

Research article

Strategic analysis on establishing a natural gas trading hub in China

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Abstract

Since 2010, the LNG importing price premium in the Asia–Pacific markets has become increasingly high, generating great effects on the economic development in China. In addition, the natural gas dependence degree is expanding continuously, making it extremely urgent to establish a natural gas trading hub in China, with the aim to ensure national energy security, to gain the pricing power, and to build the regional benchmark prices. Through a comparative analysis of internal strength/weakness and external competitiveness, we concluded that with intensively-issued supporting policies on the natural gas sector, the initiation of spot and futures markets, the rapid growth of gas production and highly-improved infrastructures, as well as Shanghai's advantageous location, China has more advantages in establishing an Asian Natural Gas Trading Hub than other countries like Singapore, Japan and Malaysia. Moreover, based on the SWOT (strength, weakness, opportunity and threat) and the marketization process analysis, the following strategies were presented: to impel the establishment of a natural gas trading hub depending on the gas supply condition, to follow the policies to complete the gas storage system, to form regional communities by taking comparative advantages, and to reinforce the marketization reform and regulation system establishment with foreign experiences for reference. This study rationalized the necessity and practicality of establishing a natural gas trading hub in China and will help China make a proper decision and find a periodical strategic path in this sector.

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With the development of China's national economy, the demand for energy (especially natural gas) has become increasingly great. Since 1993, the proportion of natural gas in China's total energy consumption has increased gradually. In 2013, China's apparent natural gas consumption was $1676 \times 10^8 \text{ m}^3$ and ranked No. 3 in the world. It is predicted in the 12th *Five-year Plan for Natural Gas* (hereinafter referred to as “Plan”) that, in 2015, China's natural gas demand will reach $2300 \times 10^8 \text{ m}^3$, and the import volume will double that in 2013 and reach $935 \times 10^8 \text{ m}^3$, and the dependence on imported natural gas will exceed 35%. The stability and economic efficiency of natural gas supply are

very important in safeguarding China's energy security. The term “economic efficiency” refers to the price of natural gas supply, which is reflected in the reduction of natural gas importing price premium in the Asia–Pacific markets, the competition for the pricing power, and the settlement to the problem that the sales price is lower than the purchase price. The term “stability” refers to the situation that the natural gas supply can meet the conventional market demand and respond flexibly to a sudden change in supply-demand balance. Establishing a natural gas trading hub will be favorable for setting up a marketized trading platform and setting up a gas price mechanism which reflects the supply-demand balance in a real-time way, so as to ensure the “economic efficiency” and “stability” of natural gas supply, improve China's energy security and enhance China's pricing power for natural gas in the Asia–Pacific markets and even in the global market.

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At the entity level, the so-called “natural gas trading hub” is the place where the physical goods transaction of natural gas from various sources (domestically-produced gas as well as imported pipeline gas and LNG) is carried out; at the financial level, it is the platform for e-commerce transaction of natural gas futures contract. Therefore, the natural gas trading hub is normally composed of spot market and futures market (as indicated in Fig. 1), between which the main difference is reflected in the delivery period [1]. As for the former, the delivery period is less than one week, the contract is reached by both parties involved in transaction directly through negotiation, and the price depends on the short-term supply-demand balance in the market; as for the latter, the delivery period is relatively long, and both parties involved in transaction agree to complete the delivery at a certain time in the future in accordance with the agreed price, quantity and quality. This mode combining the financial futures market with the physical spot market will not only make the pricing of natural gas more reasonable, but also help the traders to avoid and disperse the supply-demand risks and price risks. The natural gas trading hub mentioned in this paper is the integration of physical spot market and financial futures market, and may also be called a natural gas trading market.

At present, it has been proposed in the Plan to “study” the feasibility of establishing a national-level natural gas trading market. However, in China, the studies on spot transaction [2], futures transaction [3], market structure [4] and pricing mechanism [5] appear relatively fragmented, and the analysis on China’s competitiveness in establishing a natural gas trading hub is also relatively inadequate. In foreign countries, the studies on market experience [1,6] and pricing mechanism [7–9] in Europe and the United States are relatively adequate, but it is still necessary to consider China’s actual situation. As to natural gas spot and futures markets, this paper has systematically set forth the necessity for the establishment, and summarized the conditions for establishing natural gas trading hub in China by borrowing ideas from the market experience in Europe and the United States, analyzed China’s internal strength/weakness and external competitiveness, sorted out the

strategic options, and put forth the staged implementation path.

1. Necessity for establishing a natural gas trading hub in China

In China, the price of imported LNG is linked with Japan Crude Cocktail (“JCC”) price, and the price of domestically-produced gas is determined by adopting the netback market value method. On the one hand, the former is always higher owing to the fact that it is linked with the oil price, the latter is imperfect owing to the fact that it is just linked with the alternative energy, and then the difference between internal and external gas prices leads to the situation that the sales price of imported LNG is lower than the purchase price. On the other hand, it is difficult for the natural gas transaction to get adapted to the change in supply-demand balance owing to the adoption of medium/long-term contract. Therefore, the necessity for China to establish a natural gas trading hub is mainly reflected in two aspects, namely price and supply-demand balance. It is necessary to use the price to reflect the supply-demand balance and use the supply-demand balance to form the price, so as to promote the sound development of natural gas markets.

1.1. The necessity of price

1.1.1. To reduce natural gas importing price premium in Asia–Pacific markets

North America, West Europe and *Asia–Pacific regions* are the main regional natural gas consumption markets in the world. Comparison of their prices (Fig. 2) reveals that, in January–July in 2013, the average gas price was US\$3.71, US\$10.74 and US\$16.63 per 10^6 Btu (British thermal unit, $1 \text{ Btu} \approx 1055 \text{ J}$, the same below) respectively. Compared with that in North America, the price premium in Asia–Pacific markets is obvious, and the price difference has increased from 2.5 times in 2010 to 6 times in 2012. In addition, the gas price in Asia–Pacific markets has also increased continuously owing to the increased oil price (for example, the price in 2012 was increased by US\$1.72/ 10^6 Btu compared with that over the same period in the previous year), but the gas price in Europe and the United States has basically remained unchanged (in 2012, the Henry Hub gas price (USA) was only reduced by US\$1.25/ 10^6 Btu compared with that in 2011, and the NBP gas price (UK) was only increased by US\$0.075/ 10^6 Btu compared with that in 2011). As a result, in 2013, China had to pay additional US\$1.577 billion for the import of $245 \times 10^8 \text{ m}^3$ LNG [10] (Only the additional amount paid owing to the increase in imported gas price in Asia–Pacific markets in 2012 was calculated, without considering the inflation factor), namely about US\$100 was additionally paid for every ton of imported LNG, which has adversely affected the economic efficiency of China’s natural gas markets.

The importing price premium of natural gas in Asia–Pacific markets may be reduced and even eliminated by establishing the natural gas trading hub. Since the price

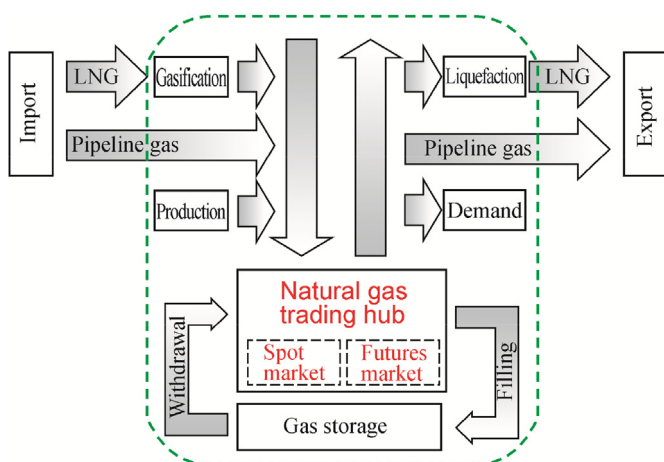


Fig. 1. Schematic diagram of the structure of natural gas trading market.

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