



Sigur Center for Asian Studies

THE GEORGE WASHINGTON UNIVERSITY

China's Energy Outlook and the Shale Revolution: New Actors and Competing Interests

Faced with surging energy demand and increased public pressure for better environmental protection, the Chinese government is trying to shift its energy policy from coal and oil to gas. Vested interests are slowing reforms, but a pluralization of actors in the energy sector has yet to prove effective as the example of shale gas development reveals.

Energy Revolution in China: Unconventional Gas

As China's energy demand outpaces supply, the country is desperate to boost gas production. Growing criticism of environmental problems, such as the endemic smog clogging Beijing and other major cities, has the government scrambling to replace China's high coal usage with less polluting sources. China's large estimated shale gas – and to a lesser extent coal bed methane (CBM) – resources present a rare chance to develop a domestic resource, thereby improving energy security.¹ While unconventional gas alone will not solve China's energy woes, its development has the potential to reduce the risks associated with import dependency that will come with increased natural gas usage. The government also hopes shale gas extraction will help lower gas prices for China. At the same time, the government hopes to lower emissions, particularly in cities, by using gas instead of coal for power generation.

1. For a general overview of China's unconventional gas development in the context of its wider energy policy, see, for example, the U.S. Energy Information Administration's *China Background*. <http://www.eia.gov/countries/cab.cfm?fips=CH>

Despite the government's conclusion that unconventional gas development has clear benefits for China's sustainable economic growth, a number of challenges risk derailing or substantially slowing the project. These hurdles range from gas prices that are too low, insufficient infrastructure, competing interests and priorities among China's energy producers, and a lack of technological and management expertise. Of the 16 winning companies in China's second bidding round announced in January 2013, not one had previous experience drilling for shale gas.² Trying to address these obstacles requires more than new legislation on shale gas extraction. China will have to engage in fundamental reforms in controversial areas like state-owned enterprise (SOE) monopolies and policy decentralization if it wants to reach its development goals.

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Unconventional Gas in China: Multiple Players, Conflicting Interests

For the central government in Beijing to implement reforms conducive to large-scale unconventional gas development, it needs to find a way to deal with multiple priorities and appease different governmental, commercial and societal groups. Mostly, the government is torn between opening gas development to market economy dynamics versus maintaining strict central control. Both systems have advantages and disadvantages for the government and other actors in China's energy sector, as is explained below.

Central Government

It is difficult to identify government advocates and opponents of energy sector reforms with certainty. Within the central government, the National Development and Reform Commission (NDRC) and the Ministry for Land and Resources (MLR) have the biggest impact on gas development. The MLR was credited early with pushing for greater domestic and foreign access to the shale gas sector against a more conservative NDRC. However, NDRC and MLR representatives are now singing the same tune, and it has been suggested that the MLR brought up reforms first as a way to shore up their credibility on energy issues. This is because the central government is long overdue for an institutional reform on energy. The creation of an energy ministry has long been debated, but responsibilities still remain scattered across numerous ministries. Even within the powerful NDRC (often

² The first round of shale gas auctions took place in mid-2011, followed by a second round in end-2012. A third round could come as soon as late 2013.

referred to as a mini State Council), the National Energy Administration only employs just over 100 people, certainly not enough to effectively coordinate energy policy for a country the size of China. Energy policy coordination therefore ultimately runs through the central administration of the State Council.

The central government aims to launch shale gas production to 6.5bcm by 2015 and 60-100bcm by 2020. China in 2012 produced only 500 million cubic meters of shale gas³ compared with the U.S. output of 6.87 trillion cubic meters in 2011. Foreign analysts have long said this goal is unrealistic, and since early 2013, even Chinese analysts have begun to say the same thing. Given how ambitious these goals are, a slower realization of production targets would still be respectable. What the initial ambitious targets reflect is the high pressure for increased domestic gas production from environmental and energy security aspects, something that is getting harder for the government to ignore.

Smartphone apps that measure smog levels are now popular among people living in Beijing, making the air pollution levels a very public embarrassment and failure for the government. While it doesn't solve the country's wider environmental challenges, replacing coal with gas in urban areas is a major face-saving priority.

National Oil Companies

The far-reaching power of China's major national oil companies (NOCs) has been well documented, and the NOCs are key actors when it comes to unconventional gas as well. Among Chinese companies, they are best placed to develop China's shale resources and are in possession of most, if not all, of the country's promising shale acreage. This applies in particular to the Chinese National Petroleum Corporation (CNPC), which holds access to a majority of the currently known shale areas.

There is just one problem: China's NOCs are not particularly interested in developing shale gas in China. The main reason for this is the high number of other, more secure, gas projects these companies have in the pipeline. CNPC, which still monopolizes China's pipeline network, imports gas from several countries, most importantly Turkmenistan. CNOOC imports LNG from countries like Indonesia and Qatar. Conventional and offshore gas projects are ongoing in several areas in China. Furthermore, the NOCs prefer other unconventional sources like tight gas or coal bed methane to shale gas, as the deposits and extraction requirements are better understood. This is due to a longer history of development of CBM and better geological data.

Despite being state-owned companies, NOCs want to be profitable. Given the incomplete understanding of China's shale gas reserves, the quality of reserves and technology required for extraction, NOCs do not want to add a further financial risk to their balance sheets. The risks in gas are high due to the low gas price set by the government. CNPC currently loses 1RMB/m³ of gas it imports, which has significantly worsened its

³ *Financial Times*. 03.16.2013. <http://www.ft.com/cms/s/0/b7013e58-e31b-11e2-9bb2-00144feabdc0.html#axzz2ZrsBbgZK>

financial performance in recent years. According to Caixin, CNPC lost RMB42bn in 2012 and is estimated to sustain RMB60bn in losses in 2013.⁴ CNPC's ongoing complaint against this situation has led to recent government reforms on gas pricing, which could slowly alleviate some of the pressure on CNPC's budget.

One of the biggest misperceptions outsiders have about China is their belief in the central government's omnipotence. In reality, NOCs do not necessarily listen to the central government. This is why the government has been torn between liberalizing the gas sector and creating more competition for the NOCs and also acceding to NOC demands like price increases and subsidies. Many observers doubt the government's capacity to break CNPC's monopoly and break off sections of the company, but the fact that the topic is being openly discussed by government officials and academics is a sign of market reform pressures.

Utilities and Private Companies

The failure of the NOCs to deliver on shale gas development has led the government to both permit and encourage non NOCs to bid for licenses in the second round of shale gas auctions. The more diverse set of companies interested in shale gas exploration has included utilities, provincial government-backed energy companies and private equity firms. Utility companies are trying to secure access to gas supplies in anticipation of the government imposing higher gas use mandates. They

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hope that direct access to supplies will help them transition from coal and also avoid monopolies by CNPC. Private equity firms are attracted to the possibility of high returns seen by some investors in the US shale revolution, who made significant profits once firms found their "sweet spots". All these firms however are challenged by a lack of access to high quality acreage and an almost complete lack of experience in unconventional gas extraction.

The inability to compete effectively with the NOCs on access to land, financing and general regulatory approvals limits these other companies' ability to develop shale gas effectively. To compensate for their lack of expertise, these companies can hire specialized, often foreign service companies. However, only four companies – two NOCs and two provincial energy SOEs – currently have the ability to partner with international energy companies to help manage the entire shale gas exploration process.⁵ It is possible these opportunities could be widened in the future, but foreign access to China's shale gas sector might be stalled until after the first production

⁴ Caixin. 05.07.2013. <http://english.caixin.com/2013-05-07/100524719.html>

⁵ These are CNPC, Sinopec, Henan Coal Seam Gas, and China United Coal Bed Methane.

targets are missed in 2015.

The lack of experience of these companies also presents a dilemma for the central government. It wants to promote competition and innovation in shale gas. It needs both desperately if it wants to tackle China's specific geological challenges in this area. However, the diversification of players in the sector brings a wider set of risks than the NOCs entail. Specifically, the lack of experience means an increase in environmental risks. Authorities remain wary from the example of the surge in smaller players in China's coal sector that contributed to a high number of accidents and deaths. Moreover, some players attracted by potential financial gains are only interested in the stock price boost they receive from their initial involvement in shale gas. These companies reportedly are not actually investing the money they raise to actively pursue development in their fields.

Provincial Governments and Provincial SOEs

The potential windfall from shale gas development has encouraged provinces suspected of being rich in the resource to get more involved in the hopes of reaping a greater share of the benefits. Since oil and gas policy is decided at the national level and royalties are similarly paid to the central government, provincial and local governments have become creative. Their primary method is the establishment of local energy companies seeking a role in the development. This is an inefficient process common across many sectors (see for example the central government's struggle to consolidate local auto companies leading to overcapacity). These local SOEs have won some recent shale gas bids, but they also lack expertise for the actual exploration and development.

The central government has realized that provinces want access to these resource gains and is considering reforms to royalties that would pay part of the taxes to local governments. In addition, Prime Minister Li Keqiang has announced a number of areas in which project approval processes will be decentralized in the hope of making them more efficient.

The central government has realized that provinces want access to these resource gains and is considering reforms to royalties that would pay part of the taxes to local governments. In addition, Prime Minister Li Keqiang has announced a number of areas in which project approval processes will be decentralized in the hope of making them more efficient. At the moment, none of these areas cover shale gas, but they do impact coal bed methane projects. In the longer term, similar reforms could impact shale. Until then, provincial governments like Sichuan have demanded the local sourcing of labor and technology for shale projects in the hope of increasing their relative gains from shale development.

Civil Society, Academics and NGOs

Often underestimated due to their weak direct influence, civil society is becoming an increasingly important actor on environmental issues that in turn shape shale gas development in China. Environmental opposition in the United States and other countries against hydraulic fracturing is well

documented. The use of sometimes toxic chemicals in hydraulic fracturing and the higher number of drills and higher amount of water required for shale gas exploration and production has led to greater concerns about water pollution. Although the main shale development region of Sichuan does not suffer from water scarcity like northern China, pollution of drinking water or contamination of food sources have become quick triggers for public anger. While companies in the United States are finding safer chemicals to use during fracking, reducing their water intensity and increasing transparency on the extraction process, corporate environmental responsibility has been problematic in many Chinese industries.

Sichuan's tragic earthquakes in recent years could result in questions about the seismic risks of fracking, whether validated or not, leading to public protests. While awareness is still limited in China, environmental concerns have already been recorded.⁶ Mass protests against shale gas installations similar to the protests that prevented the building of a refinery in Yunnan in May 2013 are unlikely, but not impossible, if poor operating procedures result in wider water pollution.

Civil society's influence on shale gas development is indirect. Public pressure on air quality is a key driver promoting shale gas in the first place. The government's need to tackle environmental concerns has led to more open debate on environmental issues, and more open consulting with academics, NGOs and other experts. On environmental issues, local officials are poorly equipped to monitor or enforce environmental protection standards. In general, the NOCs are relied on to uphold good practices, with mixed results. For this reason, experts like Ma Jun have been allowed to monitor foreign companies and more recently domestic SOE environmental performance in China.⁷ International environmental groups are being actively consulted on regulations relating to shale gas. Overall, environmental concerns are provoking increasingly organized responses from the public, which is holding energy actors more accountable. This impact on policy-making is still limited or delayed, but the trend is increasing.

Pro-Market Reforms vs. Central Control

To replicate the U.S.'s success in shale gas development, China needs to do more than adapt U.S. shale technology to China's different geology. It needs a competitive environment that encourages entrepreneurial investors and innovators to lower costs and make shale gas development viable. The current Chinese government leadership needs significant political capital to take on established interest groups like the NOCs. Even if it is able to break or dilute the monopoly power of NOCs and diversify the type of

⁶ See article by Circle of Blue from December 2012 as an example: <http://www.circleofblue.org/waternews/2012/world/chinas-water-reserves-and-worlds-warming-atmosphere-wait-for-natural-gas-breakthrough/>. Local earthquake risks linked to fracking in China are also receiving coverage, for instance on Bloomberg in July 2013: <http://www.bloomberg.com/news/2013-07-31/china-fracking-quake-prone-province-shows-zeal-for-gas.html>

⁷ Journalist turned environmentalist Ma Jun has been particularly prominent for his open coverage of water and air pollution across China, receiving the Goldman Prize for his work in 2012: <http://www.goldmanprize.org/recipient/ma-jun>

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players working on shale gas, there is a risk that the system will not attract the quality entrepreneurs the sector needs.

The challenge of creating new opportunities without leaving the sector to destabilizing, short-sighted actors is something the new Chinese leadership faces in many aspects of its economy. However, the outlook is not all grim. China is successfully using its state monopolies to push forward with infrastructure - CNPC is building China's first shale gas pipeline. In addition, shale cooperation with foreign players is underway in China, most notably between Shell and CNPC. The agreements so far are limited in scope but could form the basis for more extensive cooperation. Many Chinese industry analysts feel confident the government will take away concessions from companies failing to develop them in line with commitments, even from NOCs.

On the question of the government's broader economic reform proposals expected later in 2013, Chinese observers are wondering if it will be a case of too little, too late, to save the country's economy from a hard landing. On shale gas however, China's potential remains significant, and reforms could spark significant gains in energy security and the long-term environmental outlook.

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About the Rising Powers Initiative and Sigur Center for Asian Studies

The Sigur Center's Rising Powers Initiative examines how domestic political debates and identity issues affect international relations in Asia and America's role. The Policy Brief series is sponsored by the Carnegie Corporation of New York.

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