Questions and answers with the Chairman

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About the Report

Introduction


Scope of the Report

The time period covered by this report is from January 1, 2017 to December 31, 2017, some of its contents have been extended. The report content covers China General Nuclear Power Corporation and its affiliated branches and subsidiaries. All information and data released in the report are sourced from official CGN documents, and others officially published by external organizations. China General Nuclear Power Corporation confirms that the information disclosed in the report is true and reliable without misinterpretation, misleading statements or major omissions.

Compilation Conformance

• SASAC “The Guidance for the Central Enterprises to Disclose Their Social Responsibilities Information” (GZFYJ [2008] No.1)
• International Organization for Standardization “ISO26000: Guidance on Social Responsibility (2010)”
• Global Reporting Initiative “Sustainability Reporting Guidelines (G4)”
• National Standard “Guideline on Social Responsibility Reporting Preparation” (GB/T 36001-2015)
• Chinese Academy of Social Sciences “Guideline on Social Responsibility Reporting Preparation of Chinese Corporation” CASS-CSR3.0

How to Obtain the Report

This report (Concise Edition) is available in English. Please visit www.cgnpc.com.cn to download the PDF version of the report.
Q: As 2018 marks the 40th anniversary of Reform and Opening-up, what measures will CGN take as a clean energy company?

A: The 19th National Congress of the Communist Party of China proposed a strategic plan to speed up reform of the system for developing an ecological civilization, promote green development, and build a beautiful China. What measures will CGN take as a clean energy company?

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The report of the 19th CPC National Congress reviewed the great achievements made by the people of all ethnic groups in China led by the Party Central Committee with Comrade Xi Jinping as its core in the past five years. It pointed out the direction for the development of the next five years or even three decades, which is inspiring and encouraging. CON is a central enterprise dedicated to the development of clean energy, and it is closely related to many important issues such as innovation-driven development, green development, beautiful China, structural reform of energy supply side, targeted poverty alleviation, and the “Belt and Road Initiative” mentioned in the report of the 19th CPC National Congress.

We have formulated a medium-to-long-term development plan for CON after in-depth thinking and systematic planning based on the grand blueprint of the “two-stage development plan (2020-2050)” proposed by the 19th CPC National Congress, and made it clear that we will create two more “CONs” by 2030. We also offer development outlooks for 2025 and 2030. We will closely follow the new era and earnestly implement the new ideas, new concepts, and new strategies in the Report.

The first and foremost is to insist on the principle of nuclear safety first. “Without nuclear safety, there would be no CON.” We will regard safeguarding nuclear safety as a concrete manifestation of “political awareness”. We will keep in mind General Secretary Xi Jinping’s trust, adhere to the core value of “doing things right in one go”, insist on the basic principles of “safety first, quality foremost and pursuing excellence” and promote the level of nuclear safety management. Second, we will stick to innovation-driven development. As innovation is the “foundation and base” of CON, we will adhere to the path of innovation-driven development, keep an eye on international advanced technology, and place innovation in a more important position.

Third, we will adhere to international development, take an active role in promoting the “Belt and Road Initiative”, develop a number of support and flagship projects and promote nuclear power and clean energy to go global. The fourth is to insist on comprehensively deepening reforms. We must resistlessly get rid of all outdated thinking and ideas and all institutional ailments, and break through the blockades of vested interests. The fifth is to uphold and strengthen Party leadership. The leadership of the Communist Party of China is the root and soul of the State-owned enterprises, never wavering at any time. We will continue to uphold and strengthen the Party’s leadership in a straightforward manner and give play to the unique advantages of CON’s being a central enterprise.

With the Chinese characteristics entering a new era places CON at a new historical starting point for development. The people of CON will stay true to our founding mission and work hard together to maintain CON as a globally competitive clean energy enterprise. We will make due contributions to the realization of the Chinese dream and the great rejuvenation of the Chinese nation.

Q: Facing the new challenges in the new era, we will translate the spirit of the 19th CPC National Congress into a powerful driving force for deepening reforms and promoting development. We will implement new development concepts, constantly explore, innovate and upgrade, strengthen top-level design, and adhere to the direction of market-oriented reforms. We will strive to eliminate the outstanding problems in institutional mechanisms that have hindered the development of CON, and demonstrate the new tools and new achievement of CON in the new era.

A: Q: 2017 is CON’s “Year of Nuclear Power Safety Management Improvement”. What has CON achieved in nuclear power safety?

A: In 2017, CON actively participated in the “Belt and Road Initiative” and made great achievements in “going global”. Where does the confidence come from and what advantages does CON have in “going global”? In 2017, CON actively participated in the “Belt and Road Initiative” and made outstanding achievements in overseas business, setting “eight records” among domestic peers in going global: the largest investment projects in the UK and Europe (UK’s nuclear power projects) and in Africa (Husab Uranium Project), the largest foreign direct investors in Malaysia, the largest Chinese company to invest in Ireland, the largest independent power producer in Bangladesh and Egypt, and the largest onshore wind farm in Belgium. At present, CON has international business covering more than 20 countries and overseas operating revenue accounts for more than 25% of the total, making the company a pioneer among central enterprises in the “Belt and Road Initiative.”

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Q: As 2018 marks the 40th anniversary of Reform and Opening-up, what measures will CON take in its reform and innovation?

A: The central enterprise of CON has been growing up along with the policy of the Reform and Opening-up and has achieved remarkable progress and leapfrogged development over the past more than 30 years. Starting from the Daya Bay Nuclear Power Plant (NPP), CON has forged ahead, conquered many difficulties and explored a series of practical experiences in innovation and development. CON plays a leading role in safely operating NPPs, developing new energy and facing market-oriented operational challenges. The example of the Husab Uranium Mine project shows how CON has led China’s nuclear power industry chain in going global and promoted international cooperation, joint construction, and win-win cooperation. CON has rich experience in mixed ownership reforms, cutting-edge nuclear technologies, public transparent communication and targeted poverty alleviation. “CON Experience” condenses the wisdom and hard work of CON’s people and will advance the sustainable and sound development of the corporation in the future.

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Q: CGN has always explored better communication with the public. Can you introduce some innovative measures CGN has adopted to promote transparent communication?

CGN views “transparency” as an important prerequisite and responsibility for achieving effective communication and winning trust. CGN continuously explores more open and transparent public communication mechanisms and has established a platform for public communication. The subordinate nuclear power plants of CGN have also established a normalized pattern of opening up to the public. In 2017, we continued to increase press releases and organized 18 press conferences, winning the favor of mainstream media in China. CCTV reported to the public 38 times in 2017, 10 of which involved “Xinwen Lianbo” (CCTV’s flagship news program at 7 pm), a record high. We continued to increase communication with key populations, and participated in 15 large-scale domestic and overseas exhibitions. More than 600,000 people have visited the nuclear power bases of CGN. In the 2017 Astana EXPO, CGN attracted more than 10 heads of government and hundreds of thousands of international tourists.

CGN continues to expand the brand influence of the “Public Open Day” and innovatively launched the “Most beautiful wedding photos taken at an NPP” activity, which attracts the attention of 9 million people and helped create a new brand for public communication and nuclear power science popularization in the nuclear energy industry. We changed the impression of nuclear power among the public from being mysterious to being warm and beautiful, a most vivid science popularization of nuclear power throughout the country. In the future, CGN will continue to explore innovative public communication and build CGN’s social responsibility brand of transparent communication.

Mission:
Developing clean energy to benefit mankind

Vision:
To build a world-class clean energy corporation

Core value:
Doing things right in one go

Brand slogan:
Natural energy powering nature

Our culture

“Without nuclear safety, there would be no CGN.” “Doing things right in one go” is our core value, which we regard as the working attitude and job objective that we always adhere to; we involve it in every step of R&D, production, operations and management to ensure safe production and operations, improve quality, and promote sustainable development.
The construction of the main project of Hinkley Point C (HPC) invested by CGN commenced on March 24, 2017 in the United Kingdom.

CGN, EDF and the British government signed a package of agreements for the construction of new nuclear power projects in the UK on September 29, 2016, a historical breakthrough in China’s nuclear power going global. According to the agreement, CGN will cooperate with EDF to build three nuclear power projects including the HPC, Sizewell C (SZC) and Bradwell B (BRB). The Chinese side of the HPC project accounts for 33.5%, and two units using the European advanced pressurized water reactor technology EPR will be built. The follow-up BRB project, led by CGN and participated by EDF, will use China’s homegrown third-generation nuclear power technology, HPR1000, modeled on Unit 3 of the Fangchenggang NPP in the Guangxi Zhuang autonomous region.

"It’s China’s largest investment project in the UK and in Europe," said Chinese ambassador to Britain Liu Xiaoming in an interview. CGN took home an award for Chinese investment in the UK at a Chinese New Year dinner held by the 48 Group Club on January 23, 2017. “Chinese investment is creating new jobs, generating green, low carbon growth and bringing economic prosperity and stability,” said Liu Xiaoming in a signed article published in the London Evening Standard. Liu said that "The Hinkley Point C project, partly financed by the Chinese company CGN, is expected to create 26,000 jobs and, upon completion, reduce carbon dioxide emissions by nine million tons every year.”

The British authorities issued a joint statement on the morning of November 16, 2017, local time, announcing that the first phase of the GDA review was completed and that at that point the second phase officially began. The second phase of the assessment is estimated to take about 12 months.

"As the sixth applicant, we are confident that HPR1000 will pass the GDA assessment in about five years and push China’s homegrown third-generation nuclear power technology and Chinese manufacturing capacities to the UK and the world," Mao said with optimism.

From being a follower CGN has grown into a pacemaker, and experienced the shift from being an importer to developing and exporting its own nuclear technologies. Relying on China’s domestically-developed HPR1000, CGN will further increase its efforts to “go global” and let the national calling card “of nuclear power be well known in the world.”
Husab Uranium Mine, a modern plant in barren desert

In 2012, CGN started to construct the Swakop Uranium (Namibia Husab mine). On December 31, 2016, the first barrel of natural uranium was successfully produced, and in 2017 the mine registered a cumulative output of 1,345 tons. CGN created a “miracle” within just five years in the vast desert, a win-win cooperation between the two countries.

Factory in desert

It is beyond imagination that five years ago, it was a wilderness, still untouched by the vigorous construction procedures of the Husab plant. CGN invested in building a 22-kilometer tarmac road in Namibia with the highest grade, paving a 65-kilometer water pipeline, and upgrading the power facilities along its length. Thanks to that improved infrastructure, the factory was built smoothly and great improvements were achieved in traffic conditions and supply of water and electricity to local residents.

Personnel training

The local talents in Namibia are important to the development of the Husab Uranium Mine. The proportion of local employees in 2017 reached 95%. In order to further enhance employment, CGN has invested nearly 200 million Namibian dollars into systematic training for contract workers, maintenance workers, and operators.

In addition, CGN has developed a hotel-style camping ground for local employees, which is divided into office, residential, dining, and leisure areas. The accommodation for employees is well-equipped with facilities including air-conditioning and showers, allowing employees to live and work comfortably in a harsh environment.

The flagship project

Husab Uranium Mine is China’s largest investment project in Africa. According to statistics from the Chinese Embassy in Namibia, Chinese companies have invested about $3 billion in Namibia, 73% of which is accounted for by the CGN’s Husab Uranium Mine. Upon reaching its targeted capacity, the project is expected to contribute tax of up to 1.7 billion Namibian dollars to local government annually, making Namibia the second largest natural uranium production and export country in the world. It means a 20% increase in export volume, a 5% increase in GDP, and thousands of jobs for Namibian people.

Two Namibian presidents have visited the Husab project, each claiming that it is a “flagship project” in the country. On February 23, 2017, after learning that the Husab Uranium project had successfully produced the first barrel of qualified natural uranium, Namibian President Hage Geingob sent a congratulatory letter exclusively through the Chinese Ministry of Foreign Affairs. Geingob said in the letter that huge changes have taken place in Namibia and a group of Chinese enterprises have expanded overseas business as a direct result of the CGN Husab project.

On August 27, 2017, Zhang Gaoli, then a member of the Standing Committee of the Political Bureau of the Communist Party of China and vice premier of China, visited Husab Uranium Mine and said that CGN is a “reliable” enterprise in term of implementing the going global strategy. He made the remark after being told that huge changes have taken place in Namibia and a group of Chinese enterprises have expanded overseas business as a direct result of the CGN Husab project.

Community contribution

CGN has actively integrated itself into the local communities in Namibia to promote environmental, social, and cultural development. CGN was committed to minimizing the impact on the environment during the entire construction process. In the early stage of project construction, CGN worked with local botanists to optimize the project design in order to protect welwitschia mirabilis, a rare plant in Namibia. Only three plants have had to be transplanted instead of an anticipated 200, thanks to CGN’s efforts.

It took CGN only four years to bring diverse vitality to the desert area. The Husab project guarantees stable fuel for China’s nuclear power units, and also provides Namibia with a new driving force for development, benefiting local communities and residents and setting a vivid example for Chinese companies to fulfill their overseas responsibilities. It sets up a new win-win cooperation pattern for Chinese enterprises when taking part in the “Belt and Road Initiative” in the new era.
Ensuring nuclear safety

Our Actions
- Continue to carry out “Leaders are on site” activity
- Improve nuclear power safety management
- Strengthen engineering construction quality control
- Promote the standardization of operations in an all-round way
- Improve independent innovation capability

Safety performance
- Accident rate for every 200,000 working hours: 0.01
- Events INES level-2 and above events: 0
2017 marks the “Year of Improving Nuclear Power Safety Management” for CGN. To this end, we set a task force and formulated a plan subdivided into 153 items in 18 categories. We also organized self-examination and self-correction activities among the subsidiaries, and responded actively to the joint supervision and inspection of the National Development and Reform Commission, the National Energy Administration, the Ministry of Environmental Protection, and the State Administration for Science, Technology and Industry for National Defense.

"CGN has made great progress in nuclear safety management, and its experience is worth learning for WANO."
—— The World Association of Nuclear Operators (WANO)

"The nuclear energy safety management system of CGN is sound and effective, and safety production is under control. There is no major hidden danger affecting the safety of the industry. The safety of nuclear power is fully guaranteed."
—— The statement represents the conclusion of the joint supervision and inspection team of the National Development and Reform Commission, the National Energy Administration, the Ministry of Environmental Protection, and the State Administration for Science, Technology and Industry for National Defense.
Safe Operation

CGN’s 20 nuclear power units recorded safe and stable operations in 2017. 72% of WANO indicators of CGN mature units reached the world’s top decile (the excellent level), while 72% of WANO indicators of new units reached the world’s top quartile (the advanced level).

Independent Innovation

Technological Innovation Platforms

First national key lab on nuclear industry in China
Nuclear Power Safety Monitoring Technology and Equipment Lab

First national engineering technology research center on nuclear industry in China
Nuclear Power Plant Safety and Reliability Research Center

China’s Energy Research and Development Center

National Energy Nuclear-grade Equipment Research and Development Center
National Energy NPP R&D Center for NPP Digital I&C Systems
National Energy Advanced Nuclear Fuel Elements R&D (Experiment) Center
National Energy Nuclear Power Operation and Life Management Technology R&D Center
National Energy Nuclear Power Engineering & Construction Technology R&D (Experiment) Center
National Energy Concentrating Solar Power Technology R&D Center
National Energy Ocean Nuclear Power Platform R&D Center

Research Achievements

1,033 patent applications
627 patents granted
157 software registrations

CGN delivered the completed Yangjiang project, a high-temperature gas-cooled reactor project and saw acceptance of a transformation project in Algeria. CGN signed a contract to supply nuclear equipment to four units in South Korea with Doosan, a further step into the South Korean market.

Various models of STEP-S (8 feet), STEP-12 (12 feet), and STEP-14 (14 feet) have been independently developed by CGN as the “China Core” of nuclear power plants.

Remote-controlled environmental monitoring robots, emergency rescue detection and multi-functional operation robots fill domestic gaps and improve the level of nuclear security intelligence.

The electron beam treatment industrial wastewater technology jointly developed by CGN and Tsinghua University passed the identification of scientific and technological achievements. The demonstration project is in operation in Jinhua, Zhejiang province. It marks a historic breakthrough in China’s industrial wastewater advanced treatment and is a technological leap in the field of industrial wastewater treatment in China and the rest of the world.
Going steadily on the road to reform

SDGs

7 Affordable and clean energy
9 Industry innovation and infrastructure
11 Sustainable cities and communities
17 Partnerships for the goals

Our actions
- Developing diverse industries
- Actively exploring overseas markets
- Driving nuclear power industry chain "going global"
- Carrying out lean management

Business performance
Annual operating income totals
85 billion yuan
Total in-service installed capacity reaches
45.11 GW
On-grid electricity of clean energy reaches
211.9 TWh
Diversified development

Nuclear power

In 2017, CGN had 20 nuclear power generating units in operation with an installed capacity of 21.47 GW, 8 units were under construction in China with the installed capacity of 10.27 GW, and 1 overseas unit was under construction, maintaining CGN’s status as China’s largest and the world’s third largest operator and the world’s largest nuclear power builder.

Nuclear Power Plant/Unit Progress

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<td>Unit 5, 6 of Hongyanhe NPP</td>
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<td>HPC project in the UK</td>
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Nuclear fuel

The daily production capacity of Husab Uranium Mine steadily increased to 230 tons and its annual production reached 1,345 tons. At the same time, CGN has deepened cooperation with Kazakhstan, Australia and other countries on the development of uranium resources and processing of nuclear fuel assemblies, and promoted development of the nuclear fuel industry chain in an all-round way.

New energy

In 2017, CGN’s new energy sector completed the integration of its wind power and solar energy business, forming a scientific layout of clean energy business including wind power, solar energy and biomass energy, as well as emerging industries such as regional comprehensive energy supply.

CGN Europe Energy, based on the European “New Energy Circle”, promotes investment and acquisition, development, construction, operation and maintenance of European renewable energy projects such as onshore and offshore wind power projects. Currently, CGN Europe Energy is expanding in the UK, France, Belgium, and Ireland. CGN has grown to be the sixth largest new energy operator in France.

Energy saving and environmental protection services

CGN Energy Service is dedicated to building a clean energy company committed to comprehensive utilization of natural gas with its own characteristics and differentiated competitive advantages. It has become the largest natural gas distributor in South China and the third largest in the country, is responsible for the largest electrical heat storage heating project in China and the single largest biogas project in Asia.

CGN Service focuses on the development of water supply and water environment treatment, solid waste treatment and disposal, and environmental management of industrial parks. The company set up the first governance laboratory in this field and has engaged in several projects to help improve local environments in Hebei, Yunnan, Sichuan and other regions.

Nuclear technology

CGN Nuclear Technology Application Co., Ltd. completed major asset restructuring and delivery with Dalian International on February 27, 2017. Renamed CGN Nuclear Technology Development (CGNNT, 000881.SZ), it is the country’s first non-power nuclear technology application company listed on the A-share market, as well as CGN’s first A-share listed company.

Financial services

CGN Capital Holdings Co., Ltd. is in charge of CGN’s financial sector. It has eight member companies and supplies financial services such as fund settlement, debt risk management, credit financing, investment banking, insurance brokering, financial leasing, direct investment, and centralized management of domestic and overseas funds in the Chinese mainland, Hong Kong, Macao and Taiwan.

CGN successfully issues euro-denominated overseas green bonds and USD-denominated senior unsecured bonds with multiple tenors.

Case

CGN successfully issued 5-year, 7-year and 10-year overseas senior unsecured bonds in US dollars and euros, and successfully raised funds of 900 million dollars and 500 million euros on December 5, 2017. It was CGN’s largest ever issuance of overseas bonds and marks the first ever listing of green bonds in euro currency. The issuance also involved the largest participation rate of international investors to date in the company’s bond history.
CGN makes “eight records” in Chinese enterprises going global

01 The largest onshore wind farm in Belgium
02 China’s largest investment project in the UK — UK Nuclear Power Projects
03 The largest entity investment project in Africa — Husab Uranium Mine
04 The largest foreign direct investor in Malaysia
05 The largest investment in Ireland from Chinese enterprises
06 The largest independent power producer in Bangladesh
07 The largest independent power producer in Egypt
08 CGN makes “eight records” in Chinese enterprises going global

International cooperation

- CGN signed memorandum of understanding with British Ultra Electronics
  The two sides will strengthen cooperation in the fields of instrument, sensors, detectors, and radiation monitoring, and further enhance cooperation in global nuclear power projects.
- CGN and University of Manchester set up a joint research and development center
  The two sides plan to give full play to respective advantages in nuclear energy R&D and cooperate in fields of accident-tolerant fuels and radioactive waste treatment, and explore a feasible path for CGN to allocate R&D resources on a global scale.
- CGN signed a cooperation agreement on talent training with the Kenya Nuclear Electricity Bureau (KNELB)
  CGN and the Kenya Nuclear Electricity Bureau (KNELB) signed the “Cooperation Framework Agreement on Nuclear Electricity Training between CGN and KNELB” and reached consensus on personnel training and other issues to boost the development of nuclear electricity in Kenya.

International exchange

- He Yu attended the Davos Forum in Switzerland
- He Yu attended the Belt and Road Forum for International Cooperation
- He Yu attended the 2nd World Nuclear Energy Development Forum and delivered a keynote speech
- CGN New Energy participated in the 3rd East Asia Summit Clean Energy Forum
- He Yu attended the 2017 Asia-Pacific Economic Cooperation (APEC) meetings and forums in Vietnam
- He Yu attended the BRICS Summit
- CGN takes part in the 2017 China EU Blue Industry Cooperation Forum

In 2017, CGN cooperated with more than 20 countries with overseas revenue accounting for more than 20% of its total revenue.
Building a beautiful China, making good use of natural energy

SDGs

Our actions

- Promote development of clean energy
- Develop energy-saving services and technologies to prevent water pollution
- Constantly monitor the environment
- Protect biological diversity

Contributions to Environmental Protection

Electricity generated from clean energy was equivalent to a reduction of

- 66.13 million tons of standard coal
- A reduction of greenhouse gas emissions by 160 million tons
- 0 incidents of polluting the environment
In 2017, CGN's on-grid electricity of clean energy reached 211.9 TWh, an increase of 20% year-on-year. This is equivalent to a reduction of 66.13 million tons of standard coal, a reduction of carbon dioxide emissions of 160 million tons or afforestation of 480,000 hectares.

Develop clean energy

- On-grid electricity of nuclear power reaches 137.7 TWh
- Wind power, photovoltaic power generation and other new energy sources reach 74.2 TWh

Reduction of nitrogen oxides by about 320 kilotons
Reduction of carbon dioxide emissions by about 160 million tons
Reduction of standard coal by about 66.13 million tons
Reduction of sulfur dioxide emissions by about 320 kilotons

CGN is awarded “2017 International Clean Energy Company of the Year” at the 6th International Forum on Clean Energy held in Macao.

Hengshui biogas project enters trial operation

CGN Energy Service's biogas project in Hengshui, Hebei province produced qualified compressed natural gas and bio-organic fertilizer and was officially put into trial operation on December 29, 2017. The Hengshui project is Asia's single largest biogas project, featuring global advanced and proven technologies and equipment, and has filled a number of gaps in the domestic industry.

Sample of ecological civilization of CGN wind farm

The concepts of green, ecological, and environmental protection have always been integrated into the entire process of site selection, demonstration, construction, and operation and maintenance of CGN's projects. We have attached great importance to local environmental protection and culture when developing and constructing every wind farm, and are dedicated to building a number of wind power plants with local characteristics based on natural landscape and folk customs to achieve harmonious integration of new energy construction with the environment, ecology and tourism.
Talent development

Our actions
- Ensure employees' basic rights and benefits
- Promote occupational health
- Champion staff development and promotion opportunities
- Assist employees in need

Staff Development
- Total number of staff: 41,040
- Annual training hours per staff member: 103 hours
- Recreational and sports activities: 518 times

SDGs
- Ensure access to health and well-being
- Gender equality
- Peace and prosperity

Staff members of Yangjiang Nuclear Power Plant and their family members fly hand-painted kites.
Employee composition

- Gender structure
  - Male staff: 34,528
  - Female staff: 6,514

- Education level
  - Technical secondary school and below: 6%
  - Associate degree: 6%
  - Bachelor degree: 28%
  - Master’s degree and above: 22%

- Age structure
  - 28 years old and below: 11,865
  - 29–35 years old: 15,624
  - 36–45 years old: 8,908
  - 46 years old and above: 4,803

Occupational Health

We value staff's occupational health and provide free regular physical examinations, strengthen occupational health protection and disease prevention and achieve a zero occurrence of occupational disease throughout the year.

Note: A factor influencing the maximum personal radiation dose of each plant is annual outage. Compared with that of 2016, the outage activities of the Ling Ao NPP and Ling Dong NPP in 2017 were basically the same, and therefore the number did not change much. The reduction of overhauls in the Daya Bay and Yangyan NPPs resulted in a decrease in the number compared with 2016, while major repairs at Fangchenggang and Hongyanhe NPPs increased, giving rise to the increased doses. The annual maximum personal dose of each NPP is far below the management target value of the power plant, which is also far below the limit (50 mSv/year) specified in national regulations.

<table>
<thead>
<tr>
<th>Nuclear/Power</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daya Bay NPP</td>
<td>13.35</td>
<td>8.91</td>
<td>7.14</td>
<td>6.277</td>
<td>6.756</td>
</tr>
<tr>
<td>Ling Ao NPP</td>
<td>13.70</td>
<td>7.73</td>
<td>6.51</td>
<td>6.071</td>
<td>6.610</td>
</tr>
<tr>
<td>Hongyanhe NPP</td>
<td>5.66</td>
<td>4.10</td>
<td>5.26</td>
<td>6.834</td>
<td>7.668</td>
</tr>
<tr>
<td>NPPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units 1, 2, 3 of Yangyan NPP</td>
<td>1.02</td>
<td>1.02</td>
<td>1.02</td>
<td>1.02</td>
<td>1.02</td>
</tr>
<tr>
<td>Units 1, 2, 3, 4 of Hongyanhe NPP</td>
<td>1.11</td>
<td>8.08</td>
<td>5.62</td>
<td>5.404</td>
<td>7.803</td>
</tr>
<tr>
<td>Units 1, 3, 4 of Ningde NPP</td>
<td>1.27</td>
<td>6.08</td>
<td>12.01</td>
<td>7.537</td>
<td>8.624</td>
</tr>
<tr>
<td>Units 1, 2 of Fangchenggang</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.432</td>
<td>0.834</td>
</tr>
</tbody>
</table>

Staff Training

New staff training

We provide a series of theoretical and practical training courses for new employees, and help them quickly integrate into the company and their posts.

Senior management training

We have formally implemented a senior executive development programs (EDP) to help senior executives develop global vision while streamlining management structure. We completed the first phase of the “Egret-Flying Plan” targeting senior executive associates and the “Egret-Flying-on Plan” targeting middle-and-long-term senior executive associates.

Key personnel training

CGN has developed and implemented diversified personnel training programs including international talent orientation training classes, language classes, and senior executive classes, and has trained more than 500 international talents. In April 2017, CGN was designated as one of the five pilot units for introducing international talents and innovation by the State-owned Assets Supervision and Administration Commission of the State Council.

Staff Development

1. CGN formulated a policy of sending employees abroad to help them realize their values and better the company’s personnel structure.
2. CGN established an international talent pool and a reserve talent pool. At present, we have 2,032 international talents in reserve. A total of 245 excellent employees have been selected to work for overseas projects in the UK, France, Namibia and Malaysia.
3. We also develop localized recruitment in overseas project sites in countries such as the UK, Namibia, and Malaysia. Posts including Chief Operating Officer, Human Resources Manager, Legal Advisor, and Financial manager were taken by local people, and a total of 1,776 employees were recruited locally by CGN. The numbers of local workers recruited at the Swakop and Edra projects were 1,536 and 151 respectively.
4. We have continuously managed and improved the internal talent pool. At the end of 2017, 178 job opportunities had been offered to our internal employees, and 2,103 employees signed up for it. A further 2,400 people expressed interest in doing so. The internal personnel turnover rate of CGN has reached 55%.

We organized 31 managerial staff to take part in training activity named as “Visiting Formosa Group, learning lean management” in Taiwan.
Promote transparent communication

SDGs

1. NO POVERTY
4. QUALITY EDUCATION
10. REDUCE INEQUALITIES
17. PARTNERSHIPS FOR THE GOALS

Our actions
- Promote transparent communication
- Advance targeted poverty relief efforts
- Encourage volunteering and corporate responsibility
- Strive to blend into the local community

Promote Community Development

Donated 41.44 million yuan
8,600 staff members participated in public service activities
The “Taking wedding photos in an NPP” activity attracted nearly 9 million people
More than 600,000 people have visited a nuclear power base in the past five years

Participants in the “Taking wedding photos in an NPP” activity: Sun Zhiqin (R) and Li Shaoting (L)
### Transparent communication

**Communication channel**

- Industrial tourism
- Public open day
- Tour of nuclear power plant
- Science exhibition hall
- Press conference
- Brand activity
- Regular community notification
- Nuclear power science popularization in campus
- Nuclear power science popularization in community
- Exhibition

**Participated in**
- 15 large-scale domestic and overseas exhibitions

**Organized**
- 18 press conferences

**More than**
- 600,000 people have visited CGN's 12 science exhibition halls

**CCTV aired**
- 38 reports on CGN in 2017
- 10 of them on “Xinwen Lianbo” (CCTV’s flagship news program at 7 pm)

The activity of “Taking wedding photos in a NPP” attracted nearly 9 million people and became a phenomenon-level topic in the nuclear industry in China.

The EXPO Astana 2017 opened in Kazakhstan on June 9, local time. CGN promoted China’s homegrown nuclear technology HPR1000 at the future energy-themed exhibition, drawing more than 10 heads of government and hundreds of thousands of tourists. Chinese President Xi Jinping introduced “HPR1000” technology to Kazakhstan President Nursultan Nazarbayev when visiting the China Pavilion.

### Overseas community

A harmonious community relationship is of great importance to the successful implementation of CGN’s overseas projects. We learn from overseas community building experiences and launch featured culture and craft activities to create harmonious communities.

- **Swakop** has provided special funding to support youth employment, food supply, drought relief and other special funds through the construction and operation of the Husab Uranium Mine. CGN’s contributions to economic development, social progress, infrastructures construction and international relations under the plan are highly recognized and appreciated by President Hage Geingob.

- **The third Husab Marathon**, one of the biggest marathons in Africa, kicked off in Namibia on August 5, 2017, attracting over 780 marathon enthusiasts from China, Namibia, and South Africa.

- **The Edra project in Malaysia** is actively engaged in community charity projects such as offering scholarships, sponsoring the non-profit organization Women of 988 to assist low-income single mothers and disadvantaged women, to serve and promote local development.

- **CGN Europe Energy** opened its wind farms to 50 pupils in Lower Normandy on Global Wind Day, giving children lectures on wind power.
## Responsibility performance

### Safe Production

#### Category Indicators

<table>
<thead>
<tr>
<th>Category</th>
<th>Indicator</th>
<th>Comparison of performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2015</td>
</tr>
<tr>
<td>Nuclear safety</td>
<td>Number of units put into operation</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Advanced indicators of mature units accounted for</td>
<td>71.4%</td>
</tr>
<tr>
<td></td>
<td>Unplanned shutdown (times)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>INES level 2 and above nuclear events</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>INES level 3 and above nuclear events</td>
<td>8</td>
</tr>
<tr>
<td>Personal safety</td>
<td>Death toll</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Mortality rate per 100,000 people during nuclear power operations</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Number of serious injuries</td>
<td>0</td>
</tr>
<tr>
<td>Fire safety</td>
<td>Number of fire accidents (times)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Radioprotection</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Overdose radiation accidents (times)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Loss of radioactive sources (times)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Internal contamination accidents (times)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Work hours of nuclear power project (one hundred million man-hours)</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Work hours of conventional power project (one hundred million man-hours)</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>Total (one hundred million man-hours)</td>
<td>1.37</td>
</tr>
</tbody>
</table>

**Note 1:** Data listed above is for 20 units in operation

**Note 2:** According to the INES prepared by IAEA, level 0 events have no impact on nuclear power plant operation and the environment, so they are excluded from consideration from a safety standpoint.

### Value Creation

#### Total assets (RMB 100 million)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4,327</td>
<td>5,292</td>
<td>6,362</td>
</tr>
</tbody>
</table>

#### Installed capacity in operation (GW)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>29</td>
<td>43.71</td>
<td>46.11</td>
</tr>
</tbody>
</table>

### Care for staff

#### Performance indicators

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of staff</td>
<td>34,874</td>
<td>37,667</td>
<td>41,040</td>
</tr>
<tr>
<td>Proportion of female staff</td>
<td>16.93%</td>
<td>16.72%</td>
<td>15.87%</td>
</tr>
<tr>
<td>Proportion of management posts</td>
<td>7.7%</td>
<td>7.0%</td>
<td>7.4%</td>
</tr>
<tr>
<td>Training hours for staff (10,000 hours)</td>
<td>371</td>
<td>416</td>
<td>437</td>
</tr>
<tr>
<td>Training hours per staff (hour)</td>
<td>122</td>
<td>130</td>
<td>103</td>
</tr>
<tr>
<td>Number of new staff</td>
<td>4,645</td>
<td>4,148</td>
<td>4,346</td>
</tr>
<tr>
<td>Turnover rate of staff</td>
<td>4%</td>
<td>3.9%</td>
<td>7.29%</td>
</tr>
</tbody>
</table>

### Harmonious community

#### Performance indicators

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total donations (RMB 10,000)</td>
<td>2,211</td>
<td>2,631.34</td>
<td>4,144</td>
</tr>
<tr>
<td>Voluntary services (person-time)</td>
<td>10,000</td>
<td>7,600</td>
<td>6,600</td>
</tr>
<tr>
<td>Number of nuclear base visitors (person-time)</td>
<td>46,000</td>
<td>48,000</td>
<td>100,000</td>
</tr>
</tbody>
</table>

### Clean and Environmental Protection

#### Clean power equivalence to reduction of CO₂ emission (10,000 tons)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8,511</td>
<td>13,985</td>
<td>16,000</td>
</tr>
</tbody>
</table>

#### Consumption of comprehensive energy (10,000 tons of standard coal)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>148.42</td>
<td>169.84</td>
<td>163.90</td>
</tr>
</tbody>
</table>

#### Synthetic energy consumption per 10,000 RMB of GDP (tons of standard coal)

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.309</td>
<td>0.3078</td>
<td>0.209</td>
</tr>
</tbody>
</table>

### Discharge of the three wastes

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Daya Bay Nuclear Power Base</th>
<th>Yangjiang NPP</th>
<th>Fangchenggang NPP</th>
<th>Ningde NPP</th>
<th>Hongyanhe NPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of liquid effluent (radionuclides except for tritium) in national annual limit</td>
<td>0.47%</td>
<td>0.38%</td>
<td>0.38%</td>
<td>0.30%</td>
<td>0.32%</td>
</tr>
<tr>
<td>Proportion of gas effluent (inert gases) in national annual limit</td>
<td>0.44%</td>
<td>0.35%</td>
<td>0.30%</td>
<td>0.28%</td>
<td>0.58%</td>
</tr>
<tr>
<td>Proportion of gaseous effluent</td>
<td>0.47%</td>
<td>0.39%</td>
<td>0.36%</td>
<td>0.32%</td>
<td>0.38%</td>
</tr>
<tr>
<td>Amount of solid radioactive waste (10³ m³)</td>
<td>151.4</td>
<td>278.4</td>
<td>42.4</td>
<td>12.9</td>
<td>101.25</td>
</tr>
<tr>
<td>Environmental monitoring result</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
</tbody>
</table>

### Harmonious community

#### Value Creation

<table>
<thead>
<tr>
<th>Year</th>
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China General Nuclear Power Corporation

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