

Study on Innovation Strategies of China Petroleum Supply Chain Optimization

Wei xiaobing¹², Luo jie¹², Sun fei¹²

¹ School of Economics and Management, Northeast Petroleum University, Daqing, 163318, China; dqweixiaobing@126.com

² School of Petroleum Economics and Management, Northeast Petroleum University, Daqing 163318, China;

Abstract: With China's sustained and rapid development of economy and industrial modernization and urbanization process continues to advance, the greater demand for oil and other energy and foundation. Due to lack of oil production, China's oil imports rose steadily in recent years, the import dependence continues to expand, coupled with the frequent fluctuation of the oil price, the oil supply chain in China has huge potential safety problems. Therefore, the optimization of existing oil supply chain network system, and give full play to the role of market allocation of resources, is one of the effective ways to solve the shortage of petroleum resources. This article first elaborated the petroleum status of supply chain optimization problem, points out the problems in present research. Further research on the strategic petroleum reserve value, and constructed and put forward suggestions for perfecting China's petroleum reserve system. The purpose is to enrich the petroleum supply chain optimization strategy, further improve the supply chain management of our country actual oil.

Keywords The Petroleum Supply Chain; Optimization; Oil Reserve

INTRODUCTION

Oil is a globally important strategic materials, in the global economic integration and the trend of trade liberalization, oil politics, economy and the global established close relationship. In China, with the sustained rapid economic development and industrial modernization and city advancement unceasing advancement, the greater demand for oil and other energy and base, oil has become China's economic lifeline. At the same time, due to the development of China's oil resources and production can not meet the need of economic growth on oil

For, in recent years China's consumption of oil dependence on oil imports continue to improve, dependence on foreign oil has reached new highs, and continues to grow. Therefore, the effective use of oil resources is directly related to the long-term strategy of the sustainable development of China's economic and social. And further optimize the petroleum supply chain network system, and give full play to the role of market allocation of resources, is one of the effective ways to solve the shortage of petroleum resources.

ANALYSIS OF THE STATUS QUO OF CHINA'S PETROLEUM SUPPLY CHAIN

The status quo of the organization of the petroleum supply chain in China

In recent years, the oil industry of our country conducted large-scale restructuring, in accordance with the principle of combining to form the upstream and downstream, North and south two large petroleum

and petrochemical enterprise group company. In Northeast China, North China, northwest, southwest and other mainly China petroleum natural gas group (referred to as CNPC) focuses on the exploration and development of oil and natural gas, at the same time operation of petrochemical business. China Petroleum & Chemical Group in Beijing, Tianjin, Southern China, East, South and other regions dominated focus on the development of petrochemical industry, at the same time, the exploration and development of oil and natural gas business management. Monopoly pattern of region segmentation, the upstream and downstream, domestic and foreign trade, production and marketing integration in the land. Exploration and development business and China National Off shore Oil Corporation to shore petroleum resources.

The circulation system of current situation of China's oil supply chain

With the development of the oil industry restructuring, the oil circulation system to carry on the corresponding reform. Crude oil and imported crude oil the first domestic production of refining by Petro China and Sinopec enterprise. Secondly, Petro China, Sinopec has oil import operation right. In addition China petrochemical company bear part of the export of petrochemical products import and export trade. Third, responsible for all domestic refined oil from the oil, Sinopec two group company wholesale business, other units, the company shall participate in the social, the cleaning up of refined oil wholesale enterprises qualified, can have the Petro China and Sinopec two groups take transfer, joint

venture, and the acquisition mode, such as restructuring. Thus the refined oil wholesale franchise, gasoline, diesel retail pricing power, autonomy in management and market supervision and the right to the north and south of the two big group company, the formation of production and sales integration of duopoly. Fourth, rectification of refined oil retail market, the gas station issued a "refined oil retail business certificate of approval", in 2001 September after the new station must by Petro China and Sinopec two group company or holding company. Finally, the domestic crude oil prices since June 1, 1998 and the international community, between Petro China and Sinopec two group companies trading settlement price of crude oil price determination by both parties according to the negotiation with reference to the international price of oil products; the implementation of government guidance, setting the domestic refined oil price rise (fall) interval, two group companies in the price range of upper and lower 8% specific retail price and announced to the public.

THE PRESENCE OF PETROLEUM SUPPLY CHAIN PROBLEM IN OUR COUNTRY

After our country's petroleum industry has experienced rapid development in twentieth Century 50's recovery and exploration, 60 to 70's and 80's stable development of three historical stages. The oil industry to carry on the strategic reorganization and structural adjustment, in accordance with the principle of trade and production and marketing integration of upstream and downstream, respectively, according to the region formed Chinese petroleum and natural gas, petroleum chemical China two group companies, with business focused on the upper reaches of the Chinese offshore oil company, the composition of the supply chain system respectively in the three groups as the core of the petroleum industry. But due to many factors and the oil industry history problems, progressive and reform, the petroleum industry supply chain in our country there are still many problems to be solved, many aspects need to be optimized.

To increase oil supply and demand gap, import dependence is further improved

China's oil consumption growth rate was significantly higher than the growth rate of oil production, supply and demand gap is more and more big. From 2000 to 2008, the consumption of crude oil over the average annual growth rate of 6%, higher than the output growth rate 4 percentage points. In the future a considerable period of time demand for crude oil in our country is still strong, crude oil import dependence will continue to rise. As the strategic resources on the basis of crude oil, so a high degree of dependence on foreign oil imports, once a problem, the entire oil supply shock will be self-evident.

The sources of imported oil is too concentrated, import risk can not be ignored

At present, China's oil imports from the Middle East accounts for about half of total imports. After the Iraqi war, America strengthened the control of the Middle East, in fact, indirect control of China's imports of petroleum resources. On the other hand, China's oil transportation route lack of selectivity, 85% more to go through India ocean - the Malacca Strait - the South China Sea, which is easily blocked and controlled. In recent years, the United States in East Asia along the Japanese islands, Taiwan island and Philippines islands, carefully constructed "Pacific chain", intends to east of China to set up military ports formed around; in Singapore, intended to control the Malacca Strait; India full implementation of the so-called "effective control", to the South China Sea into the control range. In addition, the Malacca Strait were often organized piracy. All of these, direct threat to China's foreign trade and oil import security.

The passive acceptance of the international oil prices, oil imports cost prohibitive

The supply chain upstream crude oil supply price risk, will directly affect the efficiency and security of the whole supply chain. Due to China's dependence on foreign oil is high, resulting in China's oil prices are extremely vulnerable to international oil market price fluctuation. At present, our country has not established the futures trading oil market, there is no large-scale participation in the world trading oil derivatives. There is no market barrier, not to hedge for imported oil, no matter how high oil prices rise, can only passively accept. In recent years, the international market crude oil prices, while China's nearly half of the crude oil demand need to be imported, the international crude oil price fluctuations will cause a great impact on China's oil market, crude oil prices soaring, more let me is an oil import country paid a high cost.

Petroleum reserve system is not perfect, there is hidden danger of petroleum security

Chinese Petroleum Strategic Petroleum Reserve has been brewing for a long time, but a late start. In 2001 American and Japan's oil reserves have reached respectively 90 and 163 days. In 2003, China formally started the implementation of the plan of national strategic oil reserves, national oil reserve base in the first phase of construction project is started formally on March 30, 2004. At present, China's strategic oil reserve system is still not fully established, according to the government has announced the plan, by 2020, China will build a strategic petroleum reserve scale is equivalent to 90 days of imports, China's oil reserve scale ranks second in the world. Although China has started construction by stages of national strategic oil reserve base, but the strategic petroleum reserve has just started. Thus, in the supply of resources, because

of all kinds of uncertain factors such as political turmoil and military conflict, leading to sharp rise in international oil prices or supply disruption, China lost storage imports of oil, to stabilize the domestic oil market turmoil means and ability.

CHINA'S PETROLEUM SUPPLY CHAIN OPTIMIZATION STRATEGY

Optimization of supply chain structure

The petroleum supply chain present reality is part of the supply chain, internalization, namely an enterprise includes many links of oil supply chain. Therefore, the optimization of the structure of the supply chain is an important method to improve the supply chain management of China petroleum. Group headquarters can use internal resources transfer mode, the use of internal capital market, enhance internal resources ability of regulation and control, to provide financial support to the risk of the enterprise, so as to promote the positive carry a risk of equipment and fixed assets construction and transformation project of petroleum enterprises in the supply chain, and then improve the petroleum supply chain production efficiency, reduced oil supply the chain of production costs within the group.

Through a comprehensive set up the mechanism of the third party supervision, can promote communication and better coordination between subordinate enterprises of petroleum supply chain in China, the maximum extent to reduce supply chain internal default probabilities of events.

China's petroleum supply chain information sharing degree rise, not only help to improve the conventional enterprises to provide aid in proportion to the risk of the enterprise, but also reduce the direct costs of risk enterprises. At the same time, improve the degree of information sharing helps to strengthen the information integration construction of China's oil supply chain, strengthen the coordination between the various links of the supply chain.

To improve information management

With the wide application of supply chain management in enterprise management, enterprise informationization has been the scope is not limited to the enterprise, enterprise information unimpeded communication efficient supply chain management is the key to the realization of. In a large manufacturing enterprises, the existence of more or less "the information isolated island phenomenon. Effective information integration, can produce benefit between different departments, can fully reflect the advantage of information reform. For the oil supply chain in China, can be improved from the following aspects of information management.

1. To promote information management integration

The supply chain need to distributor sales terminal customer needs timely transmission of

information to the upstream! Manufacturers and suppliers, to achieve the timely communication of information between the node enterprises of supply chain and the huge data processing, therefore, must be in perfect information system based on. Establish and improve the supply chain requires a thorough revolution, need to break the traditional departmental boundaries and wall of enterprises, using the information from the collected information, are the realization of integrated management. On the one hand, information technology provides technical support for supply chain management. To make the supply chain operation efficiency is improved, and the supply chain node enterprise business process and integration of undo! Reducing logistics cost and the cost level, optimize inventory decline and overall. The implementation and the improvement in efficiency, it is basically impossible in the absence of conditions under the condition of information technology. Information technology can help enterprises to examine the structure of their supply chains, actively using the whole industry general effective business model. In the use of supply chain management software at the same time, enterprise learning supply chain management mode and procedure of advanced, so as to obtain the supply chain management thought and mode progress, improve the level of supply chain management, increase the company's operating income. On the other hand, information technology to provide data analysis and decision support for managers. Supply chain management is the task according to the known information, to provide decision-making supply chain plan! "Because of the development and application of information technology, implementation and operation of enterprises in the transaction processing large are fully automated, any person in any place at any time! Are likely to get the needed information, greatly reduce the information acquisition cost, broaden the channels of information dissemination. At the same time, the information technology has provided numerous data analysis software products, enterprises can choose according to their own needs and a data analysis software to provide decision support for supply chain management.

2. Speed up the construction of the external supply chain information platform

The construction of supply chain informatization construction includes not only the enterprise interior supply chain information platform, namely the realization between the internal production enterprises and suppliers, vendors and business departments of information transmission and sharing, but also should include the enterprise and its external supply chain network information transmission and sharing, provide support of network between enterprises and the external supply chain information interaction. The key to solve the problem of information interaction platform between multiple supply chain, enterprises

need to the industry and local government policy support, and referencing information platform construction experience of some foreign developed countries large-scale production enterprises, fully promote the development of intermediary information services based on Internet information service, increase the varieties, improve the quality of information service. Through the construction of the platform, on the one hand to meet the information sharing and exchange of visits between the demand of collaborative enterprise external supply chain, on the other hand to clear the enterprise high-level attention for the construction of informatization degree and long-term plan.

To strengthen the supply chain cost management

Keep the structure of the supply chain dynamic. In general, once the formation of supply chain is relatively stable, but the supply chain is dynamic, the dynamic can reduce the cost of supply chain. Modern market competition is the competition between supply chains, rising cost of any internal node enterprises or caused by the enterprises of the supply chain of a link cost, will make the whole supply chain because of rising costs in the competition at a disadvantage. If the lack of a certain node enterprises self cost control ability, core enterprises will put pressure on the member, if not reduce costs, then the business will be replaced by the lower cost of enterprise.

To each node of the supply chain of the whole network in the chain as a whole, protectionism elimination of each node, to realize the optimization of the whole supply chain. Moreover, should be closely linked, connected between each node, cost management, to unify the budget, accounting and control the costs of. Between each node to the method of cost control and the exchange of experience, together to reduce the cost of supply chain. Between supply chain nodes to establish trust and cooperation mechanism, good partner is an important basis for strengthening cost management of supply chain, reduce the trust and cooperation mechanism established between the partners contribute to the supply chain cost.

CONCLUSIONS

Not only has a certain theoretical significance to the study of chain optimization problems in China's oil supply, but also to improve the utilization rate of China's oil resources, reduce the oil companies operating costs, enhance the competitiveness of enterprises, has a certain practical reference value.

ACKNOWLEDGEMENTS

This work was financially supported by the Northeast Petroleum University Youth Fund Project (Project Numbers: 2012QN204; 2012QN211)

REFERENCES

- Hatice Çalçıpar. A Theoretical Model Proposal in Supply Chain Management for Turkish SMEs [J]. *Problems and Perspectives in Management*, 2007(5):90-98.
- Liu haifeng. "China's science and technology studies the allocation of resources," [J]. *Science and Technology Policy*, 2009(3): pp.95-98.
- Liu, J., Zhang, J., & Gao, Z. (2014). The Energy Management and Coordination in PHEV. *Journal of applied science and engineering innovation*,1(4), pp.251-256.
- Liu Zhengliang, Xu Jianjun*, Li Hongyu. A kind of energy saving controller based on Y/ Δ change-over[J]. *Sensors and Transducers*, v 161, n 12, p 331-336, 2013
- Long,Xing; Jian-Jun,Xu; Li-Mei,Yan*. Study on the effect of pickled cabbage using freeze-drying protective agent[J]. *Advance Journal of Food Science and Technology*, v5, n10,p1404-1406,October 2013
- Nai-bo Zhang, Jian-jun Xu*, Chen-guang Xue. Core-shell structured mesoporous silica nanoparticles equipped with pyrene-based chemosensor: Synthesis, characterization, and sensing activity towards Hg (II) [J]. *Journal of Luminescence*, 2011, 131(9):p:2021-2025
- Reich-Weiser, C.; Fletcher, T.; Dornfeld, D.A.; Horne, S. Development of the Supply Chain Optimization and Planning for the Environment (SCOPE) tool -applied to solar energy[J]. *Electronics and the Environment*, 2008(5):1-6.
- Wang hecheng, Hu qichang. Foreign corporate R & D productivity assessment study[J]. *Science and Technology Policy*.2009(3): pp.95-98.
- Wei, X., Chang, X., & An, Y. (2015). Analysis of Petroleum Enterprise Reverse Logistics Risk Factors. *Journal of Applied Science and Engineering Innovation Vol*, 2(1).
- Xu Jian-jun, XU Ai-hua, Yan Li-mei, et al. Grids State Estimation of Quadrature Kalman Filter Based on PMU/SCADA[J]. *Energy Education Science and Technology Part A: Energy Science and Research*, v 32, n 2, p 1033-1038, 2014
- Xu Jian-jun, Xu Yan-chao,Yan Li-mei*, et al. Research on the method of optimal PMU placement[J]. *International Journal of Online Engineering*, v 9, S7, p 24-29, 2013
- Yan Limei, Zhu Yusong, Xu Jianjun, et.al. Transmission Lines Modeling Method Based on Fractional Order Calculus Theory[J]. *Transactions of China Electrotechnical Society*, 2014, Vol.29(9):260-268 (In Chinese).
- Zhou, L., Zhu, Y., & Xu, D. (2014). Cointegration Analysis of China's Exchange Rate Changes and Changes in Import and Export Trade. *Journal of applied science and engineering innovation Vol*, 1(6), pp.357-362.