Three Major Factors Driving China's LNG Market Development

The development of society has further worsened the environmental pollution. Smog has become a global problem. Therefore, all countries have treated the minimization of carbon emission as the role of top priority, and formulated the target of global carbon emission reaching the peak of 32 billion tonnes by 2020. However, it has already exceeded this target in 2013. According to the data available, the new increase of carbon emission will primarily come from the developing countries take 75% worldwide in future. Consequently, the major countries of carbon emission have found it a pressing need to replace the traditional energy with the green and clean energy.

Impact of Natural Gas Development on Carbon Emission Peak

In light of the background of all countries heading for low-carbon economic development, the abundant reserve of global natural gas resources and the comparatively matured techniques have laid the foundation for the application of "green" energy - natural gas. In respect of green energies, the renewable energy taking approximately 40% of the market share will rank No. 1, with the natural gas ranking No. 2. As the renewable energy is still unable to replace the fossil energy completely for use as fuel, therefore, in the course of China's low carbon development, the natural gas will give full play to its extremely important effect.

According to the forecast based on the statistics data in recent years, the global volume of carbon emission will reach its peak in 2030. Following the extensive application of abundant replacement energies, the growth of the fossil energy will be curbed with the appearance of transition by 2035.

From 1971 to 2012, the global natural gas energy structure has undergone tremendous changes. In light of the great abundance of proven reserves of global natural gas resources, coupled with the successful "revolution" of the shale gas in Northern America, the future supply

of natural gas will increase substantially, which safeguards the replacement of the fossil energy with the natural gas. If the natural gas replaces the fossil energy on extensive basis, it will definitely reduce the carbon emission. Therefore the “high or low” peak level of carbon emission will depend on the development of the natural gas industry to a certain extent.

Because of various reasons, China’s development of nature gas industry is 30 years lagging behind the developed countries. In comparison with other countries, the consumption of natural gas remains extremely little in China, which is extremely not in line with its position as the world’s No. 2 economic system.

At present, China has three major rigid demands for the natural gas.

First, it is to raise the energy efficiency and secure supply.

In the past, China experienced the annual increase of coal consumption of over 200 million tonnes. The increasing coal consumption has the tendency of stop increasing due to emission of carbon under control. From now on, more renewable energies will replace part of the coal energy. Amidst the renewable energies, the natural gas remained the primary dependable source. However the replacement with natural gas is not as simple as the replacement of equivalent heat but to have the doubling effects of replacement, that is, the highly effective utilization of natural gas.

Second, it is the application of natural gas to the electric peak shaving and the loading center to safeguard the electricity supply .

With the development of nuclear electricity and the wind electricity, the means of electricity supply has become diversified. Although China may not be able to achieve the natural gas integrated electricity generation, the natural gas is very suitable for the electric peak shaving. The proportion of natural gas peak shaving will keep on increasing from now on.

Third, the replacement of diesel with the natural gas for transport purpose will reduce smog and the volume of imported oil. There is a great potential of market demand for replacing the diesel with the natural gas.

According to the foregoing demand estimation, China's natural gas demand will reach 400 billion cbm~450 billion cbm by 2020, and 700 billion cbm~800 billion cbm by 2030 respectively. China has undergone the second energy revolution. However, coal and gasoline remain to be main sources of power in the energy structure

Main Source of Power for Transport Energy Transformation

China has undergone the second energy revolution. However, coal and gasoline remain to be main sources of power in the energy structure, with very little use of natural gas. It is necessary to expedite the development of the natural gas industry. As the LNG is not confined to the pipeline network, it brings about more flexible operation. Moreover, in light of the widely scattered energy users, coupled with a lot of small and dispersed users, in China, it is very suitable for being the important source of replenishment to satisfy the domestic natural gas demand.

At the present stage, the LNG is the main source of power for transforming the domestic transport energy to meet the low-carbon requirements. According to the forecast of the world energy organization, in the coming 3 to 5 years, or even 20 years, the primary global demand for petroleum products is diesel, which is mainly due to the diesel demand of heavy-duty cargo trucks in the logistics industry. Because of the rapid development of storage power and fuel cell, they have become the replacement energy of gasoline and been applied to the small household automobiles. Therefore, the gasoline demand of the household automobiles will decrease in future.

However, storage power and fuel cell still have no matured technology available for application to heavy-duty trucks. The most practical solution to reduce the carbon emission of heavy-duty trucks is to replace the diesel with the LNG. Furthermore, the LNG trucks had very rapid development in the past ten years, with demonstration projects running in the countries including the U. S. A., Canada, and Australia, with considerable scale established.

As for China's energy consumption structure, the consumption volume of diesel doubles that of gasoline. According to institutional forecast, the number of China's heavy-duty trucks will rank No. 1 worldwide by 2025. It is entirely possible to use LNG trucks instead of merely keeping on increasing the volume of imported gasoline or the use of diesel. In fact, China's LNG industry development has aimed at the vehicle fuel market. In particular, the use of LNG as the transport fuel has undergone astonishingly fast development reaching 200% in the recent two years. It is not only cheap to use the LNG to replace the diesel but also highly economical, in addition to the effect of environmental protection.

In respect of the industrial chain of China's LNG application to heavy-duty trucks, the corresponding matured technologies ranging from the fuel tank to the engine and even the entire truck have already been in place and fully capable of achieving localization. At present, China's first large-scale LNG ship has been launched and first LNG refueling station in Yangtze River has been commissioned, both of which have shown very good economy, and the rate of replacing the gasoline and the diesel with the LNG is highly efficiently as well. It has turned into the tremendous momentum for pushing ahead with the LNG development. Take Anhui, a province of medium development, as an example. The market demand for replacing the gasoline and the diesel with the LNG is 3.787 billion cbm a year. It shows the gigantic LNG market demand in China.

In light of the grim low-carbon situation and the existing green energy technology, the LNG application to heavy-duty trucks is the best choice. The LNG will be the biggest transport fuel market in China and even the whole world in future. The supporting LNG equipment will be developed as well. Most probably, China will become the biggest LNG equipment production and export base.

LNG in Storage Bottles for Delivery - A Mobile Gas Source

The vehicle/ship transport of LNG in small storage bottles and containers forms the important integral part of the industrial chain in the midstream. China's reserve of the irregular natural gas resources

is more or less the same as the U. S. A. and may be even more than U. S. A. However, there is a very great difference in the situation of the two countries. According to the introduction by HUA Ben, the natural gas pipeline network of the U. S. A. has a total length of 2,000,000 km while that of China is merely 60,000 km On such basis, somebody is of the view that China is unlikely to develop the natural gas industry.

In fact, it is not so. The LNG industry has already undergone rapid development in China. Its success is mainly because that the natural gas midstream walks with "two legs" in China, that is, the "pipeline network" and the "mobile" LNG (transport in storage bottles). From the upstream liquefaction to the midstream transport and then the downstream application, China's LNG industry has taken a leading position on global basis. In the near future, an entire train of LNG will be transported to Guangdong from Xinjiang quickly. According to the initial plan, an entire train of LNG will be delivered each day. Moreover, the carriage charges are more or less the same as the costs of pipeline for the LNG.

The domestic LNG is delivered mainly through the combined transport by means of vehicle containers, train containers and inland waterway containers. The transport cost by the highway, the railway and the waterway is in the proportion of 5:3:2. The transport cost of the highway is the highest, while that of the waterway is the lowest. The current LNG transport depends mainly on the highway but not in the form of container transport. The transport cost will be reduced even much more when the majority has adopted container transport. Under the circumstances of the pipeline network not yet in place, the transport cost of LNG is already lower than that of the pipeline network. In future, the natural gas industry in China will walk with two legs, without any obstruction to the natural gas development at all.

Following the gradual increase of urban fuel gas supply, the mode of gas supply will mainly be based on the "transport of LNG in small storage bottles + regional pipeline gas supply", which will be the development direction for the mode of urban gas supply in future. This part of LNG supply will also form the pioneer in the development of natural gas

industry - to achieve gas supply with less investment and at lower cost, followed by construction of main pipeline network after the maturation of the part of the regional natural gas market.

The transport of LNG in storage bottles and containers is highly flexible, which is able to be rapidly adapted to the change of gas source and variation of gas consumption volume, so as to avoid the risks of opening the market with little consumption and making one-off big investment in the pipeline with long payback period for the investment and excessively high depreciation cost.

The transport of LNG in storage bottles and containers is capable of effectively lowering the cost in certain part of the region and also making possible the better exploration and cultivation of new markets in the downstream of natural gas industry in coordination with the pipeline transmission so as to gradually extend the pipeline network and scope of services.

(source: Oilobserver.com)