



Safety, Environment, Quality and Energy Conservation

In 2015, CNPC recorded sound HSE performance by upholding safe, environmentally friendly and resource-saving development concept, pushing forward with HSE system management, enhancing control of operational safety, risks and hazards, and minimizing pollutant emissions.

Faced with a more complicated security situation in overseas operations, we strengthened security administration and improved HSE management to mitigate various risks, maintaining an excellent track record in security and HSE, with zero reporting of major incidents.

Operational Safety

In 2015, CNPC amended the *Management Provisions on Operational Safety*, *Management Provisions on Environmental Protection*, and *Guidance on HSE Responsibilities at CNPC Headquarters* in line with recent amendments to China's *Production Safety Law* and the *Environmental Protection Law*. We also trained and evaluated relevant management people and employees accordingly. To ensure operational compliance, we emphasized HSE accountability, enhanced HSE inspection and acceptance management in construction projects, and took corrective measures for violations.

We continuously improved the performance of our HSE management system. In 2015, we reviewed the system in all of our major subsidiaries twice and classified some subsidiaries based on quantitative evaluation. Safety-related accidents were reduced by strengthening full-process control, risk control and safety supervision. Focusing on operational improvement, we established a risk control mechanism, which is composed of risk classification, full responsibility coverage, and integrated solutions. We also defined major risks, including eight safety risks and six environmental risks. Pilot activities for risk prevention and control were carried out in 11 disciplines at 10 subsidiaries. We emphasized supervision on the safety of key processes and areas, and carried out special inspection of onshore oil and gas production, well control, hazardous chemicals storage, and offshore operations. Technical diagnosis and evaluation on HSE management with regard to surface engineering at

Changqing Oilfield, the development program of Longwangmiao Gas Field, and facilities at Fushun Petrochemical were conducted in an effort to improve the HSE management and risk control abilities of our subsidiaries. Our annual targets for hazard correction were fulfilled. These corrections included the sealing renovation of large-sized storage tanks, renovation of service stations, and treatment of highly hazardous or abandoned wells; and identification and correction of hazards in oil and gas pipelines, oil products pipelines, and municipal gas pipelines.

Environmental Protection

Environmental protection and climate change have always been focus of attention of the company. We are committed to green and low-carbon development, and conduct environmentally friendly operations, accelerate the upgrading of oil products and promote the utilization of natural gas to meet the need for clean energy. We invest heavily in the R&D of low-carbon technologies and increase carbon sequestration to minimize GHG emissions and mitigate global warming.

In 2015, we continued our efforts to minimize pollution and emissions, and overfulfilled the objectives for pollution and emission reduction during the 12th Five-Year-Plan period (2011-2015). A total of 42 pollution reduction projects were completed and put into operation, including the renovation of flue-gas desulfurization at 34 catalytic cracking units, boiler denitration treatment at Daqing Oilfield and Dushanzi Petrochemical, and eliminating coal use in all of our facilities in Beijing, Tianjin, and Hebei Province. With oil product upgrading projects completed at Dalian Petrochemical, Guangxi Petrochemical, and Karamay Petrochemical, we are more capable of producing environmentally friendly oil products to help control air pollution. Bio-safe disposal of drilling cuttings and mud waste at the Yamal project was rolled out in the Arctic region, with satisfactory environmental and economic benefits.

Safety and environmental protection is one of our three fundamental projects. We continued to improve our HSE management system and promote sustainable and low-carbon growth in the process of creating a resource-saving and environmentally friendly enterprise.

With high attention on management and control over environmental risks and pollution, CNPC avoided major environmental pollution accidents by screening out "six major environmental risks". With the *Comprehensive VOCs Control Plan* in place, we established an information platform for the comprehensive management and control of VOCs at our refining and chemical companies, such as Huabei Petrochemical and Dagang Petrochemical. Moreover, we created China's first classified full-spectrum VOCs source emission inventory, as well as the calculation method and software model of emission volume, for refining and chemical companies.

Occupational Health

We ensure the occupational health of our employees through an integrated, prevention-oriented approach encompassing infrastructure development, occupational health checks, and improved health management and services in line with the *Law of the People's Republic of China on Prevention and Control of Occupational Diseases*. In 2015, more than 98% of our employees received occupational health checks, and over 98% of the specific workplaces received occupational hazard detection.

Employee occupational health check



98%

Workplace occupational hazard detection



98%



We made new progress in the prevention and control of occupational diseases by upgrading facilities and services, and establishing a specialized supervision system for such a purpose. As an oil and gas player, we identified job-related occupational hazards in our particular operational environment, maintained strict controls on sites with hazardous operations, and improved the environment of construction operations. We provided health training to corporate executives, project managers and key technicians, to improve their professional skills and awareness of health risks.

To improve the health of our employees at our overseas projects, we perfected mechanisms for healthcare and took action to prevent and control diseases pursuant to the local environment and medical availability. In 2015, our joint initiative between the headquarters and our project in Nigeria achieved major breakthroughs in the microscopic diagnosis and treatment of malaria in Africa. Moreover, we started to build overseas health Big Data, deployed "Internet +" health management, and introduced new media platforms to instill greater understanding and awareness of health issues among our employees. In addition, we provided interactive online mental health counseling for expatriates and their family members under the Employee Assistance Program (EAP).

Energy Efficiency

In 2015, CNPC continued its energy-saving and consumption reduction activities to improve energy efficiency. We implemented 54 energy-saving technology renovation projects, covering the mechanical oil extraction system, ethylene cracking furnace, and hydrogen system. New technologies and equipment for a high-efficiency combustor and a new type of heating furnace were developed, and the performance evaluation and operation management of heating furnaces were strengthened. We continued efforts on optimizing the energy system at our refineries, and conducted model development and optimized analysis in our key subsidiaries, developing 148 optimization programs. Additionally, our energy-saving standard system was improved as six national or industrial standards and five corporate standards were formulated. Throughout the year, we reduced energy consumption by 1.16 million tons of standard coal and water consumption by 20.61 million cubic meters.

Quality Control

Upholding the principles of honesty, integrity and quality, we remain committed to providing high-standard and high-quality products and services. In 2015, we integrated our basic management systems, reinforced supervision of products and engineering quality, developed internationally-compliant standards, and improved our QMS efficiency and control capacity.

To reinforce supervision of products quality of our subsidiaries, we conducted random quality inspections of 2,340 batches of products produced, sold, purchased or used by our subsidiaries, focusing on consumer products such as motor gasoline and diesel, LPG and natural gas. Chemical agents for petroleum and petrochemical operations began to be subjected to quality approval. Standard follow-up procedures were defined to improve the efficiency and effectiveness of the supervision. More quality inspection centers were set up to extend our coverage of supervision and inspection. The quality of 906 ongoing engineering & construction projects was supervised throughout the year. Experts' random checks and inspection tours eliminated deficiencies and improved the quality of 18 major ongoing projects at Yunnan Petrochemical and other facilities.

In 2015, we improved and optimized our corporate standard system by amending 156 national or industrial standards and 196 corporate standards. In particular, we developed ISO 18871, the *Method of Determining Coalbed Methane Content*, and another two international standards. In addition, we strengthened our exchanges and cooperation with API and NACE, and organized the annual meetings of ISO/TC263 and ISO/TC193/SC3 and work group meetings of ISO/TC67/WG 21 and ISO/TC193/SC1/WG22. This indicated our growing role in orienting international standards.

Energy saved



1.16

mmt of standard coal

Water saved



20.61

million cubic meters



Flue gas purification facility at Jinxi Petrochemical