



2019 Annual Report



China National Petroleum Corporation



About Us

China National Petroleum Corporation (CNPC) is an integrated international energy company with businesses covering oil and gas operations, oilfield services, petroleum engineering & construction, equipment manufacturing, financial services, and new energy development.

- **Our Goal**

To be a world-leading integrated international energy company



- **Our Strategies**

Resources, Market, Internationalization, Innovation



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Message from the Chairman



Marking the 70th anniversary of the founding of the People's Republic of China, 2019 has been a critical year for CNPC to comprehensively achieve the goals of the 13th Five-Year Plan. Faced with the increasingly complex situation with all sorts of risks and challenges, the company's Board of Directors, the management team and employees have worked together to resolutely implement the decisions and deployments of the CPC Central Committee and the State Council in line with Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era. With an aim to building the company into a world-class one, and for setting an example for other Chinese enterprises in that regard, we achieved better-than-expected operating results and saw high quality development through ongoing efforts to conscientiously implement the Board's decisions, comprehensively boost operating quality and efficiency, effectively prevent and mitigate major risks, forge ahead with the resources, market, internationalization and innovation strategies, as well as figure prominently our core business.

Boosting E&P efforts to ensure energy supply with steady improvement in core business operation. Following the instructions of the Chinese President Xi Jinping on boosting E&P activities, the company beefed up domestic E&P efforts and achieved fruitful results in 2019. The full-year additions to proven oil and gas in place hit a record high since CNPC's restructuring in 1998. There was a rebound in the company's crude production, and natural gas production growth was at a five-year high. Transition and upgrading of refining and chemical business picked up pace to support a production ramp-up in petrochemicals and decrease in refined products. In marketing refined products and natural gas, we continued to optimize market layout and sales portfolio with sales volume increased. Significant progress was made in new business development overseas and international trading volume rose steadily. Oilfield services, engineering and construction, financial services, equipment manufacturing and other supporting business were getting stronger.

Addressing climate change and promoting energy transition with natural gas and new energy business accelerated. The company has been committed to providing more stable and cleaner energy supply in response to the global trend of clean-energy and low-carbon development. Natural gas as an important choice to tackle climate change is a business marked by strategic importance, high growth and value creation. The development across the full gas value chain was accelerated. We've ensured safe and stable supply to domestic market and done our part in the national energy mix transition through quickening the building of natural gas production, storage and distribution system, optimizing sources for natural gas imports, expanding end-user's marketing as well as pushing ahead with key pipeline projects. Meanwhile, the company promoted the business layout in new energies and made action plans including the development and utilization of geothermal and natural gas hydrates.

Promoting international cooperation to create a community of shared interests with Belt and Road cooperation deepened. The company works with partners and friends from all over the world in the philosophy of "extensive consultation, joint contribution and shared benefits" to create a closer relationship and take our international oil and gas cooperation to a broader

scope and higher level. In line with the Belt and Road Initiative, the company continued to expand cooperation with countries and regions along the Belt and Road routes, and achieved remarkable results leveraging CNPC-hosted international events and bilateral and multilateral cooperation platforms as well as major oil and gas cooperation projects. In December 2019, the north section of the Eastern Russia-China Natural Gas Pipeline went on stream, marking another milestone in implementing the Belt and Road Initiative and creating energy connectivity.

Vigorously implementing innovation strategy and setting off vitality with R&D efforts greatly rewarded. Putting innovation at the core of our business development, we staged the **Guidance on Advancing Technological Innovation for High-Quality Growth** to further fund R&D activities, improve our R&D platform and incentives and encourage the creativity and engagement of our researchers and engineers. A number of R&D achievements have been scored and we won many national awards. The company has been embracing digital technologies and promoting the use of cloud computing, big data, AI and Internet of Things to make its business operations more digital, visible, automated and intelligent. Technology and information are playing a more prominent role in our transformation and our sustained success.

Protecting environment and actively fulfilling social responsibility with sustainability kept enhancing. Maintaining a strong commitment to green, clean and eco-friendly development, we reported no major HSE incidents throughout the year, our HSE performance indicators were at best in history. The company has been actively involving in the national efforts to fight the battle against air pollution. In particular, we exceeded the annual emission reduction targets for key pollutants and received the Award for Outstanding Contribution to Energy Conservation and Emission Reduction from the State-owned Assets Supervision and Administration Commission of the State Council. We strived to further improve employee's sense of gain and pride by encouraging employee's engagement in the company's development. Meanwhile, the company's CSR activities were focused on poverty alleviation. Our targeted poverty alleviation efforts under the national poverty relief plan successfully helped local communities shake off poverty.

Deepening corporate reforms and improving modern enterprise systems of Chinese characteristics with modernization level elevated on corporate governance and internal control. The company formulated a framework plan for creating a world-class enterprise, and further clearly defined the strategic objectives, implementation path and key breakthrough areas. Focusing on key areas and major challenges, the company forged ahead with reforms on corporate governance, market-driven mechanisms as well as rules regarding HR, labor and remuneration management. The company strengthened fundamental and benchmarking management and improved management innovation system. Steady headway has been made on an institutionalized, standardized, process-based and IT-enabled corporate management system. The company reported no significant risk events throughout the year thanks to its intensified efforts on risk control and legal compliance as well as to auditing's role in supervision.

These hard-won achievements provide a solid foundation for

successfully implementing the 13th Five-Year Plan. The management team and employees have united as one to make new progress towards high-quality growth. On behalf of the company's Board of Directors and management team, I would like to express my heartfelt thanks for your support for CNPC's development.

The year 2020 marks the last year for establishing a moderately prosperous society across the board and for accomplishing the 13th Five-Year Plan. China is marching towards its first centenary goal and CNPC is striding towards a new high on the path to a world-leading integrated international energy company. We are facing an ever-complicated and ever-challenging situation with more uncertainties in the energy market, coupled with the unprecedented challenges of the COVID-19 pandemic and the collapse in global oil prices. However, the positive trend of the Chinese economy in the long run remains unchanged and the company is still enjoying a strategic window of opportunity for development. We will continue to boost reserves and production, accelerate the upgrading and transformation of our refining and petrochemical business, strengthen end-users construction on marketing and maintain a leading position in domestic oil and gas supply. Meanwhile, we will promote the development and use of new and alternative energies and speed up in building a diversified and fossil fuel-centered green development landscape. With further "going global" efforts, we will launch all-around cooperation internationally, forge ahead with a global oil and gas trading system, bolster international operation and resource allocation capabilities in the global market and create a risk management system corresponding to our international operation. We will continue to encourage technological innovation, promote R&D efforts in key areas and "bottlenecks", focus on future-proof technologies research, deepen the integration of information technology with the energy industry, and enhance independent innovation capabilities as well as industrial competitiveness. In view of the trend of market-oriented reform and high-efficiency development in the energy sector, we will move fast to improve our internal systems and mechanisms as well as management innovations to bring corporate governance to a higher level.

In the new year, we will focus on high-quality development, put more emphasis on strategy guidance, low-carbon, digital transformation and value creation. We will press ahead to improve quality and boost efficiency, effectively enhance our competitiveness and innovation capability, reinforce our position in the market, and improve risk resistance, in a bid to accomplish the 13th Five-Year Plan and make new contributions to the establishment of a moderately prosperous society across the board.

Chairman 
Dai Houliang

President's Report



In 2019, in face of the frequent oil price fluctuation and intensified competition in the domestic oil and gas market, the company maintained a strong commitment to high-quality growth, a market-driven and efficiency-centered approach and a positioning of “priority, effectiveness, acceleration and coordination” for core business development in line with the production and operation targets set by the Board of Directors. The company achieved RMB 2,771.4 billion in revenue and RMB 120.4 billion in earnings before taxes for the year by optimizing production processes, making structural adjustments, deepening reform and innovation, strengthening risk prevention and control, as well as making great efforts in cost reduction and efficiency improvement. As a result, there is a stable increase in major production indices and a steady improvement in terms of value generation and the market competitiveness of our oil and gas business.

Domestic E&P efforts strengthened with reserves and production boosted remarkably. 2019 was the first year to implement the Seven-Year E&P Action Plan under the instructions of Chinese President Xi Jinping on boosting E&P activities. The year witnessed remarkable E&P achievements. A number of major breakthroughs were made in the Junggar, Songliao, Sichuan, Ordos and other basins through deploying risk exploration wells, including the discovery of 1-billion-ton reserves at the Qingcheng Oilfield and two 1-trillion-cubic-meter gas provinces, i.e. Sichuan (shale gas) and Bozi-Dabei in the Tarim Basin respectively. The full-year additions to proven oil and gas in place were 836.6 million tons and 1,239.9 billion cubic meters respectively, both at record highs since the company's restructuring in 1998. The company reversed a downward trend in crude production and produced 101.77 million tons of crude oil in 2019 by stabilizing production in mature fields and ramping up production in key areas such as Xinjiang and Sichuan. Natural gas production reached 118.8 billion cubic meters, marking the biggest increase in five years.

Refining transformation and upgrading made headway with “more petrochemicals and less refined products” measure effectively in place. The company has formulated a plan for the high-quality development of refining and petrochemical business, and accelerated the upgrading and transformation of the business focusing on producing more petrochemicals and less refined products, structural adjustment as well as technological innovation. In 2019, the company processed 168.44 million tons of crude oil in China, up 3.7% year-on-year, by optimizing resource allocation, rationally arranging utilization and ensuring the safe, stable and long-cycle operation of facilities. The ramp-up in petrochemical production resulted in an optimized product mix. The company produced 119.13 million tons of refined products in China, and realized a decline in diesel-gasoline ratio for ten years running. The year also saw a fast rise in high-value products such as jet fuel and premium gasoline as well as a steady sales increase in ethylene and other petrochemicals. The upgrading project at Huabei Petrochemical was put into operation. Key projects construction made progress, including the refining-petrochemicals integration project at Guangdong Petrochemical and the ethane-to-ethylene projects in Changqing and Tarim.

Oil product sales continued to grow with marketing efforts made at full stretch. Facing the fierce competition in the refined oil market, the company introduced a new marketing model, furthered sophisticated and strategic marketing, and implemented a differentiated approach for various regions, products and business processes. In 2019, the company sold 119.59 million tons of refined products in China, up 1.9% year-on-year. Focusing on high-end markets and high-value stations, the company further bolstered its sales network and built a number of Version 3.0 service stations offering convenient, eco-friendly and intelligent services. The integrated approach to marketing refined products, fuel cards, non-fuel commodities and lubricants was strengthened. The company achieved significant growth in non-fuel business. The number of newly issued Kunlun ETC cards exceeded 1.8 million.



Natural gas and pipeline business went well with end-user's market expanded and profit increased. As the most important natural gas producer and supplier in China, the company has been playing an active role in stabilizing market supply based on a holistic approach to coordinating domestic and overseas resources, optimizing resource portfolio, market layout and sales structure, as well as forging ahead with the construction of the production, trade, storage and transportation system. The company sold 181.3 billion cubic meters of natural gas in China throughout the year, up 5.1% year-on-year. The Three-Year Action Plan for End-User's Market Development was implemented across the board and the cooperation with Heilongjiang, Xinjiang, Wuhan and Yinchuan registered progress. Meanwhile, effective measures were taken to enhance pipeline safety and optimize network operation. Key pipeline projects proceeded smoothly. The north section of the Eastern Russia-China Natural Gas Pipeline was put into operation. A total of 21 pipeline connectivity projects went on stream, including the Fujian-Guangdong branch trunk line of the Third West-East Gas Pipeline and the capacity build-up for the Fourth Shaanxi-Beijing Gas Pipeline etc.

Overseas production and profit increased as international operation continued to deepen. Focusing on the Belt and Road construction, the company continued to deepen all-round cooperation across the value chain of the oil and gas industry and participated actively in global energy governance. In 2019, the company expanded and deepened international cooperation by holding the Second Belt and Road Roundtable for Oil & Gas Cooperation, the Second China-Russia Energy Business Forum, CNPC International Cooperation Forum, and the 11th International Petroleum Technology Conference. The company achieved important progress in new project development, having completed the transaction on the Arctic LNG-2 project, won bids for two deep-sea pre-salt oilfields in Brazil, inked the MOU to further oil and gas cooperation with Kazakhstan partners, and signed the extension contract of Block 5 in Oman. The management level of the company's overseas business was further enhanced. Risk exploration efforts led to a large-scale breakthrough in western Africa; and multiple new discoveries were made through rolling exploration in mature areas in host countries such as Kazakhstan and Ecuador. A number of key projects including the Chad Project Phase 2.2 were put into operation. Production was resumed at Block 1/2/4 in South Sudan. Our project in Mozambique and Libra Oilfield in Brazil were making headway. The company's international trading business beefed up its network layout as well as cross-region and cross-market operations with trading capabilities growing stronger and a trading volume of 540 million tons realized in 2019.

Service capabilities and competitiveness continued to sharpen with business performance kept improving. Leveraging the integrated business architecture, the company consolidated the coordinated development of its core business and service business, and continued to sharpen its capabilities in oilfield services, engineering and construction, financial services as well as equipment manufacturing etc. The company launched the "Service Guarantee Year" campaign in 2019 to improve the quality and efficiency of services. Key indicators such as 3D seismic acquisition ratio and drilling footage per crew were greatly boosted to provide staunch support for increasing oil and gas reserves and production. The quality of engineering and construction projects was effectively improved through whole-process management. The company won the National Quality Engineering Gold Awards 2019 for the revamping of Shymkent Refinery in Kazakhstan and the Yunnan Petrochemical Project. Our financial business continued to expand market and beef up risk management and realized a rapid growth in revenue. The company's equipment manufacturing arm forged ahead with lean management and moved fast towards service-oriented manufacturing.

Technological innovation accelerated enabling a high-quality growth of core business. Technology is the primary productive force and innovation is the key driver for development. In 2019, the company issued the Guidance on Advancing Technological Innovation for High-Quality Growth to boost R&D efforts in major theoretical knowledge, key core technologies and proprietary equipment development etc., and to facilitate the integration and application of new technologies. These efforts have led to a number of major deliverables, providing solid support for the company's core business development. In 2019, the "100-million-ton production capacity and high efficient development for extremely-thick and complex carbonate reservoirs in the Middle East" received the First Prize of the State Science and Technology Progress Award. The company also won the China Patent Gold Award and Silver Award. Meanwhile, the company took lead in drafting and amending several international standards. Information technology has been extensively integrated with all our businesses in the form of cloud-based E&P platform, digital oilfields, intelligent pipelines, intelligent refineries and smart service stations etc.

HSE performance continued to improve while practicing Green Development. The company maintained a strong commitment to safe, environmentally-friendly and resource-saving operations, in order to build a resource-saving and environmentally-friendly enterprise. Production process was vigorously managed and controlled. Safety responsibility system was put in place through a safety responsibility list, warning talks for under-performance, and a management accountability mechanism etc. For the first time, HSE review was conducted in parallel with quality management review. Tighter measures for contractor management were taken and a new round of hazard control programs was launched to ensure safe and stable operation of all businesses. Pollution control efforts were strengthened. An investigation of pollution source was conducted extensively across the company's domestic and overseas projects. Treatment of VOCs and revamping on leak-proof underground storage for service stations were accelerated. The annual emission reduction targets for key pollutants were overfulfilled in 2019. Energy management efforts were proceeding smoothly to save energy and boost energy efficiency. The company reduced energy consumption by 0.82 million tons of standard coal, and water consumption by 10.84 million cubic meters throughout the year. In 2019, the company's HSE performance indicators were at their best in history, with no major safety and environmental accidents happened.

The company is faced with a series of emerging risks and challenges in 2020. In particular, the world economy is being massively hit by the COVID-19 pandemic. International oil prices plummeted as the supply glut continues to worsen. To navigate through these trends and challenges, we will stay focused on our core business operation and continue to improve management, operational quality and efficiency through ongoing efforts to boost operational excellence, strengthen risk management, and deepen reform and innovation. We will do our utmost to accomplish the goals of the company's 13th Five-Year Plan, and strive for greater success in building a world-leading integrated international energy company.

President



Li Fanrong

Operation Highlights

	2017	2018	2019
Financial Index			
Revenue (billion RMB yuan)	2,340.3	2,739.0	2,771.4
Earnings before taxes (billion RMB yuan)	53.3	110.6	120.4
Net income (billion RMB yuan)	17.6	42.8	59.6
Taxes and fees paid globally (billion RMB yuan)	377.4	421.2	404.5
Oil and Gas Production			
Oil production (mmt)	171.34	176.37	181.03
Domestic	102.54	101.02	101.77
Overseas (Equity)	68.80	75.35	79.26
Gas production (bcm)	128.73	138.02	150.30
Domestic	103.27	109.37	118.80
Overseas (Equity)	25.45	28.65	31.51
Refining, Chemicals and Sales			
Crude runs (mmt)	198.22	207.36	207.97
Domestic	152.45	162.36	168.44
Overseas	45.78	45.00	39.53
Domestic refined products output (mmt)	103.51	112.91	119.13
Domestic lube oil output (mmt)	1.64	1.60	1.63
Domestic ethylene output (mmt)	5.76	5.57	5.86
Domestic refined products sales (mmt)	114.16	117.36	119.59
Domestic service stations	21,399	21,783	22,365
Natural Gas and Pipelines			
Domestic natural gas sales (bcm)	151.84	172.42	181.29
Domestic pipeline mileage (km)	85,582	86,734	90,352
Crude oil	20,359	20,736	20,779
Natural gas	53,834	54,270	55,810
Refined products	11,389	11,728	13,762
Overseas pipeline mileage (km)	16,500	16,500	16,500
Crude oil	8,597	8,597	8,597
Natural gas	7,903	7,903	7,903

Corporate Governance

CNPC is a solely state-owned enterprise. According to laws and regulations such as the Company Law of the People's Republic of China, the Law of the People's Republic of China on State-owned Assets in Enterprises, the Constitution of the Communist Party of China, and the Regulation on the Work of Leading Party Members Groups of CPC, as well as arrangements made by the State-owned Assets Supervision and Administration Commission of the State Council, CNPC has built and continuously perfected the legal person governance structure with clearly defined rights and responsibilities of the Board of Directors, the Board of Supervisors and senior executives, to ensure that each department carries out its own duties with effective balance, scientific decision-making and coordinated operations.

Board of Directors

The Board of Directors as the decision-making body of the company has four affiliated committees, the Strategy & Development Committee, the Nomination Committee, the Remuneration & Evaluation Committee and the Audit & Risk Management Committee, which are designed to provide advice to support the decision-making of the Board.

According to the Articles of Association of CNPC and Board of Directors Authorization Management of CNPC, the Board of Directors issues conventional authorization on decision-making regarding corporate operations to the Chairman.



Dai Houliang
Chairman



Li Fanrong
Director



Wang Jiuling
External Director



Liu Guosheng
External Director

Top Management



Li Fanrong
President



Liu Yuezhen
Chief Financial Officer



Lv Bo
Vice President



Jiao Fangzheng
Vice President



Xu Jiming
Chief of Discipline &
Inspection Group

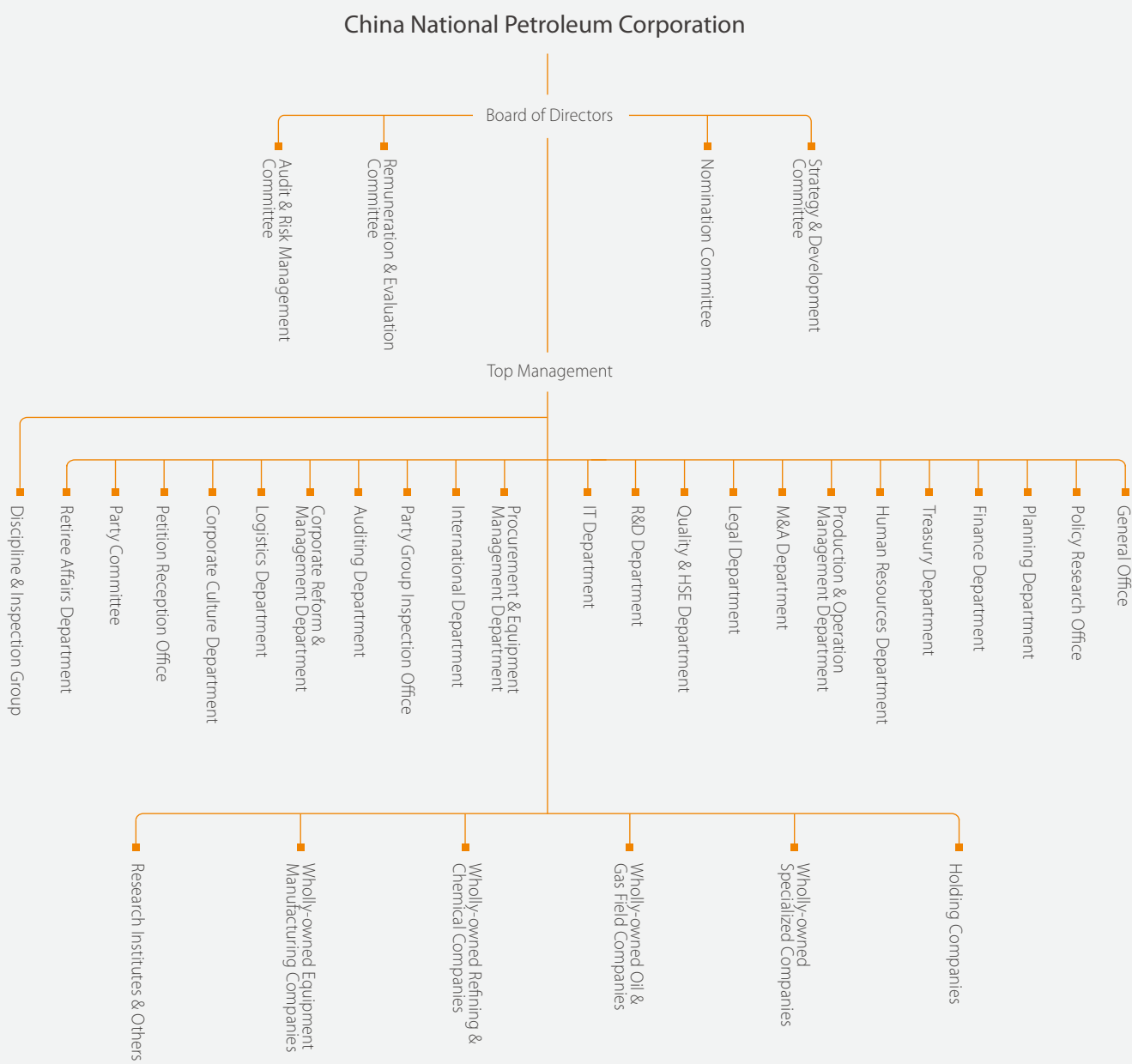


Duan Liangwei
Vice President,
Chief HSE Supervisor



Huang Yongzhang
Vice President

Organization



Key Topics |

01 Technological Innovation Drives Newly Added Reserves to Record High

Technological innovation is the primary driving force for the company's growth. At CNPC, we embrace innovation as part of our organizational strategy with a strong focus on business orientation, indigenous innovation, strong incentives, openness and sharing. Under this strategy, we strive to be more innovative and competitive by pushing ahead with breakthroughs in core technologies, nurturing and motivating technical talents and creating an open and innovative corporate ecosystem.

In recent years, with the high-quality growth of the domestic economy and the accelerated upgrading of the energy consumption mix, there has been increasing demand for oil and gas resources. In response to this demand, we have stepped up investment in upstream activities and strengthened R&D efforts in exploration technology. Meanwhile, prospective, concentrated, refined and integrated techniques have been carefully deployed, with a focus on new and key areas. In 2019, these efforts resulted in a number of major discoveries and achievements in the Ordos, Junggar, Tarim, Sichuan and other basins, leading to a significant year-over-year increase in newly added proven geological reserves and marking the highest level since the company's restructuring in 1998.

A solid resource base for oil and gas production

Newly proven oil in place (Domestic)

836.60
mmt

up **31.3%** year-on-year

Newly proven gas in place (Domestic)

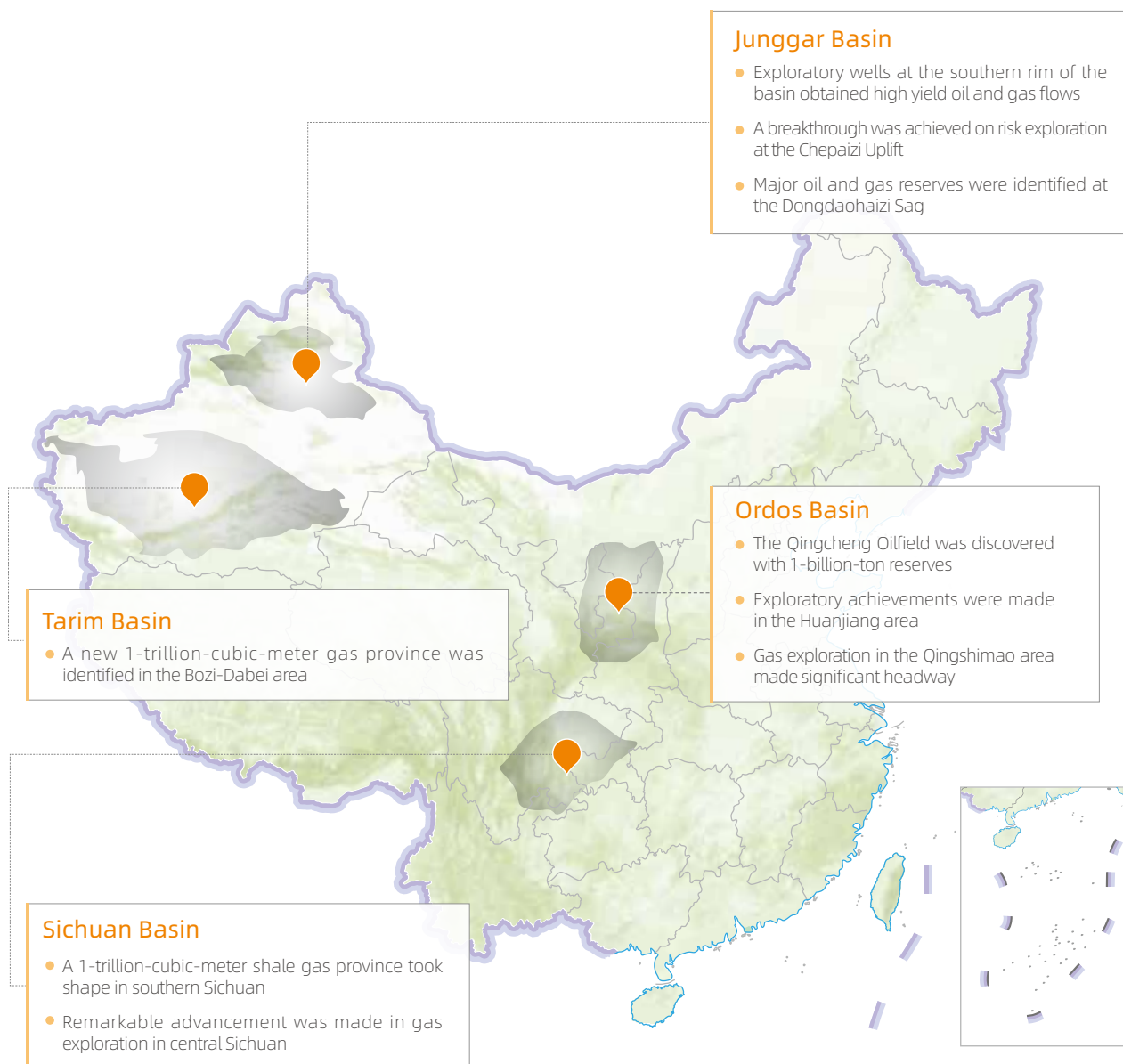
1,239.9
bcm

up **112.1%** year-on-year



Oil and gas exploration in the Bozi-Dabei area, Tarim Basin

Major discoveries in 2019



02 The Eastern Russia-China Natural Gas Pipeline in Operation

The Eastern Russia-China Natural Gas Pipeline was officially put into operation on December 2, 2019. With CNPC's participation in its investment and construction, the Pipeline includes the section in Russia, often referred to as Power of Siberia gas pipeline, the cross-border section and the section in China. The gas is mainly supplied from the Kovyktinskoye Gas Field in Irkutsk Oblast and the Chayandinskoye Gas Field in Sakha Republic (Yakutia) in East Siberia, Russia.



Project Background

The Chinese section of the Eastern Russia-China Natural Gas Pipeline with the largest diameter and the highest pressure currently in the country, starts from Heihe city, Heilongjiang Province in the north and winds its way to Shanghai municipality in the south. As planned, it will be constructed and put into operation in three subsections. The north subsection (Heihe-Changling) was put into operation this time, and the middle subsection (Changling-Yongqing) and the south subsection (Yongqing-Shanghai) are scheduled to come on stream in 2020 and 2023 respectively.

In May 2014, Gazprom and CNPC signed the Gas Sales and Purchase Agreement via the Eastern Russia-China Natural Gas Pipeline. According to the contract, Russia will export gas to China for 30 years via the route since it is put into operation, and the volume will gradually increase to 38 billion cubic meters per annum.





Intelligent Pipeline

To build China's first long-distance gas pipeline of 1,422mm in diameter, the company initiated research on applicable technologies of X80 steel pipes of 1,422mm in diameter. It took three years to overcome difficulties in pipe manufacturing, fracture control, welding and construction equipment development.

This pipeline is the company's first pilot program on intelligent pipeline systems. The project integrates a real-time data acquisition and transmission system, intelligent site monitoring system, a lifecycle project management system, crew and project management platforms to enable standardized design, intelligent detection, IT-aided management and digital hand-over along the entire pipeline, which has promoted a shift from digital to intelligent pipeline construction for the company.



A Green Project

The pipeline is also a green project in China. Construction and operation of the Chinese section faced remarkable

challenges from the complex geological and topographical conditions, including permafrost, rivers, forests, and natural reserves. During initial pipeline design, the company took into full consideration the potential environmental impacts, and took tailor-made measures for different regions with regards to water protection, forest-fire prevention or layered backfill, in order to minimize the environmental footprints. In particular, culvert and shield crossing techniques and measures were applied in environmentally-sensitive areas such as rivers, lakes, forests, roads and bridges.

The Eastern Russia-China Natural Gas Pipeline is a landmark project of Russia-China energy cooperation and a paradigm of the deep convergence of both countries' interests and win-win cooperation. The operation of the pipeline will further optimize China's regional gas consumption structure and enable a multisource supply of gas, which is of great significance for China to ensure gas supply in winter and to control air pollution. The construction and operation of the pipeline have also driven the development of infrastructure and supporting industries, created job opportunities, and promoted the economic growth in places along the route.





2019 Industry Review

The global oil and gas industry was faced with growing risks and uncertainties against the backdrop of international political and economic complexities. The industry was navigating through opportunities and challenges on stormy waters.

Global Oil & Gas Industry

World energy consumption grew slowly and energy transition kept moving forward. As major economies slowed down in economic growth and trade tensions escalated, global primary energy consumption grew slowly to 13.82 billion tons of oil equivalent, which was 0.6 percentage points down from a year earlier. Despite the process of reducing greenhouse gas emissions being challenged across the globe, the shift to clean energy was still underway. China and the EU led the way in boosting the use of renewable energy and natural gas, which were the fastest-growing energy sources in 2019.

Global oil market was struggling to balance with oil prices lower than the previous year. Oil prices were down from a year earlier as a whole. Brent crude futures averaged at USD 64.2 per barrel in 2019, down 10.5% year-on-year. With global economic growth at its lowest since the financial crisis in 2008, the demand increase in oil fell below 1 million barrels per day for the first time since 2011. As many oil producing countries have to cut production, the world's oil supply and demand staggered to reach balance.

LNG trade expanded rapidly amid the natural gas demand slowdown. As a result of the sluggish growth in natural gas consumption in North America and Asia Pacific, global natural gas

consumption and production grew at 3.5% and 3.4% respectively, which were 1.8 percentage points down from a year earlier. Natural gas prices in major markets fell in varying degrees and the Asian premium further narrowed. The LNG trade growth rose to 12.2%, which was nearly twice the growth rate of pipeline gas, driving the global natural gas trade grew steadily.

There was a significant increase in oil and gas reserves discovered globally with E&P investments on the rise. The newly discovered recoverable reserves of oil and gas amounted to 1.28 billion tons of oil equivalent globally, marking a significant increase of 60% year-on-year. 25 major discoveries were above 100 million barrels of oil equivalent, mainly from South America and Africa. Global E&P investments rose 8% from the year of 2018, indicating onshore E&P investment growth across the globe except for a slight decline in North America. 110 offshore oil projects were launched in 2019 around the globe as international oil giants showed more interest in offshore oil resources.

Global refining/ethylene capacity grew remarkably but underperformed as a whole compared with the previous year. Global refining capacity saw a net increase of 117 million tons per year largely from emerging economies and developing countries such as China, Saudi Arabia, Malaysia and Turkey,

marking the greatest addition for a single year since 1970. However, global processing volume for crude oil failed to grow in tandem with the refining capacity and remained basically the same as a year earlier. Refinery utilization rate declined across the major refining markets in Europe, America and Asia Pacific. Global ethylene capacity rose to 11.8 million tons per year in 2019, up 6.7% year-on-year, and reported weaker performance compared with a year earlier.

Trading volume of oil and gas assets increased but the number of deals slumped and U.S. shale assets transaction started to cool down. The upstream M&A market remained lackluster, seeing only 220 deals closed in 2019, down 30% from a year earlier. However, the transaction amount totaled USD 190 billion, up 30% year-on-year, thanks to mega-deals. The transaction of US shale assets started to decline in terms of both the number and value of deals, i.e. down by 49% and 67% respectively year-on-year.

China's Oil & Gas Industry

China's energy mix continued to improve amid a slowdown in energy consumption. The Chinese economy was under downward pressure in 2019. The total energy consumption reached 4.79 billion tons of standard coal, up 3.2% year-on-year, indicating a slight retreat. The shift to low-carbon energy made headway, with non-fossil fuels power generation increasing by 6% year-on-year. Renewable energy power generation was refocusing on quality improvement over capacity expansion. As the government work report proposed for the first time to promote hydrogen energy, some local governments and companies has started working on and implementing their hydrogen energy initiatives.

China's dependencies on foreign crude oil and petroleum both stood above 70% and refined products consumption saw anemic growth. China's demand for crude oil surged as a result of large private refineries coming on stream, pushing its dependencies on foreign crude oil and petroleum up to 72.5% and 70.8% respectively. Economic stress, weak car demand and more alternative energy sources, among others, hampered gasoline, diesel, and kerosene consumption into mediocre growth. Meanwhile, exports expanded to exceed 50 million tons for the first time. The rise of large private-sector refinery companies contributed to a more diversified landscape in the domestic market.

The increase in gas production hit a new high and the building of natural gas production, supply, storage and sales system made steady headway. The full-year natural gas consumption

stood above 300 billion cubic meters, up 9.6% year-on-year and accounting for 8.3% of China's primary energy consumption. The full-year natural gas supply was 310.6 billion cubic meters, up 9.5% year-on-year and domestically produced natural gas grew by 9.6%, marking a new record high. Natural gas import growth slowed sharply compared with the previous year, with a foreign dependence rate of 45.2%, which was barely changed from the previous year. Steady progress was made in the building of natural gas production, supply, storage and sales system. In particular, the construction of key connectivity projects, LNG terminals and gas storages picked up pace to ease effectively gas supply crunch in winter.

The E&P action plan started to pay off with a boom in oil and gas investment. 2019 was the beginning year of China's Seven-Year E&P Action Plan in order to vigorously promote domestic oil and gas E&P. Upstream investment increased remarkably, and crude oil production rebounded after three years of downward movement. The full-year crude oil production was approx. 191 million tons with an increase of about 1.1% from a year earlier; natural gas production was approx. 173.8 billion cubic meters, up about 9.8% year-on-year. Unconventional gas accounted for more than one-third of total natural gas production as both tight gas and shale gas outputs hit record highs.

Capacity growth for refining and ethylene picked up momentum resulting in further excessive refining capacity with private companies accounting for an even greater share. In 2019, China's refining capacity expanded to 860 million tons per year, marking another refining boom after 2014. The total ethylene capacity stood above 30 million tons per year for the first time, up 21.1% year-on-year. New additions to refining capacity were mainly from the private-sector refineries. The domestic refining overcapacity issue became graver.

Reforms in the oil and gas system were unprecedented to push ahead with energy transition in a pragmatic manner. Government departments stepped up efforts to reform the oil and gas system in 2019. The oil and gas industry opened up to private and foreign investors in full measure. Major breakthroughs were made in improving the mechanism for the operation of oil and gas pipeline networks. A national oil and gas pipeline network company was established to facilitate a market-driven oil and gas industry.

Source: 2019 Report on Oil and Gas Industry Development by CNPC ETRI

Environment and Society

The company is committed to the principle of "people-oriented, quality foremost, safety first, environment prioritized" to achieve "zero defect, zero injury and zero pollution". We pay attention to people's livelihood and social progress, and strive for harmonious relationship between energy and the environment, as well as enterprise and the community.



At CNPC, we put the provision of clean and efficient energy, environmental protection, energy conservation and emission reduction as well as joint development with the community as an important basis for our sustainability strategy. The company continues to promote safe, green and thrifty operations, press ahead with the construction of ecological civilization and develop a resource-saving and environmentally-friendly enterprise. As a good corporate citizen, we actively support community development where we operate in order to promote local economic and social development.

Safe Operation

We actively promote the building of a long-acting safety system and comprehensively enhance our work safety management. In 2019, the company maintained a safe momentum in production.

Management System and Performance Assessment

In 2019, we launched a range of rules and procedures, including Safe Production Accountability Report Rules for Corporate Executives and Measures for Safety Supervision and Management of Leasing Business. We amended the head office's Emergency Response Plan together with a number of supporting plans as part of our ongoing top-level design. We improved reviews of the HSE management system, and put more efforts into rectifying problems found in these reviews. Competence on HSE performance was assessed across the board for new recruitments as well as key job roles. We revised the detailed regulations based on the assessment of safety performance, and strengthened performance evaluation and accountability for accidents.

Safety Risk Management

The company implemented a dual-prevention mechanism covering risk prevention and control as well as hazard identification and treatment for production safety, and improved the risk prevention and control classification system, so as to eliminate safety risks and potential hazards before incidents happen. In 2019, we continued to push ahead with supervision on classified risks in our subsidiaries. Early warning and risk control in the key areas were stepped up and a series of safety operation campaigns were launched to prevent risks, eliminate hazards and contain accidents. We formulated guidelines for risk prevention and control in oil and gas field operations as well as refining & petrochemicals operations, and guided the subsidiaries to formulate their risk prevention and control plans. Meanwhile, we promoted standard HSE management practices across our production sites.

Hazard Control

We attach equal importance to both prevention and control of hazards, build a long-acting mechanism for hazard control, so as to ensure all hazards are timely and effectively treated, and the fundamental safety level enhanced. Inspections targeting hazards in oil and gas pipelines and volatile organic compound (VOCs) etc. were conducted in 2019. Safety management was stepped up for oil and gas pipelines to ensure a significant improvement in inherent safety.



An on-site oilfield safety inspection by safety engineers

Hazardous Chemicals Management

We exercised full-process management on hazardous chemicals production, storage and transportation. In 2019, the company implemented special campaigns to tackle safety hazards associated with hazardous chemicals under the national Guidelines on Detection and Control of Safety Hazards for Hazardous Chemical Producers. We also push ahead with the relocation and transformation of hazardous chemicals producers in densely populated areas, improve our risk monitoring and early warning platform for hazardous chemicals, and keep bolstering the ability to monitor the safety of hazardous chemicals.

Supply Chain Safety

We include suppliers and contractors into our safety management, and have an all-process management from access, selection, training, use, to evaluation, so as to prevent and reduce accidents caused by suppliers and contractors. In 2019, we took a stricter approach to contractor supervision focusing on access control and strengthening safety training program for key positions in a bid to reduce safety risks in connection with contractor operations on an ongoing basis.

Offshore Oil Safety Management

We keep beefing up offshore oil safety management. Safety inspections on offshore oil reserves and production capacity expansion were conducted in 2019. Risk control measures were stepped up for the key procedures of offshore crane operation and emergency plans were implemented to protect the safety of

offshore oil production systems against storm surges caused by super typhoons such as Lekima.

Overseas Security Management

The company constantly reinforces the operation of social security management system, strengthen social security risk prevention and control, and enhance emergency response capabilities. In 2019, we properly responded to political turmoil and social unrest in a number of countries. There were no fatalities in our overseas projects.

Environmental Protection

We make great efforts to reduce adverse effects on environment and climate. By improving resource utilization efficiency, implementing the Clean Air Act, and promoting energy conservation and emission reduction, we strive to achieve environmentally-friendly and resource-saving operations and vigorously advocate the construction of ecological civilization, in order to achieve harmony between energy and the environment. We were named the 2016-2018 "Outstanding Contribution to Energy Conservation and Emission Reduction" by State-owned Assets Supervision and Administration Commission of the State Council in 2019.

Environmental Risk Prevention and Control

We carry out environmental risk identification and assessment, and implement a risk prevention and control management model focusing on forecasting, pre-warning and monitoring. We have established a sound risk management mechanism featuring "tiered management and hierarchic prevention and control", in order to ensure overall control over environmental risks. In 2019, no major environmental accidents were reported.

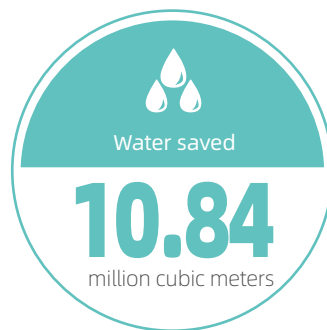
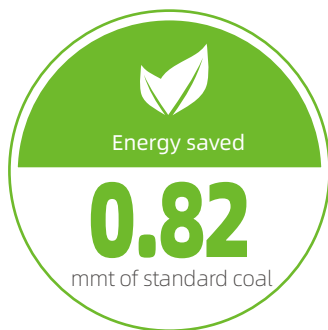
Beefing up environmental protection management

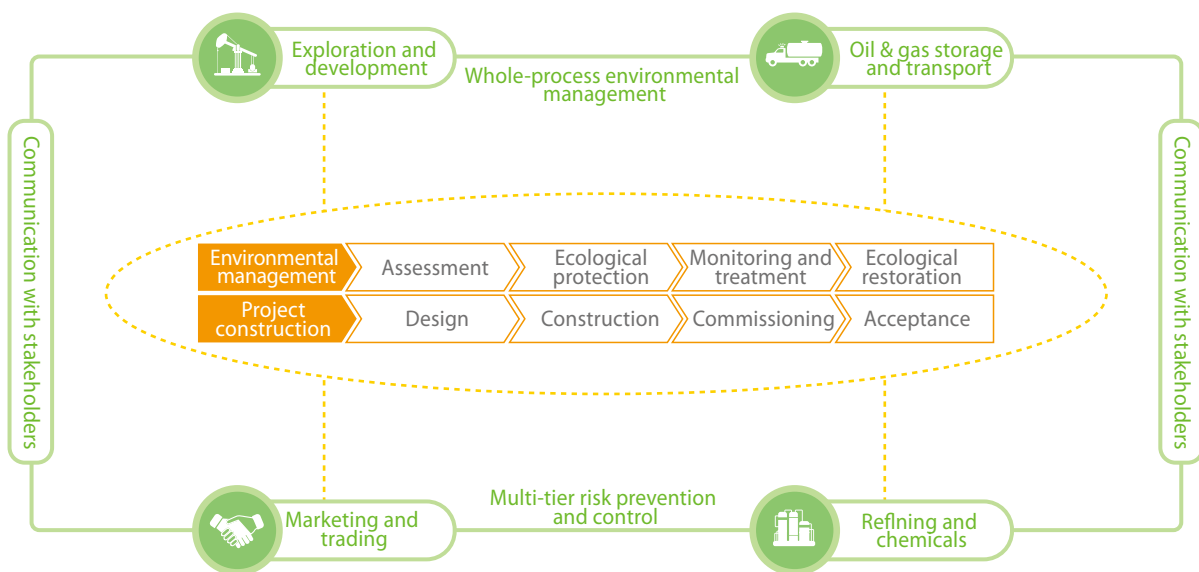
We spent approx. RMB 9.9 billion on environmental protection management in 2019 with a focus on a series of special management activities such as leak-proof underground storage tanks at service stations, integrated VOCs treatment, revamping of wastewater treatment plants, oily sludge treatment and environmental risk management, etc.

Sustainable Use of Resources

We attach great importance to the protection and rational utilization of resources. We have been striving to reduce the consumption of fossil fuels and enhance energy efficiency by reducing energy consumption intensity. Compared with 2010, the proportion of natural gas consumption in our total energy consumption in 2019 was increased by 7.77 percentage points, while the proportion of raw coal consumption in our total energy consumption was decreased by 7.87 percentage points. We endeavor to improve water utilization efficiency and realize sustainable use of water throughout the process of our production and operation activities. Through innovation in land-saving techniques and management, we make careful and efficient use of land during production, make good use of land in various ways, proactively reclaim land, carry out geological environment treatment and recovery in mining areas, and enhance land use efficiency. In 2019, the company reduced energy consumption by 0.82 million tons of standard coal, water consumption by 10.84 million cubic meters, and land consumption by 1,247 hectares.

In 2019





Eco-environment management in full life cycle across the industry chain

Control of Wastes and Pollutants Discharge

We strictly monitor and control discharge of waste and pollutants in the production process, strengthen waste management, and reduce discharge of pollutants in the air, land and water. We actively promote collection measures and recycling technologies for drilling wastes, and clean operation technologies at our oil and gas fields, which has significantly reduced wastes and pollutants.

Conservation of Biodiversity and Natural Habitats

We are committed to reducing the potential impact of production and operation on the ecological environment and biodiversity. We endeavor to avoid environmental impact, and restore the environment to its original state in case of any adverse impact from our production. We make an all-out effort to identify and address environmental pollution and ecological damage, and reduce the impact on the ecological environment by various means, including reducing noise and emissions. We do our utmost to reduce the occupation of cultivated land, protect water and land, and restore vegetation and work hard to restore the ecological environment in the working areas and protect biodiversity.

Climate Change

We support the Paris Agreement adopted by the 2015 United Nations Climate Change Conference, and embrace the goal of limiting global warming to less than 2°C by the end of this century. To this end, we actively respond to climate change, devote ourselves to low-carbon development, and share the practice of greenhouse gas emission control with industry peers and all sectors of society.

Carbon Emission Management

We pay close attention to greenhouse gas emissions and include combating climate change in our development plan. In 2019, the company announced its Green Development Action Plan 2.0, set up a task force for carbon emission management, improved carbon emission control system and played an active role in the collaborative effort of the global oil and gas industry to combat climate change.

Our Role in Oil & Gas Climate Initiative (OGCI) Decarbonization Actions

As the only Chinese member of the Oil and Gas Climate Initiative (OGCI), CNPC is deeply involved in international cooperation to address climate change, and coordinates with other OGCI members in response to climate change and low carbon transition of the oil and gas industry. In 2019, the CNPC-proposed Xinjiang CCUS Hub was selected by OGCI as one of the five regional centers around the world under the Carbon Capture, Utilization and Storage (CCUS) KickStarter Initiative, which has aroused international attention.

Carbon Emission Reduction During Production

We pay high attention to optimizing our own energy consumption structure and to reducing carbon emissions and carbon footprint during production and operation. In condition-permitting areas like Huabei Oilfield and Tarim Oilfield, we use renewable energies such as geothermal energy and solar energy needed for production to reduce carbon emissions during production.

Market-based Mechanism for Carbon Saving

We actively participate in carbon trading activities to achieve

carbon emissions reduction through market-based mechanisms. We are the co-founder of the Tianjin Climate Exchange (TCE), the first comprehensive emissions trading institution in China. The energy saving and emission reduction projects developed by TCE can reduce energy consumption by more than 200,000 tons of standard coal annually, equivalent to over 500,000 tons of carbon dioxide in emission reduction. All CNPC's subsidiary companies engaged in the China's emissions trading system fulfilled their end of bargain in 2019.

Forestry Carbon Sink

We support and partake actively in the construction of carbon sink forest and forestation activities in China. The company established the China Green Carbon Foundation together with the State Forestry Administration for ongoing efforts in that regard. Meanwhile, we set up the Forestation Committee to ensure continuous forestation in our production areas and living quarters. As of 2019, CNPC's green coverage reached 286 million square meters. The company's forestation activities attracted 499,000 participants to plant 2.027 million trees throughout the year.



Forestation in production areas and living quarters

Social Responsibility

We remain committed to combining our business growth with local sustainable development, attaching importance to people's livelihood and social progress, sharing development opportunities and resources value with the local community. In 2019, we continued to carry out targeted poverty alleviation and aid programs, and participated in community building through various ways, including education and healthcare, etc.

Targeted Poverty Alleviation

We respond actively to the initiatives of the United Nation's 2030 Agenda for Sustainable Development and to the Chinese government's policies on poverty alleviation, with a special focus on people's livelihood, industrial development, intellectual development and medical care. By combining our business strengths with local resources and market advantages in areas receiving assistance, we take targeted measures to help them develop the local economy on their own.

CNPC recognized as Responsible Enterprise of Year 2019

CNPC was named "Responsible Enterprise of Year 2019" at the 15th China • International CSR Forum jointly hosted by China News Service and China News Weekly.

In 2019, we continued efforts in targeted poverty alleviation and invested RMB 152 million in 70 projects, including infrastructure reconstruction, education and training, healthcare, as well as industrial collaboration, in 13 counties and districts from seven provinces (municipalities and autonomous regions) of China, namely Xinjiang, Tibet, Qinghai, Chongqing, Henan, Jiangxi and Guizhou.

Developing tourism for poverty alleviation in rural areas

CNPC has been implementing the Developing Tourism for Poverty Alleviation Demonstration Program in three poverty-stricken counties since 2017, i.e. Xishui in Guizhou as well as Taiqian and Fanxian in Henan. By exploring the local tourist resources and adopting the mode of villager's cooperative, CNPC invested in featured accommodation to boost the tertiary industry focusing on rural tourism, in a bid to create an industry cluster including farming, processing, tourism, cultural & creative products making, and vacation resorts etc.

- In 2019, the program saw two projects becoming operational in Henan, which bolstered local economy greatly and improved the lives of villagers:
- Based on protection-oriented planning, idle properties in villages are transformed into comfy accommodation to retain the pastoral style as much as possible
- Rural infrastructure and living conditions of the villagers were improved
- With a tourist-friendly environment, a great choice of tourism products was available, which facilitated the marketing of local agricultural products
- In this process, villagers received skill training, which improved the overall quality of rural population and the level of urbanization

Rural tourism is a platform for giving play the local cultural and natural resources and achieving harmony and sustainability in rural areas



Well-trained villagers started their new jobs locally as housekeepers



The Safflower Industrial Park invested by CNPC in Qapqal County, Yili, Xinjiang

Supporting Education

We carry out various activities in helping young people access equal opportunities for education. Specifically, we set up scholarships, offer grants and subsidies to students from underprivileged families, improve teaching conditions for impoverished regions, and support scientific and cultural activities as well as relevant competition events. In 2019, CNPC Scholarships totaled RMB 3.99 million to 635 students.

In addition, we explore new models to support education, and call on the public to pay attention and work together to achieve education equality. In cooperation with China Foundation for Poverty Alleviation (CFPA), Beijing Normal University Education Group and Tencent Foundation, the Xuhang Scholarship Program and the Teacher Training Program effectively helped more students from poverty-stricken areas to realize their dreams for education.

Promoting Local Development

We adhere to the principle of open-up and cooperation for mutual benefit, and keep expanding our joint-venture cooperation with local capital in the upstream, midstream and downstream sectors. During the process of developing and running our projects, we help to nurture local suppliers and contractors, thereby creating jobs, driving related business growth, and giving back to local people.

Contributions to the Development of Overseas Communities

We respect the cultures and conventions of the host countries, and are committed to establishing long-term and stable cooperative relations. As a good corporate citizen, we incorporate our development into local socio-economic growth and actively create socio-economic value to jointly promote the development and prosperity of local communities.

Enhancing Communication with Local Communities

We set up environmental protection and community relations coordinating bodies in many overseas areas to promote communication with local governments, NGOs and community representatives, with whom we have strengthened communication and coordination by holding conferences, issuing reports and paying visits.

Managing Community Impact

We exert a positive influence in community development through responsible operations, which is not only reflected in job creation, tax contribution, and business opportunities for local suppliers,

but also in reducing the impact from production and operation activities on community environment and society to protect rights and interests of community residents.

Participating in Community Welfare

We take an active role to help improve the living conditions of local people to achieve harmonious and mutual development through donating in education, healthcare and other public welfare programs. We launched in 2019 a wide range of public welfare activities in the countries where we operate, such as Iraq, Chad, Kazakhstan, Ecuador, Peru, and Canada. We supply clean energy, build hospitals, schools, roads, and water wells, make cash and in-kind donations, provide health check-ups and site consultation on medical care, as well as support education, culture and healthcare in the local communities.

Promoting Localization

We strictly comply with laws and regulations in the countries where we operate, and have made remarkable contributions to local economic development. We try our best to protect the legitimate rights and interests of the indigenous people. Before launching a project, we conduct assessments of its social and economic impact, taking into consideration of the needs of the indigenous people, rights and benefits, cultural heritage, and involuntary resettlement. We place priority on purchasing local products and services, and create opportunities for local contractors and service companies to participate in our projects. We also support the development of local SMEs and business start-ups in local communities and create job opportunities. In Iraq, CNPC has created over USD 400 million worth of business opportunities and more than 20,000 jobs.

Growing together with the local community to facilitate urbanization

The town of Koudalwa was originally a small village with fewer than 500 people near the Ronier Oilfield in Chad. There was a lack of basic amenities, roads and schools in the village, and water supply facilities were seriously inadequate. During the hot dry season, villagers had to move from place to place to seek water sources and this unsteady lifestyle made it difficult for them to receive education and improve living conditions.

We visited the local community to see what could be done to help the villagers. A total of 49 water wells were dug in Koudalwa to provide access to clean water, benefiting 39 surrounding villages and 25,000 people in the adjacent communities. We also built for the Koudalwa village a main road and a 6-grade public primary school enough for accommodating 300 students, which have met the transportation and education needs of local residents. The development of the oilfield boosted employment. As of the end of 2019, it created new jobs for 969 people.

Over these years, people from other villages and towns gradually gathered in the village of Koudalwa to drive its population up above 10,000, which has created an effect of urbanization and gained high appreciation by the local people.



Human Resources

The company actively pushes ahead with the reform of talent development strengthens and strengthens talent pool building to develop an innovative and motivated workforce and provides an enabling environment for employees' self-realization.



Upholding the people-first concept, we attach great importance to safeguarding employees' legal rights and interests, building an effective platform for employees' career development, and promoting the localization and diversification of our overseas workforce. We pay close attention to the physical and mental health of our staff, care about their life outside work, and ensure that all employees could benefit from company's development and grow along with the company.

Employees' Rights and Interests

Strictly complying with international conventions on labor and human rights, we respect and safeguard employees' legal rights and interests, and advocate an employment policy focused on equality and non-discrimination. We continue to perfect the compensation and benefits system, and improve workplace democracy, so as to create a fair and harmonious working environment for employees.

Employment Policies

We always value and safeguard the lawful rights and interests of our employees. We strictly comply with the Labor Law of the People's Republic of China, the Labor Contract Law of the People's Republic of China and the Trade Union Law of the People's Republic of China, relevant international conventions approved by the Chinese Government, and relevant laws and regulations of the host countries.

We promote the employment policies of equality and non-discrimination, and provide equal opportunities and fair treatment to all employees regardless of nationality, race, gender, religion or cultural background. We resolutely prohibit child labor and forced labor, and try to increase the percentage of women and ethnic minorities, and guarantee fair compensation, benefits and career development opportunities for all employees.

In 2019, the company hired 2,711 fresh graduates, with 38.1% holding master's degree or higher. By the end of 2019, 32.36% of the company's employees are female, and 35.94% hold bachelor's degree or higher.

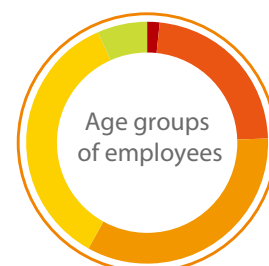
Compensation and Benefits

In 2019, we intensified our efforts to reform the remuneration and benefits system, improve policies on enterprise annuity and supplementary medical insurance, and further improve the salary distribution system which is more performance-based and profit/efficiency-focused. We also amended the **Measures for Performance Evaluation** together with the supporting rules to support the organization-wide performance review. A system underlying on-the-post contribution, which fully considers different types of work was put in place. Besides, priorities are given to R&D employees, grass-roots level employees, key positions employees and under harsh environment employees, in an effort to respect and reflect the value of employees. 100% of our employees are put under labor contract as well as the Social Insurance Law of the People's Republic of China.

Master's degree and higher	3.40%
Bachelor's degree	32.54%
Junior college	24.11%
Technical secondary school and below	39.95%



25 and below	1.71%
26-35	22.98%
36-45	33.37%
46-55	35.55%
56 and above	6.39%



Male	67.64%
Female	32.36%



Employee Engagement

The company has established a democratic management system and an open bulletin system based on workers' congress, and encourage employee engagement in company management. We have established multiple channels to communicate with employees for opinions through employee representative meetings. In addition, we guarantee the employees' rights to know, participate, manage, vote and supervise to improve employee engagement constantly.

Career Development Platform

Driven by modern corporate governance concept, we embrace innovation in our talent development system in a bid to understand the needs for career development of employees at different stages, create a career path and develop an innovative workforce. All this provides a great platform for employee self realization.

Education and Training

The company continues to deepen the reform in education and training to deliver diversified and differentiated vocational training programs that integrate the company's business growth into the employee career development paths, in a bid to realize the growth of both the company and individuals. We maintain a focus on "Four Talent Training Projects" for managerial personnel, technical experts, skilled operators and international talents. Job skill competition, in combination with on the job training, helps improve skill excellence, motivate front-line employees and test training effectiveness.

Career Development

We attach great importance to the career planning of employees and support the career development of employees to realize their value. In 2019, we deepened the reform of technical rank-based career development for technical staff at R&D institutions, and

Major progress in education and training in 2019

- We have spent RMB 1.98 billion in employee training
- The number of trained employees: 1,023,000, training coverage ratio of front-line employees: 100%
- Remote training: 1.12 million person-times, 2.16 million hours, 110 projects

continued to improve the incentive mechanism to fully unleash the potential of employees in an effort to provide technical personnel with an independent, unimpeded and stable career path. We implement Oil Scientists Training Program and Outstanding Young Technician Training Project, and push forward the Skilled Workers Training and Development Program so as to chart course for the development of innovative talents.

By the end of 2019, we had 93 Skilled Expert Workshops, including 18 National Skilled Expert Workshops, 22 CAS and CAE academicians, 113 senior technical experts and 385 technical experts.

Skill Excellence China 2019 in CNPC

In 2019, CNPC, the Ministry of Human Resources and Social Security, and the State-owned Assets Supervision and Administration Commission of the State Council jointly launched the Skill Excellence China 2019 in CNPC Program to promote technical talent training.

So far, hundreds of seminars, technical expert knowledge-sharing sessions and on-site technical support workshop, have been held in more than 30 subsidiary companies to solve problems in front-line operations, file patents and promote the adoption of innovative techniques. Meanwhile, a variety of skill competitions and courses have been organized to train more than 23,000 skilled employees and reach nearly 300,000 operators.



CNPC employees participated in skill competition



CNPC Latin America employees participated in outward bound program

Localization and Diversity

At CNPC, we embrace a culture of respect, openness and inclusiveness and take a profession-based and market-driven approach to local employment. We continue to improve our HR procedures for recruitment, employment, performance review and reward/punishment under the applicable laws and regulations of the host country. Meanwhile, we attract and retain top talent from the local community by providing them with a career development platform.

Local Employment

We bring job opportunities, employ and train local people, and promote local employees to management positions. Our overseas operations are hiring professional talent in E&P, engineering and construction, international trade, finance, accounting and human resources management in more than 70 countries and regions. In 2019, international and local employees accounted for 84.92% of the total workforce in our overseas oil and gas operations.

Respecting Cultural Diversity

We give full accommodation to the personality, ability and background of employees, and cherish their varied talents. We make every effort to eliminate the employment and occupational discrimination, create a relaxing and inclusive working environment, and promote the mutual respect and understanding among employees from different ethnic groups, nationalities and cultural backgrounds.

Employee Health

We treasure employees' life and attach great importance to employees' health. Striving to provide a favorable working

environment for the physical and psychological health of our employees, we have rolled out a series of policies and measures to ensure that they can work in good physical conditions with positive attitudes.

Occupational Health

The rules for evaluating the measurable occupational health objectives were formulated in 2019 to provide guidelines targeting workplace-related health hazards. Occupational health checkup and the Occupational Disease Prevention & Treatment Law awareness events were carried out to promote continuous improvement in employee health. The plan to implement the Healthy China 2030 Initiative was developed to guide our employee health activities. In 2019, 99.62% of our employees received occupational physical examinations and the detection rate of occupational hazard factors stood at 99.28%.

Mental Health

We take measures to continuously improve the employee recuperation and vacation system. We implement the Employee Assistance Program (EAP), set up hotlines and website for psychological consultation, and carry out various forms of training on mental health improvement of employees. In 2019, ten psychological crisis response training programs, three EAP Ambassador training classes, and seven family happiness camps were conducted throughout the year. Nearly 400 employees received more than 1,200 hours of consultation services through our mental health hotline. Mental health teams were deployed in Niger, Chad, Myanmar and other countries to provide consultation services and mental health support for overseas employees.



Technology and Innovation

In light of its business development program, the company has deepened R&D reforms and stepped up talent development in a bid to foster innovation on all fronts and create a new engine for growth.

Technological innovation is the key driver behind the company's high-quality growth on its way to build an integrated international energy company. In 2019, driven by a focus on business needs, we continued to unleash the power of innovation through increased R&D spending, key R&D programs and R&D reforms, with the principle of "business orientation, indigenous innovation, strong incentives, openness and sharing" at the heart of our efforts. These efforts brought important high-quality R&D achievements and prestigious technology awards to provide a strong support to our business growth.

Construction of Technological Innovation System

We have further strengthened an innovation-driven system for technological innovation by introducing a multi-tier, multi-faceted R&D system to support the growth of our business units. A supporting system is in place to secure funding, streamline processes and facilitate team building. In 2019, we implemented the Guidance on Advancing Technological Innovation for High-Quality Growth and introduced a series of institutional frameworks for deepening reforms, regulating incentives, and motivating R&D teams and talents to provide a better environment for technological innovation.

By the end of 2019, the company has 82 research institutes, 55 key laboratories and testing centers, and 19 national R&D platforms covering upstream, midstream and downstream activities. We have 30,968 scientists and researchers, including 22 academicians, 289 senior technical experts and chief experts.

Major R&D Achievements

In 2019, our R&D efforts were focused on oil and gas exploration, production efficiency, eco-friendly oil products and high-end petroleum equipment manufacturing etc. We made significant headway in know-how, core technologies, and equipment independent R&D and owned a series of technologies with independent intellectual property rights.

Exploration and Production: The reservoir forming theories and evaluation methods for subsalt, ultra-deep natural gas reservoirs were studied and the EOR techniques such as air/foam flooding for low-permeability oil reservoirs were developed to provide technical support for achieving breakthrough discoveries and production growth, operating overseas projects, and managing production operations.

Refining and Petrochemicals: Our proprietary catalysts for National VI-compliant gasoline were developed for commercial applications. The R&D programs for refinery upgrades, refining catalysts, and polyolefins etc. were implemented. New polyolefin grades were launched, and production processes and technological packages for polyolefin catalysts were improved to provide technical support for the sustained growth in the refining and petrochemicals business.

Oilfield Services: A range of new techniques and systems were launched,



including fiber-based borehole geophysical data acquisition system, ocean bottom node (OBN) seismic acquisition system, high-performance rotary steerable system (RSS), 10,000-meter formation micro imager (FMI), and smart pipeline construction system for alpine regions, to enhance greatly our capabilities to deliver oilfield services under complex and extreme conditions.

Frontier Technology: New headway was made in nano oil displacement, with the mechanism for the use of nanofluids in EOR closely investigated. These nanofluids were commercialized and tested for single/clustered wells, which proves the effectiveness of the nanofluids.

Application of Information Technology

Information technology has been extensively integrated with our production and operation in the form of digital oilfields, intelligent refineries, intelligent pipelines and smart service stations etc. A

centralized R&D information platform is in place to support ERP integration and R&D information management. Meanwhile, information systems for professional areas have been improved to facilitate the construction of IoT systems for oil and gas production, engineering technology, refining and petrochemicals, equipment manufacturing etc. that enable integrated operation from real-time data collection, remote monitoring to decision support. An expert sharing mechanism has been introduced to provide supports and solutions to engineering and production issues through online technical support centers. The cloud-based platforms for business scenarios, e-commerce and scientific computing are expanded to provide cloud computing resources for R&D and engineering design activities.



Industrial robots on patrol at the Changqing Oilfield

Technological Cooperation

We have been actively involved in exchange and cooperation with IOCs, NOCs, international academic bodies, industrial organizations and research institutes from home and abroad in a bid to promote theoretical and technological innovations.

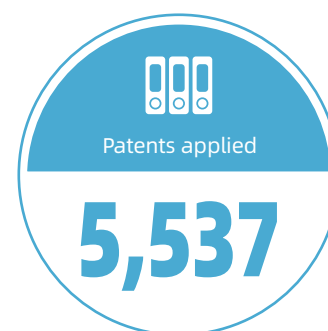
In 2019, we continued to deepen collaborative efforts in R&D under a wide range of strategic partnerships through working groups and technical seminars with oil companies such as Equinor, Gazprom, Rosneft and Total etc. to promote cooperation over EOR techniques and collaborate on frontier technologies in digital technology, big data, carbon emission reduction, shale oil and intelligent refinery etc.

We have been partnering with domestic research institutes and universities to carry out technical research and personnel training in the field of oil and gas. We worked closely with the Chinese Academy of Sciences at the frontiers of E&P, renewable energy and new materials in 2019. Meanwhile, the strategic cooperation with China University of Petroleum, Southwest Petroleum University and other universities was advancing robustly.

S&T Awards and Intellectual Property Rights

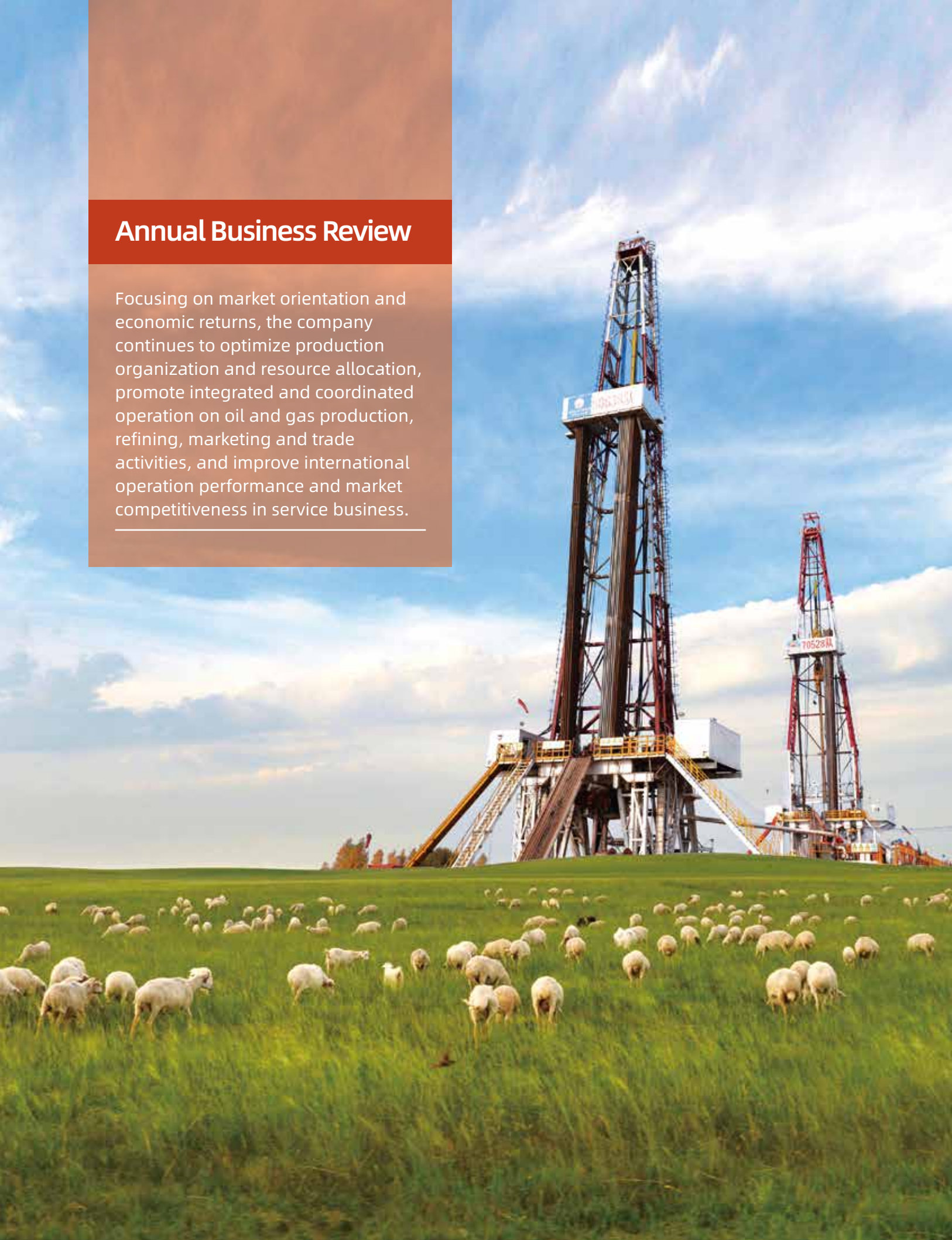
In 2019, our "100-million-ton production capacity and high efficient development for extremely-thick and complex carbonate reservoirs in the Middle East" received the First Prize of the State Science and Technology Progress Award from the National Science and Technology Progress Award Committee. In addition, the company was in charge of the preparation and amendment of seven international standards, i.e. Life-Cycle Integrity Management for Onshore Pipeline, Life-Cycle Integrity Management for Offshore Pipeline and Geological Hazard Risk Management for Onshore Pipeline etc.

Our patent applications have seen rise in terms of both quantity and quality. In 2019, the company applied for 5,537 patents (including 3,045 patents for inventions) at home and abroad and was offered 4,340 patents (including 1,600 patents for inventions). In particular, "A Well Logging Method and Apparatus for Rock Brittleness Evaluation" and "A Method for Determining the Source of Highly Mature Gas Condensate" won the China Patent Gold Award and Silver Award, respectively.



Annual Business Review

Focusing on market orientation and economic returns, the company continues to optimize production organization and resource allocation, promote integrated and coordinated operation on oil and gas production, refining, marketing and trade activities, and improve international operation performance and market competitiveness in service business.

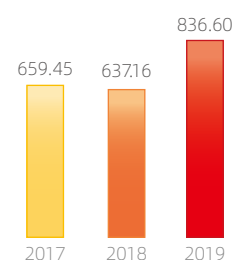


Exploration and Production

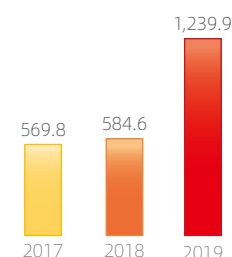
2019 was the first year to implement the Domestic E&P Business Acceleration Plan. The year saw our significant progress in E&P, thanks to our corporate reform and technological innovation, well-planned and enhanced E&P activities, favorable outcomes from unconventional resources, and active engagement in foreign cooperation in China.

Exploration

Persisting in the resource strategy in 2019, we carefully deployed prospective, concentrated, refined and integrated techniques, with a focus on new and key areas. Strategically significant discoveries were made in Junggar, Ordos, Tarim and Sichuan basins and in shale oil. The full-year increment to proven oil in place and gas in place are 836.60 million tons and 1,239.9 billion cubic meters respectively in China, recording a leap over those in 2018 and the best since our restructuring in 1998.



Newly proven oil in place (Domestic)
(mmt)



Newly proven gas in place (Domestic)
(bcm)

Reserves and operating data (Domestic)

	2017	2018	2019
Newly proven oil in place (mmt)	659.45	637.16	836.60
Newly proven gas in place (bcm)	569.8	584.6	1,239.9
2D seismic (kilometers)	26,813	18,182	11,478
3D seismic (square kilometers)	7,843	12,570	15,204
Exploration wells	1,774	1,803	1,405
Preliminary prospecting wells	986	997	733
Appraisal wells	788	806	672

Major Discoveries

Exploration in new blocks and domains

14 important discoveries achieved from risk exploration and preliminary prospecting

- High yield oil and gas flows were obtained from risk exploration wells Gaotan-1 and Chetan-1 in Junggar Basin
- A new gas province with one trillion cubic meters of reserves was identified in Bozi-Dabei region in Tarim Basin
- In Ordos Basin, we began explore shale oil in Block Chang-7 and uncovered the first 100 billion cubic meters gas field in the Qingshimao area of Ningxia Hui Autonomous Region
- New progress was made in exploring tight gas in Sichuan Basin
- Important discoveries were made in Songliao, Qaidam, Erlian, and Bohai Bay basins

Exploration in mature blocks

Oil exploration resulted in 18 important achievements and unveiled 5 uncompartimentalized reserves of 100 million tons for each

- In Ordos Basin, we discovered the Qingcheng Oilfield with reserves of more than one billion tons; and newly found more than 300 million tons of probable oil in the Huanjiang region
- Several large-scale oil plays were unveiled in the Manan region of Junggar Basin, the northern part of Tarim Basin, the Yingxi region of Qaidam Basin, and Songliao and Bohai Bay basins

Gas exploration resulted in 10 important achievements and unveiled 9 uncompartimentalized reserves of 100 billion cubic meters

- A 1-trillion-cubic meter shale gas province was found in the southern part of Sichuan Basin, which consisted of more than 700 billion cubic meters of newly proved shale gas in place in the Changning, Weiyuan, and Taiyang blocks
- Several large-scale natural gas plays were newly unveiled in the Sulige region of Ordos Basin, the Keshen-Dabei region of Tarim Basin, etc.



Xinjiang Oilfield

Crude Production

With continued emphasis on both stabilizing production in mature fields and ramping up the profitable production in new blocks, we produced 101.77 million tons of crude oil in China in 2019 by highlighting the organization and implementation of production and accelerating the transformation of development methods.

Stabilizing Production of Mature Fields

With the Stable Production Program, we stabilized production of mature fields, which accounted for most of our onshore fields, by mitigating the decline rate and enhancing the recovery factor. The natural and composite decline rates and the growth of the water cut were reduced, thanks to measures such as fine interpretation and classified and hierarchical management of reservoirs, effective water injection in oilfields, restoration of dormant wells, and pilot development. Based on a combination of secondary and tertiary recovery techniques and deployment of surfactant/polymer flooding, we increased the overall recovery by more than 20 percentage points in Xinjiang, Dagang, and Liaohe oilfields.

Ramping up Production in New Blocks

Focusing on profitability, we ramped up production capacity in new blocks by 14.78 million tons in 2019, thanks to increased single-well output and enhanced efficiency respectively attributable to improved technologies and innovative management. The application of "horizontal wells + SRV fracturing" technologies was extended, and at the same time, new "large-platform, three-dimensional, factory-process" ramp-up model rolled out, which brings new ideas to traditional production concept and development mode. Construction

of 13 demonstration zones, one of which was shale oil at Changqing Longdong, was pushed forward, shaping a new model for building the profit-based productivity of unconventional resources.

Exploration and Development Technologies

In 2019, our enhanced R&D gave birth to innovative E&P technologies that created more possibilities for stabilizing and ramping up production. We accelerated the R&D and application of high-precision 3D seismic exploration, deep and long horizontal well drilling and completion, and fracturing stimulation technologies. We also carried out pilot development focusing on "high water cut and high recovery percentage" and "low permeability and low abundance" reservoirs. Our technological systems of complex reservoirs logging evaluation, platform-based arrangement of large well clusters, SRV fracturing, well borehole and operation technology were improved. All these technologies have fully enhanced our capability of engineering and technological support. Remarkable results were achieved with innovative and strategic technologies like oxygen-reduced air drive and natural gas gravity flooding in Liaohe and Xinjiang oilfields. Based on E&P Dream Cloud, eight of our oilfields, such as Changqing, Southwest and Dagang, were fully digitalized.

E&P Dream Cloud 2.0

E&P Dream Cloud is CNPC's first intelligent information sharing platform. It is intended to bolster connectivity for data, technology and research in upstream activities and promote the intelligent E&P. In November 2019, E&P Dream Cloud 2.0 was released, heralding a new stage of IT-based intelligent upstream operation.

By the end of 2019, the platform's unified data pool had managed six decades of data assets from 360,000 wells, 600 reservoirs, 7,000 seismic sections, and 40,000 stations and storages. These shared data included all our core E&P data in six business segments of 15 disciplines. The collaborative research environment was put into full use and improved the efficiency of comprehensive research data preparation by more than 60 times. More than ten companywide centralized systems and some 100 local systems of oil and gas fields were quickly integrated over the cloud to support more than 30,000 users, which shows the synergy of the six business segments of CNPC.

Natural Gas Production

In 2019, our natural gas output in China recorded a new high of 118.8 billion cubic meters, increasing for three consecutive years after climbing up to 100 billion cubic meters, significantly helping improve the energy structure of China. We achieved this by pushing forward with conventional gas development and emphasizing R&D and investment in unconventional resources such as tight gas and shale gas under the **Natural Gas Business Development Plan**. This increase not only occurred in the major regions of Changqing, Southwest and Tarim fields, but also in Daqing Oilfield for nine consecutive years and was stable in the Qinghai, Huabei and Dagang fields.

Underground Gas Storages

In 2019, we further tapped the potential of operating storages and built new ones to accommodate both regional and seasonal imbalances and ensure supply in the domestic natural gas market. By the end of 2019, our ten operating storages had peak-shaving

capability of 10.2 billion cubic meters; and 18 storages were under construction, two of which were being built and the other 16 were under preliminary evaluation and pilot testing.

Unconventional Hydrocarbon and New Energy

E&P of unconventional hydrocarbon such as tight oil, shale oil, tight gas, shale gas and CBM and development of new energy such as geothermal energy and natural gas hydrates have proceeded progressively.

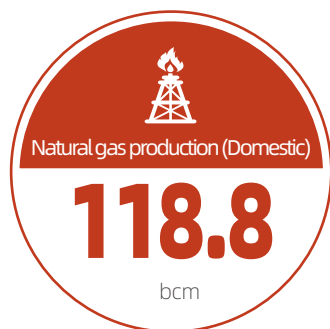
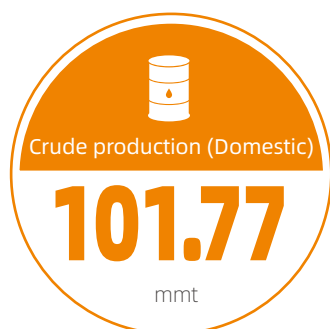
E&P of Unconventional Hydrocarbons

In 2019, we expanded unconventional E&P by enhancing the prediction and evaluation of sweet spots, pilot development, and demonstration of profit-based capacity building.

Tight oil (shale oil): Our E&P of tight oil (shale oil) saw significant results in several regions. In Ordos Basin, we proved the one-billion-ton Qingcheng Oilfield, the largest ever shale oilfield of China. In Bohai Bay Basin and Sichuan Basin, we made new progress in exploring shale oil. In Dagang Oilfield, we started China's first industrial development of continental shale oil. In Junggar Basin, we accelerated the E&P of tight oil (shale oil) in Jimusaer and Mahu regions. Moreover, scaled productivity of tight oil was built in Santanghu Basin and the southern part of Songliao Basin.

Tight gas: Tight gas exploration saw another breakthrough in the middle part of Sichuan Basin, where a new gas province with reserves of one trillion cubic meters was unveiled by multiple exploration wells that produced industrial gas flows. Tight gas accounts for most of the output from Changqing Oilfield, the largest gas producer in China. By upgrading E&P technologies and promoting more efficient development models, the oilfield kept increasing its tight gas output per well and much improved its development efficiency. In 2019, CNPC produced 33 billion cubic meters of tight gas, accounting for more than 1/4 of our total gas output in China.

Shale gas: A shale gas province with reserves of one trillion cubic meters was formed in the southern part of Sichuan Basin, with more than 700 billion cubic meters of shale gas were newly proved. New breakthrough was made in the deep shale gas exploration in Luzhou and Weiyuan blocks. In the Southwest gas province, we built China's largest base of shale gas production with daily output of 30 million cubic meters.



CBM: We kept extending our reach in CBM exploration and development. In Huabei Oilfield, we accelerated R&D for developing CBM in deep layer and of medium rank, and extend the depth from 800m up to about 2,000m. In two major producing fields, namely, Qinshui Basin of Shanxi Province and Edong Gas Field of Shaanxi Province, we increased the output by innovatively tapping potentials of sweet spot resources and comprehensively treating mature reservoirs, especially in the blocks of Baode, Sanjiao, and Hancheng.

New Energy

We have been pushing ahead with our new energy development plans and deployed a series of new energy projects closely related to our core operations. Areas of focus include geothermal energy, natural gas hydrates, biomass, energy storage, hydrogen fuel and uranium.

Geothermal energy: We have been actively promoting the development and utilization of geothermal energy and supporting relative research efforts, and implemented demonstration projects for the development and utilization in Huabei, Liaohe, Daqing and Jidong oilfields. In 2019, our first geothermal well in Xiong'an New Area of Hebei Province was completed, which would considerably help the area "build a clean and environmentally-friendly heat supply system by rationally utilizing geothermal resources".

Joint E&P in China

We have been deepening the cooperation in China with international partners including Shell and Total around low-permeability reservoirs, heavy oil, shallow-water reservoirs, sour gas, high-temperature and high-pressure gas reservoirs, CBM, tight gas and shale gas.

In 2019, CNPC's foreign cooperation E&P projects in China produced 10.71 million tons of oil equivalent, maintaining growth and including 2.39 million tons of crude oil and 10.4 billion cubic meters of natural gas. By the end of 2019, the company had 29 joint E&P projects in operation.

We stepped up collaborative efforts in these projects, where the investment and drilling workload were much increased and new breakthrough was made in developing new projects. The Zhaodong Project, under an extension agreement with our partners, New XCL-China and ROC Oil, yielded more than 100 tons of oil every day from each of the 12 wells among of the 14 wells that were newly put into production. The Changbei Project, with Shell as our partner, produced more than 3 billion cubic meters of gas for 12 consecutive years. The Sulige South Project, with Total as our partner, built up the capacity to supply 10 million cubic meters of gas per day. CNPC was also under joint research agreements with CNOOC and Sinopec to push forward the E&P of oil and gas resources, especially tight gas, shale gas and other unconventional hydrocarbon, in Beibu Bay, Bohai Bay, Junggar and Sichuan basins.



Xiangguosi underground gas storage

Natural Gas and Pipelines

In 2019, we put more importance on the entire value chain of gas business. By actively arranging domestic and foreign gas resources, we stabilized not only the market supply but our sales growth. Moreover, we continuously optimized the operation of our gas pipeline network and put into operation of a number of key pipeline projects.

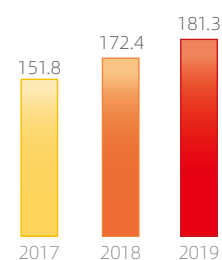
Natural Gas Sales

2019 saw faster transformation of China's energy structure and thereby higher demand for natural gas. In a market-oriented way, we optimized the portfolio of domestic and foreign resources, as well as the market layout and sales structure. Moreover, we improved our differentiated marketing strategies. In the key regions of Beijing-Tianjin-Hebei, the Yangtze River Delta and the Pearl River Delta, we advanced the "Gasification" campaign. In winter, measures were taken to meet the demand for heating purposes. All these efforts ensured stable market supply and increased gas sales. In 2019, we sold 181.3 billion cubic meters of gas in China, up 5.1% year-on-year.

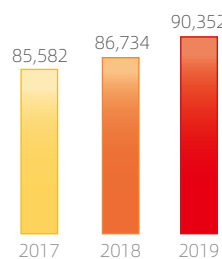
Natural Gas Marketing

In natural gas marketing, we focused on expanding our market share by direct supply to end users. We also worked out marketing strategies pursuant to the trend of market and the industry and policy changes. With optimized retail portfolios, we quickly expanded our end-user sales of urban gas supply, CNG and LNG refueling stations, gas-fueled power generation, and distributed energy, etc.

To extend our reach on the end-user market, we initiated joint-venture or cooperation projects with Heilongjiang Province, the Xinjiang Uygur Autonomous Region, the provincial capitals of Wuhan and Yinchuan, etc., as well as local enterprises. Progress was made in key projects. To develop the market, we signed cooperation framework agreements for 551 projects and sold 34.5 billion cubic



Natural gas sales (Domestic)
(bcm)



Pipeline mileage (Domestic)
(km)



Dalian LNG receiving terminal

meters of retail gas in the year.

Construction of urban gas distribution networks saw progress. Changsha-Yiyang Branch began gas supply. Yueyang-Baling-Changling-Linxiang and Duyun-Kaili branches were mainly completed. The Honghe and Chaozhou branches were built as planned.

By the end of 2019, CNPC supplied gas to 31 provinces, municipalities, and autonomous regions, and the Hong Kong Special Administrative Region (HKSAR). While maintaining dominance in North China, Southwest China, Northwest China, Central China, and Northeast China, we expanded our presence in the East China and South China markets.

Liquefied Natural Gas (LNG)

CNPC stepped up to strengthen its peak-shaving capability of gas supply. Based on a holistic plan of LNG operations, we built new LNG facilities and expanded existing capacity to create an offshore hub of gas resources. Our Shenzhen LNG peak-shaving station, Phase 3 of Tangshan Project and Jiangsu Project saw advancement. Progress was made with two LNG projects, one in Maoming City of Guangdong Province, and the other in Fujian Province.

By the end of 2019, CNPC had three LNG terminals in Jiangsu, Dalian and Tangshan, as well as 24 LNG plants, which unloaded 18.56 billion cubic meters of LNG in the year. In 2019, we sold 1.53 billion cubic meters of gas to LNG-powered vehicles and vessels, up 7.7% year-on-year, marking the increased application of LNG in the transportation industry.

Oil and Gas Pipelines and Key Pipeline Projects

In 2019, we optimized the operation of our oil and gas pipelines. By upgrading their safety management, we significantly reduced legacy risks and maintained smooth production of those long-distance important ones such as the West-East Gas Pipelines, Shaanxi-Beijing Gas Pipelines, and Northeast Oil and Gas Pipeline.

With improved top-level design, CNPC incorporated intelligence into all business processes related to pipeline networks. The north section of the Eastern Russia-China Natural Gas Pipeline became operational in 2019.

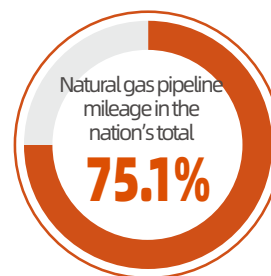
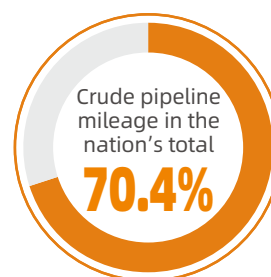
21 major projects for pipeline connectivity, including the Fujian-Guangdong branch trunk line of the Third West-East Gas Pipeline and the upgrading of the Fourth Shaanxi-Beijing Gas Pipeline, were completed or started operation.

By the end of 2019, we operated 90,352 kilometers of pipelines in

China, including 20,779 kilometers for crude oil, 55,810 kilometers for natural gas, and 13,762 kilometers for refined products, accounting for 70.4%, 75.1%, and 46.6% of China's total respectively.

The Eastern Russia-China Natural Gas Pipeline

On December 2, 2019, the Eastern Russia-China Natural Gas Pipeline began supplying gas. It consists of a Russian section ("Power of Siberia"), a cross-border section, and a section in China. The Chinese section was planned to be built and put into operation in three subsections, including the northern subsection (Heihe-Changling) already put into operation, and the middle subsection (Changling-Yongqing) and the southern subsection (Yongqing-Shanghai) are scheduled to come on stream in 2020 and 2023, respectively. The pipeline will further optimize China's regional gas consumption structure and enable a multisource supply of gas, which is of great significance for China to ensure gas supply in winter and to control air pollution.



Promoting the use of natural gas

Accelerating the utilization of natural gas is a practical solution for China to transform its energy structure and control air pollution. This is why CNPC promotes healthy growth of the natural gas industry and guarantees stable gas supply to contribute to the socio-economic development and ecology.



Beijing-Tianjin-Hebei Region

To implement the three-year Blue Sky Program, CNPC enhanced cooperation with local governments to maintain stable gas supply to the Beijing-Tianjin-Hebei Region, one of the major regions for air pollution control. We also promoted the "Replace coal with natural gas" initiative. In five months, we helped more than 130,000 households of two counties in Xiong'an New Area to burn gas instead of coal for heating before the coming winter of 2019-2020. All existing end users in the northern part of China under the initiative received sufficient gas in the winter, thanks to our coordination of



Yangtze River Delta

supply. In 2019, we supplied 36.2 billion cubic meters of gas to the Region.

To meet the huge energy demand of the economically developed Yangtze River Delta, we supplied 33.9 billion cubic meters of gas in 2019 to help with the gas-fueled power generation, "Replace coal with natural gas" initiative, and natural gas-powered vehicles and vessels industries in the region.



Pearl River Delta

We increased gas supply to the Pearl River Delta, where the economy is most vigorous in China, to help them build a system of green and clean energy in line with the energy plans of Guangdong Province and the Guangdong-Hong Kong-Macao Greater Bay Area. In 2019, we supplied 4.6 billion cubic meters of gas to Guangdong Province, and 1.5 billion cubic meters to Hong Kong Special Administrative Region (HKSAR).

Refining and Chemicals

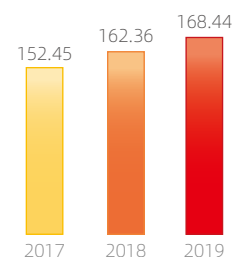
To face the challenges brought out by China's ever-competitive refining market which was much changed due to soaring productivity, we optimized product portfolio by reducing crude runs and increasing output of chemicals. We also transformed and upgraded the operations at a faster pace and ensured their high-quality development.

To guarantee high utilization of our integrated refining and chemical complexes and high-performing refining units, we allocated resources based on the market demand and the characteristics of these facilities. In 2019, we processed 168.44 million tons of crude oil and produced 119.13 million tons of refined products and 5.86 million tons of ethylene in China, an increase than those in 2018.

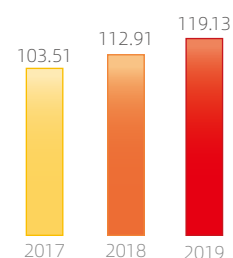
Construction and Operation of Large Refining & Petrochemical Bases

In 2019, we overhauled more refining facilities than in any single year in the past three years. All these overhauls were performed in non-peak hours. We also rationalized the processing load of our facilities and optimize their running to keep long-term stable production even better. By doing so, 99.87% of the facilities maintained smooth operation. By the end of 2019, CNPC had seven large integrated refining-petrochemical complexes and eleven 10Mt/a refineries.

Projects were pushed ahead to transform or upgrade the refining and chemical operations or ensure their high-quality development. We inaugurated the production of the 10Mt/a refinery upgrade work at Huabei Petrochemical, the needle coke unit



Crude runs (Domestic)
(mmt)



Refined products output (Domestic)
(mmt)

Refining and chemicals operating data (Domestic)

	2017	2018	2019
Crude runs (mmt)	152.45	162.36	168.44
Utilization rate of refining units (%)	80.8	83.1	85.1
Refined products output (mmt)	103.51	112.91	119.13
Gasoline	40.98	45.90	50.44
Kerosene	10.18	12.54	14.02
Diesel	52.35	54.46	54.68
Lub oil output (mmt)	1.64	1.60	1.63
Ethylene output (mmt)	5.76	5.57	5.86
Synthetic resin output (mmt)	9.40	9.17	9.58
Synthetic fiber output (mmt)	0.06	0.05	0.04
Synthetic rubber output (mmt)	0.81	0.87	0.91
Urea output (mmt)	1.44	0.83	1.21
Synthetic ammonia output (mmt)	1.36	1.05	1.32

at Jinzhou Petrochemical, the lube oil hydrogenation units at Liaohu Petrochemical and Karamay Petrochemical, and the jet fuel units at Daqing Refining and Chemical, Jilin Petrochemical, and Sichuan Petrochemical, in addition to the alkylation units at Jilin Petrochemical, Daqing Refining and Chemical, and other eight enterprises. We also started building three major projects for high-quality development, including the integrated refining and chemicals project at Guangdong Petrochemical and the ethane-to-ethylene units at Changqing and Tarim.

Optimizing the Portfolio of Refining and Chemical Products

We further optimized the portfolio of refining and chemical products. In 2019, our refineries improved 24 out of 28 key technical and economic indicators over the past year, pressing down the diesel-gasoline ratio for ten consecutive years, and elevating the percentage of high-value products by 2.6 percentage

points year-on-year. We made new breakthrough in the jet fuel market by starting the operation of projects at Huabei Petrochemical and Jilin Petrochemical, and again, increased our annual output of jet fuel by more than one million tons. We also developed and began trial production of low-sulfur marine fuel at a number of refineries to satisfy the sulfur reduction requirement under International Maritime Organization (IMO) standards.

We increased the chemicals output and strengthened its R&D. 2019 saw higher output of major chemicals including ethylene, PX, synthetic resin and synthetic rubber. In addition, new products under 72 brands were developed. Some of the new products were put into commercial production, such as the polypropylene resin for medical fibers at Dalian Petrochemical, SBS waterproofing film at Dushanzi Petrochemical, and an ABS resin for electroplating and high-flow applications at Jilin Petrochemical. A metallocene polypropylene (mPP) fiber material for filaments was successfully produced on the first trial at Dushanzi Petrochemical.

Supplying jet fuel to Beijing Daxing International Airport

Beijing Daxing International Airport began pre-operation calibration flights in January 2019. As the only supplier of premium jet fuel for the commissioning, trial operation and initial operation of the airport, CNPC affiliated Huabei Petrochemical ensured sufficient supply by improving its capacity of production and transportation, thanks to a 10Mt/a refinery upgrading work completed in June and a dedicated pipeline from its facility to the airport becoming operational in July.



Beijing Daxing International Airport

Marketing and Sales

In 2019, we insisted on integrated marketing for oil products, pre-paid fuel cards, non-fuel products, lubricants and natural gas, in order to expand market share, increase retail volume per nozzle and improve profitability. By carrying out market-oriented reform, fine marketing, data-based operation and diversified development, the performance and development quality of our marketing and sales business were further enhanced.

Refined Products

Despite tough competition in the domestic market in 2019, we increased our sales of refined products by adjusting marketing strategies. Our wholesale and retail marketing was integrated, with marketing strategies differentiated by region, product, and business. We also developed and maintained special users, small and micro users, and end users. In 2019, we sold 119.59 million tons of refined products in China.

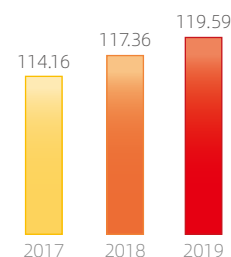
Marketing Network

To optimize the layout of marketing network, we deployed service stations at lucrative areas, such as city downtown, areas along highways and tourist destinations. Among a total of 505 newly built service stations, 471 became operational, adding 2.72 million tons to our annual retailing capacity according to feasibility study. By the end of 2019, we had totally 22,365 service stations operating in China.

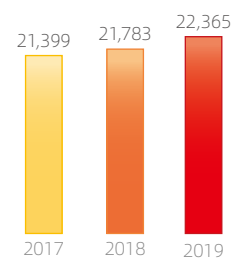
We launched the Service Station 3.0 demonstration program to promote a new retail model. A number of service stations that incorporate Internet technologies, cross over marketing, and online and offline channels were put into trial operation to meet diversified needs of our consumers.

Embracing an innovative service model, we deepened our cooperation with different industries. In 2019, we launched Kunlun ETC cards, which could also be used for payment at our service stations, in corporation with China's Ministry of Transport and the Industrial and Commercial Bank of China. By the end of 2019, we had issued more than 1.8 million such cards nationwide.

According to the brand ranking and analysis report of the 2019 China Customer Satisfaction Index (C-CSI) released by brand rating and consulting institute Chnbrand, CNPC service stations ranked the first for the fourth consecutive year.



Refined products sales (Domestic)
(mmt)



Service stations (Domestic)

Non-fuel Business

To promote non-fuel business, we managed our convenience stores in a targeted, professional and refined approach in 2019. By strengthening self-made product marketing, commodities out-sourcing, as well as strict quality control measures, vehicle services business were speeded up and fast food, advertising, insurance, and imported products were made available at service stations. We initiated "uSmile Premium Lifestyle" and upgraded "uSmile Premium+" products to build up our non-fuel brand image.

Lube Oil

We actively promoted the upgrading of our "Kunlun Lube" brand. The brand gained impact thanks to a new marketing model of "Products + Service" & "Offline + Online", and our capabilities in integrated R&D, production, distribution and technical services. We

also made breakthroughs in the development of new products, such as multifunction hydraulic-transmission-brake fluid, cylinder oil, and transformer oil. In 2019, we sold 1.61 million tons of lube oil.

Miscellaneous Refined Products

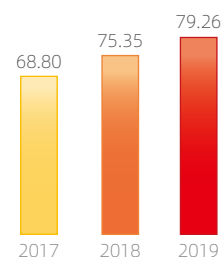
In 2019, we sold 31.12 million tons of miscellaneous refined products. Our asphalt sales registered a new record, securing our position as China's largest asphalt supplier, thanks to our delivery of branded high-end asphalt to end users and our development of potential markets. Our sales of fuel oil, solvent oil, and distillates exceeded targets.



Service station 3.0

Overseas Oil and Gas Operations

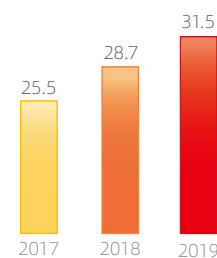
In 2019, we continued to promote international cooperation particularly along the Belt and Road route based on optimized investment structure and regional footprint in Central Asia-Russia, Middle East, Africa, Latin America, and Asia Pacific. Our managerial capability of global operation was steadily enhanced. We achieved new breakthroughs in developing new projects in key areas. In addition to obtaining new exploratory discoveries, our equity production of oil and gas equivalent exceeded 100 million tons for the first time and a number of major capacity boosting projects were put into operation. All these have increased our profitability. By the end of 2019, our investment in oil and gas business covered 35 countries and regions around the world.



Overseas crude production (Equity)
(mmt)

Oil and Gas Exploration

In 2019, we made many new discoveries from expanded exploration scale and scope in overseas blocks. Breakthroughs were achieved in the Doseo and Bongor basins in Chad. Potential resources were revealed in the T-slope of Niger's Bilma block. The eastern accumulation belt in the central block of Kazakhstan's pre-Caspian Basin was expected to become an important reserve replacement. Additionally, progress was made from rolling exploration in the mature blocks of Ecuador's Andes and Kazakhstan's PK and Aktobe. These activities added 28.15 million tons to our equity recoverable reserves, including 23.87 million tons of crude oil and 5.4 billion cubic meters of natural gas.



Overseas natural gas production (Equity)
(bcm)

Oil and Gas Production

In 2019, with a cost-efficient strategy on overseas operations, we steadily increased oil and gas production and boosted our equity production to over 100 million tons for the first time. This was attributable to the enhanced full-cycle management of development plans, application of new techniques, intensive research of reservoir geology, on-going application of waterflooding, effective drilling and startup of new wells, as well as dynamic tracking of oil wells. In 2019, our overseas operations yielded 182.21 million tons of oil and gas equivalent, in which CNPC's share was 104.36 million tons. The operating and equity

Layout of overseas oil and gas operations



production of crude oil were 152.18 million tons and 79.26 million tons respectively; and those of natural gas were 37.7 billion cubic meters and 31.5 billion cubic meters respectively.

Central Asia-Russia

With advancement of the Belt and Road construction, CNPC made progress in oil and gas cooperation in Central Asia-Russia, one of our core cooperation zones under the Belt and Road Initiative. In Russia, the three LNG trains of the Yamal project already started operation and ran smoothly, with the fourth train built as scheduled. In Turkmenistan, the Amu Darya project saw higher gas production capacity as its Territory B East Phase I went on stream. In Uzbekistan, three major gas fields of the New Silk Road Project began to produce 1.8 million cubic meters of gas per day. The project was the first fully intelligent and digital gas field project in the country. In Kazakhstan, our Aktobe and PK projects maintained stable production.

The Middle East

Under a multiplex development concept, CNPC continued to optimize asset structure and business layout. With an innovated multi-level cooperation mechanism of different forms, we registered a robust growth in oil and gas operation. In Iraq, with well tie-ins started at a faster pace, the Halfaya project realized the peak production target of 400,000 bbl per day, becoming the first of all the oilfields awarded in the same period to reach the promissory peak production. The output of Rumaila project also recorded a new high. In the UAE, the Abu Dhabi project reached the target of 10 million tons of equity oil output one year ahead of schedule. Our Dubai and Abu Dhabi sub-centers for technical support and the Middle East oilfield service center were founded in the year, to boost high-quality oil and gas development in the Middle East.

Africa

Africa is one of our key overseas conventional oil and gas cooperation regions. In Western Africa, our operating oil production was higher than that in 2018. We made progress in several capacity building projects in 2019. With the capacity building efforts, the Chad Project Phase 2.2 produced more than 5 million tons of oil throughout the year. In Niger, construction of Agadem Oilfield Phase II was commenced. In South Sudan, we completely resumed production of Block 1/2/4. The capacity of the Coral Gas Field Phase I as part of our LNG project in Mozambique was pushed forward as planned.

Latin America

We continued to improve the development efficiency of the ultra-heavy oil project in Venezuela, and to improve our management capabilities for the deep-water project in Brazil. In 2019, we registered growth in oil and gas production in Latin America. Our projects in Brazil, Ecuador, and Peru have all exceeded output objectives. In Brazil, the Libra Oilfield saw faster development with Mero 1 in its north-western block built as scheduled. In Ecuador, Andes Project continuously increased reserves and output of a 40-year-old mature oilfield by using a package of development technologies combining subtle-trap oil discovery, directional drilling, and jungle-specific streamlined process.

Asia-Pacific

Our oil and gas development and integration projects in Indonesia, Mongolia and Australia maintained stable operation. Progress was made at the Canada LNG Phase I project.



The gas distribution station in Mandalay along the Myanmar-China gas pipeline

Pipeline Construction and Operation

With a focus on operation management, coordination and hazard control, our overseas long-distance pipelines, including the Central Asia-China Gas Pipeline, Myanmar-China Oil and Gas Pipelines and Kazakhstan-China Crude Pipeline, remained safe and stable operation, delivering 26.92 million tons of crude oil and 51.9 billion cubic meters of natural gas throughout the year. By the end of 2019, CNPC has built a total of 16,500 kilometers overseas oil and gas pipelines, including 8,597 kilometers for crude oil and 7,903 kilometers for natural gas.

New achievements were made in overseas pipeline construction. We commenced the construction of the Niger-Benin Crude Pipeline, a transnational pipeline receiving our largest investment in Africa. Phase I of the Kazakhstan-China Crude Pipeline (Northwest) revamp project was mechanically completed ahead of schedule, and was able to transport 3Mt/a oil in the reverse direction. The New Bukhara Control Center for the Uzbekistan-China Gas Pipeline was completed on schedule. The Phase II pipeline revamp project in Chad was steadily advanced.

Refining and Chemicals

In 2019, our joint-stock refineries in Kazakhstan, Niger, Singapore, UK and France maintained safe and stable production, processing 39.53 million tons of crude oil. In the renovated Shymkent Refinery in Kazakhstan, we handed over all upgraded facilities to Kazakh employees for their independent operation. We also conducted

high quality overhaul on the Zinder Refinery in Niger and the N'Djamena Refinery in Chad, among others, as scheduled.

New Project Cooperation and Development

With active yet prudent joint venture and cooperation throughout the industrial chain, we shared opportunities with international partners and achieved important progress in new project development. We signed equity acquisition agreement on the Arctic LNG-2 project and already completed the transaction. In Brazil, we won bids for the Buzios Oilfield, a large deep-sea oilfield under production, and the pre-salt Aram risk-exploration block. We also inked memorandum of understanding to further oil and gas cooperation with Kazakh partners, equity transfer agreement for Block M in Mozambique and extension contract of Block 5 in Oman.

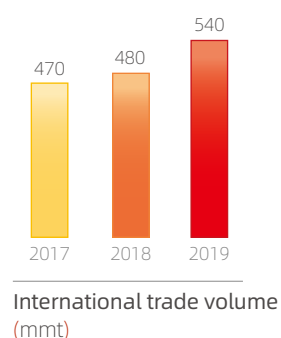
In 2019, we kept expanding and deepening international cooperation by holding the Second Belt and Road Roundtable for Oil & Gas Cooperation, CNPC International Cooperation Forum, the Second China-Russia Energy Business Forum, and the 11th International Petroleum Technology Conference (IPTC). We concluded strategic cooperation agreements and procurement contracts with many partners and suppliers on the Second China International Import Expo.



The project in Umm Shaif and Nasr offshore concessions, Abu Dhabi

International Trade

In 2019, our trading activities in more than 80 countries and regions maintained a focus on resource allocation and global deployment. Trading and shipping of crude oil, refined products, natural gas and chemicals remained robust, thanks to optimized imports of oil and gas, enhanced sales of our shares in overseas oil production, higher export of refined products, an extended high-end market, and an improved trading network. With improved operating management, our three international operation hubs in Asia, Europe and America became more capable of operating and transacting oil and gas in cross-regional markets. In 2019, we reported trading volume of 540 million tons, worth USD 240.7 billion, up 12.5% and 1.8% year-on-year respectively, with sales revenue above RMB 1 trillion.



Crude Trading

By customizing service for different oils, we efficiently marketed our share of oil of overseas projects. We also enhanced our coordination on crude imports and conducted cross-regional crude transactions on a routine basis. All these translated to excellent profits. In addition, we traded oil futures and delivered the highest volume at the Shanghai Futures Exchange. Moreover, we participated in the launch of the ICE Futures Abu Dhabi (IFAD).



Refined Products Trading

Thanks to the expansion to the high-end and profitable market beyond our designated zone, our exports of refined products were up by 15.5% year-on-year, with exports of gasoline and diesel seeing breakthroughs in the markets of Nigeria, India, and Europe. We pushed forward with jet fuel trading by supplying bonded jet fuel at airports in the Chinese cities of Kunming, Chengdu, Dalian, and Shenyang, and expanding refueling to 13 countries or regions worldwide. Our service stations ran well in Kazakhstan, Singapore, and Myanmar, and our ship bunkering market share kept increasing. In addition, we made a profit by intensively trading fuel oil futures at the Shanghai Futures Exchange.

Natural Gas Trading

We supplied natural gas from diversified sources and coordinated the pipeline imports according to market demand. The Eastern Russia-China Natural Gas Pipeline began gas supply. We also optimized our long-term LNG supply contracts to ensure stable gas provision in China. We deployed our worldwide LNG value chain by building a global LNG pool and constructing LNG tankers.

Chemicals Trading

Consolidating resources and markets at home and abroad, we continued to expand imports and exports of polyolefin, alcohol ether, chemical fiber materials and other chemicals. Our olefin became more popular in the US market.

Freight Shipping

Our freight shipping operations have refocused on a global network, optimized service offering to ensure continuous improvement in service capabilities and operational efficiency. Despite emergencies, we secured transport for the import of crude oil and export of refined products. We have deepened business ties with domestic shipping companies, including COSCO Shipping and China Merchants Group.

International Operation Hubs

Our three international operation hubs in Asia, Europe and America showed progress in bolstering operational efficiency. By operating across regions, markets, and products, they were upgraded to "global hubs" running on a 7x24 global relay.

The Asian operation hub coordinated the global sales of Basra crude oil and played on key regional markets of India, Thailand, and Japan by introducing the concept of "crude oil supermarket" and offering "one-stop" solutions to end users. The hub became an important trader of high-end refined products in the markets of Myanmar, Indonesia, Thailand, and Australia by taking advantage of our downstream network and time-charter logistics. By expanding LNG resale to Japan, Korea, India, Pakistan etc., it consolidated the "boom in both oil and gas trading".

The European operation hub made progress in long-term contracts - renewing those for Kashagan and Doba crude and winning new contracts for three grades of North Sea crude. By enhancing the trade between the European and American markets, we had much increased our share in the biodiesel market, and stepped forward in LNG trade. In Spain, we marked a preliminary success in developing the natural gas market of the country. In 2019, by opening trading offices in Nigeria and the Netherlands, we built close relationship with local traders and suppliers.

The American operation hub optimized its crude portfolio by adjusting pipeline oil business and integrating shipping trade in North America. In 2019, we renewed the long-term supply contract of jet fuel to Delta Airlines, and entered the Peruvian market by winning a supply agreement of ultra-low-sulfur diesel fuel for the first time. We also marketed natural gas from upstream Canadian projects, and its LNG trade achieved breakthrough in the Caribbean market.



Our European operation hub in London, UK

Services Business

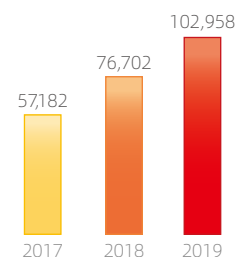
Leveraging its integrated business capabilities and expertise, CNPC kept optimizing market layout and enhancing technological innovation and lean management. Our service quality, market competitiveness and operating results in oilfield services, engineering and construction, equipment manufacturing and financial services continued to improve in 2019.

Oilfield Services

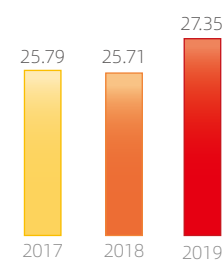
In 2019, our oilfield services arm launched "Service Guarantee Year" campaign. To accelerate the application of new technologies, we implemented key measures like demonstrating drilling technologies and improving fracturing speed and efficiency. By doing so, we made breakthrough in the quality, quantity, speed and profit of the services, greatly supporting the increase of both reserves and production.

In the international market development, we signed contracts on drilling, geophysical prospecting and cementing services in Ecuador, Iraq, Indonesia etc., and solidified traditional markets such as Niger, Kazakhstan, and the UAE. As an important global provider of marine geophysical prospecting services, we bettered all our global peers in OBN market share.

By the end of 2019, CNPC offered geophysical prospecting, drilling, well logging, mud logging, downhole operation and offshore engineering services in 55 countries.



3D seismic data acquired
(square kilometers)



Drilling footage
(million meters)

Oilfield services operations

		2017	2018	2019
Geophysical prospecting	2D seismic data acquired (kilometers)	154,904	105,739	56,551
	3D seismic data acquired (square kilometers)	57,182	76,702	102,958
Drilling	Wells completed	11,687	11,264	11,403
	Drilling footage (million meters)	25.79	25.71	27.35
Well Logging	Well logging operations (well-times)	101,531	106,963	105,746
Mud logging	Mud logging operations	13,187	14,256	13,175
Downhole operations	Downhole operations (well-times)	110,844	87,007	87,563
	Formation test (layers)	9,237	11,969	7,602
Offshore engineering	Offshore drilling footage (meters)	18,500	72,000	264,700

Geophysical Prospecting

In 2019, CNPC acquired data of 56,551 kilometers of 2D lines and 102,958 square kilometers of 3D profiles, with the average daily efficiency up by 16% and 18% year-on-year for the onshore 2D and 3D seismic acquisition, respectively.

With enhanced R&D efforts in core software, core equipment, and key technologies, as well as application of innovative technologies in risk exploration, new areas, and new types of resources, we provided technical support to many major oil and gas discoveries. Our geophysical prospecting became more efficient and automated thanks to the newly developed GeoEast V3.3 software, the fiber-optic-based, ultra-sensitive Distributed Acoustic Sensing (uDAS) seismograph and GPR Ocean Bottom Node (OBN), as well as the improvement and deployment of precise vibroseis, geophysical prospecting UAVs, and all-terrain vehicles.

With upgraded management, optimized technical plans, and innovative organization and operation, we made progress in a batch of key projects. The Saudi Aramco's S78 in Red Sea project and the Nigeria's OBN project were completed consecutively. The onshore/offshore 3D seismic acquisition project in the UAE was commenced and efficiently advanced.

Drilling

In 2019, we spudded 11,596 wells and completed 11,403 wells, with a total footage of 27.35 million meters, up 6.4% year-on-year.

Not only did we elevate the number of deep wells, but also rapidly increased the annual average footage per drilling crew by developing and deploying drilling technologies and rolling out factory-drilling and technological demonstration projects. Our operation capability was further enhanced. Directed by expert teams dispatched to site, our drilling in key zones was performed much faster and more efficiently.

Our drilling capabilities of deep and horizontal wells kept improving. Compared with 2018, the number of deep wells over 4,000 meters and that of horizontal wells completed in 2019 were increased by 55% and 80%, with footage increased by 53% and 73% respectively. Moreover, the drilling cycle of deep wells was shortened by 15%. We also registered records on onshore drilled depth in Asia and on horizontal interval among China's onshore wells in Tarim, Changqing, and Liaohe oilfields.

Well Logging and Mud Logging

In 2019, we completed 105,746 well-times of well logging and perforation and 13,175 well-times of mud logging. Our first-trip success rate of well logging was up to 98.27% in China.

Focusing on imaging logging, fast logging and logging while drilling, we sped up integration and R&D of cutting-edge technologies as well as application of matured technologies. Breakthroughs were continuously made in core technologies and high-end equipment R&D, including the new-generation CLog system, well logging chips, fiber-optic transmission, and 3D printing. We also boosted our capabilities to log deep and complex wells in sophisticated geological conditions. Important progress was made on logging evaluation technologies for continental shale oil development. The success rate of formation testing and the hit rate of sweep spot prediction were improved from 35% and 70% respectively to 100%.

Targeted at reservoirs of different characteristics, we established a complete system of mud logging technologies. With compound logging playing a major role, the system was also supported by geochemical logging, element logging, and other unique techniques. We also developed and deployed an early and fast monitoring system for the overflow and loss of drilling fluid and a system for online monitoring and evaluation of flowback cuttings.

Downhole Operations

In 2019, we completed 87,563 well-times of downhole operation, including 7,602 layers of formation testing.

By optimizing operating modes and deploying factory fracturing, we increased our efficiency in conventional fracturing by 23.1% and factory fracturing by 34.4% year-on-year, particularly in our three major blocks of Sichuan-Chongqing shale gas, as well as Mahu Jimusar and Changqing Longdong tight oil. We strengthened the R&D and application of new downhole techniques and equipment. Breakthroughs were achieved in the FrSmart fracturing system software and the factory testing techniques for mountainous shale gas blocks. We also independently developed heavy-duty fracturing trucks, electric fracturing skids, core downhole materials, and high-end downhole staged tools.

Offshore Engineering

We delivered offshore engineering services for well drilling, well completion, well cementing, formation testing and production testing, downhole operation as well as the design and construction of offshore projects in the Bohai Bay, South China Sea, and Persian Gulf. In 2019, we spudded 106 offshore wells and completed 87 throughout the year. The total footage was 264,700 meters, up significantly over the last year.

In 2019, we won a general contract for the pilot production of natural gas hydrates in deep water. This made us more capable and competitive in deep-water operations. We also completed a general contract for three offshore wind-farm booster stations in Jiangsu province.

Engineering and Construction

In 2019, we improved construction quality and project execution efficiency by strengthening project lifecycle management and pushing ahead with standardized design, factory precasting, modular construction, mechanized operation, and IT-based management.

Key projects were closely tracked, coordinated and supervised, to ensure quality and smooth progress, such as the non-patented unit project at the Amur Natural Gas Processing Plant in Russia, the middle section of the Eastern Russia-China Natural Gas

Pipeline, the natural gas pipeline interconnectivity projects, and the integrated refining and chemicals project at Guangdong Petrochemical, among others.

Progress was made in utilizing new models, such as EPC+OM, in market development. We won contracts for the Basra Natural Gas Processing Plant in Iraq, the Lawe-Lawe single-point mooring and marine pipeline project in Indonesia, and the oil products pipeline in northeast Thailand, etc.

In 2019, we executed 79 key projects in oil and gas field surface engineering, refining and chemicals, and storage and transportation at home and abroad.

Oil and gas field surface engineering: Capacity building projects of the Southwest Gaomo Phase 2 Natural Gas Purification Plant, Amu Darya Gas Field Territory B East Phase I in Turkmenistan and Chad Project Phase 2.2 began operation. A boosting and deep-cooling project was generally completed in the Kelameili Gas Field in Xinjiang. To increase gas production and secure supply, we built the Changning-Weiyuan shale gas capacity building project as scheduled. The Belt and Road projects, including the non-patented unit project at the Amur Natural Gas Processing Plant in Russia, and the revamp of integrated facilities at the Bab Oilfield in the UAE were making steady headway. Construction of the 3/4/5 train crude processing project at Garraf Oilfield in Iraq and Agadem Oilfield Phase II in Niger commenced.



Downhole fracturing operation in Tarim Basin

Storage and transportation: The north section of the Eastern Russia-China Natural Gas Pipeline became operational and construction of the middle section was kicked off. Projects aimed at strengthening gas pipeline interconnectivity, such as the Fujian-Guangdong branch trunk line of the Third West-East Gas Pipeline and the upgrading of the Fourth Shaanxi-Beijing Gas Pipeline, completed construction or began operation. The Tangshan, Jiangsu and Shenzhen LNG terminals projects were pushed forward as scheduled. Key overseas pipeline projects, such as the projects in Saudi Arabia and the single-point mooring (SPM) project in Bangladesh, advanced at a faster pace.

Refining and chemicals facilities: A number of projects were put into operation, including the revamp of the ethylene unit at Dushanzi Petrochemical, the high-pressure hydrogenation unit for naphthenic base lubricants at Liaohu Petrochemical, the revamp of the aromatics unit at Liaoyang Petrochemical, the Algiers Refinery Brownfield project, the polyester unit in Vietnam, the polypropylene unit of a refinery and petrochemical integrated development project (RAPID) in Malaysia, and the second line of the polypropylene project in India. The restructuring and upgrading projects at Daqing, Jinxi and Jinzhou Petrochemical companies, and the EPC project of Sinochem's Quanzhou EVA unit saw smooth progress. Construction of more than 20 polyester units located in places including Chongqing Municipality, Zhejiang province, Indonesia, Saudi Arabia, was going on smoothly. Construction of the ethane-to-ethylene facilities in Changqing and Tarim oilfields commenced. We won the National Quality Engineering Gold Awards 2019 issued by China Association of Construction Enterprise Management for the revamping of Shymkent Refinery in Kazakhstan and the Yunnan Petrochemical Project.

Petroleum Equipment Manufacturing

Our manufacturing enterprises gained higher productivity and profitability, thanks to faster transformation and upgrading, lean management, and service-oriented manufacturing.

Particularly, the lean management was turning from "lean production" to "full-process improvement" across marketing, production, research and purchasing. As a result, production became more process-based, standardized and intelligent, and thereby much more efficient. The production cycle of drilling rigs was shortened by 14.5% and average cycle of commissioning by 12%. We built intelligent production lines of straight seam pipes, and researched the manufacturing techniques of pipes for long-distance transportation, which were successfully used in the Eastern Russia-China Natural Gas Pipeline project with over 10% less of on-site welds.

Centering on a "Manufacturing + Services" model, we continued to push ahead with the integration of product R&D, manufacturing, marketing and services. We persistently improved user experience and further elevated our service. Covering full lifecycle of products, we offered customer-centered technical services in different forms. For example, we researched and customized patented equipment for oil and gas development while providing technical support for production ramp-up; we provided equipment lease, renovation, package solutions and quality inspection.

A range of new products were developed and launched, including fracturing pump QPI-7000, which is the world's most powerful of its kind, a 9,000m quadruple-stand AC VFD drilling rig for ultra-deep wells, a horizontal subsea Xmas tree, and a new diesel engine for drilling. Our independently developed products such as $\Phi 1,422\text{mm}$ X80 steel pipes, coiled tubing CT130, and special-thread casing were used in the Eastern Russia-China Natural Gas Pipeline and in the E&P in Southwest, Changqing, and Xinjiang oil and gas fields.

We improved our marketing and service network in Central Asia, Latin America, the Middle East, Africa, and Asia-Pacific. By the end of 2019, we had exported petroleum equipment to more than 80 countries and regions of the world.

Financial Services

CNPC provides a wide range of financial services, including in-house banking, banking, financial leasing, trust, insurance, insurance brokerage, and securities, etc. Centering on serving oil and gas business, our financial services arm scored higher revenue and better performance in 2019 by further exploring markets and controlling risks.

We ensured compliance and prudence, and intensified full-process management of high-risk projects, yielding evident effects in financial risk management and control. We improved capital operation by aligning financial services with production needs and coordinating different financial institutions. To maintain vitality and competitiveness, we expanded our space of development in consumer finance and Techfin with the help of new technologies and business.

Green financing remained a priority for the company. Financial resources were directed into the green industry to boost the development of clean energy. We provided financial support to green projects including natural gas, "Replace coal with natural gas", oil and gas storage, and pipeline transport, through green loans, green bonds, and green leasing.



A refining unit under construction

Financial Statements

Consolidated Balance Sheet

million RMB yuan

	2018	2019
Current assets		
Cash and cash equivalent	229,910.44	235,219.65
Funds lent	212,766.93	218,250.12
Financial assets held for trading	80,164.85	71,433.97
Derivative financial assets	270.98	216.93
Notes receivable	2,725.78	511.90
Accounts receivable	104,757.04	102,826.89
Receivables under financing	15,897.36	7,562.56
Prepayments	202,177.11	158,604.29
Premium receivable	117.35	94.12
Reinsurance accounts receivable	626.58	615.50
Reinsurance reserves receivable	1,332.93	1,291.31
Other receivables	23,793.52	30,613.57
Financial assets purchased under resale agreements	30,736.27	10,957.11
Inventories	249,224.40	257,020.86
Contract assets	-	0.01
Non-current assets maturing within one year	134,266.38	168,726.62
Other current assets	114,144.19	132,878.14
Total current assets	1,402,912.11	1,396,823.55
Non-current assets		
Loans and advances issued	63,784.31	29,149.65
Debt investments	94,929.89	93,385.88
Other debt investments	38,813.56	40,430.82
Long-term accounts receivable	57,139.13	54,294.96
Long-term equity investments	116,215.01	154,018.37
Other investments in equity instruments	9,062.48	10,778.95
Other non-current financial assets	28,416.92	42,810.70
Investment properties	2,573.44	2,855.36
Fixed assets	891,236.22	905,281.70
Construction in progress	252,692.12	277,849.67
Productive biological assets	0.19	0.15

Consolidated Balance Sheet (continued)

million RMB yuan

	2018	2019
Oil and gas assets	930,672.37	970,722.41
Right-of-use assets	-	-
Intangible assets	93,610.71	100,875.87
Development expenditure	1,274.99	1,251.68
Goodwill	42,363.05	42,905.99
Long-term deferred expenses	37,503.24	46,604.68
Deferred tax assets	32,969.78	33,542.12
Other non-current assets	35,094.16	32,159.61
Total non-current assets	2,728,351.57	2,838,918.57
Total assets	4,131,263.68	4,235,742.12
Current liabilities		
Short-term loans	80,876.11	102,286.47
Borrowings from central bank	1,817.19	1,331.12
Borrowing funds	72,101.24	65,139.67
Derivative financial liabilities	404.88	3,551.41
Notes payable	27,914.56	41,554.65
Accounts payable	361,643.93	379,410.75
Receipts in advance	36,584.48	32,884.98
Contractual liabilities	67,605.49	81,784.64
Funds from sales of financial assets with repurchase agreement	28,041.50	30,324.45
Deposits from customers and interbank	200,926.68	198,436.48
Funds arising from acting trading of securities	0.01	0.01
Employee benefits payable	33,896.29	44,763.16
Taxes payable	85,638.38	78,407.69
Other payables	69,861.56	79,106.03
Handling charges and commissions payable	30.25	29.85
Reinsurance accounts payable	721.78	582.44
Non-current liabilities due within one year	121,243.22	72,592.67
Other current liabilities	65,670.41	88,604.46
Total current liabilities	1,254,977.96	1,300,790.93

Consolidated Balance Sheet (continued)

million RMB yuan

	2018	2019
Non-current liabilities		
Reserve for insurance contracts	3,355.05	3,691.38
Long-term loan	21,264.60	21,146.92
Debentures payable	242,350.73	302,950.55
Lease liabilities	-	-
Long-term payables	9,359.01	5,668.89
Long-term employee remuneration payable	1,676.97	1,613.01
Accrued liabilities	158,725.49	164,026.22
Deferred income	16,982.99	23,790.49
Deferred tax liabilities	31,178.89	35,287.71
Other non-current liabilities	2,620.92	3,156.24
Total non-current liabilities	487,514.65	561,331.41
Total liabilities	1,742,492.61	1,862,122.34
Owners' equity		
Paid-up capital (or share capital)	486,855.00	486,855.00
Other equity instruments	150,468.79	104,727.09
Capital reserve	282,572.87	275,435.62
Other comprehensive income	-28,967.02	-14,870.81
Special reserve	33,366.68	32,439.08
Surplus reserve	1,084,354.66	1,084,354.66
General risk provisions	10,946.07	11,663.96
Undistributed profit	-21,575.35	-10,996.23
Total equity attributable to CNPC	1,998,021.70	1,969,608.37
Minority interest	390,749.37	404,011.41
Total owners' equity	2,388,771.07	2,373,619.78
Total liabilities and owners' equity	4,131,263.68	4,235,742.12

Consolidated Income Statement

million RMB yuan

	2018	2019
1. Revenue	2,739,011.50	2,771,434.92
Including: Operating revenue	2,713,819.61	2,747,058.33
Interest income	22,973.57	21,834.38
Premiums earned	329.92	707.50
Handling charges and commission income	1,888.40	1,834.71

Consolidated Income Statement (continued)

million RMB yuan

	2018	2019
2.Total cost of operations	2,545,501.66	2,628,014.72
Including: Operating cost	2,092,669.12	2,139,324.00
Interest expenses	9,509.95	10,372.70
Handling charges and commission expenses	188.46	220.44
Net expenditure for compensation payments	300.80	400.64
Net amount of provision for insurance contract	309.75	340.35
Policyholder dividend expenses	-	-
Reinsurance costs	-67.05	133.29
Tax and surcharges	231,975.85	240,296.07
Selling expenses	78,649.64	83,884.02
Administrative expenses	97,589.36	99,857.52
R&D expenses	15,968.93	21,752.70
Finance expenses	-1,001.12	10,262.19
Others	19,407.97	21,170.80
Add: Other gains	12,800.72	13,021.95
Gain from investment (Loss is represented by "-")	14,141.84	19,808.26
Exchange gain (Loss is represented by "-")	210.58	62.43
Net exposure gains (Loss is represented by "-")	-	-
Gains from change in fair value (Loss is represented by "-")	250.53	1,229.86
Credit impairment loss (Loss is represented by "-")	554.24	-6,071.67
Impairments loss of assets (Loss is represented by "-")	-65,890.33	-26,895.70
Gain on disposal of assets (Loss is represented by "-")	1,384.13	1,462.36
3.Operating profit (Loss is represented by "-")	156,961.55	146,037.69
Add: Non-operating revenue	11,743.52	12,141.58
Including: Government grants	7,638.14	5,977.27
Less: Non-operating expenses	58,145.58	37,815.58
4. Earnings before taxes (Loss is represented by "-")	110,559.49	120,363.69
Less: Income tax expenses	67,757.04	60,772.82
5.Net income (Net loss is represented by "-")	42,802.45	59,590.87
(1) Classified by continuity of operations:		
Net income from continuous operation	42,802.45	59,590.87
Net income from discontinued operation	-	-
(2) Classified by ownership:		
Net income attributable to CNPC	15,018.84	30,695.67
Minority interest	27,783.61	28,895.20

Notes to the Financial Statements

A. Description of Principal Accounting Policies and Estimates

1. Accounting standard and system

CNPC (hereinafter referred to as the Company) follows **Accounting Standards for Business Enterprises –Basic Principles** and the specific rules of accounting standards, guidelines for the application of accounting standards, interpretations of accounting standards and relevant regulations issued by the Ministry of Finance.

2. The fiscal period

The fiscal period of the company starts on January 1 and ends on December 31 each calendar year.

3. Standard accounting currency

The Company and most of its subsidiaries adopt RMB yuan as currency used in bookkeeping. The consolidated financial statement of the Company is listed in RMB yuan.

4. Accounting basis and valuation

Accounting is based on the accrual system. Unless otherwise specified, all assets are measured at historical cost.

5. Recognition of cash and cash equivalents

The cash presented in the Cash Flow Statement comprises cash on hand and the deposits available for payment at any given time. Cash equivalents presented in the Cash Flow Statement are short-term (mature within three months), highly liquid investments that are readily convertible into cash and almost have no risk of change in value.

6. Foreign currency accounting and translation of financial statements in foreign currency

(1) Foreign currency accounting

Our foreign currency transactions are converted into RMB yuan at the spot exchange rate on the days the transactions occurred; the monetary foreign currency items on the balance sheet date are converted into RMB yuan at the spot exchange rate on the balance sheet date. The exchange gains and losses arising from these transactions that occurred in the production and operation period are recognized as financial expenses; those related to the acquisition and construction of fixed assets, oil and gas assets and other assets in line with the capitalization condition are handled according to

relevant provisions on borrowing costs; and those occurred in the period of liquidation are recognized as liquidation gain or loss.

A non-monetary foreign currency asset measured at historical cost is converted into RMB yuan at the spot exchange rate on the trading day, with its amount in RMB yuan unchanged. A non-monetary foreign currency asset measured at fair value is converted into RMB yuan at the spot exchange rate for the date when the fair value is determined, with the difference thus caused recognized in profit or loss for the current period as a change in fair value.

(2) Translation of financial statement in foreign currency

All asset and liability items presented in Foreign Currency Balance Sheet are converted into RMB yuan at spot exchange rate on the balance sheet date; the owner's equity other than "undistributed profit" is converted at spot exchange rate when occurred. Foreign incomes and expenses presented in the Income Statement are generally converted at the average of reference rates for RMB announced by PBC on a daily basis over the period of time covered by the income statement. The exchange difference of Foreign Currency Balance Sheet arising from the conversions mentioned above is separately listed in "Converted Difference in Foreign Currency Statement" under the owner's equity. The exchange difference arising from monetary foreign currency items materially invested in foreign operation due to the change in exchange rate is also separately listed in the owner's equity when preparing consolidated financial statements. When disposing foreign operation, the related exchange difference is carried, in proportion, into profit or loss for the current period during which the operation is disposed.

The opening balances of cash and cash equivalents in the Foreign Currency Cash Flow Statement are converted at statement's initial exchange rate; and the closing balances are converted at the spot exchange rate on the balance sheet date. And other items are generally converted at the arithmetic average of reference rates for RMB announced by PBC on a daily basis over the period of time covered by the cash flow statement. The translation difference of cash flow statement arising from the conversions mentioned above is presented separately in "Effect of the Change of Exchange Rate on Cash".

7. Financial instruments

Financial instruments include cash at bank and on hand, equity securities other than those classified as long-term equity investments, receivables, payables, borrowings, debentures payable and share capital, etc.

(1) Classification of financial assets

Financial assets are classified, upon initial recognition, by form of management and cash flow characteristics into: Financial assets measured at amortized cost, financial assets measured at fair value with changes in fair value recognized in other comprehensive income, and financial assets measured at fair value with changes in fair value recognized in profit or loss for the current period.

(2) Classification of financial liabilities

Financial liabilities are classified into: Financial liabilities measured at fair value with changes in fair value recognized in profit or loss for the current period and financial liabilities measured at amortized cost.

(3) Impairment of financial instruments

For financial assets measured at amortized cost, contractual assets, and debt investments measured at fair value with changes in fair value recognized in other comprehensive income, impairment losses and provisions should be based on expected credit loss.

8. Inventories

(1) Classification of inventories

Inventories include raw materials, work in progress and semi-finished goods, finished goods, goods sold, etc.

(2) Measurement method of cost of inventories

Inventories are carried at the actual cost when acquired, using perpetual inventory method; actual cost of delivered or sold inventories are carried at weighted average.

(3) Amortization of low-value consumption goods and packing materials

Low-value consumption goods and packing materials are amortized using one-off amortization method when they are put into use.

(4) Year-end inventory valuation, impairment recognition and provision

Year-end inventories are carried at the lower of cost and net realizable value. Based on wall-to-wall inventory at the end of the period, provision for inventory write-down is retained at the difference between cost and net realizable value of inventory on the individual item basis in the following circumstances, where the net realizable value is lower than the cost. For inventory of large quantity and low unit price, provision for inventory write-down may be recognized by category. The net realizable value is defined by selling price deducts estimated complete cost, selling cost and related tax.

a. The market price of inventory continues to fall with no hope of recovery in the foreseeable future;

b. The product using the raw material is manufactured at a cost

higher than the selling price thereof;

c. The existing raw material fails to meet the needs of new products as a result of product upgrading and the market price of such raw material is lower than its carrying cost;

d. The goods or services are obsolete or there is a preference-driven change in market needs, resulting in a gradual decline in the market price thereof;

e. Other circumstances demonstrating a substantial impairment of inventory.

9. Long-term equity investments

(1) Determination of investment costs

For a long-term equity investment obtained through a combination of entities under common control, the carrying value of the owner's equity in the combined entity stated in the ultimate controlling party's consolidated financial statements should be recognized on the combination date as investment cost.

For a long-term equity investment obtained through a combination of entities not under common control, the combination cost should be accounted for the cost of the long-term equity investment.

For long-term equity investments obtained in a manner other than combination of entities, if a long-term equity investment is obtained through payment of cash, the actual purchase price thus paid should be recognized as initial cost of the long-term equity investment; if a long-term equity investment is obtained through issuing equity securities, the fair value of the equity securities being issued should be recognized as initial cost of investment.

(2) Subsequent measurement and profit or loss recognition

a. Long-term equity investments under cost method

The Company's long-term equity investments in its subsidiaries are accounted for using the cost method. Except for cash dividends or profit distributions declared but not yet distributed that have been included in the price or consideration paid in obtaining the investments, the Company recognizes its share of the cash dividends or profit distributions declared by the investee as investment income for the current period.

b. Long-term equity investments under equity method

Long-term equity investments in associates and joint ventures are accounted for using the equity method. When the initial cost of investment is bigger than the proportionate share of the fair value of the investee's identifiable net assets at the time of investment, no adjustment to the initial cost of such long-term equity investment is made; When the initial cost of investment is smaller than the proportionate share of the fair value of the investee's identifiable net

assets at the time of investment, the gain in profit is recognized.

The investor's share of the net profit or loss and other comprehensive income of the investee is recognized in investment income and other comprehensive income respectively, along with the adjustment to the carrying amount of the long-term equity investment; distributions of profits or cash dividends received from the investee reduce the carrying amount of the investment; adjustments in the carrying amount of the investment for the changes in the owner's equity other than those arising from the investee's net profit or loss, other comprehensive income and profit distribution are necessary and recognized as owner's equity.

The investor's share of the net profit or loss of the investee is based on the fair value of the investee's net identifiable assets upon acquisition of the investment and recognized after adjustment to the investee's net profit made in accordance with the investor's accounting policies and fiscal periods. Accounting of investments held should be based on the investor's share of the amount of net profit, other comprehensive income and other changes in the owner's equity listed in the investee's consolidated financial statements.

For recognition of investment income, the investor's share of the unrealized profits or losses from internal transactions with associates and joint ventures should be written off. Unrealized loss from internal transactions with the investee, if accounted for as part of asset impairment, should be recognized in full amount.

The investor's share of the loss of the investee should be accounted for as follows: i) writing down the carrying value of the long-term equity investment; ii) in the event that the carrying value of such long-term equity investment is not enough for write-down, investment loss should be recognized as much as the carrying value of long-term interests that, in substance, form part of the net investment in the investee to write down the carrying value of long-term receivables, etc.; and iii) additional obligations assumed by the investor under the investment contract or agreement should be recognized as estimated liabilities and taken into investment loss of the current period. If the investee makes a profit in subsequent periods, the carrying amount of estimated liabilities should be written down in reverse sequence after deduction of the share of unrecognized loss, and the carrying value of long-term interests that, in substance, form part of the net investment in the investee as well as the carrying value of the long-term equity investment should be restored with investment income recognized accordingly.

c. Disposal of long-term equity investments

For disposal of long-term equity investments, the difference between the carrying amount and the actual purchase price is recorded into profit or loss for the current period.

Upon disposal of a long-term equity method investment, all amounts previously recognized in the Company's other comprehensive income in relation to that investment are accounted for on the same basis as would have been required if the investee had directly disposed of the related assets or liabilities. The changes in the owner's equity other than those arising from the investee's net profit or loss, other comprehensive income and profit distribution are transferred to profit or loss for the current period in proportion.

If the investor loses joint control or significant influence over an investee for reasons such as partial disposal of the equity investment, any retained interest should be recognized in profit or loss for the current period, and measured as a financial instrument at the difference between fair value and carrying value at the date when joint control or significant influence is lost. All amounts previously recognized under the equity method as other comprehensive income in relation to such equity investment are accounted for on the same basis as would have been required if the investee had directly disposed of the related assets or liabilities. The changes in the owner's equity other than those arising from the investee's net profit or loss, other comprehensive income and profit distribution are transferred to profit or loss for the current period.

In the event that the investor loses control over an investee for reasons such as partial disposal of the equity investment, when preparing separate financial statements, equity accounting is required for retained interest with joint control or significant influence over the investee, and adjusted on the basis of equity accounting as would have been required upon acquisition of such interest; retained interest without joint control or significant influence over the investee should be recognized in profit or loss for the current period and measured as a financial instrument at the difference between fair value and carrying value at the date when control is lost.

In the event that equity interest being disposed of has been acquired through a combination of entities for reasons such as additional investment, when preparing separate financial statements, all amounts previously recognized under the equity method as other comprehensive income and other owner's equity in relation to such equity investment should be transferred in proportion, if retained interest is accounted for at cost or under the equity method; all amounts previously recognized as other comprehensive income and other owner's equity should be transferred entirely, if retained interest is recognized and measured as a financial instrument.

(3) Determination of the basis for joint control and significant influence over the investee

Joint control means the contractually agreed sharing of control of an arrangement which exists only when decisions about the relevant activities require the unanimous consent of the parties sharing

control. A joint venture is a joint arrangement whereby the parties that have joint control of the investee have rights to the net assets of the investee.

Significant influence means the power to participate in the financial and operating policy decisions of the investee but not control or joint control of those policies. For an investor with significant influence over the investee, the investee is considered an associate of the investor.

(4) Impairment test and provisions for impairment

At the end of the year, the long-term equity investment is reviewed and the provision for the impairment of the long-term equity investment is retained against the difference between the recoverable amount and the carrying value. Once the provision for the impairment of the long-term equity investment is retained, it should not be reversed during subsequent accounting periods.

For non-marketable long-term equity investment, impairment is likely in the following circumstances:

- a. There is a change in the political or legal environment of the invested business, such as an enactment of or amendment to the tax and trade regulations, which may result in huge losses of the invested business;
- b. The goods or services of the invested business are obsolete or there is a change in market needs, resulting in a serious deterioration in the financial conditions of the invested business;
- c. The invested business has lost its competitive edge due to a major technological change etc. in the sector, resulting in a serious deterioration in the financial conditions of the invested business such as clean-up or liquidation;
- d. Other circumstances demonstrating a substantial failure of the invested business to generate economic benefits for the Company.

10-1.Revenue (old standards)

Revenue arising from sale of goods, rendering of services, royalties and construction contracts, etc. are recognized as follows:

(1) Sale of goods

The seller has transferred to the buyer the significant risks and rewards of ownership; the seller retains neither continuing managerial involvement to the degree generally associated with ownership, nor effective control over the goods already sold; the amount of revenue can be measured reliably; the economic benefits associated with the transaction are likely to flow into the seller, and the costs incurred or to be incurred in respect of the transaction can be measured reliably.

(2) Rendering of services

Revenue should be recognized by reference to the stage of completion of the transaction at the balance sheet date if the amount of revenue can be measured reliably.

(3) Royalties

Provided that the economic benefits are likely to flow into the enterprise and the amount of revenue can be measured reliably, revenue should be recognized in accordance with the time and method specified in the relevant contract or agreement.

10-2.Revenue (new standards)

Revenue should be recognized when a performance obligation in the contract is satisfied, i.e. control of goods or services is passed to the customer. Where a contract has multiple performance obligations, the transaction price should be allocated to these performance obligations upon the effective date of contract by reference to the relative proportion of standalone selling prices of promised goods or services and revenue should be measured accordingly.

11. Government grants

(1) Types of government grants

Government grants comprise mainly of treasury funding, interest subsidies, tax rebates and free allocation of non-monetary assets etc.

(2) Acknowledgment of government grants

The Company has acknowledged government grants that it ineligible for and granted.

(3) Accounting treatment of government grants

Asset-related government grants are recognized as deferred income which is taken into profit or loss for the current period appropriately and systematically during the lifespan of related asset.

Income-related government grants used to recover relevant costs, expenses or losses in the subsequent period are recognized upon receiving as deferred income which is taken into profit or loss for the current period during the verification of related costs, expenses or losses; otherwise, recognized as non-operating income, or used to write down relevant costs, expenses or losses; those used to recover relevant costs, expenses and losses incurred by the Company are directly recognized as profit or loss for the current period; otherwise, recognized as non-operating income, or used to write down relevant costs, expenses or losses.

(4) Measurement of government grants

Government grants in the form of monetary assets are measured at the amounts received or receivable. Government grants in the form of non-monetary assets are measured at fair value.

12. Deferred tax assets and deferred tax liabilities

Deferred tax assets and deferred tax liabilities are recognized at (temporary) difference between the carrying value of an asset or liability and the tax base of such asset or liability. Deductible losses and tax credits that are carried forward to reduce taxable income in future years under the tax provisions are deemed temporary differences and accounted for deferred tax assets. Deferred tax assets and deferred tax liabilities as of the balance sheet date are measured at the applicable rate for the period when such assets or liabilities are estimated to be recovered or settled.

Deferred tax assets are limited to the taxable income that is likely to be obtained to reduce temporary differences, deductible losses and tax credits. For recognized deferred tax assets, when it is unlikely to obtain sufficient taxable income to offset against deferred tax assets by the future period, a write-down of the carrying amount of deferred tax assets is necessary. If it is likely to obtain sufficient taxable income, the write-down amount should be reversed.

Deferred tax assets and deferred tax liabilities are presented on a net basis, provided that the following conditions are satisfied:

- (1) Deferred tax assets and deferred tax liabilities are related to the income tax imposed by the same taxing authority on the same entity in the Company.
- (2) Such entity in the Company has the legal right to offset current tax assets against current tax liabilities.

13. Changes in accounting policies during the reporting period

The Company has implemented since January 1, 2019 Accounting Standards for Business Enterprises No. 22 – Financial Instruments: Recognition and Measurement, Accounting Standards for Business Enterprises No. 23 – Transfer of Financial Assets, Accounting Standards for Business Enterprises No. 24 – Hedge Accounting, and Accounting Standards for Business Enterprises No. 37 – Financial Instruments: Presentation (collectively, “New Financial Instruments Standards”) as amended by the Ministry of Finance in 2017; and Accounting Standards for Business Enterprises No. 7 – Exchange of Non-monetary Assets as amended by the Ministry of Finance in 2019; and Accounting Standards for Business Enterprises No.12 – Debt Restructuring as amended by the Ministry of Finance in 2019.

In addition, the Ministry of Finance announced on April 30, 2019 the issuance of Model Financial Statements for Business Enterprises 2019 (CK [2019] No.6) and Model Consolidated Financial Statements 2019 (CK [2019] No.16), in accordance with which we have revised the model financial statements for business entities.

- (1) The impact of New Financial Instruments Standards
The new standards on financial instruments require retroactive

adjustment to financial instruments pending final recognition as on the effective date in the event of discrepancy between the previously recognized and measured items and the revised requirements. For financial data reported in the comparative statements for prior periods, retroactive adjustment is not required for inconsistency with the revised requirements. The Company has recognized the cumulative effect of initial application as an adjustment to the opening balance of retained earnings and other comprehensive income.

- (2) The impact of new standards on the exchange of non-monetary assets and debt restructuring

Adoption of these standards has no significant impact during this reporting period.

- (3) Implementation of the new model financial statements

The Company has prepared its financial statements in accordance with the new model financial statements and the changes to items previously reported in the financial statements have been adjusted under Accounting Standards for Business Enterprises No. 30 – Presentation of Financial Statements and other applicable regulations for comparative data in the comparable periods.

B. Main Types of Taxes

1. Corporate income tax

In accordance with the Directive on Tax Policy Issues in Relation to the Further Implementation of the Western China Development Strategy (CS [2011] NO.58) announced by the Ministry of Finance, the General Administration of Customs and the State Taxation Administration, business establishments in the industries encouraged to develop in the western region are entitled to a reduced corporate income tax rate of 15% from January 1, 2011 to December 31, 2020. This preferential rate of 15% is applicable to the calculation and payment of corporate income tax of some of the Company's branches and subsidiaries located in western China.

Under the Corporate Income Tax Law, Implementing Regulations of the Corporate Income Tax Law, Administrative Measures for the Determination of High and New Technology Enterprises and Guidelines for Eligibility Management of High and New Technology Enterprises, the corporate income tax rate applicable to a high and new tech company is 15%. The Company's subsidiaries with the High and New Technology Enterprise Certificate are eligible for the preferential tax rate of 15%.

2. Value-added tax

In accordance with the Directive on the Relevant Policies for Deepening Value-added Tax Reform ([2019] No.39 issued by

the Ministry of Finance, the State Taxation Administration and the General Administration of Customs), the new tax rates of 13% and 9%, instead of 16% and 10%, are applicable to taxable sales and imports respectively, effective since April 1, 2019.

In accordance with the Directive on the Relevant Policies for Deepening Value-added Tax Reform ([2019] No.39 issued by the Ministry of Finance, the State Taxation Administration and the General Administration of Customs), taxpayers in producer and consumer services (including financial services) are eligible for incremental tax credit from April 1, 2019 to December 31, 2021 by adding 10% to the input tax deductible in the current period.

In accordance with the Directive on Proportional Refund of Import VAT on Natural Gas Imports from 2011 to 2020 and Central Asia Natural Gas Imports before 2010 (CGS [2011] No.39) issued by the Ministry of Finance, the General Administration of Customs and the State Taxation Administration, when the cost of imported natural gas from the permitted projects is higher than the government-regulated natural gas sales price, the Company is eligible for import VAT refund in proportion to the difference between the import cost and the regulated sales price.

In accordance with the Notice on Printing and Distributing VAT Management Measures for Oil and Gas Enterprises (CS [2009] No.8) and the Supplementary Directive on VAT-related Issues for Oil and Gas Enterprises (CS [2009] No.97) issued by the Ministry of Finance and the State Taxation Administration, the Company is subject to VAT on production-related services provided in the process of producing oil and gas and exempt from VAT on the transfer or supply of taxable goods and services for production between the oil and gas field companies and the non-independent accounting units.

Overseas subsidiaries are subject to the applicable local tax rates.

3. Surtaxes and surcharges

The urban maintenance and construction tax rate is 1%, 5% or 7% of the amounts actually paid for value-added tax and consumption tax. The rate of education surcharge is 3% of the amounts actually paid for value-added tax and consumption tax.

4. Consumption tax

In accordance with the Directive on Increases in Fuel Consumption Tax (CS [2015] No.11) announced by the Ministry of Finance and the State Taxation Administration, the unit consumption tax amount has increased from RMB 1.40 to RMB 1.52 per liter for gasoline, naphtha, solvent oils and lubricants, and from RMB 1.10 to RMB 1.20 per liter for diesel, jet kerosene and fuel oils, effective since January 13, 2015. The suspension of consumption tax remains unchanged for jet kerosene.

In accordance with the Directive on Consumption Tax Exemption

for Oil Consumption in the Production of Oil Products (CS [2010] No.98) announced by the Ministry of Finance and the State Taxation Administration, the Company has been exempt from consumption tax since January 1, 2009 on self-produced refined oils used as fuel, power and raw materials to produce oil products.

In accordance with the Provisional Directive on Consumption Tax Refund (Exemption) for Naphtha and Fuel Oil Used in Producing Ethylene and Aromatic Hydrocarbons ([2012] No.36) issued by the State Taxation Administration, the Company is exempt from consumption tax on self-produced naphtha and fuel oil for continuous production of ethylene and aromatic hydrocarbons, and also exempt from consumption tax on self-produced naphtha and fuel oil sold under the dedicated direct supply programs announced by the State Taxation Administration.

5. Resources tax

In accordance with the Directive on Adjusting Resources Tax Policies for Crude Oil and Natural Gas (CS [2014] No.73) announced by the Ministry of Finance and the State Taxation Administration, the rate of mineral resources compensation fee has been reduced to zero and the resources tax rate has been raised from 5% to 6% for crude oil and natural gas, effective since December 1, 2014. CNPC is eligible for resources tax exemption for crude oil and natural gas used for heating during the process of heavy oil transportation in oilfields and eligible for a resources tax reduction of 40% for heavy oil, high pour point oil and high sulfur natural gas, 30% for tertiary recovery, 20% for low abundance oil and gas fields (on a temporary basis) and 30% for deep-water oil and gas operations.

In accordance with the Directive on Cutting Resources Tax on Shale Gas (CS [2018] No.26) announced by the Ministry of Finance and the State Taxation Administration, resources tax on shale gas is cut by 30% (from the standard rate of 6%) from April 1, 2018 to March 31, 2021 to boost shale gas production and increase gas supplies.

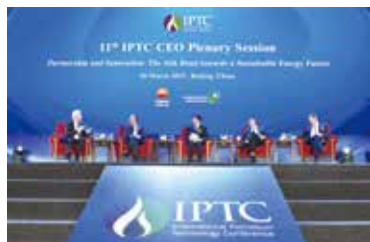
6. Special oil gain levy

In accordance with the Directive on Raising the Threshold for Special Oil Gain Levy (CS [2014] No.115) issued by the Ministry of Finance, with the approval of the State Council, the Ministry of Finance has decided to raise the threshold for special oil gain levy to USD 65 per barrel, effective from January 1, 2015, with the five-level progressive ad valorem rates remaining in place.

7. Personal income tax

The employees are responsible for their own income tax, which is withheld and remitted by the Company.

Major Events



Mar. 26



Apr. 28



Jun. 14



Aug. 5

January

Jan. 6

Exploration activities in the Junggar Basin, Xinjiang resulted in a major breakthrough at the Gaotan-1 exploration well to produce high-yield oil and gas flows.

March

Mar. 26

The 11th International Petroleum Technology Conference (IPTC) co-hosted by CNPC and Saudi Aramco opened in Beijing.

April

Apr. 28

The Second Belt and Road Roundtable for Oil & Gas Cooperation hosted by CNPC opened in Beijing.

June

Jun. 6

CNPC and Rosneft held the Second China-Russia Energy Business Forum in St. Petersburg.

Jun. 7

CNPC signed a share purchase agreement with Novatek to secure its participation interest in the Arctic LNG-2 project.

Jun. 14

Chad Project Phase 2.2 went into production.

July

Jul. 19

CNPC received the transferred equities in the Arctic LNG-2 project from Novatek.

Jul. 30

The jet fuel pipeline from Huabei Petrochemical to Beijing Daxing International Airport was put into operation.

August

Aug. 5

The Niger-Benin Crude Pipeline Construction and Operation Agreement was inked.

Aug. 7

The oil production contract for Block 5 in Oman was officially extended for 15 years.

September

Sep. 29

A significant shale oil discovery was made in the Ordos Basin, marking the birth of the 1-billion-ton Qingcheng Oilfield.

Sep. 29

A 1-trillion-cubic-meter shale gas play was taking shape in the Sichuan Basin based on remarkable progress in shale gas exploration.

October

Oct. 3

High-yield industrial flows were obtained at Well Bozi-9 in the Tarim Basin, marking the second 1-trillion-cubic-meter gas play in the basin.

November

Nov. 6

CNPC International Cooperation Forum & Signing Ceremony was held in Shanghai during the second China International Import Expo.

Nov. 6-7

CNPC, with its partners, was awarded two deepwater presalt oilfields, i.e. Buzios and Aram, in Brazil.

Nov. 11

CNPC participated in the ICE Futures Abu Dhabi.

Nov. 13-14

CNPC signed an MOU on expanding cooperation in the oil and gas sector with KazMunayGas and an MOU on natural gas cooperation with the Ministry of Energy of the Republic of Kazakhstan and KazTransGaz.

December

Dec. 2

North section of the Eastern Russia-China Natural Gas Pipeline came on stream.



Sep. 29



Oct. 3



Nov. 6



Dec. 2

Glossary

Proven reserves

According to China National Standards, proven reserves are estimated quantities of mineral deposits. They can be recovered from reservoirs proved by appraisal drilling during the period of reservoir evaluation, with a reasonable certainty or a relative difference of no more than 20%.

Oil equivalent

Oil equivalent is the conversion coefficient by which the output of natural gas is converted to that of crude oil by calorific value. In this report, the coefficient is 1,255, i.e. 1,255 cubic meters of natural gas is equivalent to one metric ton of crude oil.

Recovery rate

The percentage of oil/gas in place that is recoverable from underground.

Decline rate

A decline in production occurs in an oil or gas field that has been producing for a certain period of time. The natural decline rate is defined as the negative relative change of production over a period of time, without taking into account an increase in production resulting from EOR (enhanced oil recovery) techniques. The general decline rate is defined as the rate of decline in the actual production of such an oil or gas field, taking into account an increase in production from the new wells and EOR techniques.

Water injection

The pressure of the reservoirs continues to drop after the oilfield has been producing for a certain period of time. Water injection refers to the method where water is injected back into the reservoir through the water injection wells to raise and maintain the pressure, increase oil recovery, and thereby stimulate production.

Tertiary recovery

Tertiary recovery is also called enhanced oil recovery and is abbreviated as EOR. It is a method to increase the recovery of crude oil by injecting fluid or heat to physically or chemically alter the oil viscosity or the interfacial tension between the oil and another medium in the formation, in order to displace any discontinuous or hard-to-tap oil in reservoirs. EOR methods mainly include thermal recovery, chemical flooding and miscible flooding.

ASP flooding

A flooding system is prepared with alkali, surfactant and polymer. It

not only has a high viscosity but also can create ultra-low water-oil interfacial tension to improve the oil-washing capability.

LNG

Liquid Natural Gas is produced by dewatering, deacidifying, dehydrating and fractionating the natural gas produced from a gas field and then turning it into liquid under low temperatures and high pressure.

Horizontal well

A class of nonvertical wells where the wellbore axis is near horizontal, or fluctuating above and below 90 degrees deviation. A horizontal well may produce at rates several times greater than a vertical well, enhance recovery efficiency and prolong the production cycle, due to the increased wellbore surface area within the producing interval. Meanwhile, the environmental costs or land use problems that may pertain in some situations, such as the aggregate surface "footprint" of an oil or gas recovery operation, can be reduced by the use of horizontal wells.

HSE management system

The HSE management system provides a framework for managing all aspects of health, safety and the environment. It is defined as the company structure, responsibilities, practices, procedures, processes and resources for implementing health, safety and environmental management.

Occupational diseases

A disease or ailment caused due to excessive exposure to noxious fumes or substances in a working environment.

Internet +

China's "Internet +" action plan refers to the application of the internet and other information technology in conventional industries. It is an incomplete equation where various internets (mobile Internet, cloud computing, big data or Internet of Things) can be added to other fields, fostering new industries and business development in China.

VOCs

Volatile organic compounds (VOCs) refer to organic compounds with saturated vapor pressure over 70 Pa under room temperature, and boiling point below 260°C under atmospheric pressure. VOCs also refer to all organic compounds that easily evaporate at temperature of 20°C and vapor pressure of 10 Pa or higher.

About this Report

In this report, the expressions "CNPC", "the corporation", "the company" and "we" are used for convenience where references are made to China National Petroleum Corporation. This report is presented in Chinese and English. In case of any divergence of interpretation, the Chinese text shall prevail.

Recycled/recyclable paper is used for this report.

It is recommended that you visit www.cnpc.com.cn or scan the QR code to browse or download the PDF version of this report and learn more about us.



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