

# Research and Inspiration on Enron`s Business Model of “Natural Gas Bank” from the Perspective of Financial Innovation

Huiwen Xu<sup>1,\*</sup>, Zhen Wang<sup>1</sup>

<sup>1</sup> *School of Economic and Management, China University of Petroleum (Beijing), China*

<sup>\*</sup> *Corresponding author. Email: 378628879@qq.com*

## ABSTRACT

The goals of carbon peaking by 2030 and carbon neutrality by 2060 define the future direction of China's energy development, and set higher requirements for the natural gas industry to accelerate innovation and enhance competitiveness. In the late 1970s, the US government gradually relaxed industry regulation to promote the process of natural gas marketization. Enron keenly noticed the mismatch between supply and demand in the process of market mechanism transformation, introduced financial instruments and created the business model of "Natural gas bank", which achieved success and promoted the rapid development of natural gas industry in the US. This paper carried on the deep analysis on the background, mode and successful reason of "natural gas bank", find that “accurate grasp the opportunity of environmental policy change”, “apply the financial innovation to activate the industry chain” and “more open and flexible compared to the traditional business model” are the main successful reasons for Enron`s business model. Follow the innovation experience of “Natural gas bank”, China natural gas industry need speed up infrastructure construction and promote the formation of a natural gas pricing centre, meanwhile enterprises should firmly implement asset-light strategy and accelerate the pace of financial innovation.

**Keywords:** *Business Model, Natural Gas Bank, Financial Innovation, Inspiration*

## 1. INTRODUCTION OF BUSINESS MODEL

Business model refers to the logic of how an enterprise create value. In essence, it is about how the enterprise maximizes its profits, and usually involves a series of operation activities, including value proposition, value creation, value acquisition, value network, strategic choice, etc.; Its core lies in value creation, that is, be able to enhance value for the enterprise, and then gain an advantage in market competition[1].

Business model concepts may be understood from different perspectives. From a strategic aspect, the business model is described as the choice of an enterprise`s strategic direction, involving the identification or selection of factors such as enterprise vision, market propositions, and stakeholders, which is closely related to the future of the enterprise. From an operational aspect, the business model is described as an enterprise`s operational structure, which refers to the creation and enhancement of value through internal process and structural design. This course involves every link in the internal value chain of the enterprise, and it

means to improve competitiveness and gain competitive advantage through the optimization of the enterprise`s operating model. From an integration perspective, the business model is to describe how the enterprise`s business system achieves optimal operation. This course involves the combination of multiple factors such as enterprise strategic direction, operating mode, and marketing strategy, and ultimately means to enhance market competitiveness, deliver enterprise value, and improve enterprise profits[2].

A successful business model is usually characterized by the following three elements: 1. It takes value creation as the core, and can lead to a win-win situation for the industry, the enterprise and the customer; 2. It can start from the strategic goals of the enterprise, accurately grasp the needs of customers, and find entry points to solve the resource mismatch between the market and users[3]; 3. It implies the ability to keenly discover changes in the market environment, because any factor that brings overall or partial changes may turn into the starting point of business model innovation, such as policy changes,

technological progress, and changes in consumption concepts.

The business model serves as a core element for an enterprise to engage in market competition, and it is inseparable from the external environment the enterprise is in and its own characteristics. The business model might involve all aspects of the operation, as well as the innovation in a specific field. It can be specific and simple, or abstract and complex. A successful business model can fully embody the enterprise's advantages, which is hard to be imitated or replicated in the short term. Considering such scarce, any research, learning or imitation of successful business models may become an important way for enterprises to enhance their value and competitiveness[4].

## 2. RESEARCH ON THE BUSINESS MODEL OF "NATURAL GAS BANK"

### 2.1 Background of "Natural Gas Bank"

Since the implementation of the Natural Gas Policy Act in the 1970s, the rise in natural gas prices in the US promoted producers to explore and exploit the upstream. However, due to the sluggish economy and restrictions on natural gas use, natural gas demand did not achieve the expected growth, but the supply exceeded demand. Meanwhile, the integration of pipeline transportation and sales led to a situation that consumers could not freely choose pipeline companies. Consequently, pipeline companies took an absolutely monopolic position in the market, and the market could not give into play its role in resource optimization[5].

To further deregulate and deepen reforms, the US government has successively issued a series of policies and decrees, aiming to accelerate the process of marketization, including: every user can use state-level pipelines to transport natural gas; local gas distribution companies can buy natural gas from anyone and anywhere, and also freely choose a pipeline company for transportation; the pipeline company must separate the pipeline transportation and sales, and all users can freely choose natural gas sellers and pipeline companies. The introduction of these policies and measures has effectively promoted the formation of a mechanism of "separation of transportation and sales". After the reform, the wellhead price and terminal distribution price of natural gas are completely determined by the market, and the interstate pipeline transportation fee is controlled by the government. Moreover, the pipeline market realizes further free competition, and the marketization mechanism of the natural gas market is fully established[6].

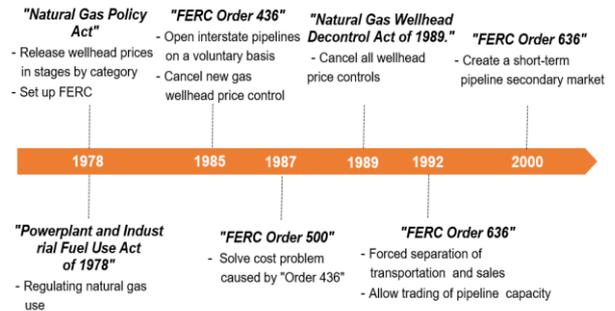


Figure 1 Deregulation of natural gas control in the US

In the course of marketization and deregulation, the natural gas market has been constantly adjusting and improving to adapt to the new operating mechanism. It is known that changes in the mechanism will inevitably result in many new issues. In this context, Enron has keenly discovered the chance, and created a new natural gas business model with the help of financial innovation.

### 2.2 Analysis of "Natural Gas Bank" business model

In the early 1980s, natural gas pipeline companies tended to sign many high-priced "take or pay" contracts with upstream producers, so as to prevent supply shortages of natural gas. However, the ensuing drop in international oil prices and declining demand of natural gas turned "take or pay" contracts into a nightmare for pipeline companies, and a large number of pipeline companies were on the verge of bankruptcy, including Houston Gas Enterprise--Enron's predecessor. In early May 1985, Houston Gas Enterprise and United Northern Enterprise merged in response to the business crisis, with a new enterprise named Enteron, which was later renamed Enron.

At the beginning of its establishment, Enron owned approximately 37,000 kilometers of intra-state and interstate natural gas pipelines, and the company mainly engaged in traditional businesses such as natural gas procurement, transportation and sales. At that time, the natural gas industry in the US was still under strict government control, and the development of energy companies was greatly restricted. Then it occurred to Enron that only with deregulation could it promote the development of the natural gas industry. Therefore, Enron worked together with other major energy companies to lobby the government for deregulation, and succeeded eventually. Then to adapt to the market competition after deregulation, Enron has reformed its traditional business models comprehensively. For example, it hired courageous and talented brokers with high salary, paid more attention to the value of natural gas pipelines as the network, bought low and sold high in different regions to make profits, and also explored innovative business models in the natural gas spot

market[7]. Enron’s innovations received achievements, and it developed into the largest natural gas enterprise in North America and Europe in the early 1990s.

Although deregulation has brought more new supply and demand to the market, the violent fluctuations in natural gas prices and demand have prevented producers and consumers from effectively arranging production. An intermediary is demanded to balance between the two. In addition, the inefficient allocation of resources also implies that the market really needs a new business model to solve this problem[8]. In 1989, Skilling, the then McKinsey’s consultant to Enron and later CEO of Enron, proposed a brand-new business model concept, which ingeniously introduces financial instruments into the traditional natural gas market and balances the allocation of resource supply and demand in the market.

This the well-known “Natural Gas Bank”. This business model has completely subverted the production and consumption methods of the natural gas industry. In the initial stage of the “Natural Gas Bank”, Enron played the role of a virtual bank. It relied on long-term contracts signed with producers and consumers. To be specific, it bought natural gas from producers (savings), and sold natural gas to consumers (lending). In this course, Enron made a profit by advantage of the price difference between the two[9]. Producers (consumers) were more willing to sign long-term contracts with Enron, because they could obtain predictable cash flow (gas source) to plan the long-term production through this method. With sufficient experience, Enron then gradually introduced a large number of standardized contracts in its transactions with producers and consumers. In this course, Enron achieved capital through selling standardized contracts and obtained funds from financing in the financial market. With the capital, Enron conducted a large number of financial transactions based on natural gas spot and futures, and then obtained excess returns[10].

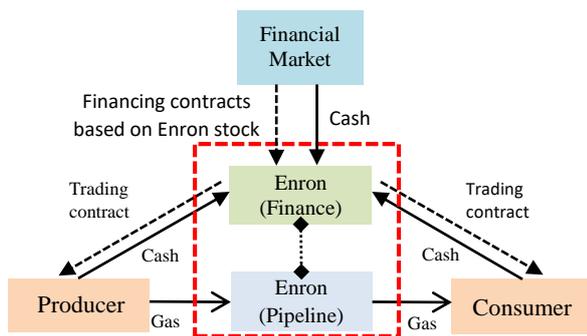


Figure 2 “Natural Gas Bank” business model of Enron

The “Natural Gas Bank” business model serves as a turning point and milestone in the growth of Enron. With the vast market it opened and the huge benefits it brought, Enron quickly developed from an ordinary pipeline enterprise to a leading natural gas enterprise in the US. After the bankruptcy, Enron’s core energy trading

department for business model innovation was acquired by Merrill Lynch Bank, which demonstrated Enron’s success in natural gas financial innovation. In summary, Enron’s “Natural Gas Bank” business model and related financial innovations promoted the maturity and improvement of the US natural gas futures trading market and the final formation of the North American natural gas pricing center, which further accelerates the development of the US natural gas industry.

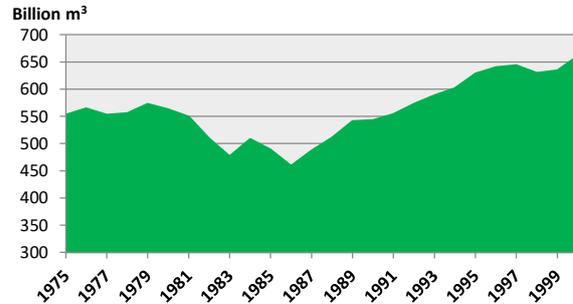


Figure 3 Natural gas consumption in the US (1975-2000)

### 2.3 Successful factors of “Natural Gas Bank”

For natural gas companies, it is a great challenge to innovate business models in the field of traditional energy. It doesn’t attempt to rectify the name of Enron, but to provide new ideas for the financial innovation of Chinese natural gas companies. The success of the “Natural Gas Bank” business model can be concluded into following aspects:

#### 2.3.1 Keenly and accurately grasp the opportunities brought by environmental policy changes

The success of the “Natural Gas Bank” is closely related with the general environment of deregulation of natural gas in the US. In fact, it was Enron’s keen awareness of the opportunities brought by deregulation and how it persuaded the government to further deregulate the natural gas that laid a sound foundation for this business model. In the process of the transformation of the US natural gas industry, deregulation has made the natural gas market more open. The lowered market threshold has allowed commercial financial skills to open to all companies. However, only a few companies represented by Enron can innovate business models, because they can keenly grasp changes in environmental policies. When other companies were still struggling to maintain the original system, Enron has started to promote the deregulation of regulatory policies and conducted corresponding business model research, so as to take the lead in future business competition.

2.3.2 Activate capital flow across the industry chain through financial innovation

Under the “Natural Gas Bank” model, Enron actually gave full play to the role of a natural gas trading centre. The unidirectional capital flow model of consumer to pipeline and enterprise to producer was broken, and finance became the core[11]. By comprehensively introducing financial tools, Enron has financialized the natural gas market, which then greatly improved the speed of capital flow and the pace of market transactions. Consequently, it has activated the flow of capital within the entire industry chain. And under the conditions of abundant liquidity, participants are able to supply and buy commodities with lower transaction costs. In this context, more investors have been attracted, thus further promoting the expansion and development of the market.

2.3.3 More open and flexible than traditional business models

Compared with the traditional model, the “Natural Gas Bank” is more closely related to finance in terms of products, business, prices, transaction objects, and operating modes. In turn, the diversity of financial products, the high liquidity of capital and the financial leverage effect have made the “Natural Gas Bank” business model more open and flexible. Under this model, the core of the transaction is financial products represented by options, contracts, etc. Enron can provide standardized transaction contracts with different prices and periods based on its own understanding of market information, while producers and consumers select products based on their demand, which leads to resource allocation that is difficult to achieve in the physical natural gas market. Due to the lower transaction costs and easier access, many new companies have entered the market and provided new services, which brings convenience to consumers while ensuring sufficient market liquidity, thereby promoting the rapid development of the entire natural gas industry.

	Traditional Model	Gas Bank
Product	Natural Gas	Gas Contract
Price	Gas Price	Option, Contract Price
Transaction object	Consumer	Producer, Consumer
Operation Mode	Produce, Transport	Contractual transaction
Resource Porfolio	Physical Asset (Pipeline, etc.)	Pipeline, Contract, Trader

Figure 4 Key factors comparison between “Natural Gas Bank” and traditional business model

3. INSPIRATION FOR CHINA’S NATURAL GAS INDUSTRY DEVELOPMENT AND FINANCIAL INNOVATION

The “Natural Gas Bank” business model comes along with the changes in the external environment of the US natural gas industry, which is pretty similar to that in China. Despite the final bankruptcy of Enron, the US natural gas market, which was revived thanks to Enron’s financial innovations, has not went downhill. The rapid development of natural gas spot and futures markets have significantly promoted the progress of the US natural gas industry and promoted the formation of North American natural gas pricing centre. Furthermore, it even created conditions for the subsequent shale gas reform. Drawing on the successful experience of Enron’s “Natural Gas Bank” business model innovation, China’s natural gas industry could learn many significant experiences.

3.1 Accelerate infrastructure construction and “separation of transportation and sales”, and promote the formation of a natural gas pricing centre at the industrial level

A well-developed pipeline network and infrastructure make it convenient for physical and financial transactions of natural gas, thus enabling a wider range of contract transactions. In addition, “separation of transportation and sales” can break the original market monopoly, thus making pipeline transportation costs and terminal prices more open and transparent. All these measures are important foundations for natural gas business model innovation. In the late 1970s, the US already developed a mature and complete pipeline network infrastructure, which laid a sound foundation for Enron to conduct extensive and flexible natural gas transactions and the use of multiple financial derivatives[12]. Through years of efforts, China has built a complete natural gas industry chain, and the national backbone pipeline network has basically been formed. In this context, the natural gas transportation and deployment capabilities have been greatly enhanced, and market-oriented reforms have been steadily advanced. Furthermore, it plans to keep enhancing the terminal coverage area and speed up the construction of regional and branch pipeline networks relying on the establishment of the national pipeline network companies. In this way, it is able to improve infrastructure utilization, reduce pipeline transmission costs, and achieve a more thorough “separation of transportation and sales”, so as to provide a good foundation for natural gas business model innovation.

If deregulation policies have lifted the shackles for the natural gas industry, then the acquisition of natural gas pricing power based on financial innovation has served as a booster for the rapid development of the natural gas industry[13]. The US obtains natural gas pricing power through the path of “spot market-futures

market-pricing centre”. Under this background, Enron’s financial innovation has enriched natural gas futures trading varieties and accelerated the popularization of natural gas financial derivative transactions, thus contributing greatly to the maturity of the US natural gas futures market and the formation of a pricing centre. With an ever increasingly important role of natural gas in global energy, it has been more evident that the natural gas may separate from oil and form an independent pricing system. Although China has not yet set up a natural gas financial market, it has been provided with sufficient conditions with setting up a regional natural gas pricing centre thanks to the continuous growth of import and trade volume and the acceleration of market reforms. In this regard, China requires continuous financial innovation to promote the development of the natural gas financial market. The establishment of natural gas trading centres in Shanghai and Chongqing, as well as the increase in transaction varieties and transaction volumes, also lay solid foundation for the creation of natural gas pricing mechanism in Asia.

### ***3.2 Firmly implement the “asset-light” strategy and accelerate the pace of financial innovation at the enterprise level***

Under the “Natural Gas Bank” business model, Enron implemented an “asset-light” strategy and took capital as the most important resource. Therefore, abundant liquidity drove the rapid growth of investment in the entire industry chain and improved the capital operation capabilities[14]. Chinese natural gas companies should draw experience from Enron and firmly implement the “asset-light” strategy. For infrastructure such as pipeline networks with huge investments and long payback periods, it is possible to speed up the realization while ensuring long-term use rights. And such way not only affects nothing of the actual operation of the enterprise, but also provides financial support for the future development and innovation of enterprises. During the implementation of the “asset-light” strategy, a step-by-step strategy of “from small to large, from non-core to core” can be adopted. Without influencing the overall operation, it can gradually implement asset divestiture or equity conversion. For strategic assets, it is necessary to retain controlling rights to avoid creating opportunities for competitors. Enterprises can gradually achieve the goal of “asset-light” through two ways:(2)Retain controlling rights and use rights, while introducing other strategic investors (such as social security funds, banks, private capital, etc.); (2)Transfer controlling rights and retain use rights (transfer to an infrastructure operator represented by the National Pipe Network Enterprise), while also guaranteeing the right to use the facility by signing a long-term lease agreement with the new shareholder.

The combination of natural gas and financial products can be a vital entry point for natural gas business model innovation. The proposals of carbon peak in 2030 and carbon neutrality in 2060 provide new opportunities and challenges for the development of China’s natural gas industry. Natural gas companies should seize this historic opportunity and invest more in financial innovation research. In addition, they may also draw on the “Natural Gas Bank” business model and then establish “Natural Gas Industry Fund” and “2060 Carbon Neutrality Fund”, thus introducing national pipeline companies, local governments, and new energy companies as shareholders. On this basis, it is able to boost the development of natural gas industry in energy backward areas and the overall progress of the new energy industry. The “Natural Gas Fund” focuses on the development of the natural gas industry in the central and western regions, including natural gas infrastructure construction, market cultivation, and natural gas industry support. The “2060 Carbon Neutral Fund” focuses on investing in new energy and renewable energy fields and gives full play to the resource advantages of traditional energy companies and experience advantages of new energy companies. In this way, it is conducive to accelerating the transformation and development of enterprises, and then promoting the realization of China’s carbon peak in 2030 and carbon neutrality in 2060.

## **4. CONCLUSION**

Currently China is undergoing a transition to low-carbon energy, while natural gas industry is in a critical period of marketization reform. Policy adjustment, market development and promotion of enterprises’ competitiveness make the original equilibrium is broken and the new equilibrium is forming. The dislocation of various resource elements in the market is very obvious. If better grasp the market opportunity and construct the business model with the help of financial innovation, it will be of positive significance for the development of China’s natural gas industry and the enhancement of the competitiveness of natural gas enterprises.

The key to the success of a business model is to find new problems arising from the dynamic changes of the market and solve them by means of innovation, so as to promote the development of the market and enhance the value of the enterprise. “Natural Gas Bank” actually possesses three core elements of a successful business model: (1)It promotes the development of the natural gas industry in the US, achieves value enhancement and a win-win situation for the industry, enterprise, and user; (2)Enron formulated clear strategic goals based on its own resources and information advantages, thus solving the problem of supply-demand balance between natural gas producers and consumers; (3) It has keenly grasped the opportunity of market changes caused by the deregulation of natural gas by the US government, and

opened up a new business model with the help of financial innovation.

Drawing on the successful experience of Enron's business model innovation, China's natural gas industry should focus on accelerating infrastructure construction and setting up a natural gas pricing center, while natural gas enterprises should actively implement the "asset-light" strategy and strengthen financial innovation, so as to boost the realization of China's 2060 carbon neutral target with practical actions.

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