

News and Highlights

Present Situation of China's Shale Gas Exploration and Development

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In recent years, with China's continuous investment in shale gas exploration and the continuous efforts of scientific workers, China's shale gas exploration and development has achieved leap-forward development. In 2011, China's State Council approved shale gas as a new mineral resource. In 2014, shale gas was first proved at geological reserves of 106.8 billion m³. In 2015, 2016 and 2017, China had 130.18 billion m³, 122.413 billion m³ and 376.76 billion m³ of newly proven geological reserves of shale gas, respectively. Until April 2018, the proven geological reserves of shale gas in China had exceeded 1000 billion m³.

With the strengthened shale gas exploration in China, the development of shale gas has also entered the fast lane. From the first cubic meter of shale gas development in

2010, China had 0.1 billion m³, 1.3 billion m³, over 4.4 billion m³, 7.9 billion m³ and up to 9.1 m³ of shale gas production in 2012, 2014, 2015, 2016 and till the end of 2017, respectively. China is expected to exceed producing 10 billion m³ of shale gas during the whole of 2018. China has become the third country to achieve industrial production of shale gas, followed by the United States and Canada. According to the "Shale Gas Development Plan (2016–2020)" issued by the State Energy Administration of China, shale gas production will reach 30 billion m³ by 2020 and 80–100 billion m³ by 2030.

At present, China's shale gas exploration is mainly characterized by its late start, complex basic geological conditions of shale gas reservoirs, a low degree of investigation and evaluation, and of exploration and

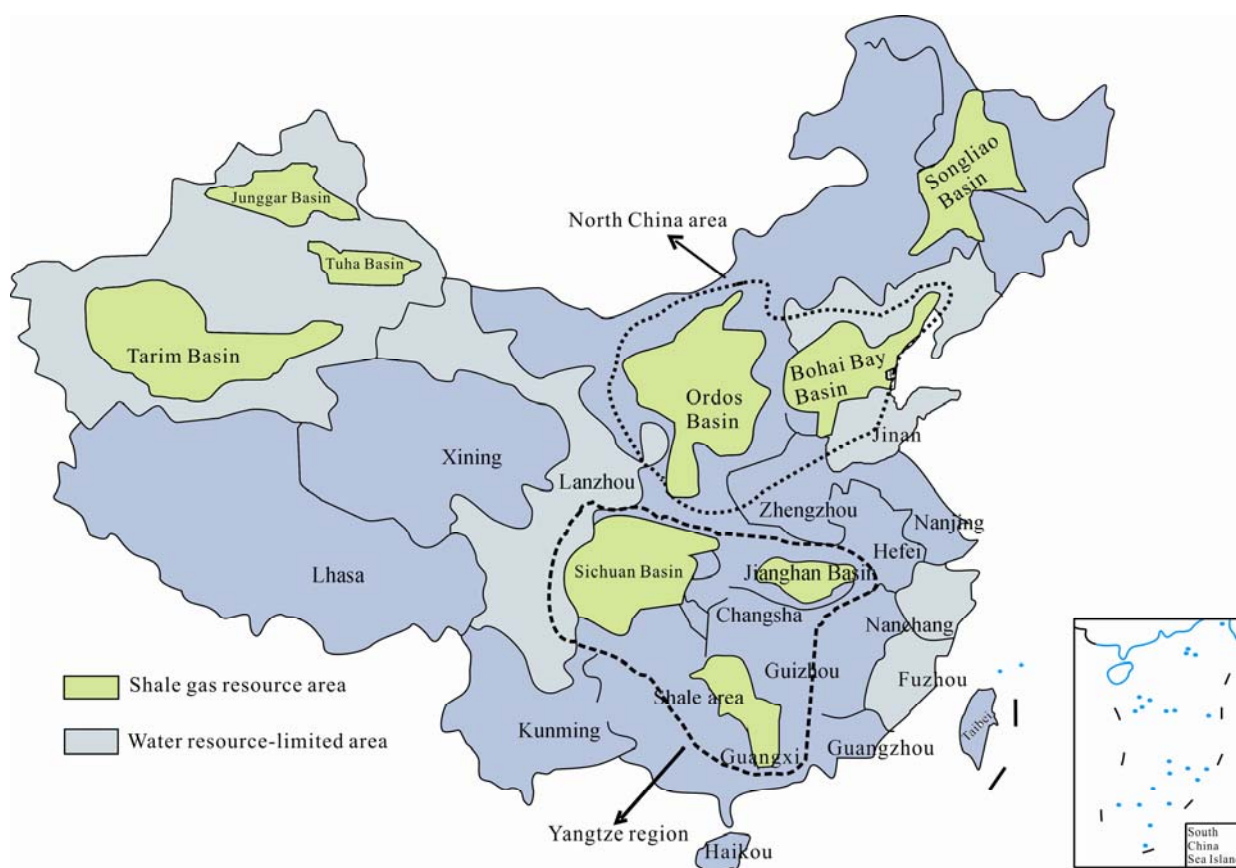


Fig. 1. Map showing major shale gas resource areas in China.

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Table 1 China's main shale gas basins and gas accumulation characteristics

Shale gas basins	Main gas-bearing strata	Main types of gas accumulation and enrichment
Bohai Bay Basin	Paleogene Dongying Fm., Shahejie Fm. and Kongdian Fm., Permian Shanxi Fm. and Taiyuan Fm., Carboniferous Benxi Fm., Middle Proterozoic Xiamaling Fm., Jixianian Hongzhuang Fm., Changchengian Chuanlinggou Fm.	Marine-continental transitional facies and continental facies
Songliao Basin	Cretaceous Nenjiang Fm., Qingshankou Fm., Quantou Fm., Yingcheng Fm., Shahezi Fm. and Huoshiling Fm.	Continental facies
Sichuan Basin	Jurassic Shaximiao Fm. and Ziliujing Fm., Triassic Xujiache Fm., Permian Longtan Fm., Silurian Longmaxi Fm., Ordovician Wufeng Fm., Cambrian Qiongzhusi Fm., Sinian Doushantuo Fm.	Marine facies, marine-continental transitional facies, continental facies
Qaidam Basin	Jurassic Dameigou Fm. and Huxishan Fm., Carboniferous Keluke Fm.	Continental facies
Junggar–Tuha Basin	Jurassic Xishanyao Fm., Sangonghe Fm. and Badaowan Fm., Triassic Baijiantan Fm., Lower Permian Wuerhe Fm., Fengcheng Fm. and Jiamuhe Fm., Carboniferous Dishuiquan–Bashan Fm.	Continental facies
Ordos Basin	Triassic Yanchang Fm., Permian Shanxi Fm. and Taiyuan Fm., Carboniferous Benxi Fm., Ordovician Pingliang Fm.	Marine-continental transitional and continental facies
Other South China areas	Permian Longtan Fm., Carboniferous Jiusi Fm. and Datang Fm., Devonian Luofu Fm. and Yingtang Fm., Silurian Longmaxi Fm., Ordovician Wufeng Fm., Cambrian Qiongzhusi Fm., Sinian Doushantuo Fm.	Marine facies and Marine-continental transitional facies

development of shale gas resources; the exploration and development are thus facing many difficulties and challenges. However, China has widely distributed shale and many shale intervals, ranging from the Changchengian period to the Paleogene period, indicative of the large exploration potential of shale gas. Shale gas fields in China are mainly distributed in the Sichuan, Ordos, Bohai Bay, Songliao, Qaidam, Junggar–Tuha and other southern basins (Table 1; Fig. 1).

Clearly, China contains abundant shale gas resources, which is the most important unconventional natural gas resource after coalbed methane and tight sandstone gas. The shale gas resources are typified by their long mining

life, long production cycle, short hydrocarbon migration distance and large gas-bearing area. To speed up the development of the shale gas industry is thus of great significance to improve the guaranteed capability of energy resources, to optimize energy structure, to improve ecological environments and to build a clean, low-carbon, safe and efficient energy system in the process of economic development.

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