

Overseas Oil and Gas Operations

Leveraging the opportunities presented by the Belt and Road Initiative, our overseas oil and gas operations expanded steadily in 2017 and saw a number of new cooperation agreements signed. Our overseas investments were further optimized, bringing our international presence to the next level. Major discoveries were announced in main overseas exploration areas. Many key projects became operational. So far, we have oil and gas investments in 38 countries worldwide.

Exploration

Pursuing a low cost strategy, our overseas exploration activities in 2017 proved very fruitful as we took steps to curb high-risk investment-intensive exploration, focus on readily producible quality reserves and guide exploration funds to key areas and key projects. These activities resulted in newly added recoverable reserves of 90.93 million tons of oil equivalent, including 62.80 million tons of crude oil and 35.3 billion cubic meters of natural gas.

Major discoveries in key areas led to greater than expected total amount of newly proved reserves. In Brazil, a world-class uncompartimented oil prospect was confirmed by deepwater exploration in Libra, identifying 1.56 billion tons of oil in place and 500 million tons of recoverable reserves in the Northwest. Extended well testing resulted in first oil. In Turkmenistan, exploration activities at the right bank of Amu Darya identified large-scale replacement areas and new breakthroughs were achieved in the central and eastern tectonic belts.

A number of high-quality, readily producible reserves were identified through progressive exploration. High yield oil flows were obtained from exploration wells from buried-hill basement and new discoveries were made in the P Formation in the Bongor Basin of Chad. Three new reservoirs were discovered in the Agadem oilfield in Niger. Exploration activities in the Andes Block T in Ecuador proved fruitful. Progressive exploration at the Daleel Oilfield in Oman led to an increase in reserves. High yield and oil enriched reservoirs were discovered at Block 6 in the Sufyan sag in Sudan. In Kazakhstan, detailed prospecting resulted in a number of discoveries in the South Turgai Basin and significant progress was made at the Precaspian Central Block and presalt of the Zhanazhol Oilfield. In Iraq, deep-zone exploration resulted in new breakthroughs in the Halfaya Oilfield.



CNPC's share in overseas
crude production

68.80

mmt



CNPC's share in overseas
natural gas production

25.5

bcm

Production

In 2017, our overseas projects achieved steady growth in oil and gas production by aligning workload schedules with oil price trend and development benefits, optimizing waterflooding measures at matured fields, bringing in new wells and speeding up key projects. The full-year operating production reached 162.74 million tons of oil equivalent, of which equity production was 89.08 million tons, an increase of 17.2% year-on-year. The operating and equity production of crude oil were 136.18 million tons and 68.8 million tons respectively; and those of natural gas were 33.3 billion and 25.5 billion cubic meters respectively.

Central Asia-Russia: The Phase I of Yamal Project, which is the world's biggest Arctic LNG project and has CNPC's full participation in the operation, was completed and put into production with the first shipment launched successfully. In Kazakhstan, Aktobe project won the bids of two exploratory blocks of Teresken I and II, with a total area of approx. 4,500 square kilometers. In Turkmenistan, the Amu Darya natural gas project remained highly productive by bringing in new wells and well stimulation; four compressor units became operational at the Saman-Depe Gas Field as part of the first phase of the EGR Project; the second phase was under construction and expected to enhance the recovery ratio significantly after completion. In Uzbekistan, the first phase of Karakul Gas Field Project, including three fields, went on stream, with a designed capacity to deliver 1 billion cubic meters annually.

Latin America: CNPC Latin America's oil and gas operations remained safe and steady thanks to lean management, deployment of new wells and implementation of stimulation measures. The Libra Project in Brazil started production in November 2017, generating a return alongside investment. The consortium comprised of CNPC, Petrobras and BP won the Peroba exploration block in presalt, deepsea of Brazil, marking another huge deepwater prospect of CNPC following the Libra Project. In Venezuela, the construction of key projects advanced, with new progress achieved in surface engineering of the Phase I 165,000 bbl/d capacity expansion of the MPE3 project, thermal recovery pilot tests at the Junin-4 project, and the 15,000 bbl/d rapid ramp-up for the Zumano Project.

Middle East: CNPC signed a stock purchase agreement with Abu Dhabi National Oil Company to acquire an 8% stake in ADCO onshore concession. The Phase I of Abu Dhabi Al-Yasat project proceeded smoothly and is expected to achieve first oil in the first half of 2018. The Rumaila and West Qurna-1 fields in Iraq saw effective waterflooding and an improvement in production capacity and a continued drop in natural decline through injection-production well spacing optimization and balanced injection. The Phase III of Halfaya Project went on stream ahead of schedule, delivering crude oil at a rate of 250,000 bbl/d. The Rumaila power plant project began to send electricity to local grid. In Iran, the MIS Project restored operation. The consortium by CNPC, Total and a local company signed an agreement with National Iranian Oil Company to develop the South Pars Phase 11 (SP 11) Gas Field.

Africa: CNPC International Nile operated its oilfields in Sudan and South Sudan efficiently by stepping up measures for production management, bringing in new wells and promoting the use of low-cost, proven EOR techniques. In South Sudan, oil and gas production grew steadily in Block 3/7 as a result of dynamic reservoir assessment, optimized well siting and improved stimulation programs. De-bottleneck projects were completed with high quality, boosting fluid handling capacity to 29 Mt/a. New techniques such as gas injection, gas lift and MFCA viscosity reducer were adopted in Block 1/2/4 together with cost-saving drilling solutions. At Block 6 in Sudan, thermal recovery of heavy oil contributed 72% to the total output of FNE Oilfield. In Mozambique, the integrated ultra-deepwater gas E&P and LNG project in Coral Gas Field of Block 4 in the Rovuma Basin was launched. In Chad, the first Daniela CPF train for the Phase 2.2 oilfield surface engineering project went on stream successfully.

Asia-Pacific: In Indonesia, we kept production on schedule by bringing in new wells, tapping potential of old wells and optimizing production processes. In Canada, gas condensate development began at the Duvernay tight oil and gas field, thanks to continuous optimization of drilling and completion design and investment; the Phase I MacKay River oil sands project saw 42 pairs of horizontal wells in production using steam-assisted gravity drainage (SAGD), with daily production peaking at 11,000 bbl. In Australia, the Arrow PTL project saw the fuel gas system for compressors upgraded and put into operation.

Pipeline Construction and Operation

In 2017, we maintained safe and stable operation of the long-distance cross-border pipelines, including the Central Asia-China Gas Pipeline, Myanmar-China Gas Pipeline, Russia-China Crude Pipeline and Kazakhstan-China Crude Pipeline. By the end of 2017, CNPC operated 16,500 kilometers of overseas oil and gas pipelines, including 8,597 kilometers for crude oil and 7,903 kilometers for natural gas, which transported 33.47 million tons of crude and 47.6 billion cubic meters of gas throughout the year.

Key overseas pipeline projects advanced steadily. The Myanmar-China Crude Pipeline and Second Russia-China Crude Pipeline became operational. The north section of the Eastern Route of Russia-China Gas Pipeline fully started construction. The Line D of Central Asia-China Gas Pipeline was kicked off. Two compressor stations along the Phase II Kazakhstan-China Gas Pipeline (the South Kazakhstan section) became operational, boosting the pipeline capacity to 10bcm/year. The Grand Rapids pipeline in Canada started oil transportation, delivering approx. 100,000 tons of crude oil per month.

Myanmar-China Crude Pipeline

The Myanmar-China Crude Pipeline starts at Maday Island in Kyaukphyu in Myanmar, enters China at the border city of Ruili in Yunnan province and terminates at Yunnan Petrochemical in Kunming. The pipeline has a total length of 1,420 kilometers, including 771 kilometers in Myanmar and 649 kilometers in China, with a designed annual capacity of 13 million tons. The pipeline kicked off in June 2010 and became operational on April 10, 2017. Crossing big rivers for many times along the route, the pipeline construction is faced with tough operation and control challenges such as height difference, high operating pressure and multi U turns. In particular, the difference of height is up to 1,500 meters when crossing the Nujiang River, making the pipeline one of the most complicated liquid pipelines in the world. As China's fourth energy import channel following the Central Asia-China Pipelines, Russia-China Crude Pipeline and Maritime Route, the Myanmar-China Oil and Gas Pipelines represent an important achievement of energy cooperation between the two countries.

Second Russia-China Crude Pipeline

The Second Russia-China Crude Pipeline starts at Mohe in Heilongjiang, crosses Inner Mongolia, and ends at Daqing in Heilongjiang. In parallel to the existing Russia-China Crude Pipeline, it has a total length of 932 kilometers, pipe diameter of 813mm, designed pressure of 9.5-11.5 MPa, and designed annual capacity of 15 million tons. The pipeline started to be constructed on July 20, 2016 and became commercially operational on January 1, 2018. Under the agreement between CNPC and Rosneft on the increase of oil supplies, Rosneft will deliver another 15 million tons of crude oil to China every year through the Second Russia-China Crude Pipeline.



Oil tanks under construction in Maday Island, Myanmar

Refining and Chemicals

In 2017, our overseas refineries operated in a safe and steady manner and processed 45.78 million tons of crude throughout the year. In Kazakhstan, the Phase I upgrading project at the Shymkent Refinery went on stream. The refinery's sour oil processing capacity was significantly improved and it was able to produce vehicle fuels in compliance with the Euro IV and Euro V standards; the Phase II project was halfway through the construction plan and expected to start production in the second half of 2018. In Sudan, the takeover in the Khartoum Refinery was completed smoothly and a technical service agreement was signed. The N'Djamena Refinery in Chad and Zinder Refinery in Niger completed production plans successfully, and actively explored markets.

Project Cooperation and Development

In 2017, CNPC's overseas oil and gas cooperation continued to deepen and expand. The cooperation between CNPC and many countries, especially those along the Belt and Road routes, was fruitful and a range of cooperation agreements were signed with the governments and energy companies of Russia, Kazakhstan, Uzbekistan, Azerbaijan, Mozambique, and Abu Dhabi, etc.

In Central Asia-Russia, CNPC and Gazprom signed a number of agreements, including the supplementary agreement to gas sales and purchase contract via the Eastern Route, the MOU on strategic cooperation between CNPC, CCCC, Gazprom and Russian Highways in using LNG as vehicle fuel for trunk road transport, the MOU between CNPC, Gazprom and China Huaneng Group on cooperation in gas-fired power generation. In addition, CNPC signed an agreement with Rosneft on establishing a joint coordinating committee, and an agreement with Novatek on strategic cooperation.

CNPC and KazMunayGas signed an agreement on promoting the renovation of the Shymkent Refinery and an MOU on the export of Kazakhstan gas to China. CNPC and the Energy Ministry of Kazakhstan signed an MOU on the extension of petroleum contracts.

CNPC and Uzbekneftegaz signed a supplementary agreement to the sales and purchase contract between the two companies, an MOU on underground gas storages in Gazli, and an agreement between CNPC, Bank of China and Uzbekneftegaz on financing loan for New Silk Road projects.

CNPC and the State Oil Company of the Azerbaijan (SOCAR) signed an MOU between CNPC, China Development Bank and SOCAR on cooperation in investment and financing for natural gas chemical projects in Azerbaijan, an MOU on oil and gas cooperation, and the FEED/OBCE contract for natural gas chemical projects in Azerbaijan.

In the Middle East, CNPC and Abu Dhabi National Oil Company (ADNOC) signed an agreement on equity purchase of Abu Dhabi's ADCO onshore oil concession. Under this agreement, CNPC is awarded an 8% interest in the project for a contract term of 40 years and an 8% stake in Abu Dhabi Company for Onshore Petroleum Operations (ADCO). In addition, the two sides signed an MOU on strengthening cooperation in oil and gas blocks, gas field development, and construction of oil storage facilities. CNPC, Total and an Iranian company formed a consortium and signed an agreement for gas development and production of Phase 11 of South Pars (SP11) with National Iranian Oil Company (NIOC).

In Africa, we deepened cooperation with ENH Mozambique. The two sides signed a range of cooperation agreements, covering oil and gas exploration and development, oilfield services, engineering construction, refining and chemicals, and logistics.

In Asia-Pacific, CNPC signed an agreement with Myanmar on crude oil pipeline transportation, and an MOU with Pertamina on deepening oil and gas cooperation outside China and Indonesia.

In addition, CNPC and Eni signed an agreement on cooperation in E&P, natural gas and LNG, trade and logistics, refining and chemicals areas. CNPC and Cheniere Energy signed an MOU on long-term LNG sales and purchase, to strengthen LNG cooperation in the Gulf of Mexico and facilitate long-term sales and purchase of LNG between the two countries.



Shymkent Refinery in Kazakhstan