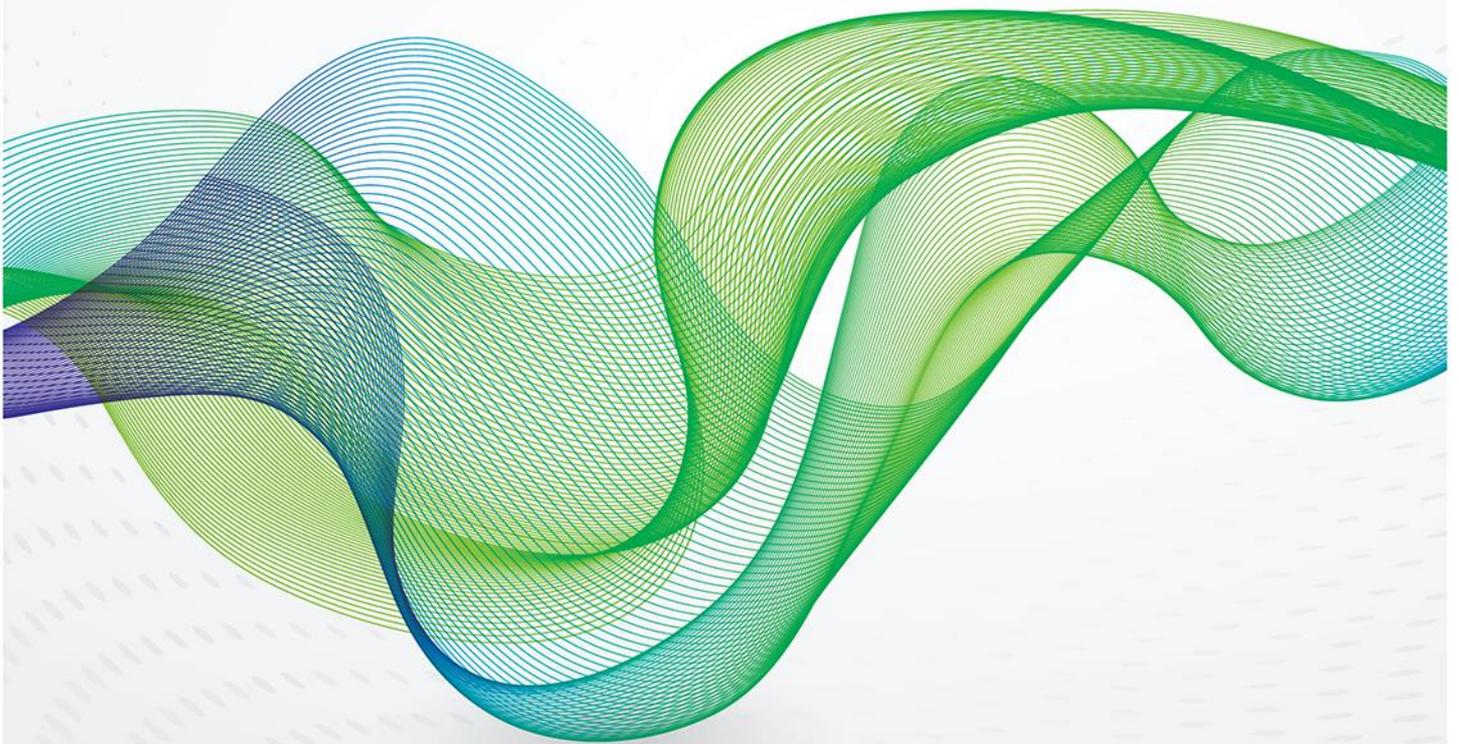


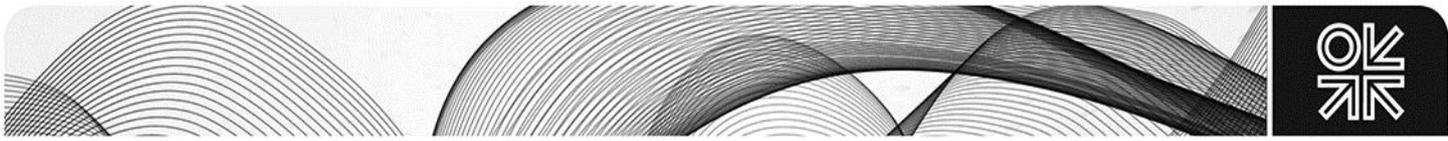


THE OXFORD
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The Commercial and Political Logic for the Altai Pipeline





Introduction

During President Putin's visit to Beijing in November 2014 Gazprom and CNPC signed a memorandum of understanding concerning the export of gas to China via the so-called "western route" via the Russian republic of Altai.¹ The announcement was hailed by Russia as another example of its shift towards Asia as a diversification of its traditional gas export business in the West, but was met by a level of cynicism amongst western commentators over the likelihood of any real progress being made towards the 2021-24 date proposed for first gas deliveries.² A degree of scepticism is clearly merited, given the length of time that it took to agree Russia's first gas export deal with China. Signed in May 2014, the agreement to export 38bcma via the Power of Siberia pipeline from East Siberia to north-east China had been under discussion since the mid-1990s and under active negotiation since an initial memorandum was signed in 2004.³ On a number of occasions the Russian side announced that all the key parameters of the deal had been agreed, with the one rather important exception of the price, and now similar statements are being made about the Altai pipeline.⁴ After the most recent signing in Beijing Alexei Miller, Gazprom's CEO, underlined his confidence that a western pipeline deal could be completed soon but also confirmed that a final sales contract (including the price) as well as an inter-governmental agreement still needed to be finalised;⁵ one possible interpretation of these statements could be that, given historical precedent, another decade might pass before settlement of these remaining fundamental issues might be resolved.

An additional concern, related to the first Power of Siberia deal, is that although Russia and China appear to have reached a firm agreement the promised Chinese financing that was expected to support the construction of the pipeline is no longer on offer. Gazprom CEO Miller has argued that negotiations over a possible \$27 billion loan have foundered over the possible impact that the debt could have caused, suggesting that Gazprom would proceed independently rather than accept a lower price.⁶ However, questions have been asked about the company's ability to finance the cost of one, never mind two, huge new pipeline projects, and scepticism has also been raised by suggestions that the widely reported start of construction of the pipe was also something of a public relations mirage, with little real progress being made to date. As a result, although it seems to be a reasonable assumption that Power of Siberia will proceed, given the level of inter-government agreement concerning the project, clear questions of cost and financing remain that could affect the timing of negotiations over the second western route. This has important implications not only for Russia and China, but also for all the other potential suppliers of gas, and especially LNG, into North-East Asia. Confirmation that China could import up to 68bcma of Russian gas starting from 2019 would create a significant dent in the country's potential LNG import requirement from 2020, increasing the competition between the planned sources of supply that are being constructed and planned over the next 5-10 years. Despite the doubts mentioned above, it would appear that LNG suppliers would be right to be concerned, as there is real commercial as well as political logic for significant Russian gas to flow south into the world's fastest growing gas market.

¹ Interfax, 10 Nov 2014, "Gazprom, CNPC framework agreement determines preparation schedule for Western route contract"

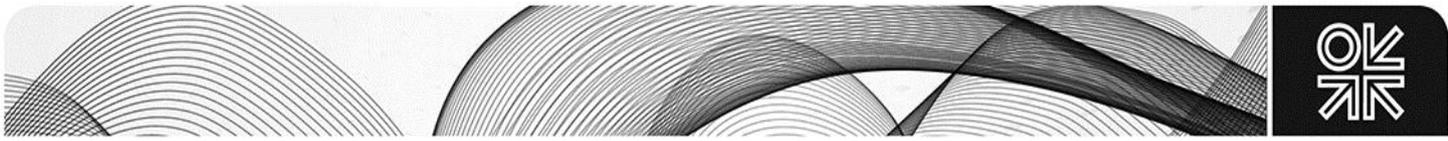
² For example, O'Sullivan, M.L., Op Ed Bloomberg View, 14 Nov 2014, "New China-Russia Gas Pact is No Big Deal"

³ See Henderson, J., 2011, "The Pricing Debate over Russian Gas Exports to China", NG 56, Oxford Institute for Energy Studies, p.8

⁴ Interfax, 18 Nov 2014, "Gazprom, CNPC haven't discussed price of western route gas, pipeline to by-pass third countries"

⁵ Interfax Natural Gas Daily, 10 Nov 2014, "China and Russia close in on second major pipeline deal"

⁶ Interfax, 10 Nov 2014, "Gazprom not considering advance for Power of Siberia to further reduce price"



From Power of Siberia to Altai

The signing of the Russia-China export agreement in May 2014 was a significant moment in the development of Russia's gas export strategy, as it marked the opening of a major new market for the first time in the post-Soviet era. Although LNG has been exported to Asia from the Sakhalin 2 project since 2009, the 38bcma of peak supply planned through the Power of Siberia pipeline is set to have a much more substantial impact both on Gazprom's and the Russian government's export revenues. It will also help to cement increasing geo-political ties between two neighbouring countries that have endured a volatile relationship over the past three to four decades, and provides a fundamental example of Russia's shift in trading strategy from western to eastern markets. However, it also underlined the strength of the Chinese bargaining position in its relations with Russia, as it both achieved its goal of prioritising an eastern export route and did so at what appears to be a very competitive gas price.

Since negotiations on gas exports began in the 1990s Russia has preferred a strategy of linking its West Siberia gas to China over the development of East Siberia fields, and has wanted to price its gas sales at a level equivalent to the high LNG prices being paid under oil-linked contracts in Asia.⁷ However, it has been forced to concede not only that its eastern gas should be developed and exported first, but also that it should be done at a price which, although linked to oil product prices, is effectively much lower than it had hoped. The volume and price indications provided by Gazprom (total sales of just over 1tcm of gas over the life of the contract and total revenues of \$400 billion)⁸ suggest a sales price of around \$11/mmbtu, although later more informal discussions have suggested that this figure may be closer to \$10/mmbtu or even slightly below. Whichever is the case, a range of \$10-11/mmbtu is much lower than the \$15-20/mmbtu that has been on offer over the past 2-3 years on the LNG market, even after transport costs of \$2/mmbtu have been added to take the Russian gas to the eastern seaboard of China. As a result, China appears to have achieved its goal of setting a new benchmark for gas imports in the range of \$12-13/mmbtu while also securing a substantial volume of long-term gas on its northern border.

The deal has by no means been a disaster for Russia or Gazprom, though. Both have been forced to react to changing circumstances in the global gas market and the politics of Russia-EU/US relations in the light of the Ukraine crisis, and Russia has adjusted its export objectives accordingly, but the Power of Siberia deal does offer a number of benefits and a reasonable rate of commercial return. A Figure 1 shows, the primary political objective has been to demonstrate to European buyers that Russia has an alternative market should its western customers fulfil their stated desire to diversify away from Russian gas. The figure shows contracted sales to Europe over the next fifteen years at an 80% take-or-pay level, with the projected sales through the Power of Siberia pipeline compensating for any decline in a scenario where European customers do not renew their contracts as they expire. Given the declining indigenous supply position in Europe and the lack of alternative import options this seems very much like a downside scenario for Gazprom,⁹ with the only further negative being the possibility that all European contracts could have the take-or-pay level reduced to 70% (as is rumoured to have occurred in some recent renegotiations). This could knock 15-20bcma off Gazprom's export sales, but even in this eventuality its overall non-FSU exports remain stable for the next decade. In a more benign (and in the author's opinion more likely) scenario, in which Europe remains reliant on Russia for at least the current level of imports (around 160bcma in 2013) the new Chinese volumes provide a clear growth opportunity.

⁷ Henderson, J., 2011, "The Pricing Debate over Russian Gas Exports to China", NG 56, Oxford Institute for Energy Studies, p.6

⁸ Miller quote

⁹ For discussion of Europe's import options and likely continued reliance on Russia see Stern et al, Nov 2014, "Reducing European dependence on Russian Gas", NG-92, Oxford Institute for Energy Studies

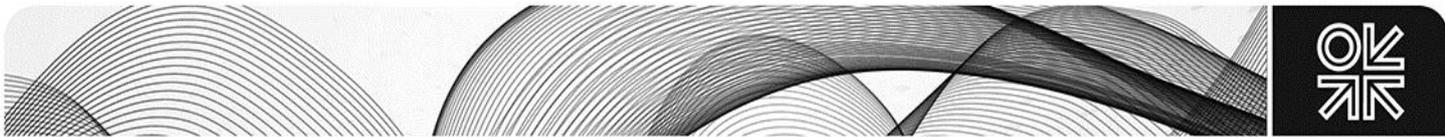
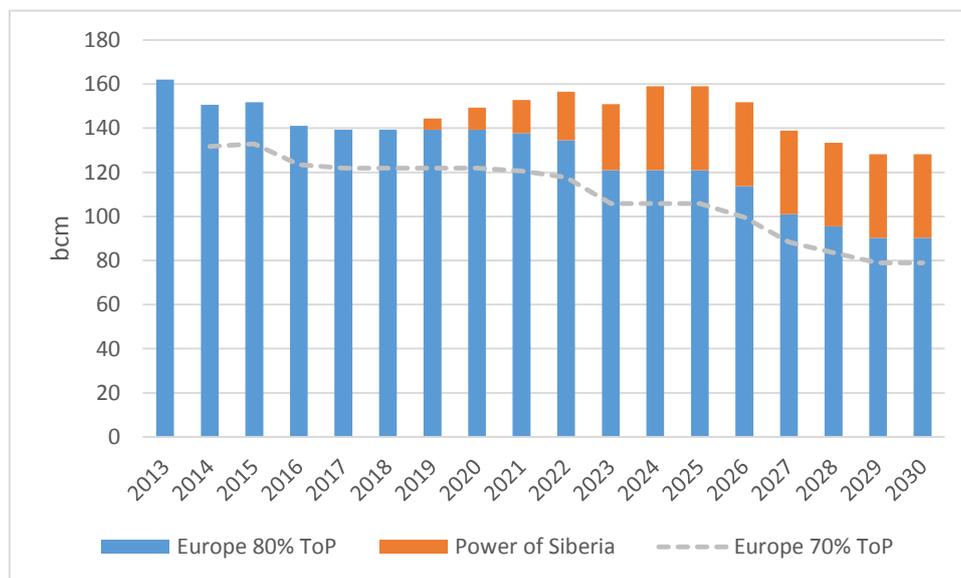


Figure 1: Possible Gazprom Non-FSU Gas Pipeline Exports to Europe and Asia



Source: OIES

NB: Graph shows a downside scenario in which Gazprom's sales to Europe are limited to current contracts at an 80% take-or-pay level, with no renewal of contracts as they expire. Dotted line shows impact on European sales if all contracts reduced to 70% take-or-pay.

The price of securing this diversification, however, has been a gas price that is competitive with alternative sources in China but which offers a relatively low rate of return to Gazprom. A delivered price of \$12-13/mmbtu for East Siberian gas in Shanghai compares with a price for Turkmen gas of around \$13.50/mmbtu,¹⁰ a prospective price of US LNG in Asia of \$12.75/mmbtu (based on a Henry Hub price of \$5/mmbtu) and a domestic gas price in the range of \$10-14/mmbtu (for existing and incremental contracts respectively). As such it is clear that CNPC has managed to secure Russian gas at an advantageous price, while the return for Gazprom, based on a total capital expenditure of \$60 billion, is calculated by this author as being in the range 7-8% real, based on the cashflow profile shown in Figure 2. This is relatively low compared to a likely minimum expected return of 10% real (a figure which most analysts use to calculate the NPV of Russian projects), but is arguably acceptable for a project that can be the foundation for Russia's eastern gas programme and could be improved by additional export sales in future. Furthermore, the alternative is that the gas would be left in the ground for many years generating no return at all, as it is effectively stranded unless sold into the Chinese market.

One additional point is that all the prices above, including the price of Power of Siberia exports from Russia, are based on an oil price that averaged more than \$100/bbl in 2013. Clearly, with the oil price having fallen back to an \$80-90/bbl range in November and December 2014 these gas prices, which other than the US LNG price are largely linked to oil, would also fall, potentially reducing the returns for Russia. However, no Russian gas will be exported to China before 2019 at the earliest, by which time it is arguably a reasonable assumption that the oil price could well have returned to the \$100/bbl level, taking gas prices back to the levels discussed above.

¹⁰ Chen, M., 2014, "The Development of Chinese Gas Pricing", NG-89, Oxford Institute for Energy Studies

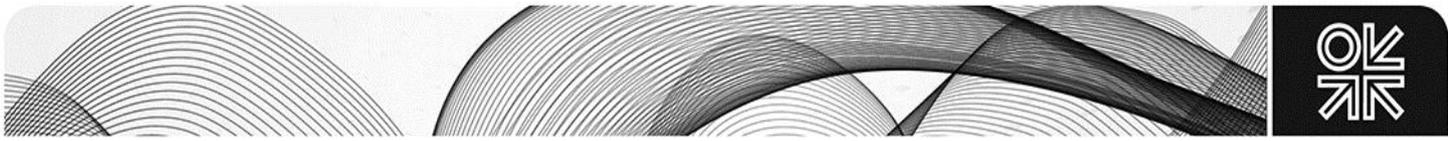
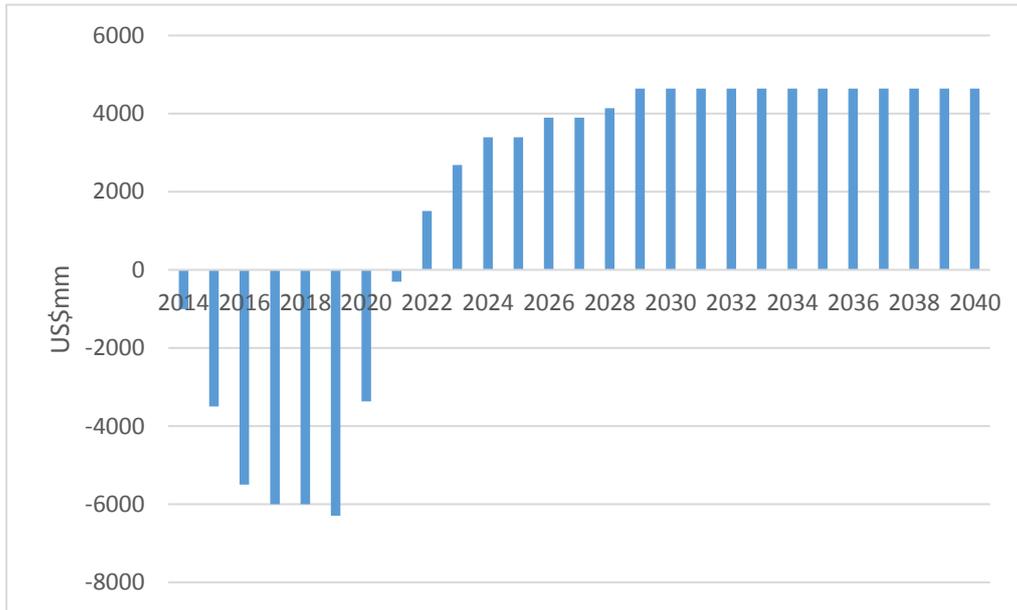


Figure 2: Estimated Net Cashflow Profile for Power of Siberia Gas Exports



Source: Author’s Estimates

The commercial and political argument for proceeding with the Power of Siberia scheme would therefore appear to be strong on both sides, and is underpinned by the long-standing logic of linking Russia’s huge gas reserves with China’s rapidly expanding gas demand. The financing of the project remains an outstanding issue, especially as US sanctions now limit Gazprom’s access to capital markets, but the company’s relatively strong balance sheet plus potential support from the Russian government for this high priority development mean that this issue is unlikely to be a prohibitive barrier to progress. A key question, however, is whether similar logic applies to the Altai pipeline, as Gazprom attempts to accelerate the second of its eastern export projects.

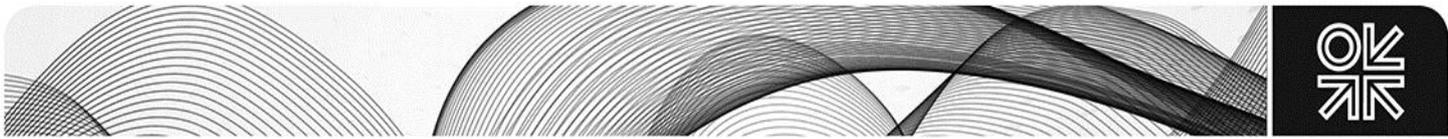
The Russian logic for Altai pipeline sales – further diversification and a use for its excess gas

The rationale for Russian gas sales into western China via the Altai pipeline has always been to optimise sales from Gazprom’s vast West Siberian resource base and to provide an arbitrage opportunity for switching sales between Europe and Asia. Events over the past five years, which have seen demand for Gazprom’s gas go into decline in all its traditional markets,¹¹ have increased the need to find new outlets for gas that would otherwise be left in the ground, while the geo-politics surrounding the Ukraine crisis have exacerbated the need to create a demonstrable link between gas that could go to Europe or Asia.

On the demand side, Gazprom’s European exports declined from 160bcm in 2008 to 140bcm in 2012,¹² due to the impact of the economic crisis, the re-direction of LNG from the US, the increase in support for renewables in Europe and the increased availability of cheap coal, before rebounding to 163bcm in 2013 as LNG was re-directed to Asia and Gazprom adjusted its export prices to more competitive

¹¹ See Henderson, J. and Pirani, S., 2014, “The Russian Gas Matrix: How Markets are Driving Change”, Oxford Institute for Energy Studies, chapter 2

¹² Gazprom Databook 2013



levels.¹³ However, in the first nine months of 2014 exports to non-FSU markets have fallen again by 4% as demand on the continent remains depressed amid economic stagnation and warm weather.¹⁴ Demand from FSU countries is down even more dramatically, by 12%, as demand from Ukraine has been sharply reduced, while in the Russian domestic market the erosion of Gazprom's market share by independent producers has seen a 60bcm fall in sales between 2006 and 2013, with a further 12% decline in the first nine months of 2014.¹⁵ In the face of this reduction in demand Gazprom's production has fallen from 560bcm in 2008 to an expected 463bcm in 2014,¹⁶ but this decline has been driven not by a shortage of available resources but by a lack of markets for the company's gas. Indeed over the past six years Gazprom has continued to develop new resources on the Yamal peninsula to replace declining production in West Siberia, with the result that its production capacity is estimated at 600bcm or more by company CEO Alexei Miller.¹⁷ Even if this is regarded as an exaggeration, or at least an annualised estimate of short-term capacity in winter, it seems clear that Gazprom has at least 100bcm of spare capacity at present and is shutting in production or delaying field developments to manage the supply-demand balance for Russian gas. As a result, the opening of a new market for West Siberian gas in Asia would be a very welcome development, and the company has already identified the fields that it proposes to use in West Siberia to supply the gas (mainly Zapolyarnoye and South Russkoye), with any reduction in supplies to the west being made up from the developed, but under-used, Bovanenkovskoye field on Yamal.¹⁸

For the Russian government, the Altai link would also be very useful on both political and economic grounds. Firstly, it would allow President Putin to at least present the argument that Russia can divert gas meant for Europe towards Asia instead. Although the current oversupply of gas in West Siberia means that this presents no real risk to European customers, it can be used by the Russian government as an overt threat if required but also as a demonstration that Russia has the ability to grow its export sales without recourse to its traditional customer base if necessary. Figure 3 below builds on Figure 1 and shows how Altai sales would further consolidate Russia's gas exports. Furthermore, if exports via the Altai pipeline were to take preference over the alternative plans for an LNG scheme at Vladivostok this would also have benefits for the Russian budget, as pipeline exports are taxed at 30% of the sales revenue while LNG sales are export-tax free.

¹³ Gazprom strategy day presentation 2012, p.18; Gazprom strategy day presentation 2014, p.22

¹⁴ Interfax, 14 Nov 2014, "Turkey remains Gazprom's only growing market in Q3, shipments to Russia falling"

¹⁵ Ibid.

¹⁶ Reuters, 17 Sept 2014, "Gazprom says unable to meet rising gas demand from Europe for now"

¹⁷ Energy Post, 8 Oct 2014, "How does Alexei Miller look at the world"

¹⁸ Argus FSU Energy, 20 Nov 2014, "Squaring the Circle"

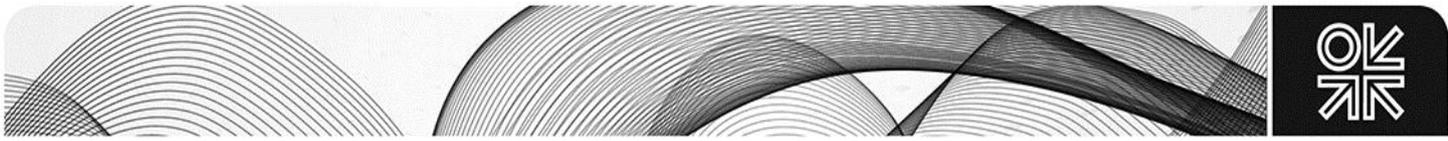
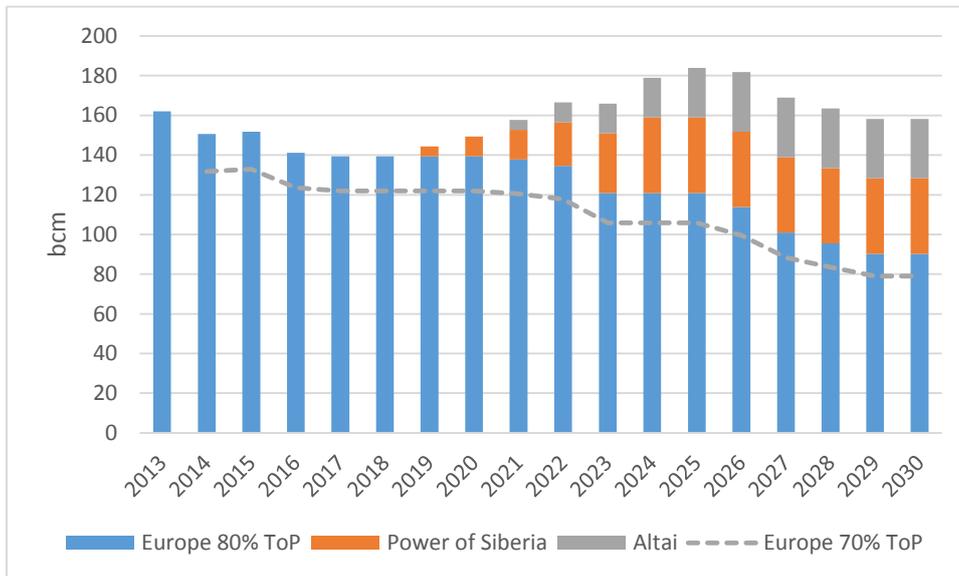


Figure 3: Possible Russian gas exports to Europe and Asia



Source: Author's estimates

NB: Dotted line again shows impact on European sales of reduction in Take-or-Pay level to 70%, reducing sales by approximately 15-20bcm

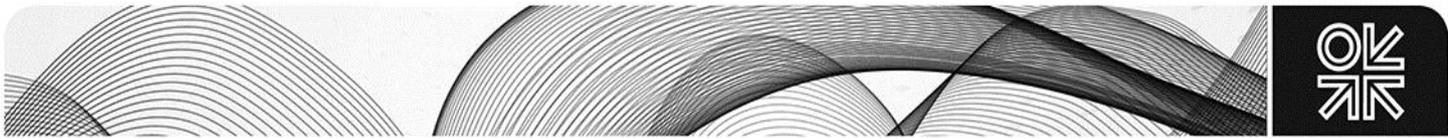
Indeed, this distinction between LNG and pipeline exports points to another reason why Gazprom may be keen on Altai, as it plays more to its core strength as a pipeline gas supplier. The expansion of LNG sales has been a stated Russian gas strategy for the past decade, with the Shtokman project providing the first (and ultimately failed) initiative, followed by more extensive plans in the East targeted at the Asian market. However, from a Gazprom perspective LNG has brought increased competition with domestic peers Novatek and Rosneft, who are already challenging it in the domestic market, following the liberalisation of LNG exports in December 2013.¹⁹ Novatek's Yamal project and Rosneft's plans for an LNG scheme for Sakhalin-1 gas have challenged Gazprom's proposed project at Vladivostok, and have even raised the possibility of Gazprom's entire export monopoly being removed. Lately, though, the inclusion of Novatek and Rosneft on US and EU sanctions lists has undermined both companies and the prospects for their LNG projects,²⁰ and appears to have re-focused Gazprom and the Russian government back towards a preference for piped exports, especially as China has emerged as an ever more important market. Furthermore, the fear that LNG technology could be included on a future sanctions list has added to a reluctance by Russia to commit to an extensive LNG strategy in the current geo-political situation. As a result, although Novatek's Yamal project is still likely to go ahead, Gazprom now seems much keener to focus on the Altai project as its next major export option, with the apparent full support of the Russian government.

Does China want even more Russian gas?

Clearly, though, any expanded Russian export plans based on a new Altai pipeline rely on sufficient demand for the gas in China. Over the past five years the outlook for Chinese gas demand has been driven by a stated desire of the government to improve the country's environment by replacing coal with

¹⁹ Financial Times, 22 Nov 2013, "Russia paves way for limited liberalisation of LNG exports"

²⁰ Wall Street Journal, 13 Sept 2014, "Rosneft, Novatek could receive state aid, Russian minister says"



alternative fuels,²¹ and a diversified portfolio of imported LNG, piped gas and indigenous gas production has been built up. In its latest World Energy Outlook the IEA sees Chinese gas demand rising from 148bcma in 2012 to 471bcma in 2030 and over 600bcma in 2040, making it the fastest growing gas market in the world.²² The role of imports in meeting this demand is somewhat uncertain because the outlook for Chinese gas production is itself reliant to an extent on the development of the country's shale gas resources, which are very large but as yet with unclear productivity. A short-term target of 60-100bcma of shale production by 2020 has been recently downgraded to 30bcma,²³ but nevertheless the IEA sees overall Chinese gas production reaching 266bcma by 2030 and 368bcma by 2040, assuming 110bcma of shale production by the end of the period. As a result gas imports could exceed 200bcma by 2030 and reach almost 240bcma by 2040, and perhaps more if the country's shale resources continue to disappoint.

To meet this increasing import requirement China has built a multi-vectorised compass of supply, including Central Asian gas from the West, pipeline gas from Myanmar in the South, LNG delivered to the Eastern seaboard and Russian gas from the North. All carry their own security of supply and price risks, and the maintenance of a competitive balance is likely to be the continuing goal of the Chinese authorities. LNG arrives from a multitude of sources, and the average price at present is rather low thanks to Australian and Malaysian contracts signed in the early and mid-2000s at very favourable rates. China currently has just under 50bcma of regasification capacity, with a further 50bcma under construction or planned,²⁴ but given concerns over seaborne supplies arriving through the narrow Malacca Straits or the US-dominated Pacific routes it is unclear whether the Chinese authorities would countenance any further expansion beyond this. Furthermore, the rising cost of LNG to China, as new contracts are signed, could also limit this source of imports if cheaper alternatives can be found.

A pipeline from Myanmar provides import capacity for 12bcma of gas, although this has yet to be fully utilised and bears the continued risk of terrorist attacks from indigenous tribes. Furthermore, even if a full 12bcma can be imported the expansion capacity is limited by gas availability in the Gulf of Martaban, meaning that it will remain a marginal source of supply. A much more significant, and expandable, source of pipeline gas comes from Central Asia, from where imports could reach more than 80bcma in the next ten years.²⁵ Supply is mainly sourced from Turkmenistan, in particular from the giant Galkynysh field, and agreements have been reached to expand imports to 65bcma (from the current 23bcma) in theory as early as 2016, although a timescale towards 2020 is more likely. Uzbekistan and Kazakhstan are also planned to provide 10bcma of exports each at some point, but demand and production issues in both countries mean that current export levels of 2.9bcma and 0.1bcma respectively²⁶ may not increase in the foreseeable future. Furthermore, Central Asian gas is not cheap, arriving in Shanghai at around \$13.50/mmbtu, comparable or even more expensive than some LNG contracts, and also appears to be rather flexible, underpinned by governmental agreements signed by Heads of State rather than formal sales and purchase contracts between companies. As a result, China would seem to be in a strong position to adjust its offtake of Central Asian gas depending on the speed of its domestic demand growth and the availability of alternative competitively-priced imports.

Within this picture Russian gas can offer another attractive option for China, depending of course upon the price that is agreed. Adding up all the possible total of other import options above (say 100bcma of

²¹ NY Times, 16 Aug 2014, "China confronts its coal problem"

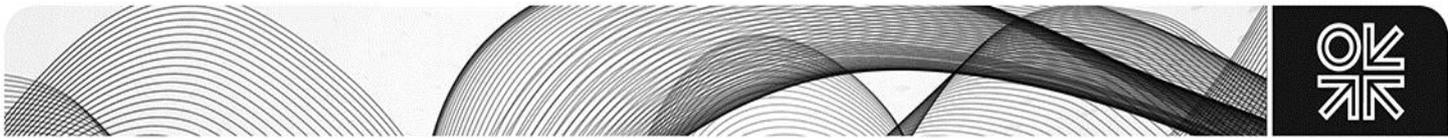
²² IEA World Energy Outlook 2014, p.139

²³ Platts, 18 Sept 2014, "China cuts 2020 shale gas output target"

²⁴ EIA, 4 Feb 2014, China Energy Brief at <http://www.eia.gov/countries/cab.cfm?fips=CH>

^{25,26} Henderson, J. and Pirani, S. (2104) "The Russian Gas Matrix: How Markets are Driving Change" Oxford Institute for Energy Studies, Chapter 14

²⁶ BP Statistical Review of World Energy 2014, Gas Trade Movements by Pipeline 2013



LNG, 65bcma of Central Asian gas and 12 bcma from Myanmar) leaves a gap of around 30bcma for Russian gas, which would be adequately filled by the Power of Siberia pipeline alone. However, given the price and security of supply risk of LNG, uncertainty over the ability of Myanmar to meet its supply commitment, uncertainty over China’s indigenous gas supply (especially from shale gas) and a potential Chinese desire to create supply competition on its western border, it is conceivable that a second source of Russian gas could be seen as an interesting alternative, especially given the relative flexibility of the LNG and Central Asian sources. Statements from the Chinese authorities suggest that they are genuinely interested in a second pipeline from China,²⁷ which in itself is a positive sign given the normal reluctance to make clear statements of intent on such issues, and it is not hard to understand why a negotiation with Russia on gas prices would be seen as attractive now. Given the geo-political pressure on the Russian government and Gazprom to diversify export sales, it is arguable that there may never be a better time for China to discuss a second gas purchase agreement.

Can a mutually acceptable price be found?

In the OIES 2011 working paper “The Pricing Debate over Russian Gas Exports to China” this author argued that in order to secure a sales agreement it would be essential for Russia to offer a price for Power of Siberia gas that would be competitive in Shanghai, and further asserted that this could be done while providing a reasonable, if not exceptional, rate of return for Gazprom.²⁸ That deal having now been signed, the same argument would logically apply to the Altai pipeline, and Table 1 shows a calculation of a benchmark price at the Altai-Xinjiang border in western China that could achieve this goal.

Table 1: Benchmark of Chinese Gas Import Prices

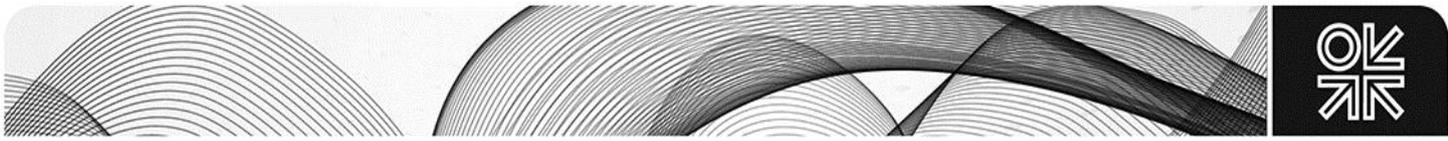
	Price at entry to China <i>US\$/mmbtu</i>	Transport to Shanghai <i>US\$/mmbtu</i>	Price in Shanghai at City Gate <i>US\$/mmbtu</i>	Transport back to Xinjiang <i>US\$/mmbtu</i>	Net back price at Altai pipeline entry point <i>US\$/mmbtu</i>
Turkmen price in West China	9.60	4.48	14.08	4.48	9.60
Russia East Siberia Gas	10.00	2.50	12.50	4.48	8.02
Average LNG imports (2013)	11.10	0.00	11.10	4.48	6.62
Qatar LNG (spot)	17.76	0.00	17.76	4.48	13.28
New Australia (from 2015)	15.77	0.00	15.77	4.48	11.29
US LNG (HH \$5/mmbtu)	12.75	0.00	12.75	4.48	8.27
Myanmar imports	11.75	1.85	13.60	4.48	9.12
Benchmark Import Price					9.46
Shanghai domestic price (incremental)	14.25	0.00	14.25	4.48	9.77
Shanghai domestic price (existing)	10.50	0.00	10.50	4.48	6.02
Average Overall Benchmark Price					9.11

Sources: Energy Intelligence Group, Chen (2014), Henderson and Pirani (2014)

Each source of gas is priced at its entry point into China, before the transport cost of delivery to Shanghai is added (where appropriate) and then the cost of transport from the western end of the West-East pipeline is subtracted to create a netback price on the Altai border. For example, Russian gas arriving via the Power of Siberia pipeline is priced at \$10/mmbtu on the Chinese border, \$12.50/mmbtu in Shanghai and \$8.02/mmbtu in western China after the removal of a \$4.48/mmbtu transport cost

²⁷ Interfax, 18 Nov 2014, “Gazprom, CNPC haven’t discussed price of western route gas, pipeline to by-pass third countries”

²⁸ Henderson, J. (2011), “The Pricing Debate over Russian Gas Exports to China”, NG-56, Oxford Institute for Energy Studies



through the West-East pipeline.²⁹ A theoretical price for US LNG imports is based on a Henry Hub price of \$5/mmbtu (plus liquefaction, transport and regasification costs) while the other LNG and pipeline prices are based on largely oil-linked contracts from 2013, when the average oil price was \$108 per barrel (Brent).³⁰ The result is that the average imported gas price to China, netted back to the Altai-Xinjiang border, is approximately \$9.50/mmbtu, based on a similar oil price assumption. A further point of comparison is the Chinese domestic price, which is increasingly being based on an oil-product linked formula but which also has regulated limits of \$10.50/mmbtu for current contracts and \$14.25/mmbtu for any incremental gas. When these two figures are added the average price falls to \$9.11/mmbtu, although in reality it is the higher incremental gas price which has been created by the Chinese authorities to provide a realistic benchmark for future imports.³¹

From a Gazprom perspective, it is then necessary to consider whether this can provide an adequate return. One initial way to do this is to compare the net back for theoretical sales via the Altai pipeline with the net back for gas sales to Europe, and this comparison is shown in Table 2. Taking \$9.50/mmbtu as a starting point at the Russia/China border, then removing export tax at 30%, the cost of transport 2,600km to West Siberia (based on the average UGSS tariff) and Mineral Extraction Tax one arrives at a net wellhead price of \$4.72/mmbtu. The same calculation for European sales, based on either the average Gazprom price in 2013 or the average NBP spot price in the first nine months of 2014, gives comparative prices of \$4.35/mmbtu and \$2.93/mmbtu respectively, suggesting that sales to Asia via the western route can be more profitable than exports to Europe.

Table 2: Netback comparison of Gazprom exports to Europe and Asia (via Altai pipeline)

	Border price US\$/mmbtu	Export tax US\$/mmbtu	MET US\$/mmbtu	Transport US\$/mmbtu	Wellhead US\$/mmbtu
Europe netback to WS (Gazprom 2013 prices)	10.66	-3.20	-0.45	-2.67	4.35
Europe netback to WS (Europe spot price 2014)	8.63	-2.59	-0.45	-2.67	2.93
Altai netback to WS	9.46	-2.84	-0.45	-1.46	4.72

Source: Energy Intelligence Group, Author's analysis

However, this makes the major assumption that the cost of building the Altai pipeline would be spread across the UGSS system as a whole, whereas the IRR of the project should also be assessed on a stand-alone basis in order to understand whether Gazprom can commercially rationalise sales to western China on an individual basis. On the assumption that the 2,600km pipeline costs \$18.5 billion to construct,³² coming online in 2024³³ with a maximum throughput of 30bcm/a and a peak operating cost of 5% of total capital expenditure, we estimate that Gazprom would need to charge a transport tariff of almost \$6/mmbtu to generate a 10% real rate of return. We would regard this as an adequate IRR for a project of this type, given the utility nature of the pipeline investment and its use as a foundation investment with potential for upside if gas throughput can be increased over time. Using this transport tariff, it is then possible to calculate what the breakeven price would be at the Altai border, adding lifting costs, MET and export tax. Importantly it is also assumed that there will be no additional

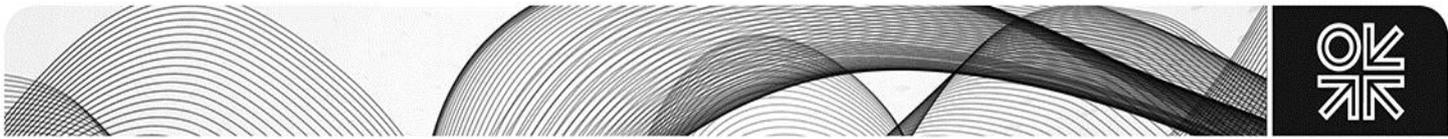
²⁹ Argus FSU Energy, 13 Nov 2014, "Priceless Deal"

³⁰ BP Statistical Review of World Energy 2014

³¹ Chen, M. (2014), "The Development of Chinese Gas Pricing: Drivers, Challenges and Implications for Demand", NG-89, Oxford Institute for Energy Studies, p.9

³² This compares with a Gazprom estimate from 2010 of \$14 billion. We have assumed that the cost of the Altai pipeline would be split into two separate parts. The first 1,600km of pipeline would be built alongside the existing UGSS system at an estimated cost of approximately \$6 million per km, while the remaining 1,000km of pipeline would be built in a new trench across the mountainous Altai region at a cost of approximately \$9 million per km. This compares to an average cost of the Sakhalin-Khabarovsk-Vladivostok pipeline over virgin territory in the Far East of \$8.3 million per km.

³³ Gazprom has suggested a timetable for first gas in the range 2021-2024



capital expenditure required because, as described earlier, Gazprom has a significant oversupply of gas in West Siberia at present and the Altai gas would be coming from existing fields such as Zapolyarnoye and South Russkoye. Table 3 shows this calculation and suggests that the breakeven price for Altai gas at the border with western China would be just below \$10/mmbtu.

Table 3: Breakeven price for Altai gas in Western China

	\$/mmbtu
Lifting Cost in West Siberia	0.50
MET	0.45
Transport (Altai)	5.97
Export Tax	2.97
Total	9.89

Source: Author's calculation

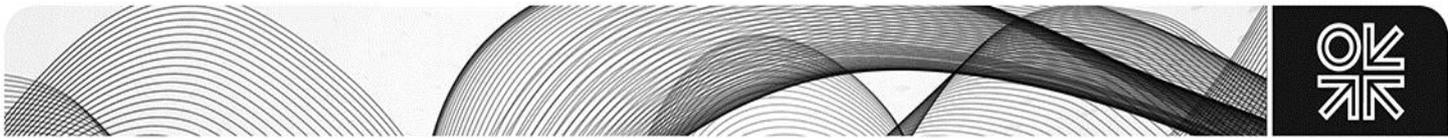
As discussed earlier, it seems that a more likely price would be no more than \$9.50/mmbtu, and using this in our Altai model would reduce the rate of return of the Altai project to around 9% real, while a price of \$8.50/mmbtu would bring the IRR down to 8%. Although both these figures are likely to be below Gazprom's assumed cost of capital, and would therefore provide a negative net present value in a discounted cashflow analysis, it nevertheless suggests that the Altai pipeline can provide a not unreasonable return for an infrastructure project which, like the Power of Siberia pipeline, could provide significant growth opportunities over a number of decades. Indeed it could be argued that one compensation for the low rate of return on this specific project would be an improved return on Gazprom's upstream investments in West Siberia, which are currently being significantly under-utilised. Gas that might otherwise have remained in the ground would be produced from fields where significant investment has already been made (particularly the Bovanenkovskoye field in Yamal), albeit that this Yamal gas would go to Europe to replace other current production that would be diverted to the Altai pipeline.

For President Putin the political benefits more than justify the low return

From a political perspective the low commercial return on the Altai project would be a small price to pay for the benefit of finally being able to say that Russia and Gazprom could now swing gas from the same core producing fields either to western or eastern markets, providing an arbitrage opportunity and a political bargaining point. In reality, the oversupply of gas in West Siberia means this is something of an empty achievement, as there is really no threat to European customers, as noted above. There is more than enough gas to supply both Europe and Asian for the foreseeable future, and any cross-marketing would merely allow Gazprom to argue theoretically for similar netback prices, as any threat to withdraw gas from one market to supply the other would have little credibility. Gas sold in either the European or the Asian markets will need to be priced relative to competing supply in those regions, as Gazprom has already discovered, and although in future the prices between the two may become more closely aligned, Russia's ability to supply both will only be one part of a multi-layered logic for this to occur.

Furthermore, although Gazprom CEO Alexei Miller has claimed that China and NE Asia could ultimately match Europe in Gazprom's portfolio,³⁴ this again is more rhetoric than reality in anything other than the very long term. If China in particular did come to dominate Gazprom's export portfolio then the Russian state company would find itself very exposed to the whims of a strong single buyer with significant bargaining power – not a comfortable situation for any gas supplier. In truth, although China

³⁴ Interfax, 3 April 2014, "Russia to up gas deliveries to Asia to European level"



currently provides a useful diversification option and a new growth market for Russia, the more Gazprom expands its sales there the more it will need to continue to balance them with continued European revenues, especially if it has also invested in expensive new west-facing infrastructure such as the South Stream pipeline. As much as Gazprom's customers wish to have a diversified supply portfolio to avoid dependence on a single supplier, so Gazprom clearly needs to avoid dependence on a single dominant purchaser, especially if that purchaser is an increasingly powerful China.

Nevertheless, the geo-political benefit of being able to demonstrate to Europe and the US that Russia has alternative markets for its gas and can use its existing supply base to service them could well be enough to encourage Gazprom, under the direction of the Russian authorities, to agree a price for Altai gas that attracts China to do a deal in the relatively short-term. The example of Power of Siberia demonstrates that Gazprom's commercial returns can be sacrificed for political gain, which should be no surprise for a state-controlled energy company, and it would seem likely that the same logic could apply to a second potential pipeline from Russia to China.

Conclusions

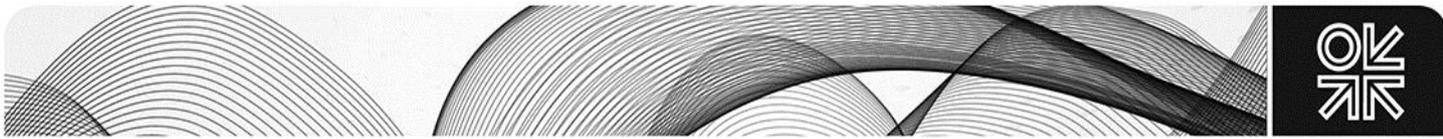
The commercial logic for a gas export deal from East Siberia to North-East China, catalysed by a political imperative for Russia to demonstrate that it has an alternative export market to Europe, eventually led to the signing of a 38bcma deal between Gazprom and CNPC in May 2014. Although concern over financing of the project means that this scheme is not yet completely confirmed, it would appear that there is significant government support from both sides and as a result it seems likely to proceed, even if the initial target date for first gas in 2019 may be somewhat optimistic.

Similar logic applies to the recent agreement on gas exports via the Altai pipeline into western China. Although a degree of scepticism is certainly warranted, given historical precedent over the length of negotiations and concerns over the ability of Gazprom to finance a second project, commercial and political logic suggests that probability of a deal being signed in 2015 is relatively high. From a Russian perspective, gas is available in West Siberia that might otherwise remain in the ground, and it can be sold at a competitive price at the Chinese border while still generating an acceptable, if not exceptional, return for Gazprom. The political benefits of the deal, in terms of demonstrating further diversification from Europe, a stronger link with China, the opportunity to generate extra budget revenues post 2020 and the chance to develop a new infrastructure base in the Altai region, provide further compensation for a potentially low commercial return.

From a Chinese perspective, growing gas demand, uncertainty over some of its existing sources of supply, a desire to create more competition with Central Asian gas and the one-off nature of the opportunity to negotiate with Russia from a position of exceptional bargaining strength mean that an Altai deal is also likely to make sense. There may be some concern over the need for more Russian gas, with the possibility that total supply of 68bcma (the combined capacity of the Power of Siberia and Altai pipelines) could account for as much as one third of total Chinese imports by 2030. However, any potential security of supply threat is offset by the fact that the Russian contribution to overall Chinese gas consumption would be much lower, at around 13%, while the share of gas in the China's total energy balance is estimated to remain below 10% at that date.³⁵ Furthermore, China will also be very likely to be able to adjust its actual purchases according to its needs, whatever the contract may state, by switching between LNG and pipeline gas according to the relative price of each option, giving it significant flexibility to optimise the competitive advantage and strong bargaining position that it has as the world's second largest energy economy.

Overall, then, although the scope for disappointment always remains in any negotiations involving two forceful and politically-driven state-controlled companies, the potential for a deal on exports via the Altai

³⁵ IEA World Energy Outlook 2014, p.654



pipeline appears to have significant commercial and political logic. While it would be foolhardy to go so far as to predict that a deal will be signed in 2015, the arguments in favour appear stronger than many commentators would seem to suggest. If a deal is signed, substantial problems will still remain, not the least of which will be Gazprom's ability to raise the money needed to build the pipeline given its current inability to access western capital markets. Nevertheless, the impact of the signing of an Altai deal alone could have a significant impact on the ambitions of companies planning LNG projects that are also targeting the Chinese market, and as such the continuing discussions will require attentive observation over the next 12 months.

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