The Shale Gas Boom Shift to China

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The past two years have shown a strong impact of the US shale gas boom on the global energy market, especially the gas market. Recently, the boom has spread from the US to Europe and has just shifted to China. Explorations for shale gas by the Ministry of Land and Resources (MLR) of China started from 2004, and during the last six months, the US, which is the leader in shale gas technology and development, as well as European oil majors such as Shell and BP were all seen actively approaching China.

After President Obama and President Hu Jintao announced a US-China Shale Gas Resource Initiative at the 1st US-China Strategic Economic Dialogue last December, aiming at realizing the initiative, the US Department of State and China's National Energy Administration (NEA) signed a US-China Shale Gas Resource Task Force Work Plan through the 2nd Dialogue held during 24th - 25th May 2010. The two sides intend to use technology advancement and experiences gained in the US to assess shale gas potentials and develop shale gas resources in China. Meanwhile, it appears that US companies are exploring entry into the Chinese market.

Besides the US, recently, European majors seeing shale gas exploration positively are also working together actively with Chinese companies to develop shale gas reserves in China. After Shell and PetroChina signed an agreement on shale gas development in the Sichuan area last December, since the beginning of this year, BP and Sinopec have been discussing developing shale gas reserves in Guizhou province and Jiangsu province as well.

The move has been prompted by factors including the tight Chinese natural gas market, spreading supply-demand gaps, surging dependency on gas import, and increasing concern about supply securities. In recent years, the gas demand of China has surged sharply driven by the expansion of the petroleum chemistry industry, improvement in living standards, and the development of city gas infrastructures. Last winter, gas supply of some inland regions was cut due to supply shortages caused by severe weather. Further, facing pressures of promoting polices responding to greenhouse gas emissions, the Chinese government is considering improving the role of natural gas in its energy mix from the current level of 4% to 8% in 2015 and then 10% in 2020[1]. If the goal is

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materialized, the gas demand of China is expected to reach 200 Bcm and 300 Bcm in 2015 and 2020, respectively[2]. If this is the case, China's dependency on import gas would increase from 6% in 2009 to 25% in 2015 and further to 33% in 2020[3]. Under such circumstances, the Chinese government would definitely pay attention to its shale gas resources.

Actually, China is believed to have significant shale gas potential. The preliminary investigation by the US shows that the shale gas resources in China might reach 100 Tcm[4], the same level as that of the US. Meanwhile, according to MLR, the recoverable reserves alone may come to 26 Tcm. This April, MLR announced that the pioneer shale gas field in Chongqing, which its affiliated organizations, the Strategic Research Center for Oil & Gas Resources and the University of Geosciences, have been working on since 2004, will start commercial production from 2011. Also, MLR has a goal of building its total production capacity to 3-5 Bcm from 10-15 leading shale gas fields by 2015, and a further expansion to 15-30 Bcm from 20-30 dominant fields by 2020, which is to see shale gas production equivalent to about 8 -12% of the total annual domestic natural gas output[5]. Besides MLR, the energy regulatory authority of China, the National Energy Administration (NEA), also started creating policies to support exploration, development and utilization of shale gas since last autumn, and it even has incorporated shale gas into the "National Energy Strategies Toward 2030".

Thus, in the long run, shale gas has a large potential for supplying the Chinese market, and its development would continue to attract much interest. However, at least for the next five years ahead, progress would halt at an early stage of exploration and development and it would be difficult for it to become a leading source for China's gas supply, as the gas demand is expected to surge at a level of 10% annually during the next 10 years. Meanwhile, in terms of non-conventional natural gas, compared with shale gas, coal bed methane (CBM) has been commercialized successfully. China holds the world's 3rd largest coal reserve after Russia and the US, and its CBM resource is estimated to reach 36.8 Tcm[6]. CBM has started supplying the West-East gas pipeline by 3 Bcm per year since 2009, and its production this year is expected to reach 10 Bcm. As well, a number of coal-based synthetic natural gas (SNG) projects located in coal mining areas are progressing, whose total production capacity is expected to reach

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[1] MLR, February 2010. (Petroleum Argus, March 15th 2010)
[2] The Energy Research Institute (ERI) of the National Development and Reform Center, March 2010 (The 3rd International LNG Forum in China)
[3] Author's estimation
[4] China Chemical Industry News, March 12th, 2010
[5] MLR, February 2nd, 2010
[6] First Financial Daily, March 26th, 2010

30 Bcm two or three years later[7].

On the other hand, in China, environment restrictions for shale gas drilling are less strict, and most shale gas fields are located in thinly-populated areas compared with Europe. In this sense, shale gas exploration in China is favorable; however, serious water shortages in China may pose problems as a large amount of water is essential to the development of shale gas.

Hereafter, foreign investors that have made advancement in shale gas technology and experience are expected to enter the Chinese shale gas market under joint ventures with Chinese companies. However, as China tends to develop its natural resources by its own firms, there are concerns that bilateral cooperation may be difficult to maintain in the long run.

How would China balance the expansion of its gas supply, environment protection, and cooperation with foreign counties while advancing its shale gas development? This will need to be watched carefully in the future.

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[7] Author's estimation