

# The Pricing Mechanism of Shale Gas in China and its Development Suggestions

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**Abstract:** Shale gas, as the important supplement of conventional oil and gas resources, has become a new bright spot in the global unconventional oil and gas development, it also is our country's current unconventional energy development hotspot. Focusing on the practical problems existed in shale gas pricing mechanism in the upstream, midstream and downstream during China's development and operation of shale gas, also taking successful experience of the United States, Canada and other countries as references, this paper, combined with the specific conditions of shale gas resources and exploitation in China, studies the adapted pricing mechanism of the development of shale gas industry in China, also the suggestion of pricing mechanism for upstream, midstream and downstream is proposed in this paper.

**Keywords:** Shale Gas; Pricing Mechanism; Unconventional Gas

## 1. Introduction

### 1.1. North America

As a unified natural gas market, North American and Canada have a similar mechanism for the formation of natural gas prices.

(1) The open competitive natural gas market is established.

In North American region, the third party access policy of natural gas pipeline is implemented uniformly, the downstream consumers can freely choose a natural gas producer to supply gas, and the import price control is lifted[1]. Also, many market centers, where the pipeline system intersects, were established uniformly in North American region, the seller and the buyer do gas deliveries here, which leads to the increase of trade opportunities, the improvement of the reliability of supply, and the promotion of information exchanging.

(2) Taking gas to gas competition as the main pricing method.

The introduction of the third party formed a benign competition of natural gas market, and natural gas prices can reflect market supply and demand situation better. The establishment of the natural gas market provides a timely and effective information source and place of exchange for the implementation of this pricing method, and it protects the continuous supply of natural gas.

### 1.2. European Union

The development history of the formation mechanism of natural gas prices in the EU countries can be divided into the individually pricing stage before the establishment of the European Union and the open market stage after the establishment of the European Union[2].

#### (1) The Individually Pricing Stage

Before the establishment of the EU in 1993, the EU countries developed its gas pricing policies alone. EU member states, according to their self-sufficiency of natural gas, were divided into two categories: one is represented by the United Kingdom, self-sufficient basically in natural gas; the other is represented by France, most of its consumption of natural gas relied on imports, which was also the general situation of EU Member States.

#### (2) The Open Market Stage

In 1998, EU Member States adopted a directive aimed at creating a unified open gas market, this directive focused on the third party access, which enable countries to open their own natural gas market, the terminal consumers can freely choose a natural gas supplier to buy gas.

#### (3) Current Pricing Mechanism

Many gas pricing methods coexist in the EU, but the oil price index method occupies a leading position [3].

The EU's natural gas import contracts are mainly medium-term or long-term, and a fairly high proportion of the contracts adopt the oil price index method to determine the natural gas supply price.

### 1.3. Russia

Russia's natural gas prices are implemented in in-out two lines, that is, the domestic natural gas prices and export gas prices.

#### (1) The Domestic Natural Gas Prices

Russia's domestic natural gas resources is rich and low cost[4]. The largest domestic gas companies—Russian gas industry Ag supply domestic gas priced by the government annually, and this price is lower than the costs of natural gas production, transportation and sales.

In recent years, the government began to gradually ease the country's control of natural gas price, through the establishment of a pipeline access system for the third party, ultimately to liberalize the natural gas prices market.

#### (2) Export Gas Prices

Russia's natural gas exports prices were determined mainly by signing a take-or-pay long-term agreement with import countries (central and Western Europe), these agreements can generally be as long as 25 years. The price of the agreement is mainly the oil price index, and the natural gas price is generally associated with the international oil price..

#### 1.4. Japan and South Korea

Japan's natural gas supply depends completely on is LNG imports. Its source of imports is mainly Indonesia, Malaysia, Australia and Qatar and other countries. The price of LNG imported to Japan, through Japanese crude oil composite index price, is related to the price of crude oil, and its formula is generally[5]:

$$P=a*JCC+b$$

Where: P-imported price

JCC-Japanese crude oil composite index price

a, b-constant

South Korea, merely produce natural gas inside the country either, is second only to Japan's second largest LNG importer, its source of imports are mainly Malaysia, Qatar, Oman and Indonesia. South Korea importing LNG also relies on the signing long-term import contracts, its prices related to crude oil prices, and the formula of the price associated with JCC is adopted.

## 2. The Pricing Mechanism and Existing Problems of Shale Gas in China

### 2.1. China shale gas pricing mechanism

At present, shale gas, as unconventional gas, its pricing mechanism is basically referring to natural gas pricing mechanism[6]. Our country imposed strict price regulation on the natural gas industry, natural gas wellhead price and pipe price are determined by government pricing or government guidance price.

#### (1) The Management of Natural Gas Wellhead Price

The natural gas wellhead price of our country practices two kinds of price according to the planned and the unplanned supply quantity, and its evolution process can be divided into two stages. One is the single national pricing management phase (1956-1993); the other is the price management phase for the coexistence of national pricing and market regulation (1993 to now).

#### (2) The Management of Natural Gas Pipeline Transportation Price

In China, the price of oil and natural gas pipeline transportation has been carried out strictly by government

according to the principle of reasonable profit compensation cost[7]. At present, China's crude oil and natural gas pipeline transportation price is divided into two parts: One is the "old line-old price", namely, national pipeline constructed by the national funding or by loans but have been repaid the construction investment loan principal and interest, its transport prices implement national uniform rates. The other is the "new line-new price", namely new oil and gas transmission pipeline build by the domestic and foreign loans, adopt the management approach as new line-new price, individual price for individual line, price reports to the national price department, implemented separately after its approval.

### 2.2. The main problems of shale gas pricing in China

(1) Shale gas prices lack of competitiveness, constraining the development of shale gas industry.

Due to complex exploitation, large development investment, etc, shale gas` production costs much higher than conventional natural gas. If priced by the production costs, shale gas can be more expensive than natural gas, resulting in a even greater lack of industrial competition.

(2)The pricing mechanism dominated by government is unreasonable, and lack of flexibility. By the influence of market structure, supply structure and other factors, shale gas has monopoly commodity property.

For a long time, the domestic upstream, midstream and downstream prices of shale gas adopts the government pricing mechanism, and with a delay, cannot truthfully reflect the market`s supply-demand relation and production costs.

(3)Government`s regulation of shale gas pricing is inadequate.

China's shale gas industry chain is complicated, and lacks unified coordination. Government, as the main body of supervision, is not effectively monitoring the enterprise cost structure and disclosure, its understanding of the supply and demand situation is relatively lagging behind, resulting in inadequate regulation and unsound pricing mechanism.

(4) Lacking effective fiscal and taxation policies.

In the shale gas industry of China, the support policies (such as investment, tax policy, etc.) are relatively insufficient. Domestic shale gas standard subsidy is 0.40 yuan per cubic meter in China, and only the exploited shale gas subsidies get subsidized, this has been failed to meet the current needs of shale gas development.

## 3. Construction of Linkage Pricing Mechanism

### 3.1. Shale gas upstream pricing mechanism

In the shale gas upstream, reduce the investment of exploration and development, and gradually introduce competition, carry out the principle of benefit and risk

sharing through the basic pricing[8]. The development of shale gas in China needs the macro control of the country. However, from the long-term development and overall view of shale gas, the upstream shale gas pricing mechanism is ultimately meeting the market and getting rational. In order to avoid the problem of the pricing mechanism, the paper puts forward the following ideas (Figure 1).

- (1) Stop the government's omission, and gradually promote the standardization of shale gas market operation.
- (2) For new shale gas projects, strictly control the program and regulate its launching.
- (3) Establish the index system, it is one kind of pricing system, and it is to make the price of shale gas automatically adjust with the external market environment changes, also to establish official contacts between shale gas prices and some economic indicators.

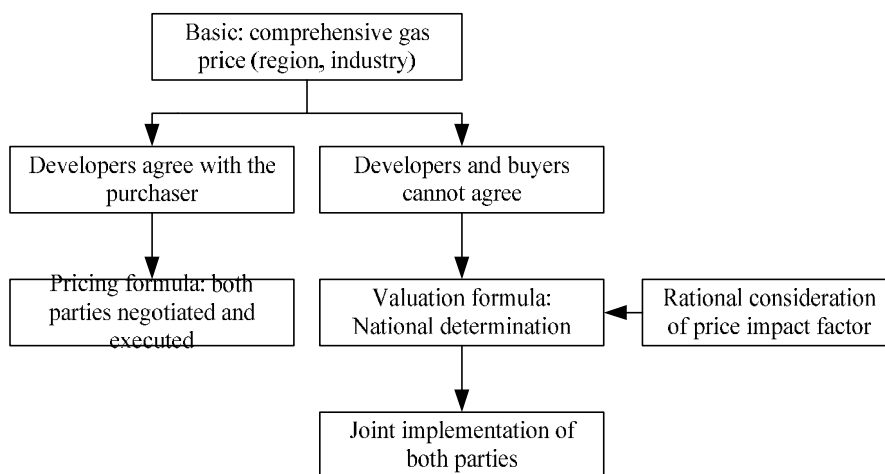


Figure 1. Upstream shale gas pricing formula flow chart

### 3.2. Shale gas midstream pricing mechanism

(1) Consumers and the shipper on the middle reaches of shale gas pipe transportation price should have rights of knowing shale gas pipe transportation price, and should not do arbitrary change, even to change, a price of the hearing should be held, and change shall be made only after the approval of hearing.

(2) For the midstream of shale gas pipeline transportation, the "third-party access" system shall be implemented [9]. Third party access is the main point of shale gas market structure to build, it refers to the requirements of shale gas companies representing the third party to transport shale gas, but there are certain conditions.

### 3.3 Shale Gas Downstream Pricing Mechanism

(1) Open the city pipe network construction, accelerate the construction of urban pipe network, encourage multi investors to intervene, so the scale economy of city gas network could be fully showed.

Secondly, the administrative mode should gradually withdraw from the construction operation of urban pipe network, so that the operation of the company can be realized, and cost reduced, efficiency improved.

Finally, the upstream producer entering the terminal market in different ways should be approved.

(2) Classify The downstream users according to the use of gas and how much of the amount of gas, Different

users match their corresponding shale gas market value, In evaluating a class of users and its corresponding market value, the cheapest alternative fuels of the user should be chosen. The capacity charge received in the pipe transport fee should be based on the requirements of the different users for the gas supply and gas stability. So that fairness is better showed.

(3) Develop the implementation of the shale gas act and the related regulations to shale gas price management as soon as possible, establish and improve laws and regulations related to the whole.

## 4. Conclusion

Shale gas, as unconventional natural gas, is not only an important supplement to China's conventional natural gas, but also an important part of China's energy strategy. The perfection of the pricing mechanism is related to the development of China's shale gas industry. This paper analysis the shale gas pricing mechanism experience in North America and the European Union, combined with China's own conditions, proposed advices in upstream midstream and downstream shale gas pricing mechanism I hope that it can be useful for the development of shale gas industry in China.

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