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Outlook for the Shale Gas Industry in China

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Shale-gas production is set to become an important instrument for meeting China's growing demand for natural gas in the coming years, along with imports of liquefied gas and supplies by pipeline. China has curbed the access of international oil and gas majors to its shale industry and is intent on maintaining strict control over the pace of the industry's development. Foreign involvement is balanced via Chinese engagement in shale projects across North America. Shale gas is unlikely to revolutionize the Chinese energy supply, but the scope of activities in China could have an impact on other prospective areas of production.

Natural Gas in China's Energy Mix. Natural gas plays a limited role among China's primary energy sources (4%) in comparison with coal (70%) and oil (20%), and is surpassed even by hydro (5%). Still, China is one of the largest natural-gas consumers worldwide, ranking fourth behind the United States, Russia and Iran, with an annual consumption of 120 billion cubic meters (an expected increase of 15% compared with 2010). Natural gas imports, which cover roughly 11% of the demand, is dominated by LNG shipments from Australia, Indonesia, Malaysia and Qatar. The role of pipeline gas is rising after the launch of the Central Asian pipeline linking China and Turkmenistan.

Official Chinese forecasts predict a nearly three-fold increase in the share of natural gas in China's energy mix: it is set to rise to 8% by 2015 and to 12% by 2020. The 12th five-year plan (2011–2015) foresees, among other priorities, a doubling of the output of gas-fired power plants and an increase in the consumption of natural gas by households. The latter goal is the reason why the price of natural gas is kept at an artificially depressed level. However, since the low price gives doubts about the long-term economic viability of gas-fired power plants, the vast majority of projects aimed at boosting China's capacity to import natural gas enjoy significant tax rebates. The Chinese authorities hope that this will allow for a tripling of China's regasification potential by 2015, up to 35 billion cubic meters annually. By then, the share of imports via pipelines will have risen from the current level of 20% to nearly 50%. China has no choice but to encourage imports since in the period between 2006 and 2010 the increase in demand for natural gas has outpaced the rise of domestic production (95% and 65%, respectively). The share of imports of natural gas is bound to increase even further since imports are the most viable means for meeting the demand in the short term.

Unconventional gas deposits (coal-bed methane, or CBM, and shale gas) offer the most promising opportunities for increasing domestic production. The extraction of CBM began in the mid-1990s but is currently yielding a mere one billion cubic metres a year, a figure five times lower than anticipated in the previous five-year plan (2005–2010). CBM development has stalled because of insufficient investment on the side of foreign gas companies that hold production licenses. The Chinese authorities are considering a repeal of the drilling licenses unless annual production is stepped up to 21 billion cubic metres by 2015. Should the companies dig in their heels and the licenses are repealed, the CBM industry would continue to struggle. Thus, the greatest optimism now surrounds shale-gas deposits, whose yet-to-be-verified reserves could hold between 26 trillion and 35 trillion cubic metres of gas, compared with roughly 3 trillion cubic metres locked in conventional deposits.

China's Approach to Shale Gas. The coming five years are considered to be a run-up to the actual expansion of the Chinese shale-gas industry. By 2020, the Chinese authorities expect that the annual output from shale-gas deposits will equal 10% of the total domestic production

of natural gas. Chinese oil and gas companies put this figure even higher, at 30%. In fact, the domestic companies are slated to spearhead the development of the industry. The first licensing round, held in June 2011, was open only to state- or province-controlled entities, including the Chinese majors (Petrochina, Sinopec, China National Petroleum Corporation, or CNPC, and China National Off-Shore Oil Corporation, or CNOOC). The next tenders are said to be open to privately-held Chinese companies as well (Sinochem, Zhenhua Oil). This move is justified as an attempt to create conditions in China akin to those in which shale gas boomed in the United States, i.e., considerable fragmentation of the industry, which in turn generated greater competition and increased innovativeness. Equally important was the desire to ensure the more harmonious development of the Chinese oil-and-gas mining industry via the transfer of shale-related technology to a greater number of market players.

Technology transfers will occur as a result of engagement with international oil and gas majors, though the activities of these companies will be strictly limited. China requires a considerable inflow of technology and know-how necessary to tap shale-gas deposits as well as professional equipment. The decision to exclude foreign companies from those eligible to obtain production licenses was motivated by the desire to retain control over the pace and scope of investment in the industry and the actual production ratio. China will continue to have significant leeway in deciding which companies will be admitted to its shale gas industry. This freedom will not be significantly curbed with the entry of non-state Chinese companies, since they will continue to rely on cooperation with state-run Petrochina, which operates the domestic transmission network.

Limitations of access to the upstream sector have not discouraged foreign companies from exploring other opportunities to join the Chinese pursuit for shale gas. In the first half of 2011, Sinopec concluded agreements with ExxonMobil and Eni aimed at the investigation of the potential of the Chinese shale plays. June 2011 witnessed an agreement between CNPC and Shell that foresees the creation of a joint venture in the area of advanced drilling systems. The CNPC-Shell deal stipulates that a majority of components for the manufacturing of drilling equipment will be acquired from Chinese suppliers.

At the same time, Chinese companies are searching for business opportunities in North America that would give them access to practical knowledge about the shale-gas industry, irrespective of intergovernmental cooperation and information exchange mechanisms such as the U.S.-initiated Global Shale Gas Initiative. In January 2011, CNOOC and Chesapeake Energy inked a deal that transferred 33% of Chesapeake's license rights in the U.S. to CNOOC in exchange for Chinese financial support necessary to ensure continued operations on the Chesapeake-owned sites. Sinopec obtained a majority stake of Canada-based Daylight Energy in April that year.

Conclusion. Even if China reaches the announced volume of production from shale-gas deposits, its impact as a source of energy supply will be limited (between 1% and 3% of the energy mix). Coupled with the challenges that the shale industry may run into, it is clear why China has incentivised natural-gas imports. One obstacle will be the lack of infrastructure, i.e., the lack of sufficient capacity in the inter-regional transmission pipelines to provide the metropolises and industry centres of eastern China with gas from shale deposits. The initial economic viability of investments, apart from depressed natural gas prices, could be further decreased if the available technology, tried and tested in North America, would require adaptation in order to be suitable for more geologically challenging Chinese shale-gas plays. The socio-economic trade-offs associated with drilling for shale gas could become an issue—the first licenses were awarded in the central-eastern part of China where there is considerable population density and a thriving agricultural industry.

At the same time, China aims for an annual volume of production of as much as 20 billion cubic meters. The provision of an adequate number of skilled personnel and advanced equipment could be challenging, especially in the initial phase. Shortages of both staff and hardware are already discernible on the North American market. Satisfying Chinese demand in these areas could negatively impact the pace of development of the shale-gas industry in other locations, all the more so if China were to overcome key difficulties and position itself as the stage of the next shale-gas revolution after the U.S. and Canada. Apart from monitoring the development of China's shale-gas industry, and irrespective of the differences in the approach to tapping the shale potential, especially the role assigned to foreign companies, Poland should consider establishing a Sino-Polish consultation mechanism that would enable an exchange of experiences in setting the stage for the commercial extraction of shale gas.