



Summary of Shale Gas Workshop at Peking University January 8, 2014

On January 8, 2014, Peking University (Beida), Columbia University's Center on Global Energy Policy and Columbia Law School hosted a workshop in Beijing on the potential for shale gas development in China. Leaders from business, government and academia from the U.S. and China participated. Topics included the geostrategic implications of the US shale gas boom, the status of shale gas development in China and a comparison of shale gas regulatory regimes in the two countries. Water and air pollution, mineral rights and pipeline issues received special attention.

The following are among the key points made by participants in the workshop (without attribution to any specific participant in accordance with the workshop's ground rules):

Hydraulic fracturing and horizontal drilling have transformed the energy landscape in the US and globally. In recent years, leading forecasts have repeatedly underestimated US hydrocarbon production. The US is now the world's largest energy producer and prospects for additional growth in production are good. Increased production from the U.S. has softened the oil market impacts of sanctions on Iran, increased gas market competition and the potential for a trading hub to emerge in Asia, and reduced Russian leverage in Europe, among other important geostrategic impacts.

China has the world's largest shale resource, but has not yet tapped that resource in a significant way. Geologic, technological and institutional barriers have all played a role. As Chinese natural gas demand continues to grow (from the current level of approximately 170 billion cubic meters (bcm) per year), shale gas development could help cut China's energy import bills and enhance energy security. In addition, China's shale gas reserves could, if produced with high environmental standards, reduce pollution and improve the sustainability of China's economic growth model.

The US oil and gas boom was seen as having mixed impacts on China. On the one hand, US natural gas exports will put downward pressure on high Asian LNG prices and help drive world economic growth, both benefiting China. In addition, US natural gas exports will mean greater competition for Chinese natural gas markets, improving Chinese leverage in negotiations with Russia and Central Asian countries over natural gas imports. On the other hand, low natural gas prices in the US increase the level of competition China faces from the manufacturing sector in the US and potentially Japan.



China has established ambitious targets for shale gas development (6.5 bcm/year by 2015 and 60-100 bcm/year by 2020). Last fall the Chinese government released its Five-Year Plan for Shale Gas Development. At present, the government offers subsidies of 0.4 yuan per cubic meter of shale gas and categorizes shale gas as a “special type of mineral.” Price reforms for natural gas will help promote shale production.

However, China faces significant challenges in developing its shale resources. Chinese shale is deeper and tends to have more clay than shale in the US. Hydraulic fracturing requires large amounts of water, which is in short supply in many parts of China. At present there is limited technological expertise in shale gas development in China. Furthermore, China has a limited pipeline network, and detailed geologic data concerning its shale reserves are not widely available. The Chinese government owns all mineral rights in the country and, historically, only large state-owned enterprises have been able to participate in the exploration and extraction of oil and gas. There were mixed views on whether China would meet its targets, with some participants expressing confidence (noting positive results in pilot/demonstration projects) and others highlighting the remaining challenges.

The US experience offers a number of lessons that may be helpful as China develops its shale resources. Natural gas prices in the US have not been subject to price controls since the 1980s. Small companies prepared to take risks played an important role in the US revolution, as did open access to a significant pipeline network. US drillers have access to substantial information concerning geology and the production activities of other drillers. Subsurface mineral rights are easily identified and transferred under the US legal system. These factors and others may be relevant as China shapes its approach to shale gas development in the years ahead.

Best practices used in the US can substantially reduce the risk of water pollution from shale gas development. Well casing and cementing, use of lined pits or steel tanks, and the disclosure of chemicals used in fracking fluids are among the important areas of focus. Regulatory mechanisms, mainly at the state level, have been an important tool to minimize risks in the US.

Shale gas development could help fight air pollution in China. However, strategies other than shale gas development—including increased use of scrubbers at coal-fired power plants and refinery investments in cleaner fuels—may be more important to alleviating air pollution in the short-term. Most Chinese citizens consider local air pollution to be an urgent threat, creating strong incentives for the central government to focus on reducing



particulate matter emissions through clean coal technologies such as integrated gasification combined cycle (IGCC). Shale gas development can help China fight global warming pollution, provided fugitive methane emissions are controlled.

Mineral rights differ substantially under the US and Chinese systems. The US is the only country in the world where mineral rights are privately owned. Landowners typically negotiate with oil and gas companies and oil and gas leases are generally filed with local authorities. In China, the government grants exploration and extraction rights. There are restrictions on the transfer of rights. The Ministry of Land Resources is responsible for auctions of shale gas development rights.

Today the US natural gas pipeline network is almost ten times as large as China's. Open access to the US pipeline network has played an important role in US shale gas development. Expanding the Chinese network will be expensive, but important to successful shale gas development. China is currently moving toward the creation of an independent pipeline regulatory authority, but this is expected to take some time. China has demonstrated the ability to rapidly build pipelines, including most recently the natural gas pipeline from Burma.

Participants welcomed the high-level and highly informative dialogue, as well as the many relationships formed and deepened during the workshop. They agreed to explore opportunities for future cooperation.