



# Through the Dragon Gate?

## A Window of Opportunity for Northeast Asian Gas Security

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### Summary points

- In the coming decade, Northeast Asia will become a major market for gas, led by China, which plans to quadruple its gas demand by 2030.
- Securing stable and affordable imports will be essential to plans to reduce carbon intensity in China and Korea, and potentially to fill the gap left by the nuclear shut-down in Japan.
- Negotiations for piping Russian gas to China have remained in deadlock for a decade but new pipeline routes to take gas to South Korea through North Korea or China could move forward in 2013, with security implications for all sides.
- Several factors are altering the market context, including prospects for unconventional gas production in China and the potential for future supplies of liquefied natural gas (LNG) from East Africa and the United States.
- The next few months will be crucial for decisions on the entry of Russian pipeline gas to China. Missing the opportunity will deprive both countries of a win-win solution to their energy and development problems, and increase future global LNG prices.
- Closer collaboration between Russian and Chinese national oil companies and a gas-importers union between China, Japan and South Korea would support an equitable pipeline deal and lay the foundations for regional energy security.

## Introduction

China, Japan and the Korean peninsula will witness a phenomenal expansion of natural gas use in the next ten years. The patterns of trade that evolve in 2013 will define energy security relations in Northeast Asia for years to come, as permanent infrastructure is put in place and long-term contracts are agreed. The effects on price – of the region's uncertain liquefied natural gas (LNG) market in particular – will have significant implications for other gas exporters and importers, from Australia to the United Kingdom. Neighbouring Russia, with its massive East Siberian gas reserves, is the obvious supplier for the region and China its largest potential market.

‘ The patterns of trade that evolve in 2013 will define energy security relations in Northeast Asia for years to come ’

China plans to increase national gas consumption in the next two decades as it strives to reduce dependence on coal and cut greenhouse gas (GHG) emissions. In spite of ambitious plans to exploit domestic unconventional gas, China will increasingly rely on imports to meet projected demand. Russia meanwhile needs the guarantees of access to the Chinese market to develop its super-giant East Siberian gas fields. Most prominent have been negotiations between Russia and China to bring gas from Russia's Far East to China by pipeline, but these have repeatedly stalled over price and route. In this regard, a Sino-Russian deal or continued delay will dictate the future pattern of trade and energy security diplomacy.

However, decisions will not be taken in isolation from other regional political and economic dynamics. Since the Russian state oil and gas company Gazprom announced

its Asian gas policy in 1997, Russia has taken a systematic approach, aiming to export gas to China, South Korea (ROK) and Japan rather than being locked into a supply relationship with China alone. Alternative pipeline proposals remain on the table, including one from Russia to the ROK through North Korea (DPRK).

The last two years have witnessed a series of crises, each of which will affect gas diplomacy. The March 2011 Fukushima nuclear disaster in Japan led to the closing down of all nuclear power stations and subsequently a larger share of natural gas in Japan's energy mix. In December 2011, the sudden death of the DRPK's leader Kim Jong-il led to the suspension of any meaningful progress on Russia's proposal for a pipeline to bring gas to the ROK via the DPRK. The end of President Lee Myung Bak's term of leadership in the ROK led to a stasis in energy policy decision-making, expected to be reinvigorated following the 19 December 2012 election. Besides this, the various territorial disputes between Northeast Asian countries in recent months – not least in the South China Sea – could also significantly affect and be affected by the level and direction of Sino-Russian gas cooperation in the coming years.

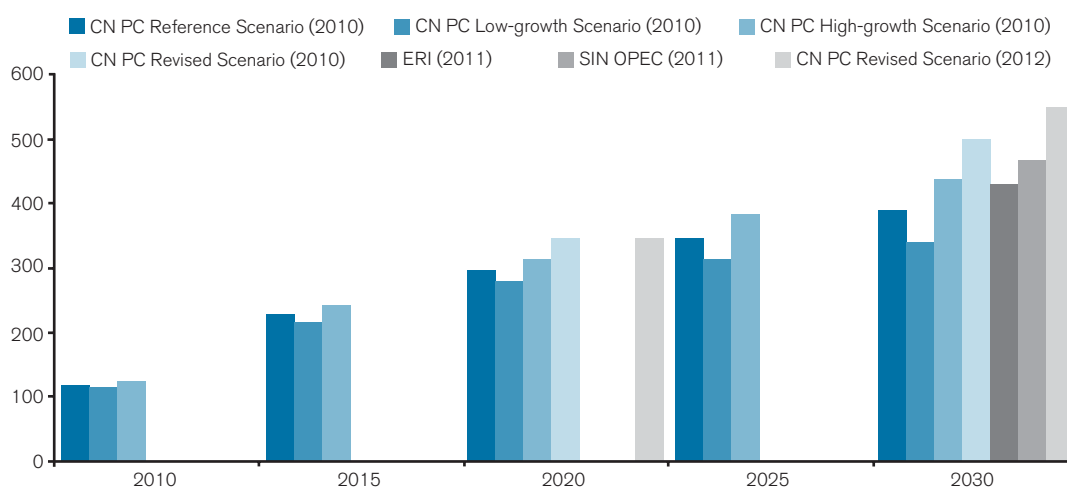
This paper sets out the complex relationship between the gas deals pursued between Russia and the Northeast Asian countries, the economic and political factors that have shaped negotiations, and the influence of recent developments in the region. The paper argues that there is a short window of opportunity for all parties to reach a win-win outcome.

## The growing Chinese demand for gas imports

Gas is of increasing importance in China as the government strives to reduce dependence on coal and cut GHG emissions. In 2011, China consumed 130 billion cubic metres (bcm) of natural gas – about 5% of the national energy mix – of which just one fifth was imported.<sup>1</sup> It now plans to increase the share of gas to 12% by 2030. If the

<sup>1</sup> 'CHINA: Natural gas consumption to rise from 130 bcm in 2011 to 550 bcm by 2030, says CNPC chief', *EnergyAsia*, 25 June 2012, <http://energyasia.com/public-stories/china-natural-gas-consumption-to-rise-from-130-bcm-in-2011-to-550-bcm-by-2030-says-cnpc-chief/>; Saltanat Berdikieva, 'China Turns to Natural Gas to Fuel their Economic Growth', *OilPrice.com*, 19 June 2012, <http://oilprice.com/Energy/Natural-Gas/China-Turn-to-Natural-Gas-to-Fuel-their-Economic-Growth.html>.

Figure 1: Gas demand projection, 2010 vs 2011 (bcm)



Sources: CNPC (December 2010, December 2011, June 2012) and author's database.

Note: For the 2010 projections, the growth rate of gas demand during 2010–30 is 6.1%, 6.4% and 5.6% respectively. In the reference scenario, natural gas demand accounts for 9.2% of the primary energy consumption in 2020 and 10% in 2030.

latest Chinese projections are realized, China will account for around one third of total global gas demand growth during this period.<sup>2</sup>

The China National Petroleum Corporation (CNPC), the Energy Research Institute (ERI) and the China Petrochemical Corporation (SINOPEC) project that Chinese gas demand will rise rapidly between now and 2030 – achieving an average growth rate of around 8% per year.<sup>3</sup> Figure 1 shows the upward revision of projections. Notably, CNPC's 2012 estimate of 550 bcm/y is much bigger than those of both ERI and SINOPEC. This suggests that the government will revise its own figures upwards, given CNPC's dominant status in Chinese gas production.

This jump can be explained by the Ministry of Housing and Urban Development's National Town Gas Development Plan (2011–15). This envisages providing gas supplies to over 94% of rural areas and more than 65% of urban areas, thereby doubling town gas volumes by the end of 2015 (to around 178.2 bcm).<sup>4</sup>

China must meet a growing gap between domestic gas resources and demand. Assuming that total demand will be 550 bcm/y by 2030, China will rely on existing and under-construction pipelines from Central Asia and Burma (Myanmar), but these, together with current levels of domestic production, can only supply at most 40% of demand. The remainder will have to be met through a combination of LNG, Russian pipeline gas and new domestic reserves of unconventional gas – all of which currently hang in the balance.

It is not clear at this stage how big a contribution China's domestic production, including conventional gas, coal-bed methane (CBM) and shale gas will make. If the government's recent projection of 450 bcm by 2030 (see Box 1) is realized, this would alleviate the need for volumes from Russia altogether by 2030. However, a combination of factors – political, geological and economic – could mean China falls well short of its production goals. According to one study, even with unconventional gas growth up to 150 bcm/y by 2030, China may still require over 130 bcm/y of as yet uncontracted imports over this period.<sup>5</sup>

2 Based on the CNPC figure of 550bcm of gas demand in 2030 and figures from International Energy Agency, *World Energy Outlook 2012: New Policies Scenario between 2010 and 2030*. The IEA projection for China is only 435bcm by 2030.

3 Xu Yongfa, president of CNPC Economics and Technology Research Institute (ETRI), as quoted in Interfax, *China Energy Weekly*, 27 February–2 March 2012, p. 8.

4 See Liu Yanan, 'China's town-gas supply to reach 178.2 bln cu.m by 2015', *China OGP*, 1 August 2012.

5 'China: Wood Mackenzie Says Shale Gas Will Not Satisfy Demand, Requiring CTG and 130bcm of Additional Imports by 2030', Wood Mackenzie, press release at World Gas Conference, Kuala Lumpur, 6 June 2012, <http://www.woodmacresearch.com/cgi-bin/wmprod/portal/corp/corpPressDetail.jsp?oid=10598941>.

### Box 1: China's uncertain plans for domestic gas production

In 2011, China produced around 103 bcm of natural gas. The government has signalled its commitment to minimize import dependence by developing domestic resources, both conventional – particularly offshore in the South China Sea – and unconventional – chiefly coal-bed methane (CBM) and shale gas.

In November 2012, the Ministry of Land Resources raised its projection for natural gas production in 2030 by 50% over 2011 figures – from 300 bcm to 450 bcm.<sup>6</sup> However, the projection rests on rapid exploitation of unconventional gas reserves.

Current NDRC plans envisage 21.5–23.5 bcm/y of CBM production by 2015 and 6.5 bcm/y of shale gas by 2015, with shale gas production then rapidly rising to between 60 and 100 bcm/y by 2020.<sup>7</sup> However, China's complicated geological structure, limited infrastructure in the remote gas basins, limited water supply capacity and distorted gas price regime all suggest that unconventional exploitation will take longer than expected.<sup>8</sup>

A total of 300 bcm of domestic production by 2030 remains a more practical and still optimistic target.

The prospects suggest that substantial volumes of gas will need to be imported by LNG shipments and pipelines, particularly between 2015 and 2030, before unconventional gas is fully developed.

## Russia's interests in accessing the Asian gas market

For Russia, China's escalating gas demand presents an unparalleled new market opportunity for its Far Eastern gas production.

Russia's Energy Strategy aims at sending 20% of its natural gas exports to the Asia-Pacific market by 2030.<sup>9</sup> As of 2012, the only gas exported eastwards came from the 9.6 million tonnes per year (mt/y) (13 billion cubic metres) of Sakhalin LNG – mainly destined for Japan. For Russia to achieve large-scale gas export to Asia, it needs to start developing the super-giant onshore gas fields in East Siberia without delay. But to do this requires securing a market of sufficient size to justify the infrastructure costs.

China is therefore an essential part of the picture but the Russian government is keen to avoid being locked into

a relationship with it as the single dominant customer. Russia has therefore pursued a number of LNG and pipeline options that could expand trade with other Asia-Pacific Economic Cooperation (APEC) countries as well as penetrate the Chinese market. Map 1 shows the various sources of Russian gas earmarked for Asian markets and transit routes under consideration.

Map 1 shows the four main gas supply sources for Russia's gas exports to Asia: Sakhalin Island, the Sakha Republic (chiefly the Chayanda field), the Irkutsk region (chiefly the Kovykta field) and West Siberia. The earliest production date that Gazprom has projected for the onshore Siberian fields is 2016, but 2017–18 currently looks more realistic. In Sakhalin Island, only the Sakhalin II project is currently producing LNG (9.6 mt/y). The Sakhalin I project and Sakhalin III project's Kirinskoye block and Yuzhno-Kirinskoye block are in preparation for production but require more exploration. Gazprom aims to start 4–5 bcm/y of gas production from Sakhalin III from 2014.

As Map 1 shows, Russia's Eastern Gas Programme aims to combine two trunk pipelines – Sakhalin-Khabarovsk-Vladivostok and Sakha Republic

6 Michael Lelyveld, 'China Ups Gas Forecast', *Radio Free China*, 12 November 2012, [http://www.rfa.org/english/energy\\_watch/forecast-11122012112847.html](http://www.rfa.org/english/energy_watch/forecast-11122012112847.html).

7 Huang Xiaolan, 'China eyes unconventional gas boom in next 5 years', *China OGP*, 15 December 2011, pp. 7–10; Li Xiaohui, 'China CBM industry to see booming development in 2011–15', *China OGP*, 1 June 2011, pp. 7–9; Leslie Hook, 'Chinese group flock to shale gas projects', *Financial Times*, 25 October 2012.

8 See, for instance, the comments of Lin Boqiang at the World Economic Forum in Tianjin. Du Juan, 'Experts: Despite China's efforts, technology constraints could curb shale gas development', *China Daily*, 28 September 2012, [http://www.chinadaily.com.cn/china/2012-09/28/content\\_15790059.htm](http://www.chinadaily.com.cn/china/2012-09/28/content_15790059.htm).

9 Keun-Wook Paik, *Sino-Russian Oil and Gas Cooperation: The Reality and Implications* (Oxford: Oxford University Press, 2012), pp. 93–95.

Map 1: Russia's Eastern Gas Programme



Source: Adapted from Gazprom. Reserves adjusted based on Rosneft and ExxonMobil figures.

(Chayandagas)-Khabarovsk-Vladivostok – to bring more gas eastwards.<sup>10</sup> Gazprom plans to export 10 million tonnes a year (mt/y) (14bcm/y) of LNG from Vladivostok – chiefly to Japan – by 2020, with the potential to send more to ROK, China and beyond.

Gazprom is also under significant political pressure to develop East Siberia and Russia's Far East. Immediately after the presidential election in March 2012, President Vladimir Putin urged the company not to ignore the exploration and development of gas resources there. He said that Russia should try to gain a significant share

of the global LNG market, focusing first on supplies to promising Asian markets.<sup>11</sup> Gazprom then announced that it would draw up an investment study for Vladivostok LNG in the first quarter of 2013, stating that it considers 2017–20 the 'most favourable period' for targeting Asia.<sup>12</sup> But there is clearly tension between the political priority and the commercial logic. In late October, Putin urged Gazprom Chief Executive Officer Alexei Miller to ensure that work on the trunk gas pipeline from the Chayanda field in Sakha Republic to Vladivostok began 'as quickly as possible'.<sup>13</sup>

10 For a detailed review of Gazprom's Asian policy, see Paik, *Sino-Russian Oil and Gas Cooperation*.

11 Andrei Glazov, 'Putin tells Gazprom to get more efficient, expand LNG ops', *International Oil Daily*, 27 March 2012, [http://www.energyintel.com/Pages/Eig\\_Article.aspx?DocId=760580](http://www.energyintel.com/Pages/Eig_Article.aspx?DocId=760580).

12 'Gazprom nurtures upstream ambitions', *World Gas Intelligence*, 28 March 2012. [http://www.energyintel.com/Pages/Eig\\_Article.aspx?DocId=759782](http://www.energyintel.com/Pages/Eig_Article.aspx?DocId=759782).

13 'Putin tells Gazprom to start building Chayanda – Vladivostok pipeline soon', *Kyiv Post*, 30 October 2012, <http://www.kyivpost.com/content/russia-and-former-soviet-union/putin-tells-gazprom-to-start-building-chayanda-vladivostok-pipeline-soon-315250.html>; Gleb Bryanski, 'Gazprom unveils \$38 billion gas project to conquer Asia', *Reuters*, 29 October 2012, <http://www.reuters.com/article/2012/10/29/us-gazprom-vladivostok-idUSBRE89SOTN20121029>.

The questions for Russia are how much gas will be able to be marketed as LNG, given that the price may not be competitive enough for China's subsidized domestic market, and what volume of sales can be secured through pipeline contracts.

## Sino-Russian gas cooperation and the price deadlock

In 2006, Russia agreed in principle to supply China with 68 bcm of its gas over 30 years. However, negotiations between the two parties for a deal to establish the necessary pipelines have been frustrated by disagreements on the linked issues of price and whether to prioritize a western pipeline into Xinjiang or an eastern pipeline into northeastern China.

National development and geopolitical aspirations underpin the position of each party. China wants Russian gas primarily to supply its northeastern provinces of Heilongjiang, Jilin and Liaoning. The influential deputy chairman of China's National Development and Reform Commission (NDRC), Zhang Guobao, made his country's position clear when he said that 'an increase in gas deliveries to Xinjiang is not so important for China [...] concerning the eastern route, it is intended to deliver gas to north-eastern China which has a population of over 100 million, and which is experiencing serious gas shortages. Gas shipments via an eastern gas pipeline may solve the problem of gas shortage.'<sup>14</sup> Map 2 shows the role of gas in each region.

Russia favours prioritizing the 'Altai route' from its West Siberian gas fields to western China, which would enable Gazprom to divert its surplus European volume to China. This would effectively make Russia a 'swing supplier', increasing its ability to use gas as a political bargaining tool with countries such as Ukraine. Gazprom has tried to gain access to China's West-East Pipeline (WEP) corridor through a joint investment proposal in the past, but to no avail (see Box 2).

Map 2: The role of natural gas in China's current provincial energy mix



Source: Interfax, *China Energy Weekly*, 28 November–2 December 2011, pp. 26–28.

### Box 2: The WEP corridor and Russia's opportunities for entry to the Chinese gas market

The West–East Pipeline (WEP) corridor consists of WEP I, II and III (see Map 3) and is the main system of gas delivery to China's eastern and southern markets. WEP I takes gas from Lunnan in Xinjiang Uygur Autonomous Region to Shanghai. WEPs II (completed in 2012) and III (CNPC began construction in October 2012) will connect with the Turkmen–Uzbek–Kazakh Pipeline, with WEP III also taking 5 bcm/y of Xinjiang gas. Two more lines, WEP IV and V, are planned to run in parallel with II and III from Xinjiang to China's east coastal provinces, thus increasing the maximum volume of western gas imports to 120 bcm/y (30 bcm/y x 4). Construction on these lines is planned to begin before 2016.

During 2002–03, Gazprom (as a member of a consortium with Shell and Exxon) attempted to penetrate the Chinese market through joint-venture negotiations with PetroChina over the construction of WEP I. Gazprom's aim was to connect this pipeline with its Altai route. Had it succeeded, it would have benefited by gaining entry into the Chinese market with its own supply source. However, PetroChina rejected the proposal in 2004 and instead completed the line to transport its domestic supplies from the Tarim Basin.

14 'Russia, China remain at odds over gas pipeline routes' *China Energy Weekly*, Interfax 30 September–13 October 2010, pp. 11–12.

For Russia, China's three northeastern provinces offer only a 20 bcm/y gas market, whereas at least 30 bcm/y would be needed to justify the development of an eastern pipeline.

While Gazprom announced in September 2010 that a legally binding agreement had been reached with CNPC setting out the commercial parameters for deliveries through the 'western route', no agreement on the border benchmark price for Russian gas deliveries has been reached to date.<sup>15</sup> According to Zhang, Russia had proposed a price of over \$300 per 1,000 cubic metres, far above the price of \$200–210 for Central Asian gas.<sup>16</sup> Neither a Sino-Russian summit in June 2011 nor an official visit to Beijing by Putin succeeded

in eliminating the price gap, which would appear to remain around \$100/1,000 cm.

### Russia's 'Korea card'

Russia has pursued a policy of negotiating separately with each of the Northeast Asian states regarding pipeline options. In early August 2004 Gazprom informed the Korean Gas Corporation (Kogas) that it would not support the gas pipeline to Korea through Dalian in China, crossing the Yellow Sea, as had been proposed following a three-party feasibility study.<sup>17</sup> Rather, Russia led negotiations to supply South Korea with gas from

Map 3: China's pipeline network



Source: Keun-Wook Paik, *Sino-Russian Oil and Gas Cooperation: The Reality and Implications* (Oxford : Oxford University Press, 2012), p. 239.

15 'Gazprom and CNPC sign extended major terms of gas supply from Russia to China', Gazprom press release, 27 September 2010, <http://www.gazprom.com/press/news/2010/september/article103507/>; 'CNPC, Gazprom expand terms of gas delivery contract', *China Energy Weekly*, 16–30 September 2010, p. 16.  
 16 'Russia, China remain at odds over gas pipeline routes', *China Energy Weekly*, 30 September–13 October 2010, pp. 11–12.  
 17 Ki-hyun Kim, 'Details materializing for Siberian Pipelines through East Sea', *Dong-Ah Ilbo*, 5 August 2004.

Sakhalin I via a pipeline running through North Korea, thus circumventing China (see Map 4).<sup>18</sup> Though the original scheme foundered owing to reluctance on the part of the North Korean leadership, the idea was revived by Russia and South Korea in September 2008. In early November 2010 Alexei Miller announced that Gazprom would supply no less than 10 bcm/y of pipeline gas to South Korea starting in 2017, and in March 2011 the DPRK's Ministry of Foreign Affairs expressed its interest in reviewing the proposal to develop a transit pipeline between Russia and South Korea.<sup>19</sup>

‘ For Russia, the idea of a North–South Korean pipeline fulfils a number of functions ... One is the political clout that Russia would gain in the region ’

While this scheme to export gas to South Korea without crossing Chinese territory may seem to have been proposed as an alternative to the deadlocked price negotiations between Russia and China, the two are in fact inextricably linked, and each serves specific political ends. For the governments of both North and South Korea, the pipeline through the Korean peninsula emerged as a factor in the constantly fluctuating political situation. In the first half of 2003, the United States also reviewed the option of a pipeline to the ROK through the DPRK as a means of resolving the latter's nuclear crisis in return for gas from ExxonMobil's project in Sakhalin I. The North Korean Ministry of Foreign Affairs' interest in Russia's renewed proposal to pipe gas to South Korea via the DPRK was facilitated by the absence of any conditions from either

of these countries for North Korea to cease its nuclear weapons programme.

Both sides also recognized the benefits of reciprocity implicit in this scheme. On the one hand, the pipeline was overtly cited as a way for North Korea to reach out to South Korea in the wake of the political impasse following the attack by a DPRK submarine on the ROK naval ship *Cheonan* in March 2010.<sup>20</sup> On the other, the scheme was used as an incentive by South Korea's president Lee Myung-bak to improve North–South relations before the end of his presidency. However, the death of Kim Jong-il in December 2011 caused the initiative to lose momentum as Kim Jong-un became preoccupied with justifying his succession.

For Russia, the idea of a North–South Korean pipeline fulfils a number of functions apart from facilitating exports of gas to South Korea. One is the political clout that Russia would gain in the region. Russia would increase its influence in the Six-Party talks to resolve the issue of North Korea's nuclear weapons, and thereby restore some of its former status as a superpower in East Asia. More immediately, the scheme is a way for Russia to put pressure on the Chinese in the negotiations for exports to China, and so to break the price deadlock. The failed negotiations between the two countries in June 2011 were immediately followed by an intensification of talks about implementing the Korean pipeline scheme: Kogas CEO Kang-Soo Choo and Gazprom deputy CEO Alexander Ananekov met in Khabarovsk in early July 2011, and the latter visited Pyongyang where he met the DPRK's oil industry minister Kim Hui-Young to discuss cooperation on oil and gas and other bilateral issues later the same month.<sup>21</sup> The proposals for a pipeline through North Korea, and its relative likelihood at different times, must therefore be viewed in the context both of other potential energy deals and of the shifting political context in East Asia.

18 Keun-Wook Paik, 'Natural Gas in Korea', in Jonathan Stern (ed.), *Natural Gas in Asia: The Challenges of Growth in China, India, Japan, and Korea* (Oxford: Oxford University, 2008), pp. 201–08.

19 Yong-Hyun Ahn 'DPRK "Review on Russia's transit gas pipeline to the South" 1st Interest Expression', *Chosun Ilbo*, 19 March 2011.

20 Ibid.

21 Joao Peixe, 'Gazprom in North Korea for Energy Cooperation Talks', *OilPrice*, 12 July 2011; 'Gazprom's delegation pays a visit to North Korea', Gazprom press release, 6 July 2011, <http://www.gazprom.com/press/news/2011/july/article114897/>; 'Alexey Miller and Kim Hui Yong discuss implementation of project for gas transmission from Russia to Korean Peninsula', Gazprom press release, 15 September 2011, <http://www.gazprom.com/press/news/2011/september/article119229/>.



## China's counter-bid: the Weihai option

Partly in response to Russia's proposal for the North Korean pipeline, China suggested the option of an undersea pipeline from its Shandong province to South Korea. This would come down from the northeast and go through Beijing, as shown in Map 4. During a meeting between the Korean National Oil Corporation (KNOC) president Kang Young-won and CNPC chairman Jiang Jiemin in Beijing in February 2012, the latter made explicit this alternative to the Russian DPRK route, saying: 'Getting Russian gas through an undersea gas pipeline from Weihai, Shandong, to South Korea is deemed more stable and economical than through North Korea for South Korea.'<sup>22</sup>

Map 4: Russian versus Chinese pipeline proposals



Source: Adapted from China National Petroleum Corporation map published in 'Korea considers undersea gas pipeline via China', *Korea JoongAng Daily*, 23 March 2012.

For Russia, this option would help to justify a pipeline to northeastern China because of the combined East Asian market it could supply, offering, at a minimum, a

market for 30 bcm/y from China and 10 bcm/y from South Korea. A single pipeline route with a market for 40 bcm/y could better justify a greenfield development and a long-distance trunk pipeline development from East Siberia to northeastern China. If the pipeline is extended from South Korea to southern Japan (assuming a 5 bcm/y gas market can be provided), it could introduce at least 45 bcm/y gas market for Russia.

This is an attractive offer for both Russia and South Korea as long as a mutually acceptable gas price is agreed. From China's perspective, the Weihai option would bring an eastern pipeline into its territory where it could also supply the provinces of Heilongjiang, Jilin and Liaoning. Furthermore, it would avoid increasing Russia's influence in the Korean peninsula, which a pipeline through North Korea would entail.

In the ROK, there is no consensus among energy planners and advisers over which proposal would bring greatest national benefit, and thus no clear policy on how the country should balance Russia and China in securing its energy supplies. For example, Jin-Woo Kim, president of the Korea Energy Economics Institute (KEEI), has come out in favour of the proposal, arguing that the Yellow Sea route should be studied separately from the North Korean pipeline route. In a newspaper article, he gave three reasons why the pipeline gas extension from China would turn South Korea into Northeast Asia's gas trading hub; it would help develop a loop pipeline network that would minimize the risk to energy supply security entailed in Russian gas being supplied to via the DPRK; and it would also help Russia's Far East economic development and pipeline gas exports.<sup>23</sup> The North Korean route, on the other hand, has been advocated by Kim Tae-Yoo, who was a science and technology adviser to former President Roh Moo-hyun; he argues that a Russian pipeline from Vladivostok passing through North Korean territory would help bring stability to the Korean peninsula.<sup>24</sup>

In the meantime, the ROK is pursuing an alternative gas supply that may well reduce the market for Russian

22 Cheong Yong-whan, 'Korea considers undersea gas pipeline via China', *JoongAng Daily*, 22 March 2012, <http://mengnews.joinsmsn.com/view.aspx?gCat=030&ald=2950386>.

23 Jin-Woo Kim, 'Russian gas pipeline, if delivered via China', *JoongAng Daily*, 4 April 2012.

24 According to author's interview with KEEI gas specialist Ki-Joong Kim, the targeted US LNG volume by 2020 is 8 mt/y. See also Kim Tae-Yoo, 'The reason that gas pipeline gas to pass through DPRK', *JoongAng Daily*, 3 July 2012.

supplies altogether, thereby undermining the additional Korean demand on which an eastern pipeline depends. In May 2012 the Ministry of Knowledge Economy set up a shale taskforce (led by deputy minister Seok Cho) to devise strategies for overseas shale investment. KNOC and Kogas are also seeking to purchase shale assets in North America with the aim of importing over 8 mt/y of LNG by 2020. Once this initiative is aggressively promoted, in parallel with Kogas' existing contract for 3.5 mt/y of LNG imports from Sabine Pass in the United States from 2017,<sup>25</sup> it will provide South Korea with some leverage in negotiations over Russian gas, whether supplied by LNG or via pipeline from Vladivostok.

### Increasing exports to the Japanese market

As prospects for progress on Sino-Russian gas cooperation decline, the possibilities for Russia to expand exports to Japan have become more attractive. Japan's gas market is significant: as of 2010 Japan generated 1,080 Terawatt hours (TWh), 27% from coal, 27% from gas, 27% from nuclear, 9% from oil, and 7% from hydro. The meltdown at the Fukushima Daichi nuclear power plant caused by the earthquake and tsunami of March 2011 led Japan to revise its energy policy, and its last working nuclear reactor was switched off in May 2012.<sup>26</sup> To make up the deficit in fuel for power generation, Japan is set to increase its LNG imports drastically in coming years.

On 25 June 2012 Japan agreed a memorandum of understanding with Russia on the supply of LNG from Vladivostok. Russia also hopes to export LNG to other countries in East Asia and was expected to outline

specifics of the Japanese investment by the end of 2012. The Vladivostok LNG facility could start operating as early as 2018, with an annual output of 5 mt, rising to 10 mt by 2020.<sup>27</sup> In principle, Japan supports two LNG projects in the region – a third train at Sakhalin-2 and a new liquefaction facility in Vladivostok. However, while Gazprom will eventually be able to supply enough gas for both projects, they will be competing for feedstock until the final decision on East Siberian gas development is made.

Gazprom is not ruling out pipeline gas supply to Japan. On 3 May 2012, it said it was considering such deliveries and raised the prospect in a meeting with a Japanese parliamentary delegation in Moscow.<sup>28</sup> After the talks with Gazprom, Seiji Maehara, a representative of the Democratic Party of Japan and a former foreign affairs minister, said that Tokyo was considering options for the construction of a gas pipeline stretching from Russia to Japan as an alternative to LNG supplies.<sup>29</sup>

In early November a Japanese energy and steel consortium announced plans to build a 1,400-km gas pipeline from Russia's Sakhalin Island to Tokyo Bay which could be completed in five to seven years.<sup>30</sup> However, the introduction of pipeline gas from Sakhalin Island to Hokkaido and northern Japan would require the blessing of the powerful Ministry of Economy, Trade and Industry (METI), which supervises Japan's energy sector. Considering that a feasibility study for this option conducted by Texaco at the end of 1990s got a cold reception from the Japanese utilities despite the positive results on both technical and commercial aspects, METI's role in pipeline option review will be pivotal. However, the likelihood of Japan importing

25 '美에 셰일가스 회사 세워 직접 개발' [Shale gas firm set-up in the US and pursuing direct development], *Dong-Ah Ilbo*, 4 August 2012, [http://news.donga.com/Economy\\_List/3/01/20120804/48334013/1](http://news.donga.com/Economy_List/3/01/20120804/48334013/1); 'S. Korea, British Columbia Sign Energy MOU', *LNG Intelligence*, 30 August 2012, [http://www.energyintel.com/Pages/Eig\\_Article.aspx?mail=PA\\_html\\_117\\_885&DocId=778688](http://www.energyintel.com/Pages/Eig_Article.aspx?mail=PA_html_117_885&DocId=778688).

26 'Tomari shutdown leaves Japan without nuclear power', BBC News, 25 May 2012, <http://www.bbc.co.uk/news/world-asia-17967202>.

27 Takashi Fukuyama, 'Japan, Russia to cooperate on LNG project in Vladivostok', *Asahi Shimbun*, 25 June 2012, <http://ajw.asahi.com/article/economy/business/AJ201206250049>.

28 'Russia considers gas supply to Japan via pipeline', Reuters, 3 May 2012, <http://uk.reuters.com/article/2012/05/03/gazprom-japan-idUK-L5E8G3FXZ20120503>; 'Gazprom and members of Japanese Parliament discuss prospects for gas supplies buildup', Gazprom press release, 3 May 2012, <http://www.gazprom.com/press/news/2012/may/article134543/>.

29 'Gazprom seeks to up sales to Japan', *Oil Daily*, 7 May 2012, [http://www.energyintel.com/Pages/Eig\\_Article.aspx?DocId=765336](http://www.energyintel.com/Pages/Eig_Article.aspx?DocId=765336).

30 Tim Dais, 'Japan Scrambles the Planet Looking for Gas Deals', *Energy Tribune*, 3 December 2012. <http://www.energytribune.com/66738/japan-looking-for-gas>.

Table 1: Summary of agreements for pipeline gas to China

Source country	Announced volume (bcm/y)	Announcement time and follow-up
Turkmenistan	65	In 2006 China and Turkmenistan agreed to construct a long-distance gas pipeline. In 2011 China and Turkmenistan agreed to increase the volume from 40 bcm/y to 65 bcm/y. The volume is estimated at 24 bcm for 2012.
Uzbekistan	25	In 2007, China and Uzbekistan agreed to construct the Uzbek section of the Central Asia-China Gas Pipeline, with 30 bcm/y capacity. In 2010 Russia's Lukoil indicated that it could start to supply 10 bcm/y of gas to China. Gas export started in August 2012. The volume is not known
Kazakhstan	10	In 2007, China and Kazakhstan to construct the Kazakh section of Central Asia-China Gas Pipeline. In 2010, the construction of a separate west Kazakh-China gas pipeline began. Export expected from 2012/13.
Russia	68	In 2006, China and Russia agreed to construct two major gas pipelines, one with 30 bcm/y capacity via Altai route into western China, the other with 38 bcm/y via an eastern route, once the gas price is agreed. No final agreement on gas price as of 2012.
Burma (Myanmar)	10–12	Construction began in 2011, expected completion in July 2013.

pipeline gas from Sakhalin Island will be improved if Sakhalin III's gas reserves are significantly increased.

### The prospects for Russian penetration of the Chinese gas market

Despite the priority that Russia is giving to LNG exports elsewhere in the region, its ultimate and prime gas export market in Asia is China. However, it is not a given that Russia will be able to penetrate the Chinese market to the extent that it hopes. China has so far signed agreements for 110 bcm/y of pipeline gas. Some volumes are already being delivered, and more are expected to begin in 2013 with the full volumes expected to flow by 2025 (see Table 1). To secure its share of the market, Russia must gain access to the WEP corridor, China's main gas distribution system (see Box 3). WEP II and III are already allocated for pipeline gas from the Central Asian states. Even if delivery of 30 bcm/y of gas from Altai is agreed between Russia and China, it cannot be exported to China until WEP IV or V is constructed. As this would make Russia a swing supplier between Europe and Asia, Chinese planners are determined to first secure Russia's eastern Siberian gas before giving the go-ahead for the Altai connection.

China is set to expand its LNG supply very rapidly. As of 2012, five LNG terminals were already in operation,

and four more are under construction. The total LNG receiving capacity for the nine terminals will be initially around 29 mt/y (41 bcm/y) and ultimately as high as 52 mt (74 bcm/y).<sup>31</sup> If the NDRC approves the 8–10 additional proposals for LNG terminals, the scale of LNG supply to China could be massive. However, China's national oil companies (NOCs) are sensitive about the price of imported LNG owing to the country's subsidized domestic gas price system and will naturally prioritize domestic sources or pipeline contracts wherever possible. Box 3 gives an overview of the current price situation.

China's national oil companies are sensitive about the price of imported LNG ... and will prioritize domestic sources or pipeline contracts wherever possible

Global prices are also a concern for Russia. Vladivostok LNG will ultimately have to compete for Asian markets against a number of other sources. The indications are

31 Paik, *Sino-Russian Oil and Gas Cooperation*, Chapter V, LNG section.

### Box 3: Chinese domestic gas pricing and the difference between LNG and pipeline prices

The Chinese government fixes natural gas prices for domestic sale well below cost. The last intervention was a 25% rise in June 2010, which brought the wellhead price the equivalent of \$4.69/million British thermal units (MMBtu).<sup>32</sup> State oil and gas companies are pressuring the government for reforms to increase the commercial viability of both current and planned imports and more expensive unconventional production. PetroChina claimed to have lost 元 21 billion (\$3.3 billion) on LNG imports and Turkmen pipeline imports from Turkmenistan, which stood at \$10.33/mmbtu in January.<sup>33</sup>

At the moment, long-term LNG contracts are reasonable in this context: China paid \$4.3/MMbtu of Indonesian LNG and \$3.2/MMbtu for Australian LNG in January 2012, according to data released by the General Administration of Customs (GAC). But costs have risen and suppliers are pushing for much higher prices linked to the price of crude oil, particularly in the wake of additional competition from Japan which has been paying \$16-17/mmbtu for its LNG imports.

Looking forward, China's coastal provinces can afford to take the LNG at higher prices but its inner provinces cannot. Even in coastal provinces, LNG for power will be too expensive if the imported price is over \$10/MMbtu; China can only afford LNG use for power generation if the price remains around \$7-8/MMbtu.

With respect to domestic price reforms, the government fears the effect of associated inflation on the economy and is taking a cautious approach. In December 2011, the NDRC announced it would liberalize wellhead prices for domestically produced coalbed methane, shale gas and coal gas, although transmission costs will remain fixed for the time being. It is also conducting a pilot scheme to link domestic natural gas pricing to imported fuels in the regions of Guangdong and Guangxi with the intention of eventually rolling this out nationally.<sup>34</sup>

that it may well not be competitive, especially for a price-constrained Chinese market.<sup>35</sup>

While the cost of LNG to China is increasing relative to the current long-term contracts with Australia, Indonesia and Malaysia signed between 2002 and 2006, a number of factors are likely to depress prices in the long term.

China's vast unconventional gas reserves and multiple channels for pipeline imports give it more flexibility than other Asian importers such as Japan, South Korea and Taiwan, and gas-on-gas competition may eventually put downward price pressure on LNG as it has done in the United States. Furthermore, Chinese NOCs have been

investing in shale gas-based LNG development from North America. At the moment, trade barriers prevent US LNG being sold to countries that have not signed free trade agreements with the United States, but if barriers come down and permits are acquired, these cheaper LNG imports could lower China's costs, replacing expensive Australian LNG.

Another challenge for Vladivostok LNG will come from the LNG supplies from East Africa. The recent offshore gas discoveries in Tanzania and Mozambique could total almost 100 trillion cubic feet (see Map 5). Their prime location in relation to Asian markets and current investment commitments strongly indicate that

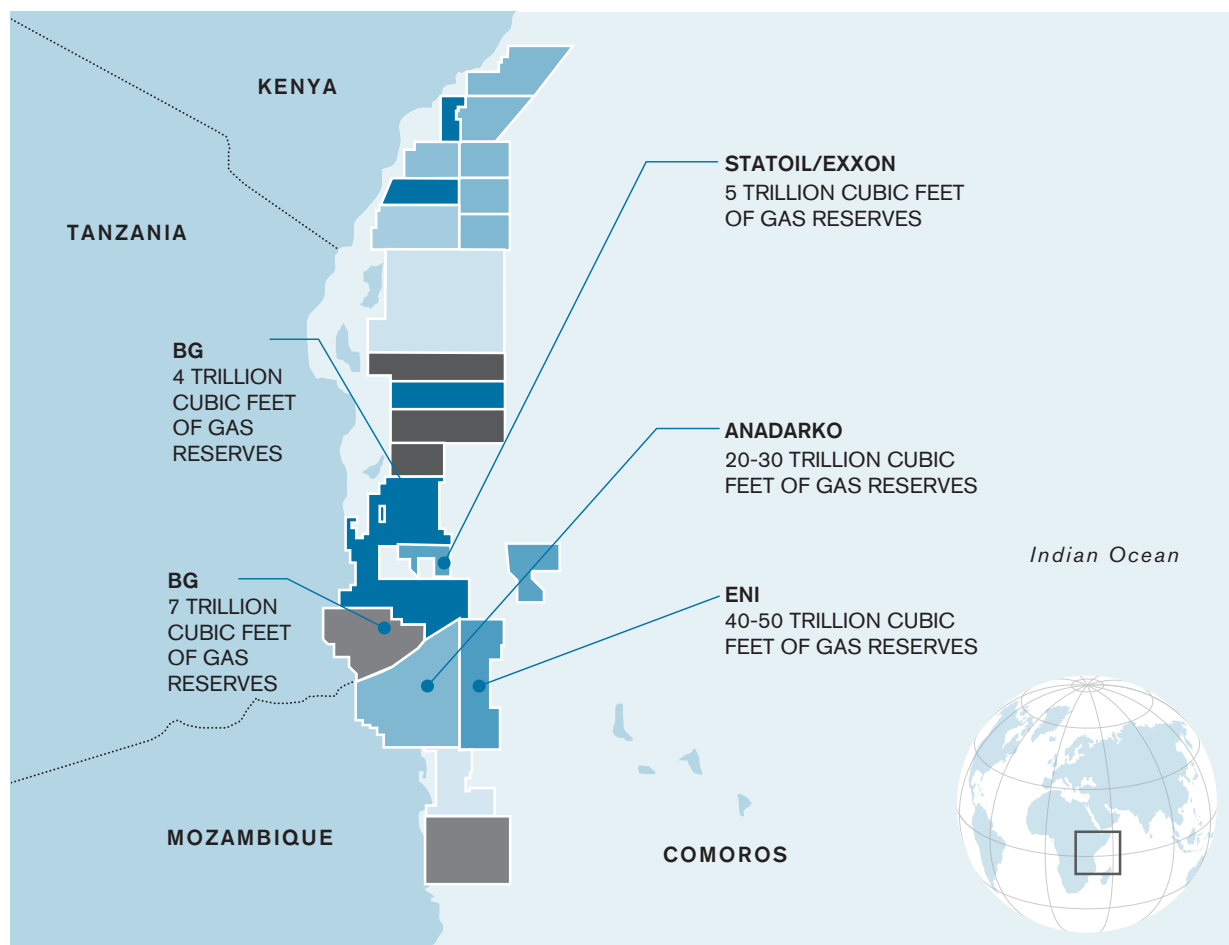
32 Yen Ling Song, 'China's Domestic Natural Gas Production Throttles Back', Platts, 21 May 2012. [http://blogs.platts.com/2012/05/21/at\\_the\\_wellhead\\_14/](http://blogs.platts.com/2012/05/21/at_the_wellhead_14/).

33 'Mixed outlook from experts on China's future LNG gas bill', *China Energy Weekly*, 27 February–2 March 2012, pp. 9–10; Yen, 'China's Domestic Natural Gas Production Throttles Back'.

34 'China reforms shale gas price, pilots new scheme', Reuters, 27 December 2011, <http://www.reuters.com/article/2011/12/27/china-gas-pricing-idUSL3E7NR3UR20111227>.

35 According to Denis Borisov of Moscow's Nomos Bank, the costs of the Chayandinksoye pipeline mean Gazprom will have to sell it for the same price it gets in Europe – close to \$500 per thousand cubic metres, or roughly \$13.90 per million Btu – if the scheme is to be financially viable. See 'Price problems dog Gazprom's Asia push', *World Gas Intelligence*, 31 October 2012, p. 4.

Map 5: East African gas fields



Source: Adapted from Matt Chambers, 'East Africa emerges as potential competitor for Australia's LNG exports', *The Australian*, 11 July 2012.

large-scale LNG supplies from to Asia will be a reality before the 2020.<sup>36</sup>

However, if Russia and China make a breakthrough agreement on price and route prioritization, it will have an impact on the global gas market. A deal to bring 68 bcm/y of gas exports from Russia to China by 2030 would make a solid contribution to the latter's future energy security. Large-scale pipeline volumes from Russia to China will help reduce the inflated premium attached to LNG heading for Northeast Asian markets, in particular China. Optimizing the price will then facilitate LNG expansion in other parts of

Northeast Asia and strengthen the role of Northeast Asian LNG buyers in the global gas market.

## Conclusion

Sino-Russian gas cooperation is the linchpin in several global and regional energy challenges. Expanding the use of gas in China will help to reduce the country's heavy dependence on coal and to meet its essential GHG emissions reduction targets. The entry of pipeline gas from East Siberia to the Chinese gas market would not only help revitalize China's three northeast provinces (Heilongjiang,

36 'Huge finds make East Africa the next big gas source', Reuters, 6 May 2012, <http://www.reuters.com/article/2012/05/16/us-east-africa-gas-idUSBRE84F00020120516>; 'Tanzania Hikes East Africa's Gas Haul', *International Oil Daily*, 21 July 2012, [http://www.energyintel.com/Pages/Eig\\_Article.aspx?DocId=770678](http://www.energyintel.com/Pages/Eig_Article.aspx?DocId=770678).

Jilin and Liaoning) but also accelerate the economic development of Russia's Far East.

But the window of opportunity for a deal that maximizes the potential on both sides is closing. Delaying a decision much into 2013 will restrict Russia's share in the Chinese gas market. To stay on track in increasing gas in its energy mix, China will be forced to pursue domestic gas exploration even more aggressively, heightening the chances of conflict with its neighbours in the South China Sea. It will also significantly expand the infrastructure for LNG imports. This will increase competition for LNG supplies – and consequently prices – in the coming decade, not just for Asian importers but also for Europe. Russia may well lose out in the longer term as cheaper supplies come on-stream from North America and eventually East Africa.

In the year ahead, several political developments could alter the negotiating stakes. During the first half of 2013, the new South Korean government's policy will determine whether existing LNG cooperation between Japan and the ROK can extend to China, and whether a pipeline from China to South Korea could be a reality. If so, this will shift the balance in China's favour. Once the new North Korean leadership is satisfied it has consolidated its position, the initiative to pipe Russian gas through DPRK territory to South Korea may be revived, giving Russia the upper hand. Initial indications are likely to be seen during the first official exchange of views between the new leaders in both Koreas. Japan's final decision on its nuclear power supply will also have a major impact on the gas trade in Northeast Asia more generally.

One thing is certain: in the next two decades, the role of natural gas in Northeast Asia's energy mix will grow and the scale of regional gas trade will expand. Russia's advantage in that trade depends largely on a breakthrough

in negotiations with China on price. Only compromise between the two sides through decisions made at the highest political level can achieve this. One way out of the impasse would be for Russia and China to build an integrated value chain business – in upstream, midstream and downstream operations – that can deliver mutual benefits. As the Chinese government is seeking upstream openings for Chinese NOCs, in particular CNPC, in Russia, it should offer the same opportunities in the downstream sector to Russian NOCs such as Gazprom. If China can offer a financial package to alleviate Gazprom's investment burden for the pipeline development, it will help to narrow the border price difference and thus facilitate a gas deal.<sup>37</sup> Of course, a solid roadmap for China's plans to link the local gas price to the cost of imports should be integral to this. This kind of value chain deal could open the door to larger-scale gas exports – up to 68 bcm/y, rather than the 30 bcm/y currently seen as a realistic figure.

“ The window of opportunity for a deal that maximizes the potential on both sides is closing ”

A pipeline to China would open the door for its extension to both South Korea and Japan, providing all three with both pipeline gas and LNG import options. Cooperation among these top three gas importers could lay the foundations for the establishment of an Asian Gas Consumers Union, which could serve as the counterpart of the Gas Exporting Countries Forum.<sup>38</sup>

<sup>37</sup> In early December 2012, Russian Deputy Premier Arkady Dvorkovich confirmed that Russia was reviewing the Chinese proposals on advance payments under contracts. See *Russia & CIS Oil and Gas Weekly*, Interfax, 6-12 December 2012, p. 44.

<sup>38</sup> See Gas Exporting Countries Forum, <http://www.gecf.org/aboutus>.

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