

The Future of Energy Derivatives in China

By Philip R. Walsh*

In June 2009, the Global Times reported that the Shanghai Futures Exchange (SHFE) had announced that they were planning to introduce a crude oil futures trading contract with the support of the China Securities Regulatory Commission (CSRC). This energy derivative instrument would mark the second of its kind in China after the introduction in 2004 by the SHFE of a fuel oil future contract. Is this the beginning of the development of multi-product energy derivatives in China, or will regulatory controls and state-owned energy monopolies limit the success or even deter altogether the creation of futures markets in China? This article will explore the nature of energy derivatives and examine the potential for creating domestic derivatives trading for the main energy commodities in China.

Energy Derivatives

Energy derivatives are contracts related to a particular energy commodity (oil, natural gas, heating oil, coal, electricity, etc.). These financial instruments provide an opportunity to manage risk associated with the volatility in energy prices by allowing a party to secure the price of their energy in advance of the actual period of energy consumption. The variety of energy derivative instruments includes forward contracts, futures contracts, options, and swaps. The two principal futures exchanges dealing in energy products around the world are the New York Mercantile Exchange (crude oil, natural gas, heating oil, gasoline, and electricity) and London's International Petroleum Exchange (crude oil, heating oil, natural gas, and electricity).

Key to the success of energy derivatives is the deregulation of the energy marketplace. Through deregulation, an energy commodity is free from any form of price regulation and a competitive spot market can be developed where pricing is liquid and reflective of the true cost of the energy commodity at any point in time. Typically, these spot markets are related to physical delivery points or energy hubs where large numbers of buyers and sellers are available to maintain a liquid market and transparent pricing. In North America, the energy deregulation process has been successful in the creation of a number of energy trading hubs where prices can be indexed to the NYMEX futures market reference locations: West Texas Intermediate for crude oil, Henry Hub for natural gas, New York Harbor for heating oil and gasoline, PJM western hub for electricity, and Central Appalachian for coal.

Derivatives in China

In the spring of 2004 regulations on derivatives trading in China were established with the creation of the Provisional Administrative Rules Governing Derivative Activities of Financial Institutions by the China Banking Regulatory Commission ("CBRC"). These rules applied not only to banks, but also to non-banking financial institutions and foreign bank branches carrying out derivatives trading in China. Under the terms of these rules, any derivative business (financial or commodity) must be approved by the CBRC.

As fuel oil were the least regulated of all of the energy types in China, it was the most-likely choice for the creation of an energy derivative instrument, and in 2004 the SHFE began trading fuel oil futures contracts. Fuel oil futures had existed previously, but had been abolished in 1994 by regulators due to problems with speculators. Since its more recent inception, the SHFE has seen its fuel oil futures trading volumes increase to a point where, in 2008, the total value of contracts traded equaled \$295.85-billion. From January through July 2009, the total lots (10 tonnes per lot) of fuel oil traded was 65,578,796 representing approximately 4.9 billion barrels of fuel oil — an increase of 390% over the same period in 2008. Putting that into perspective, the physical volume associated with the NYMEX heating oil futures contracts traded over that same period was approximately equal to 1 billion barrels. The fuel oil futures contract is the benchmark derivative for the Chinese government in determining the future success of additional energy derivatives.

In 2008, the CSRC maintained a policy of continuous improvement of a futures market, including energy futures, in terms of its infrastructure and oversight. A successful futures industry was seen to provide commodity pricing that allowed for price discovery based on a proper supply-and-demand paradigm thus encouraging optimal exploitation of resources and a more-efficient use of energy. However, the CSRC was still concerned about the need to provide a suitable derivative market framework that balanced the need for market development with the protection of domestic enterprises from market speculation and rogue trading. This balancing attempt has limited

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the progress of the creation of additional energy derivatives.

Complicating matters has been the recent global economic crisis and the initiation by the CBRC in the summer of 2009 of a more-restrictive policy toward domestic banks' derivatives operations. Citing losses due to derivatives trading activities, Chinese banks can no longer enter into complex derivatives transactions between domestic companies and overseas financial institutions.

It would appear that the government and regulators in China would prefer the development of a domestic energy derivatives market that would not only provide a mechanism for futures price discovery and energy risk management, but also be of sufficient size and scope to limit the desire of domestic enterprises to conduct energy derivative transactions outside of the institutional framework over which China's regulators have authority.

To do so the Chinese government must, as discussed previously, create a competitive energy marketplace with numerous energy hubs that provide liquid markets for energy traders, producers and consumers.

Currently, the energy marketplace in China for further energy commodity derivatives can be summarized as follows:

Crude Oil Derivatives

The choice of crude oil as the next energy futures contract to be traded on the SHFE is due in part to its strategic significance as well as its relative regulatory simplicity. A significant portion of China's energy demand is in the form of crude oil, with ever-increasing reliance on imports. Enterprises in China will be able to use the new crude oil futures contract to help mitigate the volatility of world oil prices and the creation of a domestic reference point for hedging purposes. This derivative instrument could be referenced to crude oil deliveries at Shanghai, given its prominence as one of China's largest crude oil receipt terminals. Domestic oil production pricing could then be indexed to the Shanghai reference price with basis differentials being determined by transportation costs from production areas to Shanghai.

While the upstream and downstream oil industry in China is still principally controlled by two state-controlled companies — the Chinese National Petroleum Corporation (CNPC) and the China Petroleum and Chemical Corporation ("Sinopec") — the government has allowed other Chinese companies, such as the China National Offshore Oil Corporation (CNOOC), CITIC Group and Sinochem, to become more active in the industry as competitors to the two major incumbent players. In addition, the recent move by the government to reform market pricing for petroleum products has allowed for greater symmetry between world oil prices and domestic prices and will further entice foreign investment.

Natural Gas Derivatives

Natural gas has been a less-strategic fuel than crude oil, but the government is seeking to increase the use of natural gas in order to displace the more environmentally damaging coal. Capital projects for increasing supply to meet the demand include: the expansion of the existing west-to-east natural gas transmission system that ties-in the more-prolific producing basins of western China with the populous east coast; construction of underground gas storage facilities near the west-to-east natural gas transmission system in the provinces of Jiangsu and Anhui; expanded transmission capabilities of the offshore South China Sea natural gas production onshore near Hong Kong; and the construction of liquefied natural gas ("LNG") terminals along the east coast for the receipt of imported natural gas (see figure 1). This expansion in natural gas infrastructure will result in an inter-connected natural gas network with import potential not only via LNG terminals, but also from the large natural gas reserves in countries north and west of China.

A key location for a natural gas hub for the purpose of trading would be in Jiangsu province, immediately west of the major market of Shanghai and where the west-east gas transmission system can be connected to new underground gas storage facilities. Another market hub that could develop in China is the Guangdong region (Hong Kong) with its proximity to offshore natural gas reserves and new and existing LNG facilities. The Tarim basin in the western part of China may present itself as a trading hub when gas transmission systems are built to allow for the import of natural gas from Russia, Kazakhstan, Uzbekistan, and Turkmenistan.

As with the oil industry, the natural gas industry is controlled by CNPC, Sinopec and CNOOC. However, the Chinese government is encouraging foreign participation in the natural gas market by seeking to amend their pricing policy for natural gas so that it may be priced to become more competitive with alternative fuel choices. Given the sensitivity associated with existing large-scale consumers of natural gas in China, this pricing reform is likely to take some time.

Coal Derivatives

China is the largest consumer and producer of coal in the world. The domestic coal industry (unlike other domestic hydrocarbon industries) is comprised of a large number of small- to medium-sized coal producers and is located in all regions of the country. Because of this lack of market concentration (the largest state-owned coal corporation controls 9 percent of the domestic market, with the largest three controlling less than 15 percent), there are a large number of market participants to establish a competitive market. Furthermore, the amount of regulation by the central government is less than that in other energy markets. This combination presents an opportunity to establish a coal derivative instrument. In fact, subject to approvals, the Shanxi Province — the largest coal-producing province in China (see figure 1) — announced in June 2009 the establishment of the country's first coal and coke futures exchange.

Electricity Derivatives

The Chinese electricity industry has recently undergone reform to allow for the creation of distinct generation and transmission entities. There are now five regional transmission companies operating under the direction of the State Grid Corporation (SG) serving the north, east and west of China. The south of China is served by the China Southern Power Grid Corporation (CSG) which was formed out of a number of regional power corporations. A goal of SG is to create a hub at the Three Gorges Power Plant (see figure 1) where interconnection of the north and south grids will provide electrical transmission capability for all sources of power generation to any end-use market and thus establishing a national grid system. Approximately 500 power plants generate electricity across China, and, as part of the industry reform process, operation of these plants was assigned to various power-generation groups so as to open up more-competitive bidding for transmission access and electricity supply into the national grid.

Although the physical infrastructure of the electricity market in China appears to be further advanced in regards to the creation of regional electricity trading hubs, the potential for an electricity derivative instrument is the least likely at this stage because the focus of financial and securities regulators is currently on other energy commodities.

Conclusion

It is clear that China has a long way to go before a market structure — both from a physical and regulatory perspective — has been established that will encourage the development of energy market hubs and energy trading. This should not come as a surprise given the greater element of authority that the government has in the market place, nor given the fact that even in more business-friendly jurisdictions, such as North America and Europe, the full deregulation of energy markets has taken decades to occur, if it has occurred at all.

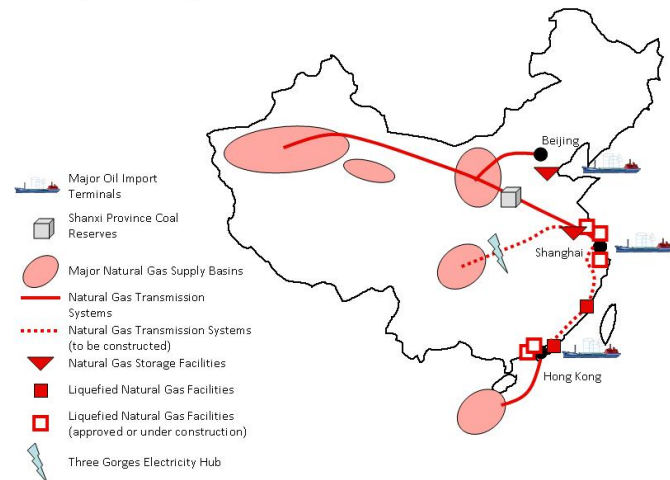
The key to the successful growth of energy derivatives in China will be the creation of competitive spot markets for each energy commodity where pricing is reflective of the true cost of supply and where energy hubs exist to maintain a liquid market and transparent pricing. To get there, the Chinese government will need to continue opening energy markets to competition (domestic or otherwise) and establish market regulations that provide a level playing field for all participants. If they are successful in doing so, then one can predict that the future of energy derivatives in China might look like this:

Shanghai will become the principal financial trading location for energy derivatives in China and perhaps Asia. Historically less-regulated energy products, such as crude oil, fuel oil and gasoline, will have derivative trading indexed to a Shanghai or Guangdong delivery point. Natural gas derivatives will be indexed to the Jiangsu Hub, coal derivatives to Shanxi Province and electricity derivatives to the Three Gorges Hub. When and if this will ever happen, given the size and scope of the required changes in regulatory policy, is subject to speculation — which, in a way, is somewhat ironic.

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Figure 1 – Energy Hubs in China



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