the local power grid companies. In 2017, seizing the opportunity arising from opening up the electricity market by the PRC government, the Group has been actively fostering its own customer base by proactively strengthening the engagement with those enterprises of large electricity consumption and building with them long-lasting and sustainable partnerships in order to secure the increased market share in direct power supply.

3.2 Safe and reliable power supply

The Group is dedicated to the building of a stable and reliable power generation system to secure safer, cleaner, more economical and sustainable electric power supply.

Safe production

The Group regards safe production as the prerequisite for stable power supply and sustainable development for the Group in firm adherence to the safety philosophy which maintains that “no risks are uncontrollable, no breaches are unpreventable and no accidents are unavoidable” and the safety production directives of “safety as priority, prevention rather than cure, and comprehensive management”. No major safety incident related to our employees, facilities or the environment occurred in 2017.

Improving our safety management regime

- Improving management system: driving the development of the quality, occupational health, safety and environment (“QHSE”) management system on all fronts, formulating 12 management systems such as “Manual on Management of Quality, Safety, Health and Environment (QHSE)”, amending 23 QHSE management systems and improving the incentive mechanism integrating positive rewards and negative constraints.
- Enhancing standardization: driving the development of the QHSE management system certification on all fronts. During the year, Beijing Zhongan Zhihuan Certification Centre and British Standards Institution (BSI) issued the quality, occupational health, safety and environment management system certification to the Company respectively, signifying that the QHSE management regime developed by the Company meets the relevant international standards and its operation is compliant with the laws and regulations and remains effective.

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Enhancing safety awareness

- Conducting trainings and examinations: the Group often invites experts to engage employees in training sessions on the laws and regulations in connection to safe production in order to enhance their safety awareness, and also uses the SABA system to organize administrators and production staff to join safety exams on a regular basis. In 2017, the Group selected a total of 1,511 staff for examination.
- Conducting safety culture campaigns: with media publicity via internet, WeChat, press and poster board and special training, all employees are familiar with the concept, approach and policy of quality, safety, health and environment. In order to enhance safety culture promotion and effectively develop a sound atmosphere of working safety, the Group also organized a range of campaigns such as the Safe Production Promotion Day, Safety Culture Week, Safe Production Month and Safe Production Variety Show in 2017.

Ensuring reliable operation of production facilities

- Improving facility management: series of facility management regulations such as "Regulations for the Management of Special Equipment", "Regulations for the Management of Repair and Maintenance Preparations for Class A Generating Units" and "Regulations for the Management of Repair and Maintenance" have been formulated.
- Enhancing facility repair and maintenance: repair and maintenance of Class A/B/C generating units has been conducted, hazard investigation and removal as well as rectification of irregularities, in particular the rectification closed-loop efforts for substantial hazards, have been reinforced to enhance reliability of the production facilities.

Ensuring safety of the production environment

- Enhancing emergency response management: practical emergency trainings and drills have been conducted where 879 on-site handling plans have been formulated, and 884 emergency drills have been organized, with a turnout of 11,449 participants (2016: 10,118 participants), which effectively enhanced the emergency response capability. All of the subsidiaries also entered into emergency rescue arrangements with local governments, hospitals, fire stations and other units to ensure the availability of external professional support in case of emergency.
- Enhancing safety management: all new power plants have applied faces, fingerprints and other biometrics to effectively control the access of external visitors and ban the access of unauthorized personnel to the production areas. Mobile video surveillance has also been installed in construction areas to perform 24-hour full-time monitoring to ensure the safety of production and construction areas.

Reliable supply

The Group implements a stringent management regime and strictly performs in accordance with the requirements for safe production. Emergency response capabilities have been continuously enhanced with a view to provide stable and reliable power supply. In 2017, the Group recorded its combined power generation of 66,683,402MWh (2016: 63,403,445MWh), providing a stable energy assurance for regional economic development.

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To ensure stable power supply, the Group has formulated specific regulations for production operations and set out plans for overhauls and technological upgrades, and adopted specific investigation to eliminate any hazards in the power generating units and increase the utilization ratio of power generating units. In 2017, the Group conducted a total of 67 overhauls on Class A/B/C generating units to secure a stable operation of the generating units and successfully dealt with the challenges in the drought periods and the peak power consumption periods during the summer/winter seasons.

During the year under review, all operating power plants in which the Group has operational control complied with the relevant production safety regulations of China. No fines or charges were imposed due to violation of regulations.

3.3 Technological innovation

In order to achieve transformation and development, the Group actively responds to the challenges and opportunities arising from the technological reforms by continuously improving the technological innovation system and advancing the development of information infrastructure, with the aim of promoting the improvement of the Company's development quality and efficiency.

To build a sound atmosphere for and enhance the capability of technological innovation, the Group strengthens the development of supporting platform for technological innovation to facilitate the application of technological achievements and reinforces the management of intellectual property. During the year under review, the Group completed the research and development of IEMS in cooperation with Tsinghua University and Huawei Company, and applied the research and development results in the Comprehensive Energy Project of Chengdu High-tech Zone, facilitating the digital transformation of the Group.

Based on the "13th Five-Year" plan of informatization, the Group focused on the development of information system and data centres and pushed forward the upgrade of information system in a bid to ensure information security, boosted the development of corporate digitalization to enhance its core competitiveness. In 2017, the Group vigorously pushed forward projects on security and protection of power monitoring system and completed the separation of intranet from extranet to ensure network security. No incident of information security issue occurred during the year. As for the improvement of information-based facilities, the Group completed the capacity expansion and reinforcement of data centres and performed the installation and commissioning of network equipment, enabling the system to meet the conditions for data transfer.

In 2017, the Group launched 60 technology projects in total and 18 patents were approved, out of which the Group was granted 18 utility models patents, registered seven software copyrights, and chaired or participated in the formulation of 11 industry standards with technology investment of approximately RMB55,920,000. All business units of the Group have proactively carried out the "Innovative Workshop" and mass-oriented technological events to create an atmosphere conducive to technological innovation. In 2017, a total of 17 new innovative workshops were organized, which incentivized our staff to engage in technological breakthroughs.

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3.4 Anti-corruption

The Group has well established its management system, namely the “Regulation of Collective Decision Making for Significant Business Issues”, “Administrative Regulations for Petitions and Whistle-blowing” and “Regulations for Integrity Talks”. The concepts of “dual responsibilities” and “two-way investigation” are stringently implemented. Where significant disciplinary and legal violations occurs at a department or unit, both the culprit and the relevant supervisor should be held responsible. Supervision and governance over the exercise of power have been strengthened and all supervisory regulations have been stringently executed.

Disciplinary and legal violations are handled based on the circumstances established by incoming reports given by mail or in person or the concerns raised and clues given by complaints of the employees. Where the issues and clues reported are too vague for further investigation, written inquiry is conducted to allow the person named in the complaint to make actual pledges and explain the actual situation for further filing. If the reported issues are detailed and concrete enough for investigation but are subsequently found falsified, the person named in the complaint will be engaged in an anti-corruption talk as a reminder to prevent the occurrence of disciplinary or legal violations. If the case is proven true, follow-up measures, such as cautionary lectures, report of criticism, re-designation, termination of labour contract and so on, will be given according to the severity of the situation. For serious disciplinary violations which are suspected breaches of laws and regulations, such cases would be referred to government prosecution authority.

The Group emphasizes the guidance of promotion and education and combines promotional campaigns with daily anti-corruption education. By promptly providing the latest information on anti-corruption and typical case analysis through new media platforms such as websites and WeChat, the Group has also enhanced its supervision and inspection, thereby enabling its employees to be well educated in an imperceptible way. A range of activities, such as special seminars, counseling talks, admonitory videos, personal counseling on integrity and anti-corruption tests, are also regularly held by the Group to fortify the concept of legal, ethical and disciplinary compliance among employees, in order to improve self-alert and self-edifying abilities. In 2017, the Group organized trainings in anti-corruption and integrity education, which registered a total of 10,242 participants (2016: 2,196 participants). No corruption litigation occurred throughout the year.

4 Community Investment — Promoting Harmony

The Group is actively involved in community building and conducts its business in a responsible manner in the places where it operates, with the aim of driving local economic and social development. In order to effectively fulfil its social responsibilities and contributes to the sustainable development of the communities, the Group by leveraging on its own advantages, actively encourages its employees to attend volunteer servicing activities, supports rescue and relief efforts, organizes social charity, science and technology education and other campaigns that contribute to the well-being of local communities based on their practical needs.

4.1 Promoting local economic development

While making substantial contributions to local finances through its tax payments, the Group also helps to drive the rapid development of the environmental protection, construction materials and servicing sectors and the formation of a cluster of power plant-related industries. In 2017, the Group paid approximately RMB1.803 billion in various taxes and created 858 new job opportunities in the places where it operated.

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The Group completed the construction of the transportation, electricity, telecommunication and television broadcasting facilities located around the reservoir area of the Tuokou Power Plant in 2017. We also assisted in relocating residents of the reservoir area, refined the local infrastructure construction and improved the living conditions and environment of immigrants, thereby increasing the local tax revenue and the income level of the local people.

4.2 Support for education, cultural activities and charity

The Group is committed to promoting cultural and educational development in the places where it operates. We encourage and support staff participation in volunteer services to foster a sound learning environment for local youngsters. In 2017, Dabieshan Power Plant invited shareholders, Huanggang Federation of Trade Unions, banks, nearby residents, employees' families, equipment suppliers and various stakeholders to attend its open day event. After the visit, the parties understood better that our corporate efforts have been committed to environmental protection and new energy construction, and expressed their appreciation for our commitment to fulfill corporate social responsibilities and approach in actively responding to the state's ecological construction.

The volunteers of the Group engaged with the community, paid visits to the families in need and carried out voluntary activities for the underprivileged communities in need. Currently, 2,459 volunteers have been registered under our volunteer programme "Ying Shan Hong (映山红)". In 2017, 119 voluntary activities were launched involving 5,044 participants with accumulated 50,385 service hours, donating a total sum of RMB4,173,164.

In 2017, Wuhu Power Plant carried out an educational assistance activity to help and care for the students in poverty, raised RMB39,000 from employees' donations and provided subsidies to 45 primary and secondary school students as well as 3 college freshmen which brought hope to these impoverished students.

4.3 Environmental conservation

The Group encourages staff to take an active part in environmental protection activities and to advocate the green philosophy of environmental protection, in a bid to highlight the importance of protecting the ecological system and bio-diversity among our staff and other members of the society. In order to drive sustainable development of fisheries industry and maintain ecological balance of waters, Wu Ling Power has invested substantial capital to establish a fish breeding station which breeds fish and releases them to the wild every year as a means to alleviate the impact of its operation on the fauna. In 2017, San Ban Xi Power Plant released nearly 400,000 fry to the wild, which included the unique fish species of the basin. Being held for ten consecutive years, such activity fully demonstrates the Group's great emphasis and social responsibility awareness on protecting the aquatic ecosystem and fisheries resources of Yuanshui basin.

In 2017, although being affected by the uncommon heavy rainfall in Hunan province, Wu Qiang Xi Power Plant firmly adhered to the principle of "safety first, prevention rather than cure, on-alert and dedicating itself to disaster relief activities" to discharge flood waters early. By sacrificing the power generation efficiency, we protected certain towns and farmland of Yuanshui basin, and relieved the flood prevention load of Dong Ting Hu district and the midstream and downstream regions of Yangtze River. At the same time, the Group also made donations of RMB3,834,400 to the Hunan Charity Federation and the local governments where the power plants are located in order to provide disaster relief.

Capitalized terms used in this report shall have the same meanings as defined in the section headed "Technical Glossary and Definitions" of the 2017 Annual Report of the Group unless the context requires otherwise.



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