

An aerial photograph showing a construction site on a riverbank. The site is a cleared, sandy area with several excavators and pieces of construction equipment. The site is surrounded by lush green vegetation and a large river. In the background, there are yellow fields and a small town. A white text box is overlaid on the top left of the image.

# Safety and Environmental Protection

The company is committed to harmonious development among energy, environment and business growth by promoting regulatory compliance under the *Production Safety Law* and the *Environmental Protection Law*, ecological civilization construction and green growth strategy.

We continue to improve our HSE system, reinforce safety management and quality control, enhance our HSE measures, protect the ecological environment and bolster the energy-efficient, low-pollution and low-emission practices for sustainable development.

## HSE Management

Upholding the HSE concept of “people-oriented, quality and safety-first and environment-priority”, the company has been pursuing “zero-accident, zero-injury and zero-pollution” in its business operations. Under our *HSE Management Plan for the “13th Five-Year Period”*, the company has strengthened HSE management system audit by adjusting the audit method, broadening the scope of audit and enhancing audit quality. Based on quantitative assessment of more than 110 major business units, HSE issues identified in the process of audit have been diagnosed and reviewed, with major risks and hidden hazards being monitored and rectified in a timely manner. All this helps bolster our HSE infrastructure.

We revised the measures and the program for HSE training and worked out the HSE training matrices and application manual for gas production and gas purification. We also introduced a demand-driven approach to grassroot HSE training and held HSE training workshops for safety managers and HSE auditors. Risk analysis has been implemented extensively in our overseas projects, enabling a tiered approach to risk management. A variety of training programs have been developed to build HSE awareness and competency, enabling emergency preparedness and response and ensuring a safe and smooth overseas operation as well as the protection of our employees.

## Operational Safety

Operational safety, as one of CNPC’s core values, was fully integrated into every aspect of our business activities. The company promoted a long-term mechanism for operational safety and continued to improve its safety management. In 2017, the situation of operation safety was generally under control.

Strengthened safety hazard prevention. A framework of preventative controls for management and correction of safety-related risks and hazards has been developed and a tiered approach to risk management has been adopted to create a stronger safety management system. We continued to adopt measures for high-risk activities and key procedures with a focus on site inspection and special safety supervision. Meanwhile, technical diagnosis and management review was conducted on HSE practices in key business units, projects and high-risk areas to make sure major risks were effectively controlled.

Strengthened comprehensive management of hazardous chemicals. CNPC released the *Guidelines for Safe and Comprehensive Management of Hazardous Chemicals*. Responsible persons of 67 hazardous chemicals subsidiaries participated a special training program. A hazardous chemical information system was launched on schedule after an overall survey which was designed to gather information of hazardous chemicals. A safety program against hidden risks in chemical tank farms was implemented to identify and address safety issues in a timely manner.

Strengthened safety management for suppliers and contractors. CNPC has fully pushed ahead with a contractor safety qualification system and released the *Guidance on Further Strengthening Contractor Safety Qualification Management*. Contractor prequalification was introduced into a number of business units, such as Liaoyang Petrochemical. Joint safety committees were set up for contractor projects as a project owner-led on-site safety management mechanism with the involvement of constructors and supervisors.

Strengthened the construction of emergency response system. Major emergency drills were conducted at Southwest Pipeline and Yunnan Petrochemical sites. Meanwhile, a national hazardous chemical emergency response and training center, together with the company’s emergency response facility, was under construction, enabling continuous improvement of our emergency response.

## Occupational Health

In accordance with the *Law on Prevention and Control of Occupational Diseases of P.R.C.*, CNPC has achieved better performance in occupational health by bolstering the organization's occupational health infrastructure and implementing standard occupational health procedures, with a focus on hazard prevention and control, workplace environment improvement, physical and mental health.

In 2017, we revised and released the *Procedures for Early Detection and Management of Occupational Risk Factors in the Workplace, Regulations for Occupational Health Surveillance Procedures* and *"Three Simultaneities" - Based Guidance on Occupational Disease Prevention and Control Facilities for Construction Projects*. We continued to strengthen countermeasures for occupational hazard from poison and dust. A thorough inspection on protection facilities was conducted at some of our laboratories and workplaces with poison or dust hazards. And hidden troubles identified were all rectified. Owing to the improvement in both occupational health infrastructure and management, our employees' occupational health was enhanced. In 2017, the hazard factor surveillance ratio was 98.5%, and 98.5% of our employees exposed to health hazards received occupational health checks.

Heightened measures against disease sources were adopted at our overseas sites to monitor, prevent and control key diseases and infectious diseases. Overseas employee assistance programs (EAP) were implemented in the spirit of humanistic care in a variety of forms to address work-related stress and improve mental health and wellbeing of our overseas employees, especially those working in harsh natural environments.

## Environmental Protection

Climate change is the major challenge of mankind. The company has been playing an active role in international cooperation on climate change.

In 2017, the company made a firm commitment to effective control of methane emissions in the natural gas sector and joined fellow Oil and Gas Climate Initiative (OGCI) members and the international community in formulating the OGCI-2040 Low-Emission Roadmap. We also participated in the investigation of methane emissions and the formulation of evaluation standards for carbon dioxide capture and storage capacity in the oil and gas industry. In line with the state government's initiatives and actions plans for reducing methane emissions, the company has developed its low-carbon roadmap, specifying low-carbon development goals and key tasks. Meanwhile, greenhouse gas emissions calculations were conducted in accordance with the applicable national standards, including greenhouse emissions from combustion, flaring and venting, and refining processes.



In 2017, the company continued to step up control measures for reducing pollutant emissions. The upgraded version of the *Pollutant Emission Control Plan* was formulated, setting forth 12 key areas including various types of pollution i.e., air, water, noise, solid waste etc., and a full range of industrial chain, i.e., exploration and production, refining and chemicals, natural gas and pipelines and technical services, in an aim to enable life-cycle control of pollutant emissions in production activities. An integrated approach to reducing volatile organic compounds (VOCs) was adopted and a platform for VOC control was introduced to monitor and control VOC emissions in our refineries and chemical plants. In response to the state government's policy on transforming the energy mix, the company released the *Measures for 2017-2018 Air Pollution Control in Beijing, Tianjin and Hebei and Surrounding Areas during Autumn and Winter*, and unveiled programs for supervision of special projects and for standard-compliant treatment of pollution sources to deliver cleaner natural gas, gasoline and diesel products. 285 coal-fired boilers in this region were phased out or replaced by clean energy.

In line with the goal stated in the *2030 Agenda for Sustainable Development* to "protect, restore and promote sustainable utilization of ecosystems to halt the loss of biodiversity", the company has formulated the *Action Plan for Ecological Protection* and implemented six ecosystem protection projects to promote our business as well as the sustainable development in the host countries (regions).

## Energy Efficiency and Conservation

In 2017, the company stepped up its efforts in improving energy management and boosting energy efficiency by formulating the energy management standards and launching energy management demonstration projects at Changqing Oilfield and Jinzhou Petrochemical, etc. Energy conservation techniques were introduced, shared and promoted among subsidiaries. An energy system optimization demonstration project was launched at Daqing Oilfield and a number of pilot projects on furnace heating efficiency and heat transfer efficiency were completed. With respect to the treatment of associated gas and the recovery of gas flared, light hydrocarbon recovery projects were put into operation at Tarim, Xinjiang and Tuha oilfields. For water resource management, water application regulations were heightened and water-saving techniques were enhanced to reduce the use of fresh water and to use water more efficiently. To address land use issues in oil and gas production, the *Guidelines for Land Management* were formulated to promote land conservation, land reclamation and environmental restoration. In 2017, the company reduced energy consumption by 880,000 tons of standard coal and water consumption by 12.41 million cubic meters.



## Financing for environment projects to promote energy transition

In July 2017, Kunlun Financial Leasing made a RMB 60 million loan to State Power Investment Corporation in support of a MSW-fired power plant project in Bazhou, Hebei. As one of the key eco projects funded by the company, the power plant will receive RMB 200 million in total from Kunlun Financial Leasing to purchase eco-friendly generator sets. After its completion, the project is expected to handle 1,200 tons of municipal solid waste per day for the Beijing New Airport and the Xiong'an New Area in Hebei.

Under the green finance initiative unveiled by the "13th Five-Year Plan", the company has actively participated in clean energy and environmental protection projects ranging from hydropower, wind power, photovoltaic power generation, to waste power generation, with its green financing framework coming into shape. The company has invested in clean energy projects in Chongqing, Guiyang and Zhangpu, etc. to effectively ease the shortage of electricity in these cities, reduce coal-fired power generation as a percentage of the total energy mix and ensure energy security and environment protection for the development of the rural areas as well as the tourism industry. As of the end of 2017, the company has made loans to seven clean energy projects, which will reduce more than 1 million tons of CO<sub>2</sub> emissions per year.

In the future, the company will continue to explore the green finance opportunities in the clean energy market and promote the development of hydropower, nuclear power, wind power and photovoltaic power to accelerate energy transition, with oil and gas remaining as the priority. It is expected that by 2020, green finance will become one of the pillar businesses of the company.