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ANALYSIS

The Political Challenges of an Oil Boom: the Resource Curse and Political Stability in Russia[1]

By Andreas Heinrich & Heiko Pleines, Bremen

Abstract

This article discusses the political challenges arising from the Russian oil boom. It focuses on the regulation of foreign direct investment, the role of state-controlled companies and the management of resource revenues. It argues that inefficient governance allows the exploitation of resource revenues within political patronage networks, while, on the other hand, the insulation of the management of resource revenues from the patronage networks guarantees the future availability of rents. At the same time, the distribution of smaller parts of the rents to the larger population is meant to ensure that no serious political challenge to the patronage system will occur.

Common sense would predict that countries with huge oil and gas resources prosper, or at least perform better than those without such natural wealth. However, the actual performance of resource-rich countries has been meagre. Russia is often seen as a point in case. The first conceptual approaches to explain the related problems of oil and gas producing countries were the 'rentier state' and the 'Dutch disease'.

The concept of the rentier state was created in reaction to the rise of petro-states in the Middle East. The basic idea is that in the wake of a resource boom a national economy receives large external rents, i.e. considerable income (from oil exports) without the need for major capital investments (as in a boom phase the world market price for oil is much higher than production costs). This approach was pioneered in 1970 by Hossein Mahdavy's comparative study of Iran. He stressed that the large share of external rents in the state budget had important consequences for the political system: 'A government that can expand its services without resorting to heavy taxation acquires an independence from the people seldom found in other countries. However, not having developed an effective administrative machinery for the purposes of taxation, the governments of rentier states may suffer from inefficiency in any field of activity that requires extensive organizational inputs. In political terms, the power of the government to bribe pressure groups or to coerce dissidents may be greater than otherwise. By the same token, this power is highly vulnerable since the stoppage of external rents can seriously damage the government'.

The negative macro-economic impacts of a resource boom were summarized as Dutch disease, a term first coined by the British journal 'The Economist' in the 1970s in an analysis of the economic development of the Netherlands after North Sea oil had been discovered. The starting point is that oil exports lead to huge inflows of petro-dollars, which causes a rise in the exchange rate. This in turn has two major consequences: high inflation rates and reduced competitiveness of the domestic non-resource sector, which can potentially lead to de-industrialization. At the same time the oil and gas industry employs only a small number of people and does not induce major modernization or innovation processes in the national economy.

Since the late 1980s many macro-statistical studies, looking for correlations between resource booms and manifold country-level indicators, asserted that natural resource abundance increases the likelihood that countries will experience negative economic, political and social outcomes, including poor economic performance, increased income inequality, widespread poverty, low levels of democracy, high levels of corruption and a greater likelihood of civil war. In this context, the term 'resource curse' was coined by Richard Auty in a book published in 1993. This literature has been extremely influential: the idea that natural resources are bad for development is now widely accepted.

However, after more than two decades of research on the issue, there is still no conclusive evidence regarding the effects—and even less regarding the causal mechanisms—of the 'resource curse'. Contradictory results are due to differences in the quality of data, in the operationalization of variables and in the construction of statistical models. Looking into regional differences Thad Dunning (2008) comes to the conclusion that resources are bad in many regions of the world, but have a marked positive political impact on development in Latin America. Indeed, some resource-rich countries, most promi-

1 This article is based on research from the project 'The Energy Sector and the Political Stability of Regimes in the Caspian Area: A Comparison of Kazakhstan and Azerbaijan', which has been conducted by the Research Centre for East European Studies at the University of Bremen from 2009 until 2011 with financial support from the Volkswagen Foundation.

nently Norway, manage a resource boom very well, and thus mitigate or avoid the negative impacts.

The Concept of Resource Challenges

That is why there is a growing consensus in the academic literature that institutional weakness is central to the explanation of the negative effects of resource booms. That means, the negative consequences of a resource boom are by no means an inevitable 'curse', but can be mitigated through adequate policy choices. If we assume that the specific features of the resource curse can be influenced by policy choices, the political decision-making process is introduced as an important explanatory factor. For that reason we prefer to speak of resource challenges instead of a resource curse.

In this context several sets of policy challenges arising from an oil or gas boom can be identified. For the purpose of comparing the ways in which political decision-makers address the related policy issues, it makes sense to group these challenges according to policy fields and examine the development of policy responses over time. Of course, these fields are highly interconnected, and decisions in any one area certainly impact policies in the others.

- The most basic resource challenge for governments is to ensure control over the resources by guaranteeing the state's monopoly of power and its legal claim to ownership of (or income from) the natural resources concerned. This claim might be challenged by foreign powers trying to invade the resource-rich region, by separatist movements in the resource-rich region or by armed gangs using violence to extract a share in profits. In the case of offshore-fields legal ownership might be subject to international law and arbitration.
- Another major group of policy issues concerns the regulation of oil production, covering the creation and implementation of regulations, dealing with issues ranging from ownership rights over licensing, taxation and foreign direct investments to environmental safety, as well as negotiations with foreign investors and the decision on whether to establish a national oil company.
- A third challenge is the development of export infrastructure, as an oil or gas boom can only materialise if a large share of the production is exported. For most oil producing countries this task is limited to the construction of port facilities. However, if reserves are situated in landlocked areas pipelines need to be built.
- A fourth group of policy issues is related to financial flows resulting from the sale of resources. This covers the challenges summarized as Dutch disease as well as budgetary policy, as it has to be decided which part of resource revenues will be channelled into the state budget under what conditions. In authoritarian states the oil money can be used to strengthen regime stability as described in the rentier state approach.
- A fifth group of resource challenges pertains to the effective implementation of the designed policies (independently of their content). Major issues in this group are administrative reform or anti-corruption measures, as the influx of petro-dollars hugely increases the risk of bribes.
- The final two groups comprise long-term challenges of industrial policy to diversify the economy beyond the resource sector and socio-economic challenges to improve the well-being of the population.

Obviously, depending on the specific country some resource challenges are not relevant and some seem to be more pressing than others. That means every country that experiences a resource boom is confronted with a specific combination of resource challenges. Moreover, as different leaders react differently to the same challenges, policy outcomes vary. This introduces dynamic aspects into the concept of resource challenges. In the short term, a change in leadership (or even a leader's change of mind) can lead to a policy change in relation to resource challenges. In the longer term, the set of relevant or most pressing resource challenges can change.

Post-Soviet Resource Challenges

For Russia contextual factors, many of which were inherited from the Soviet system, have largely determined the set of relevant resource challenges. As the Soviet oil and gas industry was focused on onshore production in Western Siberia, it never came to acquire the requisite expertise for offshore production. In addition, the economic crisis which accompanied the break-up of the Soviet Union depleted capital for larger exploration and development activities. The resulting weak economic situation as well as the need for technology and expertise created a strong demand for foreign direct investment (FDI). At the same time, the collapse of the Soviet command economy left a regulatory void in relation to property rights and investment. The resource challenges related to the regulation of oil and gas production were, therefore, particularly acute for the post-Soviet states.

With a recent history of hyper-inflation, weak financial institutions and low international competitiveness, Russia was especially vulnerable to the Dutch disease, making resource revenue management all the more critical. In addition, the inherited Soviet-style administrative systems meant that problems related to weak administrative capacity and corruption also constituted a major challenge.

The location of oil and gas deposits far away from ports and foreign markets also means that revenues can only be received if a functioning system of export pipelines is in place. This added a foreign policy dimension to the resource challenges.

Finally, the nostalgia of large parts of the population for the Soviet welfare system had the potential to put pressure on the political leadership to deal with the resource challenge of promoting socio-economic development, or at least to maintain large parts of the Soviet-era welfare system.

Regulation of Foreign Investment

With no relevant legislation in place, all post-Soviet states saw production sharing agreements (PSAs) as the preferred means of regulating FDI in oil and gas production, because these case-specific agreements are immune to administrative and legislative changes in the host country.

Although host governments and investors may have complementary interests, as both profit from rising oil or gas production, there are limits to reciprocity. On the one hand, big multi-national companies can have an information advantage, as they often have a better understanding of the nature of deposits, the technical challenges and the amount of profits to be expected. On the other hand, oil and gas projects are characterized by large capital investments. Thus, the host government might use the (sunk) assets as 'hostages' to extract increased resource rents and/or limit foreign ownership through forced divestment and expropriation of assets.

The Russian state has been markedly indecisive concerning foreign direct investment in the oil and gas industry, swinging between a desperate need for investment in order to modernise one of the most important sectors of the Russian economy and a fear of surrendering control over this important sector to foreign interests. Which aspect dominated was influenced by general political and economic trends. Until 1992, when enthusiasm for market reforms was growing, the legal foundations for joint ventures were laid. When public sentiment against capitalism and a sell-out to foreign investors was rising, restrictions on foreign investment were tightened. When the financial crisis of 1998 made foreigners the only possible source of cash, a more attractive PSA law was enacted rather smoothly. Increased earnings, resulting from the rise in world market prices for oil, then again cooled the interest in foreign direct investment in the industry. In a turn to resource nationalism the role of state companies in the industry was increased.

This turn was in line with international developments. The allure of enormous profits prompted many resource-rich countries to seek to increase their contractual share of fossil fuel revenues often through a violation of investors' rights. Russian authorities endeavoured to boost the country's share of oil and gas monies by undermining the rights of foreign oil and gas companies, namely by accusing them of violating environmental regulations, contractual terms or taxation rules. Once contracts had been redrawn in the government's favour, however, the charges were consistently dropped. By now all oil and gas projects in Russia give a prominent role to Russian companies.

Promoting National Oil and Gas Companies

As a means of both retaining a dominant stake in resource production and developing domestic know-how and capacity in the field, national oil companies (NOCs) help governments to maintain sovereignty and control over domestic fossil fuel endowments.

While the Russian gas industry in the form of the monopolist company Gazprom remained under state control, large parts of the country's oil industry were privatised in the 1990s and neither specific fields nor deals with foreign investors were reserved exclusively for NOCs. As a result, the share of the state in oil production dropped below 15% in 2002. However, under president Putin this trend was stopped and state support for NOCs related to resource nationalism led to a threefold increase in the state's share from 2004 to 2007. An important feature in the process of increasing state ownership in the oil industry was the state's reliance on heavy pressure and legally dubious measures. The Yukos affair has become the prime example of this. As a result, the major Russian NOC in the oil industry, Rosneft, is now a leading player.

Many experts regard the dominant role of state-controlled companies as a major cause of poor resource management. However, this view assumes competitive markets. But the natural resource sector is generally characterized by the dominance of a limited number of large companies. Furthermore, extreme economics of scale within the production process hamper the entry of new companies into the sector. In his analysis of the role of the state in the oil and gas industry, Joseph Stiglitz (2007) concludes that in such an environment private companies do not necessarily operate more efficiently than state-owned ones. Instead, the institutional setting and the political attitude of the government in charge are important criteria for the efficiency of the oil and gas sector.

In Russia the commercial efficiency of NOCs has been compromised by three factors. First, the companies lack organizational stability as a result of regular structural 'reforms' and personnel reshuffles. Second,

the political leadership has burdened the NOCs with tasks that do not normally fall within their scope of operation, namely regulatory functions and the provision of subsidies to industry and the social sphere. As a result of this continual interference, the NOCs are greatly hampered in performing their designated activities. Third, NOCs are partly seen as a self-service shop by political elites charged with oversight over the respective industry. A report by the Warsaw-based Centre for Eastern Studies thus concludes: "The process of Gazprom's assets being taken over by private companies and business partners from within Vladimir Putin's closest circle is underway." Next to Gazprom and Rosneft, which are controlled by the national government, Tatneft, controlled by the regional government of Tatarstan, is also a prime example for these negative features of state-owned companies.

Management of Resource Revenues

Large foreign currency inflows from exports of natural resource make the financial situation of the exporting economy highly dependent on world market prices. In order to provide a cushion for times of falling prices and also in order to sterilize the inflow of petro-dollars and to avoid symptoms of Dutch disease, sovereign wealth funds (SWFs, also called national wealth funds) have become a major instrument for managing a large share of the revenues that the state derives from resource exploitation.

Russia has successfully established a sovereign wealth fund during the first term of Putin's presidency. The fund, which was split into two in 2008, has accumulated considerable amounts of resource revenues. The funds have helped to ward off obvious symptoms of the Dutch disease, and perhaps even more importantly, they were instrumental in limiting the impact of the 2008–09 global financial crisis on the national economy.

A technocratic team has defended the revenues accumulated in the wealth funds against the demands of political interest groups. This proves that despite an inefficient and corrupt state bureaucracy, policies can be implemented successfully in Russia if they are directly supported by the president/prime minister and can be realized by a small technocratic team.

Further Resource Challenges

The resource challenges described above concern all oil and gas producing countries. They are specific for the post-Soviet countries only in so far as they were much more pressing than in other countries, because not only regulation directly related to oil and gas production, but the full legislation and state administration related to a market economy had to be created from scratch.

However, two further resource challenges are also relevant for Russia. One of these challenges is a rather unique feature of the post-Soviet region. As most oil and gas deposits are situated in land-locked areas, post-Soviet oil and gas producers are one of the very few which rely heavily on international export pipelines. This has important consequences. As export pipelines are long-term projects, they rely on strategic cooperation with both importing countries and transit countries. Accordingly, the decision on export pipelines becomes part of a country's foreign policy and geopolitical strategy.

Another important resource challenge for Russia is the promotion of socio-economic development. This aspect has gained in importance for two reasons. First, two decades after the end of the Soviet Union the regulation of the oil and gas industry is fully in place and the process of adjustment to higher world market prices (and related policies of resource nationalism) has clearly been designed. As a result the resource challenges related to regulation have become less pressing and there is now a desire to move ahead. Second, while the first oil revenues were used to compensate for investment costs and to reduce state debts, the oil boom of the 2000s has led to strong economic growth and to the accumulation of larger financial funds. This development has given risen to expectations of improved well-being among the population. Public pressure is visible in Russia, where protests are discouraged by the political leadership, but are not impossible as has been demonstrated in recent months.

This is why the Russian government has conducted some populist transfer payments to the population, but there have also been attempts to develop long-term projects aimed at socio-economic development. Already in the mid-2000s, Russia started four so-called national projects to be financed with oil revenues, which were aimed to address infrastructural problems. In addition, the Russian government tries to stimulate the modernization of the economy as a means to diversify away from the production of natural resources. However, the success of these long-term policies has so far been very limited. The major obstacle has been the lack of governance capacities due to an inefficient and corrupt state administration.

Explaining Performance: The Link to Politics

Russia has proven to be relatively efficient in addressing clearly defined, limited tasks of a technocratic nature, such as dealing with foreign investors or managing the sovereign wealth funds. As a result of this capacity, Russia has stabilized oil and gas production while managing to avoid overt symptoms of Dutch disease.

However, as soon as the political elites begin to interfere in these activities, serious governance problems ensue, resulting in decreased efficiency and reduced sustainability of policies and regulations, namely in the cases of the national oil and gas companies, as well as social policies. Governance issues also harm the country's relationship with foreign investors.

Based on the standard academic benchmark of a successful public policy, that is, one that aims to promote the public good, Russia is showing strong deficits. However, for the Russian elites, the relevant criterion often seems to be political stability and increased personal power and wealth.

A relatively stable political environment under Putin has enabled the evolution of larger elite networks, often referred to as oligarchic and secret service camps, although their composition is more diverse. It seem that vast, multi-layer patronage networks have emerged which help to stabilize political leadership, as they can be used to co-opt potential rivals. These networks, which transcend the constitutional institutions of the state and are based on a logic of mostly bilateral exchange between patrons and clients, thus play a vital role for regime stability. Although resource revenues are obviously not a precondition for the formation of patron-client relations in politics, large revenues arising from oil and gas booms nevertheless serve to make these networks more attractive, more sustainable and more capable of broadening their scope to include more societal segments.

It is not clear how much these networks have been actively created by the top leadership or how far the top leadership has failed to fend off asset-grabbing from lower ranking elite groups, but this does not change their nature. And although the many distinct groups that make up these networks are frequently in competition with each other, they all regard the president/prime minister as their patron and willingly exchange loyalty and support for access to public offices and state funds.

Accordingly, the governance failure described above with reference to the public good is exactly the outcome the patrons might be aiming at. On the one hand, the inefficient governance and regular political interference into the management of the national oil and gas companies allow the exploitation of resource revenues within the patronage networks. On the other hand, the insulation of the management of resource revenues from the patronage networks guarantees the future availability of rents. At the same time, the distribution of smaller parts of the rents to the larger population is meant to ensure that no serious political challenge to the patronage system will occur.

This assessment has two important implications. First, the real challenge for post-Soviet rentier states is not the lack of governance capacities, as the public good view would suggest. The real challenge is the patronage system, which intentionally supports weak governance so that elites can exploit the loopholes for their own benefit. Second, the argument that the current governance system is not sustainable because it is inefficient and wastes financial resources on a large scale is simply not tenable: the political leadership in the post-Soviet rentier states has in fact made extremely efficient use of resources to create vast, sustainable patronage networks that have the capacity to guarantee political stability.

About the Authors

Dr. Andreas Heinrich and Dr. Heiko Pleines are working at the Research Centre for East European Studies at the University of Bremen. They are both specialising in energy politics in the CIS region. This article is based on their research project 'The Energy Sector and the Political Stability of Regimes in the Caspian Area: A Comparison of Kazakhstan and Azerbaijan', which has been conducted from 2009 until 2011 with financial support from the Volkswagen Foundation.

Further reading

- Vladimir Gel'man/Otar Marganiya (eds) (2010): Resource curse and post-Soviet Eurasia. Oil, gas, and modernization, Lexington Books: Lanham, MD.
- Heinrich, Andreas (2011): Challenges of a resource boom. Review of the literature. Bremen: Research Centre for East European Studies (Working Papers of the Research Centre for East European Studies, No. 114), available online at http://www.forschungsstelle.uni-bremen.de/UserFiles/file/06-Publikationen/Arbeitspapiere/fsoap114.pdf
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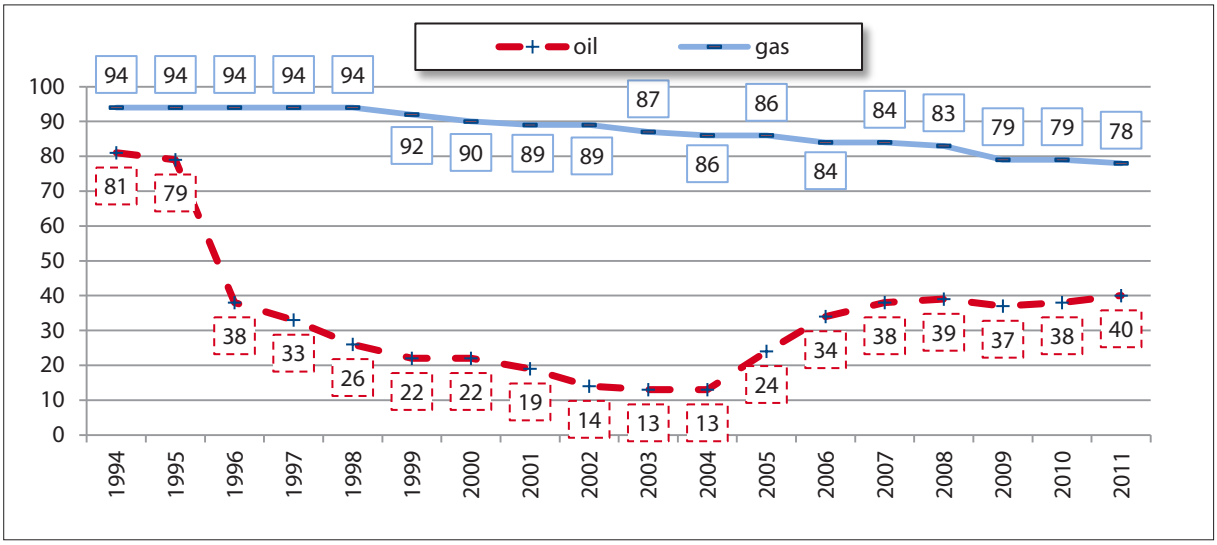
- Ewa Paszyc (2012): Gazprom's position on the Russian gas market weakening, Warsaw: Centre for Eastern Studies (OSW Commentary 2/2012), available online at http://www.osw.waw.pl/en/publikacje/osw-commentary/2012-02-23/gazprom-s-position-russian-gas-market-weakening

STATISTICS

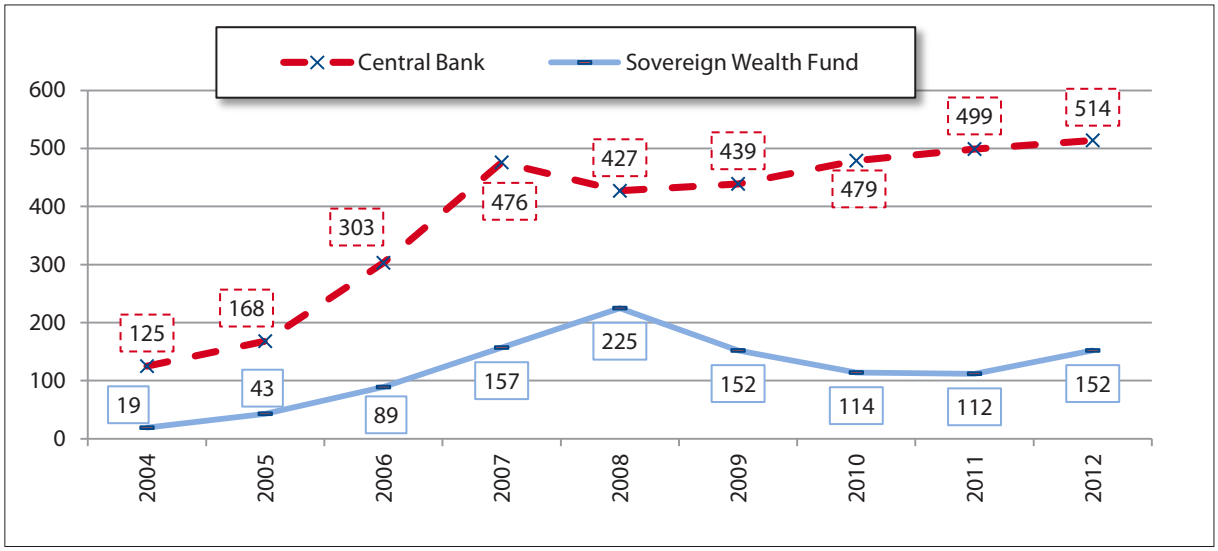
Russia's Oil and Gas Industry and its Impact on the Russian Economy

Figure 1: The Share of State-Owned Companies in Russia's Oil and Gas Production (in %)



Source: own calculation, based on company data and overall production figures from the Russian Federal Agency for Statistics.

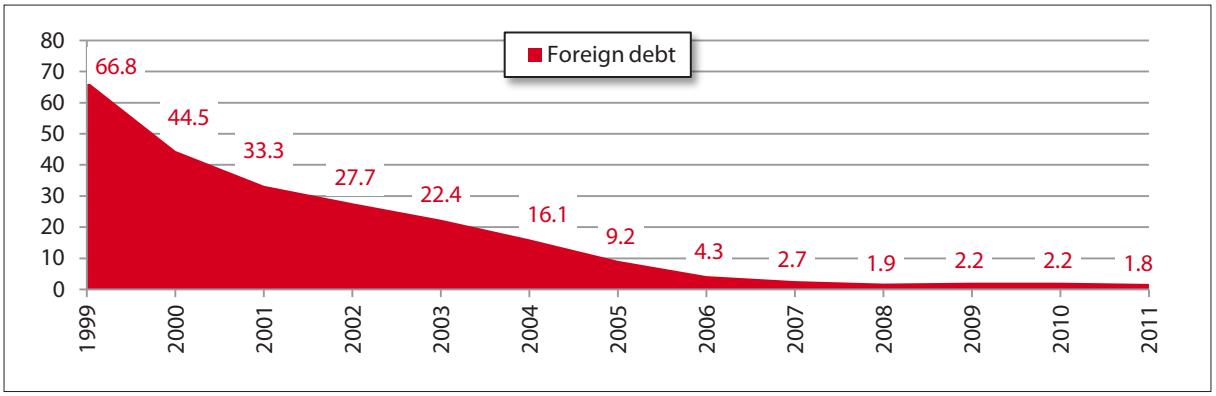
Figure 2: Russia's Sovereign Wealth Fund and Central Bank reserves (value in bn USD)



Note: Figure for 2012 as of March 2012.

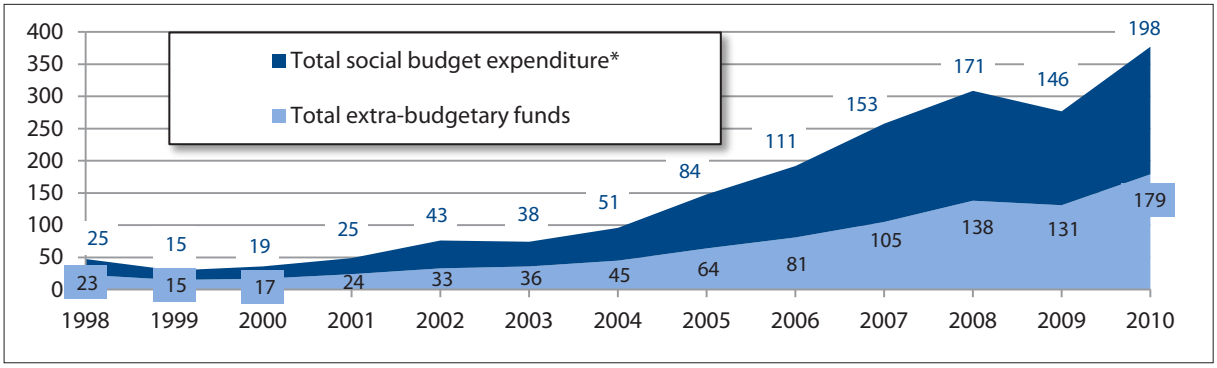
Source: Bank of Finland Institute for Economies in Transition, BOFIT Russia Statistics, http://www.bof.fi/bofit_en/seuranta/venajatilastot/

Figure 3: Foreign Debt of the Russian State (as % of GDP)



Source: Bank of Finland Institute for Economies in Transition, BOFIT Russia Statistics, http://www.bof.fi/bofit_en/seuranta/venajatilastot/

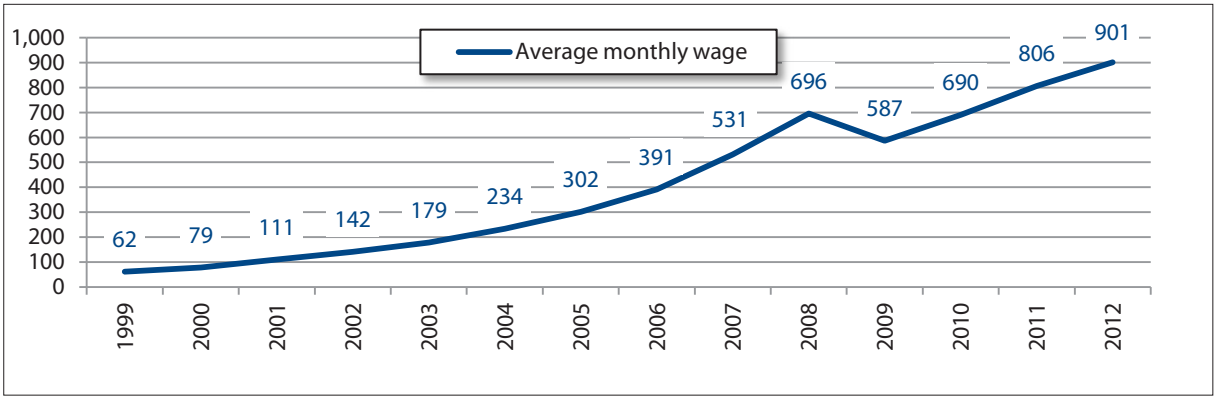
Figure 4: State Spending on Social Policy (in bn USD)



** without transfers within the budget (covered by official statistics since 2005)*

Source: Roskomstat, calculations by Dr. Jakob Fruchtmann, Research Centre for East European Studies; average exchange rate of USD: 1992–1994 Roskomstat, from 1995: www.oanda.co, http://www.gks.ru/bgd/regl/b08_51/IssWWW.exe/Stg/02-01.htm, http://www.gks.ru/bgd/regl/b04_51/IssWWW.exe/Stg/d010/i010070r.htm, http://www.gks.ru/bgd/regl/b02_51/IssWWW.exe/Stg/d010/i010050r.htm

Figure 5: Average Monthly Wage (in USD)



Note: Figure for 2012 as of March 2012.

Source: Bank of Finland Institute for Economies in Transition, BOFIT Russia Statistics, http://www.bof.fi/bofit_en/seuranta/venajatilastot/

ANALYSIS

Russia's Pipeline Overstretch: Market Monopolisation at the Expense of Reliability

By Jonas Grätz, Zurich

Abstract

The Nord Stream pipeline, which is going to reach full capacity this year, is a crucial tool for Russia's long-term influence in the EU gas market. In times of high uncertainty over future gas demand and market structure, it has the dual goal of cementing market share at oil-indexed (or in other words, high) prices, and strengthening Russia's market and political power vis-á-vis Ukraine by creating overcapacities for gas transport to the EU. Although not the most efficient transport route to the EU market, the pipeline may realise modest gains in transport efficiency in comparison with the Ukrainian corridor as production moves to the Yamal peninsula. Nord Stream is thus hugely advantageous for Russia, while it is not of particular value from an EU perspective. Meanwhile, the proposed South Stream pipeline is less efficient in terms of transport economics. Russia's strategy to construct new costly undersea pipelines is eroding Gazprom's reliability and competitiveness: Investment resources are being diverted towards long-term potential benefits of market monopolisation, while investments of immediate necessity in storage and production are being postponed.

Gazprom's Nord Stream pipeline through the Baltic Sea is close to completion and will possibly reach its full annual capacity of 55 bcm this year. This will realize Russia's first "Ukraine bypass" project. It implies that Russian export capacities to the EU will stand at roughly 250 bcm at the end of 2012, while actual exports in 2011 were merely 112 bcm—not even half of the expanded capacity that Nord Stream will contribute to. Meanwhile, Gazprom has been ordered by Putin to start construction of a second pipeline project, South Stream, during 2012. It has a planned annual capacity of 63 bcm and is intended to run through the Black Sea to Bulgaria. Costs for both pipelines may reach €40 billion. This strategy of building significant overcapacities begs the question why was it pursued in the first place?

Context of Gas Markets in Russia and the EU

Gazprom is highly reliant on export markets for gas—they contribute 70% of revenues, while only receiving about 40% of Gazprom's total natural gas sales. This predisposes Gazprom towards pursuing a strategy aimed at preserving high prices in export markets. Even though Gazprom pays lower taxes in comparison to the oil industry, it is Russia's biggest taxpayer because of its sheer size. Not only this fact, but also its huge cash flow that can be used for various inefficient and politically motivated investments in Russia and abroad, account for the extraordinary interest among political actors in maintaining and strengthening the export vector of the company. Thus, even assuming that the Russian political leadership and Gazprom are separate entities with differing interests, and while they may come into conflict over raising internal gas prices, they both agree on a strategy to extract maximum value from export markets.

In Gazprom's main market, the EU, gas supply has been severely shaken up by the EU's market liberalisation policies, and the coincidence of the technologically driven "shale gas revolution" in the US with an economic downturn in the EU. This helped the arrival of significant quantities of liquefied natural gas (LNG) into the EU market, while demand has been depressed, greasing the wheels of gas-to-gas competition. The emerging spot markets for natural gas, in conjunction with persistently high oil prices, are severely depressing the balance sheets of EU utilities, which are mostly bound to suppliers by oil-indexed long term contracts. The traditional structure of the market, which meant that EU utilities could easily take on oil-indexed long-term commitments as they could be certain that they could sell their products, is gone for good. So is the once unwritten rule of the European gas industry that no upstream or downstream partner would pursue profits, while the other is making losses. In their adversity, utilities try to negotiate with suppliers or take them to arbitration in an effort to replace oil indexation with other benchmarks or spot prices. The problematic issue is not so much long-term take-or-pay commitments, but rather the lack of competitiveness of oil-indexation in the current context.

Nord Stream: in Pursuit of Long-Term Structural Effects

In this context, Gazprom's declared goal is to restore the integrity of oil-indexed long-term contracts by limiting the purview of the market. To achieve this, Gazprom made only modest concessions on its long-term contracts with some minor customers or enterprises in

which it shares ownership, but resisted any redesign of oil-indexation. As other upstream players have been more flexible, Gazprom's strategy resulted in a loss of market share, while prices stayed high in line with oil prices. This "value maximization" strategy, which is pursued instead of prioritising the enlargement of market share, seems to be somewhat at odds with the ambitious program for export pipeline construction.

This signifies that Nord Stream is not primarily about rapidly increasing market share. This remains a future possibility, but the prime reason for constructing the pipelines is to divert gas flows away from the Ukrainian corridor and to trigger structural effects in the target markets by way of a large investment project. Also, as Ukraine is currently reaping a transit rent from its position as the main transit country for Russian gas, and as subsea transport consumes less fuel gas for transport, Nord Stream may be a more cost-efficient way of transporting gas to the North-Western European market in the long run. This is helped by the fact that Gazprom passed substantial investment costs that are connected to Nord Stream on to EU utilities. But due to its high construction costs, Nord Stream is less efficient than comparable overland routes. Furthermore, additional costs for constructing new storage facilities have to be taken into account, as Ukraine boasts high amounts of storage capacities which have to be substituted if Nord Stream is meant to replace the Ukrainian corridor.

As the expansion of different overland routes, such as Yamal–Europe, would have been more efficient than the subsea pipeline, we are left with the economic explanation of the pipeline being a "strategic investment" aimed at creating a binding effect on consumers, thereby limiting gas-to-gas competition. As the commitment of resources from downstream participants grows with project size, a more expensive project results in a more pervasive and longer strategic effect on target markets and is therefore preferable over a less expensive project from the supplier's point of view. The key is then to get downstream utilities subscribed to the project, despite its non-optimal nature.

In the case of Nord Stream, Gazprom not only succeeded in getting several EU utilities to provide economic resources and take over project risks as shareholders, but also concluded new oil-indexed long-term contracts related to the pipeline. The former limits their economic resources available for diversification, whereas the latter is cementing the oil indexation principle while enlarging subscribed volumes.

The "strategic investment" character of the project is reinforced by the fact that it triggered "adjustment investments" at the infrastructural level in the EU. They are a result of Nord Stream's impact on gas flows in the EU: Significant amounts of natural gas from Russia will now land on the German shore and travel from North to South-West, rather than from East to West. This will leave the gas transit infrastructure of Central Eastern European countries, such as Slovakia, the Czech Republic but also Austria, idling. It thus necessitated knock-on investments in reverse flow capacities from the West to the East. Although not totally redundant from an EU internal market perspective, these investments are consuming economic resources that could have been used more effectively on diversification and interconnections. Not to mention the devaluation of existing pipelines that did not yet reach the end of their economic lifetime. Also, on a regulatory level, Nord Stream is challenging EU market integration legislation, as exemptions from third-party access are vigorously being pursued by the shareholders of the new connecting pipelines, not only via due process, but also by deploying diplomatic and other resources of the Russian state. This has been partly successful in Germany, where one of the two connecting pipelines was granted exemptions from third-party access.

Concerning Ukraine, the Nord Stream project erodes its position as the dominant transit state for the supply of Russian gas to Europe, which helps to enlarge both the bargaining power of Gazprom and the possibilities to use gas as a political tool. Already, Ukraine pays the highest gas price on a netback value and is Gazprom's best consumer, while enjoying only a modest transit rent. But ironically, Russian interest in taking over the Ukrainian gas network, which has been a long-time goal, has been reduced by the advent of Nord Stream: As Nord Stream is designed as a way of bypassing Ukraine, taking over the Ukrainian gas transit system would bring the former into competition with the latter and create incentives to break Nord Stream's ship-or-pay contract, as the Ukrainian corridor is more flexible due to its storage facilities. But breaking the contract would create a huge backlash for Gazprom in the credit markets, which is therefore not likely to occur. Hence, a takeover of the Ukrainian gas transit and storage system is now less likely than before, as it could not be used to its full capacity, with the commitment to Nord Stream being contractually guaranteed.

To sum up, for consumers in the EU Nord Stream is not a good deal, as it fragments rather than integrates the EU's gas market and is strengthening the market power of an already very potent actor. Also, it helps to uphold oil indexation in the EU's gas market, which is not an adequate solution in light of the large differences in the availability of oil and gas resources in general. The first casualties are the EU's gas utilities, which are locked into their dependence on oil indexation and

have to accept negative margins due to the lower spot market price for gas.

German Corporatism and Geopolitics: Why Downstream Actors Cooperated in Nord Stream

The key to understanding the commitment of EU utilities to Nord Stream lies in politics. In Germany, Nord Stream was kicked off by German chancellor Gerhard Schroeder. Schroeder believed that it was necessary to more strongly integrate Germany and Russia, in order to master competition with China and the US. Even if shrouded in economic terms, what he envisaged was essentially a geopolitical and geo-economic alliance between two land-based Eurasian states that would help both of them become stronger economically, and politically. According to the terms of this "modernisation partnership", one (Russia) would provide energy resources, the other (Germany) technologies. Economically, high forecasts for future German gas imports that proliferated in the aftermath of the (first) decision in 2000 to phase out nuclear energy helped to justify the project for the less geopolitically minded. In this light, increased gas imports from Russia seemed inevitable in the eyes of society and policy-makers. At the same time, the dominant German gas importer and transmission system owner, Ruhrgas, was focussed more on economics, which led it to reach a contrasting conclusion that did not envisage a huge growth of the German gas market. It was also less sanguine about Nord Stream, rightly seeing the project as the most expensive possibility to bring gas to the EU.

Nonetheless, the Schroeder government ensured partial political control over the gas industry, which eventually led to compliance: It allowed the acquisition of Ruhrgas by power utility E.ON in 2003, even though the cartel office had voted against the deal as it would unduly distort competition. In return for allowing a "national champion" to emerge, the Schroeder government required E.ON to provide assurances that the new entity would invest to ensure "security of supply". This master-stroke led Ruhrgas to become dominated by an electricity supplier, which, in turn, had to take into account Schroeder's preferences. Thus, in summer 2005, Schroeder and Putin could preside over the signing of a memorandum that foresaw E.ON Ruhrgas's participation in Nord Stream. Even so, E.ON Ruhrgas dragged its feet, but was eventually persuaded by the competition from Gazprom's joint venture on the German market, Wingas, and by reassurances from Schroeder. Although the German gas industry is now suffering from the after-effects of the Nord Stream adventure, the project has proven highly profitable for some other German industries, such as metals and pipe-rolling, and also process engineering firms. This highlights that there is a broader macroeconomic rationale behind the German inclination to align with Russian interests: Through the recycling of petrodollars, Germany, as well as other competitive and industrialised EU states, tend to get compensated for higher energy prices. The German trade balance with Russia has been almost entirely positive throughout the 2000s. In essence, the gas industry has been exploited by Schroeder via a form of a corporatist arrangement to support German heavy industry in its efforts to gain market share in Russia.

Schroeder also organised public credit subsidies for the project, which made its financing a success. 80% of the bank loans for the offshore section are secured by German and Italian credit insurance agencies UFK, Euler Hermes and SACE. As Nord Stream has been financed in project finance mode, only 30% of the offshore pipeline is being financed by shareholders. Gazprom owns 51% of the pipeline, whereas European utilities contributed the rest of investment. The bank loans, which correspondingly provide 70% of financing, are only secured against the future proceeds of the pipeline, while no recourse to the project initiators (Gazprom and other shareholders) is possible. Concerning the onshore sections, Gazprom financed the Russian section on its own (€3.5 billion), whereas the German sections OPAL and NEL are financed by Ruhrgas and the Gazprom/Wintershall joint venture Wingas (€2 billion). The Czech section of Nord Stream, meanwhile, is financed by German utility RWE (€0.5 billion).

Gazprom committed to a ship-or-pay contract (under Swiss law) between itself and the pipeline consortium Nord Stream AG. It obliges the former to ship a certain amount of gas for 22 years and thus guarantees a future revenue stream for the project. While the problem of insufficient storage capacity in the EU persists, this obligation should be relatively easy to fulfill for Gazprom, as it may shift volumes for the German and French markets from the Ukrainian corridor to Nord Stream as long-term contracts are in place. Thus, while Gazprom is committed to bear the whole cost of the project over its lifetime, the risks are distributed across a broad constituency. The distribution of risks and benefits will help to increase the interest of EU utilities in the financial viability of the pipeline, especially when the ship-or-pay contract has expired, thereby rendering additional long-term take-or-pay contracts with Gazprom likely in the future.

South Stream: Same Goal, but Worse Economics

The South Stream project is also aimed at undermining Ukrainian bargaining power as a transit state, and,

similar to Nord Stream, strives to cement Gazprom's market position in the South Eastern European market. However, while Nord Stream may improve transport efficiency relative to the existing route through Ukraine, South Stream will certainly be less efficient than the current transport route through Ukraine, particularly for Gazprom's more important markets. South Stream is also aimed at a concrete competitor—Central Asian gas producers and the Nabucco pipeline—and is thus being advanced with a tighter time-frame in order to realize a greater strategic effect on the competitor. While it lacks the political support of a strong EU state and EU institutions, it draws on the competition of many small peripheral EU members that are vying for proposed future transit revenues.

The key problem for Gazprom is that it will be much more difficult to secure financing for South Stream in international markets, as shipping guarantees are less credible than in the case of Nord Stream. South Stream is much more expensive, and it comes as the second project, adding further capacities which are not covered by long-term contracts. The odds are that Russia may go for state-backed financing of the pipeline, which will mean a large takeover of risks by the Russian state and by Gazprom. In any case, the risks for shareholders will be far greater than in the case of Nord Stream.

If South Stream goes ahead, it will signify the triumph of inefficient mega-projects over the more mundane investment requirements in the Russian gas industry. In addition to ordering a speedy construction of South Stream, Putin is also demanding higher taxes from the gas industry. The price for this "all in one chunk" approach will be paid by European gas consumers and utilities, as well as by Russian citizens and Gazprom shareholders (the least captive of all the actors named here). As the winter of 2011/12 revealed, existing export capacities are more than sufficient, while it is insufficient gas storage capacities in Russia that trigger supply shortfalls regardless of the new pipelines. Thus, Russia's approach, which is prioritising big strategic capital investments that reap quick political dividends and may result in the preservation of high prices and monopolised markets in the future, is overstretching its economic capabilities and leads to gross misallocations of capital. This has already become a manifest threat to Gazprom's reliability.

About the Author

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MAP

Major Russian Gas Pipelines to Europe

Source: Wikimedia Commons, http://en.wikipedia.org/wiki/File:Major_russian_gas_pipelines_to_europe.png, *map created by Samuel Bailey and modified (updated) by the Research Centre for East European Studies*

ANALYSIS

Friction and Reconciliation: the Path of Contemporary Sino–Russia Energy Cooperation

By Li Lifan, Shanghai

Abstract

This article analyses the likely trends and limitations of Sino–Russian energy cooperation. Moscow and Beijing are interested in mutual cooperation on oil and gas. This interest in cooperation is based on common interests for which neither side would have to give anything up. At the same time, a number of restrictions on the development of cooperation exist.

China's energy demand has doubled since 2000 and recently the country overtook the US to become the world's largest energy user, according to the International Energy Agency. Even after three decades of rapid economic growth, during which it became the world's leading exporter and second-largest economy, China continues to import just 10 per cent of its annual oil requirement. That is thanks primarily to vast domestic reserves of coal, which supply 70 per cent of China's energy. At the same time, China's dependence on imported energy has continued to increase. In 2009 China was dependent on foreign oil for more than 50 per cent of its domestic crude oil consumption. Given that in 2020 this proportion is expected to rise to 60% or 70%, China needs to maintain economic cooperation with Russia and other global energy suppliers. Currently, China mainly relies on oil imports from the Middle East and Africa, with nearly 60% of China's imported oil coming from those two places. However, China has sought to diversify its pattern of suppliers, and the parameters of its energy diplomacy can be clearly seen in efforts to strengthen oil and gas cooperation with Central Asia, Russia and ASEAN countries.

In light of the Sino–Russian strategic cooperation partnership, energy cooperation between Russia and China looks set to become an important element of both countries' energy policy. Russia's plan to reorient its energy trade towards the East has taken a leap forward with the start of oil exports through a new pipeline to China. The pipeline, running from Skovorodino in Eastern Siberia to Daqing in Northern China, is an offshoot of a new oil export route that Russia is building to the Pacific Ocean, providing the world's top oil producer with a strategic window on the energy-hungry markets of Asia. When it is completed in 2013, the 4,070km pipeline will be able to carry up to 1.6m barrels of oil a day, about one third of Russia's current exports. Russia began commercial oil deliveries through the new pipeline to China on New Year's Day in 2011 consolidating its energy ties with the world's fastest-growing oil consumer. It is clear that Moscow wants to diversify from its currently European-oriented network—politically as well as economically—and building links with China is the best way to do it.

The Foundations of Russian–Chinese Energy Cooperation: Supply and Demand Potential and Competitive Advantage

Several factors point to Russia–Chinese cooperation in the energy sector as being mutually advantageous: the resource potential of Russian oil and gas, its export capacity and both sides willingness to cooperate.

The potential of Russia's natural resources has been extensively and systematically demonstrated by Russian and foreign experts. According to experts from major research institutions in Russia, the country has proven oil reserves of about 130–160 million tons, accounting for 13% of world reserves. Natural gas reserves stand at around 46.8 trillion cubic meters, accounting for one third of world reserves. One expert from the Russian Ministry of Natural Resources, states that 1300–1360 million tons of oil and gas resources exist in Russia's northern sea, the Barents Sea, Marmara and Karra Sea, which accounts for 66% of all long-term reserves in the Russian continental shelf. It is important for its long-term viability as an energy exporter, however, that Russia does not remain satisfied simply with consuming these existing resources, but also actively tries to find additional resources. To this end, it is both committed to an expansion of a plan for a 200-nautical-mile economic zone on the Arctic continental shelf, and has also continued to seek outside resources for oil and gas from Iraq and from the contract for the Sikurna-2 field in Africa, from which it has received about one billion tons of oil reserves for exploitation. As a major Eurasian power, Russia has also not given up its possessions in Central Asia, where it has access to huge gas and oil resources through geographic advantage. In addition, working actively in other parts of the world with oil and gas reserves-rich countries (such as Venezuela, Algeria and Colombia etc.), Russia has engaged in widespread global oil and gas exploration and exploitation, expanding its own oil and gas resources and opening up new sources.

Russia's strategic concept on energy is called 'Go East'. The plan is to raise the percentage of oil that is exported to China, Korea and other East Asian countries from 3% to 30% by 2020, and from 5% to 25% in terms of natural gas. Within this programme, Russia is trying to build a new cooperative framework between itself and China, as indicated by Russia's construction of an Eastern Siberia–Pacific Ocean oil pipeline as part of its plans to develop its presence in the Asian energy market. Under the Skovorodino–Daqing pipeline agreement, Russia has agreed to supply China with 15 million tonnes of oil (300,000 barrels per day) each year for 20 years in exchange for a loan worth US$25 billion to Russian companies Transneft and Rosneft for the further development of its eastern pipeline and oil fields. Russia is also committed to the development of Eastern Siberia's natural gas resources, something that is dependent on favourable conditions for exporting to China.

Due to its rapid economic growth over the past 10 years, China's energy consumption has been growing rapidly and become more dependent on imports. More than half of the country's petroleum and iron consumption—about 70% of its copper consumption and 64% of its sylvite consumption—now rely on imports. New resources in China, detected in the past 10 years, account for about half of all resources found in the past half century, and the amount of new resources found each year has surpassed annual consumption. However, China will still experience resource bottlenecks in the future. As a big developing country, China must make greater efforts to exploit domestic supplies to ensure energy security, as well as reach out to neighbours rich in natural resources. Energy cooperation with Russia will help quench China's growing thirst for hydrocarbons, and will therefore mean that energy co-operation advances the respective interests of China and Russia. Russia needs money in order to insure itself against the loss of income due to the world economic recession and falling energy prices, and to this end Russia built the Eastern Siberia Pacific Ocean (ESPO) pipeline to expand its eastern market potential, but also to spur the economic development of Russia's Far East. Russia in particular stands to benefit from China's growing energy need given its geographical proximity, and consequently good relations between the two are going to be an important feature of international relations in the near future.

Sino–Russian cooperation in the field of oil and gas has a number of advantages: firstly, the scale and huge potential for cooperation. Cooperation on both sides includes several million tons of oil supply and 10 billion cubic meters of potential demand for natural gas. Secondly, reliability. Both the supply side has enough capacity, and the other party has the money to pay. Thirdly, energy security. For Russia, with large oil and gas resources, it is important that it effectively develops its capability and export markets so that it can benefit from the high economic growth rate that flows from hydrocarbon exports. For China, importing oil and gas from Russia will ensure a relatively stable supplier, and will reduce transportation risks.

The Dilemma of Energy Cooperation Between China and Russia

Although Sino–Russian energy cooperation has great potential, there are also frictions between the two countries that require constant management. The main friction in developing energy cooperation between China and Russia remains both sides firm stance on the terms of contracts, above all on price. In the case of gas contract talks, Russia seems to feel that its negotiating position has been strengthened by Germany's decision to abandon nuclear energy, and the consequent expected increase in Russian supplies to Europe. Russia's efforts to build a gas pipeline to the two Korean states are also part of the negotiations. China, in turn, is putting pressure on Moscow by making more agreements with Central Asian countries (Turkmenistan and Kazakhstan) to increase the supply through the gas pipeline from Turkmenistan.

Also Sino–Russian energy cooperation involves the interests of relevant energy companies and even if the two governments have a strong intention to cooperate, the companies are not necessarily always willing to play along. For Chinese enterprises in the middle of a "going out" strategy aimed at seeking out greater profitability abroad, the difficulties of Russia's investment and financial environment means they may be obliged to undertake "gray swap" deals instead of following an internationally transparent standard and then also face restrictions on local employment. On the other side, Russian companies and government are afraid of China's consumption of Russian resources, and are also fearful of the rising development gap between the two countries.

Russia has acquired a large number of resources and energy companies in Central Asia, such as Russia's Lukoil's agreement with an Uzbek oil company, which will give the Russian firm a controlling stake in Uzbekistan's South-West oil and natural gas fields. Lukoil has succeeded where natural gas exporter Gazprom failed, supplying fuel to China. Gas from Lukoil's fields in Uzbekistan, where output generates more profit per barrel of oil equivalent than Western Siberian crude, is flowing to China under an agreement with its Uzbek partners. Meanwhile, this trend also increases the difficulties for Chinese enterprises in handling their overseas strategy of mergers and acquisitions.

Finally, Russia's long-term suspicion about its relationship with China creates an unfavourable structure of trade between the two countries, with the main principles of their energy cooperation a central problem. The countries have been unable to conclude several years of negotiations on constructing a pipeline and a long-term contract on gas supplies to China because of a dispute over gas prices. Gazprom signed an agreement to signal its intent to supply oil and natural gas to China, but as prices have gone up, the intention of the contract has not been implemented. The absence of a specialized framework for strategic energy cooperation between China and Russia means that such issues cannot be resolved as tidily as they were recently between Russia and Belarus as a result of the special offers made by Moscow after Belarus joined the Russia-led Customs Union.

Conclusion

With conflicts in the Middle East and North Caucasus, Sino–Russian oil and gas cooperation would seem likely to grow, while continuing to face a series of new challenges. China is facing increasingly serious constraints due to growing anthropogenic environmental pressures, which are largely linked to the expansion of coal production and use. Over 80% of all freight traffic in China is coal. As a result, the Chinese leadership are seeking to encourage the redevelopment of their oil and gas industry, including facilitating supply routes from various regions of the world. Against this backdrop, compromise on pricing disputes would appear to be a win-win situation for both Moscow and Beijing, so that Russia can continue to supply much needed oil and gas resources to the Chinese market, while China may open up its internal market allowing Russian energy companies to become involved. Russia needs big oil and gas markets, such as China and the EU, but will face growing challenges from Central Asia, from where it imports oil and gas and has developed commercial interests.

The most optimistic scenario for energy relations between China and Russia is one in which both sides approach this for mutual benefit, coexistence and win-win cooperation. The opposite is a return to the zero-sum politics of the past. The optimistic scenario would develop if trends continue that enable Russian oil and gas investors to further enter the Chinese market as sellers, while China continues to provide FDI to Russia to help develop their natural resources, so that they are then able to sell them to China. In this way, the links between the Russian and the Chinese economies would structurally complement each other.

About the Author

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Eastern Siberia – Pacific Ocean Pipeline

Source: Economic Research Institute for Northeast Asia (ERINA) in Japan. http://www.erina.or.jp/, *published in Russian Analytical Digest 73* (http://kms2.isn.ethz.ch/serviceengine/Files/RESSpecNet/113103/ipublicationdocument_singledocument/723a71fa-c86f-4681-9e0c-2c953cc3a51a/en/Russian_Analytical_Digest_73.pdf), *slightly modified for this issue by the Research Centre for East European Studies*

ANALYSIS

Russian Nuclear Energy in the Wake of Fukushima[1]

By Peter Rutland, Middletown, CT

Abstract

Russia has staked its future as an energy producer and high tech exporter on nuclear energy technology. The accident last year in Fukushima did not change these plans, though rising supplies of cheap natural gas present a viable competitor.

State, Society Clash over Nuclear Policy

The energy sector is central to Russia's economic and political recovery under president Vladimir Putin. Russia is the world's leading producer of oil and gas, and has major assets in coal, hydro and nuclear power. The current energy dynamic in Russia has some serious flaws, since its Soviet-era infrastructure is in need of massive new investment, and the system must transition to a model that is based on prices that take into account market conditions and long-run externalities. The problem is that Russia's political and economic elites have found a way to make the status quo work well—very well—to their own personal benefit.

Russian civil society is not completely inert: it has proved capable of mobilizing over ecological issues, such as Lake Baikal. But the political system provides few opportunities for society to hold officials accountable, and a widespread respect for nature is not matched by a sophisticated culture of risk evaluation and safety consciousness.

The disaster that struck the Fukushima reactors in March 2011 was the most serious nuclear accident since the Chernobyl disaster of March 1996.The significance of Chernobyl as one of the factors leading to the break-up of the Soviet Union is often overlooked. Apart from the economic burden of dealing with the disaster, Chernobyl triggered a wave of protests across the country by citizens concerned about local nuclear sites. This breathed grass-roots life into the top–down glasnost campaign. After Chernobyl, Russia overhauled the safety of its reactors and no new plants were started. In the wake of Chernobyl, two plants then under construction were finished, the 4-unit Balakovo in 1988–90, and a third unit at Smolensk in 1990. After a hiatus in the 1990s, four additional reactors were completed in the 2000s, at Kalinin and Volgodonsk. The anti-nuclear movement is now struggling to gain momentum in the face of a Russian state determined to expand the nuclear industry to meet the energy challenges of the 21st century.[2]

In the Wake of Fukushima

After Fukushima revealed the vulnerability of reactors to the loss of power for their cooling systems, in June 2011 Rosenergoatom announced a $530 million program providing supplementary power and water back-up systems for its reactors.[3] Otherwise, the main impact of Fukushima was to make Russian natural gas more attractive for power generation in Japan and other countries such as Germany, which are newly wary of nuclear power.

However, this favorable development for Russian natural gas has been countered by the explosive arrival of shale gas on the US markets since 2008. This unexpected gas output has led to a radical drop in the price of natural gas in the US and by extension elsewhere, as the US has cut imports of liquefied gas (LNG) and may even build capacity to export LNG to Europe in the future. US customers are now paying $2 per million BTUs, while European customers are paying $11 and Japan is signing LNG contracts at $17.[4] This radical and unforeseen development is likely to undermine Gazprom's pricing policy of long-term, take-or-pay contracts tied to the price of oil. The dawn of a new era of cheap gas poses a particular challenge to the viability of some of Gazprom's new projects, which require drilling in expensive off-shore Arctic or remote Siberian fields.

Even before Fukushima, escalating safety concerns and unresolved environmental issues, including the disposal of spent fuel and radioactive waste, were pushing up construction costs to prohibitive levels. The share of nuclear power in the generation of electricity around the world fell from 18% in 1996 to 13% by 2010. Nuclear reactors can cost $4,000–$5,000 or even $9,000 per kW of installed capacity, versus $1,000 for power stations fueled by natural gas (although the Chinese claim to be able to build reactors for $2,000 per kW).[5] Russia's newest reactor, Kalinin-4, came in below $3,000

1 An earlier version of this paper was presented at Indiana University on 6 April 2012.

2 Alisa Nikulina, "The Russian anti-nuclear movement," *Russian Analytical Digest*, no. 101, 1 August 2011. http://kms2.isn.ethz.ch/serviceengine/Files/RESSpecNet/132291/ipublicationdocument_singledocument/799c98c8-8b61-43a6-a27e-89e6947f88e8/en/Russian_Analytical_Digest_101.pdf

3 http://world-nuclear.org/info/default.aspx?id=366&terms=russia

4 Guy Chazan, "Shale gas: terminal decline no longer," *Financial Times*, 23 April 2012.

5 "Bandwagons and busts," *The Economist*, 10 March 2012.

per kW, while the two new blocs at Nizhnii Novgorod are projected at close to $4,000.[6]

In June 2011 the German government announced it would close the country's 17 nuclear reactors by 2022. Japan is likely to follow suit. Vladimir Putin reacted to Germany's decision with the acid comment "They don't want nuclear energy; they don't want natural gas. Do they want to go back to heating with wood?"[7]

Nuclear power also faces an uncertain future in the US. Only four new plants are currently under construction, in Georgia and South Carolina, where regulators are able to pass the costs straight on to the customer. Nevertheless, it remains an attractive option for rising economies, such as China and India, which are dependent on fossil fuel imports, and which face more immediate environmental problems from their continued dependence on coal as a source of power generation.

Ambitious Development Plans

Currently 16% of Russia's electricity is generated from nuclear power—less than the US, at 20%. Natural gas accounts for 48% of electricity generated followed by hydro (18%) and coal (17%).[8] Russia thus has room to expand its nuclear capacity—and the more electricity is generated from atomic power, the more gas can be exported to European customers.

Russia has 32 nuclear reactors, with 11 more under construction, all under the jurisdiction of the Russian Nuclear Energy Corporation, Rosatom.[9] Much of this capacity was laid down in the 1960s, such that over one quarter of Russia's plants are now beyond their initial 30 year operational lifetime, having been granted 10–15 year extensions. (A similar situation pertains in the US.)

In 2006 the Russian government launched an ambitious plan to spend $55 billion, doubling the country's nuclear power capacity and raising nuclear to 25% of power generation by 2030. This means building two new plants a year from now through 2020. They are also moving ahead with the construction of floating reactors that will power remote mining communities on the Arctic shore and Kamchatka peninsula. The *Energy Strategy 2030* released in November 2009 projects nearly doubling electricity generation capacity from 225 gigawatts (GW) in 2008 to 355–445 GW in 2030.[10] Nuclear capacity would grow from 24 GW in 2010 to 51 GW by 2020. During a visit to mark the opening of the Kalinin-4 plant Putin said the industry was going through a "renaissance,"—but he also had to field complaints that Rosatom no longer has any social funds to provide schools or housing for its workers.[11]

Since 2000 the electricity monopoly RAO EES was prepared for privatization by its head Anatolii Chubais. Regional energy companies were sold off to Russian and foreign buyers, the process being completed in July 2008—just as the global economic crisis shattered the demand projections for investors in these dilapidated generating companies. The main challenge facing investors in the electricity sector is the continuing cross-subsidization of households by industrial customers (and the subsidization of domestic natural gas customers with receipts from foreign sales.) Russian households only pay about 9 cents per kilowatt/hour compared with an EU median of 18.5 cents.[12] Promised annual tariff increases have lagged behind inflation and were repeatedly postponed in the face of successive waves of elections (including the December 2011 Duma election). Nevertheless, regional energy companies in Siberia are investing heavily in power stations linked to giant aluminum smelters.

In March 2008 Rosatom was given a 60% stake in Inter-RAO, the branch of the electricity monopoly RAO EES that handled foreign sales of electricity. Russia is stepping up exports of electricity to China and East Europe. In February 2010 Inter-RAO broke ground on the construction of two reactors in the enclave of Kaliningrad, with a view to exporting the surplus electricity to Poland and Germany. The move was in part a response to the closure of the Ignalina nuclear plant in Lithuania in 2009, which led to concerns of an electricity deficit in the Baltic region.[13] Inter-RAO has tried without success to find an international partner to co-finance the project. Lithuania has its own rival reactor project at Visaginas.[14]

Moscow also sees a lucrative international market for Russian nuclear engineering, which is handled by the Rosatom subsidiary Atomstroyexport.[15] This is one of

6 Based on the reported cost of $3 billion and $8 billion respectively. Vadim Ponomarev, "Atomnyi kart-blansh," *Ekspert*, 16 December 2011; Anna Pavlova, "Dorozhayushchii atom," *Kommersant*, 5 April 2012.

7 Quoted in "Undeterred by Fukushima," *Der Spiegel*, 8 March 2012. http://www.spiegel.de/international/world/0,1518,819452,00.html

8 http://world-nuclear.org/info/default.aspx?id=366&terms=russia

9 The state corporation Rosatom was formed in 2007 on the basis of the previous Federal Nuclear Agency, which had been converted from the Ministry of Nuclear Energy in 2004. The liberal economist Sergei Kirienko has headed Rosatom since 2005.

10 http://www.energystrategy.ru/projects/docs/ES-2030_%28Eng%29.pdf

11 "Prime Minister Vladimir Putin meets with workers of the Kalininskaya nuclear power plant," 12 December 2011. http://premier.gov.ru/eng/events/news/17370/

12 http://www.world-nuclear.org/info/inf45.html

13 The European Union made closure of Ignalina, an RBMK reactor with no containment vessel, a condition of Lithuania's entry to the EU in 2004.

14 Marijus Antonovic, "The Baltic Nuclear Power Plant in Kaliningrad," *Geopolitika*, 3 August 2011. http://www.geopolitika.lt/?artc=4813

15 Ponomarev, 2011.

the few manufacturing sectors in which Russia is still competitive on international markets—the other being arms. Russia is building one in three of all new reactors under construction around the world. Atomstroyexport claims a portfolio of $17 billion worth of orders to build 21 reactor units in China, India, Bangladesh, Belarus, Vietnam, and of course Iran, where the Bushehr reactor is ready for start-up.[16] Ten of these contracts were added in the past year.

Back in 2009 Germany's Siemens had cut its ties with France's Areva and instead announced its intention to partner with Rosatom to build reactors in developing countries. But in September 2011, in the wake of Germany's decision to give up nuclear power, Siemens withdrew from the Rosatom partnership.

For uranium to fuel the dozens of new domestic and international reactors, Rosatom had to look beyond domestic sources, which account for just 10% of the global supply. In the past two years Rostatom has spent $2 billion purchasing uranium deposits in Kazakhstan, Tanzania, and elsewhere, mainly through its acquisition of a controlling stake in the Canadian company Uranium One by its subsidiary ARMZ. The International Uranium Enrichment Center at Angarsk takes in radioactive waste from other countries that lack their own facilities and processes it for re-use in reactors. Russia now accounts for 40% of the global enrichment market.

Rosatom's export strategy suffered a blow in March 2012 when the Bulgarian government announced it was terminating the nuclear plant at Belene. Construction of a VVER reactor at the site had been halted in 1990, and only in 2008 did Rosatom win a contract to complete the project. Bulgaria had invested close to $1 billion in Belene, and will have to compensate Rosatom for its outlays, another $150 million. The Bulgarians concluded it was more cost-effective to build a new gas-fired power plant—using gas that will be imported from Russia. (Bulgaria is backing the planned South Stream pipeline across the Black Sea.) Apart from cost considerations, safety concerns are causing problems at some Rosatom projects. In October 2011 protestors managed to halt work at Rosatom's Koodankulam site in Tamil Nadu, at the southern tip of India. The first of the two reactors there may become operational at any time.

Most of Russia's 32 reactors utilize the VVER pressurized water design technology. Experts believe that the RBMK type reactor, the sort that exploded at Chernobyl, is seriously flawed in that it relies on a graphite moderator and water coolant, increasing the chances of meltdown if the coolant leaks, particularly since it lacks a containment vessel. All 11 RBMK reactors in Russia (clustered at three locations) are still in operation, though they are due to be closed down by 2024. (They are all past their initial 30 year projected lifespan.) The European Union has insisted that RBMK reactors be shut down in Ukraine and Lithuania.

In Russia there was a protracted debate over whether to spend an additional $1–2 billion to complete the Kursk-5 RBMK reactor, which is 70% finished. On the eve of the Fukushima anniversary, on March 1, 2012, Rosatom announced that the plant will be abandoned—a signal victory for the environmentalist movement.[17]

Russia is a leading source of greenhouse gases and was a passive spectator to the Kyoto Protocol. It finally joined in 2004, but the fact that its emissions were locked in at 1990 levels, before the 1990s deindustrialization radically cut Russian emissions, meant that this was an empty gesture. It would not obligate Russia to curb emissions, and would allow Moscow to profit from the sale of unused carbon credits. Russia is one of the few countries that sees itself as standing to gain from climate change, from a longer growing season to an Arctic maritime trade route to Asia. With Russia on the brink of joining the WTO, it will be crucially important to get Moscow involved as a leader and not just an opportunistic bystander in tackling climate change.

Conclusion

Russia sees the expansion of nuclear power as part and parcel of its aspiration to the status of an energy superpower. Constructing new reactors at home and abroad frees up natural gas for lucrative export and may reverse the shrinkage of Russia's high-tech manufacturing base. The accident at Fukushima has not made a dent in this national industrial strategy. However, the current slump in global natural gas prices poses a serious challenge.

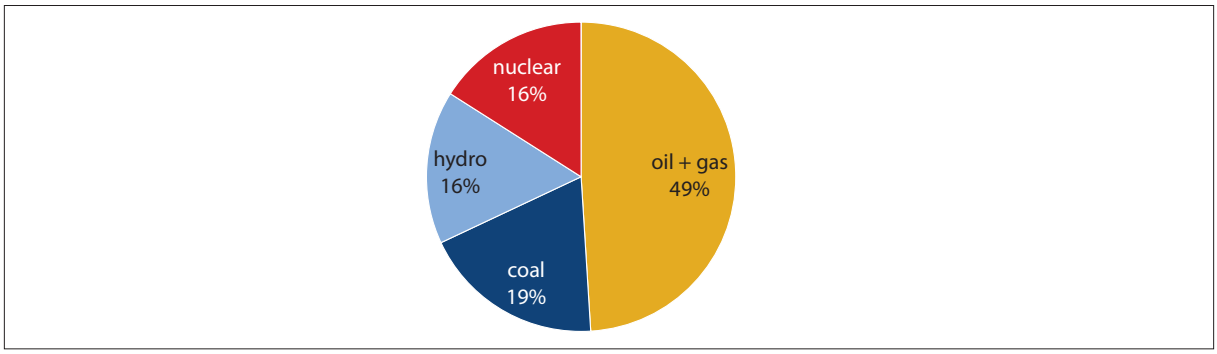
About the Author
Peter Rutland is Professor of Government at Wesleyan University.

16 Sergei Kirienko press conference, 23 March 2012. http://www.rosatom.ru/
17 Vadim Ponomarev, "'Fukusimy' v Kurske ne budet," *Ekspert*, 7 March 2012.

STATISTICS

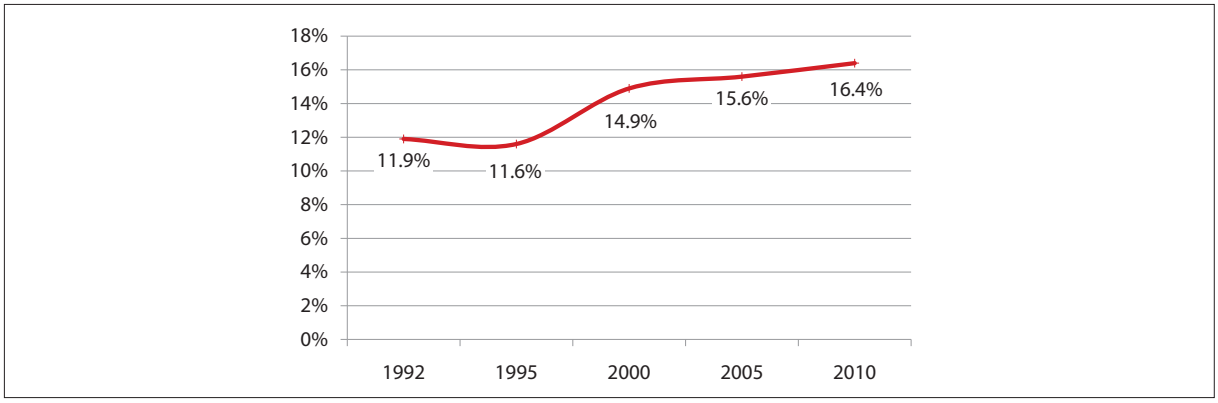
Nuclear Energy in Russia

Figure 1: Electricity Production by Source (share in %)



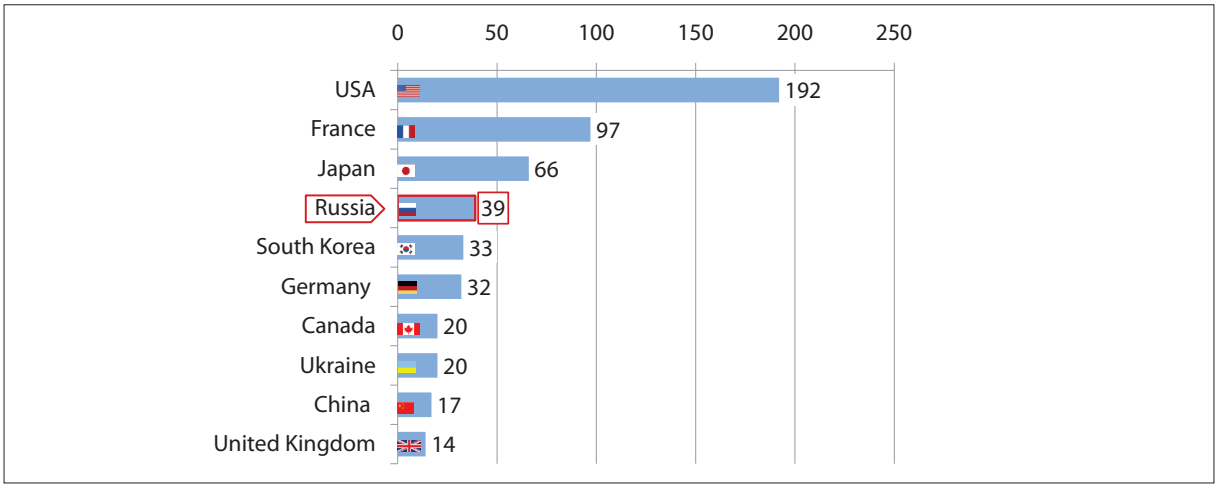
Source: International Energy Agency, http://www.iea.org/stats/electricitydata.asp?COUNTRY_CODE=RU

Figure 2: Share of Nuclear Energy in Russian Electricity Production (in %)



Source: Rosstat (Russian State Agency for Statistics), http://www.gks.ru/free_doc/doc_2011/rusfig/rus11.rar

Figure 3: World's Ten Biggest Consumers of Nuclear Energy (mtoe, 2010)



Source: BP Statistical Review of World Energy 2011, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/pdf/nuclear_energy_section_2011.pdf

Table 1: Operational Nuclear Power Stations in Russia

Reactor	Type V=PVR	MWh/year	Location	Connection to grid	Operating time in years (until 06/11)	Planned shutdown
Balakovo 1-4	V-320	988	Saratov	05/1986, 01/1988, 01/1989, 12/1993	25, 23, 21, 17	2015, 2017, 2018, 2023
Beloyarsk 3	BN600 FBR	560	Sverdlovsk	11/1981	29	2025
Bilibino 1–4	LVGR EGP-6	11	Chukotka Autonomous Okrug	04/1974, 02/1975, 02/1976, 01/1977	37, 36, 35, 34	2019–21
Kalinin 1–2	V-338	950	Tver Oblast	06/1985, 03/1987	26, 24	2014, 2016
Kalinin 3	V-320	950	Tver Oblast	12/2004	6	2034
Kola 1–2	V-230	432, 411	Murmansk	12/1973, 02/1975	37, 36	2018, 2019
Kola 3–4	V-213	411	Murmansk	12/1982, 12/1984	28, 26	2026, 2014
Kursk 1–2	RBMK	971	Gebiet Kursk	10/1977, 08/1979	33, 31	2021, 2024
Kursk 3–4	RBMK	925	Gebiet Kursk	03/1984, 02/1986	27, 25	2013, 2015
Leningrad 1–2	RBMK	925, 971	St. Petersburg	11/1974, 02/1976	36, 35	2018, 2020
Leningrad 3–4	RBMK	925	St. Petersburg	06/1980, 08/1981	31, 29	2024, 2025
Novovoronezh 3–4	V-179	385	Voronezh	06/1972, 03/1973	39, 38	2016, 2017
Novovoronezh 5	V-187	950	Voronezh	02/1981	30	2035, after major overhaul
Rostov 1	V-320	990	Rostov Oblast	03/2001	10	2030
Rostov 2	V-320	990	Rostov Oblast	03/2010	1	
Smolensk 1–3	RBMK	925	Smolensk Oblast	09/1983, 07/1985, 01/1990	27, 25, 21	2028, 2015, 2020
Total: 32 reactors	**Total output: 23,084 MWh**			**Average operating time: 27.4 years**		

V-320 is the basic model, usually VVER-1000; V-230 and V-213 are usually VVER-440; V-179 and V-187 are prototypes. Rostov was formerly known as Volgodonsk.

Sources: World Nuclear Association: Nuclear Power in Russia, http://www.world-nuclear.org/info/inf45.html *and International Atomic Energy Agency IAEA: Power Reactor Information System (PRIS),* http://www.iaea.or.at/programmes/a2/*, download on 23 June 2011.*

Table 2: Nuclear Power Stations Under Construction in Russia

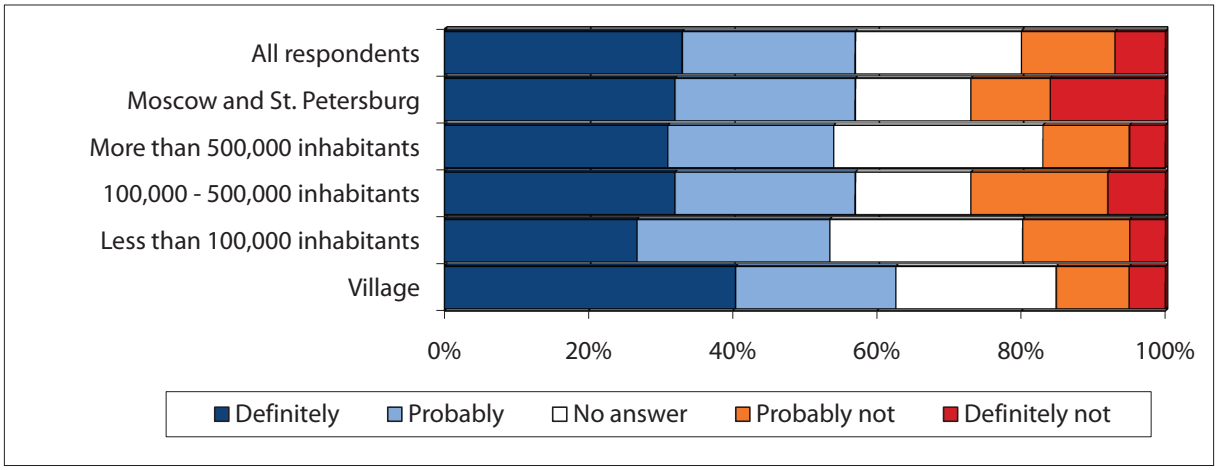
Reactor	Type	MWh/year	Location	Start of construction	Planned date of connection to grid
Akademik Lomonosov 1–2	PVR	32	Kamchatka	15 Apr. 2007	01.12.2013
Beloyarsk-4 (BN-800)	FBR	804	Sverdlovsk	18 July 2006	
Kalinin-4	PVR	950	Tver Oblast	01 Aug. 1986	
Kursk-5	LVGR	915	Kursk Oblast	01 Dec. 1985	
Leningrad II-1, II-2	PVR	1085	St. Petersburg	10/2008, 04/2010	
Novovoronezh II-1	PVR	1114	Novovoronezh	24 June 2008	31.12.2013
Novovoronezh II-2	PVR	1114	Novovoronezh	12 July 2009	
Rostov-3, 4	PVR	1011	Rostov Oblast	09/2009, 06/2010	
Total: 11			**Total output: 9,153 MWh**		

Rostov was formerly known as Volgodonsk, construction of reactor blocks 3 and 4 was initiated as early as 1983, but was postponed indefinitely and hardly progressed until renewed initiation of construction.
Sources: World Nuclear Association: Nuclear Power in Russia, http://www.world-nuclear.org/info/inf45.html *and International Atomic Energy Agency IAEA: Power Reactor Information System (PRIS),* http://www.iaea.or.at/programmes/a2/*, download on 23 June 2011.*

OPINION POLL

Russian Attitudes on Nuclear Energy

Figure 4: Germany is planning to shut down all nuclear power stations within the next ten years and to switch to other sources of energy. If Russia were to make the same decision, would you support this decision or not? (June 2011)



Source: representative opinion polls by VTsIOM 11–12 June 2011, http://old.wciom.ru/novosti/press-vypuski/press-vypusk/single/111693.html

ABOUT THE RUSSIAN ANALYTICAL DIGEST

The Russian Analytical Digest is a bi-weekly internet publication jointly produced by the Research Centre for East European Studies [Forschungsstelle Osteuropa] at the University of Bremen (www.forschungsstelle.uni-bremen.de), the Center for Security Studies (CSS) at the Swiss Federal Institute of Technology Zurich (ETH Zurich), the Resource Security Institute, the Institute of History at the University of Zurich (http://www.hist.uzh.ch/) and the Institute for European, Russian and Eurasian Studies at The George Washington University. It is supported by the German Association for East European Studies (DGO). The Digest draws on contributions to the German-language Russland-Analysen (www.laender-analysen.de/russland), the CSS analytical network on Russia and Eurasia (www.res.ethz.ch), and the Russian Regional Report. The Russian Analytical Digest covers political, economic, and social developments in Russia and its regions, and looks at Russia's role in international relations.

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Resource Security Institute
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