

# 1 Energy Supply



Satisfying energy demand and promoting social development are our fundamental goals. Our primary economic responsibility is to ensure a stable energy supply for the national economy—this is embodied not only in obtaining investment returns for sustainable development but also in expanding investment, improving oil and gas supplies, developing clean and renewable energy, providing quality services and maintaining market stability.

- 1.1 Further Enhancing Energy Supply Capability
- 1.2 Securing Stable Market Supply
- 1.3 Constructing Pipeline Network to Enhance Oil & Gas Transportation Capability
- 1.4 Striving to Improve Product and Service Quality
- 1.5 Promoting the Development and Use of New Energy
- 1.6 Expanding Domestic and Overseas Oil & Gas Cooperation

## 1.1 Further Enhancing Energy Supply Capability

### 1. Great breakthroughs in oil and gas prospecting

Sustainable and effective recovery of resources and stable increases in oil and gas production are essential for realizing the goal of sustainable development, stable market supply, and national energy security.

In spite of the difficulties in surface prospecting and increasingly complex geological conditions in the high water-cut development stage with high recovery percent of reserves, we strengthened our exploration work with intensified investment and made several strategic significant discoveries in the Bohai Bay, Erdos, Sichuan, and Junggar Basins. The newly-added proved, probable and possible oil and gas equivalent reserves of Jidong Nanpu Oilfield reached 1.18 billion metric tons, of which 450 million metric tons oil in place were proved, making Nanpu the most exciting discovery in the past three decades. The newly-added proved natural gas in place at Changqing Sulige Gasfield amounted to 565.2 billion cubic meters, making it the first 1,000 billion-cubic meter gasfield in China. Accumulative domestic newly-added proven oil and gas in place reached 830 million metric tons and 429.4 billion cubic meters, and the oil reserve replacement ratio remained above 1 for four consecutive years.

### 2. Increasing oil and gas production through technical innovation

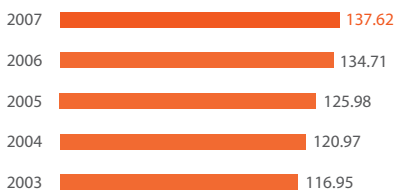
In 2007, we worked to change our development model and launched the secondary development program of mature fields aimed at

enhancing ultimate recovery efficiency. Based on high-resolution 3D seismic, residual oil distribution and potential in mature fields were quantified. 10 major development experiments were carried out to break technical logjams. Horizontal well and underbalanced drilling technologies were applied in a large scale. We also accelerated the productivity construction of new oilfields. Consequently, domestic crude and gas production reached 107.65 million metric tons and 54.2 billion cubic meters respectively, an increase of 1.01 million metric tons and 10 billion cubic meters, or 0.95% and 22.7% higher than that of the last year, further enhancing CNPC's oil and gas deliverability.

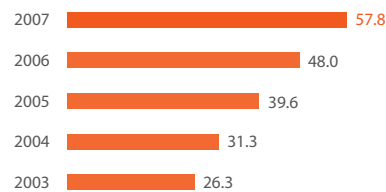
By applying horizontal well technology, higher output and higher production rate can be achieved with less land use and fewer environmental contamination risks. Meanwhile, productivity and development efficiency can be enhanced and difficult-to-tap reserves can be recovered efficiently at a lower total cost. Underbalanced drilling technology boasts various advantages: it can effectively detect and protect oil-gas reservoirs, speed up drilling rate, and prevent difficult situations such as lost circulation.

In 2007, we actively promoted the application of horizontal well and underbalanced drilling technologies, and 806 horizontal wells and 155 underbalanced wells were completed in the year, witnessing increases of 54.4% and 93.7% respectively from the previous year.

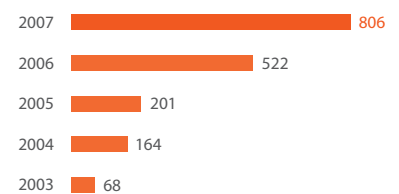
Crude oil production (including overseas production)  
(million metric tons)



Natural gas production (including overseas production)  
(billion cubic meters)



Number of horizontal wells



# Energy Supply

## Great Exploration Breakthrough in Jidong Nanpu Oilfield

On May 3, 2007, Jidong Nanpu Oilfield, located in the tidal zone and shallow water area in the Bohai Bay Basin, declared a total proved, probable and possible reserves of 1.18 billion metric tons, making it CNPC's most encouraging discovery over the last three decades.

Jidong Nanpu Oilfield is an old oilfield with over 30 years of exploration history. Since 2002, we reinforced the comprehensive geological research, deployed fine 3D seismic prospecting and applied prestack time migration in data processing and interpretation for piecing together various 3-D data sets, extended reach well and horizontal well drilling and modular reservoir dynamic logging to overcome various geological prospecting and engineering difficulties, and realized an exploration well success ratio of 88.1%, much higher than the international average of 30-50%. By popularizing horizontal well drilling, the average daily output per well both onshore and offshore was boosted to two times of the national average, and the recovery efficiency up by 10% as compared to that of conventional way. In Sept. 2004, a significant breakthrough was made in Well Laopunan-1. After two and a half years of overall prospecting, four oil-bearing structures were identified, and a total oil and gas P1+P2+P3 reserves (equivalent) of 1.18 billion metric tons was confirmed.

Through collective management of the drilling platforms on the production island, we managed to build a closed production process, in which the crude oil is transported to the gathering stations on land through underground pipelines. Zero discharge to the sea can be realized during the operation of all the drilling platforms. In 2007, the largest biochemical sewage treatment plant in China was completed in Gaoshangpu central gathering station in the Jidong Oilfield, cutting the external discharge of oilfield sewage to 1mg/L and COD discharge to 60 mg/L, up to Level-1 National Standard. After the oilfield being put into overall development, 40% of the treated produced water will be re-injected to the earth, and the remaining 60% will supply other enterprises in Caofeidian Industrial Zone.

Nanpu Oilfield Phase-I project is planned to be completed by 2012 with a production capacity of 10 million metric tons, including 7 million metric tons of offshore production and 3 million metric tons of onshore production, which would substantially contribute to the stable increase and sustainable development of China's crude oil



production and secure national energy supplies. Besides, it will also strongly promote the socioeconomic development of Beijing, Tianjin, Tangshan and the whole Bohai Bay Rim.

## 1.2 Securing Stable Market Supply

### 1. Expanding oil refining and chemical production capabilities

We continued to adjust and optimize refining and chemical production structure and layout. Keeping abreast of international technical standards, we adopted advanced technologies and equipment to improve the quality and processing capability of refined products. The oil refinery processing load reached 98%, while 121.73 million metric tons of crude oil was processed, marking an increase of 5.1%, and 76.81 million metric tons of refined products and 2.58 million metric tons of ethylene were produced, up by 4.7% and 24.8% respectively.

In 2007, the construction and technical reconstruction of four 10 million-ton refineries—Dalian, Dushanzi, Fushun and Guangxi, as well as four ethylene projects proceeded smoothly. Seven key projects including the 5 mt/a oil refinery reconstruction of Huabei Petrochemical, and the 200 kt/a ETHO/glycol project, 800 kt/a PTA reconstruction, 1.2 mt/a diesel hydrofining project and 200 kt/a ethylene reconstruction of Liaoyang Petrochemical, and the 300 kt/a lubricant high-pressure hydrogenation project and 1 mt/a asphalt project of Karamay Petrochemical were put into production after one trial run. The 5 mt/a oil refining auxiliary project of Dagang Petrochemical and the 1 mt/a hydrocracking project of Urumqi Petrochemical were constructed and were to be put into production.

## 2. Ensuring stable refined products supply

In 2007, we actively tapped our refined products stock potential to expand market supply, intensified production-delivery coordination, and optimized resource flow. The sales of refined products increased 10.1% to 82.80 million metric tons. The company has built a nationwide sales network for refined and chemical products. By the end of 2007, the number of our service stations and lubricant distribution ends reached 18,648 and 15,836 respectively.

We overcame various transportation difficulties and natural disasters such as a sandstorm in Northwest China, a snowstorm in Northeast China and a typhoon in southeastern coastal area. To meet market demand, we strengthened coordination between production, transportation and marketing and took effective measures to collect refined product resources and maintain a fair and quality consumption environment in compliance with state and local price policies, thus securing a stable market supply.

To relieve refined products supply problems in some regions, we adopted six measures to secure stable supplies: 1) Running in full capacity. Crude runs in the last quarter of 2007 increased by 6.9% with 2.07 million metric tons; 2) Optimizing products structure. We tried to optimize plant operations, improve ethylene raw materials and enhance the diesel recovery ratio; 3) Strengthening refined products purchasing to increase our external resource stock; 4) Increasing imports and constraining exports. We imported 730,000 metric tons of diesel, bearing huge losses to increase the domestic energy supply; 5) Optimizing the stock of refined products by collecting all possible resources; and 6) Strengthening transportation coordination to ensure resources in Northeast and Northwest China were delivered in a timely manner to eastern and southern China. We have also adopted a daily



monitoring and daily meeting system, strengthened price monitoring and supervision, and compiled emergency response plans. Through these measures, we successfully secured our market supply .

## 3. Enhancing safe and stable natural gas supplies

In 2007, the company strengthened the coordination of the production, transportation and marketing of natural gas. We properly organized gas transportation and improved safe and stable gas supplies, satisfying the gas demand of urban residents, public utilities and industrial users in key areas in the winter as well as the demand of downstream variable load gas-fired power plants in the summer.

In 2007, we added 1.48 billion cubic meters to seven underground gas storages in North China and Jiangsu Province to coordinate between upstream production, midstream pipeline deliverability, and downstream market demand, contributing significantly to winter gas supply security.

Crude runs (including overseas volume)  
(million metric tons)

2007	130.88
2006	124.07
2005	115.41
2004	106.65
2003	95.06

Sales of refined products (including overseas volume)  
(million metric tons)

2007	85.71
2006	77.65
2005	75.72
2004	66.81
2003	60.52

Number of service stations

2007	18,648
2006	18,207
2005	18,164
2004	17,403
2003	15,231

# Energy Supply

Domestic Oil & Gas Pipeline Network



### 1.3 Constructing Pipeline Network to Enhance Oil & Gas Transportation Capability

We accelerated the construction of four strategic oil and gas channels in Northwest China, Northeast China, Southwest China and the offshore area, as well as the construction of a domestic trunk pipeline network, upgraded storage and transportation facilities and control capability. A nationwide pipeline network and supply system has been basically formed featuring by diversified resources, flexible coordination and stable supply.

In 2007, we continued to strengthen pipeline construction. The Western Crude and Products Pipeline (Urumqi-Lanzhou), the Lanzhou-Yinchuan Gas Pipeline and the Daqing-Harbin Gas Pipeline were completed and put into operation. The Daqing-Qiqihar Gas Pipeline and the Lanzhou-Zhengzhou-Changsha Products Pipeline were under construction. The Dushanzi-Urumqi-Shanshan Crude Pipeline and the Jinzhou-Zhengzhou Products Pipeline were in the pre-engineering process. In addition, strategic channels including the Russia-China Crude Pipeline, Kazakhstan-China Crude Pipeline Phase-II Project, the Central Asia Gas Pipeline, the Myanmar-China Oil and Gas Pipeline, and the coastal LNG pipelines were launched and experienced smooth progress.

To meet increasing gas demand resulting from fast economic development and to improve China's energy consumption structure, since 1997, when the Shaan-Jing Pipeline was put into operation, we have constructed various natural gas pipelines including the Sebei-Xining-Lanzhou Gas Pipeline, the West-East Gas Pipeline, the Zhongxian-Wuhan Gas Pipeline, the Second Shaan-Jing Gas Pipeline,



the Ji-Ning Pipeline, the Huaiyang-Wuhan Pipeline and the Lanzhou-Yinchuan Gas Pipeline, forming a basic nationwide natural gas trunk pipeline network in which four gas areas are interconnected. In the meantime, we have also constructed underground gas storages in North China and Jintan, and launched three LNG projects in Tangshan, Dalian and Jiangsu, securing natural gas supplies in the downstream market. We are currently planning the construction of various domestic and cross-border natural gas pipelines such as the Second West-East Gas Pipeline, the Yongqing-Tangshan-Qinhuangdao Gas Pipeline, the Parallel Sebei-Xining-Lanzhou Pipeline, the Myanmar-China Gas Pipeline, and the Northeast Natural Gas Pipeline network to further improve pipeline network deliverability of natural gas, so as to meet robust domestic demand and environmental protection requirements.

By the end of 2007, the total length of crude and gas pipelines operated by CNPC had reached 30,000 km, accounting for over 70% of the national total.

In 2007, CNPC Beijing Oil and Gas Pipelining Control Center was established and started operations. A total of 29 long-distance oil and gas pipelines covering 22,000 km realized full interconnection and collective control and monitoring by the center, which substantially enhanced oil and gas transportation capability.

#### Example: Stable gas supply of the West-East Gas Pipeline for three consecutive years

Since its formal operation began in 2004, the West-East Gas Pipeline has maintained stable gas supplies for three consecutive years. Coal consumption and pollutant discharges in downstream areas fell by over 30 million metric tons and 1.4 million metric tons respectively. It benefits over 60 cities, 3,000 enterprises and 200 million residents in the Yangtze River Delta Region, and North and Central China.

Shanghai, the most populous city in China, started to use natural gas in April 1999, but gas supplies always remained a bottleneck problem for its economic development. Since Shanghai was connected to the West-East Gas Pipeline in Jan. 2004, natural gas from the pipeline has become increasingly important to the city, directly changing its coal-centered energy consumption structure. In 2007, 10 billion cubic meters of "west gas" was consumed by the city. According to statistics, as natural gas consumption increases by 1 billion cubic meters, GDP energy consumption will fall by 0.4%. "West gas" has become the "lucky gas to the east".

# Energy Supply

## 1.4 Striving to Improve Product and Service Quality

We actively adopted international technical standards and safety and environmental guidelines, and strictly executed laws and regulations such as *Product Quality Law of The People's Republic of China* and *Law of the People's Republic of China on Protecting Consumers' Rights and Interests* to organize specialized production and management. We established a complete product quality management system, after-sales service system and technical service system, which greatly improved our product and project quality.

### 1. Strengthening product quality monitoring

In 2007, we issued five management rules, including *Quality Supervision of Procurement*, *Provisions for Products Quality Certification*, *Provisions for Products Quality Supervision and Selective Examination*, *Provisions for Products Quality Inspection Institution* and *Provisions for Products In-the-manufactory Supervision* to regulate and strengthen product monitoring and sampling, quality control institution construction, and key product and equipment quality monitoring and management in construction projects.

### 2. Accelerating the upgrading of refined product quality

In 2007, we continued to promote the technical reconstruction of our oil refining installations. We developed and applied the innovative "component refining" technique with independent intellectual property rights to produce G-IV 93<sup>#</sup>, 97<sup>#</sup> and 98<sup>#</sup> motor gasoline, promoting the high standard gasoline proportion to 47%. In addition, the technique substantially enhanced the production capacity of G-IV diesel oil.

### 3. Improving service stations management and service quality

We promoted a unified management system for service stations step by step and deployed the headquarters-level system, card system, and ERP system at the first 30 pilot stations. The market quick response and control capability of various management levels was enhanced.

We carried out comprehensive inspections to ensure that all the CNPC stations offer stable supplies, high quality products and service. The inspections also cover station management, appearance, safety, quality and quantity, team building, and the correction of any defects found.

To avoid oil and gas leakages and treat air pollution, we carried out the oil and gas callback and re-engineering program at all stations, oil tankers and oil storage facilities in 2007. We adopted the method of integrated planning and step-by-step implementation in consideration of the vast number of service stations and the high technical requirements of the program. By implementing the program, we improved the fueling environment for drivers and our staff and helped to create a better urban environment.

## 4. Winning high recognition from society

Five CNPC products including "Kunlun" lubricant were honored with the title of China Name-Brand Products in 2006. In 2007, "Kunlun" heavy traffic road asphalt produced by Liaohe Petrochemical, Karamay Petrochemical and Lanzhou Petrochemical, "Kunlun" PAM produced by Daqing Refining & Chemical Co., Ltd., "Sanjing" acrylonitrile produced by Jilin Chemical Group, and "Baoshi" drilling rig produced by Baoji Oilfield Machinery Co., Ltd. were also honored as China Name-Brand Products. In addition, "Kunlun" urea and compound fertilizer and "Daqing" compound fertilizer were awarded the title of National Inspection-free Products.

## 1.5 Promoting the Development and Use of New Energy

We regard new energy development as a key strategic solution for future energy supply. And we regard the development and use of unconventional oil and gas resources as an effective solution for replacing and supplementing conventional energy and increasing oil and gas supply and, as a result, included it into our corporate development strategy. Now we have made significant achievements in the development and utilization of coal bed methane, fuel ethanol, oil sands and oil shale, with 275,000 metric tons of ethanol gasoline and 20 million cubic meters of coal bed methane being produced in 2007.

### 1. Planning for the development of new energy

We compiled a three-year plan and objectives and defined development guidelines for new energy development, namely to leverage resources, technology, market and capital advantages in order to actively promote coal bed methane development, stably develop biomass energy, explore the comprehensive use of geothermal resources, continuously strengthen the appraisal of unconventional resources like oil shale, shale gas and oil sands, promote the use and research of solar energy, wind energy and water dissolved gas, and

develop hydrogen energy and gas hydrates in order to make new contributions to national energy security. According to the plan, by 2010 we shall form new energy production capacity equivalent to 3 million metric tons of oil, and promote the production of coal bed methane, fuel ethanol and biodiesel to 40% of the national total and the production of shale oil and sand oil to 20% of the national total, and realize the substitution of coal with geothermal energy to 5% of the total energy consumption of CNPC's upstream business.

## 2. Cooperating with SFA and local governments to develop new energy

In 2007, we launched the "forest-oil" integration project for biodiesel production. We signed a biomass energy framework agreement with SFA to build diesel forest bases covering a total of 68,000 hectares in seven provinces and autonomous regions, carried out full cooperation in biomass energy resource development and forestry carbon sequestration, and launched a demonstration liquid biofuel project. In addition, we signed strategic cooperation framework agreements or memorandums with provinces and municipalities such as Heilongjiang, Shandong, Shaanxi, Henan, Chongqing, Sichuan, and Yunnan to develop biomass energy.

In 2007, the first biomass energy exemplary base was established in Nanchong, Sichuan Province. RMB 1 billion will be invested to realize a 60 kt/a biodiesel project and a 100 kt/a fuel ethanol project by the end of 2008 and in the latter half of 2009 respectively.

In 2007, we also signed an agreement with Shanxi Energy Group to jointly develop coal bed methane resources in Shanxi Province.

### 1.6 Expanding Domestic and Overseas Oil & Gas Cooperation

CNPC actively expanded international oil and gas cooperation to make full use of both domestic and international markets and resources. Our overseas oil and gas investment covers 71 projects in 26 countries in Africa, Central Asia, South America, the Middle East and the Asia-Pacific. In 2007, 52.41 million metric tons of oil was added to our recoverable reserves through our overseas operations. Over 60 million metric tons of crude was produced, and CNPC's share was 22.98 million metric tons, increases of 10.2% and 6.7% respectively. And 5.4 billion cubic meters of natural gas was produced, in which CNPC shared 3.51 billion cubic meters.

CNPC deepened progressive exploration in overseas major blocks and



CNPC's transfer stations in the Maracaibo Lake in Venezuela

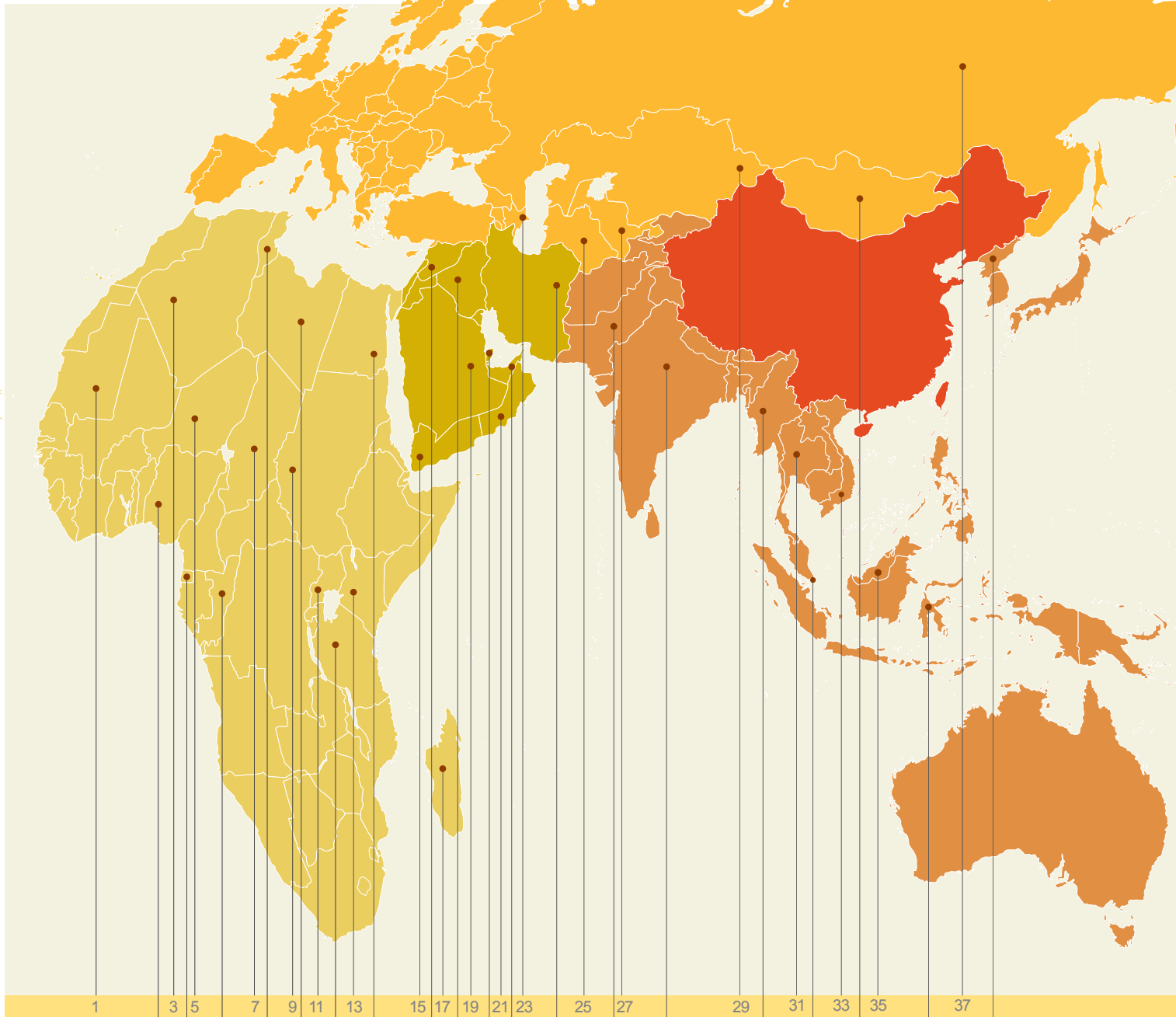
carried out risk prospecting step by step. High-yield oil and gas flows were output in Block 3 in Iran, the South Buzachi project in Kazakhstan, and the project in Chad. Significant discoveries were obtained in the projects in Algeria, Sudan, Kazakhstan and Indonesia. We also accelerated the productivity construction of some key projects including Block 3/7 in Sudan and achieved stable increases in oil and gas production.

The development of new overseas projects achieved progress. CNPC acquired Block Up icharsk and Block West chonsk in Russia and concluded the Amu Darya Right Bank product sharing contract and a gas purchase contract with Turkmenistan, the China-Turkmenistan, and the Central Asia Gas Pipeline project. We also signed contracts for five new projects including an oil sand project in Canada, a deep-sea block in Myanmar, and a project in Nigeria. Besides, we reached LNG purchase and sales agreements with Shell and Woodside Energy Ltd. respectively.

In addition, we actively promoted foreign oil and gas cooperation in China. In May 2007, Changbei Gas Field, jointly invested by CNPC and Shell, was put into commercial production with an annual gas production capacity of 3 billion cubic meters.

# Energy Supply

## CNPC's Oil & Gas Assets and Technical Services Worldwide



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

### Africa

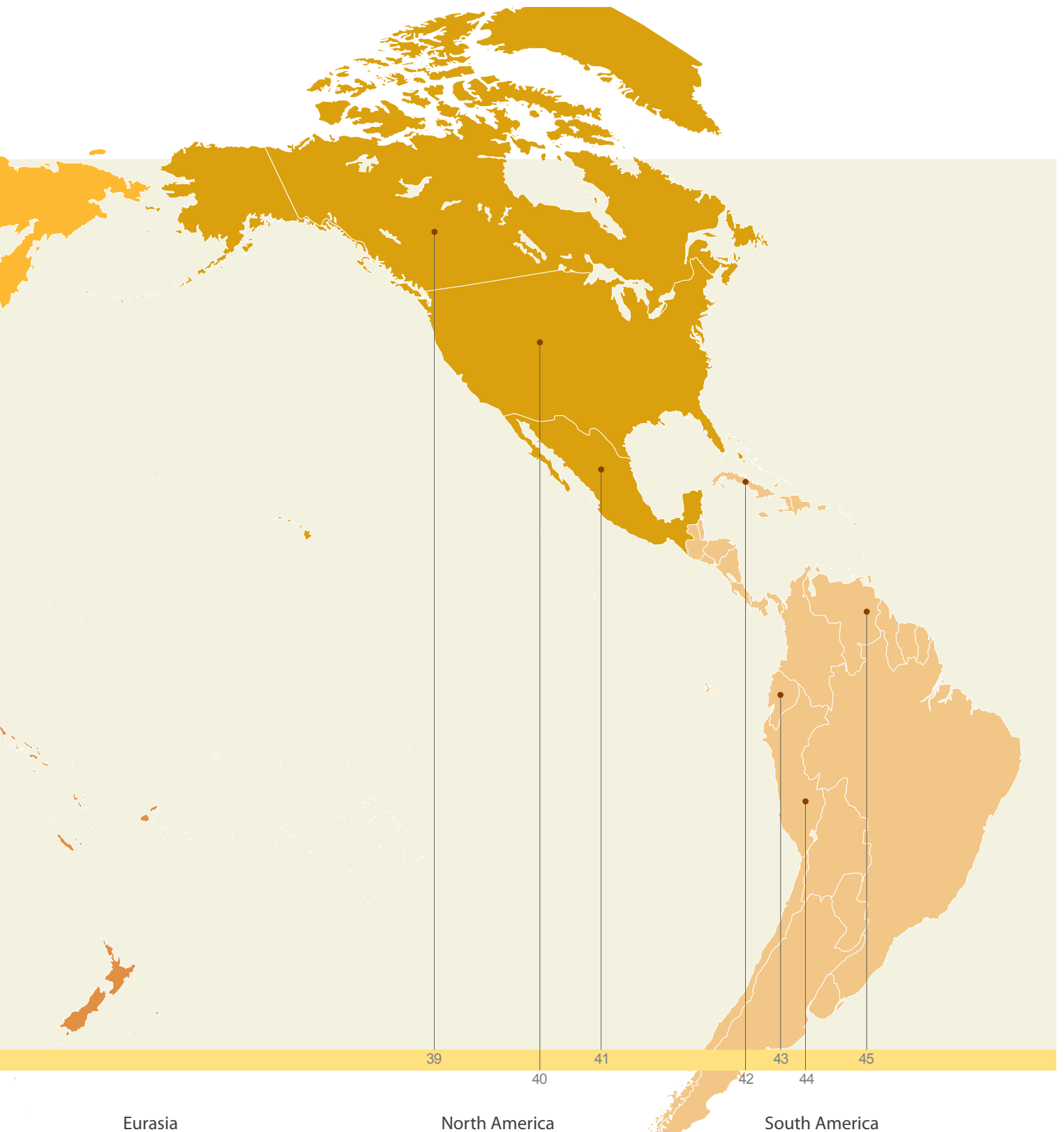
- |                      |                          |                |
|----------------------|--------------------------|----------------|
| 1. Mauritania        | 6. Republic of the Congo | 11. Uganda     |
| 2. Nigeria           | 7. Chad                  | 12. Tanzania   |
| 3. Algeria           | 8. Tunisia               | 13. Kenya      |
| 4. Equatorial Guinea | 9. Sudan                 | 14. Egypt      |
| 5. Niger             | 10. Libya                | 17. Madagascar |

### Middle East

- |                  |                          |
|------------------|--------------------------|
| 15. Yemen        | 21. Oman                 |
| 16. Syria        | 22. United Arab Emirates |
| 18. Iraq         | 24. Iran                 |
| 19. Saudi Arabia |                          |
| 20. Qatar        |                          |

### Asia-Pacific

- |               |                 |
|---------------|-----------------|
| 26. Pakistan  | 33. Vietnam     |
| 28. India     | 35. Malaysia    |
| 30. Myanmar   | 36. Indonesia   |
| 31. Thailand  | 38. North Korea |
| 32. Singapore |                 |



**Eurasia**

- 23. Azerbaijan
- 25. Turkmenistan
- 27. Uzbekistan
- 29. Kazakhstan
- 34. Mongolia
- 37. Russia

**North America**

- 39. Canada
- 40. United States
- 41. Mexico

**South America**

- 42. Cuba
- 43. Ecuador
- 44. Peru
- 45. Venezuela