

China Energy Demand vs. China LNG Fleet Development

The first LNG carrier built in China, “Dapeng Sun”, has been delivered on April 3rd 2008. Currently, Dapeng Sun has sailed to North West Shelf of Australia for her maiden voyage. Since the start commercial operation of LNG shipping in the world in 1964, the dream for China to import LNG and to build LNG carrier has finally come true after more than 40 years. The construction period of the first Chinese LNG ship was 40 months with satisfactory results of equipment tests, sea trial and gas trial. The quality and performance of Chinese LNG carrier is met with the construction criterion and specification.

The construction and operation of the first Chinese LNG vessel symbolize that China has moved forward with a significant step in security of energy supply, upgrade in shipbuilding technology, and development in LNG fleet.

Dapeng Sun is built as the dedicated ship for Guangdong Dapeng LNG Terminal, the first LNG import project in mainland China, and the basic charter period is 25 years. According to its designed fatigue life time and current LNG carrier performance records, Dapeng Sun will likely be in shipping service for more than 40 years.

1. China Energy Demand

According to a five-year statistics in 2006, the growth in Chinese energy consumption is much higher than the world average. The five-year average increase for primary energy consumption in China is 11.17%, and is 9% for oil consumption. The average oil import volume is increased by 19.23% annually. Since 1993, China has become a net oil import country from an oil export country. In 2007, China has imported a total of 163 million tons of crude oil with 12.39% growth in comparison with 2006.

2. China Natural Gas Demand

With the economic development of China and improvement of Chinese living standard, you may well notice the demand for natural gas and other clean energy have been increased as well. In last five years, natural gas consumption has been increasing by 15.71% annually, which exceeded almost 7% in comparison with crude oil consumption. The total natural gas consumption in 2007 was 67.3 billion cubic meters with 21% growth in comparison with 2006. Although China has started increasing the consumption of natural gas, it is still only a small percentage in total energy consumed. According to statistics in 2006, natural gas consumption is less than 3% in the total primary energy consumed. This number is much lower than 23.67% for the world average. The consumption ratio in China for natural gas and crude oil is only 14.3%, which is way below 66.2% for the world average. With a limited domestic natural gas supply in China and transportation difficulties from source to consumer,

there is a large gap between supply and demand of natural gas. It is urgent matter for Chinese to import natural gas. Actually, the increase in natural gas consumption in China is restricted by the supply, so the actual increased amount does not reflect the real demand underneath.

Statistics shows that Chinese natural gas consumption will reach 100 -120 billion cubic meter per year in 2010, and in 2020, it is likely to reach 200-240 billion cubic meter annually.

Looking at globally, LNG supply is in high demand. With exceptional of very few place, the rest of countries or regions with rich gas resource have been exploited. The price of LNG in the international market is closed linked with the price of crude oil. The price of recent signed LNG SPA was almost 100% linked with the caloric value of crude oil.

We are aware that LNG is mainly used for power plant, industry and resident. The most power plants in China are still coal fired power plants. If the price is the top priority, imported LNG cannot compete with coal. However, industrial users and residential households are able to consume at a higher price. In recent years, with the production of “pipeline gas from the West to the East” project, the demand for clean energy in China has increased rapidly. Most of coastal cities are facing the short supply of natural gas.

Looking at long term, the small-scaled and regionalized city gas pipeline supply will be replaced by large-scale, long distance and across regions pipeline network. With well developed natural gas supply network and natural gas application equipments, certain industrial customers will likely start to use natural gas instead of electricity, crude oil, LPG and other energy and material. With increased production cost of coal and environmental protection awareness, natural gas power plant will likely have more competitive advantages over coal power plant. Therefore, it is the inevitable trend for China to import LNG to meet the demand of economic development and to improve the quality of life.

3. China LNG Receiving Terminal Projected

Since the start-up of LNG import project planning in China at the end of 1998, there are total of 11 LNG receiving terminals projected. Some have started operation, some have been under construction, and some are still under planning. The total forecasted import volume is 33 million tons of LNG, which is approximately 450 billion cubic meter of natural gas.

Currently, there are three LNG SPAs coming into force in China with annual supply of 9.3 million tons of LNG, which is approximately 13 billion cubic meter of natural

gas, representing 20% of total consumption in 2007. In addition, PetroChina has signed 3 million tons LNG binding HOA and Key Term Agreement with Gorgon, Australia. Recently, PetroChina and CNOOC have signed 3 million tons and 2 million tons LNG purchase agreement with Qatar respectively.

Total volume of import LNG mentioned above has already reached 17.3 million tons, which is approximately 24 billion cubic meter of natural gas. With estimation, 15% of natural gas consumption in China will come from imported LNG in 2015.

Guangdong Dapeng LNG has started up operation in June 2006. Until the end of 2007, Dapeng LNG has imported 4 million tons of LNG with 3 million tons in 2007, which is approximately 4 billion cubic meter of natural gas, representing 6% of national consumption and contributing to one third of national consumption growth.

According to our prediction, even all 11 projected LNG receiving terminals will start operation before 2015, the total import volume will only meet 30% of consumption at that time.

4. China LNG Fleet Demand

Without a doubt China LNG demand will enhance the demand on China LNG carrier fleet. If all planned LNG import project in China will be fully implemented, China will likely contribute 10% shipping capacity growth to the international LNG carrier fleet.

5. China LNG Fleet Development Model

COSCO Group and China Merchants Group jointly started to research and promote LNG transportation projects since 1999. During the time, they have participated in research and preparation for transportation arrangement in Guangdong and Fujian LNG import projects. In 2004, they have jointly incorporated China LNG Shipping (Holdings) Limited (“CLNG”) to be responsible for investment and management of LNG carriers. After five-year of preparation and four-year of office operation, CLNG has invested in five LNG carriers and jointly incorporated China LNG Shipping (International) Company Limited with BP shipping to operate and manage LNG carriers.

In order to fully adopt advanced international management experience, to guarantee safe and stable operation of Chinese LNG carrier, and to ensure stable and reliable LNG supply, domestic company in China has cooperated with foreign experienced shipping company to develop LNG fleet.

1) Shipbuilding

Hudong-Zhonghua Shipbuilding (Group) Co., Ltd. and Chantiers de l'Atlantique have together developed and designed the largest cargo capacity membrane type LNG tanker at the time. Chantiers de l'Atlantique has provided technical and construction support and assistance. Shipowner has entrusted Shell International Trading and Shipping Company Limited to be in charge of shipbuilding supervision.

2) Ship Investment

The dedicated ship for Guangdong LNG import project, the pilot LNG import project in China, has attracted BPS, Shell, Chevron and other well-known major oil companies to invest. The participation of these companies has promoted the coordination of relevant parties in the project, has enhanced HSE management concept in ship investment, and has enhanced strategic decision making process with more effectiveness and more risk control management.

3) Ship Management

CLNG and BP Shipping have jointly incorporated a specialized ship management company, which is mainly managed by expatriate staff from BP Shipping.

During the initial operation stage of LNG ships invested by CLNG, BP Shipping will dispatch five officers, including the Master, to be on board of the ship and the rest of crews are from COSCO Dalian.

4) Seafarer Training

The shareholders of CLNG have VLCC, VLGC, LPG and other oil tanker fleet with a well trained seafarer team. In order for crews to have the qualifications required by LNG carrier, CLNG has established a very strict and specific training requirements, which including familiarization of main systems and equipments in LNG ship, simulation training and working on board of LNG ship.

6. Challenges Face by China to Develop LNG Fleet

Whilst rapid growth in energy demand in China has brought opportunity to develop LNG fleet, there are lots of challenges ahead of us. First, limited LNG resource in global market and continuous increase in crude oil price have led to higher and higher LNG price, the planned LNG import projects cannot be implemented according to schedule. Secondly, LNG market has become seller's market, and in general, seller prefers DES contract with LNG shipping service provided by themselves. This has created uncertainties for buyer to participate in LNG transportation. Thirdly, high

demand in long distanced shipping and advanced shipbuilding technology has led to large-sized vessels. China still needs to explore and develop more homemade vessels. Fourthly, the stagnation in shipping industry has passed, but it left us with limited manpower. The world wide shortage of officers and office staff is appreciated by the whole industry.

We have to realize the opportunity that import LNG has brought for China shipping industry, but more importantly, the challenges along with it. The only way to ensure a safe, stable and retainable LNG shipping service in China is by careful study and research, and scientific strategy.