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Working Paper

Energy relations between Russia and China: Playing chess with the dragon

OIES Paper: WPM, No. 67

Provided in Cooperation with:

The Oxford Institute for Energy Studies, Oxford

Suggested Citation: Henderson, James; Mitrova, Tatiana (2016) : Energy relations between Russia and China: Playing chess with the dragon, OIES Paper: WPM, No. 67, ISBN 978-1-78467-064-1, The Oxford Institute for Energy Studies, Oxford, <https://doi.org/10.26889/9781784670641>

This Version is available at:

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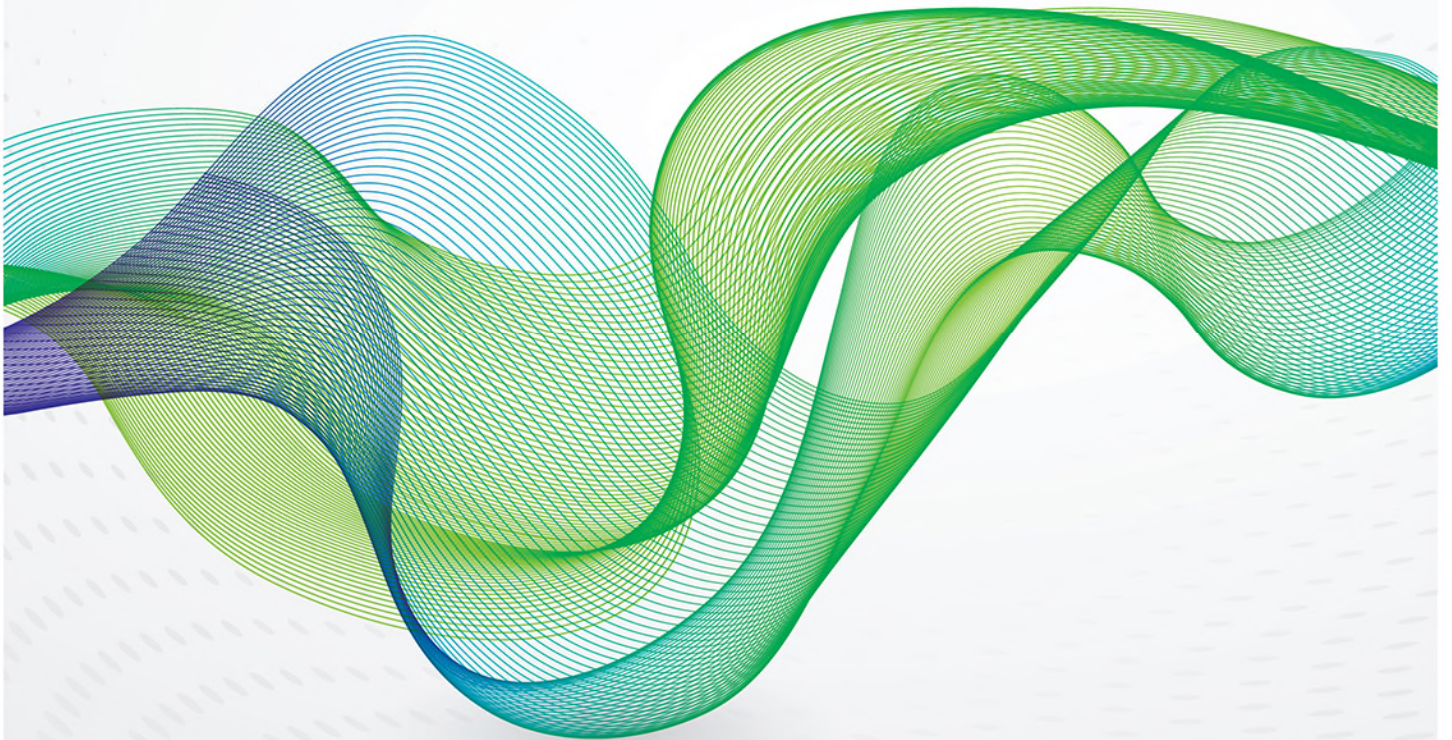
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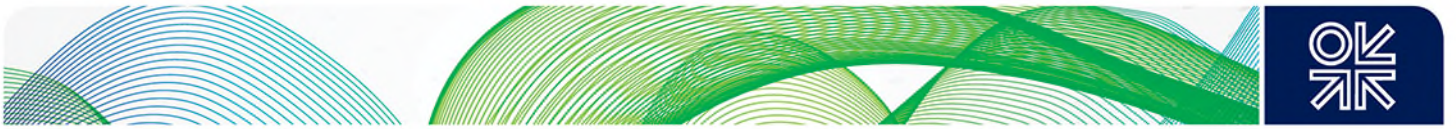
August 2016

Energy Relations between Russia and China: Playing Chess with the Dragon



OIES PAPER: WPM 67

James Henderson & Tatiana Mitrova*



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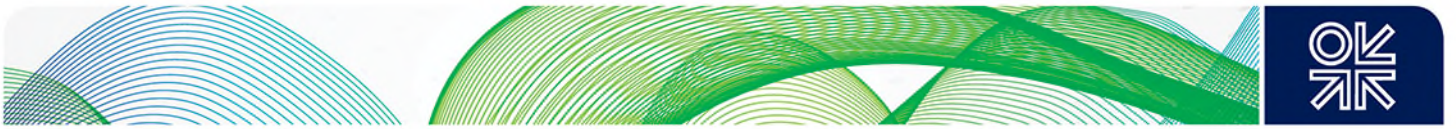
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ISBN 978-1-78467-064-1

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Acknowledgements

We would like to thank our colleagues at OIES and ERI RAS for their help with this research and to those who also assisted by reviewing this paper. In particular, we are very grateful for the support and comments provided by Keun-Wook Paik, whose contributions were vital to the completion of our analysis. We would also like to thank our editor, John Elkins, for his detailed corrections and useful comments.

Thanks also to the many industry executives, consultants and analysts with whom we have discussed this topic, but as always the results of the analysis and any errors remain entirely our responsibility.



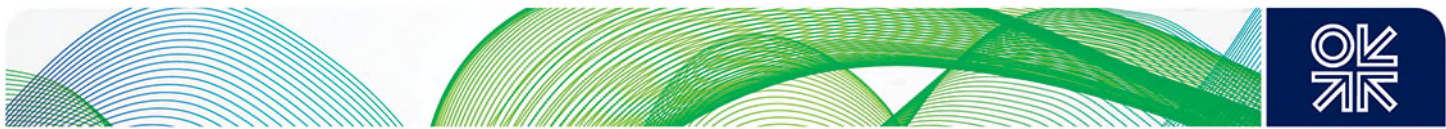
Abbreviations and Units of Measurement

bbls	Barrels
bcm	Billion cubic metres
bcma	Billion cubic metres per annum
bn bbls	Billion barrels
boepd	Barrels of oil equivalent per day
bpd	Barrels per day
E&P	Exploration and Production
ESPO	East Siberia – Pacific Ocean (Pipeline)
FSU	Former Soviet Union
IOC	International Oil Company
kboepd	Thousands of barrels of oil equivalent per day
kbpd	Thousands of barrels per day
km	Kilometres
mm bbls	Million barrels
mcm	Thousands of cubic metres
mmboepd	Millions of barrels of oil equivalent per day]
mmbpd	Millions of barrels per day
mmbtu	Million British thermal units
mmcm	Millions of cubic metres
mmt	Millions of tonnes
mmtoe	Millions of tonnes of oil equivalent
mmtpa	Millions of tonnes per annum
Mm tonnes	Millions of tonnes
P&P	Proved and Probable
tcm	Trillion cubic metres

Conversion Factors

<i>Equals</i>			
1	tonne oil	7.3	barrels of oil equivalent
1	tonne condensate	8.0	barrels of oil equivalent
1	bcm gas	6.6	mm barrels of oil equivalent
1	bcm gas	35.3	billion cubic feet of gas
1	bcm gas	0.9	mm tonnes of oil equivalent

Source: BP Statistical Review



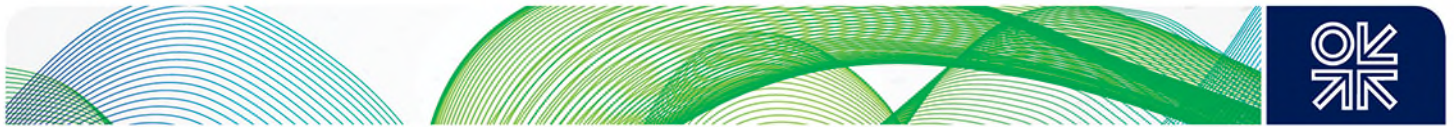
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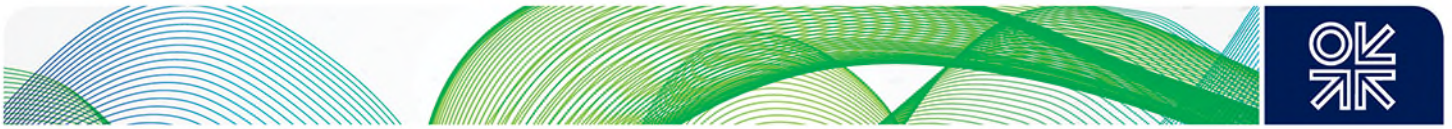


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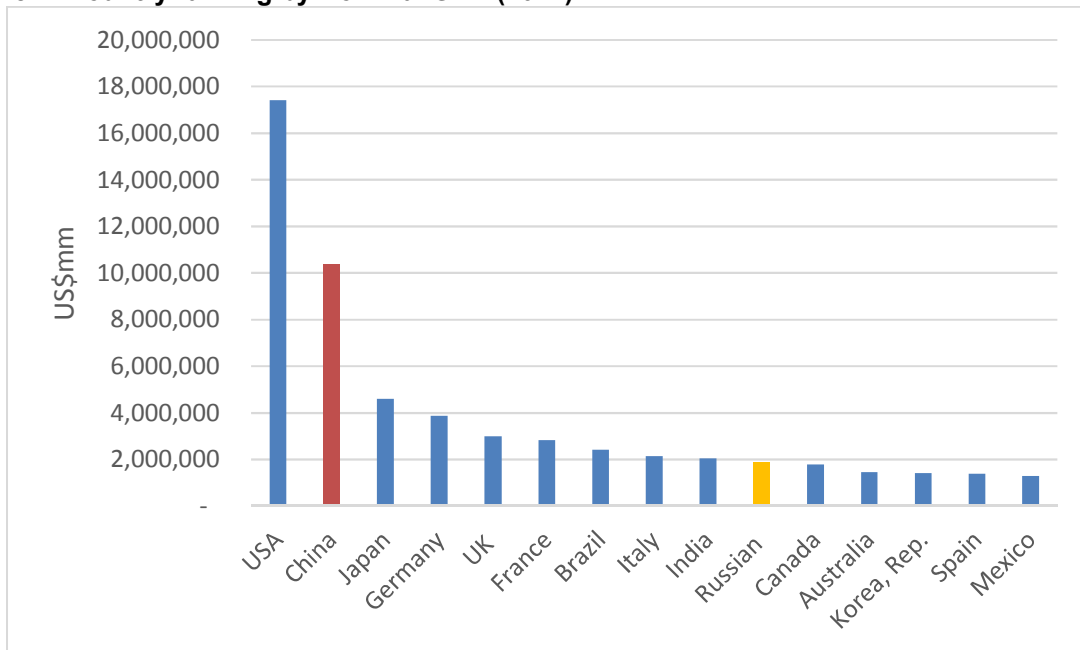
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Introduction

Russia's relationship with China has a long and complex history, catalysed by the lengthy border between the two countries, the complementarity of their economies and the ambitions of both to be seen as key global geo-political actors. Following periods of tension and friendship in the Soviet era, when the two communist states often struggled to find a mutual understanding, the post-Soviet era has seen a more complicated relationship develop based as much on economic reality as political ideology. Russia's economy has suffered collapse and recovery, often driven by oil price volatility, and has yet to achieve much-craved stability and consistent growth. China, meanwhile, has genuinely become an economic superpower, having enjoyed growth rates in the 7-15% per annum range since the mid-1990s¹ and has now become the second largest economy in the world in terms of nominal GDP. The disparity in the size of the Russian and Chinese economies is clearly shown in Figure 1 below.

Figure 1: Country ranking by Nominal GDP (2014)

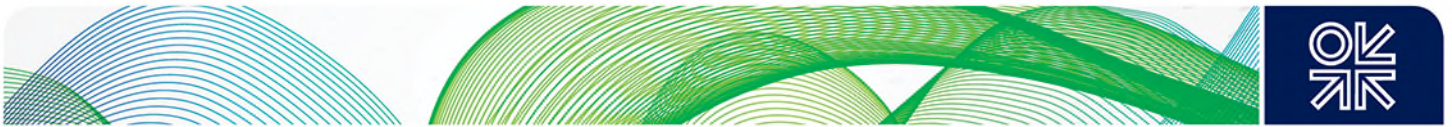


Source: World Bank

China's rapid economic growth, which has largely been based on industrial expansion, has also seen it become, since 2009, the world's largest energy consumer, with total primary energy demand in 2015 of just over 3 billion tonnes of oil equivalent (by comparison the USA consumed 2.3 billion tonnes and the whole of Europe and Eurasia 2.8 billion tonnes).² The geographical accident that China is also located next to the world's largest owner of fossil fuel reserves means that a commercial relationship based on energy was bound to emerge, and the development of ties between the two countries based on oil, gas and coal trade has generated significant interest and discussion. In particular over the past decade, as Chinese energy imports have increased rapidly while Russia has sought new markets for its key commodities, the issues of inter-dependency, reliance and security have been at the forefront of the debate.

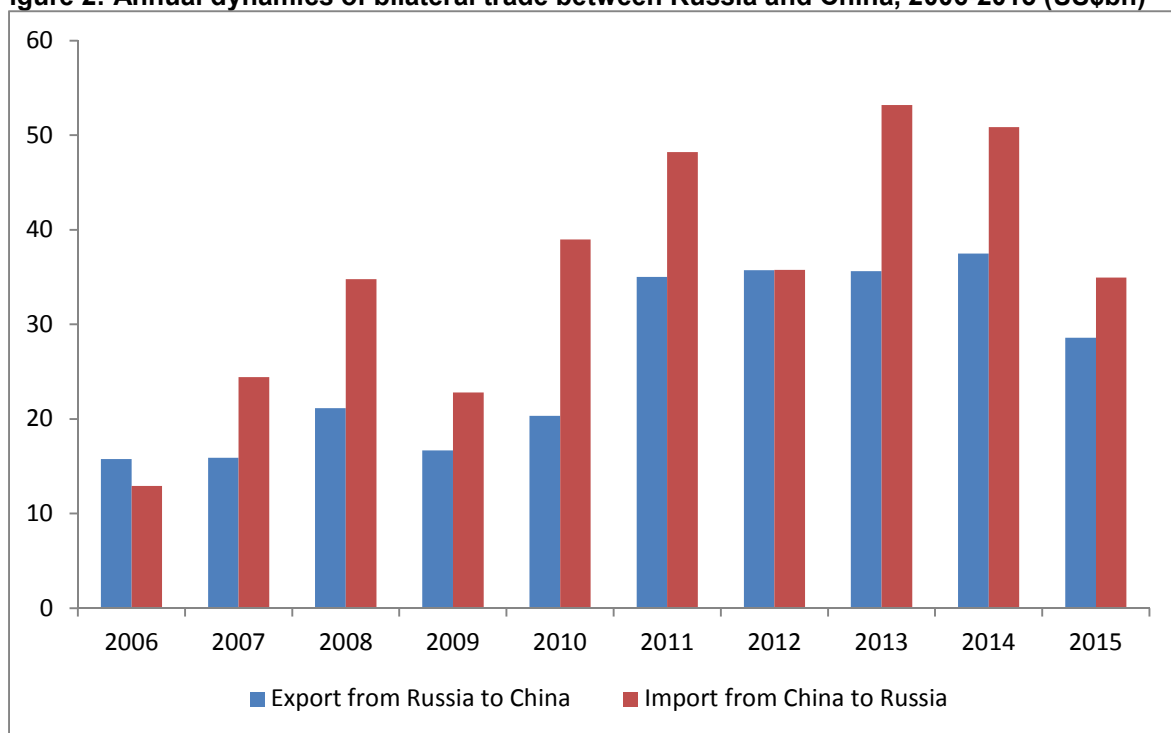
¹ Trading Economics, at <http://www.tradingeconomics.com/china/gdp-growth-annual>, sourced on 18 May 2016

² BP Statistical Review of World Energy 2016



Some growth in trade between the two countries started in the early 2000s, in association with warming political ties which involved the signing of the Treaty of Good-Neighbourly and Friendly Cooperation in 2001. But the real change occurred in 2007-2008, when China started to increase sales of its goods to Russia dramatically and Russia initialized a number of large projects to supply raw materials (primarily – fossil fuels) to China. In consequence there has been a considerable expansion of Russia-China trade relations over the past few years (Figure 2), with the only exception being 2015 with its low energy prices (Figure 2). As a result, according to the Russian Customs Service, China has already become Russia’s second most important partner after the European Union and the first among individual countries,³ while according to the Russian Ministry of Economic Development, in 2015 Russia was ranked as China’s sixteenth largest trading partner.⁴

Figure 2: Annual dynamics of bilateral trade between Russia and China, 2006-2015 (US\$bn)



Source: Federal Custom Service of the Russian Federation

Of most relevance, though, is that Russia’s current trade balance with China is dominated by hydrocarbon exports, as shown in Figure 3 below. Indeed, in 2014 energy resources accounted for 74% of total exports to China, and although this figure has fallen in 2015 to 67% due to the decline in oil prices, it is still substantial. Oil, oil products and coal are the key energy resources that make up the bulk of trade with China, with gas remaining marginal at present (some LNG from Sakhalin) with first pipeline deliveries scheduled for the end of this decade.

³ http://www.customs.ru/index.php?option=com_content&view=article&id=22570:-----2015-&catid=53:2011-01-24-16-29-43

⁴ http://www.ved.gov.ru/exportcountries/cn/cn_ru_relations/cn_ru_trade/

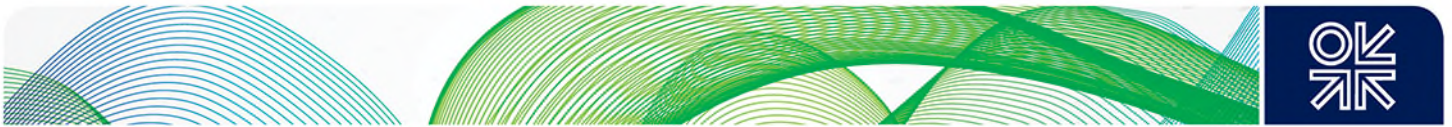
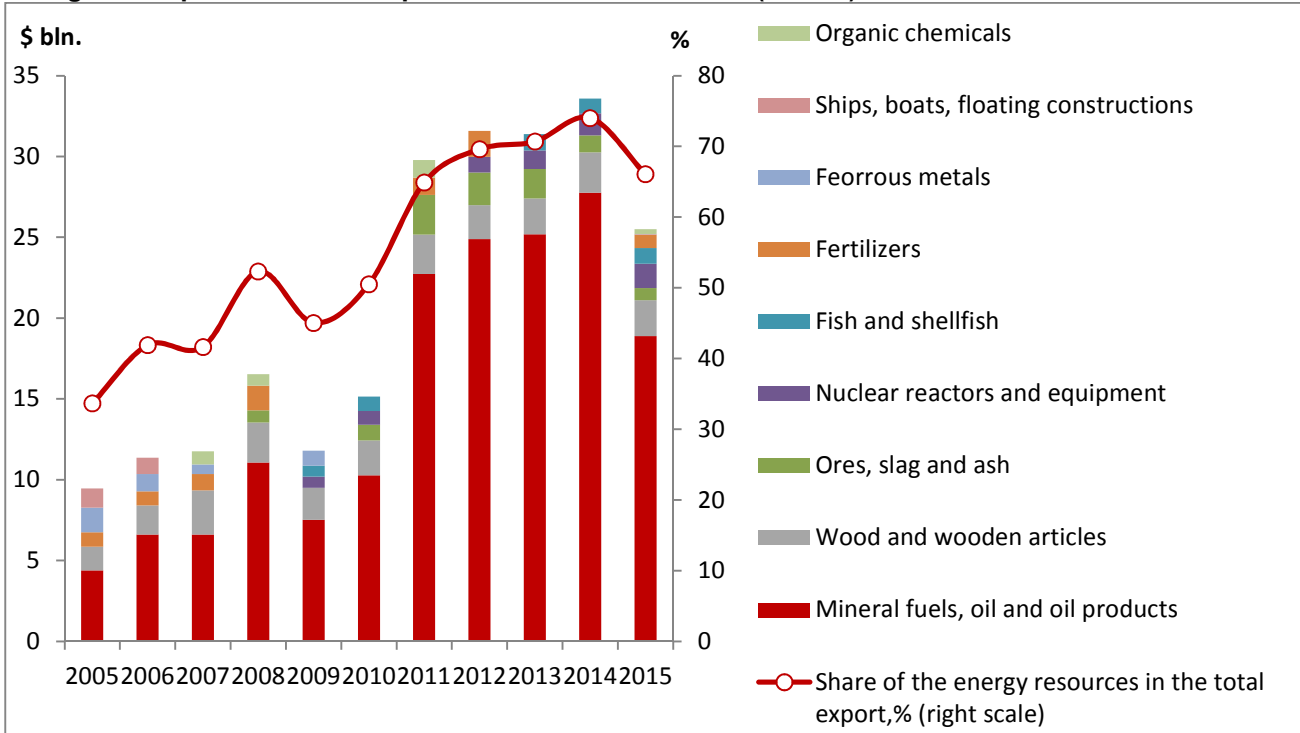


Figure 3: Split of Russian exports to China in 2005-2015 (US\$bn)



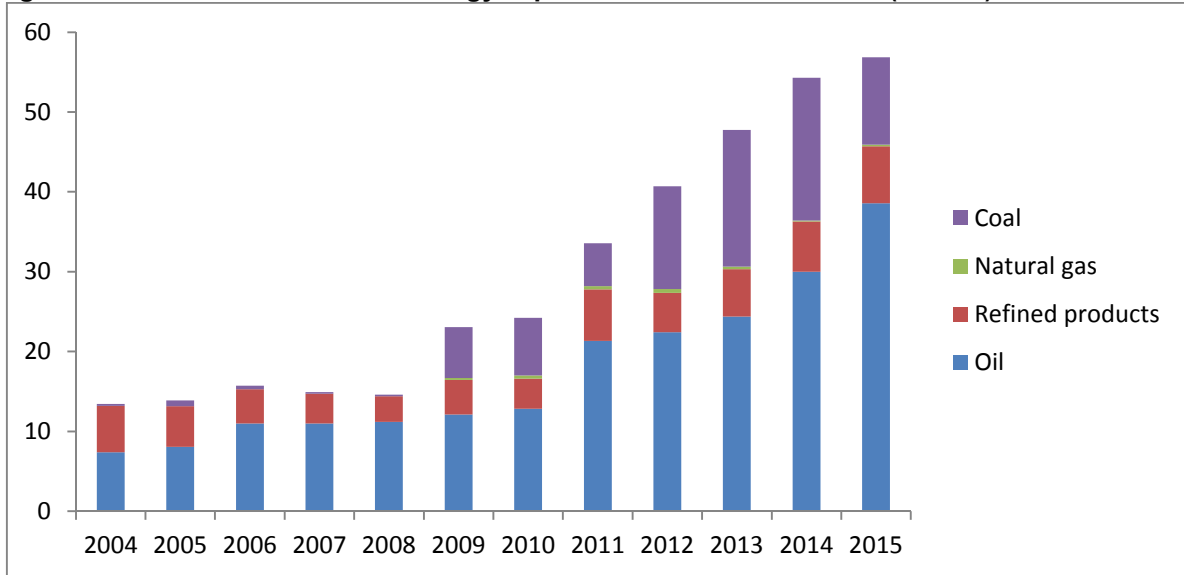
Source: Federal Custom Service of the Russian Federation

Figure 4 shows the split of crude oil, oil products and coal exports by volume, and demonstrates that although oil has consistently been the most important energy export over the past decade, coal sales have increased sharply since 2008 as China’s overall import requirement has grown. This momentum came to something of an abrupt halt in 2015, when coal exports fell while oil exports continued to rise, and this new trend is expected to continue as China readjusts its coal consumption in the light of environmental concerns in many parts of the country.⁵ Meanwhile oil demand is expected to continue to rise, and existing contracts with Russia foresee further increases in exports over the remainder of this decade and well into the 2020s.

⁵ Greenpeace, September 2013, “China clean air plan to slow coal consumption”



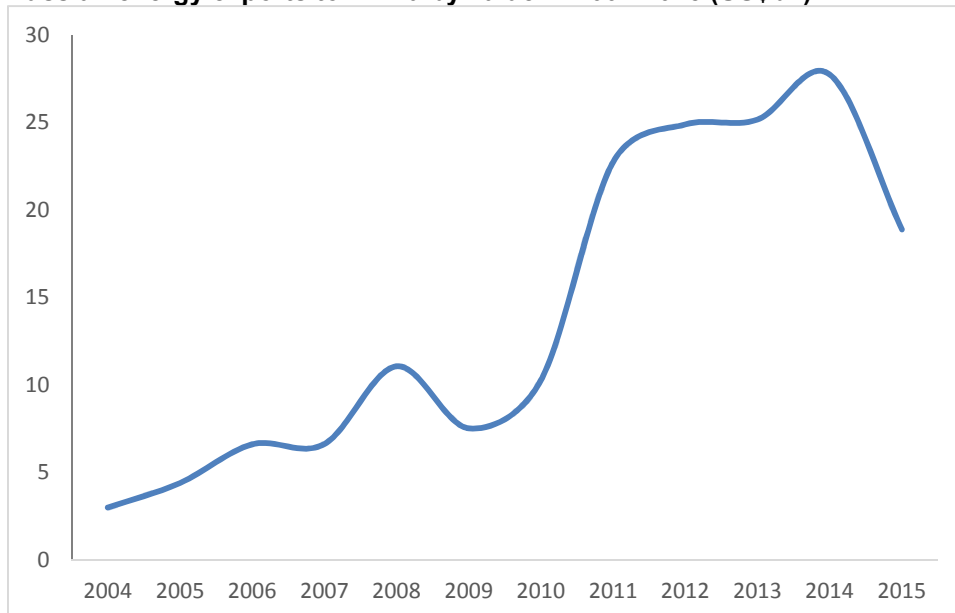
Figure 4: Breakdown of Russian energy exports to China in 2004-2015 (mmtoe)



Source: Federal Custom Service of the Russian Federation

The total value of Russia's energy exports to China peaked in 2014 at \$27.75 billion, and although this fell in 2015 to \$18.9 billion (Figure 5) due to the decline in commodity prices, the share of energy exports to China as a proportion of the Russian total energy exports remained stable at around 8%. Although this figure seems relatively low it reflects the comparatively recent change in emphasis from the Russian state on the diversity of its export sales.

Figure 5: Russian energy exports to China by value in 2004-2015 (US\$bn)



Source: Federal Custom Service of the Russian Federation

It has only been during the 2000s that Asia has been regarded by Russia as a major new market worthy of significant investment in both oil and gas assets and the infrastructure required to transport the commodities to market. The Eastern Gas Programme was only launched in 2007, while the key oil



pipeline (the Eastern Siberia-Pacific Ocean (ESPO) discussed below) came online at the end of 2009. As a result, expectations are high that the share of China and Asia in Russia's commodity export mix will grow significantly over the next decade, with a draft of the latest Energy Strategy suggesting that oil and gas flows could double over the next twenty years.⁶

This cooperation is important and attractive for both countries. For Russia the shift east has a number of strategic components, based both on economic and political logic. Primarily, Russia's traditional markets in Europe and the West are now mature and growth prospects are limited. When the current state of political relations between Russia, the EU and the US, which have deteriorated dramatically since the annexation of Crimea in 2014, are layered onto this commercial logic the imperative for Russia to diversify its export market is clear. European countries are seeking to diversify away from Russian imports for security of supply reasons, while overall energy demand is declining due to increased efficiency and economic stagnation.⁷

Furthermore, competition for the remaining demand for fossil fuels is increasing. In the oil market Saudi Arabia and Iran are adopting increasingly aggressive tactics to maintain market share,⁸ while in the gas sector the growing oversupply of LNG is causing prices to fall and giving customers much greater choice over their source of supply options. With new supply from the US set to increase sharply towards the end of this decade, and with Australian output already rising quickly, there is an increasing need for existing gas suppliers such as Russia to develop new outlets for gas exports.⁹

Given these global circumstances the logic for Russia to look east towards the expanding markets of Asia, and in particular China, is irrefutable. Not only can this be a source of expanding revenues and export sales, but it can also offer political diversity towards a region that has a less antagonistic relationship with the Kremlin. This is not to say that the Asia-Pacific region offers a wealth of new political allies for Russia, but at least the countries there appear more open to doing business than those in Europe.¹⁰ As we will discuss later, the impact of US sanctions on Russia is still a factor in the Asia-Pacific region, given US influence there, but the opportunity for Russia to forge alternative, and more positive, relationships is also evident.

Another key element of the "pivot to Asia" for Russia is the development of its own eastern regions. These have been largely neglected in the post-Soviet era, with the result that their population has declined and their economy has stagnated. The Russian authorities are keen to reverse this trend, not least because it leaves Russia weakened in its relations with China, and have therefore embarked upon a re-development programme that is based on the construction of key infrastructure, such as oil and gas pipelines, in the region. If this foundation can be used to support the emergence of new industries and services, then there is some hope that the potentially pervading influence of China in East Siberia and Russia's Far East can be contained.¹¹

On a broader scale too, expansion of trade with the world's fastest growing economies is important for Russia's standing as a geo-political player. Russia's oil and gas resources and exports play a key role in establishing the country's standing in the world, and in order to be a "global energy superpower" it is obviously vital to be present in all the key energy consuming regions.¹² The absence of Asia as a major market for Russian commodities had become an anomaly which is now slowly being addressed, but further development of eastern trade will continue to be an important theme for the foreseeable future. In particular, if the business of selling raw hydrocarbons can be matured into upstream and downstream

⁶ Moscow Times, 27 Jan 2014, "Draft strategy sees Russia's oil and gas flow to Asia doubling"

⁷ Financial Times, 27 April 2014, "Europe seeks alternative gas supplies"

⁸ Wall Street Journal, 6 June 2016, "Saudi Arabia cuts oil prices in Europe as Iran ramps up exports"

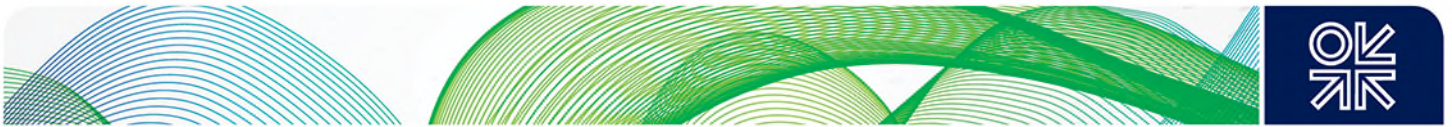
⁹ Forbes, 21 Jan 2016, "The US and Australian race to export liquefied natural gas"

¹⁰ The Moscow Times, 22 Sept 2014, "If Western Majors leave Russia, Asian companies will replace them"

¹¹ Kremlin Press Release, 3 April 2015, "Meeting on developing the Russian Far East" at

<http://en.kremlin.ru/events/president/news/49084> sourced on 6 June 2016

¹² Baev P. (2007), pp.447-465



partnerships which involve Russian companies participating in the sale of energy to end-users in consuming markets, then there is the chance that energy can also be used to build powerful geo-political alliances with emerging powers. This can then offer Russia political and economic diversity and can remove some of the threat of isolation which is apparent in its current relations with the West.

From a Chinese perspective, the attraction of importing energy from Russia is mainly concerned with increasing diversity of supply. This is particularly driven by Chinese concern over waterborne imports which could be disrupted by the US Pacific Fleet,¹³ especially as they transit narrow shipping lanes such as those in the Straits of Malacca. As a result, tanker-borne oil, refined product and LNG supplies are seen as a security risk, and China has been keen to find ways of mitigating this. Pipeline supplies from near neighbours offer an obvious solution. This Chinese strategy is most evident in the gas sector, where pipelines have been constructed from Central Asia (see Map 2 and Figure 24) and Myanmar into western and southern China which can help to offset the LNG arriving by tanker on the eastern seaboard. The obvious final point of the energy supply compass is the north, where gas and oil can come from East Siberia and from Sakhalin Island.¹⁴ Both are discussed later in this paper. China's oil options are somewhat less diverse, as although some does arrive from Kazakhstan by pipe the majority is delivered by sea from the Middle East. As a result, Russia offers a very attractive alternative pipeline option that can provide diversity both from the volatility of politics in the Middle East and from the risk of interruption of the shipping routes.¹⁵

Of course pipeline links with Russia bring their own political and economic risks, and it is clear from China's recent interactions with its northern neighbour that a reticence about full engagement still exists. For all the bold statements about energy co-operation and alliances, the memories of past political differences (and indeed military conflicts) are still fresh and are reflected in the cautious way the Chinese authorities are proceeding in their relations with the Kremlin.¹⁶ Furthermore, China no doubt also perceives that it has a strong bargaining position relative to Russia with regard to fossil fuel sales. It is the major market available to Russia, it fully understands that Russia wants to exploit a shift to Asia in its relations with the West and perhaps most importantly it sees that in all three buyer markets for oil, gas and coal there is a current surplus of supply and it is therefore very much a buyer's market. As the largest buyer in the world it is not surprisingly keen to exploit this position.¹⁷

Analytical context and literature review

State officials from the both sides are, not surprisingly, exchanging very positive messages, when assessing the level of cooperation: Russian Foreign Minister Sergey Lavrov said in May 2016 that "the level of relations between our countries – which is in fact the highest in historical perspective – represents an example of cooperation in the 21st century",¹⁸ while China's National People's Congress spokeswoman Fu Ying echoed him, stating that: "[The relations with Russia] are at the highest level of development in the history of our bilateral relations. External factors will not have any impact on them, they will continue to develop in a healthy way, because it corresponds to the interests of the two countries".¹⁹

¹³ Wall Street Journal, 27 Oct 2015, "US Navy tests China over sea claims"

¹⁴ Henderson & Mitrova (2015), pp.10-14

¹⁵ Bloomberg, 21 Oct 2015, "Russia races past Saudi Arabia in tussle for Chinese oil market"

¹⁶ Foreign Affairs, 14 Dec 2015, "An insider's view of Chinese-Russian relations"

¹⁷ Wall Street Journal, 19 May 2014, "Why China is driving a hard bargain with Russia over gas exports"

¹⁸ K.Zubacheva. Re-thinking Russia's pivot to China. Russia Direct. 02.07.2016. http://www.russia-direct.org/analysis/re-thinking-russias-pivot-china?utm_source=Russia+Direct+free+weekly+newsletters&utm_campaign=a8b918ea08-RD_Newsletter_june_06_2016&utm_medium=email&utm_term=0_cd2cf54b82-a8b918ea08-78578317

¹⁹ Russian-Chinese cooperation will continue to develop in a healthy way despite any possible external factors, Fu Ying, a spokeswoman for China's National People's Congress, said Friday. Sputnik. 04.03.2016. <http://sputniknews.com/politics/20160304/1035761674/russia-china-relations.html#ixzz4ErUToG3z>



However, amongst international politicians, journalists and academics the increasing economic (and primarily energy) cooperation between Russia and China over the past few years, with all the rhetoric which usually accompanies it, has caused many debates and led to radically different evaluations. The situation has been further complicated by the events of 2014, namely the annexation of Crimea and the introduction of international sanctions against Russia. Some Western media and policymakers have reacted to the Kremlin's "pivot to China" in the wake of the Ukraine crisis with significant scepticism,²⁰ while a number of Russian commentators are concerned that Russia could just become a puppet of China, supplying the raw exports to fuel the creation of an economic powerhouse on its eastern border.²¹ Alternative views have seen a more benign relationship between two partners who can find mutual benefit from each other's strengths, and have described the relationship in the 2010s' as "the strongest it has ever been, having completely removed any suspicion and left any "elder" or "younger brother" complexes in the past."²² Meanwhile in the West the potential threat of an alliance between a world energy superpower and a world economic superpower has also been analysed in depth,²³ with more generous interpretations seeing a "benign alliance" while a greater threat is seen by others in the form of "the world's new superpower axis."²⁴

However, the situation seems to be much more complex than these narratives suggest. The main aim of this paper is to investigate the development of bilateral energy cooperation between China and Russia in the post-Crimea period and to assess the complicated and lengthy negotiating game which is now emerging as both Russia and China attempt to find compromise solutions on a wide variety of commercial and political issues. These range across topics such as a fair price to encourage long-term investment in energy assets and infrastructure, political influence in Central Asia, potential Chinese investment in upstream assets in Russia, Chinese financing for Russian projects, the sequencing of export projects to meet China's market requirements, the balancing of China's relations with Russia and the West and the commercial requirements of both countries' state oil and gas companies, with all of the above also involving the implicit transfer of strategic messages to the other actors in the global geo-political landscape. Finding a suitable balance within this complicated matrix of concerns would be difficult at the best of times, but in an era of volatile prices and political turbulence the issues are magnified. In the remainder of this paper, we will review the issues in each relevant sector and attempt to conclude on progress in the Russia-China energy relationship to date while also speculating on future developments.

Firstly, though, we attempt to put our analysis into context with a brief review of relevant literature on the energy relationship between Russia and China. Anyone writing about the links between Russia and China in the energy sphere must first acknowledge the significant work that has already been done on the subject by Paik, whose 2012 book "Sino-Russian Oil and Gas Cooperation: The Reality and Implications" is a seminal work.²⁵ He provides a detailed review of the history of the interactions between the two countries, especially in the oil and gas sphere, but provides a different assessment for the prospects of each fuel in the bilateral relationship, seeing the potential for oil exports being fulfilled while Russian gas may be less successful at penetrating the Chinese market over the next twenty years, despite its obvious potential.

Paik provided a short update of his longer work in a 2015 working paper written in the aftermath of Gazprom's Power of Siberia gas deal with CNPC.²⁶ He argues that the agreement can fundamentally change the gas balance in the Asia-Pacific region, and can match the oil deal completed by Rosneft

²⁰ Foreign Policy, 8 May 2015, "Russia's stumbling pivot to Asia"

²¹ <http://echo.msk.ru/blog/milov/1323818-echo/>

²² Т. Бордачев. Китай и Россия ищут ответы на общие вызовы. 06.04.2016. <http://ru.valdaiclub.com/a/highlights/kitay-i-rossiya-ishchut-otvety-na-obshchie-vyzovy/>

²³ European Council on Foreign Relations Policy Brief, 2015, "A Soft Alliance? Russia-China relations after the Ukraine crisis"

²⁴ The Guardian, 7 July 2015, "China and Russia: the world's new superpower axis"

²⁵ Paik (2012)

²⁶ Paik (2015)



and CNPC in the previous year as a key turning point for Russia-China energy relations. At the time he was writing a second gas deal, via a western route, was also under negotiation, which Paik believed could place Russia as the swing producer between Europe and Asia. We now know that this second deal has been delayed, and our analysis assesses the current state of the negotiations and their further implications.

Although Paik is a key source on the topic of interactions in the energy sector between Russia and China, a number of other authors have also contributed on various aspects of the subject. In the oil sector Six (2015) has highlighted that, although Russia was somewhat late in entering the Asian market it has now accelerated developments in East Siberia and the Far East and constructed the infrastructure to supply both China and the broader Asia-Pacific market. However, he also highlights the fact that Russia's, and especially Rosneft's, commitment to the Chinese market is limiting its ability to increase supplies to other customers in the region. The theme of increasing dependence on China is also emphasized by Poussenkova (2013), who points out that not only are increasing amounts of physical oil being committed to China, but also that Rosneft is very reliant on Chinese finance to sustain its balance sheet in a low oil price environment. Indeed, she questions whether the corporate interests of Rosneft are compatible with Russia's strategic objectives, given that the increasing levels of financial reliance on China are creating a level of dependency for Russia overall.

The question of the nature of the relationship between Russia and China is a theme that we will follow through this paper, but previous authors have introduced clear areas of debate on the issue. On a positive note, Fu Ying (2016) describes a relationship that is now more stable than during the Soviet era, when rivalry and mistrust undermined any thoughts of real cooperation. However, while the ties between the countries are now tighter, China's view is encapsulated by the principle of "no alliance, no conflict and no targeting any third country." This theme is also picked up by Jakobson et al (2011), who assert that although many commentators, especially Russian ones, describe the relationship with China as "the strongest it has ever been", this does not mean that it is a partnership of equals. Instead the authors see three common threads in the China-Russia partnership, namely pragmatism, lack of political trust and the US factor, all of which point to a scenario in which any grand expectations of a broad alliance will be unfulfilled. Indeed, Jakobson et al see Russia's significance to China continuing to diminish in spite of the obvious room for energy partnership. Thim (2011) agrees that Russia risks losing ground in its competitive position in China, with energy remaining one of the last spheres where it can hope to have a meaningful role. As a result, negotiations on oil and gas exports take on an even more important strategic as well as commercial dimension. Chang (2014) agrees that both the economic and military balance in the relationship is tipping towards China, but still argues that in the energy sphere the relationship remains one of mutual dependency. Russia needs to sell its hydrocarbons into a new and growing market, but China needs to diversify its sources of imports and Russia is too big a producer to be ignored in this respect, in spite of lingering political concerns.

This balance between co-operation and rivalry is particularly evident in the gas sector, where Henderson (2011b) points out that conflicting views of the balance of negotiating power continue to cause delay and frustration. Russia sees China as a rapidly growing gas market which needs Gazprom's gas and should pay a premium for it, while China regards East Siberian fields as stranded assets reliant on the Chinese market as their only potential source of monetization. This has led to significant difficulties over agreeing on price, and has meant that the first gas export deal (via Power of Siberia) took a decade to finalise while a second (via Altai) is still being discussed. Furthermore, Henderson (2014) underlines the economic difficulty with the latter export scheme, as for Gazprom the gas has an alternative market in Europe, and so an obvious comparative price, while for the buyer (CNPC) the gas arrives in western China far from the key areas of demand, thus necessitating a lower price to cover transport costs. These economic realities, as much as any political uncertainty, are at the root cause of much of the delay in completing what appears on the surface to be a logical commercial deal.



Chow (2015) points out that Russia's failure to understand the commercial realities of a more competitive global energy economy could undermine the overall relationship with China. The Chinese authorities have become frustrated with Gazprom's attempts to push a second western pipeline option that is not needed and is not economic, and as a result are inclined to play a waiting game to see how the commercial and political dynamics play out. As highlighted by Cornot-Gandolphe (2014), this strategy is also driven by the fact that the Chinese authorities have a major dilemma to resolve regarding the coal sector, which provides a cheap and secure source of domestic energy but which has a clearly negative environmental impact that is also starting to affect political and social action in the country. Replacement of coal by gas is one obvious solution, at least in the short to medium term, but the implications of this move are still seemingly being thought through, as gas is not only more expensive but also provides less security of supply, as an increasing amount of it will need to be imported. Indeed, to return to Paik (2012) it can be argued that the future of gas imports to China may be determined as much by domestic supply as by domestic demand, as the authorities may not wish to see gas imports make up too much of their overall supply portfolio.

This paper aims to contribute to the literature on the Russia-China energy relationship by providing detailed evidence of activity in the post-sanctions period which we believe demonstrates that China in particular views the relationship in largely commercial terms, with clear political overtones. It provides a most comprehensive and up-to-date review of recent negotiations and transactions, as well as an assessment of the current state of the balance of bargaining power and cooperation between the two countries.

We will argue that, in spite of the apparent mutual dependency, the development of a true strategic partnership is rather unlikely, and Russia will have to face the fact that it is in a fierce competition for market share in the Chinese energy market. In this sense, its relationship with China is no different to its relationship with any other major customer, and it needs to accept that its prices must be competitive and its contract terms flexible enough to meet customer needs. There is also a clear risk for Russia, though, in that it may become overly dependent on one major Asian customer, both for export sales and for finance, and therefore leave itself in a weak bargaining position in the long term. It is also worth noting that China does not appear to want to go so far as to form an alliance with Russia or engage in a way that might risk its relations with other major powers. Indeed, among the world's major powers China is the only one that claims to uphold a non-alliance policy, having apparently learned its lesson from its unsuccessful alliance with the Soviet Union.²⁷

The paper is structured as follows. First, we briefly review the history of the relationship back to the Soviet era, tracing the various attempts at co-operation and partnership through the Communist era in Russia and then outlining the changes seen in the early post-Soviet period. We then analyse the Putin era from 2000-2013, as relations began to take on a more concrete form in the first decade of the new millennium. We then focus on the changes seen in the post-sanctions world from 2014.

Secondly, we address each major fuel in the energy sector, with a particular focus on oil and gas but also covering coal, electricity, petrochemicals and oil products. In the oil sector, first exports were sold by Yukos in the early 2000s, but since 2006 Rosneft and Transneft have become the major players, and it is the chief executive of the former, Igor Sechin, who is now arguably Russia's leading proponent of increased ties with China. We analyse the role of Rosneft in developing the relationship, the bargaining that has continued over the past few years and the recent diversion of Russian attention towards other partners (India, potentially Japan, etc.) as Chinese companies have delayed their investment decisions.

²⁷ F. Zhongping, H. Jing. China's strategic partnership diplomacy: engaging with a changing world. ESPO. Working Paper 8. June 2014. http://fride.org/download/wp8_china_strategic_partnership_diplomacy.pdf



In the gas sector, the main theme has been Gazprom's negotiations over pipeline exports, with one deal now confirmed and two others under negotiation. However, the emergence of LNG as a key plank of Russian gas export strategy has introduced two other players on the Russian side, Novatek and (once more) Rosneft, who are emerging as potential competitors to the state gas company. On the Chinese side the key question remains the extent of demand growth and import requirement, as well as the potential place for Russia within the Chinese import compass. Current expectations have been dampened by a slowdown in economic growth, but environmental pressure and a desire to balance pipeline and LNG imports could catalyse further negotiations with Russian gas exporters.

In the coal sector the outlook is much less promising, as Russia's growing dependence on the Chinese market turned out to be a huge problem when China recently started to review its energy policy with a specific goal of limiting the role of coal for environmental reasons. As a result, Russia's coal export dynamics in 2015-2016 were extremely negative, and China's lack of interest in investing in the Russian coal sector (unlike its ambitions in the oil and gas sectors) does not bode well for future trade. Significant oversupply in the global coal market, and the availability of numerous competing sources of supply, has meant that China has no interest in investing in enterprises with huge social responsibilities and low profits. As a result, the coal sector provides a clear example of an area of cooperation which is completely driven by market forces, with China having no incentive to develop any form of "special" relationship.

In the electricity sector economic reality is also the founding principle of any cooperation, as although a variety of different projects are under discussion only one export scheme is active. The main reason is that low regulated domestic Chinese prices do not make export projects attractive for any Russian counterparty, which would have a huge struggle to make any investments profitable.

Cooperation in the petrochemical and oil products sectors is also not advancing well. Although several projects have been under discussion since 2009, and numerous memoranda have been signed, no scheme has yet shown any visible progress.

Finally, we conclude with a review of the financial and asset based transactions that have taken place between Russia and China over the past few years, and evaluate the potential for the relationship to mature further, assessing the potential positions of both countries. We discuss the potential extent of Russian hydrocarbon exports and whether Russia can develop a more value-added proposition or will remain merely an exporter of raw hydrocarbons. We debate the likelihood of further cooperation between Russian and Chinese companies in both the upstream and downstream sectors in both countries. We review the likely geopolitical consequences of closer energy ties between the two countries, but also question whether the economics of extensive new projects can be justified in the current low oil and gas price environment. And lastly, we assess the competitive position of Russian hydrocarbon projects in the context of increasing global competition in the oil and gas sectors, with particular reference to the Chinese market given its status as the world's largest energy consumer and a rapidly expanding importer of fossil fuels.



Historical background

1949-1999 Uneasy relations and border disputes delay energy co-operation

In 1949 when the People's Republic of China (PRC) was established after the Communist Party of China (CPC) won the Chinese Civil War, the Soviet Union immediately became its closest ally. Soviet design, equipment and skilled labour were supposed to help industrialize and modernize the PRC. But the extent of actual support, while not insignificant, fell well below Chinese expectations.²⁸

After Stalin's death in 1953 ideological tension between the two countries emerged, when the two regimes started to criticize each other. This tension was very strong - in 1969 there was even a seven-month undeclared military border conflict between the two countries on their eastern border in the vicinity of Zhenbao Island on the Ussuri River (known as Damanskii Island in Russia) and on the western part of the Sino-Soviet border in Xinjiang. These skirmishes led to the intensification of border fortifications and the mobilization of the civilian populations on both sides. Furthermore, these events caused Chinese leader Mao Zedong to re-appraise China's foreign policy and to seek rapprochement with the U.S.²⁹ This enmity began to lessen after the death of Mao in 1976 and the end of Chinese anti-revisionist policy, but relations with the Soviet Union remained poor for the next 15 years with additional conflicts over Vietnam and Afghanistan aggravating the situation.

An olive branch was extended by the Soviet Union in 1982 when Brezhnev made a speech offering reconciliation with the PRC, and the then Chinese leader Deng agreed to restore diplomatic relations. As a result, in the energy sphere the Soviet Union began to contemplate plans for constructing oil and gas pipelines to China in the late 1980s, but Beijing did not really take these schemes very seriously as oil prices had not then risen above \$20/barrel, and there was an excess of supply on the market.³⁰

A real improvement in diplomatic relations only started after the end of the Soviet Union in 1991. During Gorbachev's visit to China in 1989 both sides signed an agreement on delimitation of the main part of the border.³¹ After a short pause caused by Chinese support for the GKCHP putsch,³² in December 1992 the relationship was further improved: the first Russian President Boris Yeltsin made his first official visit to China, during which border negotiations started and the trade was resumed.³³ Both sides defined their relationship as "good-neighbourly and mutually beneficial", and active military-technical cooperation between the two countries began at this time.

In May 1994 Russian and Chinese officials signed an agreement on the Sino-Russian Border Management System intended to facilitate border trade and hinder criminal activity. During the return visit to Russia in September 1994 Jiang Zemin called these bilateral ties a "constructive partnership". On October 17, 1995, an agreement over the last 54 kilometre stretch of the border was reached (though the question of control over three islands in the Amur and Argun rivers was left to be settled later) and finally in April 1996 the relationship was named a "strategic partnership of coordination".³⁴

²⁸ For a comprehensive and insightful view of Sino-Russian relations see Iwashita (2004)

²⁹ Kuisong, Yang. "The Sino-Soviet Border Clash in 1969: From Zhenbao Island to Sino-American Rapprochement," *Cold War History*, Volume 1, Issue 1 (2000), pp. 21-52, <http://www.tandfonline.com/doi/abs/10.1080/713999906>

³⁰ Poussenkova N. (2013) "Russia's Eastern Energy Policy: A Chinese Puzzle for Rosneft." IFRI, Paris, France. April 2013. http://www.ifri.org/?page=contribution-detail&id=7634&id_provenance=97

³¹ Галенович Ю.М. Россия и Китай в XX веке: граница. М. : Изограф, 2001 [Galenovich Yu.M. Rossiya i Kitay v XX veke: granitsa. M. : Izograf, 2001].

³² The State Committee on the State of Emergency (GKCHP) was formed in 1991 by eight members of the Soviet elite who were determined to oust President Gorbachev

³³ New York Times, 18 Dec 1992, "Yeltsin starting 3-day China visit"

³⁴ Xia, Yishan. "China-Russia Energy Cooperation: Impetus, Prospects and Impacts." James A. Baker III Institute for Public Policy, Rice University. May 2000. pg. 5-6.



Then in December 1998 Russia and China issued a joint communique pledging to build an “equal and reliable partnership,”³⁵ which importantly was one of the first Chinese strategic partnership agreements.

However, despite the fact that in the early post-Soviet years significant political progress was made, the Russia-China relationship was not regarded as particularly important by the new Russian elites, who were west-oriented (primarily building communication channels with the U.S. and trying to integrate Russia into the European space). The Asian vector was regarded as a secondary, marginal part of the country’s external policy.³⁶ Indeed, the East was more perceived as a region of potential conflict, where close political ties could create difficulties in Russia’s relations with the West, while any economic benefits would be ambiguous at best. As a result, the Chairman of the Government of the Russian Federation Egor Gaidar called Russia an “outpost” of democracy in the East,³⁷ while the Ministry of Foreign Affairs regarded China primarily as a potential threat to its relationship with the West.³⁸ Moreover, the history of military conflicts in the 1970s had not completely been forgotten, with the psychology of the “Chinese threat” remaining prevalent (as it still does to an extent today). In the 1990s and early 2000s many Russian leaders expressed growing concerns regarding both Chinese settlement in the energy-rich but sparsely-populated Russian Far East and increased Chinese investment in and control of Russian energy ventures there. China’s growing oil and gas partnerships with former Soviet Central Asian republics have also been regarded as a potential source of tension, as Chinese policy-makers advanced their country’s interests in an area where Moscow had traditionally exerted a dominant regional influence.³⁹

In line with this political background, Russia-China energy relations during the 1990s were quite modest. Despite declarations of goodwill and bilateral energy cooperation (including an intergovernmental agreement on joint development of cooperation in the energy sphere in April 1996 and an agreement between the Energy Ministry of the Russian Federation and CNPC on organization of cooperation on oil and gas projects in June 1997), inadequate transportation infrastructure, pricing concerns, mutual suspicions and competition for influence in Eurasia restricted any practical implementation.⁴⁰ However, towards the end of the decade the first signs of co-operation began to emerge. In 1997 feasibility studies were carried out on potential oil and natural gas pipeline projects, with the Kovykta field in Irkutsk first being mentioned as a possible source of gas exports.⁴¹ Then in 1999 construction of the first two blocks of the Tianwan nuclear power station began (based on an original 1992 inter-governmental agreement), underlining the fact that Russia had both resources and technology that China valued and was prepared to pay for, although the gas pipeline project would take another 17 years to negotiate.

1999-2013 (“Putin period” before sanctions)

The start of the “Putin era” saw a shift in Russian external policy which included an increasing acceptance of and support for an intensification of Russia-Chinese economic cooperation as a counter balance to the historically dominant economic ties with the West. Although the new president was initially wary of the potential for excessive Chinese influence in Russia’s Far East (in 2000 he warned a Siberian audience that unless Russia intensified the region’s development, the Russian Far East would end up speaking Chinese, Japanese and Korean),⁴² the geopolitical importance of cooperation

³⁵ BBC, 24 April 2015, “Brothers again? How deep is the Xi-Putin bromance?”

³⁶ Barabanov M.S., Kashin V.B., Makiyenko K.V., “Oboronnaya promyshlennost’ i trgovlya vooruzheniyami KNR. Rossiyskiy institut strategicheskikh issledovaniy,” Moscow, 2013.

³⁷ Gaydar E., “Rossiya XXI veka: ne mirovoy zhandarm, a forpost demokratii v Yevrazii”, *Izvestiya*, 18 May 1995.

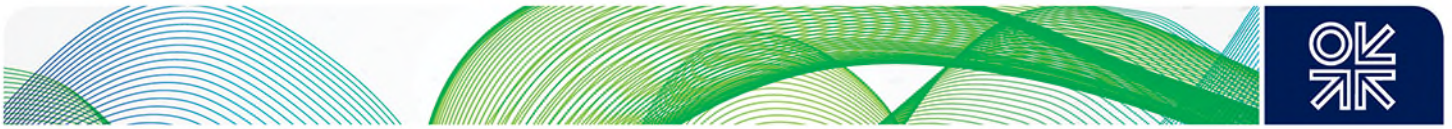
³⁸ Voskresenskiy A., “Rossiya i Kitay. Chetyre veka vzaimodeystviya,” / pod red . A.V. Lukina. M. : Ves’ mir, 2013.

³⁹ Indeo, F., *Heartland Eurasian Review of Geopolitics*, 20 Aug 2012, “The Rise of China in Central Asia”

⁴⁰ Weitz, Richard. China-Russia relations and the United States: At a turning point? *Rianovosti*. Apr 14, 2011.

⁴¹ Voskresenski Alexei. Relations between Russia and China as part of the Asian vector of Russian diplomacy (1990–2015). <http://lawinfo.ru/catalog/contents-2015/sravnitelnaya-politika/1/8741/>

⁴² *Nezavisimaya Gazeta*, Jul 22, 2000



with China ultimately outweighed these fears, and since 2001 the Russia-China political partnership has been an increasing focus for the Kremlin.

The creation of two equal vectors in Russian foreign policy – one towards Europe and another in the direction of Asia – was formulated in an article entitled “Russia: New Eastern Perspectives”, where Putin confirmed that China remained Russia’s strategic partner as it had been during Yeltsin’s presidency. However, at the same time the President underlined that new nuances had emerged in this partnership, in particular a focus on maintaining and strengthening a multipolar world and the urgent need for joint Russian-Chinese efforts to maintain strategic equilibrium and balance.⁴³

In 2001, the increasingly close relations between the two countries were formalized in the Treaty of Good-Neighbourly and Friendly Cooperation, which is a twenty-year strategic, economic, and military accord, and importantly also envisages development of cooperation in the energy sector. Moreover, Putin also stated that the existence of this treaty meant that “according to its character, relationships between Russia and China are higher than relationships between Russian and the US”.⁴⁴

Importantly both parties also confirmed that the signing of the agreement had drawn a final line under the difficult bilateral relations of the past and had opened a way for developing cooperation based on appropriate legal principles, the absence of which had previously hindered negotiations on final border control issues from being completed and had also prevented any radical growth in total trade volumes. As a result, although the Russian-Chinese agreement of 2001 did not formally create either a military or a political alliance between the two countries and did not record any joint defence obligations in the event of an external threat, it was extremely useful in promoting further movement towards closer cooperation, without defining the specific forms of any collaboration.⁴⁵ Interestingly this specific treaty between the two countries also confirmed a broader alignment in the Eurasian region which had been established only one month before, when Russia and China joined with Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan to form the Shanghai Cooperation Organisation (SCO), confirming a new regional role for both countries in Central Asia.

Further progress was made in May 2003, when China and Russia again issued a joint declaration, stating that no matter how the international situation might change, the strategic foreign policy priority for both countries would be to deepen good-neighbourly friendship and mutually beneficial cooperation. This increase in friendly relations then reached a practical conclusion in October 2003 when the two sides finally signed a border agreement, resolving the longstanding dispute. China was granted control over Tarabarov Island (Yinlong Island), Zhenbao Island, and approximately 50% of Bolshoy Ussuriysky Island (Heixiazi Island), near Khabarovsk, and the official transfer ceremony was held on October 14, 2008, fostering further reconciliation and cooperation between the two countries at a political level.

Nevertheless, despite all the progress on the political side, energy cooperation was still at a low level, and indeed it was not the Russian state but the privately-owned Yukos oil company which became the primary driver of oil and gas exports to China. In 2001, it proposed the Eastern Siberia-Pacific Ocean (ESPO) Oil Pipeline Project, which would link Yukos’s oil refinery in Angarsk to Daqing, in northern China,⁴⁶ in order to supplement the rail routes which, at the time, were the only means of transporting oil into the growing Chinese market. Yukos also started to promote a gas pipeline, but the bankruptcy of the company temporarily postponed these discussions.

⁴³ Voskresenski.A. Relations between Russia and China as part of the Asian vector of Russian diplomacy (1990–2015). <http://lawinfo.ru/catalog/contents-2015/sravnitelnaya-politika/1/8741/>

⁴⁴ А. Казанцев А. Экспорт российских энергетических ресурсов в страны АТР: экономические и политические факторы. http://nordport.ru/index.php?option=com_content&view=article&id=61&catid=20:-&Itemid=41

⁴⁵ Voskresenski A. The Three Structural Stages of Russo-Chinese Cooperation after the Collapse of the USSR and Prospects for the Emergence of a Fourth Stage // Eurasian Review. 2012. November. P. 1–15.

⁴⁶ Helmer, John. China beats Japan in Russian Pipeline Race. http://www.atimes.com/atimes/Central_Asia/GD29Ag01.html



The major turning point occurred in Russia's relations with China in 2004, when Rosneft took over the assets lost by Yukos in bankruptcy proceedings caused by a huge tax investigation catalyzed by the Russian authorities.⁴⁷ Igor Sechin, who was Chairman of the Board of Directors of Rosneft in 2004-2011 and supervised the company while also being deputy chief of Putin's administration and then deputy prime minister responsible for the energy sector, became the next driving force for Russia-Chinese energy rapprochement. In 2004 Rosneft and CNPC signed a 5-year oil delivery contract for 48.4 million tonnes to be transported by rail, while Sinopec received 25.1% of shares in the Veninskii block of Rosneft's Sakhalin-3 project.

Following this export agreement, further significant progress was made in March 2006 when President Putin visited China and signed a whole package of energy cooperation agreements, including joint oil, gas and electricity projects. Importantly, Transneft and CNPC then signed a protocol concerning the construction of an oil pipeline from Skovorodino to the Chinese border (re-kindling Yukos' original idea), while Gazprom signed a memorandum on a gas pipeline. At the same time the Eastern Energy Company and the Chinese State Grid Company SGCC signed an agreement to carry out an integrated feasibility study on a project to export electric power from Russia to China, while in 2007 Rosneft and CNPC created a joint venture for Tianjin refinery development.

In 2008 the first signs of a more confrontational attitude towards the West emerged due to Russia's military conflict with Georgia. As a result, the recently elected President Dmitry Medvedev re-confirmed his predecessor's strategy and stressed that developing friendly relations with China was the most important direction for Russian foreign affairs in Asia.⁴⁸ As part of this process, in 2009 Russia completed work on preparation of a large number of policy documents outlining the strategic development of the economy and energy industry in the East of the country to 2030 in the context of energy cooperation between Russia and East Asia countries,⁴⁹ all of which asserted that China would be the main future consumer of Russian energy resources in the East. In practical terms, 2009 also saw huge growth in Russian coal and electricity exports to China, and a significant oil export deal between Rosneft and CNPC for the delivery of 15 million tonnes per annum to 2030 was also signed, with deliveries beginning through the Skovorodino-Daqing oil pipeline.

To enhance this focus on eastern development, a special Ministry for the Development of the Far East was created in 2012.⁵⁰ However, as noted by a number of commentators, "it practically did no work in the first few years but then made some progress. Having overcome bureaucratic resistance, the ministry presented a concept of advanced development territories and determined the first of them. But the progress of current projects was impeded by bureaucratic uncertainty and the lack of initiative on the part of the local authorities, as well as by the administrative gap whereby Siberia and the Far East are not managed as one whole. Although the president has designated the development of this region as Russia's main project in the twenty-first century, sometimes it seems that its implementation may be delayed until its latter part."⁵¹ Indeed it appeared that corporate, rather than political, action was actually driving progress, as for example in 2013 the oil export contract signed with CNPC was increased by an

⁴⁷ Financial Times, 10 May 2007, "Rosneft seals takeover of Yukos"

⁴⁸ Центр устойчивого энергетического развития. Разработка комплексной программы российско-китайского энергетического сотрудничества на период до 2020 года [Электронный ресурс]. Режим доступа: http://www.isedc-u.com/index.php?option=com_content&view=article&id=102&lang=ru

⁴⁹ These documents included "Energy Strategy of Russia until 2030", "Program for Creation in East Siberia and the Far East of a Unified System of Gas Production, Transport and Supply with Potential Gas Export to the Markets of China and other APR Countries" (Eastern Gas Program), "Strategy of Socioeconomic Development of the Far East and the Baikal region until 2025", "Strategy of Socioeconomic Development of Siberia until 2020", "Energy Development Strategy of East Siberia and the Far East until 2030", "Program for Development of Oil Refining Capacities in East Siberia and the Far East"

⁵⁰ Постановление от 30 июня 2012 г. N 664 О МИНИСТЕРСТВЕ РОССИЙСКОЙ ФЕДЕРАЦИИ ПО РАЗВИТИЮ ДАЛЬНЕГО ВОСТОКА. <http://minvostokrazvitiya.ru/images/downloaded/pprf664.pdf>

⁵¹ S. Karaganov, "A turn to Asia: the history of the political idea", <http://eng.globalaffairs.ru/pubcol/A-turn-to-Asia-the-history-of-the-political-idea-17926>



additional 15 million tonnes/year for 25 years and Rosneft also signed a contract for oil supplies with Sinopec for 10 million tonnes for 10 years starting from 2014.

As a result, the second decade of Russian-Chinese relations in the post-Soviet period was marked by a significant expansion of trade and economic relations but with progress being rather uneven in nature. Annual growth in commercial and economic trade in 2000-2008 (pre-crisis) averaged 30%, and by 2008 had reached \$68 billion. Not surprisingly in 2009 trade fell following the global financial crisis, but it recovered to pre-crisis levels by the end of the decade. At the same time another new and important trend emerged in trade and economic relations, namely that the share of imports from China increased substantially and China became Russia's leading trade partner. At this time China's share in Russia's foreign trade had reached 10.2%, and Russia's share in China's foreign trade was slightly over 2%, emphasizing the reciprocal nature of the arrangement but also underlining that the dependence of Russia on China was becoming significant. It is also important to note that the share of machinery and equipment supplied by Russia to China fell sharply (to less than 2% of total exports), as Russia became primarily an exporter of raw materials (fuel and energy products, raw wood products, timber, wood cellulose, iron ore and iron ore concentrates, fertilisers, fish etc.). Meanwhile, the structure of Russian imports from China showed an increase in the share of machinery, equipment, transportation vehicles, chemical goods, consumer electronics and consumer goods. As a result, Russia and China swapped places in their trade and economic cooperation when compared to the Soviet period: Russia became a supplier of raw materials to China (part of the analytical and political community in Russia has even coined the term "a raw materials appendix to China"), while China became a supplier of end products, including machine-building equipment and even petrochemical products produced from Russian oil products exported to China.⁵²

Post-sanctions relationship in 2014-2016

In 2014-2015 a fundamental shift in Russian foreign policy took place, catalysed by the annexation of Crimea and the global reaction to it. As a result, the Russian political regime now no longer regards the West as a strategic partner, and is increasingly turning to the East, primarily towards China. It is becoming apparent to the Russian political elite that "the country will have to live in a new reality that differs from the previous rosy dreams of integration with the West, while preserving its independence and sovereignty...In early 2014, Russia decided to put an end to its latent confrontation with the West, which had become obvious in the previous year, and hit first, thereby bringing this confrontation into the open. This turn of events sharply strained Russia-West relations. Russia was faced with unpleasant sanctions and the West's attempts to organize its international isolation, while centripetal tendencies were increasing within the Western alliance".⁵³

As Alexander Gabuev mentions, the phrase "pivot to Asia" became popular among the Russian elite in May 2014, following Putin's triumphant visit to Shanghai right after the imposition of the first Western sanctions. Half of Russia's ministers and many of its wealthiest men came home from the trip with memoranda of understanding and friendship - if not actual agreements or contracts. Gazprom CEO Alexey Miller, who brought back a \$400 billion contract, stated that one can't apply European standards to doing business in the Asian gas market and that "just in one day, our esteemed Chinese partners did business on the same level as Germany, our major gas consumer."⁵⁴ His words reflected the general optimism in Russia. Many were confident that the Chinese would flock to take advantage of Russia's

⁵² A. Voskresenski. Relations between Russia and China as part of the Asian vector of Russian diplomacy (1990–2015).

<http://lawinfo.ru/catalog/contents-2015/sravnitelnaya-politika/1/8741/>

⁵³ S. Karaganov, "2015: Global Tendencies and Russian Policies", <http://eng.globalaffairs.ru/number/2015-Global-Tendencies-and-Russian-Policies-17976>

⁵⁴ Address by Gazprom Management Committee Chairman Alexey Miller at 13th International Investment Forum Sochi-2014. September 19, 2014. <http://www.gazprom.com/press/miller-journal/335371/>



rift with the West by buying up assets, issuing loans, and sharing technology.⁵⁵ Russian companies were looking to China for equipment supplies and financing. But the year 2015 then became one of sobering reality, as it became clear that Chinese technology and financing would be less forthcoming than had been hoped.

Chinese technological involvement was very limited, as Chinese companies for the most part did not possess many of the technologies needed, with the main exception being the provision of rigs for offshore drilling.⁵⁶ On the financial side China was also quite cautious, preferring not to challenge its relationship with the United States, with the Big Four Chinese banks deciding to comply with Western sanctions, despite the fact that Beijing officially condemns them. Given the choice between the opportunity to increase their presence in Russia's high-risk market (previously small and now declining further due to economic recession) and the potential to strengthen their positions in the huge and stable markets of the United States and the EU, Chinese banks are opting for the latter. Rare cases when Chinese credit is available for Russian companies are mostly syndicated loans involving China's Big Four banks acting in concert with other international players. This money is offered only to prime borrowers like Novolipetsk Steel and Gazprom, which are not under sanctions and don't have problems tapping Western credit.⁵⁷ Moreover, in 2015 some of the Chinese banks with large US assets were even asking their Russian clients to withdraw money from their accounts, which otherwise would be frozen.⁵⁸ The only big success with Chinese commercial banks was Bank of China's announcement that it was providing Gazprom with a loan of \$2 billion for 5 years - the largest loan from a single bank in Gazprom's history.⁵⁹

But the main Chinese financial institutions that have been signing agreements with Russian partners are China's two "political" development banks - China Development Bank (CDB) and the Export-Import (ExIm) Bank of China - and the Silk Road Fund (SRF), established in 2014. All three are less connected to the international financial system and thus can take greater risks – but at a price. In private conversations, Russians have described the terms on offer from CDB and ExIm Bank as "highway robbery" and added that it is often easier to evade sanctions and get money in the EU.⁶⁰

This has been a huge disappointment for the Russian side, but at the end of 2015 the situation started to improve slowly. In autumn 2015 Rosneft was offered huge support from an unknown source (most likely CNPC),⁶¹ receiving \$15 billion in prepayments which helped the company to stabilize its financial position, while in 2016 Novatek's Yamal LNG has also received Chinese financing. Although all this funding came after significant delays, it did nevertheless eventually arrive and underlined that that Chinese support is available after lengthy negotiation.

Russia's trade with China has also developed in a quite volatile way over the past two years, as after growing in 2014 by 6.8%, in 2015 it collapsed by nearly 30%, moving Russia from one of the top-10 Chinese trading partners down to 16th position.⁶² The main reason for this disappointing performance was the collapse in commodity prices, which are the core of Russian exports everywhere, but a second

⁵⁵ Gabuev A. A Pivot to Nowhere: The Realities of Russia's Asia Policy. Carnegie Moscow Center. 22.04.2016. <http://carnegie.ru/commentary/2016/04/22/pivot-to-nowhere-realities-of-russia-s-asia-policy/ixfw>

⁵⁶ М.Золотова. Китайские козыри «Роснефти». Труд. 01.07.2016. http://www.trud.ru/article/01-07-2016/1339198_kitajskie_kozyri_rosnefti.html

⁵⁷ Gabuev A. A Pivot to Nowhere: The Realities of Russia's Asia Policy. Carnegie Moscow Center. 22.04.2016. <http://carnegie.ru/commentary/2016/04/22/pivot-to-nowhere-realities-of-russia-s-asia-policy/ixfw>

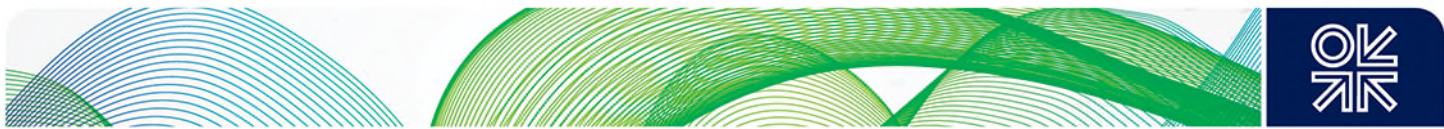
⁵⁸ Коммерсант, 25.12.2015, «Недоворот на Восток». <http://kommersant.ru/doc/2884691>

⁵⁹ Bank of China предоставит "Газпрому" 2 млрд евро на пять лет. Прайм. 03.03.2016. <http://1prime.ru/energy/20160303/824000047.html>

⁶⁰ Gabuev A. A Pivot to Nowhere: The Realities of Russia's Asia Policy. Carnegie Moscow Center. 22.04.2016. <http://carnegie.ru/commentary/2016/04/22/pivot-to-nowhere-realities-of-russia-s-asia-policy/ixfw>

⁶¹ <http://www.rbc.ru/rbcfreenews/5649621d9a79471139f5a7de> November 201

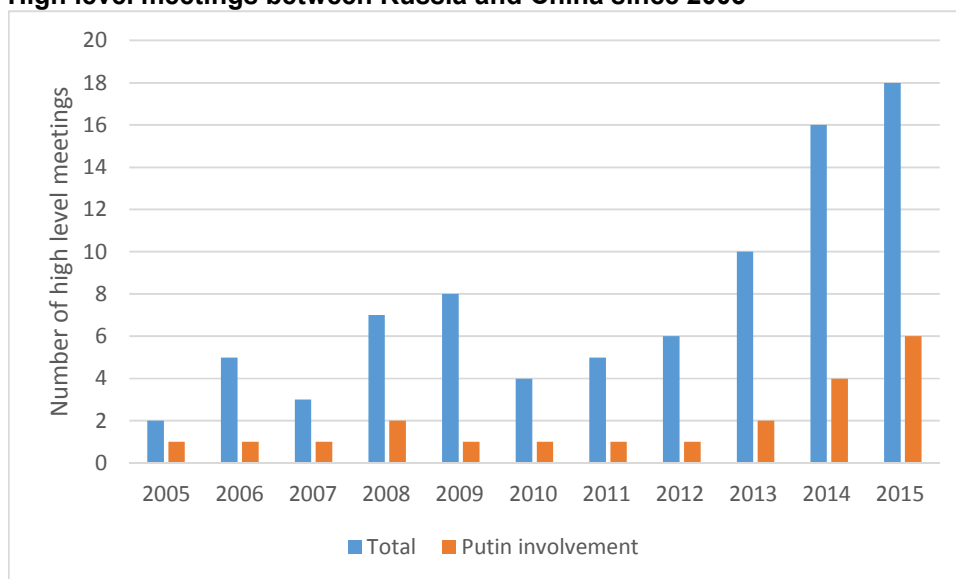
⁶² Ministry of Economic Development: http://www.ved.gov.ru/exportcountries/cn/cn_ru_relations/cn_ru_trade/



important factor was the shrinking purchasing power of Russian companies and households due to the devaluation of the ruble and the consequent drop in imports.⁶³

It is also interesting to note that from a political perspective the desire to achieve the goal of greater cooperation has not just been left to oil and gas companies in the “post-Ukraine” era, but has been backed up by increased government interaction, underlining the geo-strategic nature of the relationship with China. Figure 6 shows the number of high-level Russian government meetings with senior Chinese officials that have taken place since 2005, and also highlights direct interventions by President Putin. As can be seen, the 2008/09 period, when the new eastern strategy first evolved in the wake of the Georgian crisis, saw a significant increase in meetings, followed by a lull as the economic situation necessitated a more domestic focus. However, once relations with the West had again deteriorated dramatically after the annexation of Crimea in 2014 the number of meetings with China increased sharply once more, and Putin’s involvement became more important. Indeed, in May 2014 Presidents Xi and Putin met in Shanghai for the seventh time in 14 months, concluding with a joint statement confirming a desire to expand cooperation in all fields and coordinate diplomatic efforts to cement the China-Russia strategic cooperation partnership. Clearly, although commercial drivers of the eastern strategy are important, as Asia provides a significant opportunity for new revenue generation, the political dynamics are also vital and have taken up a large amount of Russian government time and resource.

Figure 6: High level meetings between Russia and China since 2005



Source: Authors’ analysis using assorted press sources

This extra political effort has produced some visible results in the sphere of energy. In May 2014 the long awaited gas deal was signed between Gazprom and CNPC, while a strategic cooperation agreement between CNPC and Rosneft was also completed. Rosseti (the Russian Grid Company) and SGCC signed a long term electricity import contract for a supply of 100 billion kWh of electric power for the period up to 2036, while Rushydro (via its subsidiary RAU EES Vostoka) signed two agreements on cooperation with PowerChina and Dongfang Electric. Furthermore, in October 2014 Russia and China signed a “road map on cooperation in the coal industry”, which envisioned the participation of

⁶³ Коммерсант, 25.12.2015, «Недоворот на Восток». <http://kommersant.ru/doc/2884691>



Chinese companies in Russian coal projects. And finally, but perhaps most significantly, CNPC acquired a 20% stake in Yamal LNG and also signed a 20 year sales contract for 3 mmtpa.

2015 then saw Rosneft actively negotiating with Sinopec over the joint development of several oil fields in East Siberia and construction of petrochemical plant, as well as discussing with ChemChina participation in the Far East Petrochemical Complex. Meanwhile Sinopec has acquired 10% of petrochemical and gas processing company Sibur. In 2016 a deal between Novatek and Silk Road Fund on the purchase of 9.9% of Yamal LNG was signed and \$12 billion of project financing from Chinese banks was granted to the project. Gazprom has also received a loan from the Bank of China. However, perhaps more significant will be the outcome of the privatization of Rosneft, in which a 19.5% stake is due to be sold during 2016. As will be discussed below, CNPC has expressed an interest in buying the shares,⁶⁴ but is facing competition from Indian state company ONGC and, according to Russian officials, other interested parties as well. The outcome of the auction will provide an important indication of the state of Russia-China energy relations.

In 2016 China also proposed various investments in 12 key industries (like construction, metallurgy, energy, machinery) at production sites in the Russian Far East.⁶⁵ Although these discussions are still at a very early stage, the promise to bring Chinese state and private investments to Russia has been received very positively by the Russian establishment as it looks for further confirmation of its expanding cooperation with Asian countries.

However, despite the need for Russia to find new allies in the East, it has also been recognised that there is potential for confrontation there too, not least over influence in Central Asia. Nevertheless, it is interesting to note that Russia has adopted a very benign stance towards increasing Chinese influence in its former “colonies.” Indeed, Moscow and Beijing have not only managed to avoid confrontation, but in 2015 reached agreement to integrate or “pair” the Silk Road Economic Belt project and the Eurasian Economic Union, with the aim of avoiding competition in the region.⁶⁶ In reality the actual input and influence of both partners in this initiative is yet to be seen, and there are reasonable grounds to expect that Russia, with its economic and financial constraints, will not be able to match Chinese support for new infrastructure projects in the region and the consequent increase in influence which this naturally provides.

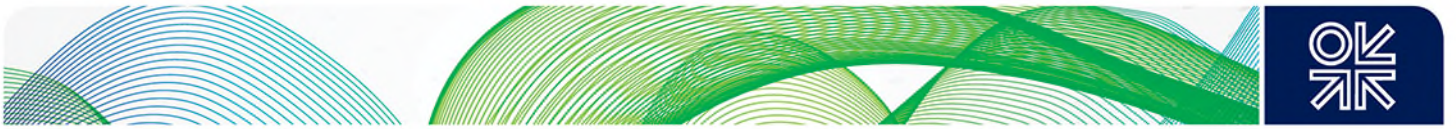
Overall, though, it is clear that, in spite of many contradictions and challenges, the development of Russia-China relations is becoming a serious factor in global politics and in the global energy economy. It would seem that Russian conflict with the West, combined with China’s growing import needs, have encouraged both sides to cooperate, although China would certainly appear to have the stronger bargaining position and has the ability to wait for opportunities to extract maximum value from any deals to emerge. However, although it is apparent that confrontation with the West has significantly weakened Russia’s position in relation to China, the Kremlin has not been prepared to complete deals at any cost, and has started to seek alternative partners (such as Indian companies) to demonstrate that it has alternatives.

It remains to be seen to what extent the Russian government will be able to develop its relationship with China on anything resembling an equal basis, and also whether it can leverage this relationship to further strengthen its political and economic position in the international arena. Initial indications suggest that China is not keen to be seen as supporting Russia against the West, and also that it is not prepared to do Russia any favours in its commercial deals. As will be discussed in the analysis below, it would

⁶⁴ China's oil and gas corporation ready to consider Novatek's proposals on new projects. TASS. 21.04.2016. <http://tass.ru/en/economy/871686>

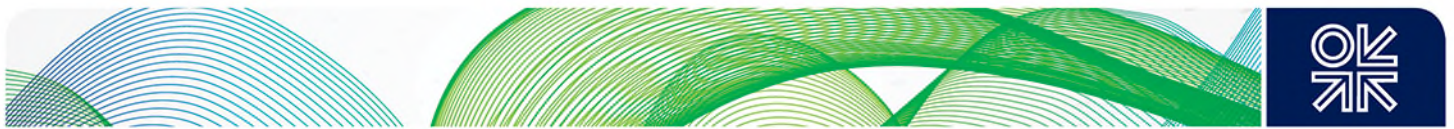
⁶⁵ Минвостокразвития России и Госкомитет развития и реформы КНР обсудили повестку инвестиционного сотрудничества на Дальнем Востоке. 05.04.2016. http://minvostokrazvitia.ru/press-center/news_minvostok/?ELEMENT_ID=4125

⁶⁶ Коммерсант, 25.12.2015, «Недоворот на Восток: итоги российской политики поворота в Азию противоречивы»



rather seem that China is exploiting its competitive advantage, and Russia's strategic weakness, while being fully mindful that it has a much broader geo-political agenda that should not be undermined by the unique needs of a useful, but far from essential, northern neighbour.⁶⁷

⁶⁷ Voskresenski Alexei. Relations between Russia and China as part of the Asian vector of Russian diplomacy (1990–2015). <http://lawinfo.ru/catalog/contents-2015/sravnitelnaya-politika/1/8741/>



Oil industry

Brief review of Russia's eastern oil assets: resource potential and production

Russia's Eastern Siberia and Far East provinces have huge oil production potential. However, the remote geography of Russia's eastern regions has meant that both the exploration and development of oil and gas fields has lagged behind European Russian and West Siberia, where significant infrastructure has been in place for many decades. Indeed, the reserves to resources ratio in East Siberia is still very low at just 5%, underlining the potential for large new discoveries but also the lack of activity to date.⁶⁸ In addition, the markets for oil and gas in Asia, and particularly in China, have matured more recently than those in Europe, Russia's main export destination to date, meaning that demand for Russian exports in the East has been limited so far.

However, the changing dynamics of global economic growth towards the East, combined with the need for Russia to compensate for declines in existing oil fields in West Siberia, has catalyzed a much greater focus on the resources in East Siberia and the Russian Far East. Russia's energy strategy of 2009 highlighted the potential for these regions to account for an increasing share of the country's total output and exports, and the core infrastructure has now been put in place to allow this growth to occur.

Oil output in East Siberia got under way at the end of the 1990s, with pilot production at a number of fields located in the northern Irkutsk region, southern Yakutia and the Evenk district of the Krasnoyarsk territory. However, by the end of 2009 the cumulative volume of oil extracted (including condensate) in the region amounted to only about 11 million tonnes in total. As with many new oil provinces, a classic chicken and egg dilemma emerged, with a lack of infrastructure undermining field development while the main pipeline company, Transneft, was not eager to invest heavily until it had been demonstrated that sufficient reserves were in place. However, this changed when a key decision was made to route oil from the Vankor field east rather than north to the Arctic Ocean. As a result, a catalyst for the development of the Eastern Siberia-Pacific Ocean (ESPO) Oil Pipeline Project was created, which then allowed other fields to connect to a trunk pipeline system.⁶⁹

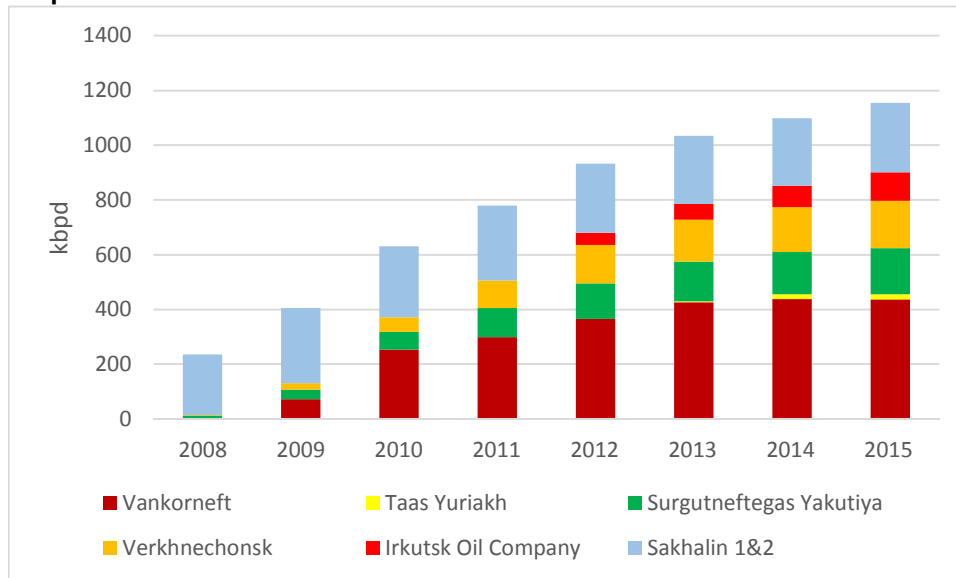
As soon as the ESPO was in place (see below for details) production increased rapidly, rising by 2.5 times in 2010 and continuing on an upward trajectory since. Figure 7 shows output growth from the major operating companies in East Siberia, as well as the offshore projects in Sakhalin, and a brief description of the key producing areas follows. It is clear, though, that onshore production in Russia's East has risen from around 100,000bpd in 2009 to almost 900,000bpd by 2015, emphasizing the huge emphasis that has been placed on diversifying Russia's oil sales towards eastern markets.

⁶⁸ The resource to reserve ratio measures how much of a region's potential (resources) have been turned into identifiable oil (or gas) reserves which can form the basis of future production. A mature basin might have a reserve to resource ratio of around 50%

⁶⁹ Kravets (2014)



Figure 7: Oil production from East Siberia and the Far East of Russia



Source: CDU TEK

Henderson (2011a) details the significant reserves and exploration licences held by Russian companies in East Siberia and the Far East of Russia, with established fields containing around 10 billion barrels of oil while further exploration could expand this to 70-160 billion barrels if current resource estimates are correct.⁷⁰

In terms of production outlook, there are a number of key fields around which clusters of assets are set to provide a solid foundation for exports to Asia. Indeed some of the largest oil-gas condensate fields in Siberia are located in the East, namely Vankorskoye (which, has recoverable oil reserves of about 440 million tonnes (3.2 billion barrels) if satellite fields are included), Verkhnechonskoye (200 million tonnes, or 1.5 billion barrels), Talakanskoye (more than 120 million tonnes of oil (900 million barrels) and 60 bcm of gas), Yurubcheno-Tokhomskoye (more than 70 million tonnes of oil (500 million barrels) and 180 bcm of gas), Kuyumbinskoye (150 million tonnes, 1.1 billion barrels) and Srednebotuobinskoye (130 million tonnes, 950 million barrels) (for details see Annex 1).

These large fields are controlled by the major companies in the Russian oil industry, with Rosneft, GazpromNeft and Surgutneftegas being the key players in the region. However, a number of smaller companies, such as Irkutsk Oil, also own assets with significant production potential and all are keen to access export markets in the region as well as to supply local industrial bases and refineries. In addition, licences around Sakhalin Island in the Far East contain another 2 billion barrels of reserves, with production already emerging from the Sakhalin 1 and 2 projects run by Rosneft/Exxon and Gazprom/Shell respectively.⁷¹

Projections of the future oil production in this overall area vary significantly depending on the assumptions concerning investment availability and ability of the companies to implement projects in a timely manner. However, it is interesting to compare the forecast of the Russian government from the Energy Strategy (2009) with some more detailed analysis of the various regions involved. Figure 8 shows a breakdown of the government forecasts for East Siberia (ES) and Far East Russia (FE) out to

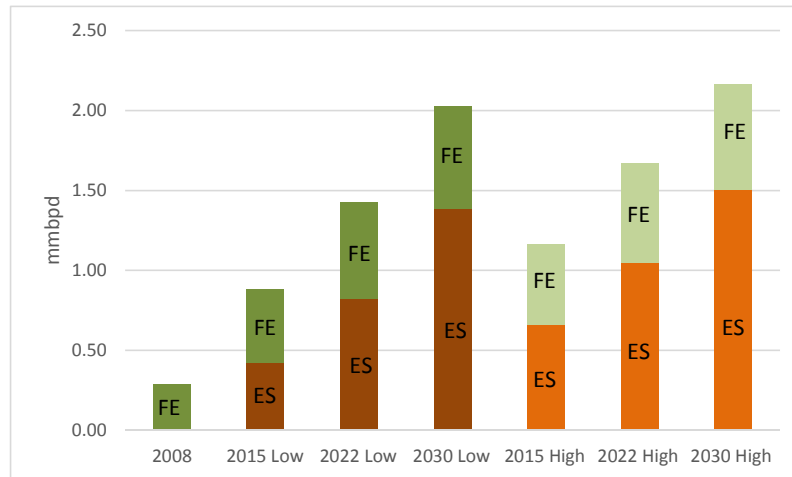
⁷⁰ Henderson (2011a), p.22

⁷¹ For Sakhalin 1 detail see <http://www.sakhalin-1.com/Sakhalin/Russia-English/Upstream/default.aspx>, and for Sakhalin 2 see <http://www.gazprom.com/about/production/projects/eng/sakhalin2/>



2030, with a low and high case scenario. In both cases total output is expected to exceed 2 million barrels/day by the end of the next decade, with East Siberia coming to dominate production from Russia's eastern regions, as output from Sakhalin Island plateaus in the early 2020s.

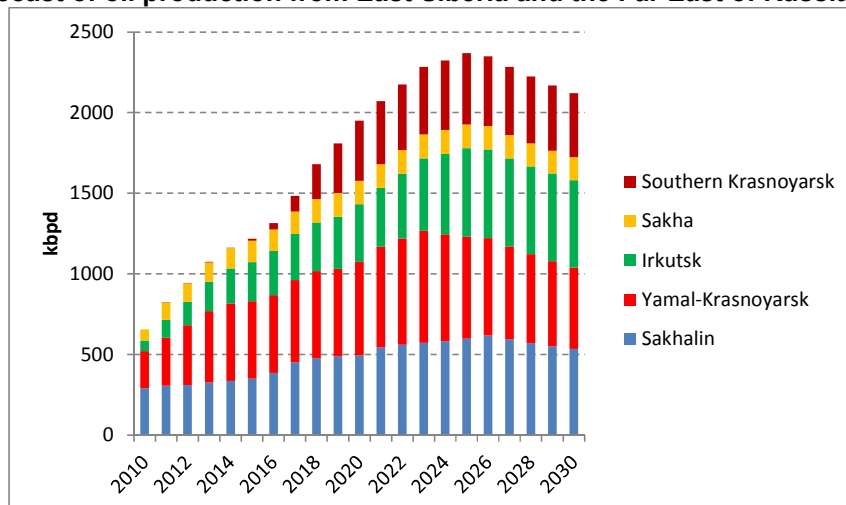
Figure 8: Forecast of oil production from Russia's eastern regions (Russian Energy Strategy 2009)



Source: Russian Energy Strategy 2009

In order to provide a contrast with this state analysis the authors have conducted a field analysis based on data provided by the main companies operating in the region, and have generated the output shown in Figure 9. The calculations are based on a best estimate of when various fields may come on line and reach peak production, and as such the timing of the overall output levels is somewhat subjective, but it is interesting at least to note that the peak of 2.35mmbpd is similar to the level forecast by the Russian government for 2030. As a result, it would appear that the potential for the region to produce more than 2mmbpd in the next 15 years can be forecast with a reasonable degree of confidence, with offshore output from Sakhalin Island peaking at around 600 kbpd in the mid-2020s while onshore output from the four key regions in East Siberia can advance towards 1.5-2mmbpd at some point over the next 10-15 years, depending on the oil price outlook and the willingness of companies to invest in new field development.

Figure 9: Forecast of oil production from East Siberia and the Far East of Russia

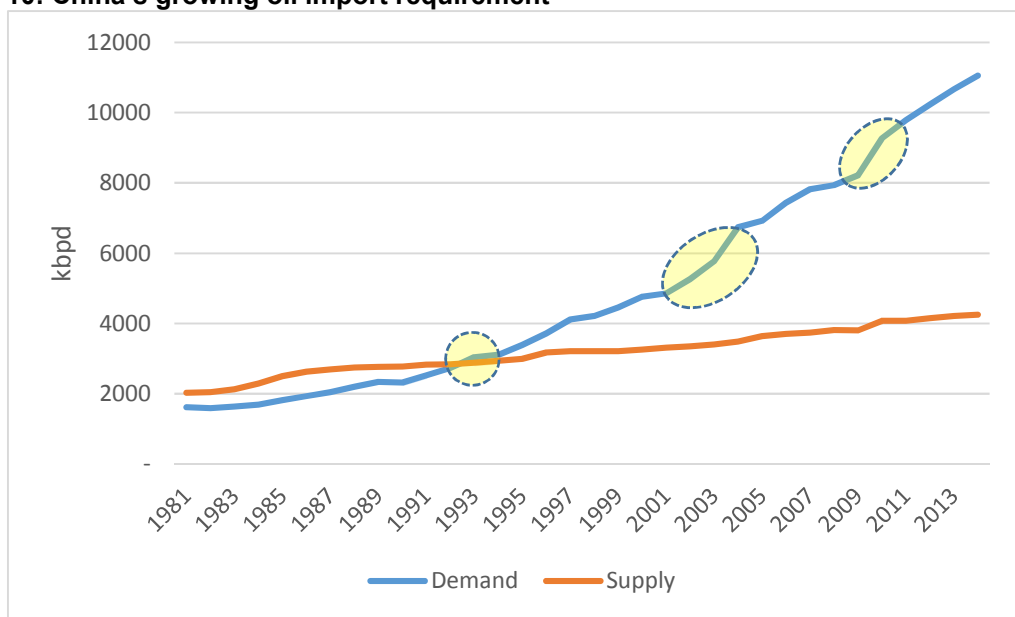


Source: Authors' analysis

Chinese oil import requirement

The main outlet for Russia's eastern oil, though, will be the markets of the Asia-Pacific region, and a key element in discussing Russia's expanding energy relationship with China in particular is the timing of the latter's growing need for oil imports. As can be seen from Figure 10 below, China's oil supply and demand was relatively balanced (with a slight supply surplus) until the early 1990s, when the country became a net oil importer. Since then its import requirement has grown rapidly, with two particularly intense periods of growth in the early 2000s and between 2009 and 2011.⁷² As a result, in 2014 China imported more than 7mmbpd, and the latest IEA forecast suggests that this figure could reach 9.5mmbpd by 2021.⁷³

Figure 10: China's growing oil import requirement



Source: BP Statistical Review of World Energy (2015)

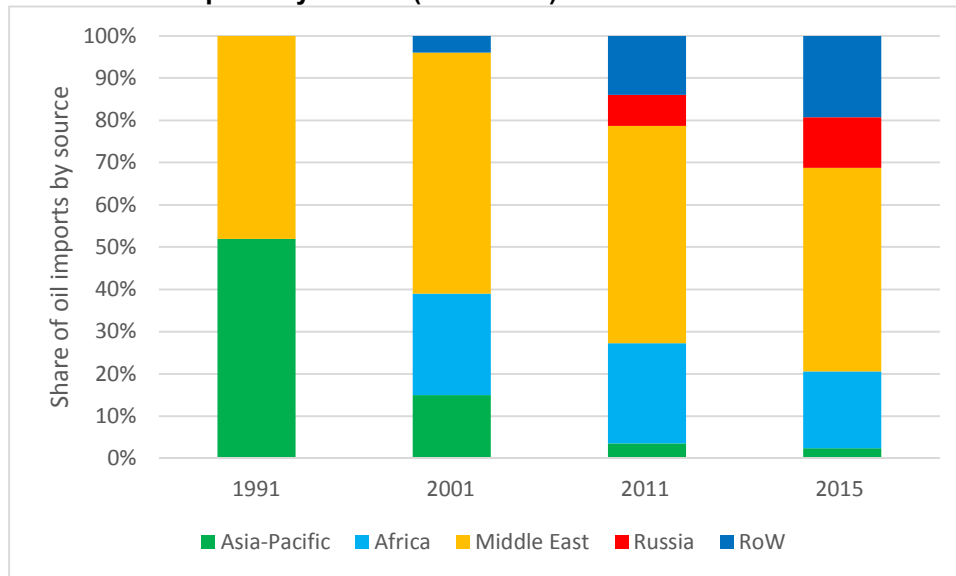
However, given the concern of the Chinese authorities over security of supply, with particular reference to the amount of imported energy that arrives by sea, it is important to consider the evolution of the country's oil imports by source. Figure 11 shows the shift in sources of oil imports since the early 1990s, but highlights that the Middle East and Africa have dominated throughout the current century and still accounted for almost 70% of the total in 2015.

⁷² BP Statistical Review of World Energy (2015)

⁷³ IEA (2016), p.113



Figure 11: Chinese oil imports by source (1991-2015)



Sources: China Customs, Bustelo (2007), BP Statistical Review of World Energy (2016)

Imports from alternative sources such as Russia have therefore been seen as a vital part of China's diversification strategy, especially because they come via land rather than sea. The Chinese authorities are very sensitive to the potential risk of a blockade, with any narrow shipping lanes being particularly vulnerable.⁷⁴ In particular, with around three quarters of oil imports being forced to travel through the Malacca Straits while a further 10-12% come via the Pacific, China feels very exposed to potential action by the US Pacific Fleet which, in a worst case scenario, could potentially cut off the majority of China's oil supply.⁷⁵ It is clear, then, that imports which can arrive by rail or preferably by pipeline have an added diversity value, even though they can also bring specific security risks. Within this geo-strategic context, the emergence of Russia as a major oil exporter to China over the past decade makes eminent sense from the perspective of both sides.

Oil negotiations and deals

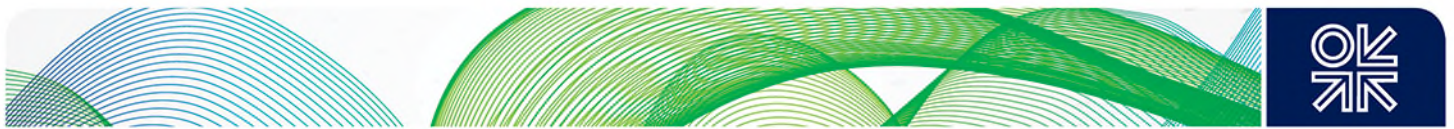
One of the first Russian companies to negotiate oil supplies to China was YUKOS.⁷⁶ Its initial oil exports to the Chinese market were via rail, after signing an agreement with China's Sinopec in 1999 on the supply of 500,000 tonnes per annum of crude oil followed by 1 million tonnes per annum of oil products.⁷⁷ This initial agreement was followed by a series of meetings between high-ranking Russian and Chinese officials at which various co-operation agreements were signed concerning the development of fields and the construction of an oil pipeline to China. The talks culminated in a meeting between Chinese Premier Hu Jintao and Russian President Vladimir Putin in May 2003 at which an overarching statement confirmed the importance of energy co-operation in both the oil and gas sectors for both countries and committed the governments to support projects in both Russia and China. As one direct result in the early 2000s, as its import requirement was starting to rise sharply for the first time, China began talks with YUKOS concerning an oil pipeline from Angarsk to Daqing, and in the summer of 2002 YUKOS obtained a pledge from CNPC to finance 50% of the construction cost. CNPC also indicated a readiness to buy all the crude that would go through the new route.

⁷⁴ The Diplomat, 13 Mar 2013, "A US naval blockade of China?"

⁷⁵ Chen (2010)

⁷⁶ RusEnergy (2003)

⁷⁷ Moscow Times, 25 Feb 1999, "Yukos to double oil to China"



In May 2003 the heads of YUKOS and CNPC then signed another 3-year contract for supply of 6 million tonnes to China via railroad with a value of \$1.1 billion.⁷⁸ The companies also signed a long-term contract for the supply of oil through a future pipeline, with potential supply totaling 20 million tonnes/year (400,000bpd) for the first five years, and then 30 million tonnes/year (600,000bpd) after 2010.⁷⁹ A key additional part of the agreement was that Yukos would provide at least 50% of the supplies for the pipeline, confirming its position as the key Russian player in East Siberia.⁸⁰

However, the signing of this deal catalyzed the first major conflict between competing power groups in Russia over the development of exports to Asia. The Angarsk-Daqing pipeline planned by YUKOS was in direct competition with an alternative Angarsk-Nakhodka pipeline, promoted by the Russian state-controlled oil pipeline monopoly Transneft. The YUKOS line, extending 2,247 km, would have cost \$1.7 billion, and would have been most logical, given known reserves in East Siberia at the time, with a planned throughput of 20-30 million tonnes/year. In contrast the Transneft project was longer, at 3,764 km as it stretched to the Pacific coast of Russia, and more expensive at a cost of \$5.2 billion. In addition, it was unclear if there would be sufficient output from East Siberia to fill the larger planned capacity of the Transneft pipeline, which was targeted to reach 80 million tonnes/year at its peak. A debate also emerged around diversification options, as delivery of crude to the port of Nakhodka would allow for the supply to multiple end-markets, whereas the Angarsk-Daqing alternative would have left Russia dependent on a monopoly buyer - China. Ultimately the choice was made by politicians, and after much lobbying from both Japan and China a definitive judgment was handed down in the spring of 2003 whereby Russia decided to build the Angarsk-Nakhodka oil pipeline with a spur to Daqing in China.⁸¹ Ironically, the Ministry of Natural Resources then rejected both projects over environmental considerations (the pipeline was considered to be a risk to the fresh water lake at Baikal),⁸² and with the beginning of the "YUKOS affair", which saw the company collapse under the weight of charges of tax fraud by the Russian government,⁸³ the whole eastern pipeline concept was frozen.⁸⁴

The start of Rosneft's relations with China

Although the bankruptcy of Yukos temporarily postponed discussions about eastern oil exports, it ultimately provided a major turning point in Russia's relations with China. When, in 2004, Rosneft purchased Yukos' major producing subsidiary Yuganskneftgaz in a bankruptcy auction, having borrowed \$1.8 billion from state banks and having issued promissory notes for \$6.1 billion, the bills of credit were refinanced thanks to an upfront payment of \$6 billion for the delivery of oil to China (mainly again by railroad). For the first time Chinese financial resources were used not only to facilitate the redistribution of property in strategic sectors of the Russian economy but also to finance the supply of energy to China. Rosneft and CNPC signed a 5-year oil delivery contract for supply via railway, under which Rosneft pledged to export 48.8 million tonnes in total to China by the year 2010, with an implied price slightly higher than that in the market.⁸⁵ China thereby employed a tactic that it has subsequently emulated across the global energy economy, demonstrating that it is prepared to support projects and companies that can provide a secure source of imports to its domestic economy.⁸⁶

⁷⁸ Казанцев А.А., Экспорт российских энергетических ресурсов в страны АТР: экономические и политические факторы. http://nordport.ru/index.php?option=com_content&view=article&id=61&catid=20:-&Itemid=41

⁷⁹ China Daily, 29 May 2003, "China, Russia sign oil pipeline agreement"

⁸⁰ Казанцев А.А., Экспорт российских энергетических ресурсов в страны АТР: экономические и политические факторы. http://nordport.ru/index.php?option=com_content&view=article&id=61&catid=20:-&Itemid=41

⁸¹ The Baltic Times, 20 March 2003, "Russia to build pipelines to Japan, China"

⁸² Казанцев А.А., Экспорт российских энергетических ресурсов в страны АТР: экономические и политические факторы. http://nordport.ru/index.php?option=com_content&view=article&id=61&catid=20:-&Itemid=41

⁸³ The Economist, 17 June 2004, "The beginning of the end game"

⁸⁴ Poussenkova (2013), p.9

⁸⁵ Ibid., p.12

⁸⁶ Financial Times, 18 May 2016, "China's global energy financing raises climate fears"



At approximately the same time, on 31st December 2004, a decree was signed on the laying of the ESPO (Eastern Siberia–Pacific Ocean) pipeline over the period from 2005-2020.⁸⁷ This geopolitical project, in the words of Vladimir Putin, was regarded as having officially "broken open a window" to the East. The decision to build the ESPO provided not only a link to the world's fastest growing oil market but also the vital infrastructure which could unlock Russia's East Siberian oil reserves, which had been stranded beforehand. As a result, when Transneft and CNPC signed a protocol in 2006 concerning the construction of an oil pipeline from Skovorodino to the Chinese border, it opened a new era of Russian expansion into the Asian energy markets and also bolstered the outlook for the domestic Russian economy in the Far East.

In 2006, China appeared to want to take its co-operation with Russia even further by purchasing a significant equity stake in Rosneft, as part of the company's IPO.⁸⁸ However, Russia's long-standing concern about Chinese influence then apparently emerged once more, with the Kremlin refusing to sell more than \$500 million worth of shares (just 0.62% of the total share capital) to the Chinese state company, just one-sixth of the \$3 billion worth it had sought. As a result, the Russian position was made clear – specific commercial agreements on preferential terms might be desirable, but major investment in key Russian companies was not allowed.⁸⁹

However, this decision was made at a time of rising oil prices and economic prosperity, and only two years later, as the impact of the 2008/09 financial crisis and the consequent collapse in the oil price hit the Russian economy hard, Chinese support was urgently required. Rosneft and Transneft, the two companies involved in the upstream developments and the pipeline respectively, were short of funds, and an initial memorandum on Chinese financing was signed in October 2008. Significantly, though, it took the intervention of then Vice-Premier Igor Sechin to ensure that the deal was completed, beginning his increasingly vital role as a key intermediary between the two countries. As a result, an initial contract was signed between Rosneft and CNPC in 2009 for the delivery of 15 million tonnes/year until 2030 in return for a long-term credit agreement amounting to \$25 billion (a 20-year loan of \$15 billion for Rosneft and \$10 billion for Transneft primarily for the construction of the ESPO, including the spur to China).⁹⁰ The Russian side was particularly pleased with the deal, with Peter O'Brien, then vice-president of Rosneft, announcing: "The sum of credit is \$15 billion over a term of 20 years—at the same time a grace period is stipulated to take place, during the course of which only interest will be paid. I would call the price of credit obtained by the company unprecedentedly low."⁹¹

In September 2010 the construction of the Skovorodino-Daqing spur pipeline from the main ESPO route was completed and deliveries through it began in January 2011.⁹² Importantly, though, Article 13 of the Accord between the Governments of Russia and China on cooperation in the oil sphere gave Rosneft exclusive right of access to the pipeline for the delivery of oil to China over the course of 20 years.⁹³ This immediately gave the state company a clear competitive advantage over its private rivals working in the East and established its precedence, and that of its future CEO Igor Sechin, in Russia-China energy relations.

⁸⁷ Henderson (2011a), p.11

⁸⁸ IPO – Initial Public Offer

⁸⁹ Radio Free Europe, 19 July 2006, "CNPC denied intended stake in Rosneft"

⁹⁰ Paik (2012), p.349

⁹¹ Neftgazovaya vertical no.17, 2010, p.36

⁹² Reuters, 27 Sept 2010, "Russia's ESPO oil pipeline link to China"

⁹³ Soglashenie mezhdru Pravitel'stvom Rossiskoi Federatsii i Pravitel'stvom Kitaiskoi Narodnoi Respubliki o sotrudnichestve v neftianoi sfere [Inter-governmental agreement on oil cooperation between People's Republic of China and the Russian Federation], Beijing, 2009.



A first dispute over commercial terms

Interestingly, though, despite the apparent political will behind the deal, commercial problems emerged even as supplies of oil began in January 2011.⁹⁴ Under the terms of the deal one particular coefficient “T”, which defined Transneft’s transport and other logistical costs, was key to the oil price paid by CNPC, and unfortunately it was perceived differently by the Chinese and Russian sides. CNPC claimed that it was being charged too high a price, as now it received oil by the spur from the ESPO instead of by railway, a route that was half as long, and as a result it began to underpay by \$13/barrel. If this had been extended over the life of the 20-year contract it would have cost the Russian companies \$30 billion, and even by the summer of 2011 China’s underpayment had reached \$200 million. After heated negotiations, though, Rosneft, Transneft and the CNPC agreed to new conditions at the start of 2012 under which Rosneft and Transneft would offer a “country” discount to CNPC of \$1.50/barrel, while CNPC would repay the debt for supply of oil from the beginning of 2011.⁹⁵ Although this still cost Rosneft \$3 billion over the life of the contract it was regarded as a success by the Russian side, as the discount had been reduced by a factor of 9 times. However, the negotiations also exposed how vulnerable Russia’s position could be in a disagreement with a monopoly buyer as strong as China. Ultimately the latter’s real need for Russian oil catalyzed a resolution, but the warning signs were clear for future deals in which China’s position might be stronger – especially in the gas sector.

More financial assistance, to support Rosneft purchase of TNK-BP

Following the resolution of this pricing issue, however, Rosneft once again turned to China for financial assistance, this time in response to the high debt burden it had accumulated due to its acquisition of TNK-BP for \$55 billion in 2013. As with the Yuganskneftegaz deal, almost a decade earlier, the company took on short-term debt that needed to be re-financed, and as a result signed two pre-payment deals with China to facilitate this. In 2013 it expanded its contract with CNPC by adding a further 15 million tonnes/year of sales over 25 years, building up in stages from 2014.⁹⁶ Rosneft then signed up to supply a further 10 million tonnes/year to China, this time via Sinopec, from 2014.⁹⁷ Under both agreements it was anticipated that around 25-30% of the total value of the contract would be paid in advance (although not all at once). This implied total prepayments of \$65-70 billion from CNPC and approximately \$10 billion from Sinopec. Although exact details of when and how much pre-payment has actually been made have not released, press statements and Rosneft’s financial results suggest that CNPC may already have paid as much as \$35-45 billion in advance.⁹⁸ As far as Sinopec is concerned, it remains unclear whether the deal has actually been ratified, as there is no specific record of payment being made or oil being delivered.

Nevertheless, the implied impact of the combined deals between Rosneft and Chinese counterparties is significant, as shown in Figure 12 below. Converted from tonnes to barrels, total exports via the two CNPC deals and the notional Sinopec deal could exceed 700,000bpd by the end of this decade, compared with total Rosneft crude exports of approximately 1.9 mmbpd in 2014. Clearly, this not only implies a significant potential shift in exports from West to East, but also underlines the need for the continued expansion of pipeline infrastructure to move the oil to its intended markets.

⁹⁴ Nefte Compass, 24 Mar 2011, “Rosneft, CNPC in price dispute”

⁹⁵ Reuters, 28 Feb 2012, “Russia, China resolve oil pricing dispute – paper”

⁹⁶ Paik (2015), p.4

⁹⁷ Bloomberg, 22 Oct 2013, “Rosneft agrees to sell Sinopec \$85 billion of oil over 10 years”

⁹⁸ Financial Times, 25 Nov 2015, “Rosneft’s \$15bn financing beats sanctions”

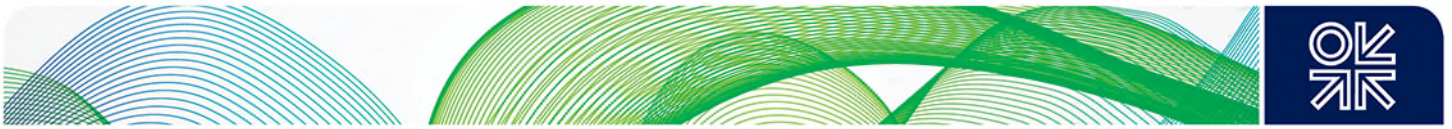
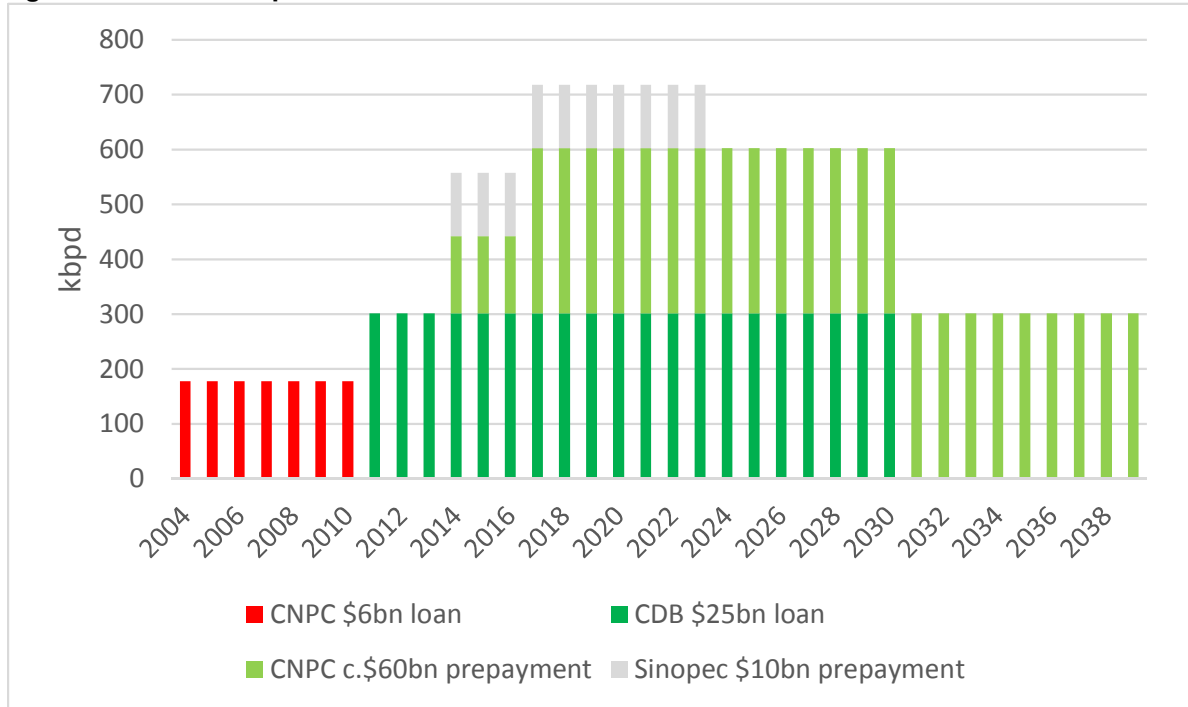


Figure 12: Rosneft export deals with China



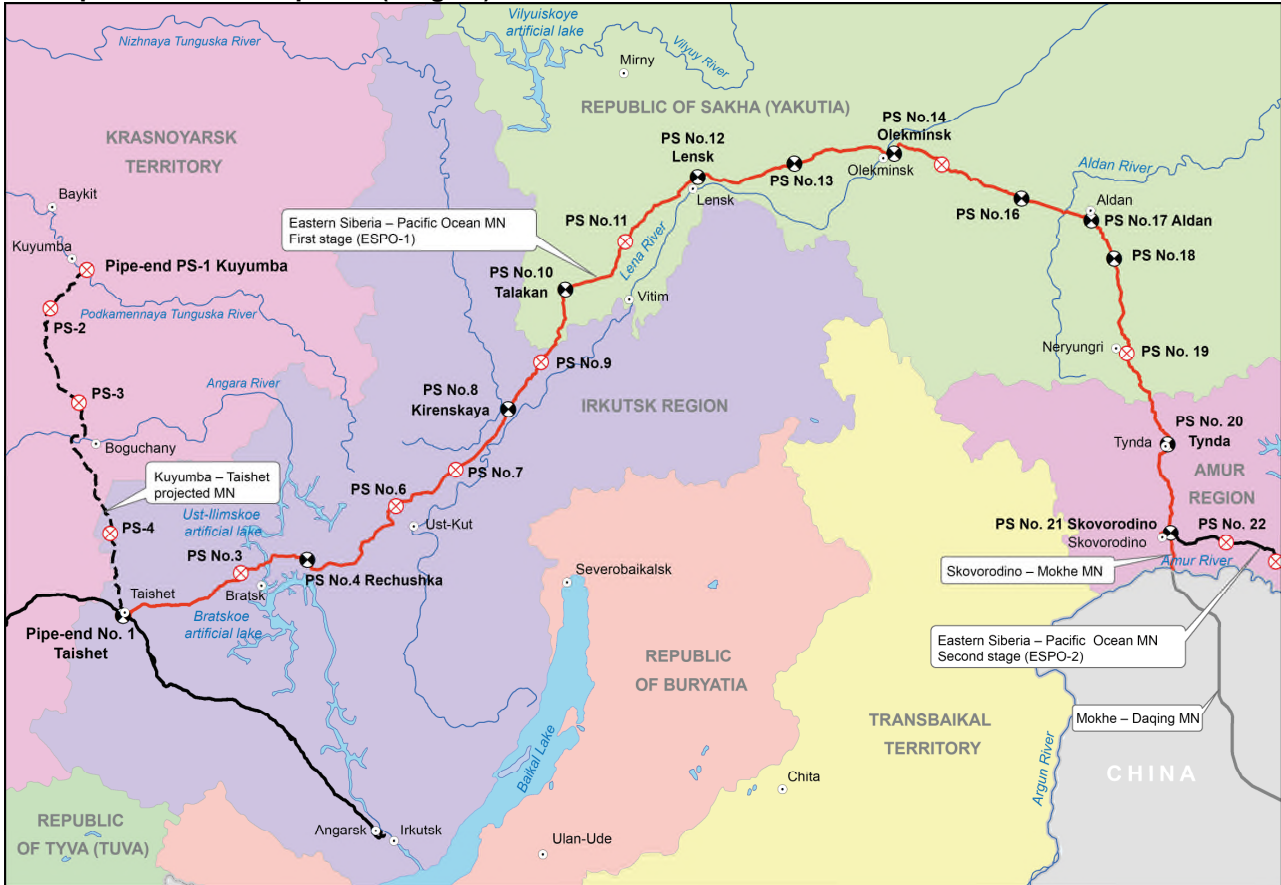
Source: Author's analysis

Development of the ESPO pipeline

Construction of the ESPO pipeline was started in 2006, with the initial stage (ESPO-1) being a 30 million tonne/year (600kbpd) line from Taishet to Skovorodino. From there a 15 million ton (300kbpd) spur was constructed to the Chinese border at Mohe, with a further extension to Daqing being constructed (by CNPC) inside China. Oil from Skovorodino was then also transported by rail to a new port at Kozmino Bay on the Pacific Coast (see Map 1 below).



Map 1: The ESPO Pipeline (Stage 1)



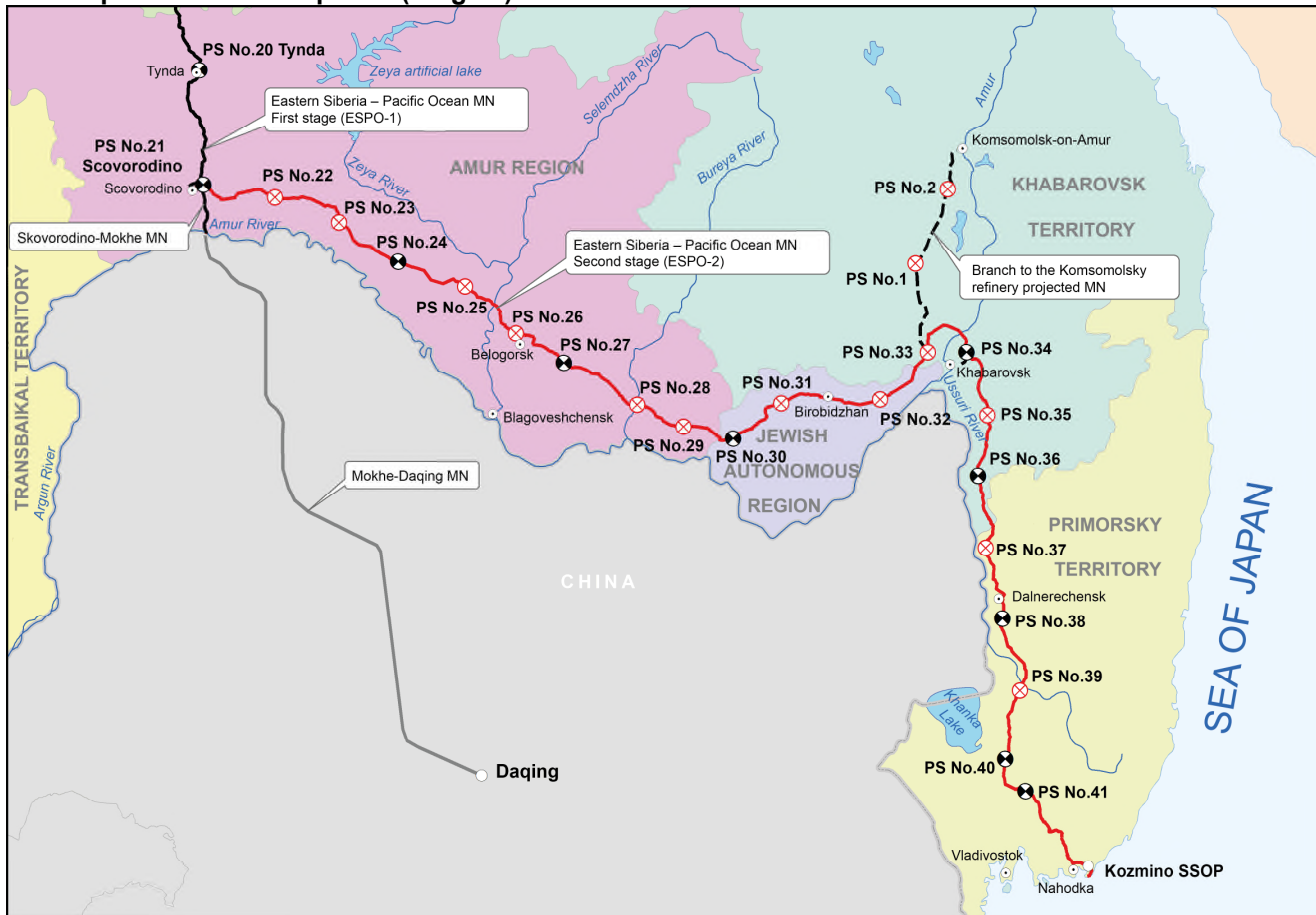
Source: Transneft

As soon as first oil began to flow at the end of 2009, with the spur to China completed in late 2010, plans for an expansion of the system were also started. The next step was to construct the second part of the pipeline (ESPO-2) to Kozmino Bay, and a 30 million tonnes/year (600kbpd) line stretching more than 2000 kilometres from Skovorodino to the Pacific coast was completed in 2012 (see Map 2 below) At this point the total length of the ESPO reached 4,700km from Taishet to Kozmino Bay. Once this had been completed the demand for throughput capacity began to grow, especially as Rosneft signed up new contracts. As a result, extra pumping stations and storage tanks were added to the ESPO-1 line, bringing its capacity up to 58 million tonnes/year (1.2mmbpd) by 2014.⁹⁹ At this point 15 million tonnes/y could still directly travel to China through the spur to Mohe and Daqing, while a further 30 million tonnes/y could reach Kozmino, meaning that any surplus would need to be railed once more.

⁹⁹ Transneft web site at <http://en.transneft.ru/about/projects/realized/58/>, accessed on 16 May 2016



Map 2: The ESPO Pipeline (Stage 2)



Source: Transneft

The capacity of the Skovorodino-Mohe spur to China has also been expanded, initially to 20 million tonnes/y (400kbpd), with extra pumping stations allowing the flow to increase, but the demands of Rosneft’s export contracts mean that this will be expanded further to 30 million tonnes/y (600kbpd) by 2017.¹⁰⁰ Meanwhile, the third stage of overall ESPO expansion, to increase the capacity from Taishet to Skovorodino to 80 million tonnes/y (1.6mmbpd) and from Skovorodino to Kozmino Bay to 50 million tonnes/y (1.0 mmbpd) is ongoing and is scheduled for completion by 2020, after a one-year delay was agreed with the Russian government.¹⁰¹ In addition, branches to the Komsomolsk and Khabarovsk refineries are planned to be completed in the next few years, with a 7 million tonnes/y link to the former due by 2018 and a 6 million tonnes/y spur to the latter planned by 2019.¹⁰² A further downstream plant, the Far East Petrochemical Company (FEPCO),¹⁰³ which is set to be located near Kozmino Bay, is planned to take crude oil from the line, implying a potential distribution of crude as shown in Table 1:

¹⁰⁰ Transneft web-site at <http://en.transneft.ru/about/projects/current/mohe/>, accessed on 16 May 2016

¹⁰¹ Interfax, 30 Dec 2015, “Transneft to cut 2016 investment program 11%”

¹⁰² Ibid.

¹⁰³ Interfax, 22 Dec 2015, “Govt approves roadmap for FEPCO project, expects financing proposals by mid-2017”



Table 1: ESPO capacity and potential crude oil utilization

Million tonnes per annum	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Taishet to Skovorodino (ESPO-1)	30	30	30	30	30	58	58	58	58	58	58	80
Skovorodino to Kozmino Bay (ESPO-2)				30	30	30	30	30	30	30	30	50
Skovorodino to Mohe	15	15	15	15	15	20	20	20	30	30	30	30
Spur to Khabarovsk											6	6
Spur to Komsomolsk												7
Spur to FEPCO												12
Remaining for Kozmino Bay	15	15	15	15	15	38	38	38	28	28	22	25

In tandem with this expansion east, Transneft is also looking to increase the capacity of the pipelines connecting fields in West Siberia with the ESPO, in case assets in East Siberia are not developed fast enough to fill the line’s capacity. In particular, extra pumping stations are being added on the line from Purpe, which takes oil from the Yamal district, while reconstruction of existing stations will also help to increase the availability of West Siberian oil for eastern markets.¹⁰⁴ However, while every effort is being made on the Russian side, it is interesting to note that slower progress is being made in China.

Issues with Chinese capacity have necessitated alternative routes in the short term

Under the terms of CNPC’s second agreement with Rosneft, the Chinese company should have received 800,000 tonnes of extra crude in 2013, 2 million tonnes in 2014, 5 million tonnes/y in 2015-2017 and up to 15 million tonnes/y in the period 2018-2037.¹⁰⁵ In order to facilitate this, both Russia and China committed to expand the capacity of the Skovorodino-Mohe-Daqing link by 5 million tonnes/y (to 20 million tonnes/y) by 2015 and then to an ultimate capacity of 30 million tonnes/y by 2018. As discussed above, Transneft is well on schedule to achieve this target, but has expressed its concern that the Chinese side may not be ready in time.¹⁰⁶ Indeed, in the period 2013-2015 China has had to receive much less than planned via the ESPO spur because of lack of capacity on its side, taking an extra 600,000 tonnes in 2014 via rail and 1 million tonnes in 2015. In 2016, CNPC has said that it is prepared to take 16.5 million tonnes of total throughput (in other words an extra 1.5 million tonnes, as opposed to the 5 million tonnes originally scheduled), and in order to make up as much of the remaining oil as possible rail transport may be used to move a further 3 million tonnes.¹⁰⁷

Indeed, as Figure 13 shows, Russia (and in particular Rosneft) has had to find alternative routes to transport sufficient oil to China to meet demand. Rail has been one method, but trans-shipment by pipeline via Kazakhstan has been another, with an agreement having been reached with KazTransOil in 2013 to ship 7 million tonnes/y via the Atasu-Alashankou line.¹⁰⁸ This pipe has a total capacity of 20 million tonnes/y, but Kazakhstan only exported 12 million tonnes of its own crude to China in the past few years and so it has been happy to generate extra transit revenues from Russia. Indeed, it is reported that the transit volumes may expand to 10 million tonnes over time.¹⁰⁹

¹⁰⁴ See Transneft web site at <http://en.transneft.ru/about/projects/current/1204/>
¹⁰⁵ Interfax, 19 Aug 2015, “China to launch second line of Mohe-Daqing oil pipeline at year end”
¹⁰⁶ Interfax, 28 May 2015, “Transneft not sure of China’s readiness to accept 30 mln tonnes of oil via ESPO branch from 2018”
¹⁰⁷ Interfax, 13 Jan 2016, “Rosneft ups exports via Skovorodino-Mohe pipeline branch to 16.5 million tonnes, looking for exports to China via rail”
¹⁰⁸ Reuters, 11 Nov 2013, “Rosneft agrees to ship oil to China via Kazakhstan”
¹⁰⁹ KazInform, 27 April 2015, “Russia to ship up to 10 mln tons of its oil via Kazakhstan to China”

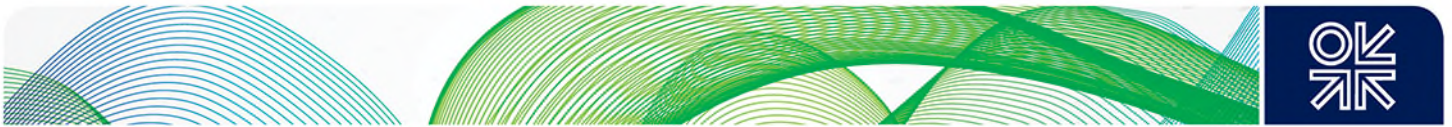
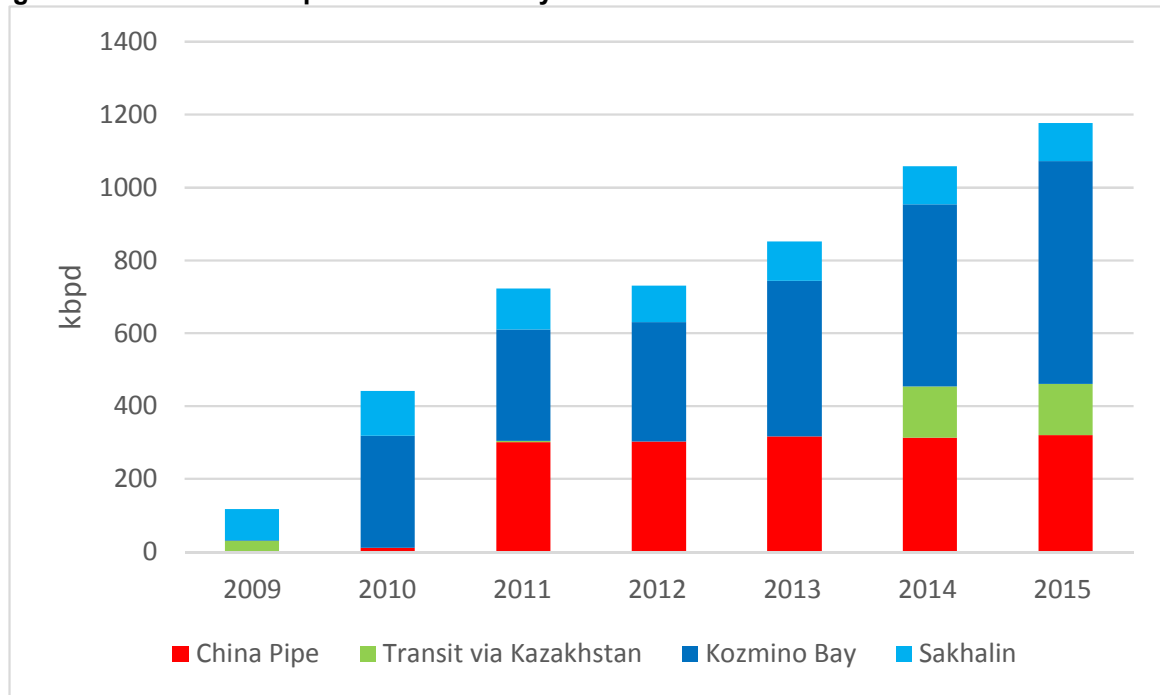


Figure 13: Russian oil exports to Far East by route



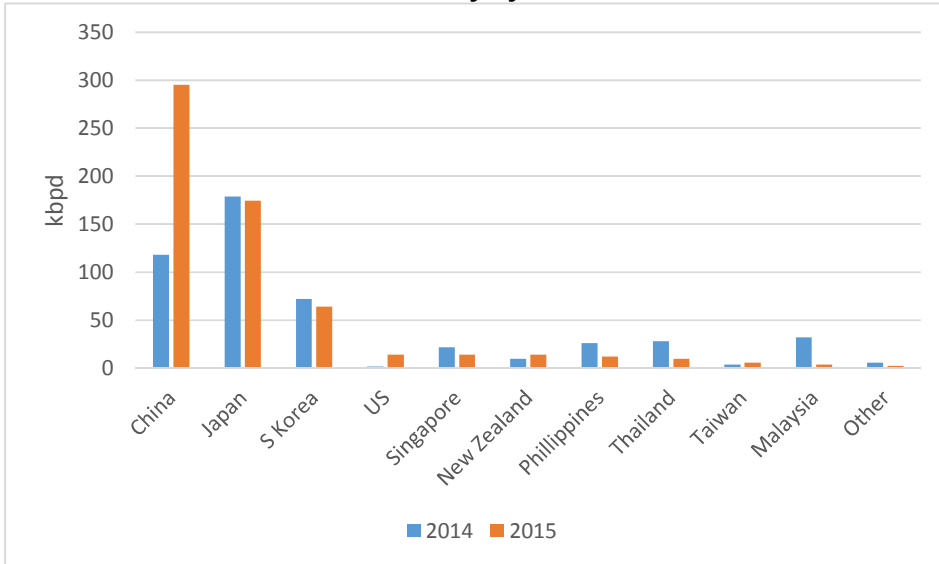
Source: Energy Intelligence Group, Interfax, Argus Media

Rosneft and CNPC not the only players involved

It is important to note, though, that although CNPC and Rosneft are the most important players in Russia’s eastern oil export story they are certainly not the only parties involved. Figure 14 below shows the liftings of crude oil from Kozmino Bay by destination in 2014 and 2015, and highlights that while China is certainly the largest player, and grew its imports from this source significantly in 2015, Japan and South Korea are also important buyers, while a number of smaller Asian countries also purchase ESPO Blend crude.



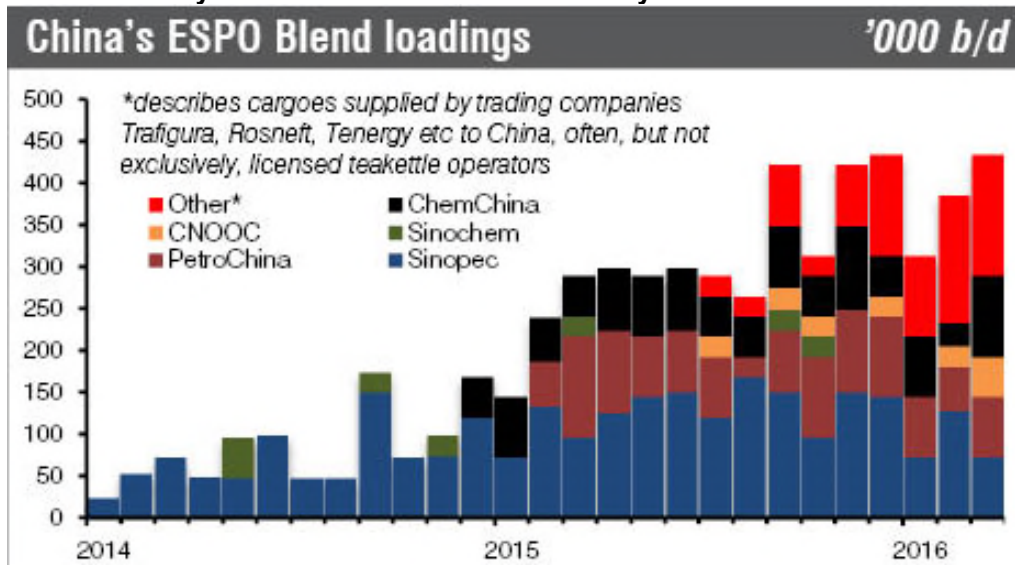
Figure 14: ESPO crude sales from Kozmino Bay by destination



Source: Argus Media

The growth in Chinese offtake at Kozmino Bay was partially driven by a need for Rosneft to find alternative routes to meet CNPC's demand, as discussed above, but it is important to note that a number of smaller Chinese importers were also keen to increase purchases of ESPO crude. Indeed, it has been reported that many Chinese "teapot" refiners have been active participants in the ESPO market thanks to its proximity and quality and also due to the high margins which they have been able to generate over the past 12 months on domestic sales of refined products.¹¹⁰ Figure 15 shows that Sinopec, ChemChina, SinoChem and CNOOC have also been buyers over the past two years, as Chinese purchases of ESPO crude have been on the rise.

Figure 15: Chinese buyers of ESPO crude at Kozmino Bay

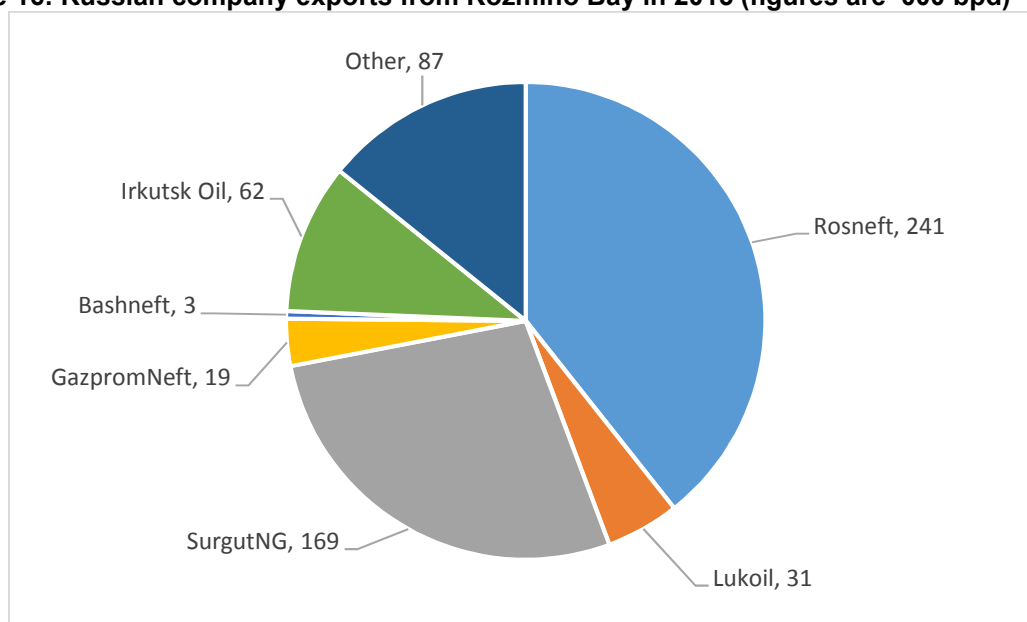


Source: Energy Intelligence Group

¹¹⁰ International Oil Daily, 12 Feb 2016, "Market Eye: Teapot buying gives ESPO surprise boost"

There is also diversity on the Russian supplier side, as a number of major companies and smaller players look to diversify into the expanding Asian market. Figure 16 shows the split of companies who have loaded cargoes at Kozmino Bay in 2015. Again, while one player, Rosneft, dominates, with a 40% share, Surgutneftegas is another significant exporter and Irkutsk Oil, GazpromNeft and Bashneft also have active roles. In addition, there are a number of smaller companies who compete actively for access to loading berths, reflecting the diverse nature of Russia's East Siberian producers.

Figure 16: Russian company exports from Kozmino Bay in 2015 (figures are '000 bpd)



Source: Argus Media

This diversity of both supply and demand is an important factor in China's desire to purchase Russian crude oil in the East, as it provides not only an important new source of supply but also diversification away from reliance on Middle Eastern crude. In 2015 Russia became the second largest exporter of oil to China, selling 42.43 million tonnes of oil and products, second only to Saudi Arabia which exported 50.55 million tonnes.¹¹¹ In some months Russia has even overtaken Saudi Arabia, thanks to the continuing growth in East Siberian export volumes, with Chinese companies now accounting for the largest share of sales at Kozmino Bay in addition to purchases through the dedicated line from the ESPO.¹¹² Figure 17 shows the rapid growth in oil and oil product sales that have flowed to China over the past decade, with the clear spike occurring after the opening of the ESPO pipeline, with the readiness of Russian companies to accept payments in renminbi being a significant factor in the sales growth.¹¹³

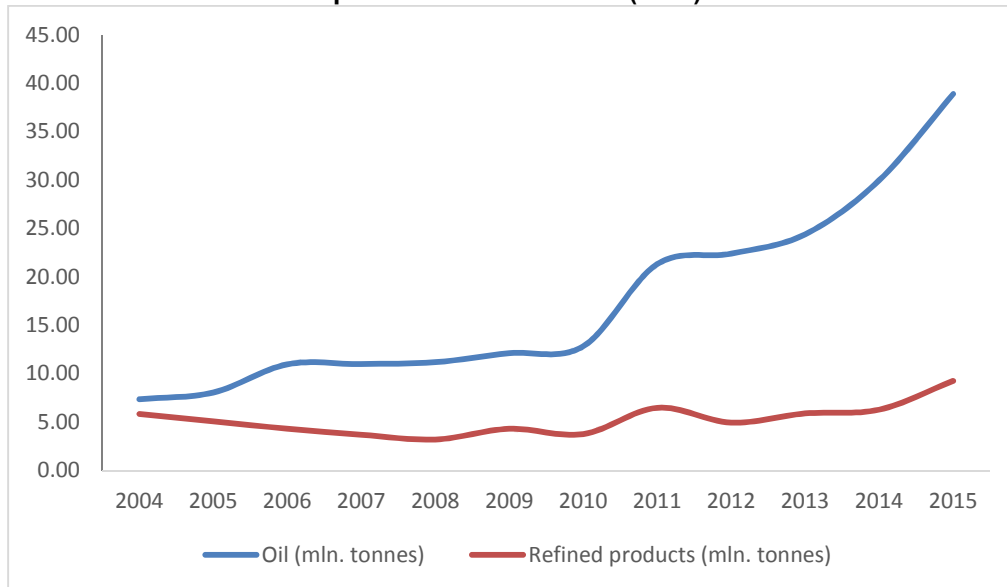
¹¹¹ Interfax, 26 Jan 2016, "Russia supplants Angola to become second biggest exporter of oil to China in 2015"

¹¹² Interfax, 21 Dec 2015, "Russia was leading supplier of oil to China in November, supplanting Saudi Arabia"

¹¹³ Россия переиграла саудитов в борьбе за китайский рынок нефти. RIA Novosti. 29.05.2016. <http://m.ria.ru/economy/20160529/1440448701.html>



Figure 17: Russian crude oil and product sales to China (mmt)



Source: Federal Custom Service of the Russian Federation

ESPO as a potential benchmark in Asia

The growing demand for ESPO crude has led to Russian calls for its oil to become a benchmark in its own right, with the Kremlin hoping that this will confirm Russia’s place in the Pacific oil market. However, the increasing importance of China as a sales destination is actually seen as an obstacle, because it has reduced the liquidity of ESPO crude on the spot market, which is one key criterion for any oil to become a benchmark against which other crudes may be priced.¹¹⁴ In addition political risk is also regarded as a problem, especially in the light of the current issues in Ukraine and Syria, meaning that although the Russian authorities may attempt to start trading of an ESPO benchmark on the exchange platform in St Petersburg, it is unlikely to be accepted as a global benchmark in the near future.¹¹⁵

However, although ESPO may not become a benchmark the demand for it is being driven not only by the option for diversification which it offers but also by its relatively high quality. ESPO Blend has an API gravity of 34-35 degrees and a Sulphur content of 0.5-0.6%,¹¹⁶ compared with the other major Russian crude blend, Urals, which has an API of just under 32 degrees and a Sulphur content of 1.35%, meaning that it is more attractive to refiners who are looking to produce lighter products such as gasoline and diesel. As a result, ESPO has traded at an increasing premium to its Russian counterpart, and also to Dubai Blend, the major Middle Eastern benchmark used in the Asia-Pacific region which has an API of 31 degrees and a sulphur content of 2%.¹¹⁷ Furthermore, it is interesting to note that even as the oil price declined during 2015 and 2016 the US dollar premium enjoyed by ESPO crude, rather than just the percentage premium, has remained very strong relative to both Urals and Dubai. This has made eastern exports even more attractive for Russian producers, who can blend some of their poorer quality West Siberian crude with the lighter East Siberian oil in order to receive a premium price. There have been some concerns that this may impact the overall quality of the ESPO Blend (again undermining its chances of it becoming a benchmark), but to date this has not been reflected in the price premium.

¹¹⁴ Interfax, 23 Dec 2015, “OPEC sees barriers to ESPO oil benchmark – World Oil Outlook”

¹¹⁵ Interfax, 17 Sept 2015, Energy Ministry hopes to introduce benchmark oil grade before mid-2016”

¹¹⁶ Henderson, J. (2013), p.26

¹¹⁷ See web-site petroleum.co.uk at <http://www.petroleum.co.uk/benchmarks> accessed on 7 Mar 2016

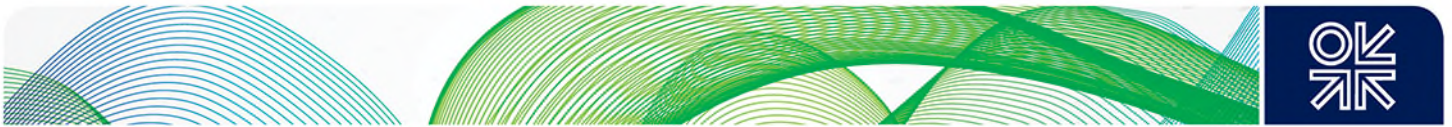
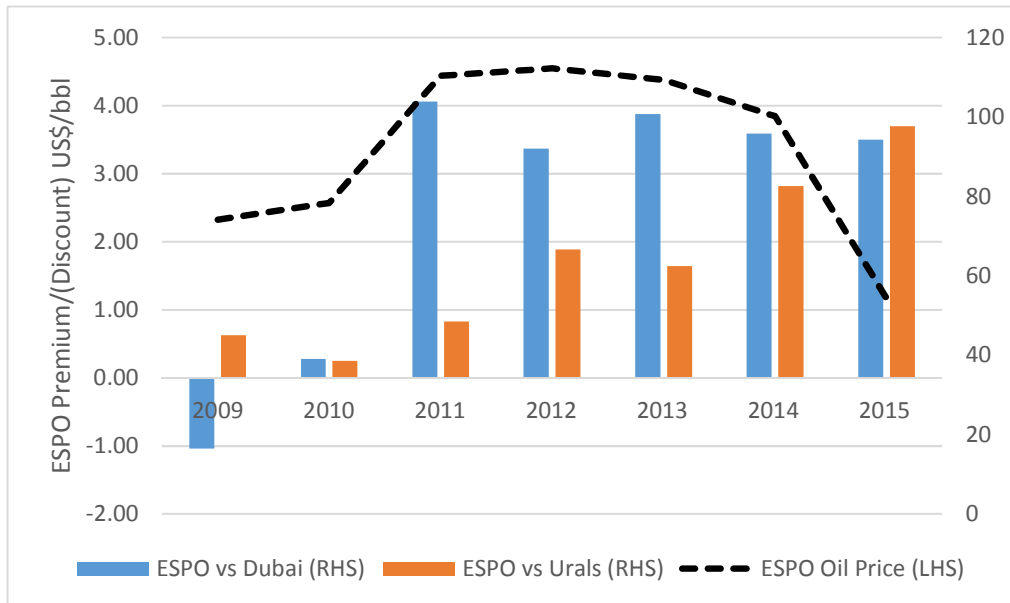


Figure 18: Premium/discount of ESPO Blend versus Urals and Dubai



Source: Argus Media

Export projections

Future growth in demand for ESPO Blend will largely continue to be driven by China's growing oil import requirements. The IEA's World Energy Outlook 2015 sees Chinese oil demand rising from 10.5mmbpd in 2014 to 14.7mmbpd by 2030,¹¹⁸ while over the same time period indigenous production is expected to decline by over 0.5mmbpd,¹¹⁹ implying a 75% increase in imports to 11mmbpd. At the same time the overall increase in Asian oil imports is estimated to be 8.7mmbpd, meaning that China will account for 55% of the region's overall expansion in imports.¹²⁰ As a result, it is perhaps not surprising that the trend in Russian oil exports towards the east is expected to continue, as Figure 19 demonstrates. As the ESPO reaches its maximum capacity of 1.6mmbpd, and assuming other export routes such as the pipeline through Kazakhstan and rail transport continue to be used, it is certainly possible that Asia will account for more than one third of total Russian oil exports by 2025, given that the overall figure is likely to rise only slowly during the next decade as overall Russian production has limited prospects for dramatic growth.¹²¹ Indeed the Russian Energy Ministry is even more optimistic than the forecast shown in Figure 19, envisaging oil exports to Asia reaching 110 million tonnes/y (2.2mmbpd) by 2035, demonstrating its belief that the share of eastern sales will grow dramatically over the next two decades.¹²²

¹¹⁸ IEA (2015a), p.119

¹¹⁹ Ibid. p. 135

¹²⁰ Calculations from IEA (2015a) references cited above

¹²¹ Henderson (2015), p.21

¹²² Interfax, 5 Oct 2015, "Energy Ministry submits Russia's Energy Strategy to 2035 to govt."

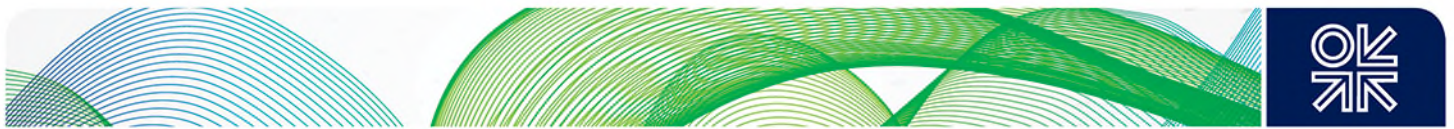
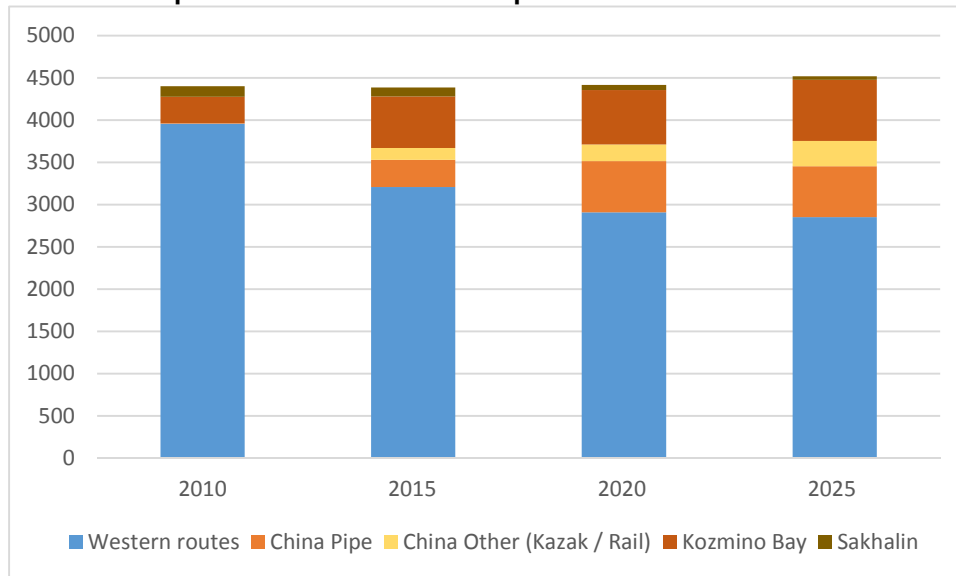


Figure 19: Estimated split of Russian crude oil exports to 2025



Source: CDU TEK, Author's estimates

Chinese investment in upstream assets

However, despite this clear growth potential for Russian oil exports to China, one further element of the relationship between China and the countries that export to it needs to be discussed, namely the evident desire of Chinese state companies (and increasingly private companies) to invest in the upstream oil assets that are providing the supply. Jiang and Sinton (2011) highlight the increasing investments that Chinese NOCs have been making overseas, underlining that the motivations for such activity are political and commercial in nature.¹²³ The National Energy Commission of China's State Council has expressed its clear support for "securing energy supply through international co-operation" in order to increase equity reserves, grow production and diversify sources of supply. However, although some of the deals completed to achieve these goals have been regarded as expensive, with Chinese companies paying a premium for access to new resources,¹²⁴ it has become increasingly clear over the past few years that the Chinese negotiating tactics have become more aggressive, particularly in a world of lower oil prices.¹²⁵

In terms of China's relations with Russia, it is evident that tactics similar to those used across the rest of the world are preferred. Loans have been offered to support the development of oil fields and infrastructure, with the debt offered to Rosneft and Transneft to catalyse the ESPO project mirroring similar deals in Brazil, Kazakhstan and Nigeria.¹²⁶ Furthermore, Petrobras has recently been offered a \$10 billion loan for an oil supply deal similar to the prepayment deal provided to Rosneft, to help Petrobras pay off its outstanding debts.¹²⁷ Beyond the provision of loans, though, Chinese companies also like to invest directly in the assets which will produce the oil that will be sent as exports, and there are numerous examples of this occurring across the globe. The IEA has calculated that 10 Chinese companies now have around 2.5mmboepd of production from international upstream oil and gas assets, having spent US\$73 billion between 2011 and 2013 alone.¹²⁸ After acquisitions in the 2000s in Africa,

¹²³ Jiang & Sinton (2011), pp.12-17

¹²⁴ Wall Street Journal, 25 Oct 2013, "Chinese energy deals focus on North America"

¹²⁵ The Fuse, 2 Nov 2015, "Flush with cash, Chinese companies score bargains on North American oil assets"

¹²⁶ Reuters, 17 May 2010, "China looking to make for loan-for-oil deals"

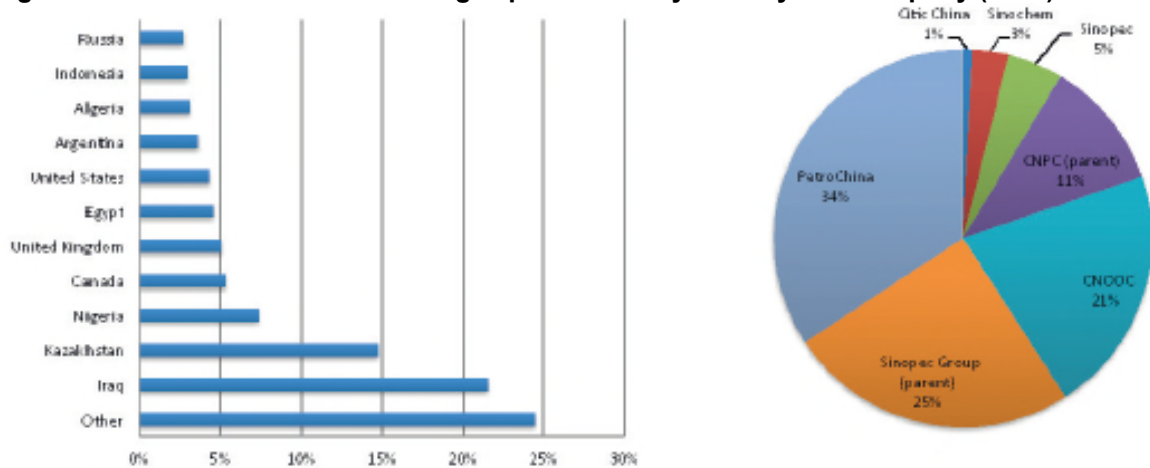
¹²⁷ Bloomberg, 26 Feb 2016, "Petrobras gets \$10 billion loan in Chinese oil supply deal"

¹²⁸ Jiang & Sinton (2014), p.7



Central Asia and South America, more recent M&A activity has been focused on North America, where the purchase of shale and tight oil assets in the US and Canada has been targeted at oil supply and the acquisition of technology, and on Iraq, which has now become a major production base (see Figure 20).

Figure 20: Chinese overseas oil and gas production by country and company (2013)



Sources: Rystad Energy; IEA data.

Source: IEA (2014), p.14

As can be seen from the bar chart above, Chinese equity investment in Russian assets accounts for a relatively small 2.5% of total Chinese overseas production. This clearly does not reflect the share of Russian oil in Chinese imports, and suggests both a reluctance on the Russian side to share assets with its economically powerful southern neighbour and also a likely caution on the Chinese side about the political impact of closer ties with Russia, as well as a reluctance to overpay for upstream assets. Russia has historically been disinclined to become simply a supplier of oil and gas that can further bolster the economic strength of its expanding southern neighbour while leaving Russia subject to the volatility of global commodity prices, a concern that could be further exacerbated by worries over creeping political influence should Chinese NOCs take significant stakes in upstream assets. Meanwhile on the Chinese side lingering concerns about Russia's real political motives and also distrust over Russian companies' business practices have also undermined rapid progress in deal-making.¹²⁹

However, even before the recent imposition of sanctions on Russia by the US and the EU it appeared that, in the oil sector at least, the relationship between companies on both sides of the border were warming, with Rosneft and Igor Sechin in the vanguard. Table 2 outlines deals that have either been completed or are under discussion, and the length of the list demonstrates that significant negotiations have been taking place.

¹²⁹ The Seattle Times, 31 Dec 2011, "China's quest for energy from Russia exposes history of distrust"



Table 2: Russian oil deals discussed or completed with Chinese counterparties

Date	Chinese counterparty	Russian counterparty	Asset	Comment
Aug-06	Sinopec	Rosneft	Udmurtneft	49% stake in company; Sinopec bought 100% for \$3.5 billion then sold 51% stake to Rosneft
Oct-06	CNPC	Rosneft	Vostok Energy and Donstream JV in China	East Siberian upstream JV; Rosneft 51%, CNPC 49%. China downstream JV; Rosneft 49%, CNPC 51%
Nov-06	CNPC	Yuzhuralneft	Joint venture	Short-lived investment in Russian geological company that was purchased by TNK-BP in 2008
Mar-07	Sinopec	Rosneft	Venineft (Sakhalin)	Rosneft 74.9%, Sinopec 25.1%. Aims to produce 1.4-1.6bcm for Far East LNG from offshore licences
Sep-07	CNPC	Lukoil	Strategic Co-operation Agreement	Lukoil CEO Vagit Alekperov signs agreement with CNPC's Jiang Jemin
Apr-09	RusEnergy	Suntarneftegaz	51% stake purchased	Consortium of Chinese and Russian investors bought into company with assets in East Siberia
Oct-09	CIC	Nobel Oil	45% stake purchased	China Investment Corp. buys stake in small Russian oil company with 150mm barrels of reserves
Sep-10	CNPC	Lukoil	Strategic Co-operation Agreement	Lukoil CEO Vagit Alekperov reconfirms agreement with CNPC's Jiang Jemin
Mar-13	CNPC	Rosneft	3 Arctic exploration licences;	Initial agreement signed, offer reiterated in April 2016, but final agreement yet to be confirmed
Oct-13	CNPC	Rosneft	Taas-Yuriakh, inc. Sredne Botuobinskoye field	CNPC offered 20% stake but failed to agree price; eventually sold to Indian companies
May-14	CNPC	Rosneft	Tianjin refinery and petrochemicals complex	JV called Vostok Petrochemical. CNPC 51%, Rosneft 49%. Also owns 300 retail sites.
Nov-14	CNPC	Rosneft	Vankor	Negotiations still continuing on possible purchase of 10% stake; Chinese turned down first offer over valuation; eventually sold to Indian companies
Nov-14	CNPC	Rosneft	Strategic Co-operation Agreement	Signed during Putin visit to Beijing
Sep-15	Sinopec	Rosneft	Yurubecheno-Tokhoms koye, Russkoye fields	49% stake in East Siberian Oil & Gas Company (R) and Tyumenneftegaz (Y-T). Binding documents to be signed by y/e 2015
Nov-15	Sinopec	Rosneft	Gas processing and chemicals in East Siberia	Discussion on partnership agreement underway.
Nov-15	CNOOC	Rosneft	Sakhalin offshore	Memorandum of Understanding signed in June 2016
Nov-15	ChemChina	Rosneft	Far East Petrochemical Complex	Discussing possible co-operation on Sakhalin shelf; two fields close to Sakhalin 1 project
Nov-15	ChemChina	Rosneft	Far East Petrochemical Complex	Memorandum of Understanding on partnership agreement. Agreement to conduct feasibility study reached in June 2016
Jun-16	Beijing Enterprises	Rosneft	Verkhnechonskneftegas	Preliminary agreement for Chinese company to buy a 20% stake

Source: Authors' analysis

The first deal, which marked the start of Russia's, and in particular Rosneft's, co-operation with China was the joint purchase of Udmurtneft with Sinopec. Udmurtneft was a subsidiary of TNK-BP located in European Russia, producing around 6.5 million tonnes/y of oil, and was put up for sale as part of a restructuring exercise in June 2006. Rosneft was keen to buy the company as part of its strategy to consolidate key oil assets under the Russian state company umbrella, but did not have adequate financial resources to make the purchase outright. Sinopec, on the other hand, did not believe that it would be allowed to buy a large, let alone a controlling, stake in a Russian production company and



therefore proposed that it would buy all 100% of Udmurtneft but would give Rosneft the option to buy back a 51% stake, to be paid for out of Udmurtneft's future earnings. This eventually transpired, as Sinopec made the winning bid in the auction and then sold a 51% stake back to Rosneft, who took control of the company, which has 58 development licences as well as geological exploration permits.¹³⁰

The first co-operation in the East of Russia was also arranged in 2006, when CNPC set up joint ventures with Rosneft operating both in Russia and China. The Russian venture, Vostok Energy, was focused on geological exploration and oil production, and was 51% owned by Rosneft and 49% by CNPC. In 2007 Vostok Energy acquired licences to explore two Eastern Siberian blocks in the North Irkutsk province of Russia – Verkhneichersky and West Chonsky. Exploration activity and some drilling has subsequently taken place, but without producing any significant results.¹³¹ Meanwhile the joint venture based in China is supposed to implement an oil refining and marketing project (a controlling stake of 51% is owned by CNPC) based in Tianjin. Negotiations around the exact timing and extent of the project are continuing.

Sinopec then appeared again in 2007, signing an agreement to participate in an exploration venture offshore Sakhalin. The exploration and development of the Veninsky block (which is part of the Sakhalin 3 licence) is to be undertaken by a venture in which Rosneft owns 74.9% and Sinopec has 25.1%, and currently the expectation is that any gas discoveries could be used to supply the potential Far East LNG project which Rosneft hopes to develop. However, although initial estimates suggest that total C1 plus C2 reserves stand at around 50bcm, progress has been limited mainly due to the uncertainty surrounding the monetization of any fields, as the Far East LNG project remains under discussion only.¹³²

Rosneft was not the only company active with Chinese partners in this period, though. CNPC formed a small joint venture with the geological company Yuzhuralneft in late 2006,¹³³ although this ended up being a rather short-lived enterprise and was purchased by TNK-BP in 2008. Of potentially more importance was the signing by Lukoil of a strategic co-operation agreement with CNPC in 2007,¹³⁴ and re-confirming it in 2010. However, Lukoil's strategy in the east and towards China has subsequently been mainly focused on gas exports from Uzbekistan, which perhaps reflects the fact that the company understood that state company Rosneft was bound to dominate Russia's relationship with China, offering little scope for other companies to participate in a meaningful way.

The 2008/09 financial crisis then reduced the level of interest in M&A activity, although two small deals did occur. Firstly the RusEnergy investment group, a consortium of Chinese and Russian investors, bought into a small production company in the Sakha Republic called Sunarneftegaz, which produces around 3bcm of gas for the local market. Then in 2009 the China Investment Corp. (CIC) purchased a 45% stake in the Nobel Oil Group, a small oil company with three fields and total reserves of around 150 million barrels.¹³⁵ Although both these transactions were not meaningful in terms of size or strategic importance, they nevertheless did demonstrate a willingness by Chinese investors to continue testing the investment environment in Russia, even during a period of economic turbulence.

The revival of the more important Rosneft-CNPC relationship began in 2013, though, when three Arctic licences were offered for Chinese participation, as well as a 20% stake in the Taas Yuriakh company in East Siberia which controls the large Sredne-Botuobinskoye oil and gas field in the Irkutsk region.¹³⁶ However, despite this initial burst of enthusiasm neither deal was finalized, as reflected in Table 2 by

¹³⁰ Ю. Когтев. Китайский нефтяной пузырь. 18.11.2015. <http://www.kommersant.ru/doc/2849786>

¹³¹ Ю. Когтев. Китайский нефтяной пузырь. 18.11.2015. <http://www.kommersant.ru/doc/2849786>

¹³² Ю. Когтев. Китайский нефтяной пузырь. 18.11.2015. <http://www.kommersant.ru/doc/2849786>

¹³³ Interfax, 21 Nov 2006, "CNPC subsidiary, Yuzhuralneft plan to set up joint venture"

¹³⁴ Interfax, 10 Sept 2007, "Lukoil, CNPC sign agreement on strategic cooperation"

¹³⁵ Paik (2012) pp.375-376

¹³⁶ Добыча на месторождении началась в октябре 2013 года, от него построен отвод к нефтепроводу ВСТО. Запасы месторождения составляют 134 млн тонн нефти и газового конденсата (C1 + C2) и более 155 млрд кубометров газа.



the fact that they are shaded grey and written in italics. Indeed, it is clear from the table that much of the interaction between Russia and China since 2013 has not led to a substantive conclusion, although it would seem that this is more a reflection of Chinese reticence and hard bargaining than any lack of Russian enthusiasm.

Following the announcement of sanctions in May 2014, Russia's eagerness to demonstrate to the EU and the US that it was developing alternative markets in Asia increased, and with it came more offers of assets for joint investment, especially in East Siberia. CNPC was offered a 10% stake in the huge Vankor field (which produces 500k bpd of oil and has significant reserves in satellite fields) and also signed a strategic co-operation agreement with Rosneft in the presence of the Chinese and Russian leaders in Beijing.¹³⁷ Furthermore Sinopec was offered a 49% share of two major fields, Yurubcheno-Tokhomskiye (YTK) and Russkoye,¹³⁸ as well as participation in a gas processing and chemical plant, while CNOOC is in discussion on co-operation over two potential fields on the offshore Sakhalin Island that are close to the Sakhalin 1 project.¹³⁹ In April 2016 Rosneft then reiterated its 2013 offer of participation in offshore projects in Barents and Pechora Seas to CNPC,¹⁴⁰ although the Chinese reaction was very cautious, with a company spokesman stating that: "Huge investments are required for such projects and the economic effect should therefore be estimated [before any final decision]".¹⁴¹ Finally, ChemChina has signed a memorandum of understanding on partnership in the FEPCO petrochemical complex situated at the end of the ESPO pipeline near Vladivostok.¹⁴² However, despite all this activity no specific joint venture project within the Russian domain has been finally signed off, with deadlines being missed and negotiations dragging on beyond schedule.

Ironically, the one project that would appear to have made some progress is actually in China, where plans first hatched in 2006 to develop the Tianjin refinery complex now seem to be moving forward.¹⁴³ In 2014 both sides approved a feasibility study, and a final investment decision was planned for spring 2016. In April 2016 CNPC vice president Van Chunsai announced that the project had been approved, and that the companies were awaiting confirmation of government support for the project.¹⁴⁴ Assuming that it does proceed, the 16 million tonnes/year facility would allow Rosneft to create extra value from its oil exports via diversification into the Chinese oil product market. The initial concept was that the plant would be built by 2019, but it appears that as the initial feasibility study has taken longer than expected, with both companies deciding that it needed to be "optimized" before each can take an investment decision, a start date in the early 2020s is now more likely.¹⁴⁵

Chinese delays have catalyzed a Russian response

As noted above, though, the amount of italic text in Table 2 emphasizes that few cross-border deals have actually been closed, and it would appear that three factors have caused delay on the Chinese side. Firstly, the perception that Russia is in a weak negotiating position, both politically and commercially, has encouraged Chinese companies to drive a hard bargain on valuation, especially given the recent decline in the oil price.¹⁴⁶ Secondly, the continuing broad sweep of corruption

¹³⁷ Financial Times, 1 Sept 2014, "Rosneft proposes Chinese oil company takes stake in Russian oilfield"

¹³⁸ Rosneft press release, 3 Sept 2015, "Rosneft and Sinopec agree on the joint development of Russkoye and Yurubcheno-Tokhomskiye fields"

¹³⁹ Interfax, 18 Nov 2015, "Rosneft CNOOC discuss cooperation on Sakhalin shelf"

¹⁴⁰ Подобедова Л. Китайская CNPC заявила о желании участвовать в управлении «Роснефтью». РБК. 30.05.2016. <http://www.rbc.ru/business/30/05/2016/574c1bb59a7947ab5f8536b9?from=main>

¹⁴¹ China's oil and gas corporation ready to consider Novatek's proposals on new projects. TASS. 21.04.2016. <http://tass.ru/en/economy/871686>

¹⁴² Rosneft press release, 3 Sept 2015, "Rosneft and ChemChina develop cooperation"

¹⁴³ Rosneft press release, 8 Nov 2014, "Rosneft and CNPC endorse feasibility study for construction of Tianjin refinery"

¹⁴⁴ <http://www.finanz.ru/novosti/aktsii/proekt-tyanczinskogo-np-z-rosnefti-i-cnpc-utverzhen-vice-prezident-kitayskoy-kompanii-1001162024>

¹⁴⁵ Interfax, 19 Nov 2015, "Rosneft, CNPC to optimise feasibility study for Tianjin refinery"

¹⁴⁶ Bloomberg, 25 March 2014, "Crimea crisis pushes Russian energy to China from Europe"



investigations in China, and in particular at CNPC,¹⁴⁷ has made corporate executives reluctant to conclude large deals for fear of then being investigated, while the dismissal of a number of senior oil executives as a result of criminal convictions has left a void in decision-making in the Chinese national oil companies.¹⁴⁸ Thirdly, the imposition of sanctions by the US and EU in 2014 has created a reason to pause for the Chinese leadership, as it contemplates the balance of its relationship between Russia and the West. As a result, the purchase of major upstream assets in Russia has been delayed despite their apparent attraction and compatibility with China's overall strategy of international diversification.

Russia has responded to this procrastination by demonstrating that its bargaining position is not as weak as it might seem, offering the assets originally destined for Chinese companies to other international players, with a particular focus on India. A 15% stake in Vankorneft, the Rosneft subsidiary which operates the Vankor field and surrounding assets, has been sold to ONGC,¹⁴⁹ with the offer that the stake could be increased to 26% over time, and an additional 23.9% could be sold to other Indian companies, meaning that India's total interest in the field could reach almost 49%.¹⁵⁰ Meanwhile a consortium of Indian companies has been announced as the buyer of a 29.9% stake in Taas-Yuriakh in an apparent direct riposte to the Chinese state companies who were unable to complete similar deals,¹⁵¹ while an additional 20% has been sold to BP (essentially the original stake that was offered to CNPC in 2013).¹⁵² In addition Rosneft has made a reciprocal purchase in India, confirming its interest in buying as much as a 49% stake in refining company Essar Oil, in an apparent replica of its commitment to the Tianjin refinery in China.¹⁵³ These deals would appear to confirm President Putin's commitment to closer energy ties with India, which were outlined during a state visit to New Delhi in December 2015, while also acting as a clear reminder to China that it does not have as much influence of Russia's "pivot to Asia" as it might have imagined.¹⁵⁴

Nevertheless, given that both Vankor and Taas Yuriakh will provide hydrocarbons for export to China, it remains an anomaly that neither deal was finalized with a Chinese company, especially given the diplomatic efforts made by Rosneft president Igor Sechin. Despite the collapse in the oil price, which has made agreeing on valuation more difficult, and the continuing corruption scandals in the Chinese oil sector, which have distracted key decision-makers at the leading oil companies, it is hard not to reach the additional conclusion that China is playing a hard bargaining game and does not see its relationship with Russia to be as strategic as the Kremlin might like.

Indeed, China may well have taken the view that, despite the optionality created by the pipeline to Kozmino Bay, the bulk of Russia's eastern oil sales are reliant on China for their market irrespective of who the equity participants may be and so there is less need to invest directly in them. Investment in regions more remote from China, such as Africa and Latin America, may be necessary in order to secure supply because the global oil market provides countries such as Brazil, Nigeria and others with multiple sales options. By contrast, East Siberian oil is heavily reliant on China for sales via the ESPO, whether through the pipeline spur or via tanker from Kozmino Bay, meaning that in reality CNPC and other Chinese NOCs have less need to become shareholders in them, unless the price is very advantageous. Instead China has offered financial support, to ensure that the developments are undertaken and the infrastructure is built, and is now also starting to provide an increasing level of oil services across the geography of the Russian oil industry.

¹⁴⁷ Financial Times, 12 Oct 2015, "Former head of China's CNPC jailed for 16 years for graft"

¹⁴⁸ The Economist, 2 April 2016, "Xi Jinping's leadership: Chairman of Everything"

¹⁴⁹ Interfax, 17 March 2016, "ONGC's purchase of 15% of Vankorneft included on agenda for govt. commission for foreign investments meeting"

¹⁵⁰ Interfax, 16 March 2016, "Rosneft to sell up to 23.9% of Vankorneft to three Indian companies, ONGC to up stake to 26%"

¹⁵¹ Interfax, 16 March 2016, "Rosneft sells 29.9% of Taas-Yuriakh to consortium of Indian cos."

¹⁵² Interfax, 30 Nov 2015, "Rosneft sells 20% of East Siberian oil, gas condensate field to BP, to bring another partner in"

¹⁵³ Interfax, 16 March 2016, "Rosneft confirms interest in buying into Essar Oil Limited"

¹⁵⁴ Reuters, 25 Dec 2015, "Russia and India cement ties with energy and defence deals"



Furthermore, the negotiating game may not be over yet, as the Chinese response to the sale of Russian assets to India has been continue negotiations for alternative assets. At a meeting in June 2016, Rosneft signed Heads of Agreement with Beijing Enterprises, which had previously followed CNPC in negotiating for the stake in Tass Yuriakh now sold to India, on the purchase of a 20% stake in Verkhnechonskneftegas (VCNG), with the parties announcing that they intend to sign binding agreements on the transaction in Q4 2016.¹⁵⁵ VCNG is a subsidiary of Rosneft that currently produces 175,000bpd of oil, and so the link with one of China's main gas companies is a strange one, but the potential deal underlines Rosneft's continued interest in doing deals with Chinese companies. In addition, the link to a Chinese gas company may also suggest that the Russian NOC's aspirations also include challenging Gazprom's position in Asia (see next section for further discussion).

Chinese oil service companies expand in Russia

US and EU sanctions against Russia have impacted the willingness of western service companies to sell equipment in Russia and as a result Chinese companies have been presented with another opportunity to exploit a Russian need in the aftermath of the 2014 Ukraine crisis. In one sense the move has been catalyzed by Russia, with Natural Resources Minister Sergei Donskoi identifying in September 2015 that "we need to bring this [oil field equipment] in from outside, possibly from our Asian colleagues, the Chinese, who have entirely competitive, world class equipment."¹⁵⁶ However, it is also clear that Chinese companies understand the extent of the opportunity provided by western sanctions, with Cheng Yongfeng, a vice president at China's largest oil equipment manufacturer Yantai Jereh Oilfield Service Group, stating in August 2015 that "the sanctions have forced a lot of western companies to withdraw their business from Russia. It may be a turning point for China and a long-awaited door may be opened for Chinese oil and gas players to sweep into the Russian market."¹⁵⁷

Subsequently, Rosneft has signed a service contract with Jereh to work at its Yuganskneftegaz subsidiary, crucially supplying hydro-fracking and flexible tubing equipment that has been restricted under western sanctions if intended for shale oil.¹⁵⁸ Meanwhile, Chinese companies such as Honghua (an onshore rig maker) and Petro-King (oilfield services) have reported significant increases in business from Russia, leading them to open offices in Moscow to exploit growing demand.¹⁵⁹ Furthermore, it is not just onshore work that is being offered to Chinese companies, as the sanctions have limited western companies' ability to work in the Russian offshore, especially in the Arctic and in deep water (defined as more than 500 feet). As a result, Rosneft and Statoil have now hired China Oilfield Services Limited (COSL) to provide equipment and manpower to drill two wells offshore Magadan in 2016,¹⁶⁰ and Rosneft CEO Igor Sechin has stated that this could open the way for further co-operation between China and Russia in Arctic waters.¹⁶¹

Interestingly, then, it may be in northern waters that China sees the greatest incentive for long-term investment in Russia, as it seeks to gain a stake in the northern sea route from Europe. CNPC's investment in the Yamal LNG project will be discussed below, but the company also continues to negotiate with Rosneft over access to three Arctic exploration licenses, and Chinese shipping companies have started to invest both in Arctic LNG tankers and perhaps more importantly in ice-breaking ships. Indeed it is here that Russia may be able to develop its own bargaining strength, as China is keen to learn more about the new nuclear-powered icebreakers that Russia is developing as part of its Arctic strategy.¹⁶² As a result, while East Siberian oil may be stranded and reliant on the

¹⁵⁵ Rosneft, 25.06.2016 <https://www.rosneft.com/press/releases/item/182759/>

¹⁵⁶ Interfax, 17 Sept 2015, "Russia should buy drilling equipment in China, former communist bloc countries – Donskoi"

¹⁵⁷ Interfax, 22 Aug 2015, "Opportunities for China's oilfield service sector"

¹⁵⁸ Interfax, 19 Nov 2015, "Rosneft signs service contract with China's Jereh for Yuganskneftegaz"

¹⁵⁹ South China Morning Post, 1 Dec 2014, "Sanctions on Russia open door for Chinese oil and gas companies"

¹⁶⁰ Interfax, 3 Sept 2015, "Chinese companies to render drilling, contract services for \$550mm to Rosneft"

¹⁶¹ The Maritime Executive, 16 Nov 2015, "Russia ready to bring China into Arctic Offshore"

¹⁶² Sputnik News, 4 Sept 2015, "China interested in Russian icebreaker technology"



Chinese market, Arctic oil, although higher cost, may provide a geo-strategic political driver for greater co-operation between Russia and China, despite the fact that the economics of hydrocarbon development in ice-bound regions are very challenging during times of lower oil prices.

Discussion of the Arctic, though, highlights one other important feature of Sino-Russian relations in the oil sector, namely that on the Russian side they are dominated by one company, the state-controlled Rosneft. In Arctic waters licences continue to be reserved for state companies alone (Gazprom also has preference, as will be discussed later), but in general it is clear that Rosneft and Igor Sechin see themselves as the leader in Russia's oil relations with China. Other Russian companies, such as GazpromNeft and Bashneft, have developed links, in particular with regard to financing,^{163 164} but in reality Rosneft has positioned itself China's main ally in Russia. This dominance has some positive aspects, in as much as company CEO Igor Sechin does appear to have developed close personal relations with Chinese counterparts, but it also carries significant risks, as Rosneft has been particularly targeted by sanctions and therefore carries a political risk for China. Indeed, this may be another reason why deals such as for Vankor and Taas-Yuriakh have not been completed. Nevertheless, it would appear that for the foreseeable future Rosneft and Sechin will continue to be the leading players in Russia's eastern oil strategy, with implications that could stretch into the political and gas arenas over the remainder of the current decade.

Conclusions on oil sector

The interaction between Russia and China in the oil sector has been driven by the latter's rising import requirement and its search for diversification of oil supply and the former's eagerness to exploit its vast eastern resources. However, a key facet of the relationship has been China's willingness to underpin new field and infrastructure investment in Russia with financial support, especially for Rosneft. Indeed, prepayments for oil have helped to bolster Rosneft's balance sheet at vital times on more than one occasion. Another feature of the relationship has been attempts by Chinese companies to purchase upstream assets in Russia, mirroring China's global strategy to secure equity in key sources of supply. As can be seen in the timeline below (Figure 21), a number of small deals have been completed, but an equal number (in italics) remain under discussion or have failed. It is notable that CNPC has been relatively unsuccessful in this area, perhaps due to a lack of management attention in the midst of continuing corruption investigations.

As a result, Russia (led by Rosneft) has started to turn its attention elsewhere, with Indian companies brought in as buyers for assets rejected by China. During the remainder of 2016, it will be interesting to see whether this new element of competition has any impact on the sale of Russia's next oil offering, a 19.5% stake in Rosneft. Both Indian and Chinese companies have expressed interest in buying shares in the forthcoming privatization, and fulfillment of this intent (or lack of it) will provide a clear indication of the current state of relations between both countries and Russia. It may be that China, and in particular CNPC, feels that enough funds have already been committed in the form of loans to secure long-term influence over Russian oil in the east, and indeed they may also feel that, as China will remain the main market for any Russian oil exports in the east, it makes little difference who actually owns the assets. Furthermore, Chinese oil service companies are now selling large amounts of equipment into the Russian oil sector, taking advantage of the impact of US and EU sanctions, and so trade has arguably increased without the need for direct investment.

The possible purchase of a stake in Rosneft in the imminent privatization could help to cement the Sino-Russian oil relationship, but equally the leadership of the Russian national oil company may be reluctant to concede the level of influence which CNPC management has allegedly requested in return for buying

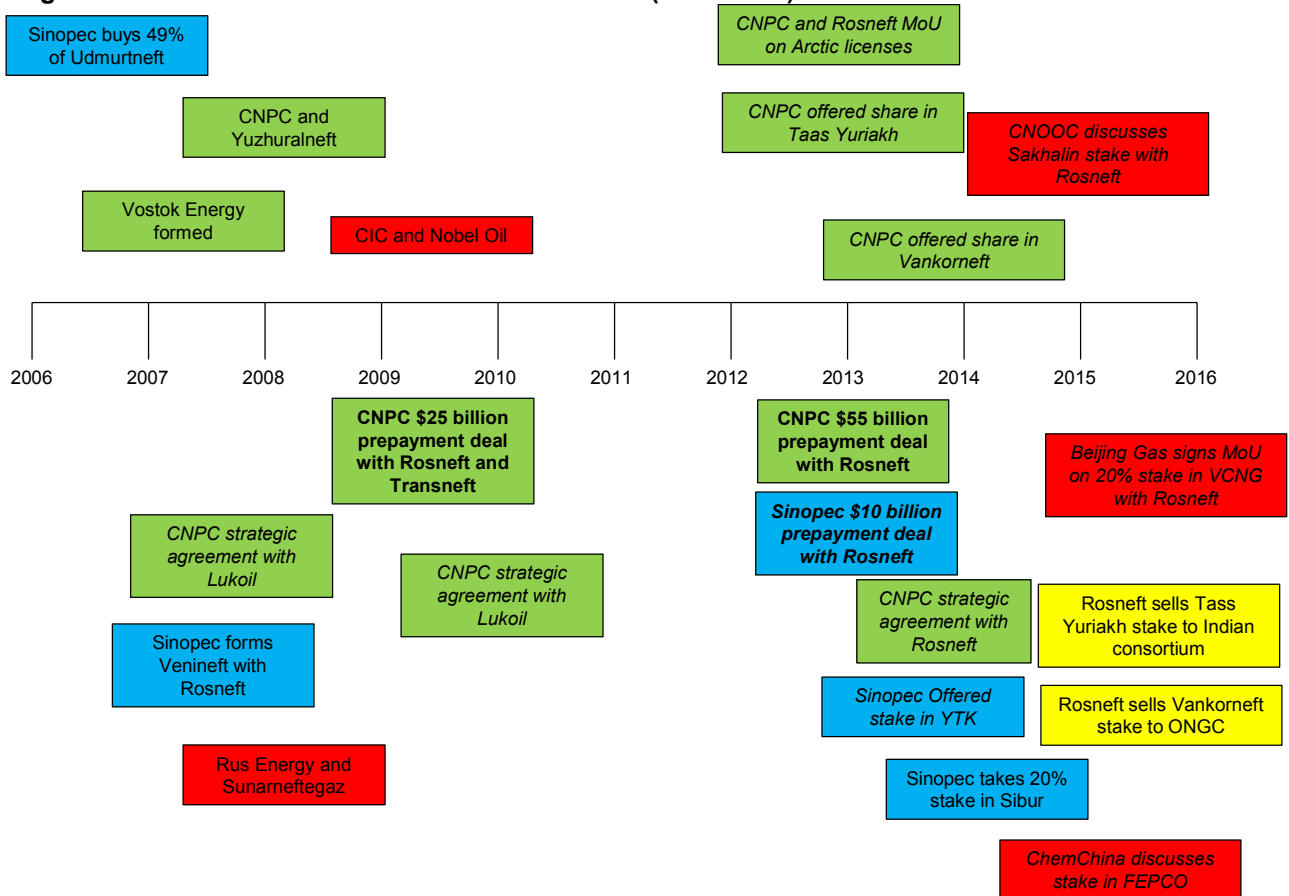
¹⁶³ Interfax, 22 Dec 2015, "GazpromNeft expects Chinese loan soon, borrowing there cheaper than in Russia"

¹⁶⁴ Interfax, 20 Jan 2016, "Bashneft has raised \$500mm prepayment for oil supplies with participation of Bank of China and ICBC – company"



a strategic stake in the company and the ability to participate in the management of Rosneft.¹⁶⁵ Indeed, the inherent dilemma in Sino-Russian relations is clear in the decision over Rosneft's privatization – Russia would like Chinese financial support and to secure a long-term energy link but wants to give as little as possible in return, and certainly does not want to lose any control over its major assets. Nevertheless, the complex and fluctuating nature of the relationship between the two countries was underlined again in June 2016 when Rosneft offered Beijing Gas a stake in one of its major East Siberia subsidiaries (VCNG), underlining that negotiations continue and assets are available, even if the specific logic of selling a stake in an oil company to a major Chinese gas production and distribution company remains unclear.

Figure 21: Timeline of Chinese oil deals in Russia (2006-2016)



Source: Authors' analysis

NB: *Italics implies that deal has yet to be officially confirmed in public domain*

¹⁶⁵ Подобедова Л. Китайская CNPC заявила о желании участвовать в управлении «Роснефтью». РБК. 30.05.2016. <http://www.rbc.ru/business/30/05/2016/574c1bb59a7947ab5f8536b9?from=main>



Gas industry

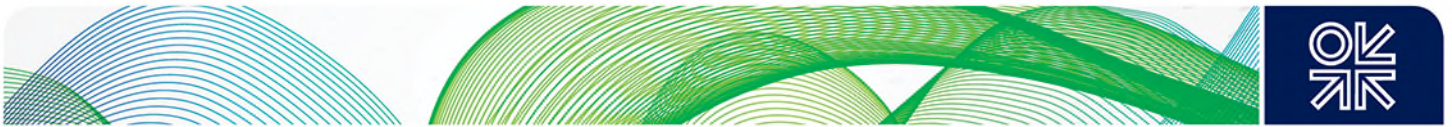
Brief review of Russia's eastern gas assets: resource potential and production

Despite the fact that almost all of Russia's eastern hydrocarbon exports to date are accounted for by oil, it is the gas sector that has taken most of the headlines over the past two years because of the increasing pressure to conclude export deals with China since the imposition of western sanctions on Russia. Russia has significant gas resources in its eastern regions and China has growing gas consumption, making trade a logical conclusion, but a combination of political and commercial issues, as well as tough bargaining tactics on both sides, has complicated negotiations and led to something of a stalemate. One deal has been signed, and Chinese companies have invested in a major Russian LNG development on the Yamal peninsula, but overall progress has been slower than expected. Nevertheless, the longer term logic of increasing gas trade seems irrefutable, if Russia can find a way to make its commercial terms competitive in a currently oversupplied global gas market.

Mitrova (2015) details the significant gas reserves held by Russian companies in East Siberia and the Far East of Russia, with the aggregate gas resources located in Eastern Russia amounting to 52.4 tcm onshore and 14.9 tcm offshore. However, there has been limited exploration of the region, with only 7.3% for the onshore area and 6% for the continental shelf having seen any activity to establish the extent of gas reserves.¹⁶⁶ There are four main clusters of assets which can potentially provide a solid foundation for gas exports to Asia (see Annex 2 and Map 3):

- The Yakutsk centre with 2.2 tcm of gas reserves (with the Chayandinskoye field alone holding 1.45 tcm);
- The Irkutsk centre with 3.4 tcm (Kovyktinskoye field is the main asset in the region with gas reserves amounting to 1.9 tcm);
- The Krasnoyarsk centre with gas reserves of 1.3 tcm
- The Sakhalin Island and the Kamchatka Peninsula which contain more than 2 tcm of gas reserves (in particular in the Sakhalin-1, 2 and 3 license areas).

¹⁶⁶ Gazprom web site at <http://www.gazprom.com/about/production/projects/east-program/>, accessed on 15 April 2016



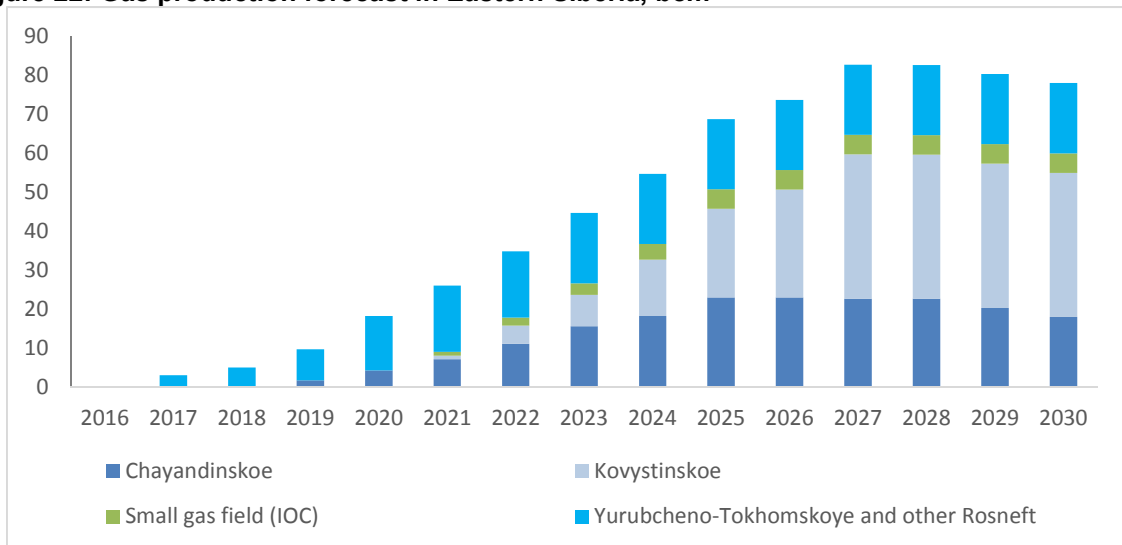
Map 3: Major Russian gas production centres in the east of the country



Source: Gazprom

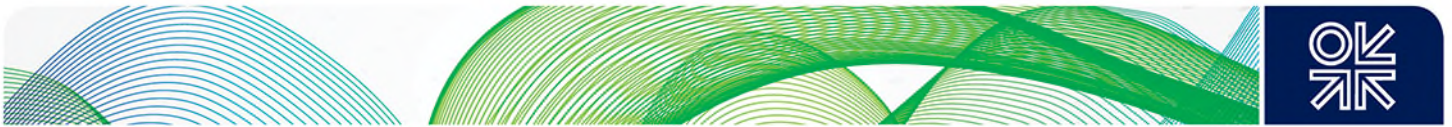
In terms of production potential Figure 22 shows that the East Siberian fields could provide a total gas production of up to 75-80 bcm/year by the end of the next decade. The majority would come from Gazprom’s Chayandinskoye and Kovytkinskoye fields, which between them have the capacity to produce 50-60bcm/y, while the remainder would come from non-Gazprom players such as Rosneft, who have a significant quantity of associated gas available. However, the domestic market in Russia’s Far East Federal District regions is very small, at around 10-15bcm/y,¹⁶⁷ meaning that the majority of this potential output requires an export market if it is to be monetized successfully.

Figure 22: Gas production forecast in Eastern Siberia, bcm



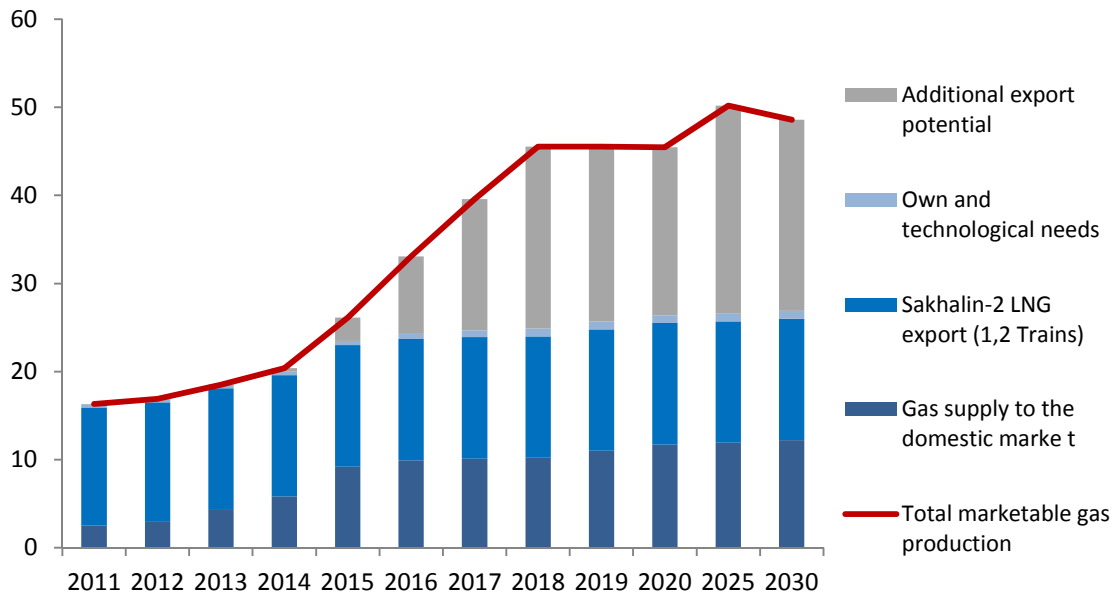
Sources: Goldman Sachs, ERIRAS

¹⁶⁷ Sberbank (2014), p.44



Further east, and offshore, the Sakhalin region is already producing gas and oil, but there is a high level of uncertainty about future gas output from Sakhalin Island, with the export potential being further complicated by potential domestic gas needs. The Sakhalin 2 project currently produces and exports 10.5mtpa of LNG (around 14bcm/y of dry gas), and the offshore region has other significant gas potential, especially in the Sakhalin 1 license where 8bcm/y is currently reinjected¹⁶⁸ and at Sakhalin 3 where Gazprom’s Kirinskoye and South Kirinskoye fields could produce a combined total of 20-25bcm/y.¹⁶⁹ Figure 23 illustrates that production from Russia’s Far East could reach 45bcm by 2030, but the question remains as to how much of this would be available for the export market. An initial estimate suggests that only around 16bcm may be available for new export projects once domestic needs and the existing LNG project are taken into consideration.

Figure 23: Sakhalin gas balance, bcm



Source: ERI RAS

Chinese gas import requirements

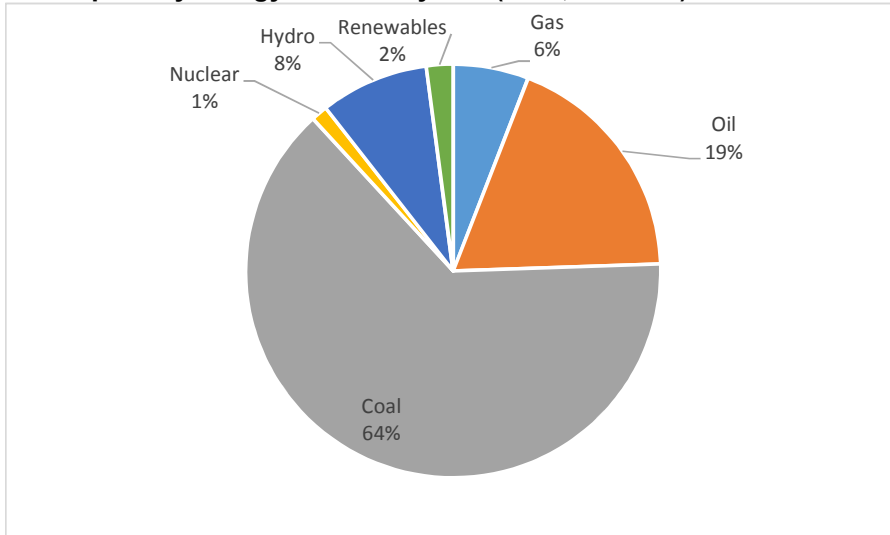
It is clear, therefore, that Gazprom and other Russian companies (primarily Rosneft) have significant gas resources that have a limited domestic market and are eagerly seeking export opportunities. However, in contrast with the oil sector, China’s need for natural gas imports has been more recent and less urgent, reducing the need for a deal with Russia. As can be seen in Figure 24 gas makes up a relatively small share of China’s total energy requirement, accounting for 6% in 2014 compared with 17% for oil and 65% for coal. Indeed renewable energy (including hydro) produces almost twice as much energy in China as gas. As a result, although the country’s focus on environmentally cleaner alternatives to coal has been increasing, with the potential for gas to benefit from switching in the power, industrial and residential sectors, the absolute volumes of gas used have been relatively small to date.

¹⁶⁸ http://www.sakhalin-1.com/Sakhalin/Russia-English/Upstream/about_phases_chayvo1_OPF.aspx, accessed on 6 June 2016

¹⁶⁹ Interfax, 25 April 2016, “Gazprom: Yuzhno-Kirinskoye field planned to reach plateau of 21bcm of gas in 2031”



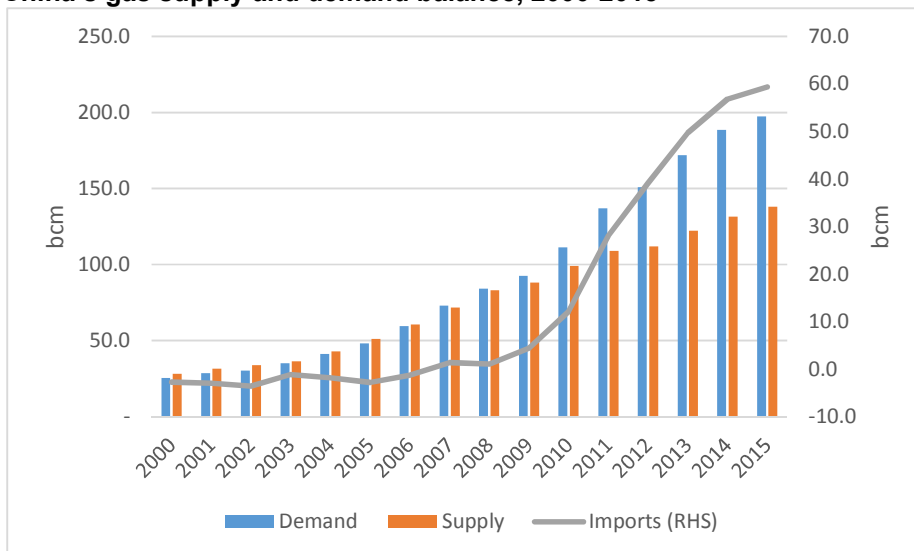
Figure 24: China's primary energy demand by fuel (2015, % share)



Source: BP Statistical Review of World Energy 2016

Consequently China's need for gas imports has been much less urgent than its oil import requirement. Until 2008 the country's indigenous supply largely covered its consumption, and although demand for gas from external sources then began to rise quite sharply it only reached 50bcm in 2014, equivalent to 28% of total demand. This compares with a much higher reliance in the oil sector, where imports account for 62% of overall demand, underlining the greater need to secure liquid hydrocarbon supplies. Figure 25 shows China's gas supply and demand balance, confirming that consumption has been growing rapidly (by an average of 14%/year between 2010 and 2014), and also showing how the country's import needs have been rising, but from a very low base.

Figure 25: China's gas supply and demand balance, 2000-2015



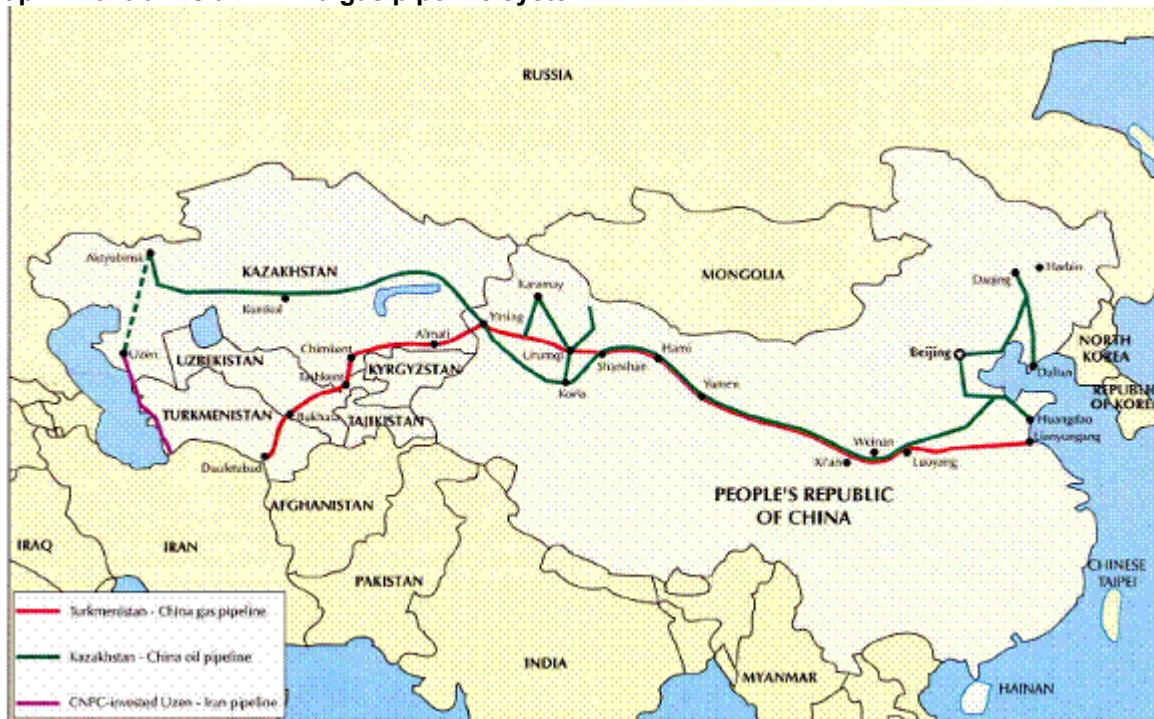
Source: BP Statistical Review of World Energy 2016

To date China has easily managed to cover this import requirement while building a diverse portfolio of suppliers. Indeed one could describe China's gas import strategy as a "compass of diversity", with pipelines from the west and south and seaborne supply in the east. The main source of current imports



is Central Asia, where Chinese companies have developed a network of supplies across the region, based in Turkmenistan but stretching through Uzbekistan and Kazakhstan thanks to the construction of the Central Asia – China pipeline system. The pipeline starts at the giant Galkynysh field in Turkmenistan, which will ultimately be the main source of the 65bcm/y which the country will supply to China by the end of this decade under a contract signed in 2013.¹⁷⁰ Indeed Chinese financing, equipment and manpower, as well as equity investment, have provided the basis for a vital source of current and future imports (over which Chinese companies have significant influence) that could also be supplemented by further sales from Kazakhstan and Uzbekistan, which have both in principle agreed to supply 10bcm/y to China.¹⁷¹ Indeed, as will be discussed later, Central Asian gas, which had previously been reliant on Russia for any export sales due to the location of the post-Soviet gas pipeline infrastructure, has now become a competitor with Russian gas in western China.

Map 4: Central Asia – China gas pipeline system



Source: IEA

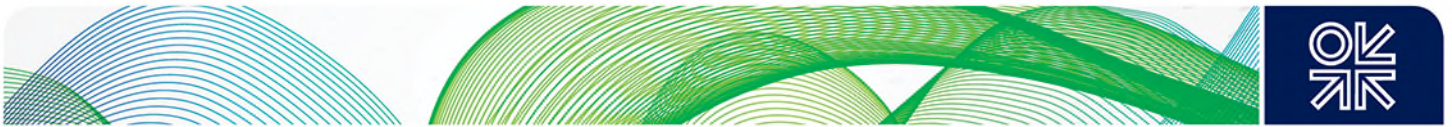
Meanwhile China has also financed and provided technical support for an additional source of piped gas supply in the south, from Myanmar. Gas from offshore fields in the Gulf of Morbihan flows north to the Chinese border and then on into the Guangxi region, with the pipeline having a total capacity of 12bcm/y. Separatist activity in northern Myanmar has hindered gas flows on occasion, and in 2014 only 3bcm was recorded as having arrived in China. Nevertheless, the potential for a significant gas corridor has been created.

Even more significant, though, is the increase in China's capacity for receiving LNG on its eastern seaboard, where 39.5 million tonnes (54bcm) of capacity was already in existence by the end of 2014, with a further 28 million tonnes under construction (38bcm).¹⁷² As a result, by the end of the current decade China should have more than 90bcm of LNG regasification capacity in place, and indeed

¹⁷⁰ Reuters, 3 Sept 2013, "Turkmen gas exports to China to hit 65bcm/a by 2020"

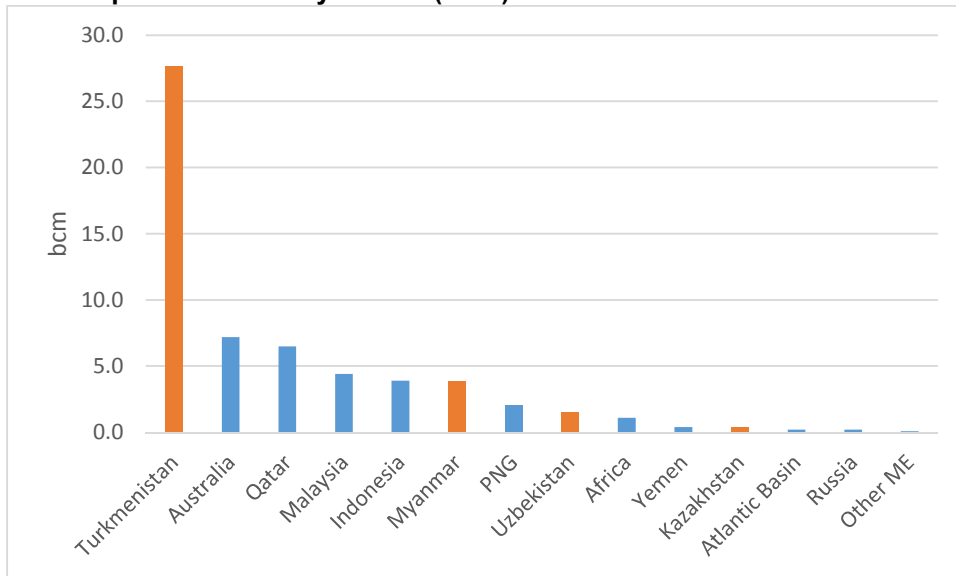
¹⁷¹ Henderson (2011b), p.16

¹⁷² IGU (2015), p.49



appears to have over-contracted relative to its LNG needs over the forthcoming 3-4 years.¹⁷³ Furthermore, as can be seen from Figure 26, although Turkmenistan piped gas is by far the largest single source of gas imports to China, LNG accounts for 48% of the total overall from a very broad range of countries, providing Chinese importers with diversity and bargaining power.

Figure 26: Gas imports to China by source (2015)



Source: BP Statistical Review of World Energy 2016

The obvious missing link in the gas import compass is the north, which provides Russia with its opportunity. Unfortunately, the timing of its negotiations with China has coincided with a number of external factors that have helped to undermine its position, including uncertainty about the potential for Chinese indigenous production, the emergence of Central Asian gas, the imminent arrival of large volumes of US and Australian LNG onto the global gas market, the decline in global oil and gas prices and the slowing of Chinese economic growth, with consequent dampening of energy demand growth. This latter factor has been particularly evident in the gas sector, where the potential for environmental issues to encourage gas demand has been offset both by the relatively high cost of gas compared to coal and also by an overall slowdown in the growth of industrial activity in China.¹⁷⁴ As a result, expectations of gas demand growth, although still positive, are less optimistic than in recent years, driven by the fact that growth is already slowing, with the 3.7% increase seen in 2015 being the slowest rate for a decade.¹⁷⁵ This has meant that, according to CNPC's research institute, the Chinese gas market was oversupplied by around 10bcm last year (see Figure 27 below), taking into account domestic production and contracted imports.¹⁷⁶ This current situation has also tempered future demand expectations, with the CNPC forecast for consumption in 2030 being reduced from 600bcm as recently as 2012¹⁷⁷ to a range of 380-540bcm in late 2015.¹⁷⁸ An additional complication has been a Chinese desire to develop its own domestic gas resources, including shale gas, in order to provide additional security of supply. Uncertainty over how much gas may be produced from conventional and unconventional sources over the next few decades has slowed negotiations on long-term pipeline

¹⁷³ Shanghai Daily, 3 Dec 2015, "LNG buyers look to rework long-term deals"

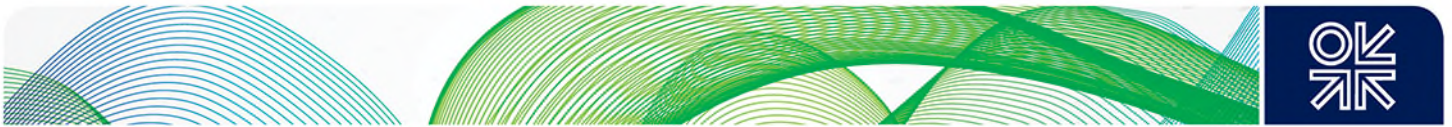
¹⁷⁴ Reuters, 3 Nov 2015, "Natural gas loses its shine as Asia holds faith in coal power"

¹⁷⁵ Reuters, 19 Jan 2016, "China's 2015 natural gas output growth slowest in at least 10 years"

¹⁷⁶ Shan (2015) slide 4

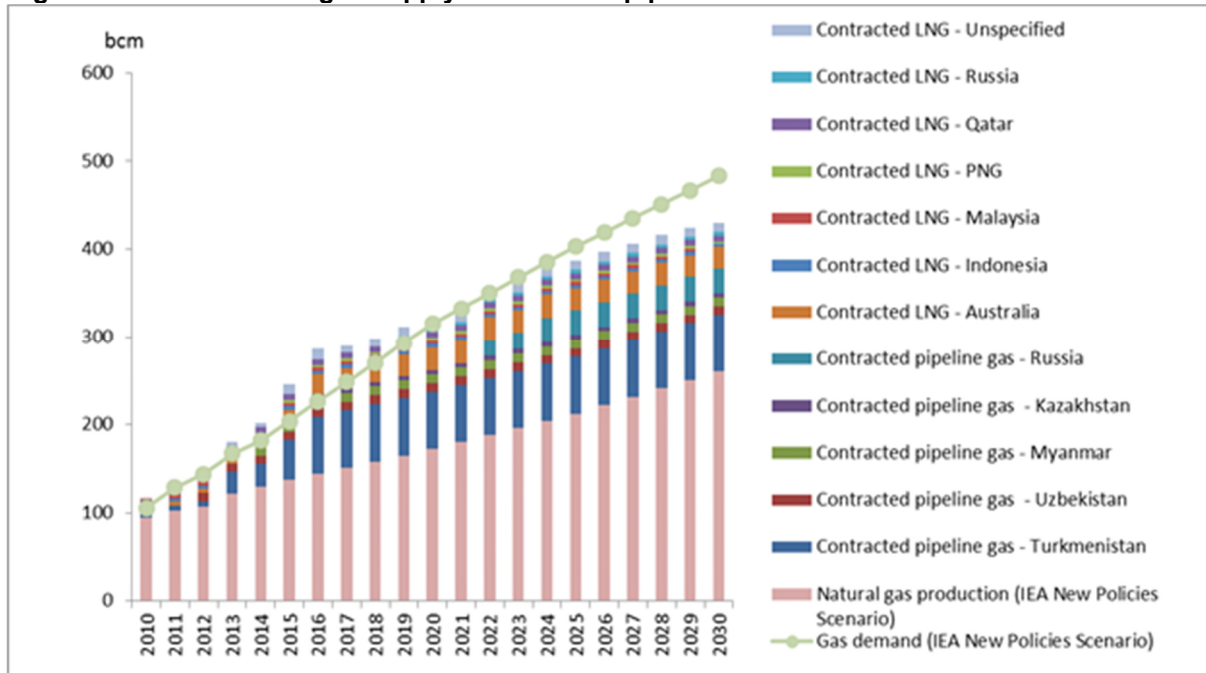
¹⁷⁷ Reuters, 7 June 2012, "CNPC sees China's gas consumption trebling by 2030"

¹⁷⁸ Shan (2015), slide 21



imports, although if the indigenous production forecast in Figure 27 does not materialize then China's import requirement will clearly increase.

Figure 27: Contracts for gas supply to China via pipelines and LNG



Sources: NEXANT, ERI RAS

Within this context it is perhaps not surprising that Russian negotiations with China over gas exports have been extended and complex, especially when the political positions of the two countries as well as their desire to get the best price deal are also taken into consideration.

Gas negotiations and deals

Interestingly, the first gas relationship between Russia and China was based on resources in Sakhalin rather than East Siberia. As early as December 2003 CNPC and Sakhalin Energy signed a framework agreement on the exploration and development of an oil field offshore Sakhalin Island, while in November 2004 CNPC began negotiations with ExxonMobil on possible long-term gas deliveries from Sakhalin-1.¹⁷⁹ ExxonMobil and its partners (which include Rosneft) ultimately agreed a gas export deal from the Sakhalin 1 project with CNPC in October 2006,¹⁸⁰ with the gas set to flow via pipeline into North-East China. The deal was blocked by Gazprom, which then managed to sell some of its own gas from the Sakhalin-2 project to China as LNG from 2010. Only a few cargoes were sold on a spot basis, as the bulk of Sakhalin-2 output is contracted to Japanese and South Korean customers,¹⁸¹ but nevertheless the basis for future expansion had been set.

However, the issue of pipeline exports has continued to be complicated by economic and political difficulties, which have dragged out a process that has long appeared to have a logical commercial conclusion. Indeed, negotiations between Russian companies and their Chinese counterparts over gas sales have been in progress since the 1990s, and although they intensified after the signing of a

¹⁷⁹ China Joins the Battle for Sakhalin. Nov. 03, 2004. http://www.kommersant.com/p521873/r_1/China_Joins_the_Battle_for_Sakhalin/

¹⁸⁰ Moscow Times, 24 Oct 2006, "Exxon's Sakhalin-1 signs China deal"

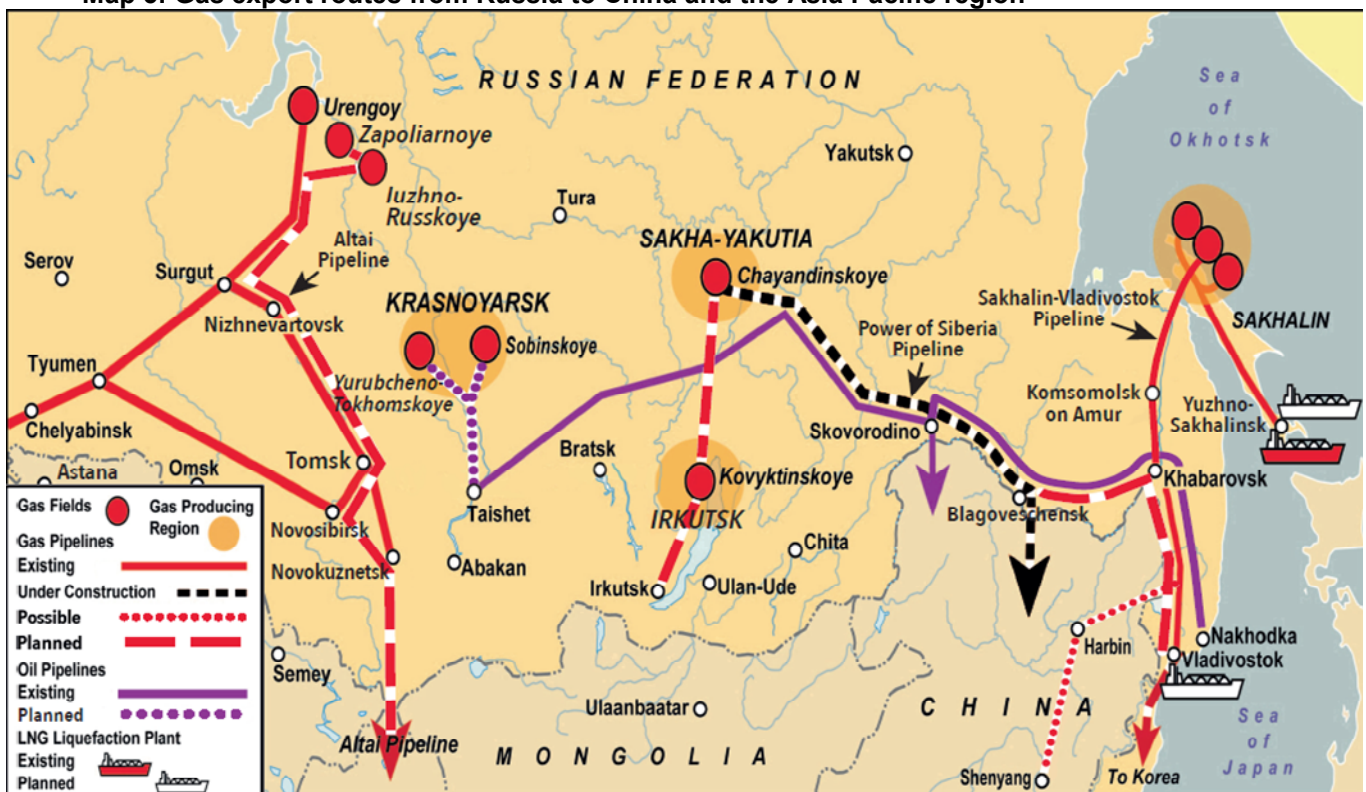
¹⁸¹ LNG World News, 26 Aug 2015, "Sakhalin Energy hits 1000 LNG cargoes milestone"



strategic co-operation agreement in 2004, in fact little progress was achieved until President Putin made a specific political intervention in May 2014. Until then disagreements over price and price formation methodology, pipeline routes, sources of gas and potential financing arrangements had led to extended delays, despite the fact that Gazprom continued to push hard for a deal.¹⁸² In essence China had again been driving a hard commercial bargain, and used the imposition of sanctions as another opportunity to get a better deal for itself rather than as a chance to demonstrate its political support for Russia. Despite the fact that both the Kremlin and Gazprom had hoped for a more benign and supportive outcome from Beijing, from a commercial perspective it is easy to understand how this occurred, because there have been a number of crucial areas of negotiation where the two sides have had conflicting objectives.

Transport routes: Russia, and in particular Gazprom, has consistently favoured selling gas to China via a western route from West Siberia (initially known as the Altai route, now Power of Siberia-2), where the company has an excess of developed gas.¹⁸³ This was particularly attractive once it became clear that relations with Europe were deteriorating, as it offered the possibility for Russia to threaten a switch of gas exports from West to East. However, this threat was always rather empty, given the volumes of gas available, and because China has consistently preferred an eastern route to bring gas from East Siberia into north-east China, closer to existing sources of demand. The debate swung back and forward but ultimately China's greater bargaining strength won out, and the Power of Siberia-1 route was chosen (see Map 4), with implications for field development in East Siberia and the pipeline construction in the Far East of Russia.

Map 5: Gas export routes from Russia to China and the Asia Pacific region



Source: OIES

¹⁸² Henderson (2011b), pp.6-10

¹⁸³ Henderson (2014), p.3



Pricing methodology: When negotiations began in earnest in the mid-2000s Gazprom was still firmly committed to an oil-linked pricing strategy in Europe and wanted to replicate this in China. This strategy was further confirmed by its LNG ambitions, which were largely focused on achieving the high prices available in Asia that had benefited from their link to high oil prices and also from the aftermath of the Fukushima accident in 2011, following which gas demand surged in Japan tightening the global LNG market and causing a spike in spot prices. Gazprom wanted its pipeline contracts to reflect the competition with high-priced LNG, and insisted on a similar oil-linked pricing methodology.¹⁸⁴ China, on the other hand, balked at committing itself to such a high cost source of supply over a 20-30 year period, and argued for a link to the Chinese domestic market price, which was gradually moving towards a link with world prices. Eventually a compromise was reached under which the Russian gas price was set relative to the same oil and oil product benchmark being used to determine the gas price in Shanghai.¹⁸⁵ At the time that the Power of Siberia-1 deal was signed in May 2014 the oil price was approximately \$105/barrel and the implied gas price was estimated at \$10.5/mmbtu.¹⁸⁶

Financing: In line with its international strategy, it was widely believed that CNPC was keen to acquire an equity interest in upstream gas assets in Russia,¹⁸⁷ but Gazprom turned down this request in line with its own consistent reluctance to accept foreign partners into its fields. Instead a \$25 billion loan package was discussed which could have provided support similar to that CNPC gave to Rosneft and Transneft in the development of East Siberian oil reserves and pipeline infrastructure.¹⁸⁸ The details of the possible deal were not revealed, but are believed to have included a prepayment concept and/or a loan at preferential rates to be repaid over the life of the gas deliveries. In any case the offer of financial support was eventually turned down by Gazprom as it preferred to seek state aid from the Russian government as a (presumably) cheaper option.¹⁸⁹

A confused Russian gas strategy in the East

Adding to these complexities on the Russian side has been the fact that its eastern gas strategy, both in terms of resources, infrastructure and participants, has also been in a significant state of flux. In 2007 Gazprom was given the role of coordinating the Eastern Gas Programme,¹⁹⁰ in line with its gas export monopoly that had been confirmed in 2006, but at that stage it did not own the main gas field in the region, Kovykta, which was controlled by TNK-BP. This situation was resolved in 2011 when the asset changed hands for a relatively nominal sum,¹⁹¹ after which Gazprom was in a position to combine this new field, with reserves estimated at 1.5tcm and with a production capacity of 35bcma,¹⁹² with its own Chayanda field, where reserves of 1.2tcm have the capacity to produce 25bcma.¹⁹³

This combined 60bcma of capacity is more than enough to fulfil the initial gas contract with China (38bcm/y), and Gazprom's plan was to use the surplus to meet domestic demand but also to supply a liquefaction plant at Vladivostok (VLNG) which could produce 10-15mtpa of LNG (14-20bcma). In this way it planned to replicate the ESPO strategy in the oil sector by creating competition between China and the global market for Russian gas, in an attempt to increase Russia's bargaining power in the price negotiations. However, this strategy was undermined by the much greater cost of transporting gas

¹⁸⁴ Wall Street Journal, 5 Sept 2013, "Gazprom refuses to US benchmark in China gas deal"

¹⁸⁵ Financial Times, 10 Aug 2015, "Gazprom's China contract offers no protection against low oil prices"

¹⁸⁶ Financial Times, 10 Aug 2015, "Gazprom's China contract offers no protection against low prices"

¹⁸⁷ Venture Capital Post, 10 Sept 2013, "PetroChina wants to invest in Russian gas fields"

¹⁸⁸ Financial Times, 5 May 2015, "Moscow offers bigger stakes in energy projects to lure Chinese"

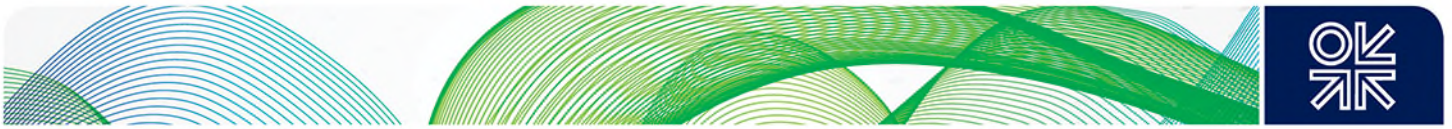
¹⁸⁹ Sputnik News, 9 Nov 2014, "Gazprom not considering advance payment from China for lower gas prices"

¹⁹⁰ For details see <http://www.gazprom.com/about/production/projects/east-program/>

¹⁹¹ Financial Times, 1 March 2011, "Gazprom pays \$770mm for TNK-BP gas field"

¹⁹² See Gazprom web site for details at <http://www.gazprom.com/about/production/projects/deposits/gas-production-center/>

¹⁹³ See Gazprom web-site for details at <http://www.gazprom.com/about/production/projects/deposits/chayandinskoye/>



3,500km and then liquefying it for onward sale, which essentially meant that VLNG was an uneconomic plan from the start, on the assumption that it was supplied from East Siberia.¹⁹⁴

This realization, which was catalyzed by a lack of international support for the project and a dearth of committed customers for the LNG, caused Gazprom to change tack, and suggest that the gas for VLNG could come from an existing field offshore Sakhalin Island (Sakhalin 3) and via an existing pipeline running from the island to Vladivostok.¹⁹⁵ However, this in turn caused confusion because it had previously been assumed that Sakhalin gas would be used to supply the expansion of Gazprom's existing plant (the Sakhalin 2 project), and the future of this project was then called into question. The overall outcome was that it became clear that the only market for East Siberian gas would be China, via the Power of Siberia pipeline, while Gazprom's Asian LNG strategy became confused and delayed.

Amidst this uncertainty, it seemed that Russia's Asian gas opportunity was slipping away, largely due to Gazprom's indecisiveness and its insistence on a high gas price. Frustrated by this situation, the Russian government was therefore ready to respond when two new players, Novatek and Rosneft, suggested that they could solve the LNG problem by developing two independent projects, Yamal LNG in the north of West Siberia and Far East LNG on Sakhalin Island. However, these two projects could only be feasible if they were granted export rights, effectively creating competition for Gazprom. After a relatively short period of negotiation these rights were granted in December 2013, and both projects began the process of establishing their commercial future.¹⁹⁶

From a Chinese perspective, this offered CNPC and the country's other NOCs the opportunity to find alternative Russian partners from whom to purchase gas, and Novatek wasted little time in negotiating a deal. By January 2014 it had sold a 20% stake in Yamal LNG to CNPC and in May of the same year also negotiated a 20 year sales contract to supply 3 mtpa of LNG (18% of the total 16.5 mtpa plant capacity).¹⁹⁷ At the same time Rosneft had also concluded initial agreements with two Japanese companies and a trader (Vitol) to cover the full initial 5 mtpa capacity of its Far East LNG scheme.¹⁹⁸ The threat to Gazprom's position in the Asian market was therefore very clear.

It is perhaps no coincidence, then, that in the same month as the Novatek sales contract was signed, Gazprom also finally concluded its own sales agreement with CNPC. Furthermore, the annexation of Crimea in February 2014 and the subsequent deterioration of relations with the US and EU had created a political incentive to conclude a major Asian energy deal, and President Putin himself provided the catalyst to get a final agreement signed. His presence in Beijing in May 2014, in tandem with Chinese premier Xi Jinping, saw Gazprom and CNPC conclude a 38bcm, 20 year sales agreement at a price that was widely regarded as being well below previous Russian expectations.¹⁹⁹ In essence, then, one clear interpretation is that China used Gazprom's commercial desperation and Russia's political need to negotiate a good deal for new gas imports that could also enhance its diversity of supply strategy. Furthermore, CNPC created competition between two Russian companies, Novatek and Gazprom, in order to enhance its bargaining position and to increase diversity of supply. Indeed Gazprom has subsequently argued that the liberalization of LNG exports undermined its ability to negotiate a good deal for gas sales to China.²⁰⁰

Since the signing of the LNG and pipeline export deals in May 2014, relations between Russia and China in the gas sector have continued to progress, but more slowly than might have been anticipated

¹⁹⁴ Henderson and Pirani (2014), pp.232-239

¹⁹⁵ Financial Times, 10 Oct 2014, "Gazprom considers shelving Vladivostok LNG project"

¹⁹⁶ Natural Gas Europe, 2 Dec 2013, "Russia passed LNG export liberalisation law"

¹⁹⁷ Yamal LNG Press Release, 20 May 2014, "Binding contract on LNG supply concluded with CNPC"

¹⁹⁸ Energy Asia, 24 June 2013, "Rosneft secures first deals to supply LNG from Sakhalin 1"

¹⁹⁹ For example Zaslavskiy, I., 2 June 2014, "Insiders benefit from Gazprom-CNPC gas deal, but Russia's budget loses", Chatham House, London

²⁰⁰ UPI, 26 April 2016, "Gazprom questions price mechanisms for LNG"



at that time. A brief consideration of each of the major projects/deals since then can serve to highlight the positions of both countries and their respective corporate entities.

Implications of the gas pivot to Asia for Gazprom and Russia

As far as **Power of Siberia** is concerned, perhaps the most important shift in expectations is exemplified by a new flexibility in the date of first gas. When the agreement on gas deliveries was initially discussed it was stated that the first exports would occur in 2019,²⁰¹ but since then it has been reported that the start date could be in a range between 2019 and 2021, suggesting that both the uncertainty over Chinese gas demand and the fall in the oil-related gas price may have caused some caution on both sides.²⁰² Gazprom continues to insist that the project is on schedule, with wells being drilled at the Chayanda field and 800km of the Power of Siberia pipeline initially planned to be laid in 2016.²⁰³ Nevertheless, rumours of delay and cuts in spending persist, with only 115km of pipe having been laid by the end of 2015 and with 2016 plans apparently halved in April to only 400km.²⁰⁴ This would suggest that the economics of the project, which were already challenging at an oil price of \$100/barrel, are undermining the urge to progress swiftly while the oil price remains below the \$50/barrel which GazpromExport head Yelena Burmistrova has identified as a breakeven price.²⁰⁵

Adding weight to the argument that the prospects for gas exports have slowed is the increasing sense that the **Altai** (Power of Siberia-2) project has also been pushed back. As soon as the Power of Siberia deal had been signed, Gazprom CEO Alexei Miller pushed forward in his attempt to secure Russia's preferred export route to the western China, and by November 2014 had secured the signing of a memorandum of understanding during another Putin visit to Beijing.²⁰⁶ Completion of the deal was initially expected during another visit in March 2015, and then again in September when a major Russian delegation visited China, but the fall in the oil price and the gas oversupply situation in China have complicated negotiations significantly.²⁰⁷ Indeed by January 2016 it was even being suggested by the Russian side that the dates for the project could be deferred,²⁰⁸ and the basic economics of the project suggest that this outcome is inevitable until prices recover. Table 3 below outlines an analysis of the comparative prices of gas imported to China, netted back to the western border with Russia to take account of the large transport distance inside China. On the basis of data in May 2016, when the oil price had recovered to US\$50/barrel, Altai gas would need to be priced below \$4/mmbtu at the Russian border to be competitive with average Chinese import prices and at around \$3.60/mmbtu to be on a par with the price of gas set to be delivered by Gazprom via Power of Siberia-1, which is significantly closer to the main gas markets in China. Despite this, negotiations over this second pipeline continued during a meeting between Gazprom and CNPC in Sochi in May 2016, although the outcome was again inconclusive despite positive statements from Russian Energy Minister Alexander Novak.²⁰⁹ Furthermore, no mention was made of the Altai route during President Putin's visit to Beijing in June 2016, suggesting that negotiations are not near to completion. Instead Gazprom and CNPC just signed a Memorandum of Understanding on underground gas storage, according to which the parties will analyze and assess conditions for creating UGS facilities in Heilongjiang, Jiangsu, and Zhejiang and set up a joint venture to implement UGS-related projects.²¹⁰

²⁰¹ See press release on Gazprom web site, 30 Aug 2014, <http://www.gazprom.com/press/news/2014/august/article199954/>

²⁰² Interfax, 18 Jan 2016, "Ulyukayev: China to uphold Power of Siberia commitments; dates for Altai route may be altered"

²⁰³ Interfax, 14 Mar 2016, "Gazprom to build over 800km of Power of Siberia in 2016"

²⁰⁴ Interfax, 28 April 2016, "Gazprom plans to build 400km of Power of Siberia pipeline in 2016"

²⁰⁵ Interfax, 7 Sept 2016, "Contract on Power of Siberia at \$50 per barrel not loss-making, contract is long-term"

²⁰⁶ Henderson (2014), p.2

²⁰⁷ Interfax, 21 Aug 2015, "Russia China don't need to sign Power of Siberia 2 contract in Sept, talks complicated by falling oil prices"

²⁰⁸ Interfax, 18 Jan 2016, "Ulyukayev: China to uphold Power of Siberia commitments; dates for Altai route may be altered"

²⁰⁹ Sputnik News, 30 May 2016, "Russia's Gazprom, China's CNPC discuss western route gas delivery"

²¹⁰ Gazprom, 25.06.2016. <http://www.gazprom.com/press/news/2016/june/article277639/>

Interestingly, though, after this visit, at the end of June 2016, CNPC for the first time offered a clear proposal to Gazprom concerning an integrated contract, which would include joint investment in gas production, pipeline construction, pipeline operation and gas export and sales.²¹¹ Gazprom's answer was predictable, though, given its previous reluctance to countenance Chinese involvement in upstream projects, with company CEO Alexei Miller immediately calling the integrated contract offer "unacceptable" and stressing that the Altai pipeline would be built only under the terms signed in 2015.²¹² As a result a clear opportunity to optimise the western pipeline project was turned down by Gazprom, leaving the future of this contract in limbo.

Table 3: Comparative pricing analysis for Altai (Power of Siberia-2) gas

	Price at entry to China	Transport to Shanghai	Price in Shanghai at City Gate	Transport back to Xinjiang	Net back price at Altai pipeline entry point
	US\$/mmbtu	US\$/mmbtu	US\$/mmbtu	US\$/mmbtu	US\$/mmbtu
Turkmen price in West China	5.42	4.48	9.90	4.48	5.42
Russia East Siberia Gas	5.60	2.50	8.10	4.48	3.62
Asia Spot LNG (May 2016)	4.35	0.00	4.35	4.48	-0.13
Average LNG imports (March 2016)	6.62	0.00	6.62	4.48	2.14
Qatar LNG (March 2016)	7.85	0.00	7.85	4.48	3.37
US LNG (HH \$2/mmbtu)	9.30	0.00	9.30	4.48	4.82
Myanmar imports	6.41	1.85	8.26	4.48	3.77
Benchmark Import Price			7.77		3.29
China domestic price (Shanghai) (Nov 2015)	10.72	0.00	10.72	4.48	6.24
Average Overall Benchmark Price					3.66

Source: Authors' analysis based on data from Argus Media, Energy Intelligence Group

With the prospects for the Altai pipeline looking difficult, the Russian delegation was faced with a potentially embarrassing situation during another Putin visit to Beijing in September 2015, when it became obvious that a planned signing of a final Altai agreement could not take place. As a result, a third pipeline alternative, using gas from Sakhalin Island that could be shipped via a possible spur from the Sakhalin-Vladivostok pipeline into north-East China, emerged.²¹³ This **Far Eastern route**, which could perhaps supply 20-30bcm/y given the capacity of the existing pipeline, remains very speculative as the reserves at the Sakhalin 3 project have yet to be finally proved, but nevertheless Gazprom promised to make a firm supply offer by July 2016.²¹⁴ However, although it may be possible, and perhaps even logical, to think about sending gas through existing infrastructure to China, the suggestion has called Gazprom's LNG plans further into question. Indeed, it is interesting to note that no mention of this route was made either during President Putin's visit to Beijing in June 2016, implying that all thoughts of a second or third gas pipeline to China are currently in abeyance.

In a further blow to Gazprom's short-term eastern ambitions the company has openly admitted at an Investor Day held in London in February 2016 that the **Vladivostok LNG** project has now been

²¹¹ А.Махнева. CNPC готова сама строить «Силу Сибири – 2». Ведомости, 15.06.16. http://www.vedomosti.ru/business/articles/2016/06/15/645346-cnpc-silu-sibiri#/V2CRfcKw_js.facebook

²¹² А.Махнева. «Газпром» против интегрированного контракта по «Силе Сибири – 2» с китайской CNPC. Ведомости. 01.07.16. <http://www.vedomosti.ru/business/articles/2016/07/01/647537-sila-sibiri-2-na-podhode>

²¹³ Interfax, 7 Oct 2015, "Talks on gas supplies to China from Sakhalin not being held by traders but by producers"

²¹⁴ Interfax, 18 Dec 2015, "Gazprom to make supply offers to CNPC by July 2016"



postponed.²¹⁵ This appears logical given the high cost and uncertain economics of the project, but further questions remain about the future of the **Sakhalin 2** project, where the addition of a third train has long been discussed. As mentioned above, the source of gas for this third train would logically be the gas fields at Sakhalin 3, which is 100% owned by Gazprom, but this gas could now be allocated to pipeline exports to China instead. Furthermore, a planned joint venture with Shell which could have eased the financial and technical issues facing Gazprom in the development of Sakhalin 3, which contains fields with complex geology and difficult operating conditions, has been undermined by the imposition of US sanctions on the license. As a result, a planned start date for the third train at Sakhalin 2, which has initially been scheduled for 2021, remains uncertain.

The complexities of Russia's gas relationship with China have not just affected Gazprom, though, as Novatek's progress at **Yamal LNG** has also been slower than expected. When the 20% equity and 3mtpa sales deals with CNPC were signed in 2014 it seemed that the future of the project was secure, despite the fact that US sanctions had specifically targeted Novatek (while ignoring Gazprom) and prevented it from raising project finance in US dollars. It was assumed that Chinese financing would be all but certain to be available, especially when the relationship was further strengthened by the sale of a 9.9% in the project to the Silk Road Fund.²¹⁶ A small loan of €730 million came from the Silk Road Fund following the announcement of the equity deal,²¹⁷ but thereafter a significant delay occurred as negotiations concerning other Chinese financing were continually extended, with numerous deadlines being missed. This meant that the Yamal LNG partners had to supply \$12.5 billion of equity financing,²¹⁸ supported by a \$2.3 billion loan from Russia's National Welfare Fund.²¹⁹ It seemed clear that once again China was using its strong bargaining position to extract the best commercial deal rather than providing preferential support even to a project where it has an equity interest. However, in the end Chinese backing finally materialized at the end of April 2016, with two institutions (China Development Bank and China Eximbank) offering two 15-year loans, one of €9.3 billion and one for Yuan9.8 billion (€1.3 billion).²²⁰ When added to the €3.6 billion credit line offered by two Russian banks, (Sberbank and Gazprombank)²²¹ the project has now secured the \$20 billion of project finance that was initially targeted, and seems set to proceed on schedule. However, it is also clear that China has extracted additional value from the deal by ensuring that a significant amount of Chinese equipment will now be used on the project. It has been reported that as much as 70-80% of the equipment modules are being constructed in Chinese shipyards, and although it would seem that the major LNG technology is still coming from the US it is also now apparent that Chinese financing has secured much of the remaining work for Chinese companies.²²²

In addition to the project lending, though, it is also important to note that the Russian government, which is providing significant financial support in addition to the financing from the National Wealth Fund and from state banks, has identified the \$27 billion Yamal LNG development as a priority for its northern strategy and is providing additional assistance as a result. Significant tax incentives have been provided and construction of the port facilities essential to berth the LNG tankers has been carried out at government expense.²²³ Without this assistance, and in particular the tax breaks which include zero export tax, a mineral extraction tax holiday and lower profit tax, it is highly doubtful that Yamal LNG would have proceeded, and so in reality the Chinese investors are benefitting from Russian state

²¹⁵ Gazprom (2016), slide 42

²¹⁶ Interfax, 15 Mar 2016, "Novatek has sold 9.9% of Yamal LNG to Silk Road Fund for 1.087bn euros"

²¹⁷ Interfax, 26 Feb 2016, "Novatek not to start paying off SRF loan for four years, sale of 9.9% of Yamal LNG not yet closed"

²¹⁸ Interfax, 26 Feb 2016, "Yamal LNG shareholders invested \$12.5 billion in project"

²¹⁹ Interfax, 19 Jan 2016, "Yamal LNG project financed for \$15 billion – Mikhelson"

²²⁰ Natural Gas Europe, 29 April 2016, "Yamal LNG completes external financing"

²²¹ 'Sberbank, Gazprombank may provide \$4bn for Yamal LNG; loans to total \$20bn overall', *Interfax*, 5 June 2015.

²²² Interfax, 6 May 2016, "Yamal LNG orders 70-80% of equipment modules from Chinese shipyards"

²²³ Reuters, 17 Dec 2015, "Russia's Putin pledges further support for Yamal LNG"

support in return for providing investment assistance.²²⁴ Moreover, it seems that China is trying to fix these conditions as specific terms for Chinese companies, as immediately after the money for Yamal LNG was provided, CNPC stated that it is also ready to discuss proposals from Novatek on a greenfield project on the Gydan peninsula (Arctic LNG), which would be developed under similar terms to Yamal LNG.²²⁵

It is interesting to observe that Gazprom has also made progress in raising capital from China over the past year, despite the fact that it turned down financial support for the Power of Siberia pipeline. In August 2015 the company agreed a club loan for \$1.5 billion from China's five biggest banks,²²⁶ while in March 2016 a five-year €2 billion loan was agreed with Bank of China, encouraging the company to believe that further loans and project financing could be secured over the next few years.²²⁷ Although an exact interpretation is difficult, it is perhaps tempting to suggest that China is once again playing its Russian counterparties off against each other, balancing the requirements of Novatek and Gazprom in order to try and encourage competition between the two to provide optimal gas supplies.

Table 4: Deals and ongoing discussions between Russia and China in gas sector

Date	Chinese counterparty	Russian counterparty	Asset	Comment
Jan-14	CNPC	Novatek	Yamal LNG	CNPC buys 20% stake
Aug-15	Chinese banks	Gazprom	Loan	\$1.5 billion loan agreed
Sep-15	Sinopec	Rosneft	Venineft JV (Rosneft, 75.1%, Sinopec, 24.9%)	Plans to develop Severo Veninskoye field to provide gas for Far East LNG project.
Sep-15	CNPC	Gazprom	Gas exports from Sakhalin to China	MoU signed for possible third pipeline route to China from Far East Russia
Sep-15	Sinopec	Mikhelson, Shamalov, Timchenko	Sibur Energy	10% plus stake; could involve participation in Amur gas processing plant; completed in Dec 2015
Nov-15	Sinopec	Rosneft	Gas processing and chemicals in East Siberia	Discussion on partnership agreement underway
Nov-15	CNOOC	Rosneft	Sakhalin offshore	Discussing possible co-operation on Sakhalin shelf; two fields close to Sakhalin 1 project
Nov-15	CNPC	Gazprom	CCGT plants in China	Plan to build power plants along the Power of Siberia line in China. Consultants being appointed to assess feasibility
Dec-15	Silk Road Fund	Novatek	Yamal LNG	SRF buys 9.9% for €1.1bn
Dec-15	Silk Road Fund	Novatek	Yamal LNG	SRF provides €730mm loan to Yamal LNG
Dec-15	CNPC	Gazprom	Power of Siberia	Agreement on underwater segment of pipeline across Amur river
Mar-16	Bank of China	Gazprom	Loan	€2 billion five year loan agreed
Apr-16	CDB, China Exinbank	Yamal LNG	Project Finance Loan	€9.3 billion loan plus Yuan 9.8 billion loan

Source: Authors' analysis, Interfax, Argus Media, Energy Intelligence Group

²²⁴ Reuters, 21 Oct 2013, "Putin offers more tax incentives for Yamal LNG"

²²⁵ China's oil and gas corporation ready to consider Novatek's proposals on new projects. TASS. 21.04.2016. <http://tass.ru/en/economy/871686>

²²⁶ Interfax, 25 Dec 2015, "Gazprom borrowed \$7bn in 2015"

²²⁷ Interfax, 14 Mar 2016, "Gazprom raises loan of 2bn euros from Bank of China at EURIBOR+3.5%"



Table 4 above summarizes the deals and ongoing discussions between Gazprom and Novatek with their Chinese counterparties in the gas sector, but it also highlights that Rosneft is also in active negotiation on gas issues as well as oil developments. This reflects the emerging triumvirate of players in the domestic gas sector in Russia, and also underlines that Rosneft has significant gas export ambitions, which its continuing negotiations with Sinopec and CNOOC confirm. It has invited both companies to explore for gas offshore Sakhalin Island, in the hope that new discoveries could bolster gas supply to its planned Far East LNG scheme,²²⁸ and it has also suggested partnership with Sinopec on a potential gas processing scheme in East Siberia to support its onshore gas ambitions.²²⁹ Interestingly Sinopec has also purchased a 10% stake in Sibur Energy, which is partially owned by Novatek CEO Leonid Mikhelson and which is involved in the Amur processing plant located at the crossing point of the Power of Siberia pipeline into China.²³⁰ This points to the potential role of both Novatek and Rosneft in gas exports via pipeline to China, which has become a significant topic for debate in Russia.

Domestic competition for gas exports

Rosneft and ExxonMobil raised the potential issue of non-Gazprom gas exports from Russia to Asia in 2006, but at the time Gazprom's monopoly position was very secure and a challenge was not countenanced by the Kremlin. However, since then further discussion about the best way to supply gas for Russia's eastern expansion, both in terms of LNG and pipeline gas, has been catalyzed both by an apparent dissatisfaction with Gazprom's performance in the region and also by the financial constraints caused by low commodity prices and sanctions, which have limited the ability of Russian companies to invest as heavily as they had planned only two years ago. The development of a more diversified LNG strategy has been mentioned above, with Rosneft and Novatek being given the opportunity to export gas for the first time. However, Rosneft CEO Igor Sechin has also raised the issue of pipeline exports, with a particular focus on the potential to export associated and dry gas from his company's assets in East Siberia. The issue was first discussed at the Presidential Energy Commission in June 2014,²³¹ and would appear to have some merit given that Gazprom has a 38bcm/y contract with China but its first field development (Chayanda) only has a 25bcm/y production peak. The remaining 13 bcm/y could be supplied, at least for a time, by 3rd party producers, deferring the need to develop the Kovykta field until gas prices have recovered or sales volumes increase. The debate has now reached a stage where the Russian government plans to produce a report on the potential for independent gas exports via Power of Siberia during 2016, and Energy Minister Alexander Novak has revealed that, although no final decisions have been made, independent producers have made applications for access totaling 15-30bcm/y. Furthermore, the discussion has now been broadened to include possible Novatek sales to Europe via pipeline as well,²³² while Rosneft has apparently written to Gazprom to suggest an agency agreement which could allow it to sell gas into the UK market via GazpromExport.²³³ As a result, it would seem that gas exports to China have catalyzed a potential revision of Russia's gas strategy as a whole, and it could be argued that the Chinese strategy of multiple interaction with the three key parties has helped to accelerate the process to the potential benefit of itself and other buyers of Russian gas.

Although Gazprom would appear to be a loser in this process, a more rational allocation and use of gas resources could benefit the company in the long term. One example of this could emerge on Sakhalin Island, where discussions between Gazprom and Rosneft about the use of Sakhalin 1 gas (owned by Rosneft) in a third train of the Sakhalin 2 LNG scheme (Gazprom) have been continuing for a decade.

²²⁸ Interfax, 18 Nov 2015, "Rosneft, CNOOC discuss cooperation on Sakhalin shelf"

²²⁹ Rosneft press release, 17 Dec 2015, "Rosneft and Sinopec signed a memorandum of understanding on cooperation in gas and petroleum chemicals projects in East Siberia"

²³⁰ Reuters, 11 Dec 2015, "China's Sinopec to pay \$1.3 billion for 10% stake in Russia's Sibur"

²³¹ Henderson & Mitrova (2015), p.74

²³² Bloomberg, 2 March 2016, "Novatek said to seek approval to send gas to EU via pipeline"

²³³ Interfax, 3 June 2016, "Gazprom does not welcome Rosneft agency agreement on gas exports, informs energy ministry – Novak"



The key issue has always been the price that Gazprom would pay for Sakhalin 1 gas, and Rosneft's decision to develop its own LNG scheme (Far East LNG) was driven by dissatisfaction with the offers it had received. However, the current constraints imposed by a low oil price and sanctions, as well as the new hope that it may be able to export gas via pipeline to China, seems to have persuaded Rosneft to relent somewhat and at least to discuss the potential for selling its Sakhalin gas to Gazprom.²³⁴ Although a final agreement is by no means certain, it would certainly present a logical outcome for Russia overall, freeing up Sakhalin 3 gas for potential sale to China via the Sakhalin-Vladivostok pipeline while reducing Rosneft and Gazprom's potential investments in competing LNG projects.

Outlook for Russia's eastern gas exports

Overall, then, the outlook for Russian gas output in East Siberia and the Far East and for gas exports to China remains somewhat unclear, particularly in terms of the exact timing of events. The most concrete development would appear to be the Yamal LNG project, notwithstanding recent issues surrounding the project's financing, and in Figure 28 below we show deliveries of LNG to China starting in 2018 and rising to their peak volume of 3mtpa (4.1bcma) by 2020. It also seems clear that Russia's commitment to completing the Power of Siberia project is firm, even if the timing of first gas is somewhat flexible between 2019 and 2021. We have assumed a mid-case of 2020, followed by a five-year build up to full contract volumes of 38bcma by 2025, although we acknowledge that there is a reasonable probability that these dates could slip by one or two years.

The outlook for other gas sales to China is much less certain. Given environmental concerns in China and the drive to switch from coal to gas, which could generate an extra 100bcm/y of gas demand over the next five years according to CNPC,²³⁵ the potential certainly exists for more Russian exports. However, equally uncertain pricing dynamics in China,²³⁶ competition from LNG and Central Asia and inadequate infrastructure inside China could delay new sales, and as a result we have only included first gas from Altai (Power of Siberia-2) in 2025 and from Sakhalin via pipe in 2028. Both these sources of new gas are shaded grey to indicate their currently speculative nature, and indeed the timing of the projects could switch if the logic of using Sakhalin gas via an existing pipe becomes clear, as an alternative to building a new pipe to a region of China very distant from existing gas demand. Nevertheless, our base case expectation would be that Russia could be supplying China with 40-50bcm/y of gas by 2025 and perhaps 90bcm/y by 2030, with the vast majority of this being via pipeline sales.

²³⁴ Rusmininfo, 5 Nov 2015, "Gazprom and Rosneft to agree on gas price from Sakhalin 1"

²³⁵ Shan (2015), slide 19

²³⁶ Petroleum Economist, May 2016, "China pushes natural gas price reforms"

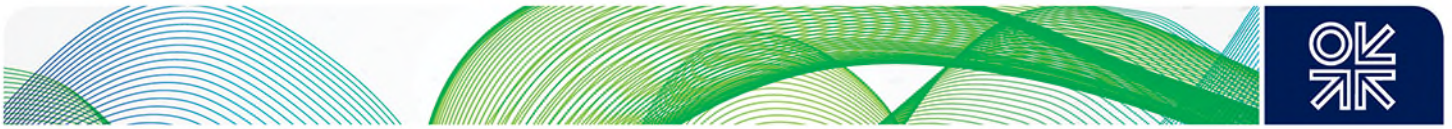
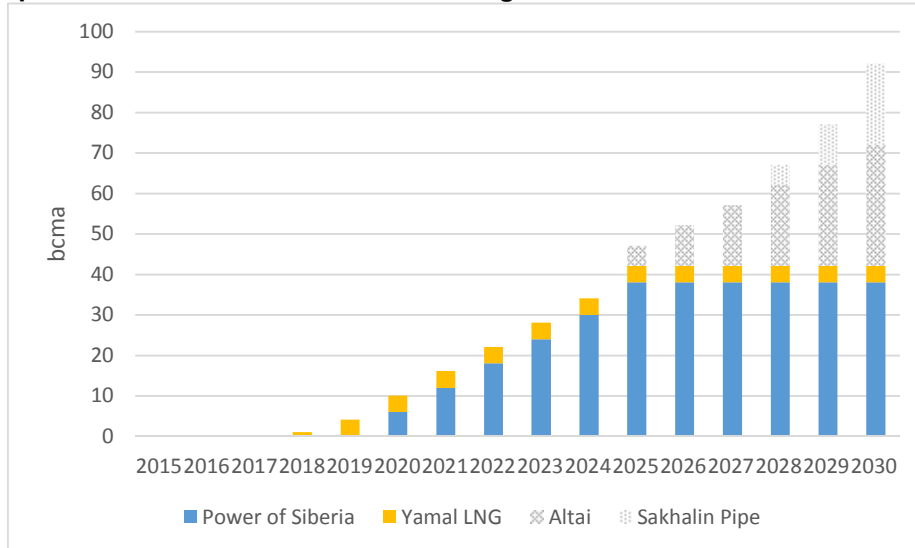


Figure 28: Speculative estimate of future Russian gas sales to China



Source: Authors' analysis

Implications for Russian gas sector and relations with China

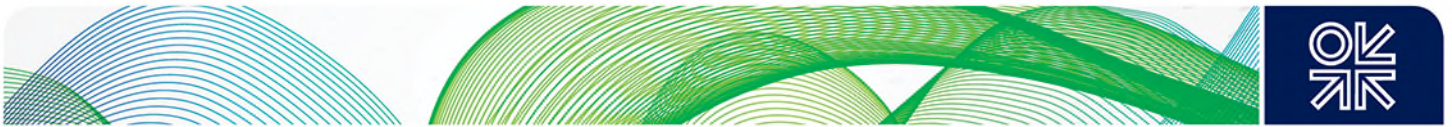
As recently as November 2015 President Putin, during a discussion of the forthcoming Russian Energy Strategy to 2035, asserted his desire to see Russia's eastern gas sales reaching 128bcm/a.²³⁷ China will of course be a major part of this drive to the Asian market, but as Figure 28 suggests the outcome is currently set to disappoint. Global market conditions, financial issues in Russia, slowing growth in China and competition from alternative sources of supply are all hindering progress in Russia's gas relationship with China. In addition, it would appear that Chinese state-owned companies and banks are taking a much more rigorously commercial view of Russian hydrocarbon imports than the Kremlin might have hoped. Negotiations for LNG and pipeline projects have been relatively slow, and it has taken significant political intervention to get even one major deal signed. Furthermore, it seems that Chinese banks are also taking a more cautious approach, driven by concerns over the impact of sanctions and the potential for China's relationship with the US (and to a lesser extent the EU) to be undermined by Chinese business dealings with Russia.²³⁸

In addition, Chinese companies, and especially CNPC, seem to be adopting a diversification strategy with regard to their dealings with Russia, supporting projects being developed by Novatek, Rosneft and Gazprom and thus optimizing their opportunity to get the best deal. Indeed, it is arguable that Novatek and Rosneft have been able to exploit this Chinese strategy to convince the Russian government to support their claim to be able to export gas for the first time, with LNG being the first route but with pipeline sales also now on the agenda. As a result, Russia's new energy relationship with China, and more broadly the Asia-Pacific region, could be a catalyst for reform of the domestic gas sector as a whole. Indeed, discussion about third party access to the Power of Siberia pipeline and exports to China are now being replicated in a request by Novatek to have access to pipeline gas sales to Europe.

The timeline shown in Figure 29 underlines the nature of the Chinese strategy and the difference between activity in the oil and gas sectors. CNPC has done gas deals with both Gazprom and Novatek, but has taken an equity position in only one (Yamal LNG) and has secured financial support for only one (Yamal LNG, via two Chinese state banks). While the lack of financing for Gazprom may reflect

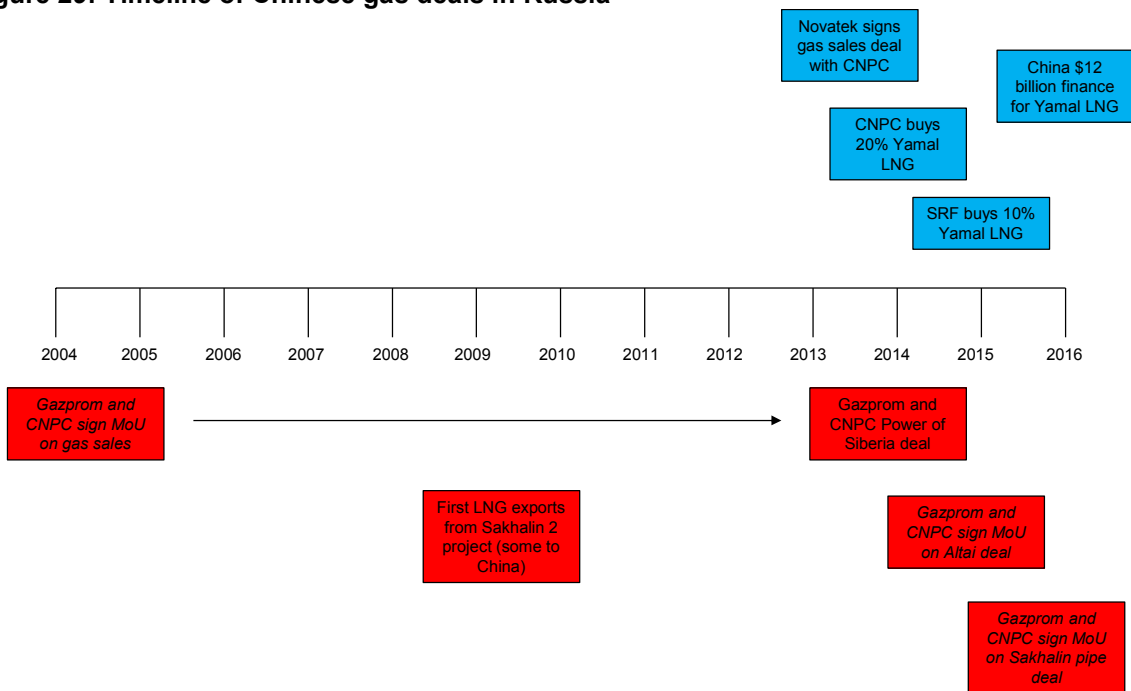
²³⁷ Interfax, 23 Nov 2015, "Russia wants to supply up to 128bcm of gas per year – Putin"

²³⁸ Interfax, 7 Sept 2015, "Settlements between Russian, Chinese banks slow due to sanctions, including on Rosneft contracts – VTB"



reticence on the Russian side, the contrast is nevertheless stark, and also emphasizes the difference with the oil sector, where Rosneft has received significant funds through prepayments. Gazprom's reluctance to receive similar support may reflect the previously mentioned general Russian reluctance to become overly dependent on its eastern neighbour, but it may also be leaving the company in a weaker position as it continues to argue that it should lead Russia's energy strategy in the Asia-Pacific region. Rosneft and Gazprom are clearly leading the way in a number of areas, and arguably have closer relations with the key actors in China.

Figure 29: Timeline of Chinese gas deals in Russia



Source: Authors

The key, though, to Russia's future gas sales to China will be price competitiveness. Chinese companies have developed a diversified portfolio of gas import options, and although Russia can occupy an obvious place as the northern source in the supply compass it will only do this if it can compete with LNG in an oversupplied market, Central Asian gas on China's western border and gas piped from Myanmar in the south. CNPC has shown its ability to negotiate a good price for itself, forcing Gazprom to accept a level for Power of Siberia sales that allowed it to make only a limited return on its investment even when the oil price was over \$100/barrel. At current prices the development of East Siberian reserves must be difficult to justify, other than from a very long-term perspective, and the low implied price of gas exports at a 2016 oil price of \$30-40/barrel is clearly making it difficult to negotiate further export sales via Altai or from Sakhalin.

It would appear, though, that once again China is in a stronger bargaining position, prepared to wait before finalizing any more gas imports from Russia. It currently has an oversupply of import options and is unclear about the potential of its own indigenous resources. The future balance of hydrocarbons in the country's overall energy mix is yet to be fully established, and as a result the range of estimates for gas demand and import requirements is wide. In the meantime, Russian gas in East Siberia is seen as a stranded resource, with China as its only realistic market. As a result, the Chinese authorities can afford to be patient, knowing that as soon as they express interest, then the gas will be available to them. There is little that Russia can do to alter this situation, as its alternative LNG options are limited, with the result that, from a gas perspective at least, China would appear to be able to dominate any price and volume negotiations for the foreseeable future.

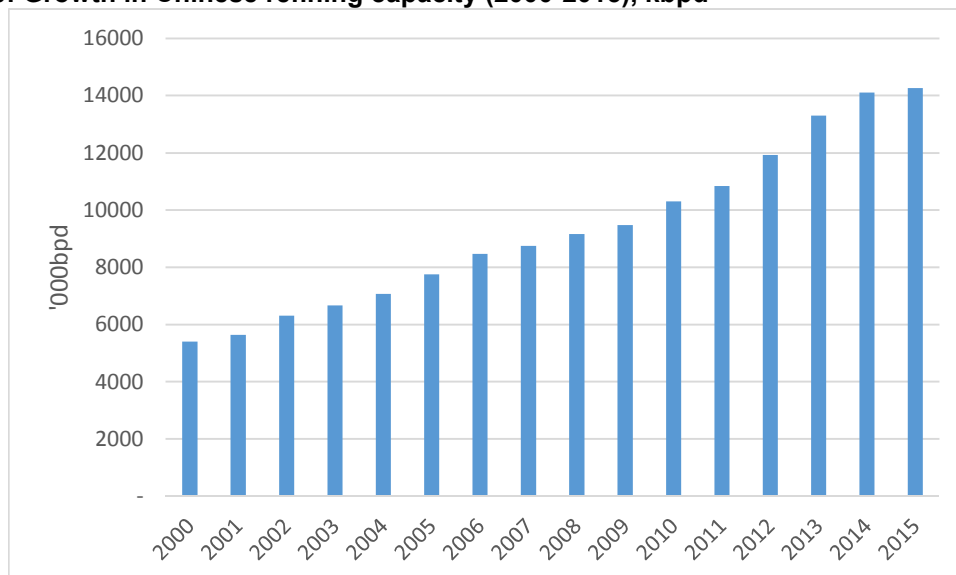


Oil and gas refineries and petrochemicals

For many years the Russian Energy Strategy and overall government policy have been promoting the concept of switching the country away from being an exporter of raw materials and towards the export of “processed goods with high value added”. Production and exports of petroleum products in the Russian Far East are usually presented as an important part of this policy, but so far very limited success has been achieved in this respect.

Once again Rosneft has been the leading player and has made several attempts to involve various Chinese companies in joint projects in this sector. In 2009 it proposed to Sinopec that they might jointly build an oil refinery in the Russian Far East, with projected annual capacity of 20 million tonnes of oil. The cost of the project was estimated at \$5-7 billion.²³⁹ The deal also envisaged construction of 300-500 gasoline stations in China, as part of a mutual cross-border co-operation. It was planned to start construction in 2010 and to launch the plant in 2012.²⁴⁰ However, the deal never advanced, as China has been developing its own internal refining industry both to reduce costs by having products produced close to consumers and to add to security of supply by reducing reliance on imports.

Figure 30: Growth in Chinese refining capacity (2000-2015), kbpd



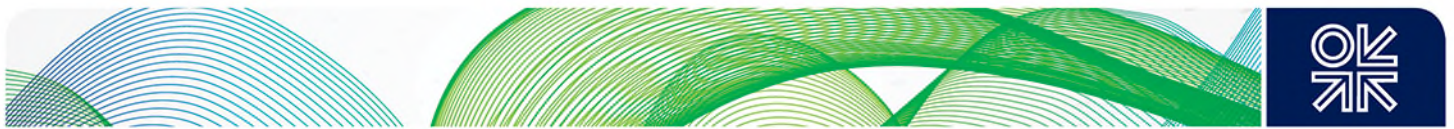
Source: BP Statistical Review of World Energy, 2016

In 2009 Rosneft and Sinopec were also considering possible cooperation in modernising an oil refinery in the city of Shijiazhuang and the construction of an oil refinery in the Caofeidian District, but no further statements followed. There was also an idea, announced in 2011, that Sinopec and Rosneft could cooperate on the construction of a new oil refinery in Udmurtia on the basis of their joint venture in the region (Udmurtneft, where Sinopec owns 49%, and Rosneft 51%). However, Rosneft decided to prioritise an alternative, government-endorsed, project for a petrochemical complex in the Far East.²⁴¹

²³⁹ Роснефть хочет строить НПЗ в Приморье с китайской Sinopec. 16.10.09. <http://old.mgimo.ru/news/press/document123689.phtml>

²⁴⁰ Роснефть и Sinopec намерены вместе построить НПЗ в России. 15.10.2009. <http://www.forbes.ru/news/17397-rosneft-i-sinopec-namereny-vmeste-postroit-npz-v-rossii>

²⁴¹ China eyes oil refinery construction in Russia. 21 September 2011. <https://www.rt.com/business/oil-refinery-rosneft-sinopec-003/>



In a further attempt to achieve its goal of expanding downstream, Rosneft decided to adopt a tactic favoured by Gazprom in Europe, namely to propose asset swaps to gain market access. This strategy started to emerge in 2007 when Rosneft (49%) and CNPC (51%) created a joint venture called PetroChina-Rosneft Orient Petrochemical (Tianjin) Company Ltd. It was expected that the joint venture would build a plant in the industrial port area of Tianjin (Lingang industrial zone, which is an important industrial and trading centre in China as well as one of the largest ports in the country). The planned annual capacity was set at 10 million tonnes with the potential to increase it to 20 million tonnes depending on the results of the feasibility study. A petrochemical complex was also discussed. The plant was supposed to process some of the Russian oil delivered via the ESPO pipeline, and the joint venture was also planning to purchase around 300 petrol stations. According to preliminary estimates, overall investment in the project was expected to be \$3.16 billion, with a notional net profit target of \$280 million, generating an internal rate of return of 10.5% over a payback period of 10.6 years. Production of petrol, diesel fuel, aviation fuel, polypropylene, paraxylene and other refined products, as well as sales of petrol and Euro-4 diesel were targeted towards Beijing and the new commercial port zone in Tianjin, which had become the third most important special economic zone after Shenzhen and Shanghai Pudong. Indeed, the new refinery was designated as a project of state importance, and initially Rosneft reported that it could be commissioned as early as 2011. However, disagreements in respect of pricing and mutual access to the markets caused negotiations to continue much longer than expected.²⁴²

Eventually on 22 March, 2013, during the first foreign visit of Xi Jinping, the President of the People's Republic of China, to Moscow, the "Agreement between RF Government and PRC Government on cooperation in construction and exploitation of Tianjin oil refining and petrochemical plant and projects in the upstream sector" was signed. It stipulated the grant of three exclusive rights to the joint venture:

- the right to independent import of crude oil;
- the right to unimpeded export of petroleum products and petrochemical products;
- the right to domestic sales of petroleum and petrochemical products of the joint venture.

The projected crude oil distillation capacity of Tianjin Refinery was also adjusted to 16 million tonnes/year, and the refining depth²⁴³ was announced to be more than 95%.²⁴⁴ However it still took another three years, until May 2016, before the Board of Directors of the Tianjin Refinery finally approved the project's feasibility study and sent it for coordination to CNPC and Rosneft. The companies will now start the process of making a final investment decision, with the result that construction may be completed by the end of 2019. Rosneft certainly intends to deliver 9 million tonnes/y of oil to the Tianjin Refinery beginning in 2020, although given delays to date this may prove optimistic.²⁴⁵ Meanwhile the timing of the petrochemical complex construction has not been disclosed.

The delays at Tianjin may also be driven by the fact that Rosneft continues to harbour ambitions to build a refinery and petrochemical complex on Russian territory. The company has initiated its "Far East Petrochemical Company Oil Refining and Petrochemical Hub Construction" project (FEPCO) which provides for the creation of the largest refining/petrochemical complex in the Russian Far East. In September 2015 Rosneft and ChemChina signed a Heads of Agreement outlining Rosneft's intention to take a 30% equity interest in ChemChina Petrochemical Corporation (CCPC) and also agreed a

²⁴² Oilcapital, http://www.oilcapital.ru/news/2009/12/161050_148129.shtml, 16.12.2009

²⁴³ Refining depth is a measure of light product output from a refinery. It reflects the share of product that is not fuel oil and other heavy products.

²⁴⁴ www.rosneft.com/Downstream/refining/Construction/

²⁴⁵ Tianjin Refinery feasibility study approved, to be agreed with CNPC and Rosneft. 30 May 2016. <http://tass.ru/en/economy/878936>



Memorandum of Understanding for cooperation in the development of FEPCO in the Primorye region.²⁴⁶ It was initially reported that ChemChina would take a 73% stake in FEPCO and would manage and build the plant, with Chinese financing also having been promised to underpin the \$10 billion investment.²⁴⁷ This was a vital concession for Rosneft to win, given that it is struggling to raise funds due to US and EU sanctions.²⁴⁸ In June 2016 ChemChina and Rosneft signed heads of agreement on jointly developing a feasibility study for FEPCO²⁴⁹ as well as the acquisition by ChemChina of a 40% interest in FEPCO's capital.²⁵⁰ Scheduled for completion in 2020, Phase 1 of the project would involve construction of a 12 million-tonne/year refinery,²⁵¹ while a second phase of the project, due to complete construction in 2022, would deliver a petrochemical plant that includes a 3.4 million- tonne/year naphtha steam cracker capable of producing 1.4 million tonne/year of ethylene and 600,000 tonne/year of propylene.²⁵² As of June 2016 preparation of the design documentation for the 1st and 2nd project stages was under way, and engineering surveys are now being performed at the petrochemical plant construction site and surrounding infrastructure.²⁵³ Should market conditions warrant it, a potential third and final phase of the project designed to double both refining and petrochemical production capacities at the complex could be built by 2028, according to Rosneft.²⁵⁴ The project is being strongly promoted by the Russian authorities and by Rosneft, but it remains at a very early stage and faces many economic challenges, including lack of gas and oil supplies and transportation infrastructure, lack of financing and the obvious fact that China prefers to have refineries and chemical plants on its own territory, providing shorter transport distances, increased security of supply and job creation.

A second petrochemical project concept for Eastern Russia was announced in December 2015 when Rosneft and Sinopec signed a Memorandum of Understanding concerning cooperation on gas and petroleum chemicals schemes to be developed in East Siberia using the resource base at the Yurubcheno-Tokhomskoy hydrocarbon cluster. The document envisages a detailed pre-feasibility and concept design study on the potential to convert natural gas and its liquid fractions to ethylene and propylene combined with integrated production of high-performance polymers and co-polymers. The processing capacity of the integrated complex in Boguchany (Krasnoyarsk Territory) and Angarsk (Irkutsk region) is expected to be up to 10 bcm/y of natural gas with an annual output of up to 3 million tonnes of ethylene and around 6 million tonnes of polymers and other petrochemicals totally.²⁵⁵

December 2015 also saw Sinopec successfully complete the purchase of a 10% minority stake in SIBUR for \$1.3 billion, with permission from the Russian Government Commission on Foreign Investments to buy a further 10% within the next three years. SIBUR is a vertically integrated gas processing and petrochemicals company which owns and operates Russia's largest associated petroleum gas processing business, and is also a leader in the Russian petrochemicals industry. As of

²⁴⁶ Rosneft, ChemChina delegations visit FEPCO construction site. 5 September 2015.

www.rosneft.com/news/news_in_press/05092015.html

²⁴⁷ www.rosneft.com/Downstream/refining/Construction/

²⁴⁸ Sechin will give the Chinese 73% of the strategic oil refinery. 10.09.2015. <http://xn--80ajgarobcee6b3h.xn--p1ai/politika-eng/sechin-will-give-the-chinese-73-of-the-strategic-oil-refinery/>

²⁴⁹ ChemChina, Rosneft start petchem feasibility study. 27.06.2016. European Rubber Report. <http://www.european-rubber-journal.com/2016/06/27/chemchina-rosneft-start-petchem-feasibility-study/>

²⁵⁰ ChemChina выкупит у Роснефти долю участия 40% в Восточной нефтехимической компании в Приморском крае. 27.06.2016. <http://neftegaz.ru/news/view/150455-ChemChina-vykupit-u-Rosnefti-dolyu-uchastiya-40-v-Vostochnoy-neftehimicheskoy-kompanii-v-Primorskom-kraye>

²⁵¹ The plant output would include 1.57mt of gasoline, 6mt of diesel, 0.8mt of kerosene and 0.14mt of bunker fuel

²⁵² Rosneft, ChemChina sign MOU for proposed integrated complex. OGJ. 14 September 2015.

<http://www.ogj.com/articles/2015/09/rosneft-chemchina-sign-mou-for-proposed-integrated-complex.html>

²⁵³ www.rosneft.com/Downstream/refining/Construction/

²⁵⁴ Rosneft, ChemChina sign MOU for proposed integrated complex. OGJ. 14 September 2015.

<http://www.ogj.com/articles/2015/09/rosneft-chemchina-sign-mou-for-proposed-integrated-complex.html>

²⁵⁵ <https://www.rosneft.com/press/releases/item/179545/>



September 2015, SIBUR operated 26 production sites located all over Russia.²⁵⁶ This latest investment by Sinopec followed an initial deal in 2013 when it entered into a joint venture with SIBUR to develop the Krasnoyarsk Synthetic Rubber Plant (KZSK), with Sinopec purchasing a 25% + 1 share of KZSK.²⁵⁷ Furthermore, in May 2015, SIBUR signed a contract with Sinopec to establish a joint venture for the construction of a 50,000 tpa butadiene nitrile rubber plant at the Shanghai Chemical Industry Park, 50km south of Shanghai, thus demonstrating an element of reciprocity in the relationship between the two companies, and underlining that, although the deals are relatively small relative to the Chinese chemical sector, they do at least represent concrete cross-border achievements.²⁵⁸

Indeed, SIBUR is in further talks with Sinopec about investing in the Amur gas chemical plant, which is planned to operate close to the border crossing point of the Power of Siberia gas pipeline.²⁵⁹ SIBUR is developing the project plan together with Gazprom according to an agreement signed between the two companies in November 2013. Gazprom is supposed to build the 42 bcma Amur gas processing plant at the end of the Power of Siberia pipeline, in order to extract ethane, helium and other components before the methane is exported to China. SIBUR, now with Sinopec, would then construct a related gas chemical plant, which will produce ethylene and polymers using the feedstock provided by the gas processing plant (up to 2,6 mln tonnes/y of ethane), at a cost of \$9.5 billion. Initially it had been thought that the chemical plant would come online in 2021, but as the timing of Power of Siberia may now slip a start-up date for the Sibur plant is now more likely to be 2023-24.

Overall, then, it would seem that despite best intentions and the signing of many memoranda, cooperation in the refining and petrochemicals sectors is progressing only very slowly. China has seen significant growth in its domestic downstream industries, and so is therefore less inclined to help to develop similar industries in Russia. The one exception to this would appear to be SIBUR, which Sinopec would seem to regard as a strategic investment in the petrochemicals industry. Interestingly the main shareholder of SIBUR – Leonid Michelson – is also the main shareholder at Yamal LNG, and he has already mentioned that the financing scheme for the Amur plant will be similar to Yamal LNG, namely project financing with the participation of Chinese banks.²⁶⁰ As a result, it is possible that once again China may be using its relationships with smaller private companies to make in-roads in Russia without committing to a major relationship with a state company.

²⁵⁶ <http://www.sibur.ru/en/press-center/news/SinopecSuccessfullyCompletedtheAcquisitionofa10StakeinSIBURasaStrategicInvestor/>

²⁵⁷ <http://www.sibur-int.com/press/news/item619.php>

²⁵⁸ http://www.mrcplast.com/news-news_open-317212.html

²⁵⁹ Sinopec to buy 10% Sibur stake, take part in building Amur Gas Processing Plant – Novak. 4 September 2015. <http://www.interfax.com/newsinf.asp?id=616289>

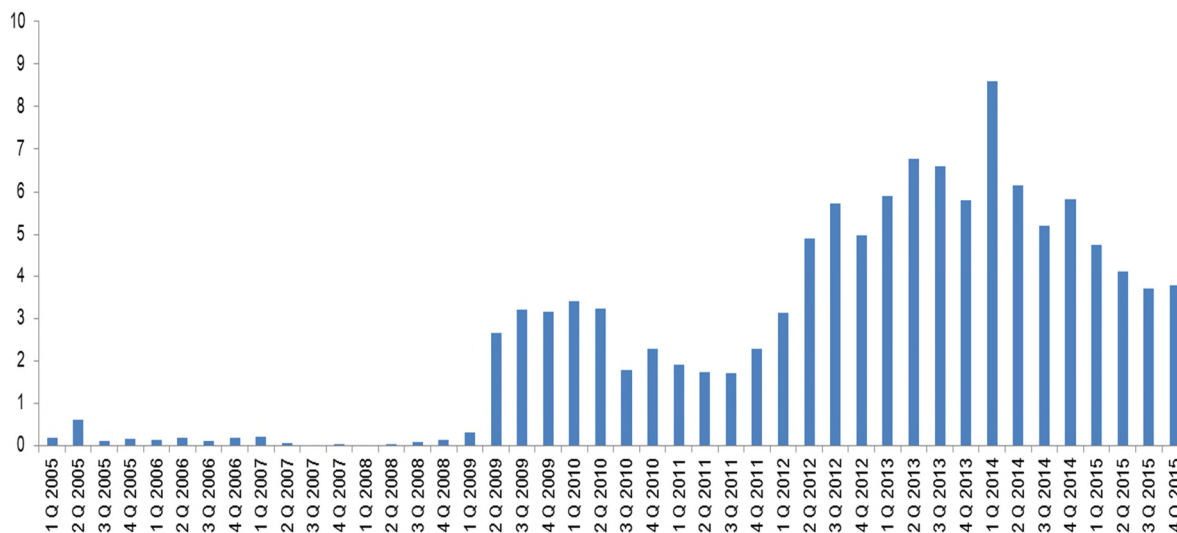
²⁶⁰ Песчинский И. «Сибур» может построить Амурский ГХК вместе с акционером – Sinopec. Vedomosti. 31 March 2016. <https://www.vedomosti.ru/business/articles/2016/04/01/635992-sibur>



Coal

China has become an increasingly important market for Russian coal exports over the last decade. Before 2002 Russia was only supplying a very small volume to China via rail, but in 2002-2008 exports started to grow gradually, and in 2009 a real breakthrough occurred with sales to China growing 38 times to reach 9.3 million tonnes and exceeding the entire total since 2001 (Figure 31). Coal deliveries started along the Trans-Baikal route delivering to enterprises located along the route of the Harbin railway in China, but the expansion of the sea ports in the Russian Far East and growing maritime transportation helped trade to develop more broadly over the past five years. Most importantly, though, in 2010 China and Russia signed a \$6 billion “coal for loans” agreement to facilitate Russian infrastructure and equipment investments, which assumes that Russia will annually provide 15 million tonnes of coal until 2015, then 20 million until 2035 – a new version of “oil for loans deal”.²⁶¹ As a result, by 2013 China had become the largest importer of coal from Russia, surpassing the UK.

Figure 31: Coal export from Russia to China, mln. tonnes



Source: Federal Custom Service of the Russian Federation

The main reason for the “coal for loans” deal and for the subsequent sharp rise in coal imports was growing demand in the energy intensive industries in China combined with a decrease in domestic coal supplies following the closure of a number of small plants which were unable meet new environmental standards.²⁶² As a result Chinese coal imports increased rapidly and Russia, with its relatively abundant resources, geographical proximity and existing railroad and maritime infrastructure seemed to be a natural trading partner in this situation.

This development made China critically important for the Russian coal industry. Given the long-term stagnation of Russian domestic coal demand,²⁶³ growth in exports became the main factor driving rising coal production, with a particular focus on China. As long as Chinese coal imports were increasing, Russian coal companies could profit from increased sales, with SUEK, Mechel and Kuzbassrazrezugol, who became the main exporters to China (partially due to the port infrastructure they have in the Far

²⁶¹ Li, D. and Chen, X., Second version for loans-for-oil deal], *Diyi Caijing Ribao*, 15 Nov. 2010.

²⁶² See “Understanding China’s rising coal imports, Carnegie Endowment for World Peace, 16 Feb 2012

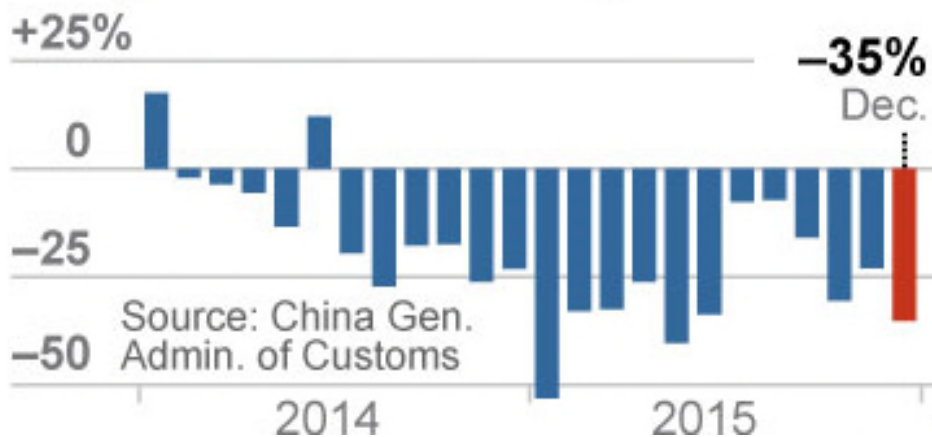
²⁶³ IEA (2014), pp.171-172



East), as well as Rospadskaya and Vostsibugol (part of the En+ group)²⁶⁴ being the main beneficiaries. Indeed, by 2013-2014 coal exports to China had already reached 18% of total Russian coal exports.

However, this growing dependence on the Chinese market turned out to be extremely risky when the Chinese authorities started to review their energy policy, targeting a reduction in the role of coal for environmental reasons, with the result that in 2015 China’s coal imports slumped 30% (see Figure 32).²⁶⁵ Since January 2015 China has banned the import of coal with a high ash and sulfur content and also (as of the end of 2014) re-introduced an import duty for coal.^{266,267} As a result, the trend in Russian coal exports since mid-2014 has been extremely negative, and although the Russia government keeps negotiating with the Chinese leadership in an attempt to abolish the import duty for Russian coal, so far there has been no positive response.²⁶⁸ Fortunately for Russian coal exporters, in the period 2014-2015 their losses resulting from both the coal price decline and the reduction of export volumes to China have been mitigated by the sharp ruble devaluation and a consequent reduction in costs. In addition, they have been able to find alternative Asian buyers in the short term. But a significant challenge remains for the longer term, especially as numerous other producers (such as Australia and South Africa) are also competing for the Asian market.

Figure 32: Chinese coal imports decline in 2015 (change each month from a year earlier)



Source: China Customs Authority, cited by Institute for Energy Economics and Financial Analysis

In contrast to the oil and gas sectors Chinese companies have never shown any strong interest in making major investments in Russian coal production. There is just one operational joint venture using Chinese capital - Razrez Ugol, which is a joint venture formed in 2013 between Vostsibugol (En+ group) and Chinese company Shenhua, that is developing the Zashulanskoe coal deposit in Zabaikalie.^{269,270}

Interestingly, though, in October 2014 Russia and China did sign a “road map on cooperation in the coal industry”, which envisioned the participation of Chinese companies in the Russian coal projects. Several joint projects were considered:

²⁶⁴ Лабькин А. Уголь уйдет на восток. Expert Online, 3 April 2014. <http://expert.ru/2014/04/3/ugol/>

²⁶⁵ UPDATE 1-China 2015 coal imports plunge 30 pct on demand slump. Reuters. Jan 12, 2016.

<http://www.reuters.com/article/china-economy-trade-coal-idUSL3N14X1TC20160113>

²⁶⁶ <http://metalin.ru/ru/news/74327>

²⁶⁷ <http://www.vedomosti.ru/business/articles/2015/03/27/otgruzki-v-kitai-energeticheskogo-uglya-sokratilis-na-40>

²⁶⁸ Импортные пошлины на уголь обсудят Россия и Китай. 23.03.2016. <http://www.eastrussia.ru/news/importnye-poshliny-na-ugol-obsudyat-rossiya-i-kitay/>

²⁶⁹ Башкатова А. Китайцы дадут стране угля. 23.12.2013. http://www.ng.ru/economics/2013-12-23/1_chinese.html

²⁷⁰ Краеугольный экспорт. Морские порты №2 (2015). <http://morvesti.ru/tems/detail.php?ID=53348>



- development of Elga coal deposit in Yakutia (Russia's largest) by Shenhua in cooperation with Mechel²⁷¹
- joint exploration and development of the Ogodjinskoe coal deposit in the Amur region plus construction of a coal terminal in "Port Vera" in the Far East, with a potential cost of \$10 billion ²⁷²
- development of the Mejegeiskoe coal deposit in Tuva²⁷³ (Evraz and China Coal were named as potential partners)
- development of the Karakanskoe deposit in the Kemerovo region (also Evraz and China Coal)
- development of the Omsukchanskoe coal deposit including new infrastructure in Magadan region (Shenhua together with Vostochnaya Gornorudnaya Kompaniya)²⁷⁴

However, so far no real progress has been seen. In 2011 Shenhua did create a JV with Russian state-controlled Rostoprom to develop the Ogodjinskoe coal deposit, but the project failed.²⁷⁵ Chinese companies Shenhua and Baosteel also showed some interest in the acquisition of Mechel's Elga deposit, when Mechel announced in 2014 that it was ready to sell 49% of the project for \$2.5-3 billion, but in the end the shares were sold to Gazprombank to cover Mechel's debts.²⁷⁶

In the light of these discussions, Russia had been planning to expand dramatically its port infrastructure in the Far East in order to multiply its coal exports to Asia – from 50 million tonnes in 2013 up to 125 million tonnes by 2030.²⁷⁷ Numerous discussions concerning the participation of Chinese companies in this sea port infrastructure development for coal export have also taken place, but again no real progress has been made, perhaps not surprisingly in light of the new Chinese policy towards coal. Given the current oversupply situation in the global coal market it makes little sense for Chinese companies to invest in resources or infrastructure related to coal in Russia, especially because many of the Russian enterprises have additional significant social responsibilities. When these are added to the relatively high cost of rail transport to China, it is clear that the returns on any investment would be low given current coal prices. In addition, with China having many alternative sources of imports and a goal to reduce coal use, the outlook for further development of trade between Russia and China based on coal is quite bleak, and will certainly not be the basis for any form of "special relationship."

²⁷¹ <http://www.bloomberg.com/news/articles/2014-05-08/putin-said-to-seek-chinese-money-with-limits-on-platinum-gold>

²⁷² Краеугольный экспорт. Морские порты №2 (2015). <http://morvesti.ru/tems/detail.php?ID=53348>

²⁷³ <http://www.vestifinance.ru/articles/49700>

²⁷⁴ РФ предложила Китаю добывать уголь в Сибири и Якутии. 30.10.2014. <http://www.vestifinance.ru/articles/48836>

²⁷⁵ Джумайло А. Олег Дерипаска подбросит угля Китаю. 19.05.2014. <http://www.kommersant.ru/doc/2474237>

²⁷⁶ Газпромбанк намерен закрыть сделку по покупке 49% в Эльгинском месторождении до конца июня 2016 г. <http://neftegaz.ru/news/view/149942-Gazprombank-nameren-zakryt-sdelku-po-pokupke-49-v-Elginskom-mestorozhdenii-dokontsa-iyunya-2016-g>

²⁷⁷ Долгосрочная программа развития угольной промышленности России на период до 2030 года. ЗАО «РОСИНФОРМУГОЛЬ». Москва, 2013.



Electricity sector

In the electricity sector initial cooperation between China and Russia was mainly focused on nuclear power generation. In 1992 Russia and China signed an intergovernmental agreement on their first ever joint energy project, which was the construction of the first two blocks of the Tianwan nuclear power station at Lianyungang, Jiangsu Province, with an installed capacity of 2 GW. The final contract was signed in December 1997²⁷⁸ and in September 1999, the construction, which cost \$3 billion, began.²⁷⁹ Russian company "Atomstroyexport" was responsible for the engineering, supply of equipment and materials, installation and commissioning of the power plant and also for personnel training. In summer 2007 the first stage was finalized,²⁸⁰ and final handover of the power plant was achieved in 2009.

Just as this project was being completed, in October 2008 Russia's State Nuclear Corporation Rosatom and the Chinese State Nuclear Power Technology Corporation signed a second cooperation agreement on the construction of a further two blocks to expand the Tianwan Nuclear Power Plant and on the construction of a demonstration fast reactor. However, negotiations were made more difficult by the fact that Russian officials have consistently remained reluctant to transfer nuclear energy technologies and other knowledge-based products to their Chinese partners. The main problem with this approach, as industry experts have pointed out, is that while protection of proprietary technology can safeguard Russian exports from being displaced by lower-cost Chinese products in third-party markets, such an approach can also reinforce Chinese doubts about Russia's reliability as a long-term energy partner.²⁸¹

Finally, in October 2009 Atomstroyexport, a subsidiary of Rosatom, and the Chinese Nuclear Power Technology Corporation signed an agreement on the participation of the Russian company in the construction of the second phase of the Tianwan Nuclear Power Plant. In September 2010, President Putin reaffirmed the potential nuclear future of Russia and China's energy relations, saying "Of course, our cooperation with China is not limited to just hydrocarbons ... Russia is China's main partner in the field of peaceful use of nuclear energy, and equipment supplies here amount to billions of dollars".²⁸² Following these remarks the general contract for the second stage was signed, under which Atomstroyexport is constructing the 3rd and 4th blocks at Tianwan, comprising two WWER-1000 type reactors, each with a capacity of 1060 MW,²⁸³ although in a slight twist to the first stage Chinese equipment is mainly being used for related infrastructure.²⁸⁴ Construction of the 3rd block started at the end of 2012, while the 4th block began in 2015, and commissioning of the second stage is planned before the end of 2017.²⁸⁵

However, cooperation in the nuclear sphere is becoming more difficult as China is developing its own nuclear power technology. China's ultimate purpose is to become an independent player in the nuclear industry, and it has already created an indigenous design, which has been used in phases I and II of the Qinshan plant. Russia also has many concerns about possible technology transfer, which could help China to become a competitor in the international market once it has gained cutting-edge technology. Furthermore, China is acquiring significant western technology in the ongoing construction of Westinghouse AP-1000 reactors. The AP-1000 has been designated as the basis for China's third-

²⁷⁸ Д. Кудряшов. В Китай без конкурса. 28.09.2007. РБК.

<http://web.archive.org/web/20080308180653/http://www.rbcdaily.ru/2007/09/28/industry/295531>

²⁷⁹ О. Алексеева. Китай выторговал АЭС. <http://www.gazeta.ru/business/2010/02/08/3321353.shtml>

²⁸⁰ Д. Кудряшов. В Китай без конкурса. 28.09.2007. РБК.

<http://web.archive.org/web/20080308180653/http://www.rbcdaily.ru/2007/09/28/industry/295531>

²⁸¹ Wietz, Richard. China-Russia relations and the United States: At a turning point? *Rianovosti*. Apr 14, 2011.

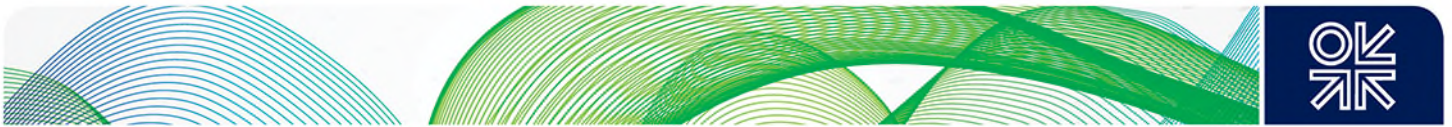
²⁸² Russia begins filling ESPO spur to China with oil. Anon. *Interfax: Russia & CIS Oil & Gas Weekly*. (Sep 1, 2010).

²⁸³ Опубликовано ИА "Финмаркет"

²⁸⁴ Актуальные аспекты российско-китайского сотрудничества в энергетической сфере [Текст] / С. С. Родин, С. П.

Ващук, Н. Н. Приходько // Вестник Амурского государственного университета. - 2014. - Вып. 67: Естеств. и экон. науки. - С. 105-111 : табл. - Библиогр.: с. 111 (7 назв.) . - ISSN 2073-0268

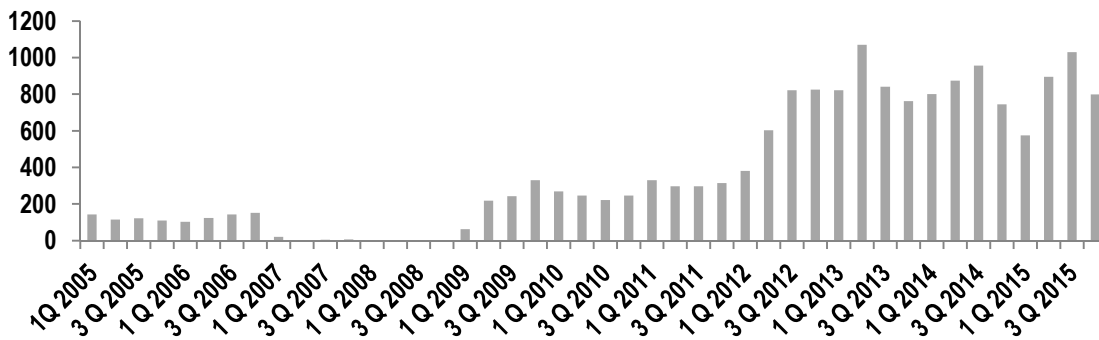
²⁸⁵ Российско-китайское сотрудничество в области атомной энергетики будет продолжено. 18 ноября 2015. <http://www.finmarket.ru/news/4162388>



generation nuclear power technology, undoubtedly making older Russian technology less attractive.²⁸⁶ So the prospects for future cooperation in this area are becoming less promising.

But cooperation in the electricity sector has not been limited to the nuclear industry. In fact, the first supplies of electricity from Russia to China started as long ago as 1992 – soon after the restoration of diplomatic relations and well before any cooperation in the oil and gas sector. They arrived via the 110 kW capacity “Blagoveshenskaya-Haihe” transmission line and were re-confirmed in 2005 when the Eastern Energy Company (INTER RAO UES Russia) and the State Grid Corporation of China (SGCC) signed a long term cooperation agreement. However, as can be seen in figure 33 the volumes were very small when compared to China’s overall annual electricity generation of 5810 TWh, and exports were even suspended for a while in 2007-09. However, they returned in March 2009 and a second “Blagoveshenskaya-Aigun” transmission line was added, doubling capacity to 220 kW.²⁸⁷

Figure 33: Trans-border electricity supplies from Russia to China, mln. kWh



Source: Federal Custom Service of the Russian Federation

More profound levels of cooperation have also been considered over the past decade, though. In March 2006 an agreement to carry out an integrated feasibility study concerning a project to export electric power from Russia to China and a second agreement on the main principles of implementing the project were both signed by Eastern Energy Company and SGCC.²⁸⁸ The target of the project was to increase supplies of Russian electricity to Chinese customers by up to 60 billion kWh/y over the decade to 2020. Construction of new generating assets (mainly pulverized-coal fired thermal plants) with total capacity of 10,800 MW was planned as well as 3,400km of transmission networks (AC and DC).²⁸⁹ A first stage was agreed in November 2006, when the companies signed a contract for supply up to 4.5 billion kWh of electric power annually, and by 2012 a 500kW power transmission line (Amurskaya-Hiahe) had been commissioned, expanding the number of trans-border lines to three. As a result, in 2012 total exports increased to 2.6 billion kWh and in 2013 to 3.5 billion kWh.

In 2011 Russia (through the Eastern Energy Company) exported electricity to China at the price of \$42/MWh. According to figures published by the Chinese State Administration of Energy in September 2011, the average wholesale electricity price in the province of Heilongjiang, where the Russian electricity is delivered, was around \$49/MWh (net of VAT). Negotiations on raising the price of Russian electric power exports were initiated and China finally signed a long term electricity import contract in 2014 for a supply of 100 billion kWh of electric power for the period up to 2036. The export price under the new contract is calculated according to a formula which takes into account wholesale price increases in the province of Heilongjiang.

²⁸⁶ Jakobson, L., Holtom, P., Knox, D. and Jingchao Peng (2011), p.40

²⁸⁷ http://www.eastern-ec.ru/ru/press-center/ptsblikatsii-media/index.php?ELEMENT_ID=371

²⁸⁸ <http://tek2011.minenergo.gov.ru/userfiles/files/>

²⁸⁹ <http://www.peeep.us/ec244864>



According to the draft "Scheme and Program of the Russian UES development for 2015-2021", by 2021 the generating capacity in the east of Russia available for exports should reach 830 MW. Furthermore, in May 2014 Rosseti (the Russian Grid Company) and SGCC signed an agreement on strategic partnership, and are planning the construction of ultra-high-tension lines to provide potential "energy bridges" (DC transmission lines) from Russia to China, with annual target transmission volumes estimated at 2-5 GW. The electricity will come both from the existing power plants in Siberia and the Far East and from the new planned projects.²⁹⁰ However, the structure of financing for the new plants and power lines remains an issue, as does the price of electricity in China.

Nevertheless, in May 2015 Rosseti and SGCC signed a further agreement on the creation of a JV (Rosseti – 51%, SGCC – 49%) which will act as an EPC-subcontractor for power projects in Russia and in other countries. The planned annual investment in generation and transmission assets is set to be \$1billion/y, and the JV aims to attract financing both from the shareholders and also from Chinese and other international financial institutions.²⁹¹ In September 2015 it appeared that the first project as part of this new cooperation had been found when Rosseti and SGCC announced plans to invest in the export of electricity from the Tomsk region via a 500 kW line. As a result, the partnership between Rosseti and SGCC could provide a significant foundation for future commercial relations in the electricity sector.

Other companies are also taking steps in this direction, though. In 2014 Rushydro (RAU EES Vostoka) signed two agreements on cooperation with PowerChina and Dongfang Electric,²⁹² the first being a simple framework agreement while the second, with Dongfang, outlines construction and maintenance of generating assets and an associated network at a cost of up to \$1.2 billion. Meanwhile in 2015 Gazprom has announced plans to build its own power plants inside China, which would be supplied by Russian pipeline gas or LNG.²⁹³ In June 2016 Gazprom and CNPC then signed a Memorandum of Understanding on gas-fired power generation, according to which by late August 2016, the parties will examine and select target projects in the field of gas-fired heat and power generation from among those offered by CNPC in order to make an investment decision and choose an organizational and legal framework for projects to be executed.²⁹⁴ This seems to be linked to a possible opportunity to expand export volumes above the 38 bcm/y currently seen in the "Power of Siberia" contract, but may well hit the commercial issue that gas generation in China requires special tariffs to be profitable and has to compete with low-cost Chinese coal-fired generation.

In conclusion, although current Russian exports to China are small, a number of companies are making plans to increase the level of interaction in the electricity sector. The JV between Rosseti and SGCC would seem to have significant potential, and it is interesting that Gazprom is now considering investments in power generation assets inside China. However, two significant obstacles remain. The first is regulated power prices in China, which are low by global standards and make it difficult for non-coal-fired plants to compete profitably without some form of subsidized prices (it seems that the breakeven costs for most Russian export project would require a doubling of Chinese electricity tariffs to achieve breakeven). The second, related, issue is one of financing, with companies and banks reluctant to provide loans for projects that are inherently unprofitable. Nevertheless, a start has been made, and signs of further joint investment in electricity export projects could provide new indications of the development (or lack of it) in Russia and China's energy partnership.

²⁹⁰ Актуальные аспекты российско-китайского сотрудничества в энергетической сфере [Текст] / С. С. Родин, С. П. Ващук, Н. Н. Приходько // Вестник Амурского государственного университета. - 2014. - Вып. 67: Естеств. и экон. науки. - С. 105-111 : табл. - Библиогр.: с. 111 (7 назв.) . - ISSN 2073-0268

²⁹¹ <https://lenta.ru/news/2015/05/08/rosseti/>

²⁹² <http://ria.ru/spravka/20141109/1032440135.html>

²⁹³ Ю. Барсуков Газпром сам сожжет свой газ. 30.11.2015. <http://www.kommersant.ru/doc/2865651>

²⁹⁴ Gazprom, 25.06.2016. <http://www.gazprom.com/press/news/2016/june/article277639/>



Conclusions

Russia's relations with China have been long and volatile, alternating between close friendship and outright hostility, especially in the Soviet era. At that time the Soviet Union took the role of "Big Brother" in a partnership where it was the provider of new technologies and operational competence. Since 1991, though, the relationship has increasingly been founded on energy, based on the obvious logic that China has been the world's fastest growing economy and, as of 2009, the world's largest energy consumer, while Russia is the world's largest producer of hydrocarbons (oil, gas and coal).²⁹⁵ Although Russia has always been eager to avoid being seen as a simple energy producer and supplier to its increasingly wealthy eastern neighbour, and China has been reluctant to become overly dependent on a politically contentious northern power, the development of close energy ties has been inevitable, and despite western cynicism has undoubtedly occurred.

As with all connections involving the export and import of energy, the elements of mutual dependency are clear. Russia needs to generate revenue from sales of oil, gas and coal and sees China, and more broadly Asia, as an expanding market which can offer diversification from the more mature, and stagnant, western markets. On the other hand, Chinese energy demand has doubled over the past 12 years, more than outstripping indigenous production and creating increasing demand for imports to fuel industrial expansion. Russia's vast resources offer one obvious source, bringing diversity both from a reliance on the Middle East and from dependence on sea lanes that can be threatened by the US fleet. However, the nature of the relationship is not equal and opposite, and since 2014, when US and EU sanctions limited Russia's ability to access technology and finance in the oil sector, the increasing sense has been that China is now the dominant force in this cooperation.

This sense is underlined by the fact that energy co-operation has largely been driven by the timing of China's energy needs. Oil exports from East Siberia commenced shortly after China became a net oil importer and have increased in step with its rising requirement and its desire to diversify its sources of supply. Coal exports have followed a similar trend, starting when China became a net importer, rising sharply as China's needs increased and now declining as China starts to shift its energy economy away from coal. The example of gas is also interesting. For many years, gas has been a minor part of the Chinese energy mix. However, by 2014 expectations of a rapid increase in demand, driven by a combination of rising overall energy consumption and a desire to burn more environmentally friendly fuels, had catalysed a search for a diversified compass of imports, with Russia playing its part as the northern vector. As a result, the Power of Siberia deal was signed and negotiations began on a second western route (Altai). However, since then Chinese economic growth has slowed, gas demand forecasts have been reduced and consequently progress on Russian gas export plans has slowed.

This underlines a key issue in the Russia-China bargaining game, which Russia will never acknowledge but which China clearly uses to its advantage – namely that the majority of Russia's eastern hydrocarbon assets are effectively stranded without the availability of the Chinese market. There are, of course, exceptions, with Yamal LNG capable of being sold to Europe and Asia, but even in this case the Chinese market and Chinese companies have been central to the project's development. Furthermore, in the oil sector China is the major buyer of East Siberian crude despite Russian attempts to maintain the option for diversity of sales through the port at Kozmino Bay. As for Russia's gas fields in East Siberia, China is clearly the only market available, especially since plans for an LNG project at Vladivostok have been postponed.

As a result, Russia has essentially become reliant on the growth of the Chinese economy and its expanding, and changing, energy needs. All new Russian energy projects in the east are related to China and therefore they are highly exposed to any changes in China's economic performance. The potential for a "new normal" of much slower economic growth is therefore not good news, and has been

²⁹⁵ BP Statistical Review of World Energy 2016



evident in the deceleration of China's need for imports from Russia. It would seem that even in the oil sector, where China's requirements appear greatest, there is now an attempt to slow the increase in exports through the ESPO spur.²⁹⁶

Consequently, the balance of bargaining power is clearly with the Chinese side, and this has been further enhanced by the political dynamics since the Ukraine crisis in 2014. The imposition of sanctions by the US and the EU has left the Kremlin seeking new political and commercial allies, in particular in Asia, and this obvious change in strategy has offered China another bargaining tool. Even though there was some necessity for China to sign a deal for East Siberian gas in 2014, given its gas demand expectations at the time, it was still able to negotiate a very competitive price partly because it understood President Putin's political desperation to sign a deal. Furthermore, the sanctions on Russia have provided China with an opportunity to provide an alternative source of finance and oilfield equipment that it has also used to its advantage.

Financial sanctions have arguably had the most significant short-term impact on Russia, and have accelerated what was already becoming an increasing reliance on Chinese loans. The initial financing of the ESPO pipeline and the development of oil production to fill it was provided by a \$25 billion prepayment agreement between Rosneft, Transneft and CNPC, and since then Rosneft has become increasingly dependent on Chinese money to cover its outstanding debts, in particular in a lower oil price environment. This was underlined in the third quarter of 2015, when a \$15 billion prepayment enabled Russia's major state oil company to strengthen its balance sheet at a time when significant international debt repayments were due.²⁹⁷ As a result of the prepayment agreements, though, Rosneft is committed to supplying a minimum of 600-700,000bpd of crude oil to China throughout the next decade and beyond, amounting to almost half its total crude exports. Furthermore, in the gas sector the Yamal LNG project would not have proceeded without \$13 billion of financing from Chinese institutions, underlining the increasing financial dependency in the relationship between Russia and China.

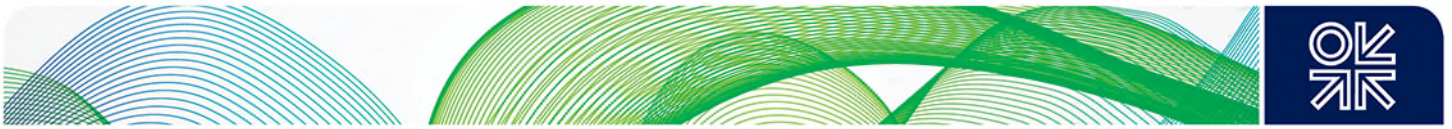
This effective provision of "loans for hydrocarbon imports" reflects a similar strategy adopted by China in countries such as Brazil, Nigeria, Venezuela and Turkmenistan, with another common feature being the sale of Chinese equipment on the back of financial support. This has also been taking place in Russia, where Chinese equipment suppliers have been increasing their market share thanks to the impact of the technological sanctions imposed on Russia. Chinese companies have been making inroads not only where sanctions specifically apply (for example offshore) but also in more traditional areas as western service companies have become cautious about any business in Russia and Russian companies have been keen to diversify their sources of equipment supply. In some instances, the sale of equipment would seem to have been directly tied to the provision of financing, with, for example, the project finance for Yamal LNG being accompanied by statements that 80% of the less technical equipment would now be coming from China.²⁹⁸ Again, it would seem that China is exploiting its clear bargaining strength to ensure the best outcome for its companies.

Another common Chinese tactic, as the country has expanded its search for sources of hydrocarbon imports, has been the purchase of equity stakes in upstream assets, which has been very evident in Australia, Africa and the Middle East. In Russia too, investment in upstream assets has been sought, but in this case the concept has been more difficult because of the clear implications concerning influence and control that an equity purchase brings. As has been mentioned earlier, Russia has long been suspicious of Chinese motivations in Eastern Russia, and so the sale of assets and corporate equity is bound to cause some controversy. Nevertheless, some deals have been completed, but not to the extent that might have been expected and not by the obvious Chinese company. Small joint ventures have been set up and some asset purchases have been agreed, but it has been Sinopec,

²⁹⁶ Argus FSU Energy, 16 June 2016, "China seeks ESPO deal changes"

²⁹⁷ Rosneft IFRS Financial Statements for 9M 2016, found at www.rosneft.com

²⁹⁸ RBTH, 6 May 2016, "Chinese companies to produce 80% of Yamal LNG equipment"



rather than CNPC, which has taken the leading role. Indeed, CNPC appears to have turned down a number of big opportunities, perhaps undermined by a temporary senior management preoccupation with the corruption scandals that have engulfed the company over the past few years or perhaps put off by the reluctance of Russian state companies to cede it any level of influence. It is interesting to note, for example, that its largest deal to date has been accomplished with the private company Novatek, while it has no real joint venture of note with either Rosneft or Gazprom.

In a clear response to its relatively weak bargaining position Rosneft has sought to demonstrate that it is not completely reliant on China by looking for alternative buyers for its assets and has found ready purchasers in India. Stakes in Vankorneft and Taas Yuriakh have been sold to ONGC and other Indian companies, emphasizing Russia's desire to show that it has options and need not be completely dependent on China. Whether this tactic encourages or infuriates the Chinese remains to be seen, but it is interesting to note that an alternative deal, a 20% stake in VCNG, has already been offered to Beijing Gas by Rosneft to coincide with President Putin's visit to Beijing in June 2016. Further signs are likely to be revealed in CNPC's potential purchase of Rosneft shares in the forthcoming privatisation auction. CNPC has professed an interest in buying all 19.5% of the company on offer, but is seeking "participation in management" in return.²⁹⁹ Rosneft and the Kremlin appear hesitant to hand over what could be a significant level of influence to China's national oil company, and the ultimate result will tell us much about the current state of relations between the two countries and about future levels of cooperation.

Despite this uncertainty over active Chinese involvement, though, it remains clear that a very significant amount of the oil produced in Russia's eastern regions will head over the border to China, either in crude oil or oil product form. The latter could come from Russian refineries at Angarsk and Khabarovsk, but could also emerge from a potential joint investment in the Far Eastern Petrochemical Company (FEPCO), or via the joint investment by Rosneft and CNPC in the Tianjin refining complex in China. These downstream ventures provide some potential for "value creation" for Russia, but still underline the fact that China will remain the major market and as a result can be fairly relaxed about the exact ownership of assets in Russia.

In the gas sector the slow rate of progress with Gazprom's pipeline exports has been noted, with one reason being the current uncertainty over gas demand and indigenous supply in China. Recent meetings in Beijing in June 2016 confirmed the lack of rapid progress, with almost no mention of the Altai pipeline, the Far East pipeline from Sakhalin or any Chinese interest in Russian LNG other than the continuing investment in Yamal. This latter project points to another important factor, which is the changing balance of power in the Russian gas sector which has been partly catalysed by the Russian government and partly by Chinese tactics. The liberalisation of LNG exports in late 2013 offered Novatek and Rosneft the opportunity to develop projects in competition with Gazprom, whose own LNG plans have stalled. CNPC took advantage of this situation to become a 20% shareholder in Novatek's Yamal LNG project, and was subsequently followed in by the Silk Road Fund (SRF), which has taken a further 9.9%. In addition, \$13 billion of financing has now been provided by Chinese banks and the SRF, while CNPC has contracted to purchase 3mtpa of LNG from 2019. As a result, China has helped to create competition within the Russia gas sector which has been to its commercial benefit, as acknowledged by Gazprom itself.

Furthermore, the contrast between the relative success of Russia-China relations in the oil sector and the more complex situation in the gas sector raises a number of interesting potential implications. Rosneft has established itself as a key actor in Russia's relationship with China, with its CEO Igor Sechin at the forefront of negotiations. Meanwhile Novatek is set to become Russia's leading LNG producer by 2020, with Chinese support. As a result, the question of whether Gazprom should remain dominant in pipeline exports seems relevant, given slow progress to date. Rosneft has catalysed

²⁹⁹ Interfax, 30 May 2016, "CNPC interested in boosting stake in Rosneft given participation in management"



enquiry into this issue, asking for independent third party access to the Power of Siberia pipeline. This in turn has sparked a wider debate about Gazprom's overall export pipeline monopoly, and the possibility of Rosneft, Novatek and others selling gas to east and west. Although the Russian government has delayed a decision for the time being, it is certainly possible that the country's "pivot to Asia", and especially to China, could inspire broader reform in the country's gas sector.

In conclusion, then, while there is no doubt that Russia's pivot to Asia is certainly taking place (the evidence from the oil sector alone is enough evidence of this), we have characterised the developing energy relationship between Russia and China as akin to "playing chess with the Dragon", by which we mean to imply that from a Russian perspective it is playing a complex and high risk game with a powerful adversary. China, with its much larger economy, its financial firepower and the benefit of Russia's weakened geo-political status seems set to control the energy relationship with its northern neighbour. However, Russia is not without strengths of its own and is attempting to exploit them wherever it can. China does need Russian oil, and wants access to the Russian Arctic. Over time (perhaps a decade) it may also come to need Russian gas in greater quantities. Nevertheless, with the oil and gas markets becoming more global in nature, it is unlikely that Russia will be able to exploit these opportunities on anything other than competitive terms. The reality is that its assets are, to an extent, stranded in the East with China as their prime market, and as such their output is unlikely to command a premium price, given China's alternative options. As a result, in order to fully benefit from its energy connection to the East, Russian companies need to create their own diversification options. Rosneft and Novatek have started to do this to a limited extent. It is now time for Gazprom to show the same levels of flexibility, or potentially face significant consequences for its future in the Russian gas sector. If it can do this, then the relative success in the oil sector can be replicated, creating an even stronger level of cross-border trade which could have very significant geo-political and global economic consequences that cannot be ignored.

One final point is that future progress will ultimately depend upon the motivations and objectives of both Russia and China, and the timing of their potential convergence. At present a number of delicate balancing points are providing catalysts for action but also reasons for caution. China needs energy imports and can exploit Russia's sanctions problem, but is also mindful of its more important relationship with the US and in any case does not fully trust the Kremlin. Meanwhile Russia needs to find new markets for its hydrocarbons but is reluctant to allow too much dependence on China to build up, given its historic concern over its powerful southern neighbour. The situation in Central Asia, where Chinese financial strength has completely undermined Russian political influence and created a quasi-Chinese hegemony, has demonstrated very vividly the potential for submission under the weight of China's economic might. This may well explain part of Gazprom's reluctance over accepting too much Chinese involvement in the Russian gas sector. However, the bare facts of the matter are that a mutual dependency does exist, and the game to be played over the coming decades will be over the balance of that dependence as China continues to expand and its energy needs both grow and shift in emphasis. If Russia can find a competitive place within the Chinese energy import portfolio for both oil and gas, then a mutually beneficial relationship can develop. If either link should fail, however, it is likely to be Russia, rather than China, which suffers the worst consequences.

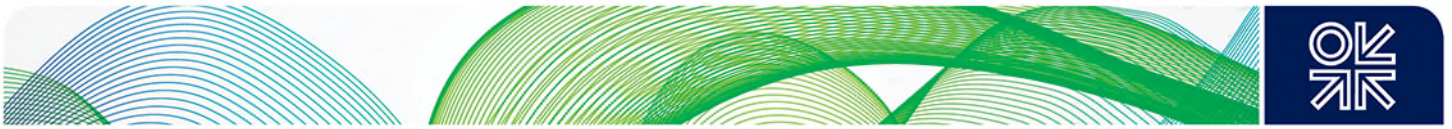


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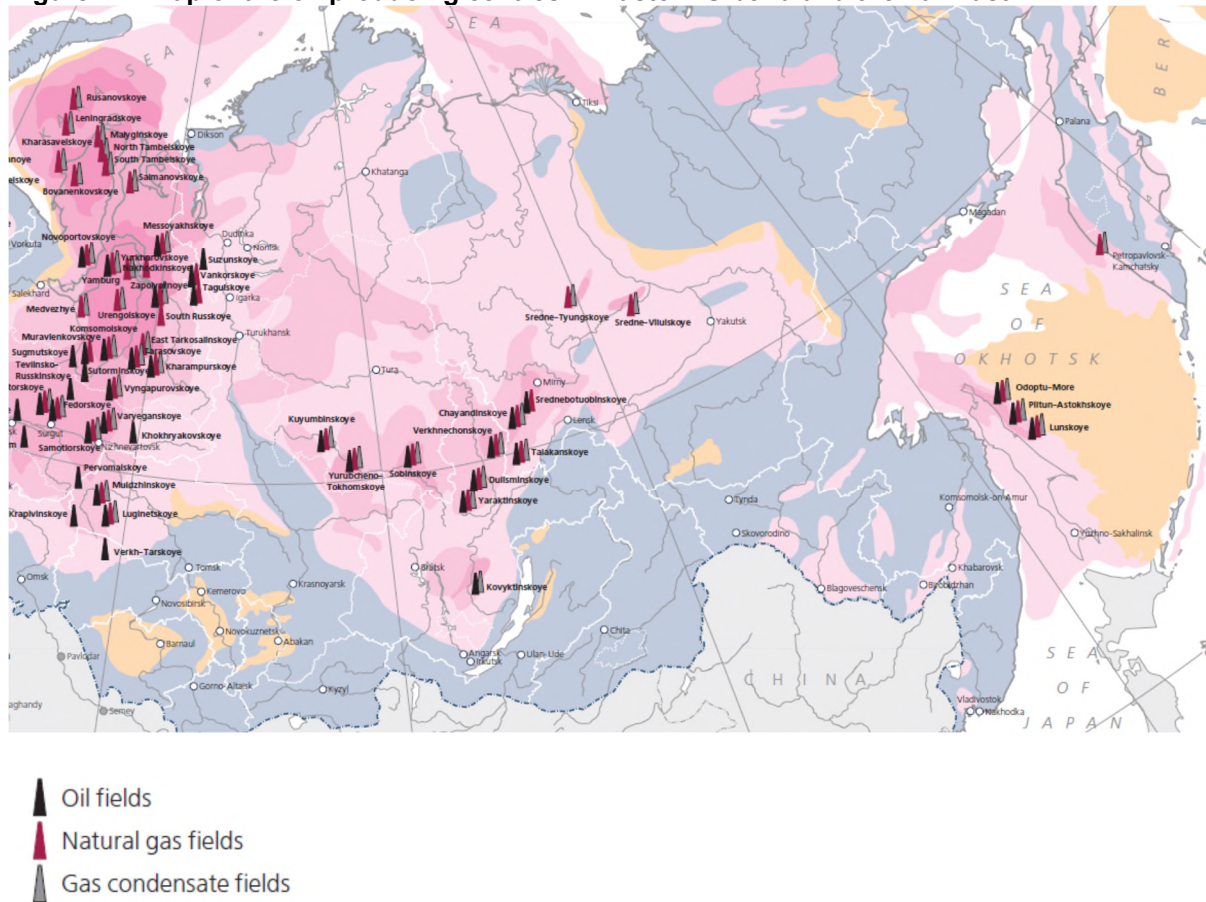
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Annex 1. Oil producing centres in Eastern Siberia and the Far East

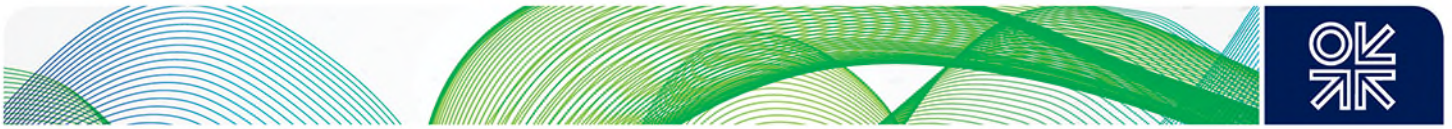
The Vankor oil and gas producing center (OGPC) contributes the largest share of eastern production but still has significant potential and will remain the major source of supply for the ESPO pipeline. Rosneft achieved peak oil production of 25.3 million tonnes at the main Vankor field in 2013/14 and output has since started to decline, although Rosneft expects a new lower plateau to be reached soon and to be maintained for some years. Furthermore, the decline is expected to be offset by the commissioning of reserves located at the nearby Suzunskoye, Tagulskoye and Lodochnoye fields. According to Rosneft's plans, these fields could be put into commercial production in 2016-2017.

Figure A1: map of the oil producing centres in Eastern Siberia and the Far East



Source: Russia Oil and Gas Atlas. Troika. January 2012.

The second largest area in terms of oil and gas production is **Talakansko-Verkhnechonsky OGPC**. Surgutneftegas is one of the main players here, with eight fields based around the Talakan asset with combined potential output of over 8 million tonnes/year of oil (160,000bpd). Meanwhile Rosneft's Verkhnechonskneftegas subsidiary reached peak output of 8.5 million tonnes/year in 2015 (172,000bpd), a level that is expected to remain flat for the rest of the decade. Furthermore, Rosneft has at least eight exploration licenses in the near vicinity, and according to current estimates the fields already identified here could yield an additional 3-4 million tonnes/y of oil production (approx. 75,000bpd). The Chayandinskoye field, operated by Gazprom as part of its gas export plans, is also expected to be a key liquids contributor, with the first wells already having been drilled and output expected to reach 30,000bpd by the end of this decade.



The outlook for development of the **Yurubcheno-Kuyumbinsky OGPC** is less certain, although plans for a delayed start-up now appear to have been confirmed. Originally Rosneft and Slavneft planned to produce a combined 9.5 million tonnes/y (190kbpd) from the Yurubcheno-Tokhomskoye (Rosneft) and Kuyumba (Slavneft) fields by 2017, rising to a peak of around 11 million tonnes/y (220kbpd) over 2-3 years, with Transneft scheduled to construct the infrastructure to take this crude to the ESPO. However, delays in field development have meant that Transneft will now develop the pipeline capacity in stages, reaching 8.6 million tonnes/y of capacity in late 2016 rising to 15 million tonnes/y by the end of 2023. Oil production will rise more slowly as well, with 1.1 million tonnes (22kbpd) fed into the pipeline in 2018 rising to 9.9 million tonnes 200kbpd) in 2023 and a peak of 11 million tonnes (220kbpd) in 2024.³⁰⁰

The Botuobinsky OGPC includes the Srednebotuobinskoye, Tass-Yuryakhskoye, Irelyakhskoye, Machchobskoye, Stanakhskoye, Verkhnevilyuchanskoye, and Mirinskoye fields which are in various stages of the development process. The most extensive, with 167 million tonnes/y (1.2 billion barrels)³⁰¹ of ABC1+C2³⁰² reserves, is Sredne-Botuobinskoye, owned by Rosneft's Taas-Yuriakh subsidiary. The field is already onstream, having produced around 0.9 million tonnes of crude (around 18kbpd) in 2015, but the plan is to increase this to a peak of 6 million tonnes/y (120kbpd) over the next few years as BP brings its expertise to bear.

The Yarakhtinsko-Dulisminskaya zone is mainly managed and operated by Irkutsk Oil company (IOC), which produces oil from six fields in the region. Output has grown from less than 1 million tonnes in 2011 to 5.6 million tonnes (115kbpd) in 2015, and plans for further exploration and development of new fields should extend this further over the rest of the decade. Also located in the same region is the Dulisminskoye field, recently sold by Sberbank to the Belarussian businessmen Yuri and Alexei Khotin. Current production is around 15-20kbpd.

The Sobinsko-Teterinsky OGPC holds the smallest oil production potential (gas accounts for the main hydrocarbon resources here). According to current estimates, the maximum scope of oil output in this area will be about 0.5 million tonnes/year (10kbpd). However, the insignificant potential of the Sobinsko-Teterinsky oil and gas producing centre, as well as its remote location from ESPO, make commercial production of this centre unlikely in the near future.

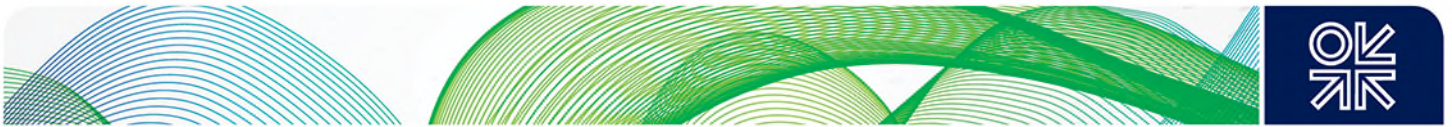
Nevertheless, in a high case scenario production from East Siberia and Yakutia could rise from around 45 million tonnes in 2015 (900kbpd) to as much as 72-73 million tonnes (1.5mmbpd) by 2022. In a more moderate scenario, which is perhaps more likely in a lower oil price environment, some projects could be delayed and this would mean oil output in the range of 60-65 million tonnes (1.2-1.3mmbpd) by 2022. In addition to the crude actually produced in the region, though, further crude oil and liquid hydrocarbons (e.g. condensate) are expected to be diverted from West Siberia, which could total up to 30 million tonnes/y (600kbpd). This would mean that the total oil available for export to Asia could reach 80-90 million tonnes/y, allowing for local demand for crude oil in the Far East region, where the Khabarovsk and Komsomolsk refineries have a combined capacity of 13 million tonnes (260kbpd) that will be supplied via the ESPO pipeline.

³⁰⁰ Interfax, 21 Jan 2016, "Kuyumba-Taishet pipeline to achieve capacity in two stages"

³⁰¹ Interfax, 2 June 2015, "BP, Rosneft discussing acquisition of 20% stake in Taas-Yuryakh project"

³⁰² Russia currently uses a temporary system of reserve classification that was introduced in 2001. This system inherited approaches that were proposed back in Soviet times and the primary classification criteria that it uses take into account geological and technical features of reserves. At the same time this method pays almost no attention to the economics of developing the fields. According to the Russian system of classification, reserves are divided into categories according to available information:

- A, B, C1 – proven reserves
- C2 – preliminary estimated reserves
- C3 – potential reserves
- D1, D2 – forecast resources



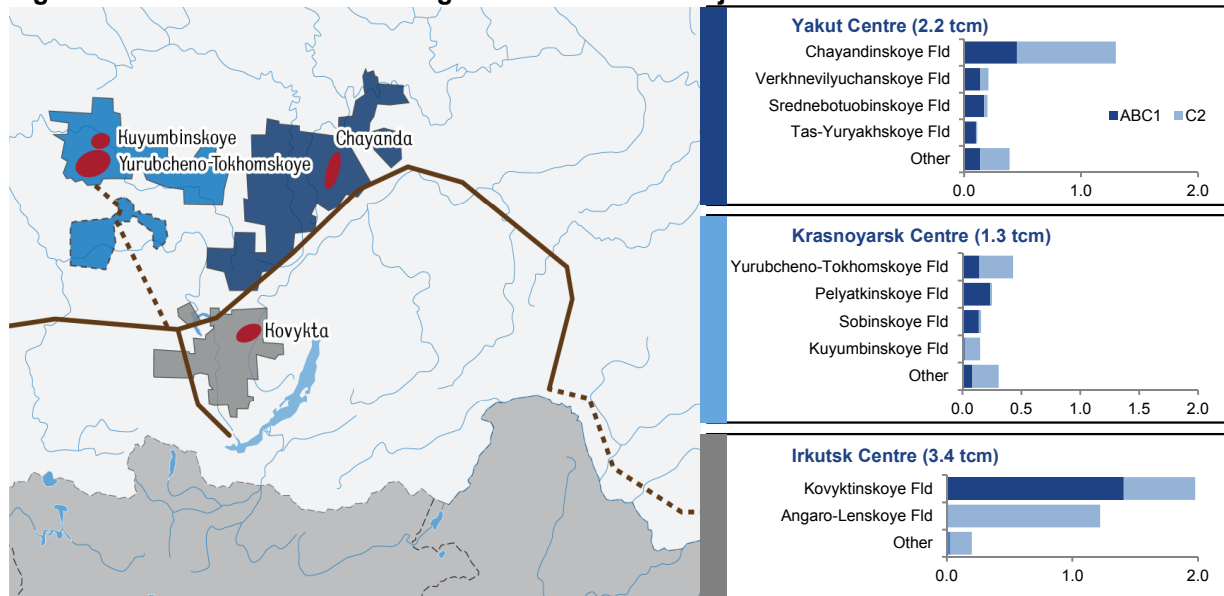
Annex 2. Gas producing centres in Eastern Siberia and the Far East

There are four gas production centres defined in the east of the country, all of which have limited domestic markets and an appetite for export sales to Asia. The key regions are:

- The Yakutsk centre (Chayandinskoye field)
- The Irkutsk centre (Kovyktinskoye field)
- The Sakhalin Island and the Kamchatka Peninsula
- The Krasnoyarsk centre

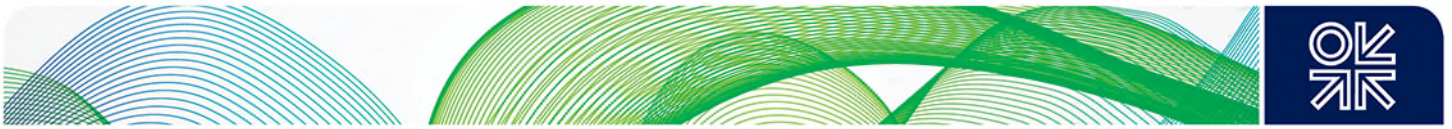
The most important gas field in East Siberia is **Chayandinskoye** as Gazprom plans to make it the foundation of its production and exports in the region. Located in Yakutsk, it contains 1.45 tcm of gas reserves and 93 million tonnes of liquid hydrocarbons (c.700 million barrels), and at full capacity will annually produce up to 23-25 bcm of gas (Figure A2) and no less than 1.5 million tonnes of oil condensate. However, in common with other fields in Eastern Siberia, Chayandinskoye has a complicated geology, and its gas has a complex chemical composition, in particular containing a significant portion of helium (0.58% of the resources amounting to 1400 million m³), which has significant value and must be stripped out prior to sale of the remaining gas.

Figure A2: East Siberian onshore gas resources and major fields



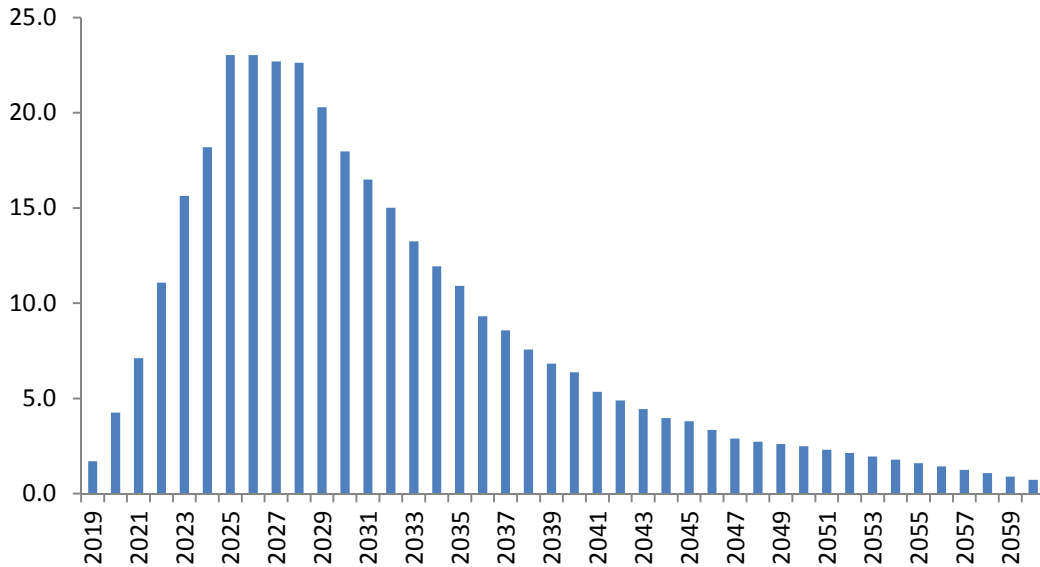
Sources: Skolkovo, ERI RAS

The timing of field development has been adjusted in accordance with estimates of when gas exports to China, which are fundamental to support the economics of the project, will begin. Production of the field's oil reserves began in 2014, and gas production had originally been planned for 2017, but this has now been pushed back to 2018 to accommodate the likelihood that exports to China will not begin before 2019 (see below). Initial work on well pads and field infrastructure has begun in 2016, with the first production wells also being drilled, although some of the geological difficulties could slow the production process as a special processing unit will need to be built. Nevertheless, it is currently



anticipated that the field will be ready to start ramping up output from late 2019, at a total estimated cost of \$15-17 billion,³⁰³ and will sustain the production profile shown in Figure A3.

Figure A3: Gas production at Chayandinskoye field, bcm



Sources: Goldman Sachs, ERI RAS (production schedule moved off two years because of Gazprom statement on Investor Day in 2014).

Given the decline rate anticipated at Chayandinskoye in the 2030s Gazprom is also planning the development of the huge **Kovyktinskoye field** in Irkutsk to provide longer term production capacity. Its proven gas reserves amount to 1.9 tcm, with extractable resources of gas condensate of 77 million tonnes, and the field is also rich with helium. Gazprom’s ownership of the field dates back to its purchase from TNK-BP in 2011, after which an initial pilot development commenced. However, it has always been cast as the second field in East Siberia to support exports to China, and as a result the development timetable does not envisage production starting before the 2020s (Figure A4). The field has a production capacity of 35 bcm/year, but the actual peak may be reduced to 25 bcm/year depending on ultimate demand for the gas.³⁰⁴ Furthermore, it is also possible that the commissioning of the field will slip to 2022 or beyond, again depending on the exact timing of gas exports to China, as there is a two year window for slippage if either side decides to delay. The current development cost of the field has been estimated at \$14-16 billion, although this may have been reduced somewhat thanks to the devaluation of the ruble.³⁰⁵

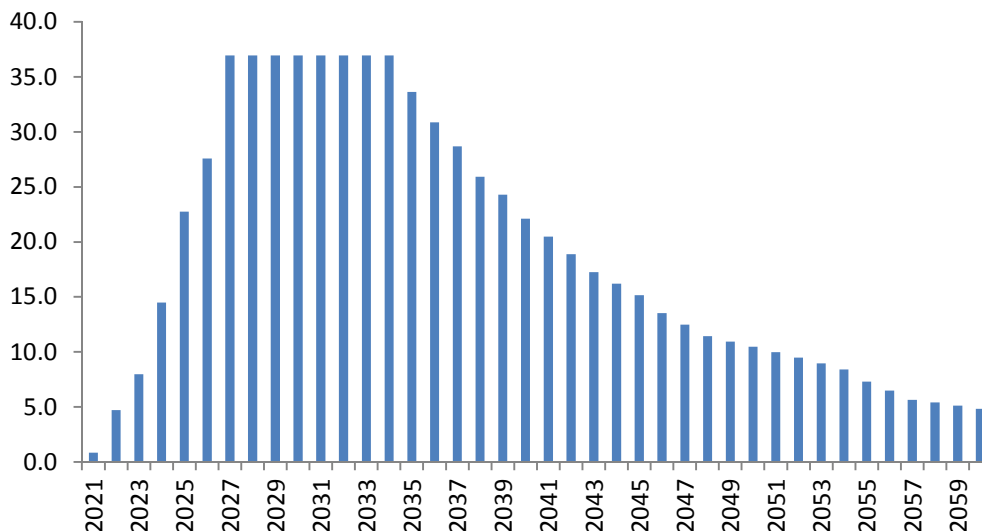
³⁰³ RBK Business News, 26 April 2014

³⁰⁴ Interfax, 22 March 2016, “Gazprom lowers plateau production at Kovykta from 35 to 25bcm/a”

³⁰⁵ RBK Business News, 26 April 2014



Figure A4: Gas production at Kovyktinskoye field, bcm



Sources: Goldman Sachs, ERIRAS (production schedule moved off 2 years because of Gazprom statement at the Investor Day).

In addition to these two giant fields there are a number of other smaller fields in Eastern Siberia. Next to the Kovyktinskoye field, Gazprom has discovered the Chikanskoye field, which contains around 100bcm of gas reserves and is currently at the stage of pilot commercial operation.³⁰⁶ Interestingly non-Gazprom third parties, in particular Rosneft, also have some gas resources in this region, although this is primarily associated gas from the oil fields. The most important are Angaro-Lenskoe (Petromir, C1+C2 gas reserves are 2.72 tcm), Yurubcheno-Tokhoms koye (Rosneft, with 237 mln tonnes of C1+C2 oil reserves and 387 bcm of C1+C2 gas reserves), Srednebotuobinskoye (Rosneft, 115 bcm of C1+C2 gas reserves), Talakanskoye (Surgutneftegaz, 64 bcm of C1+C2 gas reserves), as well as a number of smaller gas fields belonging to Irkutsk Oil Company.

All these fields could provide support to Gazprom’s output if required and could also help to meet domestic demand, if they can gain access to the relevant pipeline infrastructure. The debate about this access is continuing in 2016. In total, though, Rosneft has announced its ability to supply up to 18 bcm/year of associated gas from its East Siberian oil fields,³⁰⁷ while Irkutsk Oil Company could produce up to 5 bcm/year and Petromir, more speculatively, as much as 13bcm/year.³⁰⁸

Beyond East Siberia, in the Russian Far East, important gas resources are also located offshore Sakhalin Island. Total resources in the area amount to around 2tcm of gas, but most of the proven reserves are concentrated in the Sakhalin-1 and Sakhalin-2 projects. However, significant discoveries on the Sakhalin 3 license offer hope for medium term production, while many other undeveloped fields with significant hydrocarbon resources (projects Sakhalin 4-9) have also been identified, which suggest that gas production could also be sustained in the longer term (see Figure A5).

³⁰⁶ Gazprom web site at <http://www.gazprom.com/about/production/projects/deposits/gas-production-center/>, accessed on 15 April 2016

³⁰⁷ Vedomosti, 17 April 2014

³⁰⁸ Energy Tribune, 6 March 2007, “Petromir finds giant gas field near Kovykta”

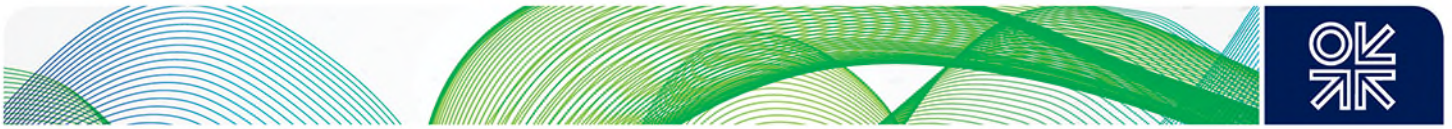
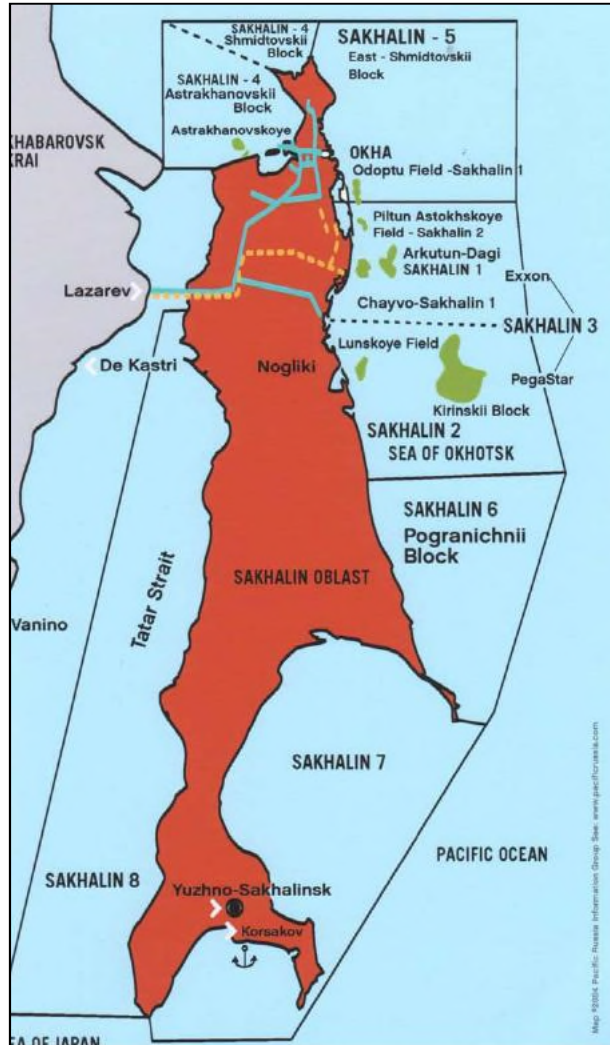


Figure A5. Sakhalin Island major hydrocarbon fields



Source: (Henderson and Pirani S. (eds), 2014).

In the context of Russia’s relations with China, though, and indeed its overall gas export strategy in the Asia-Pacific region, the Sakhalin 1, 2 and 3 projects are of most relevance. All three have the capability to expand output from the island, either via pipeline or LNG projects that are targeted directly at China or could provide gas for purchase by Chinese customers in a traded market.

Sakhalin 1, which is owned by Rosneft, ExxonMobil, ONGC and Sodeco, has to date been largely an oil project with some associated gas output. Following the recent development of the Arkutun-Daginskoye field, which has supplemented output from the Chiavo and Odoptu-More fields, oil output has now reached over 250,000bpd, while associated gas production totals around 12bcma. Most of this (around 9bcma) is reinjected into the oil fields in order to sustain reservoir pressure, while the remainder is sold into the domestic market. However, the consortium has long had a plan to monetize its gas reserves, negotiating potential gas pipeline exports to China as early as 2006. This would have involved the development of extensive non-associated gas reserves in the Chiavo field (see Figure A6 below), but was put on hold when Gazprom blocked the sales, insisting on its monopoly right to export Russian gas. Since then Rosneft and Gazprom have held increasingly heated discussions over the price that the latter would be prepared to pay for Sakhalin 1 gas, and the lack of agreement ultimately led to the Sakhalin 1 consortium planning their own 5-10mtpa LNG export scheme (see discussion below).

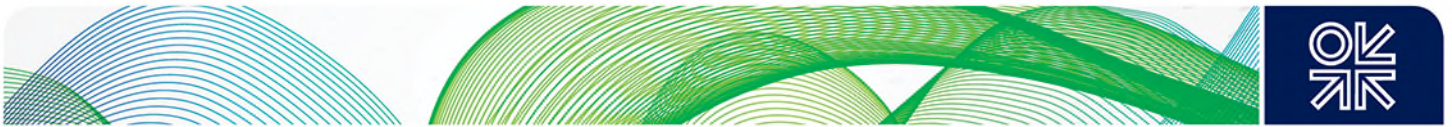
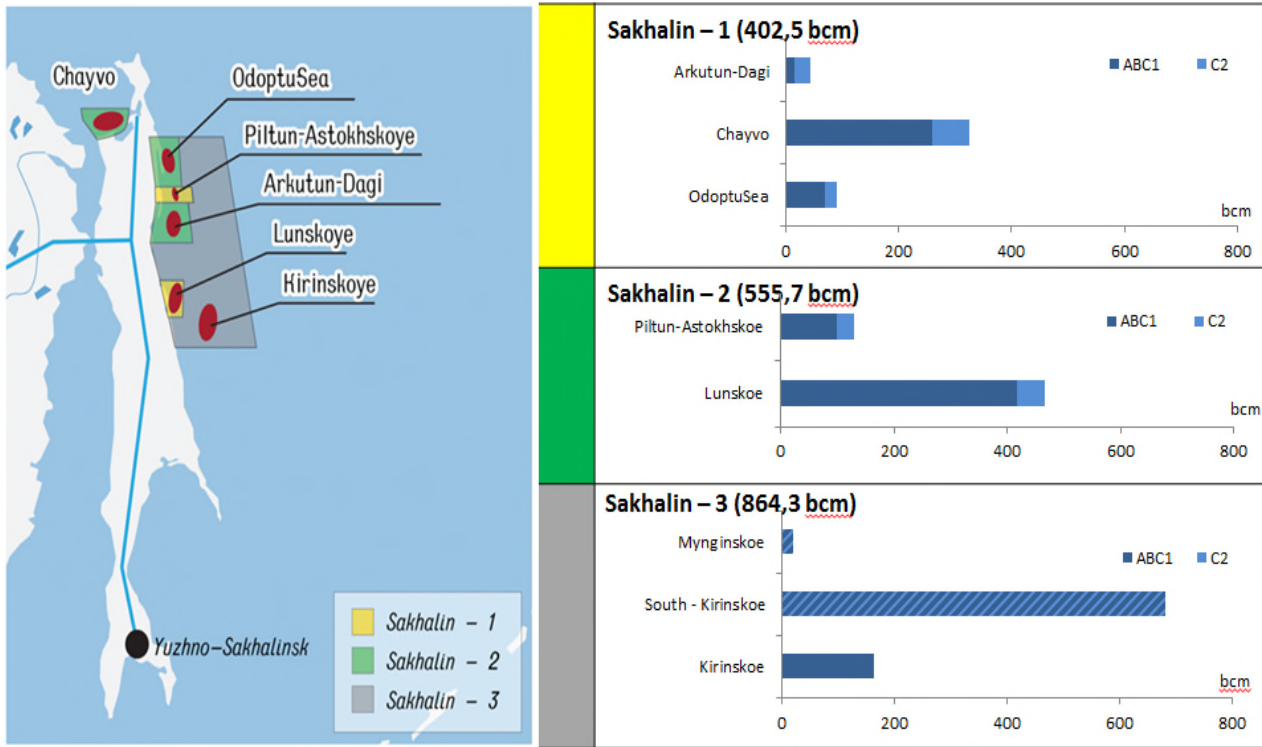


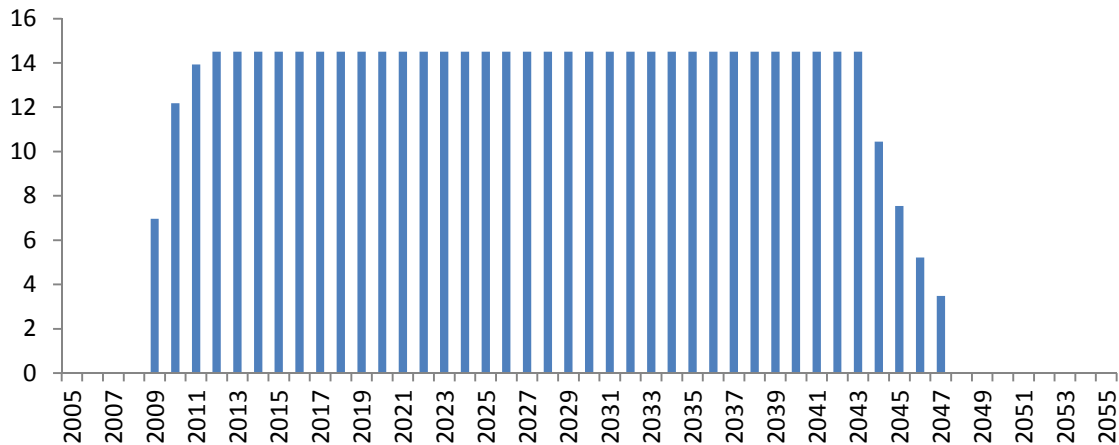
Figure A6: Sakhalin-1, 2, 3 gas resources



Sources: Skolkovo, ERI RAS

A more logical use of Sakhalin 1 gas would be to aid the expansion of the Sakhalin 2 project, which has been producing 10.5mtpa of LNG since 2009 but which has the capacity to add a third train if gas is available. The **Sakhalin-2** licence (Gazprom, 50% plus one share, Shell, 27.5% minus one share, Mitsui 12.5%, and Mitsubishi 10%) has sufficient output from the Lunskoye field to sustain production at 14bcm/a for the foreseeable future (see Figure A7), but the other field on the licences (Piltun Astokhskoye) only produces oil, hence the need for gas from an alternative source for any expansion.

Figure A7: Marketable gas production at Sakhalin-2, bcm



Source: Goldman Sachs



In the absence of an agreement with the Sakhalin 1 consortium, Gazprom is hopeful that the extra gas can come from the **Sakhalin-3** licence, which includes four field blocks on the shelf of the Sea of Okhotsk: Kirinsky, Veninsky, Ayashsky and Vostochno-Odoptinsky. By far the most important of these is Block 4 (Kirinsky), where the Kirinsky and South Kirinsky fields are located with a combined total of around 800bcm of gas plus potentially 90 million tonnes of condensate (the much smaller Minginskoye field, which is close to Kirinsky has a further 20bcm of gas reserves). Some test production at the Kirinsky field began in 2013, and it is estimated by Gazprom that it could ultimately produce 8-9bcma in combination with Minginskoye, but the major gas output would come from the larger South Kirinskoye field, which has over 600bcm of gas reserves.

Three complicating factors have hindered development to date, however. Firstly, Gazprom is relatively inexperienced at offshore development, especially using subsea tie-back technology which is planned for South Kirinskoye. Secondly, the presence of significant oil reserves, which would probably have to be produced before much of the gas, could delay future gas output. And finally, Gazprom's plan to involve Shell in the development of the field, in order to compensate for its own lack of experience, has been undermined by the fact that the license has been sanctioned by the US authorities because it is in deep water and is oil-bearing. As a result, it remains unclear exactly when any significant gas will emerge from the license either to be piped to domestic or export markets, or to be liquefied at an expanded Sakhalin 2 scheme. Initially the field had been set for commissioning in 2018 and was expected to reach peak production by 2020 of 11.4 bcma. However, according to Gazprom's latest Eurobond prospectus, production at the field will now only start in 2019, and the peak, which has now been increased to 16 bcma of gas, is to be achieved in 2023-2024.

The remaining Sakhalin licences (5-9) contain a further 5 billion tonnes of oil equivalent of oil and gas resources, but are at a very early stage of exploration and cannot realistically be expected to produce any marketable gas before 2030. Nevertheless, in the context of Russia's relationship with China, they can provide opportunities for exploration joint ventures with the prospect of long-term investment in new fields. To date only Rosneft has shown any real inclination to bring in Chinese partners in the area, but it is not inconceivable that over time Gazprom may also be persuaded to create joint ventures with Chinese companies, especially if sanctions continue to impede the activities of western oil companies.