China's Natural Gas Development: Status-quo and Prospect during the 13th Five Year Plan

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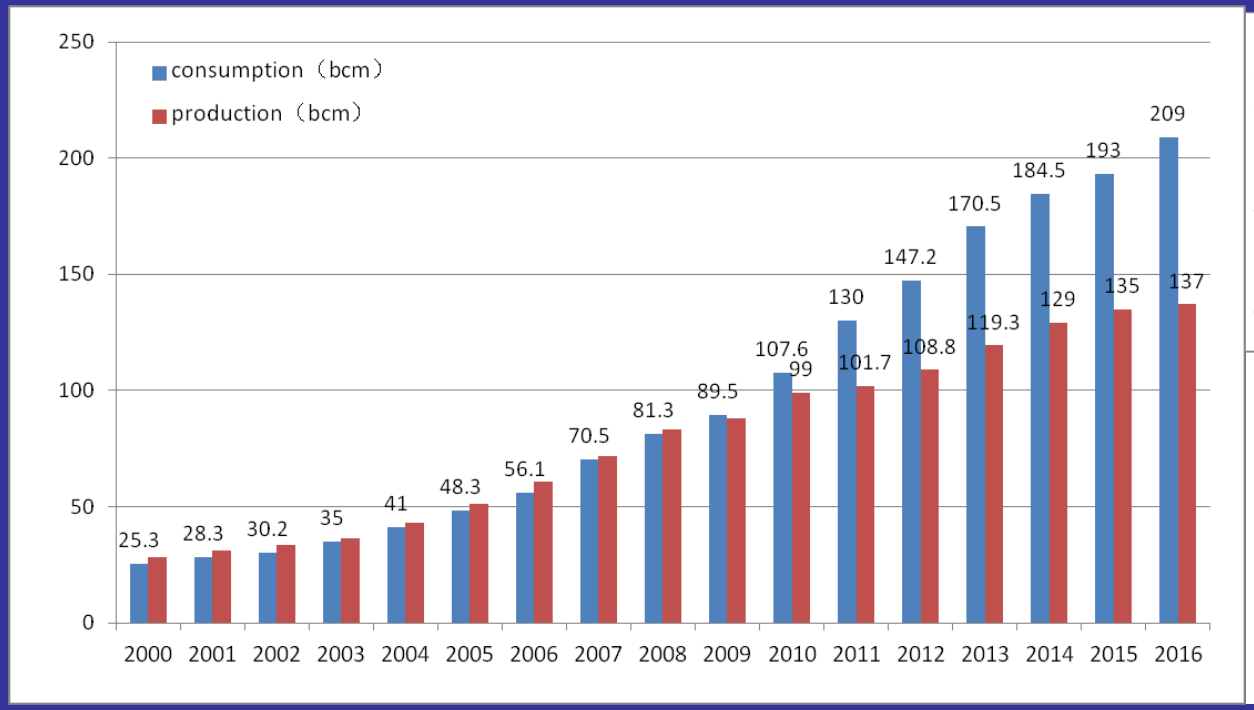
I. Status-quo and Trend of Development

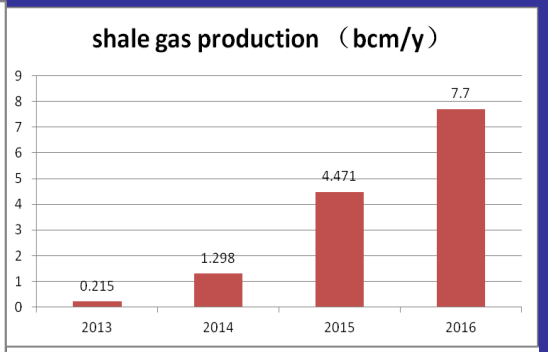
II. Goals of Development and Priority Tasks

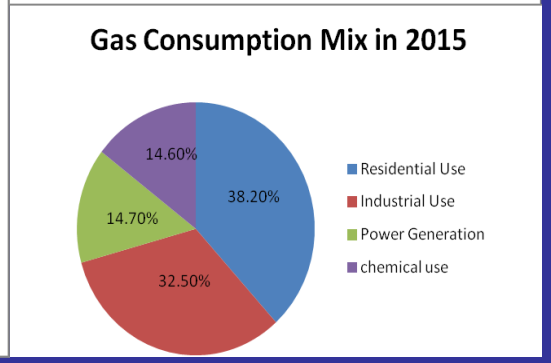
I. Status-quo and Trend of Development

In 2015, the apparent consumption of China's natural gas amounted to 191.3 billion cubic meters, and the average annual growth rate was 12.4% during the 12th Five Year Plan. In 2015, the share of natural gas in primary energy consumption increased to 5.9% from 4.4% in 2010. Industrial, city gas, power generation and chemical accounted for 38.2%, 32.5%, 14.7% and 14.6% of the gas consumption mix respectively.

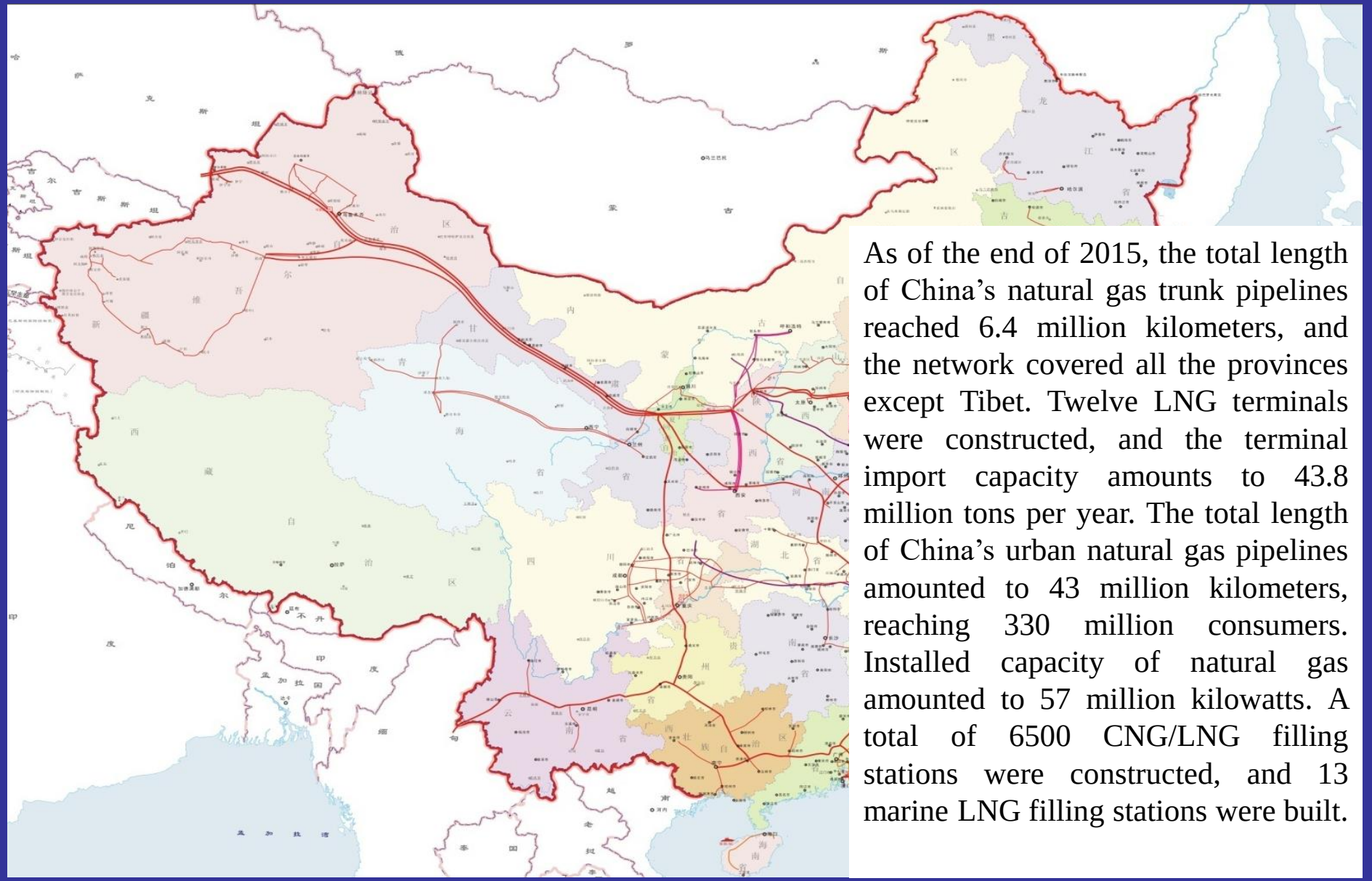
In 2015, China's total natural gas production amounted to 135 billion cubic meters, an average annual increase of 6.7%. Besides the steady growth in conventional gas production, a growing momentum was seen in the development of unconventional natural gas, especially the shale gas. Since the shale gas began its commercial development in 2012, the production has reached 4.6 billion cubic meters in 2015, and increased to 7.7 billion cubic meters in 2016.







I. Status-quo and Trend of Development



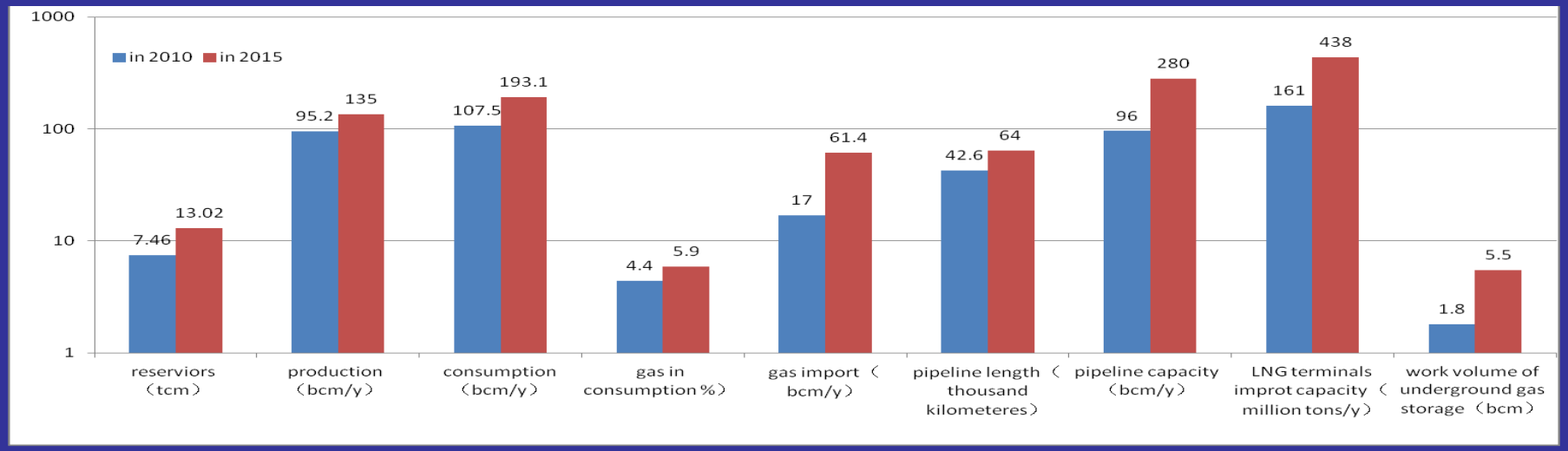
As of the end of 2015, the total length of China's natural gas trunk pipelines reached 6.4 million kilometers, and the network covered all the provinces except Tibet. Twelve LNG terminals were constructed, and the terminal import capacity amounts to 43.8 million tons per year. The total length of China's urban natural gas pipelines amounted to 43 million kilometers, reaching 330 million consumers. Installed capacity of natural gas amounted to 57 million kilowatts. A total of 6500 CNG/LNG filling stations were constructed, and 13 marine LNG filling stations were built.

I. Status-quo and Trend of Development

The institutional reform of the oil and gas system ran smoothly. The mining rights of shale gas were open to enterprises of various ownerships through tenders, and the pilot reform was launched in Xinjiang for the management of the upstream industries of conventional natural gas. Infrastructures such as pipe network and LNG terminals were open to third party operation on an equal basis. Wholesale price control was lifted for unconventional gas, including shale gas, coal bed methane, coal-based synthetic natural gas, and LNG and offshore gas. As for the consumption side, direct gas supply to industrial users and peak shaving from underground storages were deregulated to market pricing.

I. Status-quo and Trend of Development

Indicator	2010	2015	Annual Growth
Proven Total Reserves (trillion m^3)	7.46	13.02	11.7%
Production (100 million m^3 per year)	952	1350	7.2%
Apparent Consumption (100 million m^3 per year)	1075	1931	12.4%
Gas in Primary Energy Consumption (%)	4.4	5.9	6.0%
Gas Import (100 million m^3 per year)	170	614	30.3%
Pipeline Length (10 thousand km)	4.26	6.4	8.5%
Pipeline Capacity (100 million m^3)	960	2800	23.9%
LNG Terminals Import Capacity (10,000 tons/y)	1610	4380	22.2%
Working Gas Volume of Underground Gas Storage (100 million m^3)	18	55	25%



I. Status-quo and Trend of Development

In contrast with the surging demand for natural gas that far outweighs the supply in the past decade, the gas supply and demand will move to a state of easy equilibrium during the 13th Five-Year Program thanks to the increase of domestic production and increasing imports.

We will continue to optimize the energy structure, replacing coal with oil and gas and shifting from fossil fuels to non-fossil energy. To further optimize the energy mix, we will strive to increase the proportion of natural gas in energy consumption. The demand of clean and efficient natural gas will fuel the growing need for combating air pollution and urbanization.

Proven total reserves of China's natural gas accounted for only 19% of total resources and were still in the early exploration phase. The remaining recoverable reserves amount to 3.8 trillion cubic meters, and China's natural gas production growth will continue its momentum.

Technology for exploring and developing oil and gas have advanced, and brought profound changes to the global gas supply and demand landscape thanks to the U.S. shale gas revolution. Abundant natural gas supply will contribute to a low price environment.

I. Status-quo and Trend of Development

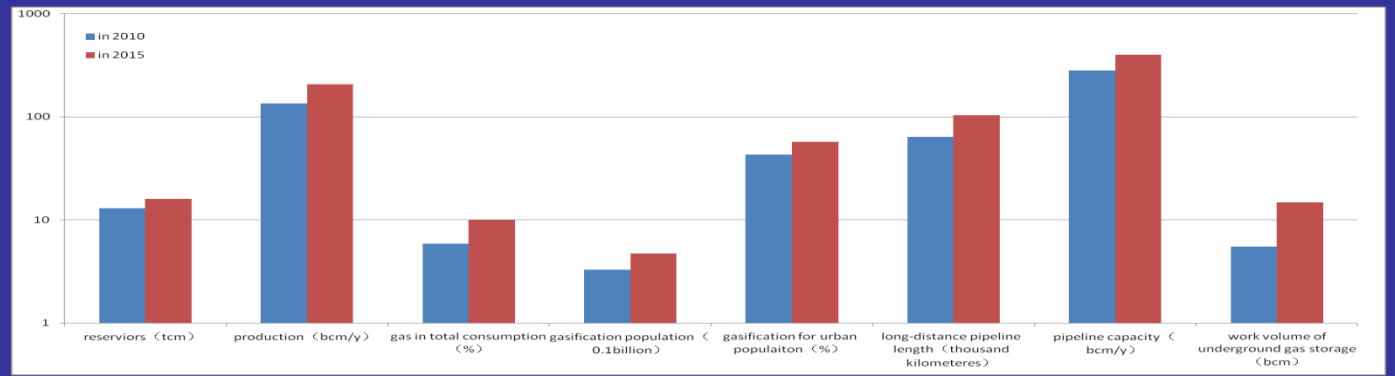
With the rapid growth of the natural gas industry, institutional and structural problems began to emerge. For instance,

- Some of the existing policies no longer meet the future need for development.
- Storage capacity severely lags behind.
- There is a shortage of enterprises engaged in the exploration, development and pipeline transport and a lack of competition. Third-party equal access remains in its initial stage.
- In some regions, redundant links exist during the midstream transport, contributing to the excessive charge and a decline of users' benefits.
- Price movements do not fully reflect the supply-demand relations of the market.
- Difficulty of selling import contract gas which is more expensive, straining corporate finance.

We will press ahead with the institutional reform of oil and gas by easing market access, improving pipeline construction, increasing equal access to infrastructure, developing market-based pricing mechanism, enhancing industry supervision and regulations, and gradually develop a modern market system that is open, orderly and enables fair competition.

II. Goals of Development and Priority Tasks

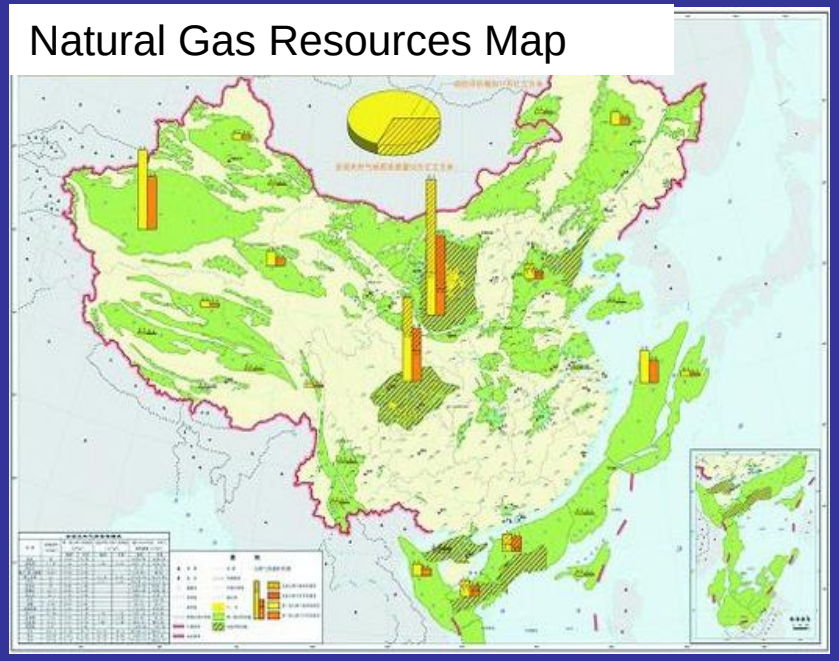
Indicator	2015	2020	Average Annual Growth	Attribute
Proven Total Reserves (trillion m^3)	13.0	16	4.3%	Forecast
Production (100 million m3 per year)	1350	2070	8.9%	Forecast
Gas in Primary Energy Consumption (%)	5.9	8.3 ~ 10	-	Forecast
Gas-covered Population (100 million people)	3.3	4.7	10.3%	Forecast
Urban Gasification Ratio (%)	42.8	57	-	Forecast
Pipeline Length (10 thousand km)	6.4	10.4	10.2%	Forecast
LNG Terminals Import Capacity (10,000 tons/y)	2800	4000	7.4%	Forecast
Working Gas Volume of Underground Gas Storage (100 million m3)	55	148	21.9%	Restrictive

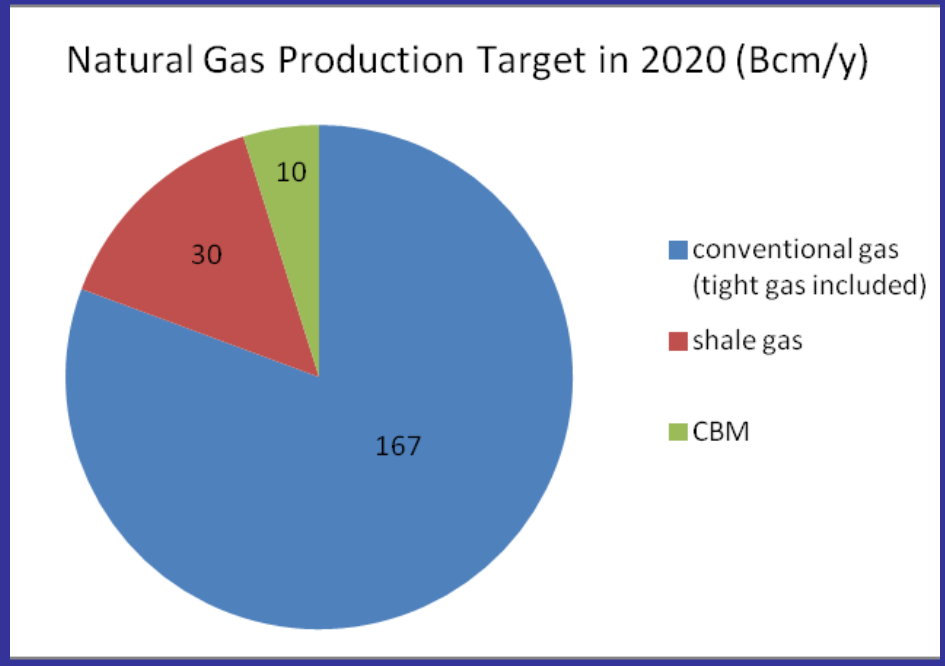


II. Goals of Development and Priority Tasks

First, we will increase domestic gas supply by enhancing exploration and development. By leveraging onshore and offshore resources and exploring conventional and unconventional gas, we aim to increase domestic gas production to 207 billion cubic meters in 2020. In addition to strengthening the development of conventional natural gas, we will step up with the exploration of unconventional natural gas, including tight gas, shale gas and coal bed methane. In 2020, we will increase shale gas production to 30 bcm and the extraction of CBM will amount to 10 bcm.

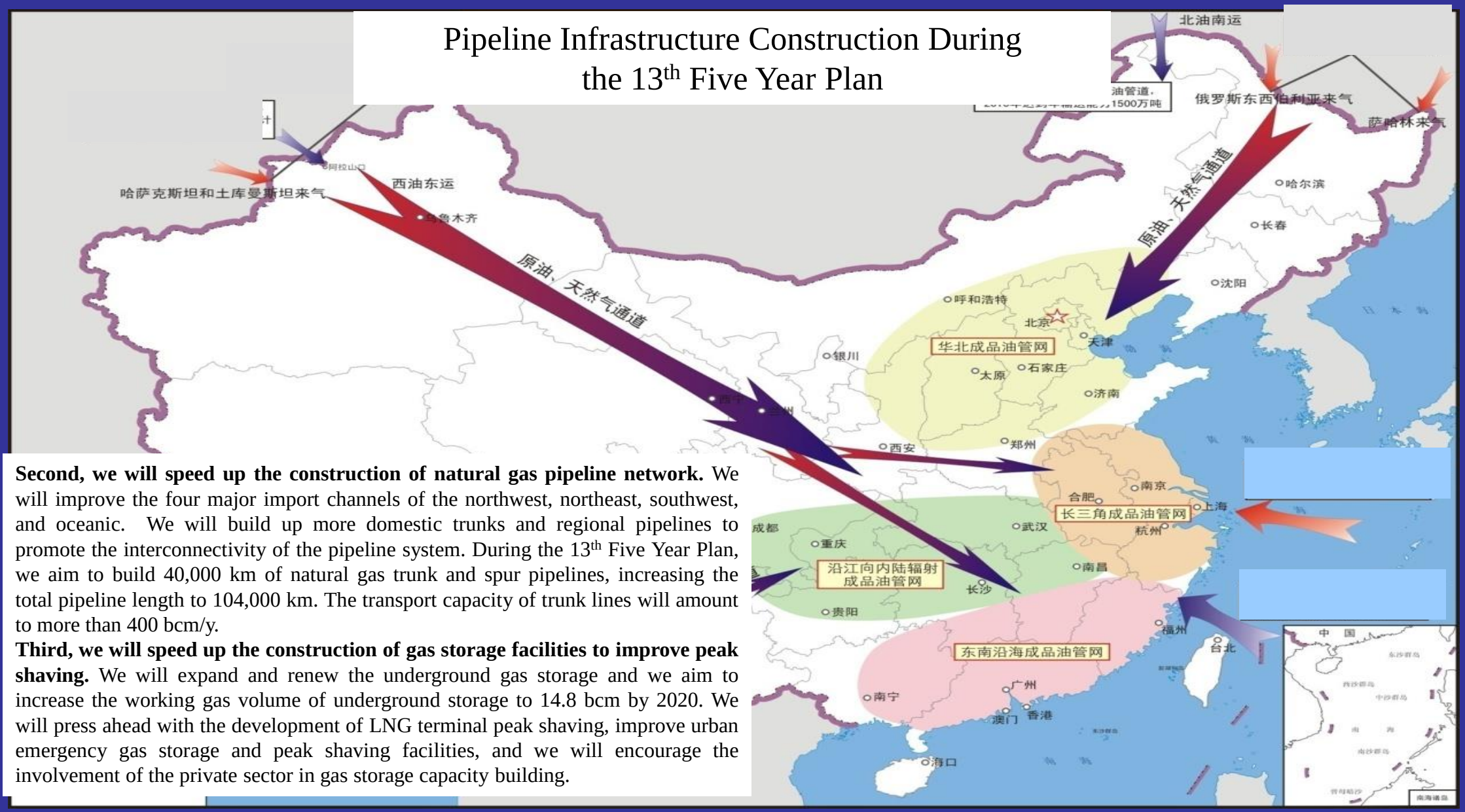
Natural Gas Resources Map





II. Goals of Development and Priority Tasks

Pipeline Infrastructure Construction During the 13th Five Year Plan



Second, we will speed up the construction of natural gas pipeline network. We will improve the four major import channels of the northwest, northeast, southwest, and oceanic. We will build up more domestic trunks and regional pipelines to promote the interconnectivity of the pipeline system. During the 13th Five Year Plan, we aim to build 40,000 km of natural gas trunk and spur pipelines, increasing the total pipeline length to 104,000 km. The transport capacity of trunk lines will amount to more than 400 bcm/y.

Third, we will speed up the construction of gas storage facilities to improve peak shaving. We will expand and renew the underground gas storage and we aim to increase the working gas volume of underground storage to 14.8 bcm by 2020. We will press ahead with the development of LNG terminal peak shaving, improve urban emergency gas storage and peak shaving facilities, and we will encourage the involvement of the private sector in gas storage capacity building.

II. Goals of Development and Priority Tasks

Fourth, we will further develop the natural gas market and promote efficient use of gas. We will promote the transition to clean fuel and expand the new market, and promote large-scale, efficient use of natural gas in residential use, industrial use, power generation and transportation. The natural gas will gradually become one of the main sources of energy in China's modern energy system, and we aim to increase the share of natural gas in primary energy consumption to 10% by 2020 and 15% by 2030 respectively.

To achieve our goals, we need to impose tighter environmental regulations and promote market-based reforms. Meanwhile, we will improve industry policies and standards; provide fiscal incentives for investment and financing; promote scientific and technological innovations and commercialization.

Thank you!